VI. Home Sewage Treatment System Plan

Purpose of the HSTS Plan
The Stark County Health Department (SCHD), along with assistance from the Northeast Ohio Four County Regional Planning and Development Organization (NEFCO), has developed a Home Sewage Treatment System (HSTS) Plan for the Nimishillen Creek Watershed (Figure VI-1) to effectively coordinate the correction of failing HSTSSs. The HSTS Plan:

- Identifies target areas of impairment caused by failing HSTSSs
- Provides guidance for financially assisting homeowners in order to correct failing systems
- Outlines long-term inspection and monitoring goals
- Offers a comprehensive educational and outreach program

The Stark County Health Department covers essentially all unsewered areas of the watershed and county. The vast majority of the other health districts in the watershed primarily cover sewered areas. Furthermore, if a land parcel within another health department’s jurisdiction within Stark County is proposed to be served by a home sewage treatment system, then the Stark County Health Department, having expertise in the program, does all the siting and installation inspections.

Within its jurisdiction, the Stark County Health Department requires a home sewage treatment system upgrade usually for one of the following reasons:

A. Nuisance abatement program: inspects a HSTS upon submission of a written complaint.
B. Evaluation for an addition to a home i.e. adding living space to home.
C. Home sale inspection conducted by Health Department personnel or a private contractor. However, this program is highly subject to contractor interpretation, and relies on the buyer or seller to notify the department.
D. Evaluation of a community with a high density of failing systems, which typically results in working with the community for the expansion of sewers.

Currently, the SCHD investigates an average of 55 HSTS written nuisance complaints per year throughout Stark County. With additional funding, the Health Department would increase HSTS inspections and establish an Operation and Maintenance (O&M) Program in the Nimishillen Creek Watershed. The three year goal will be to inspect between 3,000 to 5,000 HSTSSs in the watershed to determine system location, type, and condition. Also, 100 percent of HSTSSs inspected in the watershed would be enrolled in the O&M Program resulting in follow-up inquiries and, if needed, enforcement actions following standard Health Department protocol for the repair or replacement of failing HSTSSs.

The Stark County Health Department also proposes to initiate a cost-sharing program for homeowners in need of financial assistance to correct failing, non-discharging
Figure VI-1
Nimishillen Creek Subwatersheds

Nimishillen Creek Subwatersheds
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HSTs. Furthermore, a comprehensive education and outreach program will be implemented to include public meetings and consultation/education with individual homeowners during HSTS inspections. Lastly, the Health Department would like to offer incentives for the use of alternative HSTS technology, enabling the county to further develop non-discharging options for difficult repair situations.

The Stark County Health Department’s HSTS Plan for the Nimishillen Creek Watershed focuses on the reduction of nonpoint source (NPS) pollution arising from home systems; however, it will also serve as a model for the development of a county-wide O&M Program. Thus, funding for this HSTS Plan will continue to benefit the watershed, as well as other watersheds within Stark County.

**Key Features Affecting HSTs in the Nimishillen Creek Watershed**

**Topography and Geology**

As mentioned above, the Nimishillen Creek Watershed lies in two subdivisions of the Appalachian Plateau province. The northern two-thirds of the watershed resides in the glaciated section of the Appalachian Plateau, and the southern one-third in the unglaciated section (Figure II-5). The headwaters in the northern and central portions of the county have moderate relief and gentle slopes due to glacial movement and depositions. However, in the unglaciated southern portion of the watershed, the Creek’s Mainstem has cut a narrow gorge through highlands resulting in steep sloping upland areas and broad flat expanses in the floodplains.

Figure VI-2 shows the areas in the watershed where slopes are greater than 6 percent, with the steepest slopes predominately occurring in the southern portion of the watershed. The townships of Canton, Osnaburg, and Pike in the southern unglaciated section of the watershed have the most areas affected by steep slopes. Slopes greater than 12 percent are generally poor conditions for the installation of a properly functioning HSTS. However, this has not been a severe problem for two main reasons. First, to construct a home and driveway on steeply sloping ground has its own limitations, so many potential sites have not been developed. Second, sewage site evaluations have excluded development on steep slopes. These two factors have limited growth in these areas. In the Nimishillen Creek Watershed, severe soil types have by far caused the greatest problem for HSTSs.

**Soils**

The principal natural feature limiting HSTS installation and/or function in the Nimishillen Creek Watershed and all of Stark County is its soils. Within the unsewered portions of the watershed, there are 101 HSTS-limiting soil types, as determined by the Stark County Health Department. Figure VI-3 shows all of the soils in the unsewered areas of Nimishillen Creek Watershed which limit HSTS installation and function. The limiting soil types covering the largest areas (greater than 2,000 acres) in the watershed are:

- Ravenna Silt Loam, 0 to 2% slopes (ReA) - 3,344 acres - These soils consist of somewhat poorly drained soils in broad areas in the glaciated (northern)
Figure VI-2
Slopes > 6%
Nimishillen Creek Watershed

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Northeast Ohio Four County Regional Planning and Development Organization, 2005
Source: Ohio Department of Natural Resources (ODNR)
Figure VI-3
HSTS Limiting Soils in Unsewered Areas
Nimishillen Creek Watershed
2003

Source: Ohio Department of Natural Resources (ODNR)
parts of the watershed. They have a seasonally high water table for significant periods and are slow to dry out in the spring. They are categorized as having “severe” limitations in treating home sewage effluent.

- Sebring Silt Loam (Se) - 2,642 acres - This soil occurs in concave areas in shallow drainageways and in broad basin-like areas on the glacial till plain. Excessive wetness is the major limitation to the use of this soil for most non-farming uses. It is categorized as having “severe” limitations in treating home sewage effluent.

- Canfield Silt Loam, 6 to 12% slopes (CdC2) - 2,527 acres - These soils occur along drainageways and in the lower part of long slopes. Areas are irregular in size and shape. Limitations to the treatment of home sewage effluent are the soil’s moderately slow permeability and the slope.

- Fitchville Silt Loam, 0 to 2% slopes (FcA) - 2,370 acres - This soil is in broad areas in valleys and in partly blocked drainageways on uplands in the glaciated part of the county. Ponding and seasonal wetness are the major limitation to the use of the soil for home sewage treatment systems.

Water Supply
Three cities and a village, Canton, North Canton, Louisville, and East Sparta, obtain their municipal water supply from wellfields located within the Nimishillen Creek Watershed (Figure II-12). East Canton and Hartville do not have a municipal water system and draw their drinking water from private wells. All of the above water supply areas are within areas serviced by sewers. The City of Canton also receives drinking water from wellfields outside of the Nimishillen Creek Watershed in the Sandy Creek Watershed.

Most of the remaining homes in the watershed rely on individual wells for their drinking water and are located in areas dependant on home sewage treatment systems. These areas include portions of Jackson, Lake, Marlboro, Plain, Nimishillen, Canton, Osnaburg, and Pike Townships. To date, the Stark County Health Department has not recorded a drinking well being contaminated by a failing HSTS.

Land Uses
A detailed description of land usage within the Nimishillen Creek Watershed can be found in Section II - Inventory of the Watershed of this report or in Phase I of the Nimishillen Creek Comprehensive Watershed Management Plan (CWMP) beginning on page six. In general, the watershed is dominated by three land use/land cover types: 1) agriculture and open areas occupy 52,716 acres or 44.7 percent of the watershed; 2) urban areas (34,852 acres, 29.3 percent); and 3) wooded lands (25,106 acres, 21.3 percent).
Residential areas (which fall under the urban areas category above) with high densities of homes in unsewered portions of the watershed are likely to have the highest concentrations of failing HSTSs. The reasoning being that generally the higher the housing density the smaller the lot sizes, and therefore, less area to treat home sewage effluent. In addition, unsewered urban areas with homes built before 1980 are also a concern because the average life of a full functioning HSTS is approximately 20 years.

**Demographics, Socioeconomic, and the 2000 U.S. Census**

Like land uses, the demographic characteristics vary greatly throughout the Nimishillen Creek Watershed. Fortunately, most of the densely populated urban areas in and around the Cities of Canton, Louisville, and North Canton are serviced by sewers. However, there are still highly populated areas in the watershed that are dependent on HSTSs, and several of these populated areas have poor soils for HSTSs.

A socioeconomic and demographic analysis was done using 2000 U.S. Census information at the census tract level. Figure VI-4 shows the U.S. Census Tract numbers in relation to sewered and unsewered areas in the watershed. A tract was included if a portion of its area has unsewered areas. Table VI-1 shows the total number of structures built prior to 1980, median household income, population, and the population below the poverty level for each tract number. Please note that these are totals for the entire tract and not just unsewered areas. Therefore, the totals for unsewered areas will be less than those represented on the table. Despite this issue, the census data provides pertinent information for relatively small areas which helps prioritize future actions.

Figure VI-5 shows information for housing units per square mile for Census tract numbers with unsewered areas. In general, areas with high housing densities next to sewered areas would be candidates for sewer extensions if there were numerous failing HSTSs. Also, knowing which areas have lower household incomes or a higher population of people below the poverty level will aid in focusing any future cost-share assistance programs.
Figure VI-4
2000 U.S. Census Tracts and Unsewered Areas
Nimishillen Creek Watershed

Unsewered
Census Tract Boundary
Road
Political Boundary
Subwatershed Boundary

Northeast Ohio Four County Regional Planning and Development Organization, 2005
Sources: US Census Bureau, 2000; NEFCO 208 Clean Water Plan
Table VI-1: 2000 U.S. Census Information for Areas in the Nimishillen Creek Watershed Containing Poor Soils in Unsewered Areas

<table>
<thead>
<tr>
<th>U.S. Census Tract Number</th>
<th>Number of Structures Built before 1980</th>
<th>Median Household Income</th>
<th>Population</th>
<th>Population Below Poverty</th>
</tr>
</thead>
<tbody>
<tr>
<td>7018</td>
<td>1,164</td>
<td>$20,206</td>
<td>3,366</td>
<td>845</td>
</tr>
<tr>
<td>7021</td>
<td>1,641</td>
<td>$24,028</td>
<td>4,282</td>
<td>1,254</td>
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<td>7023</td>
<td>1,046</td>
<td>$9,006</td>
<td>2,906</td>
<td>1,778</td>
</tr>
<tr>
<td>7109</td>
<td>1,088</td>
<td>$53,351</td>
<td>4,227</td>
<td>187</td>
</tr>
<tr>
<td>7110</td>
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</tr>
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<td>7111.02</td>
<td>1,814</td>
<td>$62,875</td>
<td>9,324</td>
<td>193</td>
</tr>
<tr>
<td>7113.11</td>
<td>1,812</td>
<td>$64,720</td>
<td>7,045</td>
<td>154</td>
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</tr>
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<td><strong>Totals</strong></td>
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<td><strong>118,517</strong></td>
<td><strong>9,091</strong></td>
</tr>
</tbody>
</table>

* Only Tract Numbers 7109, 7127, 7128, and 7130 were 100 percent unsewered; therefore, totals for structures built prior to 1980, population, and poverty rates for unsewered areas will be lower than these totals.

Home Sewage Treatment System Problem Definition

Sewered and Unsewered Areas

Figure VI-4 shows the extent of sewered areas in the Nimishillen Creek Watershed. Generally, sewered areas are limited to the Cities of Canton, North Canton, and Louisville, and the Villages of Hartville, East Canton, and East Sparta. Well over half of the watershed area remains dependent on some type of home sewage treatment system. Where practicable, the Stark County Health Department will promote the
extension of sewers to areas with a large percentage of failing HSTs. Typically, sewer expansion is practicable only if an existing sewer line is in close proximity.

**Characterization of Existing Home Sewage Systems**

In 1994 the Stark County Residential Sewage Regulation revisions prohibited off-lot discharge and leach wells for new construction. Since that time, the majority of systems installed for new construction have consisted of a leaching tile field or some modification, based upon soil severity. Additional components such as Class 1, NSF approved aeration units or lift stations may be added to the system based upon need. For repairs, again on-lot treatment and disposal are highly preferred. However, when soils, lot size, or topography dictate, an off-lot discharging sewage treatment system may be used. Currently, that would consist of either: a) a Class 1 NSF approved aeration system with 100 sq. ft. filter and failsafe, or b) a subsurface sand filter (with 24" of Ohio EPA approved filter sand). This may also be followed by chlorination or a french drain, depending upon site characteristics.

The Stark County Health Department records do not predate the 1960s. Between the 1960s and early 1990s, leach fields were again the most common system used. In sand and gravel areas, leach wells may have also been used. Less frequently, an off-lot discharging system was used if soils were severe or the lot size was small. Prior to the 1960s, systems varied between leach fields, leach wells, cesspools, or some type of off-lot discharging systems. Variation was great due to the lack of oversight at that time.

**Known Impacts on Specific Stream Segments**

The only evidence of water quality impacts from failing HSTs is contained in the Water Resource Quality (Section III) above. Despite strong indications that failing home sewage treatment systems are a factor in degraded water quality, neither the Ohio EPA information or NEFCO's macroinvertebrate information directly identifies this as a cause. A water survey focusing generally on nonpoint source pollution or specifically on the effects of failing home sewage systems on the Nimishillen Creek would greatly assist the Health Department in focusing future corrective actions.

**Critical Areas**

**HSTS Inspections**

Identifying critical areas for home sewage treatment systems inspections and enrollment into an Operations and Maintenance Program is primarily based on the combination of three factors: 1) housing units per square mile; 2) HSTS limiting soils; and 3) proximity to already sewered areas. Higher priority will be given to unsewered areas with a concentration of housing units that are located on poor soils adjacent to or near areas with installed sewer lines. Figure VI-5 shows the priority areas within the watershed based on the above criteria.

The Health Department’s goal is to eventually inspect every HSTS in the watershed, but it realizes that some sections of the watershed are worse than others due to the factors outlined above. Therefore, the SCHD will start inspections in all Priority 1
Figure VI-5
HSTS Priority Areas
Nimishillen Creek Watershed
2003

Housing Density in Tracts with HSTS

- < 150 Housing Units Per Sq. Mi.
- 151 - 300 Housing Units Per Sq. Mi.
- 301 - 500 Housing Units Per Sq. Mi.
- > 500 Housing Units Per Sq. Mi.
- HSTS Limiting Soils in Unsewered Areas

Sources: US Census Bureau, 2000; ODNR

Northeast Ohio Four County Regional Planning and Development Organization, 2005
Areas, then move to Priority 2 Areas, and so on. For each Area, Health Department personnel will inspect every HSTS and enroll the homeowner in the Operations & Maintenance Program. If a system is found to be not functioning properly, then corrective action(s) will be ordered following standard Health Department protocol. Also, if the Stark County Health Department determines there is a significant public health risk as a result of multiple failing HSTSs in a small area, then a likely option would be the extension of an existing sewer system to service the area, if practical.

**Priority Area 1** - Unsewered areas with greater than 500 housing units per square mile with substantial sections of HSTS limiting soils. These areas are primarily located on the fringe of cities and villages with existing sewers, and include Census tract numbers 7018, 7021, 7023, 7120, 7121.01, 7123, 7126.01, and 7126.02. These regions will be the first to be inspected by the Stark County Health Department and the first to be enrolled in the Operation and Maintenance Program. Because of the high housing densities, likely small lot sizes, and the fairly close proximity to existing sewers, the Health Department’s preferred option would be the expansion of an existing sewer system into these priority areas if a significant number of failing systems are discovered during inspections.

**Priority Area 2** - Unsewered areas with 301 to 500 housing units per square mile with substantial sections of HSTS limiting soils. Like Priority 1 Areas, these areas are principally located adjacent to cities and villages with existing sewers. Priority 2 Areas include Census tract numbers 7111.02, 7121.02, 7124, and 7133. These regions will be inspected after all Priority 1 Areas have been inspected. Do to the close proximity to existing sewer lines in most Priority 2 Areas, sewer extension will be a possible option for the Health Department to alleviate concentrated pockets of failing systems.

**Priority Area 3** - Unsewered areas with 151 to 300 housing units per square mile with substantial sections of HSTS limiting soils. These areas are primarily located to the southeast of the City of Canton and north of the City of North Canton in Lake Township. Priority 3 Areas include U.S. Census tract numbers 7110, 7113.11, 7125, 7131, 7132.01, 7132.02, and 7146. These regions will be inspected after the inspection of all Priority 2 Areas. The Stark County Health Department will consider the extension of an existing sewer system only if feasible.

**Priority Area 4** - Unsewered areas with 1 to 150 housing units per square mile with substantial sections of HSTS-limiting soils. These sections are primarily located in the agricultural areas located in the northeastern section of the watershed. The unglaciated southern portion of the watershed is also a Priority 4 Area due to steep slopes which limit development. Census tract numbers falling into this category include 7109, 7127, 7128, 7130, and 7149.01. These regions will be the last to be inspected due to the low housing densities. In most cases, the extension of sewers into these areas is not a practicable option.
Financial Assistance
Pending funding, financial assistance will be concentrated in areas (based on 2000 Census tract numbers) where the average household annual income is below $35,000 and/or areas with high poverty population rates (greater than 500). Census tracts in the Nimishillen Creek Watershed that fit these criteria include 7018, 7021, 7023, 7124, and 7131 (Table VI-1). It is anticipated that significant financial assistance will be needed in order to correct all failing HSTSSs and eliminate the resulting water pollution. Although the focus of any cost-share assistance program will be in the areas above, all homeowners in the watershed needing financial assistance to correct failing HSTSSs will be eligible for financial assistance, if available.

Proposed Corrective Action Plan
Current Actions
Currently, the Stark County Health Department, in its 1994 revisions to its county home sewage regulations, established no off-lot discharges for new construction. When doing a repair, all reasonable on-lot possibilities are reviewed before off-lot discharge is considered. Typically, off-lot discharge is only used when dictated by small lot-sizes or poor soil types. The Stark County Health Department criteria for upgrading HSTSSs can be found above in the section titled “Characterization of Existing Home Sewage Systems.”

The Health Department does not currently have a financial assistance program for the repair or replacement of failing HSTSSs. However, financial assistance for HSTSS repairs and replacements can be attained through the Stark County Regional Planning Commission (RPC). Through the RPC’s Stark County Rehabilitation Emergency Assistance Program, eligible homeowners can receive up to $3,500 in grants to repair or replace failing HSTSSs. Anything over $3,500 can be covered by a deferred loan. Eligibility for this program is based on household income.

Proposed Actions
When funding becomes available, the Stark County Health Department will work in critical areas to aid in either correcting HSTSSs or promoting the extension of sanitary sewers to eliminate water quality degradation from failing systems. In addition, between 3,000 and 5,000 HSTSSs will be inspected to determine system location, type, and condition over a three year period. Health Department personnel will begin by inspecting all systems in the first priority areas, then move inspection efforts to the next priority areas in the watershed. For example, Health Department personnel will inspect all HSTSSs and order corrections for failing systems in all of the Priority 1 Areas before moving to Priority 2 Areas.

All (100 percent) of the HSTSSs inspected will be enrolled in the Stark County operation and maintenance program that will be established. Follow-up and necessary enforcement will be conducted under normal Health Department protocol.
for the repair and replacement of failing HSTs, where extension of sanitary sewer is unlikely within three years.

The Stark County Health Department also proposes to initiate a cost-share program for homeowners in need of financial assistance to correct a HSTs problem. It is envisioned that the establishment in an Operation and Maintenance Program within the Nimishillen Creek Watershed will result in a substantial increase in the number of homeowners needing financial assistance. Once funding is secured, the SCHD will work with the Stark County RPC to establish an assistance program that is complementary, and not in “competition”, with their assistance programs. The Health Department also understands that it will have to work under the conditions (if any) imposed by the funding agency when establishing a cost-share assistance program.

Furthermore, a comprehensive education and outreach program will be implemented to include several public meetings and consultation/education with individual homeowners during HSTS inspection. Informational pamphlets will be distributed detailing proper system maintenance and operation unique to each type of HSTS. The Health Department estimates that between 3,000 to 5,000 watershed residents will be contacted through their education and outreach program over a three year period. Lastly, the SCHD will offer incentives, pending funding, for the use of alternative HSTS technology, enabling the county to further develop non-discharging options for difficult repair situations.

The efforts outlined above will focus on the reduction of NPS pollution arising from HSTs within the Nimishillen Creek Watershed; however, it will also serve as a model for the development of a county-wide Operation and Maintenance Program. Thus, the funding of this plan will continue to benefit the watershed, as well as other watersheds within Stark County, long after the initial funding is utilized.

**Tracking and Documenting Success**

In 2000, the Stark County Health Department acquired environmental health software that enables the entry of sewage records. Currently, all new systems are recorded in the database. Additional funding will allow existing records to be entered into this same database. Once entered, the database can be used to track inspections, document problems, and provide statistical information.