Whitepaper on the Statewide Code for On-site Wastewater Treatment

On January 20, 2004, Governor Jennifer M. Granholm, in a special message to the Michigan legislature, unveiled a comprehensive plan to protect the waters of the state. One component of this plan is the development of a statewide code for on-site wastewater treatment. The Department of Environmental Quality (DEQ) has been asked to provide leadership in developing a code and assemble a task force to formulate potential legislation. Twenty six organizations representing a variety of interests involving the on-site wastewater industry were invited to name a representative to serve on the task force. The first meeting of the task force was held on March 2, 2004. Over a two month period, the task force discussed what critical issues needed to be addressed in the proposed code. This whitepaper represents consensus among the task force as to the critical issues and how to resolve them.

Background

It is estimated that there are over 1.2 million on-site wastewater systems in Michigan that generate 264 million gallons of liquid waste per day. Included in this total, it is estimated that there may be in excess of 30,000 commercial and community subsurface disposal systems treating sanitary wastewater with flows up to 10,000 gallons per day. Data supplied by the Michigan local health departments (LHDs) confirm that approximately 33,000 individual permits are being issued yearly for new and replacement on-site wastewater treatment systems. Whereas in 1990, it was suggested that approximately 28 percent of Michigan housing units were served by on-site systems, data now suggests that over 50 percent of new single family homes utilize on-site wastewater systems. The reliance on on-site wastewater systems to serve as the permanent means for wastewater treatment will continue to expand.

Historically, in Michigan as well as nationally, on-site systems were viewed as temporary solutions subject to failure eventually to be replaced by public sanitary sewers. Today's attitude is that on-site wastewater systems can serve very successfully as the permanent and appropriate solution. In the1997 USEPA "Response to Congress on Use of Decentralized Wastewater Treatment Systems" it concluded that "Adequately managed decentralized wastewater treatment systems are a cost-effective and long term option for meeting public health and water quality goals, particularly in less densely populated areas." This vision is also shared in Michigan.

Given reductions in state and federal grant and loan programs supporting the expansion of municipal sewer systems, the ability of local governments to extend sewer service to new areas has been significantly curtailed since the 1970's. Additionally, many local zoning ordinances and master plans do not anticipate extensive expansion of municipal wastewater collection and treatment systems. Clearly, on-site systems are not only a major component of the current wastewater treatment infrastructure in Michigan, but will continue to serve an important function in the treatment of sanitary sewage in the future. While the vast majority of the systems installed continue to function problem free over an extended time period, the inevitable failure of older systems will occur and as the availability of building

sites that meet conventional site suitability standards decline, alternative treatment system requests will increase.

Implementation of a major change in regulatory approach will take time and will need to be done incrementally. There are on-going efforts by professionals and regulators across the nation to bring soil based on-site and decentralized wastewater treatment systems into the mainstream of our wastewater infrastructure. The design and management of centralized systems is on a performance basis and it is widely recommended that soil based systems also be managed on a performance basis considering the varying environmental sensitivity of dispersal sites and using a risk based approach.

For decades LHDs have overseen the installation of on-site sewage systems. Local codes have been adopted that incorporate sound public health principles designed to assure sewage is disposed of in a manner that protects human health and the environment while still recognizing local variations in soils, geology and community standards. At the present time, approvals for wastewater systems serving single and two family dwellings fall under the jurisdiction of LHD sanitary codes. Of the 44 LHD jurisdictions, 39 operate under their own separate set of regulations for on-site wastewater systems. There are 5 jurisdictions in the Upper Peninsula that utilize a common code. All of these codes vary considerably as to the requirements for on-site wastewater systems and administration.

Current state rules and guidelines which relate to on-site wastewater systems include DEQ's "Michigan Criteria for Subsurface Sewage Disposal" and administrative rules "On-site Water Supply and Sewage Disposal for Land Divisions and Subdivisions" are available. The Michigan Criteria apply to other than single and two family home systems with flows up to 10,000 gallons per day which receive sanitary wastewater. Administrative rules apply to all proposed subdivision lots, site condominium units and also to other land divisions. These programs are conducted by authorized LHDs with DEQ oversight.

Although Michigan is the only state without specific state enabling legislation related to on-site wastewater treatment systems, these systems are well regulated. Across Michigan, the overall combination of local codes and state criteria has resulted in an effective, but non-uniform, prescribed system of regulatory control over conventional septic tank and drain field siting, design, and construction, providing for baseline protection of public health and the environment. For the most part, codes and criteria have served well to meet the primary goal of protecting public health through direct human contact with sewage by assuring standards that keep sewage below the ground surface. Emphasis, however, has not routinely been placed on assuring that systems perform to a treatment standard that results in necessary protection for groundwater and surface waters based upon risk. The current regulatory structure lacks clear consistent direction related to education of the user, operation and maintenance, consideration of alternative treatment technologies, approval of proprietary products, and the necessary training and qualifications of practitioners. Enabling legislation should provide a framework that promotes long term

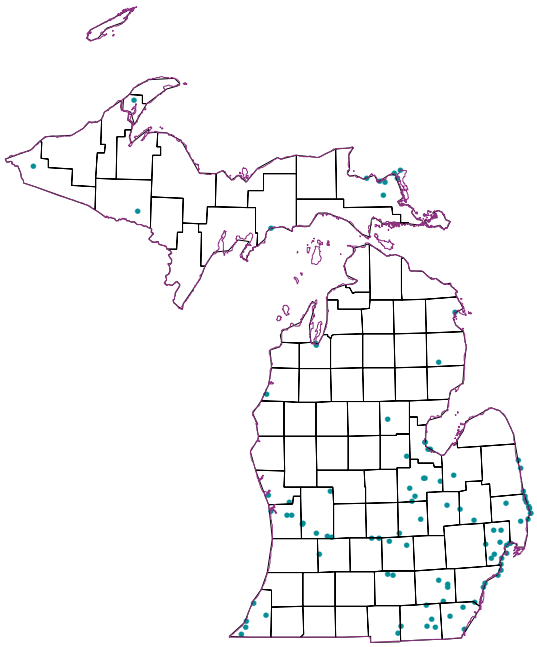
performance of on-site systems that protect public health and the environment for future generations.

Our understanding of soil treatment and the availability of advanced treatment technologies make it possible to properly treat and dispose of wastewater in many soils that are unsuitable for conventional septic systems. Proper use of these treatment technologies will require properly trained soil evaluators, system designers, regulators, and system service providers along with effective management programs. Available technologies must be evaluated and approved for Michigan conditions. Advanced treatment technology requires periodic maintenance that must be done to assume continuing performance. Effective management programs designed to assure proper maintenance must be in place before we begin to use these technologies. Implementation of changes in the way Michigan utilizes and regulates on-site wastewater treatment can best be done by adopting a uniform, well conceived statewide approach.

Amendments to the federal Coastal Zone Management Act in 1990 encouraged coastal states to develop programs specifically addressing coastal non-point source pollution and seek federal approval of the programs from the National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency (EPA). Section 6217, Coastal Non-point Source Programs (Section 6217) is subject to joint federal oversight by the NOAA Coastal Zone Management Program and the EPA Section 319, Non-point Source Program. Michigan is working toward full approval of our Section 6217. It should be noted that under Section 6217, Michigan must meet specified requirements to receive federal funding and to avoid program sanctions. Michigan receives approximately $2.9 million in federal funds annually, and nearly $1.6 million is passed through as cost-share grants to coastal communities and non-profit organizations. Michigan's Section 6217, does not have full federal approval. This means that there are outstanding conditions/ management measures that we have not met. One of the biggest hurdles to getting full Section 6217 program approval is the lack of a statewide sanitary code addressing septic tanks and other on-site disposal systems. Had Michigan's program been fully approved in the last fiscal year, the state would have received $275,000 in bonus federal funding.

Michigan's surface waters are monitored at some frequency for Escherichia coli (E. coli) and meet a defined standard. For those water bodies in non-compliance with the standard, corrective action through a Total Maximum Daily Load (TMDL) program is initiated. Further review of water bodies under this program has revealed untreated sewage discharges. In addition, many LHDs monitor bathing beaches for E. coli. While it may be difficult to attribute the water quality to failing on-site wastewater systems, they do play a role in affecting water quality. The figure below shows sample locations where the waters of the state are considered to be "impaired."

Impaired Waters Sample Locations



Nationally, in 1998, states reported in their Clean Water Action 303(d) reports that designated uses were not being met for approximately 5,400 water bodies because of pathogens and that 4,700 water bodies were impaired by nutrients. On-site wastewater systems are cited as significant contributors to these violations.

State and national level attention has also been focused on illicit discharges from on-site systems via the USEPA National Pollutant Discharge Elimination System (NPDES) Phase I and Phase II municipal separate storm sewer (MS4) program. Program requirements include illicit discharge detection and elimination, with on-site wastewater systems being included in sources of illicit discharges. Pollutant levels in illicit discharges including those from on-site systems have been shown in EPA studies to be high enough to significantly degrade receiving water quality and human health. In Michigan over 300 cities villages and townships located in urbanized areas predominantly in the southern Lower Peninsula are presently subject to program requirements.

Point-of-sale programs have been established in Benzie, Washtenaw, Wayne, Macomb, Shiawassee, and Ottawa counties. Although statewide data is not available, point-of-sale programs that are presently being conducted by these LHDs have confirmed that a significant number of existing systems are failing or deficient. Data provided by two LHDs is shown below. It should be noted that the definition of failure varies somewhat from jurisdiction to jurisdiction however the data suggests the importance of managing performance of systems after construction. It was suggested that a definition of a failed system be included in the enabling legislation.

Washtenaw County
Time of Sale-Historical Comparisons

Year	# of Evaluations	% Failure
2003	807	18 %
2002	881	20%
Overall (since 2000)	**3451**	**17%**

Wayne County
Transfer Evaluation Summary
(February 2000- December 2003)

Year	# of Evaluations	# of Failures	% Failure
2000	108	22	20.37%
2001	100	32	32.0%
2002	121	31	25.6%
2003	112	31	22.67%
Totals	**441**	**116**	**26.30%**

Legislative Authority

Section 3103 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, delegates authority to the DEQ to "protect and conserve the water resources of the state," and to control "pollution of surface or underground waters…which are or may be affected by waste disposal of any person." The DEQ has since promulgated administrative rules under Section 3103 that regulate the discharge of wastewater to groundwater. These rules are referred to as the Groundwater Discharge Rules (Part 22 – Groundwater Quality).

The Water Resources Commission (since abolished under Executive Order 1991-31) recognized that all LHDs through their sanitary codes would be responsible for the issuance of permits pertaining to wastewater discharges at private, single and two-family residences. Section 2435 of the Public Health Code, 1978 PA 368, as amended, allows LHDs to "adopt regulations to properly safeguard the public health and to prevent the spread of diseases and sources of contamination." To accomplish this, all LHDs have sanitary codes that address permitting requirements for on-site wastewater systems, which are intended to safeguard public health and the environment.

Issues and Intent

As the risk of on-site failures increases due to such factors as site conditions, wastewater flows, increased population density, system complexity, and aging on-site systems, proper management of systems becomes more critical if the risk to

public health and the environment is to be minimized. The theme that the task force pursued in recommending a statewide code is to build upon the existing state-local partnership through the development of a performance based framework that maintains the local decision making structure. Guidance and leadership from the DEQ in developing and implementing that framework is crucial if Michigan is to achieve consistency in the design, construction, operation, and maintenance of on-site systems across the state.

The task force addressed seven major issues that included the following:

1. Legislative structure of the code
2. Licensing/certification, continuing and public education
3. Regulatory structure/range of authority
4. Site suitability and design standards
5. Operation and maintenance
6. Financial

Details and the subsequent discussions of each issue are described in the following paragraphs.

Legislative structure of the code

The discussion focused on the structure of the proposed legislation and whether rule making authority by the DEQ, should be included. One possibility that was discussed included dividing the enabling statute into parts that would be introduced as separate bills. Each part would have its own funding component. One of the drawbacks of this approach is if only certain parts of the code were enacted; full funding of the program could be impacted. In light of information that indicated the DEQ can have the authority to promulgate administrative rules, the direction agreed upon by the task force was there would be one enabling statute, with the code details such as design criteria, contained in administrative rules. Any fees required as part of the code would be described in the enabling legislation. The statewide code should be sprawl neutral.

Licensing/certification, Continuing and Public Education

The task force agreed that having qualified individuals that design, inspect, install, provide maintenance, and regulate on-site wastewater systems is necessary to adequately protect both public health and the environment from improperly operating systems. Considerable discussion regarding the system owner's responsibility concluded that educating this individual as to proper operation, care and maintenance is also a critical component.

The task force recommended that a credentialing program be included in the statute both for the private and regulatory sectors. For the private sector, the designer, inspector, installer, and maintenance provider should be required to hold a license or certificate with a continuing education requirement as a measure of continuing competence. A license would be obtained by meeting minimum standards with

respect to both education and experience and successfully passing a written exam. Only those individuals licensed or certified would be able to practice in the associated field. The DEQ would administer the certification and training programs.

For the regulators working within the on-site program, an alternate process to assure that state and LHD staff have the necessary knowledge and skills covering the broader range of all areas of the on-site wastewater program should be considered. Educational and experience qualifications could be established by minimum program requirements with oversight by the DEQ through the LHD accreditation program. This process could be modeled after the food service sanitation training program which requires each LHD jurisdiction to employ a standardized trainer with structured requirements for training of new employees as well as continuing education.

Educating the public about the use, operation, and maintenance of both a new and existing on-site system is also an essential component. The DEQ will also make available to owners of on-site wastewater systems, materials for proper operation and maintenance.

Regulatory Structure and Range of Authority

The current regulatory structure for on-site wastewater systems involves a partnership between DEQ and LHDs that should serve as a framework in proposed legislation. There is a defined need for the DEQ, via statutory authorization, to assume a greater leadership role that provides for scientifically based comprehensive management of on-site wastewater treatment systems. The LHDs will continue to assume a critical role in carrying out the overall management within their respective jurisdictions, subject to state oversight and guidance.

With respect to the regulatory framework, it is critical that the statute clearly define the stated purpose of protecting public health and the environment. Rather than attempting to address specific technical issues within the statute, it was agreed that the enabling statute should define and limit specific rule making authority. Administrative rules are the preferred means of addressing technical requirements in a flexible manner so long as the enabling legislation contains provisions that yield predictable results. It would be anticipated that the rule making process would be an on-going effort over time with the need for certain issues being of higher priority than others. The concept of a rule development advisory committee to the DEQ was given general support by the task force. There was also support for the enabling legislation to establish a separate technical review committee to advise the DEQ in the areas of new product/technology, development, and approval and other related matters.

There was consensus that enabling legislation should apply to all soil based systems which utilize subsurface dispersal, regardless of flow including both conventional and alternative systems. This is a departure from the current structure which typically has placed an upper flow limit of 10,000 gallons per day for subsurface systems with certain specific exceptions. To initiate this recommendation would require a rule

modification to the Part 22 Groundwater Quality Rules. Definitions for conventional and alternative systems receiving general support were as follows:

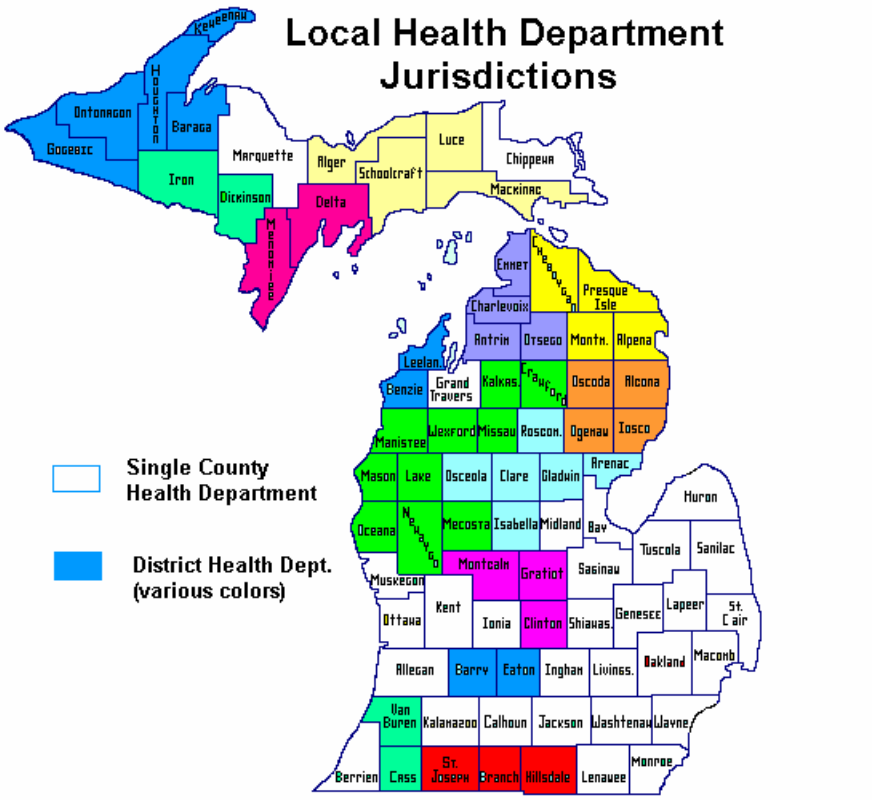
> **Conventional system** - means an on-site sewage treatment and disposal system that contains a watertight septic tank with non-uniform distribution of effluent to subsurface soil trenches or an absorption bed.
>
> **Alternative System -** means a treatment and disposal system that is not a conventional system and provides for an equivalent or better degree of protection for public health and the environment, either through uniform distribution of effluent to the final disposal system, enhanced treatment prior to final disposal or combinations thereof.

Overall regulatory structure represents a partnership between DEQ and the LHDs. LHDs would be provided specific authority over a range of system types and flows based on their capabilities. These authorizations could vary from jurisdiction to jurisdiction. The DEQ would assume responsibility over large capacity systems when a LHD is not authorized. A LHD could have the option of deferring responsibility to DEQ for certain types of alternative systems. General language calling for on-going program oversight by the DEQ at the local level should also be included.

A process for variances and appeals should be defined within the statute and administrative rules but be implemented at the local level. There should also be a similar process at the state level for those systems falling under DEQ jurisdiction. Variances would only be granted in those cases where sufficient information was available to document an equivalent protection of the public health, and the waters of the state in consideration of the defined risks. Oversight of the appeals process at the local level could be provided through criteria contained in statute or rule requiring submission of appeal decisions to the DEQ for review and comments through the accreditation program.

Site Suitability and Design Standards

At the local level, Michigan's residents are presently served by 44 LHD jurisdictions as shown:



For each jurisdiction, on-site wastewater treatment regulations establishing site suitability and design standards for single and two family on-site wastewater treatment systems have been promulgated through a local decision making process involving the Board of Commissioners, the public and the LHD. Complementing these local environmental regulations are statewide DEQ criteria for large on-site systems generating flows up to 10,000 gallons per day and DEQ rules for proposed subdivisions and site condominiums. These regulations are based upon the underlying premise of affording an adequate degree of protection for public health and the environment deemed appropriate at the state or local level. Variations in local and state regulations, to some degree, are influenced by soils, natural geologic and environmental conditions. Regulations promulgated at the state and local level are reflective of an inclusive decision making process that has resulted in standards whose goal is to protect the public health and the environment.

Rather than a one size fits all approach, there was consensus that enabling legislation should promote the development of scientifically based, but flexible, standards for site suitability, design and operation, and maintenance based upon risk. Differing situations such as environmentally sensitive areas, impaired waters, vulnerable aquifers, and density of development may factor into the selection of a range of solutions available to the LHD to provide necessary protection for public health and the environment. The department should consider the impacts of land use. Flexibility for the DEQ and LHDs to consider differing standards and options based upon risk, should be provided in both the statute and administrative rules

which acknowledge this baseline level of protection. The local decision making process should be the mechanism for consideration of standards that result in lower risk to the public health and environment, (i.e. higher standards). As well, there should be a process for consideration of exceptions to baseline site suitability standards where it can be established that viable options exist that are protective of public health and the environment, broadly defined.

With respect to development of standards and guidance for specific alternative technologies and products, it was agreed that there needs to be consistent direction by DEQ at the state level. This would include a structured process for review and approval of alternative technologies and products. The DEQ would be responsible for the development of recommended technical standards and guidance for performance, application, design, operation and maintenance.

Management of Operating Systems

Overall, there was support for the premise that there should be some frequency and degree of required oversight for all systems after construction. Such periodic monitoring and inspection is preventative and supportive of the overall goal to provide protection of public health, surface, and ground waters of the state. While management should include both conventional and alternative systems, it was recognized that the degree of oversight required by the management entity will vary, and must be flexible to consider the complexity and relative risk associated with the particular installation. Enabling legislation supported by administrative rules should clearly define the mandated minimum level of management required, and the statutory authority of the LHDs, or other management entity, to develop a local regulation and with fees to support that program function. Flexibility to require enhanced management activities in areas of high risk due to environmental sensitivity, age, history of failure, density of development, etc. should also be provided.

As the availability of building sites that meet conventional site suitability standards decline, more and more alternative systems will be installed. For these systems to work reliably, inspections and maintenance must be provided on a regular basis. It is recommended that enabling legislation supported by administrative rules adopt a requirement that each local permitting agency must have a program to address monitoring and maintenance of on-site sewage systems. These programs should be flexible enough to reflect a variety of systems and levels of monitoring and maintenance necessary to assure the systems are functioning in a manner protective of public health and the environment. Existing programs such as those in place in Washington State, and EPA models should be examined for their applicability in Michigan.

It is recommended that enabling legislation supported by administrative rules establish a statutory requirement for inspection of conventional systems with a goal that each system be inspected at a minimum frequency not less than once every ten years and reporting at the time of each maintenance event.

On a statewide basis, a number of items will be the key to successful management of all systems. A uniform statewide data management system should be considered and developed to provide a comprehensive record of system type, locations etc. and for mandatory reporting of information collected at the time of maintenance events. Of equal, if not greater importance is the credentialing of maintenance providers and inspectors as discussed earlier.

It is recommended that enabling legislation supported by administrative rules establish a statutory requirement for inspection of conventional systems at a minimum frequency not less than once every 10 years with reporting at the time of each maintenance event. It was further suggested the enabling legislation address solutions when the system is failing.

By far, conventional systems represent the vast majority of existing systems currently in use and for the foreseeable future, are expected to be relied upon for the majority of new home construction. In terms of the volume of such systems, providing a statutory mechanism that will result in an enhanced minimum level of management of these systems statewide presents the greatest challenge. To the typical homeowner, their conventional septic systems are managed “out of site” “out of mind” but have functioned amazingly well with little or no maintenance. In large measure they get attention only when they cease to work. It was the general consensus that a statute that required frequent mandatory routine inspections of conventional systems would not be politically palatable. Other options or combinations thereof that may result in the inspection of the vast majority of systems over time include:

- Point-of-Sale Inspections - Inspections mandated by LHDs or the local governing body at the time of home sale have been established in a number of counties statewide. In general, a point of sale approach is opposed by realtors, but would have general support of LHDs if promulgated with flexibility.

- Change In Use Inspections - As a condition of issuance of a building permit for modifications to an existing home, some LHD jurisdictions require a review of the existing on-site wastewater system by the LHD. The overall average frequency of inspection resulting from this approach is unknown.

- Mandatory Inspection/Reporting at the Time of Maintenance Event - Statute requiring the inspection /reporting at the time of pumping of the septic tank or other maintenance event would result in inspection of a significant number of systems. This general approach has been implemented as part of the state of Wisconsin administrative code along with a requirement that all systems be inspected for evidence of surface ponding every 3 years and that newly permitted systems include a management plan.

Financial

The discussion of how to continue support of the on-site wastewater program at the state level addressed both general funds and fee based services. The task force favored a combination of both revenue sources. Currently the on-site wastewater program at DEQ is funded entirely through general funds. The program effort consists of LHD evaluation, approval of subdivisions, site condominiums, and land divisions less than one acre, consultation with LHDs over suitability and treatment issues, and training of LHD staff. It is anticipated new activities will be added to these responsibilities that could include product approval, licensing and certification, additional training activities, the approval of alternative treatment systems, and establishment and oversight of a statewide database for the on-site wastewater program.

One option which should be given consideration would be to collect a separate state fee at the time of a required routine maintenance inspection. This fee would be forwarded to the state by the person or agency performing the inspection. Revenue derived from these fees would not only support the state program, but could also fund additional activities by LHDs in the conduct of the on-site wastewater program.

Another mechanism of obtaining revenue is through the issuance of a LHD permit with a state permit fee included. Revenue from this state fee would be deposited into an indexed restrictive fund that would be used for staff costs and an education fund for the system owner. This mechanism is generally not supported by LHDs, however.

There are also a number of other possible funding streams that could help to support the regulatory program by the DEQ. The licensing component of the program would have a separate fee system that would support both DEQ staff and fund training programs from the licensees. The DEQ would establish an approved products list that would be funded by a fee submitted by the manufacturer. If the DEQ issued permits for certain size systems or advanced treatment technologies, there would be a permit fee associated with that effort. Fees could also be considered for current statutory programs such as for subdivision and site condominium reviews. The DEQ should also pursue fully the utilization of available federal grants as an additional source of revenue for supplementing the program.

Rather than a single funding source, it is anticipated that a combination of a number of sources would meet the overall programmatic needs. Initially, general funds would be required to support a portion of program costs until the fee programs were in place and fully functional.

Prepared by: Richard Sacks, P.E., Chief
Richard Falardeau
Environmental Health Section
Water Division
Michigan Department of Environmental Quality