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### Jurisdiction

The jurisdiction of the interview was Branch, Hillsdale and St. Joseph Counties in Michigan. These counties contain many lake communities, few of which utilize a sanitary sewer system. Soils are sandy in St. Joseph County, with increasing clay content to the east. Bedrock is deep in most areas, providing a large supply of groundwater. However, shale bedrock in some areas, such as Leonidas Township, is as shallow as 6-7 feet below ground level.

### Projects/beneficial watershed features

The agency has funding to begin sampling the seven designated beaches in the three counties (two in Hillsdale County, three in St. Joseph County, two in Branch County). There are no designated beaches along the St. Joseph River in this jurisdiction. Funding is only available for "designated beaches". Mr. Todd has an interest in sampling campgrounds and children's camps, of which there are eight. There may be an opportunity to expand the sampling routine to include these beaches in the 2005 season. This season will begin the first year of routine sampling. There has been only one swimming-related illness complaint reported to the agency, i.e. from Sand Lake. The County Parks are interested in participating in a beach sampling program.

Fish Lake and Stone Lakes in LaGrange County, Klinger Lake in St. Joseph County and part of Palmer Lake near Colon have been sewerred. A comparison of aerial photographs of Klinger Lake illustrates the reduction in algal blooms following sewerred, and improvements have been observed in Fish and Stone Lakes. Citizens groups around Fisher Lake near Three Rivers are interested in sewer installation and have approached the agency to request an assessment of the lake.

### Challenges in the watershed

Lake residents tend to blame visitors for suspected pathogen problems and agriculture for algal blooms. However, approximately 90% of the lake communities utilize septic systems, and few lakes in St. Joseph County receive discharges from agricultural ditches. *E. coli* monitoring on lakes is the responsibility of the lake associations, if they wish to sample for it. However, *e. coli* are short lived and indicate short term conditions, as opposed to long term lake impacts. Monitoring for nutrients and observing changes in turbidity would more accurately characterize lake impacts from septic systems. The St. Joseph County Commission has approved a resolution based on recommendations from the Land Use Task Force to establish consistent sampling parameters. Many citizen's groups send sampling data to the agency. However, they do not test consistent parameters and often do not thoroughly describe the sample location. They tend to only want to test for pathogens, as opposed to nutrients, to attempt to pinpoint problematic feedlots.

The dammed reservoirs, such as Lake Templene and Lake Palmer (both in St. Joseph County), have excessive algal growth. In contract, most of the natural glacial lakes have a good exchange of water due to spring inputs. Many residences on the lakes are old cottages inherited from an ancestor. The new property owners may not be able to pay for sewer installation or sewer upgrades. Alternatively, new homes, which may be used year-round, are built on the lots, but the septic systems are not upgraded to meet the higher demand. Sanitary codes prior to 1975 required only a 25-foot separation between the septic system and the shoreline. In the 1960s, residents were advised to extend the drain field into the lake so that the wave action

would clean it. Current codes dictate a 50-foot separation, and the state wants to extend it to 100 feet. New developments must have a 100-foot separation. It has been known for a long time that in sandy soils a separation between the septic system and a receptor (the lake or a well) should be at least 100 feet. However, lake property has been platted into small lots as urban areas are. The Subdivision Control Act addressed this issue. However, homes built before 1975 may keep septic systems within 25 feet of the shoreline. Newer homes must bring septic systems up to code when renovations are permitted.

Some lake properties use only the septic system holding tank, which is periodically pumped. However, septage disposal is a concern. Licensed haulers can dispose the septage at a waste water treatment plant or land apply it at a licensed site. However, regulations dictating that disposal are not very stringent. Further, there are few incentives for treatment plants to accept the waste, and several do not or cannot. The City of Three Rivers experienced treatment problems when accepting the waste. However, the plant was upgraded, and now the septage is included as a part of the revenue stream. Septage haulers also clean chemical toilets, which contain much litter. Neither landowners nor waste water treatment plants typically want to accept those wastes. There is an interest in the use of temporary storage tanks at lakes for septage haulers. However, there are few regulations regarding these tanks, except the requirement to locate the unit 800 feet from a well. Other issues include the lack of licensed land application sites and the seasonal restrictions on applications, i.e., not in the winter when the ground is frozen.

Some motels in LaGrange County utilize wetlands for pretreatment. One experimental residential wetland is located in Fabius Township. They remove nitrates, but have a high cost. Some states allow the use of wetlands as sole treatment. However, in Indiana and Michigan they are used as pretreatment to remove nutrients before directing the waste water to a septic system. However, many landowners may not want wetland vegetation growing on their property and will not maintain the system. All types of pretreatment systems for septic systems require some sort of maintenance, which homeowners are reluctant to do or fail to instruct buyers to continue when the property is sold. However, pretreatment to remove nutrients is encouraged to help prevent biomass buildup, which can clog drain fields. It was suggested that a septic use assessment be established for lake communities. The assessment would be used to fund pretreatment maintenance activities. Pretreatment would serve as a good intermediate step when sewer installation is too expensive for landowners.

Often times, when a septic system fails, the homeowner is reluctant to notify the health department. He does not want to be required to upgrade the system and therefore, begins to have it pumped regularly to extend its life, as opposed to funding an upgrade or the installation of sanitary sewer. The installation of a sanitary sewer is considered a large expenditure, while the use of a septic system is considered free, until it fails. Property values increase with sewer systems. However, an increase in value causes property taxes to also increase. Sewering would be a good idea in Fabius Township, which has a cluster of lakes and a demand to redevelop lakefront lots from seasonal to year-round residences.

Nitrates have been detected in wells shallower than forty feet. The tendency is to blame agricultural land uses for these detections. However, they are likely caused by septic systems. On lake properties wells have to be drilled through the clay layer forming the lake bottom to achieve appropriate depths. However, water from these wells are rich in minerals and, thus, unpleasant tasting.