

## I. Executive Summary

Beginning in 2005, with funding provided by the Joyce Foundation, Onsite Wastewater of NW MI 501(c)3 (then Northwest Michigan Onsite Wastewater Task Force) contracted with Northwest Michigan Council of Governments to undertake a survey and assessment of the condition of both municipal, centralized, sanitary sewers and onsite wastewater systems within this region.

Onsite wastewater collection and treatment systems (septic, or advanced treatment systems) are now, and will continue to be, the primary sewage choice for:

i) individual residences on suitable soils and lots, ii) small communities, iii) small subdivisions, iv) rural commercial businesses, v) groups of homes with flows up to 10,000 gallons per day.

The intent of undertaking this survey was to enable a comprehensive overview to document the extent of service, condition, cost of operation, cost of anticipated repairs. Such an overview can be then used to plan how northwest Michigan could best be served by a range of wastewater infrastructure, in a cost efficient manner while minimizing environmental impact.

In addition, survey and assessment results would be documented visually via a series of overlay maps of critical impact areas (i.e. wetlands, sensitive and hydric soils, slopes greater than 15%). These maps will enable current and projected future growth patterns to be viewed in perspective - a look at the bigger picture. It is intended that by seeing the location, and interaction of wastewater systems with watershed topography - the true relationship of water use, reuse and potential degradation will be obvious.

We are surrounded by, live on or near, and depend on ground and surface water resources. Clean water is essential for drinking, hygiene, agricultural and industry. However, we can no longer treat water and wastewater as separate issues. They are both part of regional groundwater hydrology and watershed recharge.

A. Goals were as follows:

1. Project Population Growth, Land Use and Development Trends
2. Overview of Sanitary Sewer Collection, Transportation and Treatment Systems
  - Conduct a sewer survey
  - Compile sewer service maps
  - Extrapolate Survey Data for:
    - Miles of pipe per system, size, age and condition
    - Total miles per system and condition
    - Number of service connections
    - Cost per user per month from 2001-5
    - Operations and maintenance costs
    - Projected repair and replacement costs
    - Projected expansion or extension of lines and rationale for them
    - Overview of financing and regulatory mechanisms
    - Document sewer overflows and discharges
3. Overview of Septic Onsite Sewer Systems
  - Document locations by county
  - Compile septic service maps

Extrapolate Survey Data for:

GIS systems mapping by county with delineators for:

- \* new construction
- \* repairs and replacement
- \* failures of existing system

Number of commercial systems and location.

Document total onsite permits issued by county from 2002-2007

4. Document water well and surface water contamination reports
5. Document any hazardous or high strength systems in the region
6. Document currently permitted types of onsite system technology  
Comparative cost of construction, operation, and expected life span of advanced & conventional systems  
Any monitoring standards reports
7. Document current, and proposed, management and oversight regulation at local and state levels ([addressed in Resources](#))
8. Discussion of graywater reuse ([addressed in Resources](#))
9. Discussion of constructed wetlands systems ([addressed in Resources](#))

*“The survey results were remarkable, not so much for the data that was collected but for what they revealed about just how little we actually know.”*

Dendra Best. Onsite Wastewater Executive Director.

*“If we are serious about protecting our natural environment, citizens and officials must work together to implement proven land use and watershed management strategies.”*

Mathias McCauley.

Associate Director Northwest Michigan Council of Governments

Collecting survey responses, designed to document the status of centralized municipal sewer systems, proved challenging. **63 surveys were sent out. 19 responded.**

The overall data was, regrettably, insufficient to assemble any meaningful comparisons or project future impacts at this time.

Until that data is compiled the true future cost of maintaining current infrastructure is unknown as is any meaningful, coordinated asset management program

Onsite septic system data was provided by three regional health departments, and covered 7 of the original 17 counties. Data tracked a steady increase in both new systems for new construction as well as systems being replaced due to age, or resized for building additions.

Overall the trend of failures is as predicted due to age of the system and soils, and has not been documented as the cause of significant, ongoing surface water impairments in the region. As systems are repaired or replaced, incidences of ‘failure’ are declining.

It is worthy of note that the average life expectancy of **both** an individual onsite system and a municipal is 20 years - the survey was designed to compare costs of repair, replacement and management of each. Continued reliance on onsite systems as the primary means of collection, treatment and distribution of wastewater has lead to a growing interest in the value of oversight, management and inspections. If individuals are operating a personal wastewater treatment plant on their property should they not be held as equally responsible for environmental and public health safety as a municipality?



## II. Introduction

**Onsite Wastewater of Northwest Michigan** (OWNWM) serves northwest lower Michigan: principally assisting three regional health departments. OWNWM represents a broad range of land use and public health interests. Science, technology and protection of water quality are clearly defined in the following:

**OWNWM Mission Statement:**

***To increase awareness that water quality is directly linked to the use of appropriate wastewater systems and their management.***

Formed with direct support from the Joyce Foundation, in response to an immediate need to address environmental sustainability of water quality and infrastructure resources within the Great Lakes Basin, OWNWM seeks to accomplish this mission by informing local decision makers, and their constituents, of emerging, innovative advances in wastewater technology. Activities are designed to:

- a) lead to a change in attitude and critical thinking of how we, as both individuals and communities, use and recycle water; and
- b) educate and disseminate information on wastewater infrastructure options, community planning, decision making and best management practices.

The use of onsite systems in rural and suburban areas has increased dramatically as development continues to occur in areas without municipal collection sewers. Historically onsite systems have been viewed as a temporary stop-gap, until “the sewer arrives,” but USEPA now urges communities to view onsite as a permanent, cost effective part of wastewater treatment and management. ([See EPA\\_onsitefactsheet\\_Oct2008.pdf](#))

In a joint initiative with the Northwest Michigan Council of Governments, this project was designed to study meaningful comparison of land use and development patterns with the provision and effect of sewer and septic systems. The regional, centralized sewer and onsite system infrastructure surveys included similar questions on location, capacity, costs and service area.

Northwest lower Michigan typifies current Great Lakes development pressure on environmentally at-risk areas, located around inland lakes or on rivers, streams, encroaching on wetlands. Growth has the potential to impair water resources, quality of life and the enviable natural, water rich environment which draws people here in the first place. Sound planning is imperative. Coordinated education at the local level, to develop forward thinking visioning skills, such as [The Grand Vision](#), will play a vital role in shaping, and preserving our rural NW MI character. (see [www.thegrandvision.org](http://www.thegrandvision.org))

Population in this region has doubled in the last 30 years with people opting to live in rural settings or suburbs of population centers. Only three communities have populations of 10,000 or more. The logical conclusion, as espoused by USEPA, is that decentralized systems are more appropriate for less dense population, principally because of the high per capita cost of construction, operation and maintenance of larger public systems. As energy and construction costs continue to rise, economy of scale will play an ever more important role in decision making, as will the aging demographic of this region.

**See Appendix E: USEPA Reference and Resource Documents.**



*Mission Statement: To increase awareness, that water quality is directly linked to the use of appropriate wastewater systems and their management.*

PO Box 792, Traverse City  
MI 49685-0792

E-Mail: [secretary@michigan-onsitewastewater.org](mailto:secretary@michigan-onsitewastewater.org)  
FAX#: (231) 882-2204

*Previously Northwest Michigan Onsite Wastewater Task Force*

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For further information please contact:

Dendra J. Best  
Executive Director  
Onsite Wastewater of Northwest Michigan 501(c)3  
PO Box 792, Traverse City, MI 49685-0792  
(231)233-1806  
[secretary@michigan-onsitewastewater.org](mailto:secretary@michigan-onsitewastewater.org)  
[www.onsitewastewater.info](http://www.onsitewastewater.info)

Mathias McCauley  
Associate Director Regional Planning & Community Development  
Northwest Michigan Council of Governments  
2194 Dendrinis Drive  
Traverse City MI 49684  
231-929-5000  
[mccauley@nwm.cog.mi.us](mailto:mccauley@nwm.cog.mi.us)  
[www.nwm.org](http://www.nwm.org)  
[www.nwmcog.org](http://www.nwmcog.org)



### ***“Smart, Clean & Green 21st Century Sustainable Water Infrastructure”***

On Feb. 25, 2009 [WERF](#) and the [National Decentralized Water Resources Capacity Development Project](#) held a discussion in Washington, D.C., on emerging smart, clean and green approaches in water management -- systems that use, treat, store and reuse water efficiently at small scales and that blend designs into restorative hydrologies.

Big pipes transporting water to and wastewater away from our cities are often old and under capacity. Many existing methods of water use and wastewater treatment are wasteful, energy intensive and environmentally disruptive. Ultimately, as climate change exacerbates droughts and storm events, populations grow, and water becomes scarce, these systems may not be sustainable.

