WATER AND SEWER SERVICE NEEDS ASSESSMENT

As previously discussed, individual council, board, or trustee meetings were attended by representatives of the Henry County Commissioners, Henry County Regional Water and Sewer District along with PDG staff members. Each governmental unit was asked to review an aerial photo of their responsible areas and to note concerns associated with drinking water and sanitary treatment disposal.

An extensive file search was completed at the Northwest District office of Ohio EPA. Files from the Division of Surface Water (Sanitary Sewer) and Drinking and Groundwater were examined. The file search revealed information as it pertains to existing public and private water and sewer facilities located in Henry County. Also, the Henry County Health Department provided information as it pertains to septage treatment systems, permitting, and identification of public health nuisance areas.

Additional sources of information were obtained from each of the municipalities and from the Henry County Planning Office which included land use plans, census, and demographic data, zoning, aerial photos and existing studies all relevant to the study area.

All the information that was obtained and determined pertinent has been incorporated throughout different sections of this report.

From all the information collected and reviewed along with meetings with all of the participants, a Water and Sewer Service Needs Assessment has been completed. The assessment has been completed for each township which includes the following:

- Demographics
- Population with 20 year projections
- 20 year estimated Water and Sewer Demand
- Ground Water Resources
- Surface Water Resources
- Municipal Public Water Systems (Ohio EPA)
• Wastewater Treatment System (Ohio EPA)
  • On-Site Systems
  • Private NPDES Permits
  • Public NPDES Permits
• Proposed Water Service
• Proposed Sanitary Sewer Service
**Bartlow Township**

The township is located in the southeast corner of Henry County and the 2000 census stated that 629 people live in the unincorporated portions of the Township. The total land area is 36.3 square miles at an elevation of 709 feet. The Village of Deshler is the only incorporated community in the Township. There are 67.8 people/square miles which includes the Village of Deshler.

The Village of Deshler is located in the central eastern portion of Bartlow Township. The Village’s 2000 Census listed the population at 1,831. Deshler’s total land area is at 2.3 square miles at an average elevation of 712 feet. There are 808.8 people per square mile. Additional demographic and population projections for both Bartlow Township and the Village of Deshler are as follows:

<table>
<thead>
<tr>
<th></th>
<th>2000 Census</th>
<th>Square Mile</th>
<th>Population/ Square Mile</th>
<th>MHI</th>
<th>LMI %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bartlow Township</td>
<td>629</td>
<td>34</td>
<td>18.5</td>
<td>$39,899</td>
<td>25.4</td>
</tr>
<tr>
<td>Village of Deshler</td>
<td>1,831</td>
<td>2.3</td>
<td>796</td>
<td>$36,987</td>
<td>46.1</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Henry County Projected Rate of Change

<table>
<thead>
<tr>
<th></th>
<th>2008 Population Estimate*</th>
<th>2008 Estimated Water Demand (100 gpcd)</th>
<th>2008 Estimated Water Demand/ Square Mile</th>
<th>2030 Population Estimate**</th>
<th>2030 Estimated Water Demand (100 gpcd)</th>
<th>2030 Estimated Water Demand/ Square Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bartlow Township</td>
<td>711 (+1.5%)</td>
<td>71,100 gpd</td>
<td>2,091 gpd</td>
<td>648</td>
<td>64,800 gpd</td>
<td>1,905 gpd</td>
</tr>
<tr>
<td>Village of Deshler</td>
<td>1,797 (-0.2%)</td>
<td>179,700 gpd</td>
<td>78,130 gpd</td>
<td>1887</td>
<td>188,700 gpd</td>
<td>82,043 gpd</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Henry County Projected Rate of Change

**Groundwater Resources** - approximately two thirds of the township (southeast section) has the potential for yields up to 500 gpm. There is a test well located southeast of the Village of Deshler that has a yield at 300 gpm. The Village of Deshler has recently developed a new well field for their water treatment needs. These two new wells have been tested at 400 gpm each. The raw water quality for the test well and Village production well are listed as follows:
<table>
<thead>
<tr>
<th></th>
<th>Test Well 1</th>
<th>Production Well 5</th>
<th>Production Well 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth (feet)</td>
<td>220</td>
<td>240</td>
<td>201</td>
</tr>
<tr>
<td>Bedrock (feet)</td>
<td>74</td>
<td>76</td>
<td>81</td>
</tr>
<tr>
<td>Yield (gpm)</td>
<td>300</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>Hardness (mg/l)</td>
<td>628</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Iron (mg/l)</td>
<td>.18</td>
<td>.60</td>
<td>.17</td>
</tr>
<tr>
<td>Manganese (mg/l)</td>
<td>---</td>
<td>&lt;.30</td>
<td>&lt;.30</td>
</tr>
<tr>
<td>Dissolved Solids (mg/l)</td>
<td>1085</td>
<td>1690</td>
<td>2130</td>
</tr>
<tr>
<td>Sulfates (mg/l)</td>
<td>620</td>
<td>1040</td>
<td>1350</td>
</tr>
<tr>
<td>Fluoride (mg/l)</td>
<td>1.3</td>
<td>2.0</td>
<td>1.99</td>
</tr>
</tbody>
</table>

Surface Water Resources
These are three (3) creeks that flow to the northeast, Beaver Creek, Hammer Creek, and Brush Creek. None of these creeks would support a regional water system. Brush Creek currently provides an outlet for the Village of Deshler’s treated wastewater discharge.

Municipal Public Water Systems - The Village of Deshler has the only municipal public water system in Bartlow Township. The Village currently operates a groundwater system that includes aeration, reaction, filtration, ion exchange softening, and disinfection. The Village has recently developed a new well field to support a new water treatment plant. The new treatment facility will consist of a new membrane softening water treatment plant that will have a rated daily capacity of .432 mgd. The water treatment plant is scheduled for construction in 2010. The total pumping capacity form the new well field is 900 gpm or 1.296 mgd.

Wastewater Treatment Systems - There are currently two on-site treatment systems, one private NPDES permit, and one public NPDES permit within the Township. The are listed as follows:

On-Site Systems (Septage Tanks and Leach Field)
- Frantz Petroleum
- Fred Miller
Private NPDES Permit (Packaged Treatment System)
Bavarian Club, Inc. - 7,000 gpd
Public NPDES Permit (Two Cell Lagoon System)
Village of Deshler - 570,000 gpd

The Village of Deshler is currently working toward total sanitary sewer separation which should result in the elimination of overflow events and reduced storm-related flows to the wastewater treatment system. The Village's sewer collection system routes the wastewater to a pump station on the northeast side of the Village. The pump station pumps to the lagoon system which is operated in series and discharges treated wastewater into Brush Creek. Currently the wastewater treatment plant receives an average daily flow of 270,000 gpd.

The current NPDES permit became effective April 1, 2007 and will expire March 31, 2012.

Proposed Water Service
Currently there has been no indication that areas within Bartlow Township (outside of Deshler) require potable water by means of a regional supply.

It should be noted that upon completion of the Village of Deshler's new water treatment plant excess capacity should be available for the projected water needs for the entire township along with the existing Transient Non-Community Water Systems such as St. Johns Lutheran Church, Peach Lutheran Church, and the Bavarian Club.

Additional service areas could include the Village of Hamler, Malinta, and McClure. These combined projected 2030 water demands are estimated at 213,600 gpd. Plate 15 illustrates the proposed Bartlow Township Water Service Improvements.

Estimated construction costs for water service are listed as follows:

- Bavarian Club, Peace Lutheran Church, and St. Johns Lutheran Church, 26,950 lineal feet
  Estimated Construction and Project Costs = $2,000,000 to $2,100,000
  Note: Bavarian Club, 6,350 lineal feet = $450,000 to $500,000
› Village of Hamler, (Option 1) 22,850 lineal feet; (Option 2) 28,790 lineal feet
   Estimated Construction and Project Costs = $1,700,000 to $1,800,000 (Option 1)
   = $2,150,000 to $2,300,000 (Option 2)

› Village of McClure, 62,630 lineal feet
   Estimated Construction and Project Costs = $4,700,000 to $4,900,000

› Village of Malinta, 69,190 lineal feet
   Estimated Construction and Project Costs = $5,100,000 to $5,400,000

Note: The above estimates do not include an elevated storage tank. A 100,000 gallon elevated storage tank is estimated at $650,000 which includes contingencies and project costs.

Proposed Sanitary Sewer Service
There are currently no on-site systems that are or have been identified as a public health nuisance. The Bavarian Club, Inc. located west of the Village of Deshler at 3814 State Route 18 has an Ohio EPA permitted wastewater treatment plant. This treatment facility currently meets their effluent permit requirements.
**Damascus Township**

The Township is located in the northeastern section of Henry County. The Township borders Wood County to the east and the Maumee River to the north. The 2000 Census listed the Township’s population at 1,020 which does not include the Village of McClure. The Village of McClure is the only incorporated community in the Township. The Village is centrally located in the Township and has a population at approximately 761.

The total land area is 30.8 square miles at an elevation of 676 feet. The Township drains into the Maumee River by means of creeks and ditches. There are 59.1 people per square mile which include the Village of McClure. The Village of McClure has a total land area of .5 square miles and a population density of 1,522 per square mile. Additional demographic and population projections for both Damascus Township and the Village of McClure are as follows:

<table>
<thead>
<tr>
<th></th>
<th>2000 Census</th>
<th>Square Mile</th>
<th>Population/ Square Mile</th>
<th>MHI</th>
<th>LMI %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damascus Township</td>
<td>1,020</td>
<td>30.3</td>
<td>33.7</td>
<td>$46,950</td>
<td>23.8</td>
</tr>
<tr>
<td>Village of McClure</td>
<td>761</td>
<td>.5</td>
<td>1,522</td>
<td>$40,982</td>
<td>43.5</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Henry County Projected Rate of Change

<table>
<thead>
<tr>
<th></th>
<th>2008 Population Estimate*</th>
<th>2008 Estimated Water Demand (100 gpcd)</th>
<th>2008 Estimated Water Demand/ Square Mile</th>
<th>2030 Estimated Population Estimate**</th>
<th>2030 Estimated Water Demand (100 gpcd)</th>
<th>2030 Estimated Water Demand/ Square Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damascus Township</td>
<td>972 (-0.6%)</td>
<td>97,200 gpd</td>
<td>3,208 gpd</td>
<td>1,051</td>
<td>105,100 gpd</td>
<td>3,469 gpd</td>
</tr>
<tr>
<td>Village of McClure</td>
<td>713 (-0.8%)</td>
<td>71,300 gpd</td>
<td>142,600 gpd</td>
<td>784</td>
<td>78,400 gpd</td>
<td>156,800 gpd</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Henry County Projected Rate of Change

Groundwater Resources - The entire Township is located in a limestone aquifer beneath 40 to 85 feet of glacial drift. Wells developed in this area may yield up to 100 gpm if drilled at depths that exceed 200 feet. There is a test well located southwest of the Village of McClure which produced 40 gpm. The raw water quality and construction for this well is listed as follows:
### Test Well C

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth (feet)</td>
<td>300</td>
</tr>
<tr>
<td>Bedrock (feet)</td>
<td>42</td>
</tr>
<tr>
<td>Yield</td>
<td>40</td>
</tr>
<tr>
<td>Hardness (mg/l)</td>
<td>1,250</td>
</tr>
<tr>
<td>Iron (mg/l)</td>
<td>0.42</td>
</tr>
<tr>
<td>Dissolved Solids (mg/l)</td>
<td>1,780</td>
</tr>
<tr>
<td>Sulfates (mg/l)</td>
<td>1,050</td>
</tr>
<tr>
<td>Fluoride (mg/l)</td>
<td>1.9</td>
</tr>
</tbody>
</table>

Domestic wells in the township typically produce between 5 to 10 gpm at an average depth of approximately 65 feet. It would appear that groundwater for a municipal or regional supply is not available in Damascus Township.

**Surface Water Resources** - The Maumee River is located along the north border of the Township. The Village of McClure currently utilizes the Maumee River as a raw water supply. The Maumee River does have flow capacity for a regional water supply source.

**Municipal Public Water Systems** - As previously discussed, the Village of McClure has a surface water treatment facility that utilizes the Maumee River as a raw water supply. The treatment plant is located north of the Village on State Route 65. The following treatment is provided:

- Coagulation
- Flocculation
- Sedimentation
- Filtration
- Disinfection

The overall design capacity of the treatment plant is 200,000 gpd which is based on the filtration rate. Currently a 450,000 gallon above ground clearwell is located at the treatment plant and a 100,000 gallon elevated storage tank provides distribution system pressures and storage.
average daily production is at approximately 90,000 gpd. The peak one day flow was at 156,000 gpd.

A detailed water supply and treatment study was completed in 2002. It was indicated that water treatment improvements should be considered at an estimated cost of approximately $2.3 million dollars. The Village of McClure is currently under Ohio EPA Findings and Orders. The orders require that the Village must meet water quality standards for nitrate, total trihalomethane (TTHM), and Haloacetic Acids (HAA5).

The unincorporated area of Grelton which is located in the southwest corner of Damascus Township has a potable water supply that is supplied from the Village of Malinta. The Village of Malinta is served by a waterline connection from the City of Napoleon.

Wastewater Treatment Systems - There are currently four (4) on-site systems, one private NPDES permit and one public NPDES permit within the Township. They are listed as follows:

On-Site Systems (Septage Tanks and Leachfield):
- Spring Meadows West
- Sworden Campground Dump
- Wagner's Campground
- McClure Water Treatment Plant

Private NPDES Permit (Permit Treatment Systems)
- River Bend Mobile Home Park 5,000 gpd

The River Bend Mobile Home Park’s wastewater treatment plant consists of a trash trap, extended aeration, final settling, disinfection followed by polishing pond. The existing facility has had a history of non-compliance with the NPDES permit and is currently under Findings and Orders.

Note: This facility does not have any additional capacity or the ability to receive outside sanitary flows.
Public NPDES Permit (Controlled Discharge Lagoon)

- Village of McClure 100,000 gpd

The Village of McClure constructed a gravity sewer collection system and a controlled discharge lagoon treatment system in the late 1990s.

The collection system consists of approximately 24,300 lineal feet of 8” and 10” diameter gravity sewers. The wastewater treatment system is a controlled discharge lagoon design for an average daily flow of 100,000 gpd. The lagoon system consists of three cells with a designed detention time of 180 days. Cell Nos. 1 and 2 are aerated with mixing aspirating aerators. The treated wastewater is discharged into Big Creek which then flows into the Maumee River.

The current NPDES Permit became effective January 1, 2008 and will expire on December 31, 2012.

**Proposed Water Service**

Currently the Village of McClure supplies water to customers south of the water treatment plant on State Route 65 and north and east on State Route 65. Outside of the existing customers that are currently served with potable water, no additional areas have been identified for service.

The Village of McClure currently has some additional capacity to serve other areas, but the Village is under Finding and Orders which will limit their ability to extend service to other areas. A Water Supply Study currently being completed will evaluate a regional water connection. The regional connection would then allow for service to be extended to areas requesting water. Lucy’s 22 Campground is a Transient Non-Community Water System which is located at 1-670 State Route 65. It supplies water to 85 campsites. The proposed water service connections to the Village of McClure are shown on Plate 16.
Estimated costs for water service to McClure are listed as follows:

McClure - Six (6) alternative routes

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Estimated Project Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative No. 1 - 26,900 linear feet - Malinta</td>
<td>$2,000,000 to $2,100,000</td>
</tr>
<tr>
<td>Alternative No. 2 - 17,700 linear feet - Malinta</td>
<td>$1,300,000 to $1,400,000</td>
</tr>
<tr>
<td>Alternative No. 3 - 16,300 linear feet - Malinta</td>
<td>$1,200,000 to $1,300,000</td>
</tr>
<tr>
<td>Alternative No. 4 - 37,260 linear feet - Napoleon</td>
<td>$2,800,000 to $2,900,000</td>
</tr>
<tr>
<td>Alternative No. 5 - 44,000 linear feet - Napoleon</td>
<td>$3,300,000 to $3,400,000</td>
</tr>
<tr>
<td>Alternative No. 6 - 19,400 linear feet - Liberty Center</td>
<td>$3,200,000 to $3,300,000</td>
</tr>
</tbody>
</table>

Note: The above estimate does not include an elevated storage tank. A 100,000 gallon elevated storage tank is estimated at $650,000 which includes contingencies and project costs.

Proposed Sanitary Sewer Service

There are no on-site systems that have been identified by Ohio EPA or the Department of Health as public health nuisance. The Damascus Township Trustees did note that they were concerned about historical problems that Ohio EPA has had with River Bend MHP along with current sanitary operations at the seasonal campgrounds which are located along the river. River Bend MHP currently has a permitted wastewater treatment plant that discharges into the Maumee River. The MHP has been placed under Findings and Orders to correct all of their treatment deficiencies. The seasonal campgrounds have Department of Health approved sewage holding tanks that are pumped on a routine schedule.
Flatrock Township

Flatrock Township is located in the west central part of Henry County. The Township borders Defiance County to the west and the Maumee River to the north. The unincorporated portion of the Township has a 2000 Census population of 967. The Village of Florida and a small area of Holgate are the only incorporated community which has a population of approximately 287.

The total land area is 35.0 square miles and the Township is at an elevation of 696 feet. There are 35.8 people per square mile which includes the Village of Florida. The Township drains north to the Maumee River by means of natural creeks and manmade ditches. The Village of Florida has a total land area of .2 square miles. Additional demographics and population projections for both Flatrock Township and the Village of McClure are as follows:

<table>
<thead>
<tr>
<th></th>
<th>2000 Census</th>
<th>Square Mile</th>
<th>Population/ Square Mile</th>
<th>MHI</th>
<th>LMI %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flatrock Township</td>
<td>967</td>
<td>34.8</td>
<td>27.8</td>
<td>$40,088</td>
<td>26.9</td>
</tr>
<tr>
<td>Village of Florida</td>
<td>246</td>
<td>.2</td>
<td>1,230</td>
<td>$39,583</td>
<td>47.8</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change  
** Ohio Department of Development - Henry County Projected Rate of Change

<table>
<thead>
<tr>
<th></th>
<th>2008 Estimated Water Demand (100 gpcd)</th>
<th>2008 Estimated Water Demand/ Square Mile</th>
<th>2030 Estimated Population Estimate**</th>
<th>2030 Estimated Water Demand (100 gpcd)</th>
<th>2030 Estimated Water Demand/ Square Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flatrock Township</td>
<td>94,600 gpd</td>
<td>2,718 gpd</td>
<td>997</td>
<td>99,700 gpd</td>
<td>2,865 gpd</td>
</tr>
<tr>
<td>Village of Florida</td>
<td>23,600 gpd</td>
<td>118,000 gpd</td>
<td>254</td>
<td>25,400 gpd</td>
<td>127,000 gpd</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change  
** Ohio Department of Development - Henry County Projected Rate of Change

Groundwater Resources - Flatrock is divided into two water formations -- limestone and shale. The limestone aquifer is beneath 40 to 85 feet of glacial drift. Wells developed in the southern portion of the Township may yield up to 100 gallons per minute if drilled at depth that exceed 200 feet. The northern area of the Township is made up of thin lenses of sand and gravel with yields up to 10 gpm near the non-water bearing shale bedrock at depths ranging from 30 to 93 feet. There are no test wells within the Township and the average domestic well in the limestone aquifer is rated at
10 gpm as compared to the north shale area which is 3 gpm. The well depths in both areas range between 32 to 73 feet.

**Surface Water Resources** - The Maumee River is located along the north border of the Township. The Maumee River does have the capacity to support a regional water system.

**Municipal Public Water Systems** - The Village of Florida has a public water system that receives potable water form the City of Napoleon. An 8" waterline on State Route 424 supplies water to the Village. Water is also supplied north out of Florida to Okolona. Okolona is an unincorporated area that is located in Napoleon Township.

**Wastewater Treatment Systems** - There are currently four (4) on-site systems, no private NPDES permits, and two (2) Public NPDES Permits within the Township. The Village of Holgate’s controlled discharge lagoon is located north of the Village just west of State Route 108. Holgate’s system will be discussed later. The treatment systems are listed as follows:

**On-Site Systems (Septage Tank and Leach Field)**
- Rettig Pallets
- Standley Elevators
- Zachrich trucking
- Township Maintenance Building

**Public NPDES Permit (controlled discharge lagoon)**
- Village of Florida 47,500 gpd

In 2005, the Village constructed a gravity sewer collection system and a controlled discharge lagoon system that discharges into Brubaker Creek and subsequently Benien Creek. The lagoon system is a three cell system that was also designed and constructed for sanitary flows from Okolona. The design flows for both Florida and Okolona are as follows:

- Florida - 27,500 gpd
- Okolona - 20,000 gpd
The current NPDES permit became effective October 1, 2004 and will expire September 30, 2009. The Village of Florida has agreed with the Henry County Regional Water and Sewer District to provide treatment for the District's sanitary sewer service area which includes Okolona. This agreement was entered into in April of 2004 with a total flow of 15,675 gallons per day for the District's Okolona Service Area.

**Proposed Water Service**

There are a number of homes located on State Route 424, east of the Village of Florida over to Township Road M that could some day petition for water service from Florida. At this time, there is no indication of poor water quality or supply problems that would warrant water service to the area.

Note: Florida currently has their own water purchase agreement with Napoleon. If the District is petitioned for water in any areas outside of Florida, a water purchase agreement between both entities would be required.

**Proposed Sanitary Sewer Service**

At this time there is no indication from the Henry County Health Department or Ohio EPA that any public health nuisance exists in Flatrock Township.

There are a number of homes east of the Village of Florida on State Route 424 that could some day due to failed septic systems or identified direct discharges would be directed to construct a central sewer collection system. It would appear that the Florida Wastewater Lagoon Treatment Facility would be a logical option for treatment.

**Standley** which is an unincorporated community located in the southwest portion of Flatrock Township is the only other area that has a density of on-site systems that may require central sewers and treatment.
The Village of Holgate and Florida are approximately 4.5 miles from Stanley. Both communities should have available capacity for the estimated flow at 4,500 gpd. Another option would be to construct a packaged treatment system that would discharge into Huston Creek.

Note: The Village of Holgate's Wastewater Treatment Lagoon Treatment Facility which is located in the southeastern portion of Flatrock Township could serve some limited needs in this part of the township.
Freedom Township

Freedom Township is located in the northwest part of Henry County. The Township borders Fulton County to the north. There are no incorporated communities within the Township and the population based on the 2000 Census is at 1,002.

The total land area is 23.6 square miles and the elevation is at 705 feet. There are 42.5 people per square foot. Additional demographics and population projections for Freedom Township are as follows:

<table>
<thead>
<tr>
<th>Township</th>
<th>2000 Census</th>
<th>Square Mile</th>
<th>Population/ Square Mile</th>
<th>MHI</th>
<th>LMI %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freedom Township</td>
<td>1,002</td>
<td>23.6</td>
<td>42.5</td>
<td>$51,797</td>
<td>23.9</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Henry County Projected Rate of Change

<table>
<thead>
<tr>
<th>Township</th>
<th>2008 Population Estimate*</th>
<th>2008 Estimated Water Demand (100 gpcd)</th>
<th>2008 Estimated Water Demand/Square Mile</th>
<th>2030 Population Estimate**</th>
<th>2030 Estimated Water Demand (100 gpcd)</th>
<th>2030 Estimated Water Demand/Square Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freedom Township</td>
<td>1,091 (+1.0%)</td>
<td>109,100 gpd</td>
<td>4,623 gpd</td>
<td>1,033</td>
<td>103,300 gpd</td>
<td>4,377 gpd</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Henry County Projected Rate of Change

Groundwater Resources - Freedom Township’s groundwater supply is limited due to the fact that the Township is in a shale and gravel formation. Yields up to 10 gpm may be encountered near the non-water bearing shale bedrocks at depths ranging from 30 to 93 feet. There are no test wells located in the Township and the average domestic well in the shale bedrock is rated at 5 gpm. The average well depth is at approximately 95 feet with wells as deep as 120 feet in the northern portion of the Township.

Surface Water Resources - There are no surface water resources within the Township.

Municipal Public Water Systems - There are no public municipal water systems within the Township.
Wastewater Treatment Systems - There are currently four (4) on-site systems and no private or public NPDES Permitted Systems. The on-site systems are as follows:

- St. John Church
- Fuhrop Migrant Camp
- Gerald Grain Association Office
- Peters Dairy

Proposed Water Service

Proposed waterline in Freedom Township to serve the residents and the church, which the main developer is Vreba-Hoff (dairy farm).

There are three (3) options to consider water supply: Village of Archbold, City of Wauseon, and the City of Napoleon. If the line were to be extended from Wauseon, it would stop at the dairy farm and continue no further unless the residents or church paid the cost to extend the line.

Below are three (3) options which include Archbold and Napoleon:

Option 1: Transmission line from Ridgeville down County Road X to County Road U. This line could potentially pick up 30 residents along the way.

Option 2: Transmission line from Country View Haven up County Road 15 then to the west down County Road U with a potential 24 residents that could connect.

Option 3: Transmission line from Country View Haven to County Road S west, up to County Road 16 with a potential 17 resident connections.

Option 4: Transmission line on County Road T east to County 16 north to Vreba-Hoff.

The fee structure will be based on the developer's agreement between the Henry County Regional Water and Sewer district and Vreba-Hoff. Any resident who wishes to connect the waterline will pay a system development fee of $22 a lineal foot of property that will be
remitted to the developer. This number is set at 175 lf for each property for all Townships. There will also be a tap fee for those that connect and this will be paid to the Henry County Regional Water and Sewer District for operating and maintenance costs of the project. The fee is yet to be determined. If a resident does not wish to tie into the waterline, no cost or fees will be paid by them. If they wish to connect at a later date, they will pay the same fees as someone who connected at the time of construction. The resident is responsible for the lateral and connection point to the house from the main line.

This project, at a later date may include the unincorporated area of Gerald and County Road 15b. These projects will be paid by those residents if they wish to have the line extended. Plate 17 shows the four water service alternatives.

Church Costs: 175 lf x $22 l.f = $3,850 + tap fee (TBD)

Estimated costs for water service to Vreba-Hoff Dairy Farm are listed as follows:

<table>
<thead>
<tr>
<th>Vreba-Hoff Dairy Farm - Three (3) alternative routes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative</td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>Alternative No. 1 - 32,324 lineal feet</td>
</tr>
<tr>
<td>Alternative No. 2 - 27,690 lineal feet</td>
</tr>
<tr>
<td>Alternative No. 3 - 27,570 lineal feet</td>
</tr>
<tr>
<td>Alternative No. 4 - 33,595 lineal feet</td>
</tr>
</tbody>
</table>

Note: The above estimates do not include a booster pump building and chlorination system, only master metering.

Proposed Sanitary Sewer Service

The Henry County Health Department and Ohio EPA currently are not aware of any public health nuisance in Freedom Township. Sanitary Sewer Collection and Treatment is not warranted at this time.

Gerald which is located on County Road U just west of State Route 108 is an unincorporated area that has a density of on-site systems that may require central sewers and treatment if
in the future it is deemed a public health nuisance. Gerald is further discussed in the Monroe Township section.
Harrison Township

Harrison Township is located in the north central area of Henry County. The Maumee River borders the Township to the north. A small area of the City of Napoleon is in the Township. The population of the Township without Napoleon is at approximately 1,026 per the 2000 Census. The Campbell Soup Company is located in the northwest corner of the Township adjacent to the City of Napoleon.

The total land area is 27.0 square miles and the elevation is at 682 feet. There are 45.7 people per square mile. The Township drains north to the Maumee River and also south to Turkeyfoot Creek which flows northeast to the Maumee River. Additional demographics and population projections for Harrison Township are as follows:

<table>
<thead>
<tr>
<th>Harrison Township</th>
<th>2000 Census</th>
<th>Square Mile</th>
<th>Population/ Square Mile</th>
<th>MHI</th>
<th>LMI %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,026</td>
<td>27.0</td>
<td>38</td>
<td>$48,000</td>
<td>29.1</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change  
** Ohio Department of Development - Henry County Projected Rate of Change

<table>
<thead>
<tr>
<th>Harrison Township</th>
<th>2008 Population Estimate*</th>
<th>2008 Estimated Water Demand (100 gpcd)</th>
<th>2008 Estimated Water Demand/ Square Mile</th>
<th>2030 Population Estimate**</th>
<th>2030 Estimated Water Demand (100 gpcd)</th>
<th>2030 Estimated Water Demand/ Square Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,043 (+0.2%)</td>
<td>104,300 gpd</td>
<td>3,863 gpd</td>
<td>1,058</td>
<td>105,800 gpd</td>
<td>3,919 gpd</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change  
** Ohio Department of Development - Henry County Projected Rate of Change

Groundwater Resources - Harrison Township is divided into three (3) water formations – limestone, shale, and gravel. Limestone is in the southern and eastern areas of the Township and this aquifer is beneath 40 to 85 feet of glacial drift. Wells developed in this area may yield up to 100 gpm if drilled at depths that exceed 200 feet. The remainder of the Township consists of gravel which produce yields much lower at 10 gpm near the non-water bearing shale bedrock at depths ranging from 30 to 93 feet. There is an industrial (commercial) well located east of State Route 109 and north of US Route 6 that yields 400 gpm. The well was drilled to a depth of 202 feet and bedrock was encountered at 74 feet.
The domestic wells located in the limestone aquifer produce on the average approximately 9 gpm at a well depth of 65 feet. The shale and gravel area averages 5 gpm at 95 feet.

Surface Water Resources - The Maumee River which is located along the north border of the Township along with the Turkeyfoot Creek would have capacity to support a regional water system.

Municipal Public Water Systems - The Henry County Regional Water and Sewer District provides potable water to areas east of the City of Napoleon and also southeast to the Village of Malinta. The City of Napoleon supplies the District with water by means of a service agreement.

Wastewater Treatment Systems - Currently there are five (5) on-site systems, one private NPDES permit, and no public NPDES permits. The City of Napoleon does provide wastewater treatment to some unincorporated areas that surround the City’s corporation. The treatment systems and Napoleon sewer agreement areas are as follows:

On-Site Systems (Septage Tanks and Leach Field)
- Henry County Airport
- J&C Repair
- DH Roberts Construction
- Southpointe Business Park
- Ernsberger Private Storage
- Sharon United Methodist Church
- BA Miller Trucking

Private NPDES Permit
- Campbell Soup Company - 10 mgd

Proposed Water Service
Currently a water line extends east from Napoleon on Township Road P along with a transmission line southeast to Malinta. From Malinta an 8" diameter waterline extends east and then north to the unincorporated community of Grelton. The unincorporated community
of Shunk has both yield and water quality problems. Two (2) options for delivering water to Shunk are listed as follows:

1. Construct an 8" diameter waterline east to Shunk on Township Road N2 (from Napoleon)
2. Construct an 8" diameter waterline north on State Route 109 (from Malinta)

Note: The Henry County Regional Water and Sewer District is currently evaluating options to deliver potable water to McClure. The two options include extending the waterline on Township Road P east to McClure or from the Village of Malinta. The two water service alternatives are shown on Plate 18.

The estimated project costs for both alternatives are listed as follows:

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Estimated Project Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative No. 1 - 8,670 lineal feet</td>
<td>$500,000 to $600,000</td>
</tr>
<tr>
<td>Alternative No. 2 - 9,700 lineal feet</td>
<td>$600,000 to $700,000</td>
</tr>
</tbody>
</table>

Note: The above estimate does not include a booster pump building and chlorination system or elevated storage, only master metering.

Proposed Sanitary Sewer Service

There are no additional areas identified as public health nuisance by the Department of Health or Ohio EPA. This unincorporated community of Shunk which has approximately 20 homes may be required in the future to resolve failed septage systems.

Note: The Village of Malinta is scheduled to construct a central sanitary sewer collection system and treatment facility in 2010. Malinta could be considered as a regional treatment site for Shunk. Shunk’s projected sanitary flow is 5,200 gpd. Plate 19 illustrates the two sanitary sewer alternatives.
Estimated project costs for a pump station and force main to Malinta along with a 5,200 gpd packaged treatment plant are listed as follows:

**Shunk 5,200 gpd (Treatment)**

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Estimated Project Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative No. 1 - 12,300 lineal feet</td>
<td>$680,000 to $740,000</td>
</tr>
<tr>
<td>Alternative No. 2 - Packaged Treatment Plant</td>
<td>$180,000 to $210,000</td>
</tr>
</tbody>
</table>

Note: The above estimated project does not include a sanitary sewer collection system for Shunk, only treatment options. A detailed general plan that would identify collection system and treatment alternatives with detailed costs should be prepared for Shunk when the Henry County Health Department and/or Ohio EPA determine the area to be a public nuisance.
**Liberty Township**

Liberty Township is located in the north central portion of Henry County. The Maumee River borders Liberty Township to the south and Fulton County to the north. The Village of Liberty Center with a population of 1,295 is located centrally and just west of the Washington Township border. The population of the township without the Village of Liberty Center is at 1,296 per the 2000 Census.

The total land area is at 32.1 square miles which relates to a population density of 80.8 people per square mile. The Township’s elevation is at 673 feet and the drainage is to the south which flows to the Maumee River by means of creeks and drainage ditches. The Village of Liberty Center has a population density at 1,060.9 people per square mile. The Village has a total surface area at 1.0 square miles. Additional demographics and population projections for both Liberty Township and the Village of Liberty Center are as follows:

<table>
<thead>
<tr>
<th></th>
<th>2000 Census</th>
<th>Square Mile</th>
<th>Population/ Square Mile</th>
<th>MHI</th>
<th>LMI %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberty Township</td>
<td>1,296</td>
<td>31.1</td>
<td>41.7</td>
<td>$40,833</td>
<td>31.7</td>
</tr>
<tr>
<td>Village of Liberty Center</td>
<td>1,001</td>
<td>1.0</td>
<td>1,001</td>
<td>$40,395</td>
<td>43.3</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change  
** Ohio Department of Development - Henry County Projected Rate of Change

<table>
<thead>
<tr>
<th></th>
<th>2008 Population Estimate*</th>
<th>2008 Estimated Water Demand (100 gpcd)</th>
<th>2008 Estimated Water Demand/ Square Mile</th>
<th>2030 Population Estimate**</th>
<th>2030 Estimated Water Demand (100 gpcd)</th>
<th>2030 Estimated Water Demand/ Square Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberty Township</td>
<td>1,433 (+1.2%)</td>
<td>143,000 gpd</td>
<td>4,598 gpd</td>
<td>1,336</td>
<td>133,600 gpd</td>
<td>4,296 gpd</td>
</tr>
<tr>
<td>Village of Liberty Center</td>
<td>976 (-0.3%)</td>
<td>97,600 gpd</td>
<td>97,600 gpd</td>
<td>1,032</td>
<td>103,200 gpd</td>
<td>103,200 gpd</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change  
** Ohio Department of Development - Henry County Projected Rate of Change

Groundwater Resources - The groundwater formation is sand and gravel which is beneath thick layers of fine sand and silty clay. Yields up to 10 gpm could be produced near non-water bearing shale bedrock at depths ranging from 30 to 93 feet.
The Village of Liberty Center’s potable water system at one time was supplied by municipal groundwater wells. Historical well log information indicates that a well in the Village of Liberty Center produced approximately 200 gpm at a depth of 77 feet. The Village’s well fields have been abandoned and water is currently supplied by the City of Napoleon. Domestic wells average a yield at approximately 4 gpm at a depth of 70 feet.

The Village of Liberty Center supplies water by means of a 6” diameter waterline to the unincorporated Texas and also south along State route 109 to State Route 24. The waterline south to State Route 24 is 10” in diameter.

**Surface Water Resources** - The Maumee River which is located south along the Township borders would have capacity for a regional water system.

**Municipal Public Water Systems** - The Village of Liberty Center and the unincorporated area of Texas is supplied by the City of Napoleon. The City of Napoleon and the Village of Liberty Center entered a service agreement for potable water. The Village of Liberty Center and Henry County Commissioners have an agreement that provides water from Liberty Center to Texas.

**Wastewater Treatment Systems** - Currently there are six (6) on-site systems, no private NPDES permits, and one (1) public NPDES permit. The City of Napoleon does provide wastewater treatment to some unincorporated areas that are adjacent to the City’s corporation. The treatment systems and Napoleon’s sewer agreement areas are as follows:

- On-Site Systems (Septage Tanks and Leach Field)
  - Mitchell Farm Equipment
  - Gerken Material
  - Vorwerk Migrant Camp
  - Country Headlines Beauty
  - Roberts Craft
  - Vic’s Sales and Service
Public NPDES Permit

- Village of Liberty Center - 250,000 gpd

The Village owns and operates an oxidation ditch process (secondary treatment) that discharges into the Maumee River. The current average daily flow is at approximately 125,000 gpd. The Village is working toward reducing infiltration and inflow. During some storm-related events, flows exceed the design capacity of the plant. The current NPDES permit became effective on April 1, 2007 and will expire on March 31, 2012.

Proposed Water Service

The Liberty Township Trustees have indicated that consideration should be given to extending the 8” diameter waterline on State Route 109 (north of the Village) to County Road W and to also construct a waterline west of State Route 109 on both County Road U and V to Township Road 8. The waterline extension north to County Road W is estimated at 10,440 lineal feet and on County Road U and V approximately 2,700 lineal feet each.

Note: The Village of Liberty Center and the unincorporated community of Texas are currently having problems meeting the MCLs for TTHM (D/DBP Rule). Until this is resolved, extending water service from Liberty Center may not be permitted by Ohio EPA. The Village of Liberty Center has authorized an engineering analysis to develop water quality compliance alternatives.

The estimated project costs for the waterline extension are listed as follows:

- State Route 109 north to County Road W, 10,440 lineal feet
  Estimated Construction and Project Costs = $650,000 to $700,000
- County Road U, 2,700 lineal feet
  Estimated Construction and Project Costs = $160,000 to $180,000
- County Road V, 2,700 lineal feet
  Estimated Construction and Project Costs = $160,000 to $180,000
- County Road S, 3,960 lineal feet
  Estimated Construction and Project Costs = $240,000 to $260,000
- County Road 9, 5,280 lineal feet
Estimated Construction and Project Costs = $300,000 to $350,000

Note: Upon completion of County Road U (2,700 lineal feet) and County Road 9 (5,280 lineal feet), consideration could then be given to a future phased waterline connection on both roads (see plate). The proposed water service extensions are shown on Plate 20.

Proposed Sanitary Sewer Service
There are no areas currently identified as public health nuisances by the Department of Health or Ohio EPA, but the township trustees have requested consideration be given to extending sanitary service south of the Village of Liberty Center on State Route 109 to State Route 24 and also north on State Route 109 to County Road W. Another area to be considered is west of the Village on County Road 9 between County Roads S and T and also on County Road S, west to the railroad. Plate 21 shows the proposed sanitary sewer services.

The estimated costs for extending sanitary service to areas within the District, but outside of the Village of Liberty Center are as follows:

- State Route 109 south, 8,100 lineal feet gravity sewers, 3,960 lineal feet of 6" diameter force main, pump station, 400 lineal feet of 4" diameter force main and three (3) grinder pumps.
  Estimated Construction and Project Costs = $1,500,000 to $1,700,000

- State Route 109 North, 2,700 lineal feet of gravity sewers
  Estimated Construction and Project Costs = $380,000 to $400,000

- State Route 109 North, 10,560 lineal feet force main and grinder pumps
  Estimated Construction and Project Costs = $1,400,000 to $1,500,000

- County Road S, 4,000 lineal feet gravity sewers
  Estimated Construction and Project Costs = $560,000 to $580,000

- County Road 9, 5,280 lineal feet
  Estimated Construction and Project Costs = $740,000 to $770,000

- County Road 9 and County Road T pump station and force main
  Estimated Construction and Project Costs = $440,000 to $480,000

SUBTOTAL $1,740,000 to $1,830,000
**Marion Township**

The Township is located in the south central portion of Henry County. Marion Township borders Putnam County to the south. The Village of Hamler which is located in the northeastern part of the Township is the only incorporated community within the Township. The 2000 census listed the township’s population without Hamler at 767 and Hamler’s population was at 650.

The total land area is 36.2 square miles with a population density at 39.1 people per square mile. The Township drains into creeks and ditches and flows north into the Maumee River. The elevation is flat at 712 feet. The Village of Hamler is located in the northeast section of the Township. Hamler’s land area is at 0.6 square miles and has a population density 1,137.1 people per square mile. Demographics and population projections are listed as follows:

<table>
<thead>
<tr>
<th>Township</th>
<th>2000 Census</th>
<th>Square Mile</th>
<th>Population/ Square Mile</th>
<th>MHI</th>
<th>LMI %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marion Township</td>
<td>767</td>
<td>35.6</td>
<td>21.5</td>
<td>$42,885</td>
<td>29.9</td>
</tr>
<tr>
<td>Village of Hamler</td>
<td>650</td>
<td>.6</td>
<td>1,083</td>
<td>$40,313</td>
<td>46.0</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Henry County Projected Rate of Change

<table>
<thead>
<tr>
<th>Township</th>
<th>2008 Population Estimate*</th>
<th>2008 Estimated Water Demand (100 gpcd)</th>
<th>2030 Estimated Population Estimate**</th>
<th>2030 Estimated Water Demand (100 gpcd)</th>
<th>2030 Estimated Water Demand/ Square Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marion Township</td>
<td>751 (-0.3%)</td>
<td>75,100 gpd</td>
<td>791</td>
<td>79,100 gpd</td>
<td>2,055 gpd</td>
</tr>
<tr>
<td>Village of Hamler</td>
<td>645 (-0.1)</td>
<td>70,000 gpd¹</td>
<td>670</td>
<td>73,000 gpd²</td>
<td>111,667 gpd</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Henry County Projected Rate of Change
1 actual average flow
2 based on 109 gpcd

**Groundwater Resources** - The Township is located in a limestone aquifer beneath 40 to 85 feet of glacial drift. Wells drilled in this area may yield up to 100 gpm if drilled at depths that exceed 200 feet. The Village of Hamler currently operates a groundwater treatment plant that has two municipal wells. A municipal well located at the southeast corner of the Village has a yield of 40 gpm at a depth of 83 feet. The raw water quality for this well is listed as follows:
Depth (feet) 83  
Bedrock (feet) 48  
Yields (gpm) 40  
Hardness (mg/l) 820  
Iron (mg/l) 1.0  
Dissolved Solids (mg/l) 1,573  
Sulfates (mg/l) N/A  
Fluoride (mg/l) 1.5

Domestic wells in the township typically produce between 6 to 10 gpm at an average depth at approximately 90 feet. A test well was drilled south of Hamler near the Henry County/Putnam County line at a depth of 350 feet. This well’s yield was only at 8 gpm.

It would appear that groundwater for a municipal or regional supply is limited and not available.

**Surface Water Resources**
There are no surface water supplies that would support a regional water system. The two larger creeks, the Turkeyfoot and West Creek would support limited wastewater treatment discharge. The Village of Hamler currently discharges into South Turkeyfoot Creek.

**Municipal Public Water Systems** - As previously discussed, the Village of Hamler has a public water system that uses groundwater as its source. Hamler’s water system is the only system in Marion Township. The Village also supplies potable water to Patrick Henry School District. The water treatment plant provides iron filtration and disinfection. The Village has two (2) wells that are rated at 110 gpm each. High levels of sulfur in the well supply has historically been a problem for the Village.

**Wastewater Treatment Systems** - There are currently three (3) on-site systems, no private NPDES permits, and one (1) public NPDES permit. They are listed as follows:

**On-Site Systems (Septage Tanks and Leach Field)**
- Coressel Beauty Shop
Hope Lutheran Church  
Harvest Fellowship Church

Public NPDES Permit  
Village of Hamler - 113,000 gpd

The Village of Hamler operates a continuous discharge lagoon that is located north of the Village and east of State Route 109. The treated wastewater discharges into South Turkeyfoot Creek. The current NPDES permit became effective May 1, 2007 and will expire on April 30, 2012.

Proposed Water Service
The Village of Hamler currently operates a groundwater treatment facility with available capacity at approximately 71,000 gpd. There are no identified water needs within the unincorporated areas of the township.

Note: The Village of Hamler currently has problems with levels of hydrogen sulfide in their groundwater supply.

Proposed Sanitary Sewer Service
The Harvest Fellowship Church is planning on expanding their facility. The proposed expansion will exceed the current on-site system’s treatment capacity. The church has requested a sanitary sewer connection into the Hamler wastewater lagoon treatment facility. The proposed connection and details are currently being discussed with both the Village of Hamler BPA and the Henry County Water and Sewer District. The Henry County Health Department and Ohio EPA have not identified areas considered a public health nuisance.
Monroe Township

The Township is located in the central portion of Henry County. The 2000 Census listed the Township population at 892 which does not include the Village of Malinta. The Village of Malinta is the only incorporated community in the Township and their population is at 285. The Village is located in the northeast section of the Township on State Route 109.

The total land area is 36.6 square miles at an elevation of 686 feet. There are 32.2 people per square mile which includes the Village of Malinta. The Village drains into the Maumee River by means of Turkeyfoot Creek and other creeks and ditches. The Village of Malinta covers 0.8 square miles and has a population density of 369.8 people per square mile. Additional demographics and population projections for both Monroe Township and Malinta are as follows:

<table>
<thead>
<tr>
<th></th>
<th>2000 Census</th>
<th>Square Mile</th>
<th>Population/ Square Mile</th>
<th>MHI</th>
<th>LMI %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monroe Township</td>
<td>892</td>
<td>35.8</td>
<td>24.9</td>
<td>$42,377</td>
<td>35.2</td>
</tr>
<tr>
<td>Village of Malinta</td>
<td>285</td>
<td>0.8</td>
<td>356.3</td>
<td>$37,344</td>
<td>43.4</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Henry County Projected Rate of Change

<table>
<thead>
<tr>
<th></th>
<th>2008 Population Estimate*</th>
<th>2008 Estimated Water Demand (100 gpcd)</th>
<th>2008 Estimated Water Demand/ Square Mile</th>
<th>2030 Population Estimate**</th>
<th>2030 Estimated Water Demand (100 gpcd)</th>
<th>2030 Estimated Water Demand/ Square Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monroe Township</td>
<td>880 (-0.2%)</td>
<td>88,000 gpd</td>
<td>2,458 gpd</td>
<td>919</td>
<td>91,900 gpd</td>
<td>2,567 gpd</td>
</tr>
<tr>
<td>Village of Malinta</td>
<td>271 (-0.6%)</td>
<td>27,100 gpd</td>
<td>33,875 gpd</td>
<td>294</td>
<td>29,400 gpd</td>
<td>36,750 gpd</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Henry County Projected Rate of Change

Groundwater Resources - The Township is located in a limestone aquifer beneath 40 to 85 feet of glacial drift. Wells developed in this area may yield up to 100 gpm if drilled at depths that exceed 200 feet. There are no municipal wells or test wells in the Township. There are three (3) industrial wells located south along the township line between Monroe and Marion. One of the wells produces 25 gpm at a well depth of 63 feet. A well located to the west of this well has water quality information which is as follows:
Depth (feet)  83  
Bedrock (feet)  53  
Yield (gpm)  2  
Hardness (mg/l)  302  
Iron (mg/l)  0.42  
Dissolved Solids (mg/l)  544  
Sulfates (mg/l)  288  
Fluoride (mg/l)  2.0  

Domestic wells in the Township yield between 4 to 10 gpm at approximately 65 feet. It would appear that groundwater is limited and would not be available for a regional supply.

Surface Water Resources - There are no surface water supplies that would support a regional water system. The Turkeyfoot Creek would support a small municipal wastewater treatment plant discharge.

Municipal Public Water Systems - The Village of Malinta has a public water system that receives potable water from the City of Napoleon. A 12" waterline from Napoleon was constructed on County Highway 110 and O. At this location, a master meter and chlorination building were constructed and then an 8" line was extended to Malinta.

Wastewater Treatment Systems - Currently there are five (5) on-site systems on file at Ohio EPA. Four of the five systems are in the Village of Malinta. The Village of Malinta will begin construction of a new gravity sanitary sewer collection system and a controlled discharge lagoon. This project should be completed toward the end of 2010. The four (4) on-site systems within in the Village will
be abandoned and connected to the new sewer collection system. The Village of Malinta will then be the only public NPDES system in the Township. These are on private NPDES permit systems. The Elery Supper Club will then be the only on-site system in the Township.

**Proposed Water Service**

The Village of Malinta currently has a water purchase agreement with the City of Napoleon and the Henry County Water and Sewer District has a water purchase agreement with the Village of Malinta to serve the unincorporated community of Grelton. Outside of these existing service areas there are no additional areas within the Township that need potable water at this time.

**Proposed Sanitary Sewer Service**

The Village of Malinta in 2010 will construct a new sanitary sewer collection system and a 90,000 gpd controlled discharge lagoon. This lagoon system when completed may have some available capacity for areas outside of the corporation such as for the unincorporated community of Grelton and Elery.

There is no indication from the Henry County Health Department or Ohio EPA that a public health nuisance exists in the Township.

The only area that may be of a concern in the future is the unincorporated community of Grelton. Grelton is located in the extreme southwest corner of the township and the homes that are in the township only represent a small portion. Grelton actually has homes in four different townships. Grelton does have public water which is supplied by the Village of Malinta.

Grelton would appear to have three (3) options for wastewater treatment. The options are listed as follows:

1. Construct a pump station and force main to the Village of Malinta.
2. Construct a pump station and force main to the Village of McClure
3. Construct a 10,000 gpd treatment plant to discharge into a local stream.
Note: The force main from Grelton could be constructed along an abandoned railroad northeast to McClure at approximately 18,000 lineal feet or southwest to Malinta at approximately 12,000 lineal feet. **Plate 22** shows the three alternatives for serving the Grelton area with sanitary sewer service.

*The estimated project costs for the three (3) options are as follows:*

<table>
<thead>
<tr>
<th>Options</th>
<th>Estimated Project Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pump Station and 11,700 lineal feet of force main to Malinta</td>
<td>$650,000 to $700,000</td>
</tr>
<tr>
<td>2. Pump station and 15,000 lineal feet of force main to McClure</td>
<td>$825,000 to $900,000</td>
</tr>
<tr>
<td>3. 10,000 gpd packaged treatment plant</td>
<td>$350,000 to $400,000</td>
</tr>
</tbody>
</table>

*Note: The above estimated project costs do not reflect sanitary sewer collection costs for Grelton, but only treatment costs. A detailed general plan for sanitary sewer collection and treatment will be required if the Grelton area becomes identified as a public health nuisance.*
Napoleon Township

Napoleon Township is located in the northwest portion of Henry County. The Township borders Defiance County to the west and the City of Napoleon which is the county seat is located in the northeast corner of the Township. Napoleon Township is the highest populated Township with a total population of 10,331 which includes the City of Napoleon. The unincorporated portion of the Township has a 2000 Census population of 1,513. The total land area is at 34.7 square miles at an average elevation of 676 feet. The population density which includes the City of Napoleon is 297.9 people per square mile. The Township drains into the Maumee River.

The City of Napoleon has a population of 9,318 based on the 2000 Census. The total land area is 5.6 square miles which relates to a population density of 1,668.1 people per square mile. Projected population data along with additional demographics are as follows:

<table>
<thead>
<tr>
<th></th>
<th>2000 Census</th>
<th>Square Mile</th>
<th>Population/ Square Mile</th>
<th>MHI</th>
<th>LMI %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Napoleon Township</td>
<td>1,513</td>
<td>29.1</td>
<td>52.0</td>
<td>$40,686</td>
<td>20.3</td>
</tr>
<tr>
<td>City of Napoleon</td>
<td>9,318</td>
<td>5.6</td>
<td>1,663.9</td>
<td>$37,467</td>
<td>42.5</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Henry County Projected Rate of Change

<table>
<thead>
<tr>
<th></th>
<th>2008 Population Estimate*</th>
<th>2008 Estimated Water Demand (100 gpcd)</th>
<th>2008 Estimated Water Demand/Square Mile</th>
<th>2030 Population Estimate**</th>
<th>2030 Estimated Water Demand (100 gpcd)</th>
<th>2030 Estimated Water Demand/Square Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Napoleon Township</td>
<td>1,506 (0.0%)</td>
<td>150,600 gpd</td>
<td>5,175 gpd</td>
<td>1,560</td>
<td>156,000 gpd</td>
<td>5,361 gpd</td>
</tr>
<tr>
<td>City of Napoleon</td>
<td>8,817 (-0.36%)</td>
<td>1,153,000 gpd</td>
<td>205,893 gpd</td>
<td>9,605</td>
<td>1,256,300 gpd</td>
<td>224,340 gpd</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Henry County Projected Rate of Change
1 actual average daily flows
2 based on 131 gpcd

Groundwater Resources - Napoleon Township groundwater supply is limited because of the shale and gravel formation. Yields up to 10 gpm may be encountered near the non-water bearing shale bedrock at depths ranging from 30 to 93 feet. There are no test wells located in the Township and
the average domestic well yields between 2 and 10 gpm at an average depth of approximately 80 feet. The groundwater supply will not support a municipal or regional water system.

**Surface Water Resources** - The Maumee River which is located and flows through the southeast portion of the Township does have capacity to support a municipal system and regional system as it currently does for the City of Napoleon and areas within the Water and Sewer District.

**Municipal Public Water Systems** - The City of Napoleon is the only municipal water treatment facility in Napoleon Township. The City’s main water supply is the Maumee River which is supported by a secondary raw water supply line from the City of Wauseon. The treatment facility has a 4.5 mgd capacity with a current average daily demand at 1.2 mgd. The treatment system consists of pretreatment followed by coagulation, lime softening, flocculation, sedimentation, stabilization, filtration, fluoridation, and disinfection.

The City of Napoleon also supplies potable water to the Village’s of Liberty Center, Malinta, and Florida and also to the Henry County Regional Water and Sewer District which includes the unincorporated areas such as Okolona, Greton, and Texas.

**Note:** An existing 6” diameter waterline from Napoleon south on State Route 108 to the Filling Memorial Home of Mercy will be replaced in 2010 with a 12” diameter line. A bulk water station is also to be constructed at the intersection of State Route 108 and County Road N. The new waterline will provide improved flow and pressure to the Home of Mercy.

**Wastewater Treatment Systems** - There are six (6) on-site systems, no private NPDES permits, and two (2) public NPDES permits. There are seven on-site systems within the City of Napoleon. The wastewater treatment systems are listed as follows:

**On-Site Systems - Napoleon Township (Septage Tanks and Leach Field)**
- Okolona Grain Company
- Hudson Products
- ODOT US 24 Rest Stop
- TV Time Foods
Golf Shop
- Johnson’s Craft and Ice Company

On-Site System - City of Napoleon (Septage Tanks and Leach Field)
- Wayne Park Carryout
- Manufactured Homes Unlimited
- Harper Supply Storage Building
- J.A. Schultz and Sons, Inc.
- Hoeffel Implement Sales
- Leader Engineering - Fabrication

Public NPDES Permit
- County View Haven - 10,000 gpd package treatment facility that discharges into an unnamed ditch tributary to Van Hying Creek. The NPDES became effective on January 1, 2009 and will expire December 31, 2013.
- City of Napoleon - 2.5 mgd design flow. The Napoleon wastewater facility is a trickling filter plant which includes phosphorus removal. The treatment components consist of a 2.5 mg equalization basin, grit removal, primary settling, nitrification, reaction basin, final settling, UV disinfection, and sludge treatment and disposal. The peak design capacity for wet weather flow is at 7.5 mgd. The wastewater plant discharges into the Maumee River. The current NPDES permit became effective on July 1, 2009 and will expire on July 1, 2013. The City currently has a combined sewer collection system that requires sanitary sewer separation to be completed within the next 20 years

Note: The Henry County Regional Water and Sewer District is in the process of constructing a sanitary sewer collection system that will deliver the sanitary waste from Okolona to the Village of Florida for treatment. The project is currently awaiting Ohio EPA Plan approval and funding. The construction of sewers, pump stations, and force main to Florida’s wastewater treatment plant should begin in the near future. This project will not require an NPDES permit. Additional information as it relates to Florida’s treatment system can be found in the Flatrock Township section.
Proposed Water Service
The unincorporated community of Okolona purchases water from the Village of Florida. Based on discussions with township trustees, Ohio EPA, and the Henry County Health Department, no additional water service throughout other areas of the township is warranted.

Proposed Sanitary Sewer Service
Plans for a sanitary sewer collection for Okolona are being submitted to Ohio EPA for approval. When constructed, Okolona's sanitary flow will be pumped to Florida's existing controlled discharge lagoon for treatment. Florida's treatment system was designed and constructed for Okolona's sanitary flow.

Ohio EPA and the Henry County Health Department have not identified any other areas within the township that would be considered a public health nuisance.

The Henry County Board of Commissioners owns and operates a 10,000 gpd package wastewater treatment plant at the Country View Haven Nursing Home. The NPDES permit is scheduled to expire on December 31, 2013. On October 8, 2008, an Ohio EPA plant inspection was completed by Ohio EPA, Northwest District Office, Division of Surface Water; no violations were noted, only daily operation, observations, and suggestions were made. Plate 23 shows the proposed route to Napoleon.

If the District elected to abandon the existing wastewater plant and planned to connect south into Napoleon, the nearest sanitary sewer connection would appear to be at the intersection of State Route 108 and Becklee Drive, approximately 2.2 miles or 11,616 lineal feet, at an estimated cost between $640,000 to $700,000.
Pleasant Township

Pleasant Township is located in the far southwest corner of Henry County. The township borders both Putnam and Defiance County. The Village’s of Holgate and New Bavaria are in Pleasant Township. The total township population without the two (2) villages is 927 based on the 2000 Census. Holgate’s population is at 1,194 and New Bavaria is 78. Including both villages, the population density is 59.9 people per square mile. There is 36.0 square miles of land at an elevation of 722 feet. The Township drains both northeast and northwest into the Maumee River.

The Village of Holgate’s total land area is one square mile and New Bavaria is at .1 square miles. Additional demographics and population projections for the township and both villages are as follows:

<table>
<thead>
<tr>
<th></th>
<th>2000 Census</th>
<th>Square Mile</th>
<th>Population/ Square Mile</th>
<th>MHI</th>
<th>LMI %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pleasant Township</td>
<td>927</td>
<td>34.9</td>
<td>26.6</td>
<td>$39,071</td>
<td>30.4</td>
</tr>
<tr>
<td>Village of Holgate</td>
<td>1,194</td>
<td>1.0</td>
<td>1,194</td>
<td>$35,729</td>
<td>49.5</td>
</tr>
<tr>
<td>Village of New Bavaria</td>
<td>78</td>
<td>0.1</td>
<td>78</td>
<td>$37,813</td>
<td>40.8</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Henry County Projected Rate of Change

<table>
<thead>
<tr>
<th></th>
<th>2008 Population Estimate*</th>
<th>2008 Estimated Water Demand (100 gpcd)</th>
<th>2008 Estimated Water Demand/ Square Mile</th>
<th>2030 Population Estimate**</th>
<th>2030 Estimated Water Demand (100 gpcd)</th>
<th>2030 Estimated Water Demand/ Square Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pleasant Township</td>
<td>872 (-0.7%)</td>
<td>87,200 gpd</td>
<td>2,499 gpd</td>
<td>956</td>
<td>95,600 gpd</td>
<td>2,739 gpd</td>
</tr>
<tr>
<td>Village of Holgate</td>
<td>1,113 (-0.9%)</td>
<td>111,300 gpd</td>
<td>111,300 gpd</td>
<td>1,231</td>
<td>123,100 gpd</td>
<td>123,100 gpd</td>
</tr>
<tr>
<td>Village of New Bavaria</td>
<td>76 (-0.3%)</td>
<td>7,600 gpd</td>
<td>7,600 gpd</td>
<td>80</td>
<td>8,000 gpd</td>
<td>80,000 gpd</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Henry County Projected Rate of Change

Groundwater Resources - Pleasant Township is located in the limestone aquifer beneath 40 to 85 feet of glacial drift. Wells developed in this area may yield up to 100 gpm if drilled at depths that exceed 200 feet. There is a test well that was drilled north of New Bavaria and the Village of
Holgate is supplied by a groundwater system. Raw water quality and yield for the test well and Holgate’s wells are listed as follows:

<table>
<thead>
<tr>
<th></th>
<th>Test Well</th>
<th>Holgate Well</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth (feet)</td>
<td>405</td>
<td>310</td>
</tr>
<tr>
<td>Bedrock (feet)</td>
<td>74</td>
<td>50</td>
</tr>
<tr>
<td>Yield (gpm)</td>
<td>20</td>
<td>150</td>
</tr>
<tr>
<td>Hardness (mg/l)</td>
<td>752</td>
<td>373</td>
</tr>
<tr>
<td>Iron (mg/l)</td>
<td>.5</td>
<td>.2</td>
</tr>
<tr>
<td>Dissolved Solids (mg/l)</td>
<td>N/A</td>
<td>875</td>
</tr>
<tr>
<td>Sulfates (mg/l)</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Fluoride (mg/l)</td>
<td>N/A</td>
<td>2.8</td>
</tr>
</tbody>
</table>

Domestic wells in the Township produce between 5 to 10 gpm at an average well depth at approximately 80 feet.

**Surface Water Resources** - There are no surface water resources within the Township that would supply water for a regional water or wastewater system.

**Municipal Public Water System** - The Village of Holgate is the only public water system in Pleasant Township. The water is supplied by four (4) wells that range from 80 to 150 gpm. The water plant’s design capacity is .432 mgd and the current average daily flow is .092 mgd. The Village provides aeration, iron filtration, and disinfection. The Village in 2008 replaced the iron removal filters.

**Wastewater Treatment Systems** - There are currently three (3) on-site systems, no private NPDES permits, and one (1) public NPDES permit. The Village of New Bavaria is not served. The wastewater treatment systems in Pleasant Township are listed as follows:

- **On-Site Systems (Septage and Leach Field)**
  - Farmers Elevator
  - Maple Grove Dairy
The Village of Holgate owns and operates a controlled discharge lagoon that is located north of the Village just west of State Route 108. The lagoon system is in Flatrock Township and the treatment plant discharges into Brinkman Ditch. The controlled discharge lagoon is designed for an average daily flow of .247 mgd. The existing NPDES permit was effective on April 1, 2007 and will expire March 31, 2012.

**Proposed Water Service**

Based on discussions with the Village of Holgate officials, Pleasant Township Trustees, and the County Health Department, extending potable water to areas within the Township does not appear to be needed. It should be noted that the Village of Holgate does have available water if an area such as the Village of New Bavaria would need to resolve problems with existing individual wells.

Pleasant Bend is located southeast of New Bavaria. This unincorporated community has a farmer's elevator and church along with approximately 28 residences that could be served by a waterline connection from Holgate to New Bavaria and then to Pleasant Bend. Again, the Holgate system has treatment capacity available for both of these service areas. The three (3) water service routes to New Bavaria and Pleasant Bend (alternatives) are shown on Plate 24.

*The estimated costs for delivering potable water to New Bavaria and Pleasant Bend are as follows:*

- **New Bavaria**
  - **Option 1** - 24,310 l.f. (State Route 108 and County Road C2) $1,500,000 to $1,600,000
  - **Option 2** - 17,000 l.f. (Railroad Right-of-Way) $1,000,000 to $1,100,000
  - **Option 3** - 23,970 l.f. (State Route 108 and County Road CY) $1,500,000 to $1,600,000
Note: New Bavaria’s estimate does not include a booster pump and chlorination building only master metering.

Pleasant Bend

Option 1 - 14,280 l.f. (County Road 16 and B) $850,000 to $930,000
Option 2 - 9,350 l.f. (Railroad Right-of-Way) $560,000 to $670,000
Option 3 - 21,070 l.f. (State Route 108 and County Road B) $1,300,000 to $1,400,000

Note: Pleasant Bend’s estimate of cost does not include booster pump building and chlorination system, only master metering.

The above estimates for both New Bavaria and Pleasant Bend do not include distribution system or an elevated storage tank. A 100,000 gallon elevated storage tank is estimated at $650,000 which includes contingencies and project costs.

Proposed Sanitary Sewer Service

At this time there are no public health nuisance issued for the unincorporated areas of Pleasant Bend, other areas within Pleasant Township, or the Village of New Bavaria. The Village of Holgate currently owns and operates a controlled discharge wastewater lagoon system that would have some additional capacity for the New Bavaria and the unincorporated area of Pleasant Township. Plate 25 shows the proposed sanitary sewer options available to New Bavaria and Pleasant Bend.

New Bavaria and Pleasant Bend would have a couple of options available to correct any public health nuisances. They are listed as follows:

New Bavaria (8,000 gpd)
- Option 1 - Pump station and force main to the Village of Holgate, 17,000 lineal feet $900,000 to $1,000,000
- Option 2 - 10,000 gpd packaged treatment plant $350,000 to $400,000
Pleasant Bend (7,500 gpd)

- Option 1 - Pump station and force main to New Bavaria,
  9,350 lineal feet $500,000 to $525,000
- Option 2 - 7,500 gpd packaged treatment plant $260,000 to $300,000

Note: Option 1 could include Holgate as treatment or New Bavaria. New Bavaria’s WWTP would need to be increased by 7,500 gpd for Pleasant Bend’s flow.
Richfield Township

Richfield Township is located in the east central portion of Henry County. The Township borders Wood County to the east. The 2000 Census listed the population at 654 people. There is no incorporated community in the Township. There are two unincorporated areas – Westhope and Grelton. Westhope is located in the center of the Township and Grelton is located in the northwest corner.

The total land area is 36.5 square miles and the average elevation is at 686 feet. The Township drains to the east to Beaver and Hammer Creeks then into the Maumee River. There are 17.9 people per square mile which makes Richfield the least populated Township in Henry County.

Additional demographics and population projections for Richfield Township are as follows:

<table>
<thead>
<tr>
<th></th>
<th>2000 Census</th>
<th>Square Mile</th>
<th>Population/ Square Mile</th>
<th>MHI</th>
<th>LMI %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richfield Township</td>
<td>654</td>
<td>36.5</td>
<td>17.9</td>
<td>$47,143</td>
<td>28.3</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change  
** Ohio Department of Development - Henry County Projected Rate of Change

<table>
<thead>
<tr>
<th></th>
<th>2008 Population Estimate*</th>
<th>2008 Estimated Water Demand (100 gpcd)</th>
<th>2008 Estimated Water Demand/ Square Mile</th>
<th>2030 Population Estimate**</th>
<th>2030 Estimated Water Demand (100 gpcd)</th>
<th>2030 Estimated Water Demand/ Square Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richfield Township</td>
<td>798 (+2.4%)</td>
<td>79,800 gpd</td>
<td>2,186 gpd</td>
<td>674</td>
<td>67,400 gpd</td>
<td>1,847 gpd</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change  
** Ohio Department of Development - Henry County Projected Rate of Change

Groundwater Resources - The Township is in a limestone aquifer beneath 40 to 85 feet of glacial drift. Wells developed in the areas may yield up to 100 gpm if drilled at depths that exceed 200 feet. There are no municipal or test wells in the Township.

Domestic wells produce between 2 to 15 gpm at an average well depth of 65 feet.
Surface Water Resources - Beaver Creek and Hammer Creek flow from the south up through the eastern part of the Township. These creeks would support a small public or private wastewater treatment plant, but they would not support a regional water or wastewater treatment facility.

Municipal Public Water Systems - The unincorporated area of Grelton receives potable water from the Village of Malinta. The Henry County Regional Water and Sewer district has a water purchase agreement with the Village of Malinta. The Village of Malinta also provides operations and maintenance of the distribution line that supplies water to Grelton along with the waterlines in the service area.

Wastewater Treatment Systems - There is one (1) on-site system and one (1) private NPDES permit. There are no public NPDES permits. The wastewater systems are listed as follows:

On-Site Systems (Septage Tanks and Leach Field)
- Westhope Tavern - currently closed

Private NPDES Permit (Packaged Treatment System)
- Hope School located at J-169 State route 65 owns and operates a 3,300 gpd packaged treatment system that discharges into an unnamed ditch to Big Creek. The current NPDES permit went into effect on May 1, 2009 and expires on April 30, 2014.

Proposed Water Service
The Richfield Township Trustees have identified three (3) areas that are or have had domestic well problems. The areas include a 3 to 4 mile radius from the Custar Stone Quarry which is located in Wood County, Hope School, and the unincorporated area of Westhope.

Hope School owns and operates a groundwater treatment system that serves approximately 140 students and 70 staff members at about 1,400 gpd. The water system provides iron removal, softening and disinfection at a design capacity of 3,300 gpd. The well field capacity is limited to 15 gpm.
Custar Stone Quarry is currently in operation which requires constant groundwater pumping and blasting for rock excavation. Due to the nature of the operations, individual home owners in the area have experience problems with well production. Residents as far as 3 to 4 miles have noted problems with their existing wells.

The unincorporated area of Westhope has experienced problems with low yield and water quality. The area is relatively small for extending water service, but if water is delivered to Hope School then water to Westhope could be a possibility.

There would appear to be two (2) possible water supplies that would have available capacity for this service area. The Village of Malinta which purchases water from the City of Napoleon and the Village of Deshler which is in the process of building a new water treatment plant on State Route 18. If the Village of Deshler was to supply water to Westhope and Hope School, it would require approximately 7.5 miles of waterline as compared to approximately 5 miles from Malinta/Grelton. The distance to Hope School and Westhope could be reduced approximately 2 miles, if Malinta serves the Village of McClure and the waterline from Malinta is constructed on Township Road L. The Henry County Regional Water and Sewer District is currently evaluating alternative routes from Malinta to McClure and also from Liberty Center. Plate 26 shows the areas that may be impacted by the stone quarry.

It is reasonable to believe water from Malinta and/or Deshler could also supply water to individual residents that are affected by the operation of the Custar Stone Quarry.

See cost estimate for Bartlow and Damascus Townships.

Proposed Sanitary Sewer Service
There are no areas within the township that are considered public health nuisance by either the County Department of Health or Ohio EPA. It should be noted that the Richfield Township Trustees did indicate that Westhope was a concern to them. No stream sampling has been completed to verify failed septage systems nor has there been any reporting of contaminated wells in Westhope.
Hope School does own and operate an Ohio EPA permitted wastewater treatment plant that discharges into an unnamed tributary to Big Creek. A new NPDES permit was issued on April 8, 2009 and will expire on April 30, 2014 unless it is renewed. The facility is operational and in compliance with the permitted effluent requirements.

The Village of McClure is in the process of becoming a member of the District. When this is completed, the District would have treatment available for both Hope School and Westhope. A sanitary service connection to McClure would be approximately 4.5 miles. The estimate for a pump station and force main from Hope School to McClure is between $1,300,000 and $1,400,000.
**Ridgeville Township**

Ridgeville Township is located in the northwest corner of Henry County. The Township borders Fulton County to the north and Williams County to the west. The 2000 Census listed the population at 1,132 with the highest density in the unincorporated Ridgeville Corners. The total land area is 23.6 square miles with a population density at 47.9 people per square mile. The elevation is 735 feet and the Township drains into the Maumee River. Additional demographics and population projections for Ridgeville Township are as follows:

<table>
<thead>
<tr>
<th></th>
<th>2000 Census</th>
<th>Square Mile</th>
<th>Population/ Square Mile</th>
<th>MHI</th>
<th>LMI %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ridgeville Township</td>
<td>1,132</td>
<td>23.6</td>
<td>47.9</td>
<td>45,536</td>
<td>35.6</td>
</tr>
</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Henry County Projected Rate of Change

<table>
<thead>
<tr>
<th></th>
<th>2008 Population Estimate*</th>
<th>2008 Estimated Water Demand (100 gpcd)</th>
<th>2008 Estimated Water Demand/ Square Mile</th>
<th>2030 Population Estimate**</th>
<th>2030 Estimated Water Demand (100 gpcd)</th>
<th>2030 Estimated Water Demand/ Square Mile</th>
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</thead>
<tbody>
<tr>
<td>Ridgeville Township</td>
<td>1,209 (0.8%)</td>
<td>120,900 gpd</td>
<td>5,123 gpd</td>
<td>1,167</td>
<td>116,700 gpd</td>
<td>4,945 gpd</td>
</tr>
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</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Henry County Projected Rate of Change

**Groundwater Resources** - Ridgeville Township’s groundwater supply is limited to the shale an gravel formation. Yields up to 10 gpm may be encountered near non-water bearing shale bedrock at depths ranging from 30 to 93 feet. There are no municipal or test wells located in the Township.

Domestic wells yield between 1 to 10 gpm at an average well depth of 133 feet which is almost twice as deep as other wells in the County. The groundwater in this area will not support a regional water system.

**Surface Water Resources** - Owl Creek and Garrett Creek are the two (2) main creeks in the Township. Both creeks are limited and would not serve for a surface water supply or a wastewater treatment discharge.
**Municipal Public Water System** - The Village of Archbold supplies potable water to the Ridgeville Water and Sewer District. The service area includes the main transmission line on State Route 66 that supplies water to the Ridgeville District along with the unincorporated Ridgeville Corners and CCNO to the west on State Route 34.

**Wastewater Treatment Systems** - There are currently six (6) on-site systems, no private, and no public NPDES permitted systems:

On-Site Systems (Septage Tanks and Leach Field)
- American Legion
- Twilight Inn
- Transportation Systems
- Richards Package
- Dominique’s Dog Grooming
- Leininger Floor Covering

The Village of Archbold also provides wastewater treatment for the Ridgeville Water and Sewer District. The controlled discharge lagoon that was constructed in 1982 no longer discharges to Owl Creek. The wastewater is collected and pumped to the Village of Archbold.

**Proposed Water Service**

Ridgeville Township Water and Sewer District has sole responsibility for water service in Ridgeville Township.

**Proposed Sanitary Sewer Service**

Ridgeville Township Water and Sewer District has sole responsibility for sanitary service in Ridgeville Township.
**Washington Township**

Washington Township is located in the northeast corner of Henry County. The Township borders Fulton County to the north, Lucas County to the east, and the Maumee River to the south. There are no incorporated communities in the Township except for a small area of Liberty Center (population 108). The unincorporated area of Texas is located on the southern border adjacent to the Maumee River and Colton is north of Texas on County Highway 4A. The 2000 Census listed the Township’s population without the portion of Liberty Center at 1,913.

The total land area is 28.8 square miles and the elevation averages approximately 669 feet. There are 66.4 people per square mile. Projected population data along with additional demographics for Washington Township is listed as follows:

Projected population data along with additional demographics for Washington Township are listed as follows:

<table>
<thead>
<tr>
<th></th>
<th>2000 Census</th>
<th>Square Mile</th>
<th>Population/ Square Mile</th>
<th>MHI</th>
<th>LMI %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washington Township</td>
<td>1,913</td>
<td>28.8</td>
<td>66.4</td>
<td>$45,645</td>
<td>37.1</td>
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</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Henry County Projected Rate of Change

<table>
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<tr>
<th></th>
<th>2008 Population Estimate*</th>
<th>2008 Estimated Water Demand (100 gpcd)</th>
<th>2008 Estimated Water Demand/ Square Mile</th>
<th>2030 Population Estimate**</th>
<th>2030 Estimated Water Demand (100 gpcd)</th>
<th>2030 Estimated Water Demand/ Square Mile</th>
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<tbody>
<tr>
<td>Washington Township</td>
<td>1,1881 (-0.2%)</td>
<td>188,100 gpd</td>
<td>6,531 gpd</td>
<td>1,972</td>
<td>197,200 gpd</td>
<td>6,847 gpd</td>
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</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Henry County Projected Rate of Change

Groundwater Resources - Washington Township has three (3) different aquifer formations. The southern half of the Township is in a limestone aquifer that has limited water. The average domestic well yields between 5 to 10 gpm at an average depth of 65 feet. The north half is also limestone with a potential for yields up to 500 gpm. There are wells identified as public or industrial...
which produce between 150 to 250 gpm at a depth of 160 feet. This area could support a regional groundwater treatment plant.

The remaining area (northeast) is in a shale and gravel formation which is limited to even supplying the domestic needs for the area.

**Surface Water Resources** - The Maumee River is located along the entire southern border of Washington Township. The Maumee River does have flow capacity for a regional water supply source.

**Municipal Public Water Systems** - The Village of Liberty Center Supplies potable water to the unincorporated area of Texas and to areas east on US 24. The water supply line is 6” in diameter which limits further service extensions. The Henry County Regional Water and Sewer District has a water service agreement with Liberty Center to supply and to maintain the Texas system.

**Wastewater Treatment Systems** - There are two (2) on-site systems, three (3) private NPDES permits, and no public NPDES permitted systems. They are listed as follows:

On-Site Systems (Septage Tanks and Leach Field)
- Davis Farm Services
- Colton U.S. Postal Facility

Private NPDES Permits (Packaged Treatment Systems)
- LHS Maumee Youth Center - 10,000 gpd discharges into an unnamed tributary to Harris Ditch. The NPDES Permit became effective on November 1, 2006 and will expire on October 31, 2011.
- Rural Opportunities - 60,000 gpd discharges into an unnamed tributary to Harris Ditch. The NPDES permit became effective on February 1, 2008 and will expire on January 31, 2013.

**Proposed Water Service**

The most immediate need per the Township Trustees would be to provide potable water into the unincorporated community of Colton and then to surrounding areas with high residential density and low yield wells. It has been noted that water quality is poor with levels of black
sulfur at varying well depths. Some residential wells do not supply adequate water even for bathing.

In 1988, the Henry County Board of Commissioners entered into a Water Service Agreement with the Village of Liberty Center to provide potable water to the Texas Water Area. The agreed to water service area includes both the unincorporated communities of Texas and Colton.

The installation of a six inch diameter waterline from the east side of Liberty Center was constructed to Texas and further extended east on Catherine Drive.

In order to provide water to Colton, the following requirements which are part of the water purchase agreement between the Village of Liberty Center and County Commissioners must be considered.

**Construction of Mains.** The County Commissioners shall cause construction of the necessary service mains or extensions thereof in accordance with Section 6103 of the Revised Code of Ohio. No extension and/or construction of service mains in the Texas Water Area and/or repair or maintenance work of any nature whatsoever on any water facilities to be connected to the Liberty Center water system, or any part thereof, shall be commenced without the approval of the Board of Public Affairs or without full compliance with the procedures set forth in this section. The County Commissioners shall make application to the Board of Public Affairs for a report as to the feasibility of any proposed service main extension or construction. Upon approval of said application by the Board of Public Affairs, construction plans for the extension or construction, preparation in accordance with standards and specifications presently or hereinafter prescribed by Liberty Center, shall be submitted to the Board of Public Affairs prior to the taking of bids therefore and its written approval shall be obtained. Size and type of pipe and all other equipment, including backflow prevention equipment, and the manner of laying and construction the same shall be in accordance with the standards presently or hereafter prescribed by Liberty Center. The County shall provide supplemental chlorination equipment on County lines as needed in the future to meet disinfection standards. The Board of Public Affairs, or its duly authorized agent, shall have the right to inspect and approve service mains and related equipment and work in connection therewith, which shall
conform to standards presently or hereafter prescribed by Liberty Center. No extension shall be made to serve a proposed subdivision in the Texas Water Area unless such proposed subdivision has been approved by the proper authorities in accordance with Chapter 711 of the Revised Code of Ohio.

There shall be no connection to service mains constructed or installed under this contract unless the location and construction and the connections themselves shall be approved by the Board of Public Affairs prior to installation.

Ownership, Maintenance, and Operation. The trunk mains all service mains for the Texas Water Area which are outside the corporate limits of Liberty Center, when completed, shall be owned by the County. All debts associated with these lines shall be the responsibility of the County and not Liberty Center. County ownership shall not be transfe rrollable to any other party without approval, in writing, by Liberty Center. Ownership of the water system which is the subject of this agreement and known as project number 3002-003 shall be transferred to the Village after all debts on said water system have been retired by the County. Liberty Center, upon direction of the County, shall be responsible for all other appurtenances which may be constructed in the near future for the operation of the Texas Water Area System.

The cost of normal operating, maintaining, and repairs made to the Texas Water Area system and appurtenances thereto shall be borne by Liberty Center and reimbursed to Liberty Center as provided in Section 9(b). All major capital improvements shall be borne by the County.

The unincorporated area of Colton has two (2) options available for potable water. Option 1 would include the construction of approximately 17,890 linear feet of 8” diameter from Liberty Center. Option 2 considers the development of a groundwater source (wells) and a groundwater treatment plant. The estimated planning flow is 10,700 gpd. When reviewing the Henry County Groundwater Resources map developed by ODNR, groundwater appears to be available. If a groundwater source was found to meet the estimated daily demand for Colton, it would be reasonable to expect that additional well capacity would also be available for Neapolis. There are four (4) test wells in the general area that range between 150 and 500 gpm. Plate 27 shows the proposed water service extension in Washington Township.
Consideration will also need to be given to whether the water distribution system in Colton will be designed only for potable water needs or will fire protection be provided.

Note: The Village of Liberty Center appears at this time to be the sole provider of water to Colton as referenced in the existing water purchase agreement. It also should be noted that due to water quality problems with TTHM, Liberty Center may not be able to supply additional service areas until compliance is secured.

The estimated costs for Option Nos. 1 and 2 are listed as follows:

**Colton**

- **Option 1** - 17,890 lineal feet of 8” diameter waterline  
  $1,100,000 to $1,200,000
  
  _Note: Does not include a booster pump station, chlorination system, and telemetering or elevated storage_

- **Option 2** - 10,700 gpd ground water plant (iron removal and softening)  
  $270,000 to $320,000
  
  - Wellfield development (2 wells)  
    $200,000 to $250,000
  
  - 100,000 elevated storage  
    $650,000 to $650,000

  **SUBTOTAL**  
  $1,120,000 to $1,220,000

*Water distribution system includes booster pump, chlorination system and telemetry*  

$900,000 to $1,100,000

*Note: Does not include an elevated storage tank*

**Proposed Sanitary Sewer Service**

The unincorporated communities of Texas and Colton are not sewered and are served by individual septage treatment systems. A Sanitary Sewer Collection System and Treatment General Plan was completed in 1991 for the Texas area. To date, Ohio EPA has not issued Findings and Orders and design drawings have not been completed. Possible options discussed in the General Plan includes a joint treatment facility for both Texas and Colton or a regional connection to Liberty Center.

The Colton area has not been included in any formal plan or a general plan has not been completed for Colton.
The community of Texas which includes Catherine Drive has been identified by Ohio EPA as an area that will need to correct failed septic systems. No timeframe has been established for Ohio EPA Findings and Orders.

The Washington Township Trustees are also concerned about the lack of adequate on-site septic treatment systems in the Colton Area. As an example, the trustee building does not have restroom facilities due to the lack of adequate lot size for the installation of a system with a leach field.

There would appear to be three (3) options for the development of a central sewage collection system and treatment facility. The treatment options include 1) the construction of a pump station and force main to the Village of Liberty Center, 2) the construction of a wastewater treatment plant with a discharge into Bad Creek, or 3) a joint treatment facility with Texas and a discharge into Bad Creek or into the Maumee River. Plate 28 illustrates the proposed Colton and Texas sanitary sewer treatment alternatives.

**Colton Sanitary Sewer Options and Cost Estimates**

- **Option 1 - Pump Station and 14,025 lineal feet of force main to Liberty Center** $750,000 to $850,000
- **Option 2 - Treatment Plant (10,700 gpd)** $375,000 to $430,000
- **Option 3 - Joint Treatment (10,700 gpd)** $375,000 to $430,000

_Pump Station and 7,000 lineal feet of force main to treatment site_ $390,000 to $420,000

**SUBTOTAL - OPTION 3** $765,000 to $850,000

**Texas Sanitary Sewer Options and Cost Estimates**

- **Option 1 - Pump Station and 13,530 lineal feet of force main and 2,475 lineal feet of 8” diameter gravity sewer** $1,100,000 to $1,200,000
- **Option 2 - Treatment Plant (12,300 gpd)** $430,000 to $500,000
- **Option 3 - Joint Treatment (12,300 gpd)** $430,000 to $500,000

_Pump Station and 7,000 lineal feet of force main to treatment site_ $390,000 to $420,000

**SUBTOTAL - OPTION 3** $820,000 to $920,000
Note: The estimates do not include the sanitary sewer collection system for Colton or Texas. A detailed general plan for sanitary sewer collection and treatment will be required if Colton or Texas are identified as a public health nuisance by the Department of Health or Ohio EPA.
**Providence Township**

Providence Township is located in the southwest section of Lucas County. The Township borders the Maumee River to the south and Henry County to the west. The total land area is 26.1 square miles at an average elevation of 659 feet. The 2000 Census stated that 3,454 people live in the Township which equals 132.3 people/square miles. There are no municipalities in the Township, but there are two (2) unincorporated communities, Neapolis which is located in the northwest area of the Township and Providence which is in the southern area. Additional demographics and population projections for Providence Township are as follows:

<table>
<thead>
<tr>
<th></th>
<th>2000 Census</th>
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<th>Population/ Square Mile</th>
<th>MHI</th>
<th>LMI %</th>
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<tr>
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<td>132.3</td>
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<th>2030 Population Estimate**</th>
<th>2030 Estimated Water Demand (100 gpcd)</th>
<th>2030 Estimated Water Demand/ Square Mile</th>
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<tbody>
<tr>
<td>Providence Township</td>
<td>4,395 (+3.0%)</td>
<td>439,500 gpd</td>
<td>16,839 gpd</td>
<td>5,346</td>
<td>534,600 gpd</td>
<td>20,483 gpd</td>
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</tbody>
</table>

* Ohio Department of Development - Average Annual Rate of Change
** Ohio Department of Development - Providence Township Projected Rate of Change

**Groundwater Resources** - The northern half of the Township has the potential for yields up to 500 gpm. There is an industrial well south of the Village of Whitehouse that has a yield at 500 gpm at a depth of 134 feet. The Village of Whitehouse has abandoned their wellfield and have connected to the Lucas County Water System. The Village’s well produced in excess of 250 gpm each at an average well depth of 135 feet. There is also a test well located 2.5 miles north of Neapolis that is in a limestone formation that has a yield of 500 gpm at 250 feet deep. Water quality data is available and is listed as follows:

- **Depth (feet)**: 250
- **Bedrock (feet)**: 66
- **Yield (gpm)**: 500
Hardness (mg/l) 278
Iron (mg/l) .22
Manganese (mg/l) .03
Dissolved Solids (mg/l) 425
Sulfates (mg/l) 152
Fluoride (mg/l) 2.3

The southern half of the Township is also located in a carbonate bedrock aquifer, but this aquifer has a lower yield potential. The yield could be up to 100 gpm, but would require much deeper wells in excess of 40 feet. Domestic wells in this area are producing 10 to 15 gpm at 70 to 80 feet.

Surface Water Resources - The Maumee River is located along the entire southern border of Providence township. The Maumee River does have capacity for a regional water supply.

Public Water Systems - There are no municipal public water systems within the Township, but there is one (1) community water system and four (4) transient non-community systems. The systems are listed as follows:

Community Water Systems
▶ Whispering Winds Mobile Home Community 18,600 gpd

Transient Non-Community
▶ Bethany Baptist Church.
▶ County Campground
▶ St. Patricks Church
▶ Whitehouse/Waterville Lodge #2537

Wastewater Treatment Systems - There are no municipal wastewater systems but there is one (1) private NPDES permitted system at Peaceful Acres Mobile Home Park and twenty-five (25) on-site systems. They are listed as follows:
On-Site Systems (Septage Tanks and Leach Field)

- American Legion Post 232
- Abbott Assembly Co.
- Height Trailer Park
- Ludwig Auto Service
- Highcroft Country Day School
- Northern Timber Framing Co.
- Neapolis Church of Christ
- Maumee Valley Power Equipment Co.
- St. Patricks Church
- Providence Metroparks Restrooms
- Whispering Winds Mobile Home
- Towpath Inn
- Thermogas Co.
- Stack Inn Kennels
- Scheub Oil Co.
- Whitehouse Grain and Supply Co.
- Whalen Realty and Auction
- U.S. Propane
- Karls Trading Post
- Bethany Baptist Church
- Grand Rapids Farmers Grain Association
- Grand Rapids Sportsman Club
- Delventhal Landscaping
- Country Campgrounds
- Cantell Commercial Building

**Proposed Water Service**

The Providence Township Trustees have requested that consideration be given to the development of a potable water system that would also provide fire protection to the unincorporated community of Neapolis. The Neapolis area has suffered from both poor water quality and low yields for a number of years. Each home or commercial business in
the Neapolis area is currently served by individual wells. The Trustees have recently submitted a request to become members of the Henry County Water and Sewer District. By becoming members, Providence Township hopes that the District will begin working toward the development of a community wide water distribution system.

There would be two (2) options available for the development of a water system that would serve the Neapolis area. As previously discussed in the Washington Township section, the unincorporated community of Colton has shown an interest in bringing water into their immediate area. It would appear that Colton’s options would be similar to Neapolis’ options in that a waterline connection from the Village of Liberty Center could be extended past Colton and to Neapolis. The Colton connection could be considered as Phase 1 with a service connection to Neapolis as a second phase. A waterline connection to Neapolis from Colton, depending on the selected route would require approximately 24,100 lineal feet of waterline to be constructed. Pumping and elevated storage would also need to be considered for this joint service area.

A second option would be to develop a ground water source (wells) and a ground water treatment plant to provide potable water to both Neapolis and Colton. When reviewing the Lucas and Henry County Groundwater Resources map developed by ODNR, groundwater appears to be available. There are four (4) test wells in the planning area that range between 150 to 500 gpm. Option Nos. 1 and 2 are shown on Plate 29.

Note: Due to water quality problems with TTHM, Liberty Center may not be able to supply additional service areas until compliance is secured.

**Neapolis Water Service**

- **Option 1** - 24,100 lineal feet of 8” diameter waterline  
  $1,500,000 to $1,600,00
100,000 gallon elevated storage tank $650,000 to $650,000

SUBTOTAL $2,150,000 to $2,250,000

Note: This waterline estimate does not include booster pumping, chlorination, and telemetry.

- Option 2 -  58,000 gpd ground water plant (iron removal and softening) $1,500,000 to $1,800,000
Wellfield development (2 wells) $200,000 to $250,000
100,000 gallon elevated storage tank $650,000 to $650,000

SUBTOTAL $2,350,000 to $2,700,000

Water distribution system includes booster pumping, chlorination, and telemetry $1,900,000 to $2,000,000

It would appear that from the preliminary estimates, the development of a wellfield and water treatment plant should be considered as a viable option as compared to a regional waterline service connection from Liberty Center to Colton and then to Neapolis. A detailed study which should include a Hydrogeologic Report on available groundwater should be completed on the available options for potable water. The study should evaluate a regional plant for both Colton and Neapolis along with other areas within Washington and Providence Township.
Proposed Sanitary Sewer Services

The Lucas County Health Department (Environmental) was contacted and asked if they were aware of any public nuisance associated with failed septic systems. The unincorporated community of Neapolis has had documented water quality concerns. TMACOG serves as the Area-wide Water Quality Management Agency. The following is a brief description of the 208 Plan developed for Neapolis:

A 1988 population estimate, based on a house count, put the population of the Village at 530. Presently the area is served by individual septic systems, and one package plant at the Peaceful Acres trailer park, on the edge of the Village. It is a 12,500 gpd extended aeration plant without filters, built in 1970. There are 58 mobile homes in the park. In 2005 the Lucas County Court of Commons Pleas ordered the mobile home park owners to bring the wastewater plant into compliance with Ohio EPA Standards.

A Facilities Plan has been prepared for Neapolis which documented water quality violations due to fecal coliform in local streams (Blue Creek and Aumend Ditch). The Lucas County Health Department notes in addition that septic system leach fields fail to function properly because of the seasonally high water table. High groundwater, which occurs in the spring and fall, is a continuous threat to drinking water supplies, which are from private wells. Neapolis is not under order from Ohio EPA to install sewers.

The Lucas County Health Department agreed to installation of public water before sewers. Eliminating wells will allow more space on lot for septic systems and will help alleviate system failures in the short term.

The project proposed in the Neapolis Facilities Plan was for conventional gravity sewer and a treatment lagoon, at a cost of $2 million. TMACOG did not study of lower-cost alternative technology systems for Neapolis, and proposed a system costing an estimated $530,000. No financial aid was available for the project, and it was not affordable. Neapolis continues to need a sewer system; financial assistance is needed to make it affordable to residents.
Lucas County plans on serving Neapolis by tapping into the County system to the Maumee River wastewater plant.

Peaceful Acres Mobile Home Park located northeast of Neapolis is the only NPDES permitted wastewater facility in the Township. The treatment facility is out of compliance with the permitted discharge to Blue Creek. When the NPDES permit was issued and became effective on March 1, 2006, a compliance schedule was established that requires that the entity shall attain compliance with the final effluent limits no later than nine months from the effective date of this permit.

A detailed Sanitary Sewer Collection and Treatment General Plan for Neapolis should be completed. This plan would evaluate collection system and treatment alternatives for the Neapolis planning area which should include Peaceful Acres Mobile Home Park.