Model Decentralized Wastewater Practitioner Curriculum

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These educational materials can also be accessed online in PDF format at this website:

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Additionally, the source materials of this adaptation are the collective effort of individuals from academic, regulatory, and private sectors of the onsite/decentralized wastewater industry. The source materials were peer-reviewed and represent the current state of knowledge/science in this field. They were developed through a series of writing and review meetings with the goal of formulating a consensus on the materials presented. The source materials do not necessarily reflect the views and policies of North Carolina State University, and/or the Consortium of Institutes for Decentralized Wastewater Treatment (CIDWT). The mention of trade names or commercial products does not constitute an endorsement or recommendation for use from these individuals or entities, nor does it constitute criticism for similar ones not mentioned.

Citation of these Materials

The educational modules should be cited in the following manner as appropriate. Note that the documents in each module also include a specific citation.

Hoover, M. T., N.E. Deal, J. Anderson, D. Gustafson, D. Lenning, J.M. Mooers, D. L. Lindbo, and T. Loudon. 2005. Model National Curriculum. *in* (D.L. Lindbo and N.E. Deal eds.) Model Decentralized Wastewater Practitioner Curriculum. National Decentralized Water Resources Capacity Development Project. North Carolina State University, Raleigh, NC.

Lindbo, D.L., M. Stolt, R. Miles, D. Mokma, S. Greene, and M. Hoover. 2005. Soil and Site Evaluation Module *in* (D.L. Lindbo and N.E. Deal eds.) Model Decentralized Wastewater Practitioner Curriculum. National Decentralized Water Resources Capacity Development Project. North Carolina State University, Raleigh, NC.

Anderson, J., D. Gustafson, A. Amoozegar, and D.L. Lindbo. 2005. Water Movement and Soil Treatment Module. *in* (D.L. Lindbo and N.E. Deal eds.) Model Decentralized Wastewater Practitioner Curriculum. National Decentralized Water Resources Capacity Development Project. North Carolina State University, Raleigh, NC.

Lenning, D., T. Banathy, D. Gustafson, B.J. Lesikar, S. Wecker, D. Wright. 2005. Technology Overview Module. *in* (D.L. Lindbo and N.E. Deal eds.) Model Decentralized Wastewater Practitioner Curriculum. National Decentralized Water Resources Capacity Development Project. North Carolina State University, Raleigh, NC.

Loudon, T.L., T.R. Bounds, J.C. Converse, T. Konsler. 2005. Septic Tanks Module *in* (D.L. Lindbo and N.E. Deal eds.) Model Decentralized Wastewater Practitioner Curriculum. National Decentralized Water Resources Capacity Development Project. North Carolina State University, Raleigh, NC.

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Abstract

The Project Team developed a model decentralized wastewater field practitioners training curriculum for use throughout North America. The curriculum consists of a series of noncredit short courses organized similar to a college curriculum. The primary topics that the curriculum addresses are:

1. Onsite and decentralized planning issues
2. Onsite wastewater technology
3. Soil and site evaluation
4. Design and engineering
5. Installation and inspection
6. Operation, monitoring and maintenance
7. Troubleshooting and repair
8. Rules and regulations

High priority subtopics in 4 areas of this curriculum were selected for full development of detailed training modules including trainer's guides and audio-visual educational materials. These basic foundations of the curriculum are: 1) soil and site evaluation, 2) water movement and treatment in soils, 3) decentralized technology overview and 4) septic tanks. Through this project a web site was developed to facilitate the development, assessment and electronic delivery of these training materials and their distribution to trainers who will deliver the training to the end-users.

Introduction

Onsite wastewater treatment systems that serve individual homes and businesses along with clustered wastewater treatment systems that treat wastewater from multiple facilities at nearby communal treatment and drainfield areas have been jointly termed "decentralized" wastewater treatment systems. These have been contrasted to "centralized" systems that provide for collection of wastewater from entire large communities and/or regional areas followed by treatment and disposal at one location. The decentralized concept urges treatment, proactive management, reuse and recycling to the maximum practical extent as close to where the wastewater is generated as possible. Thereby, the decentralized approach eliminates the costs, disruptions, environmental hazards and land use influences of a conveyance system that moves pollution from place to place. Decentralized technologies are used by about 25% of the population across the U.S. Additionally, 35% to 40% of new development uses decentralized technologies. While the use of decentralized systems varies from state to state, it can be quite extensive locally.

The effect of poor implementation of all aspects (from siting to design to installation to maintenance) of decentralized wastewater concepts by field practitioners can result in negative public health and environmental consequences. Many wastewater professionals are inadequately educated regarding the use of decentralized wastewater treatment strategies. Some of these individuals attempt to further educate themselves through attendance at workshops in decentralized subjects. This project provides extensively reviewed, nationally accepted training materials to enhance the training opportunities for field practitioners. The overall goals of the project are to elevate the decentralized wastewater treatment approach into the main stream by coordinating the expertise from the broad knowledge base of academic and advisory Consortium delegates, to develop a draft model curriculum for training practitioners, to provide four high-quality, peer-reviewed, electronically-based, practitioner training modules and to establish an enhanced communications network.

The central concept of the materials developed in this proposal follows the model developed by the Northwest Onsite Training Center in the state of Washington. This Center was the first to develop a curriculum of short courses that offer training opportunities for practitioners from the novice to the experienced professional. Washington's curriculum is organized similar to a college curriculum. Classes (short courses) begin with the basics and build one upon the other into more advanced courses in each topical area. The courses are organized into topical subject matter areas, described in a curriculum catalog and numbered as college courses are (to express the relative course difficulty). The course description includes a list of prerequisites needed to successfully complete each succeeding short course. The specific core areas that Washington utilized have been modified through evaluation and expansion of the training curricula utilized by North Carolina State University, University of Rhode Island, Texas A&M University, University of Minnesota, Michigan State University and other training centers and programs. The culmination of this effort is the development of a Model Curriculum that is discussed in Chapter 5.

In addition to a Draft Model Practitioner Curriculum, four modules have been fully developed. These high priority subtopics were selected for full development of detailed training materials including an instructor guide, suggested course outlines, text, and PowerPoint presentations. These basic foundations of the curriculum are: 1) soil and site evaluation, 2) water movement and treatment in soils, 3) decentralized technology overview and 4) septic tanks. Through this project a web site was developed to facilitate the development, assessment and electronic delivery of these materials and their distribution to personnel who will deliver the training to the end-users. The specifics of these materials are discussed in their respective chapters.

Use of Curriculum Materials for Practitioner Training

Each module in the Practitioner Curriculum contains specific information on using the materials. From an overall perspective, the following information is offered to potential users:

Considering the nature of the subject of onsite/decentralized wastewater treatment, it is important that training be a cooperative effort among academic, extension, regulatory and private industry partners. Such collaboration offers opportunities for effective delineation and communication of training objectives and offers different personnel the opportunity to express concerns and clarify technical information.

Because the bulk of the materials are presented in PowerPoint format, instructors should have at least a rudimentary grasp of its use and manipulation. This enables one to not only add and subtract photos of local/state/regional particulars, but also to expand upon the notes pages already included in the presentations.

As with all practitioner training, the instructor must have a firm grasp on the nature of their audience in order to present the appropriate level of detail and target key issues for emphasis. This provides a point of beginning when choosing which materials to present. Additionally, the available time and resources that an instructor has will influence their use of these training tools.

The availability of a field site where technologies can be viewed and/or operated will enhance the training experience when using the *Technology Overview* and *Septic Tanks* modules. For septic tanks, a visit to a tank manufacturing yard is a valuable experience for participants. In situations where field sites and training centers are unavailable, instructors have other options. These include bringing small system components into the classroom and using video segments of larger components to cover the topics. The *Soils and Site Evaluation* and *Water Movement and Soil Treatment* modules would, likewise, be enhanced by outside activities that illustrate key points in the materials. Barring this option, video presentations, soil monoliths and scale model demonstrations can still provide an effective means of conveying concepts related to soils.