

*Mahoning County
Home Sewage Pollution
Prevention Plan*

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Mahoning County General Health District
Board of Health

Ohio Environmental Protection Agency
Division of Environmental and Financial Assistance

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I. Introduction

A. Purpose of the plan

The purpose of this plan is to outline a program for the identification, inventory, and correction of failing home sewage treatment systems in Mahoning County.

Eighty-three percent of Mahoning County's 80,000 households depend on surface water for their drinking water supply. Human activities and natural processes can affect the quality of this precious resource. In Mahoning County, human activities contribute to both point and nonpoint source pollution. Point source pollution is the introduction of impurities into water sources from an identifiable, known location. Examples of point sources can include discharges from industrial plants, power plants, commercial businesses, and wastewater treatment facilities.

Nonpoint source pollution also involves the introduction of impurities into a surface-water body or an aquifer, except the route is usually non-direct and the sources are diffuse in nature. A major portion of the sediment, nutrients, acids and salts, heavy metals, toxic chemicals, and pathogens enter the state's water resources through nonpoint source pollution, affecting both ground and surface water. Examples include automobile emissions, runoff from parking lots, and runoff and drainage from agricultural fields, home septic systems, feedlots, home lawns and gardens, residential development, construction, mining, and logging activities.

Natural processes such as precipitation also have an impact on surface water and, to a lesser extent, ground water. For example, rainfall that is acidic ("acid rain") may alter the quality of a stream, lake or other water resource that receives the rainfalls.

Through the Ohio Nonpoint Source Assessment and Water Resources Inventory, the Ohio Environmental Protection Agency (Ohio EPA) has identified 13,000 stream miles in Ohio that have been affected by nonpoint source pollution. Water quality monitoring indicates that all or parts of the following Mahoning County streams are affected by nonpoint source (NPS) pollution: Mahoning River (Meander Creek to Mill Creek; Mill Creek to Yellow Creek; Yellow Creek to the PA state line), Maylor Ditch, Mill Creek, Bear's Den Run, Ax Factory Run, Cranberry Run, Anderson's Run, Indian Run, Honey Creek and parts of Middle Fork Little Beaver Creek (see Figure 1 in Appendices). These streams are affected by one or more of the following NPS pollution categories: surface coal mining, in place pollutants, pasture, channelization, dam construction, on-site wastewater treatment systems, urban sources, agriculture, storm sewers, construction sites and surface runoff. Other county streams are affected by point source pollution (municipal and/or industrial wastewater). Point source affected streams include: Mahoning River (same segments as above), Mill Creek, Bear's Den Run, Anderson's Run, Meander Creek, Naylor Ditch, Honey Creek, Saw Mill Run, and Cherry Valley Run. Mahoning County also contains streams that have good water quality and are attaining chemical and biological water quality standards. Monitoring has shown that all or parts of the following streams have good water quality: Bull Creek, Yellow Creek, Crab Creek, and Duck Creek. A generalized surface-water map of Mahoning County is given in the Appendices.

B. Home sewage pollution prevention concept

The leaching and discharge of materials from sewage systems is one of the most common threats to water resource quality in and near areas not served by sanitary sewer systems. Many of

Mahoning County's household and small commercial (semi-public) wastewater treatment systems are improperly located, badly maintained, and have the potential to contaminate nearby wells, drainage ditches and streams with viruses, bacteria and chemical substances. This problem is further compounded by the significant number of home aeration sewage systems which have been installed since the 1960's.

Recent surveys of home sewage systems conducted by the Board of Health in one of Mahoning County's western townships indicate that septic system malfunction is alarmingly common: 26 of 44 septic systems surveyed, or 58%, were malfunctioning in an area that fronts on lake Milton State Park, a prime water recreation area.

Although the Board of Health's records are unreliable and incomplete, it is estimated that there are about 14,000 permanent homes in Mahoning County in unsewered areas, about 7,000 of which rely on private wells for drinking water. A large proportion of these homes with septic systems are located in the eight townships within the Mill Creek, Meander, Lake Hamilton, Lake Milton and Berlin Lake watersheds. Furthermore, these areas continue to experience an unprecedented, unabated boom in residential development, with hundred of new septic permits issued each year, adding to the septic system density of the area and to the actual and potential adverse impact on area water resource quality.

Land application of sewage sludge and septage has been the subject of recent nuisance complaints from local elected officials concerned about odors and impact of septage runoff to ponds and private water wells. Although the Mahoning County Board of Health enacted sanitary regulations governing land application of septage in 1989, requirements of 40 CFR Part 503 for land application are

not currently being met.

Septage and home sewage systems will remain an important and growing nonpoint pollution source unless an effort is made to locate these home sewage systems, educate their owners about the environmental significance of proper maintenance, develop a regulatory program to insure that proper maintenance takes place, and insure that septage from these systems is disposed of in a safe manner.

C. Uniqueness of the County's problems/resources

Due to its close proximity to the Pittsburgh and Cleveland metropolitan areas and its reasonable housing prices, Mahoning County is rapidly becoming a "bedroom" community for these cities. Much of this residential development is taking place in unsewered areas of the County; in the last six years, over 1,000 home sewage systems and almost 1,200 wells have been installed in these areas (see Table 1).

Table 1

Residential Well and Septic System Installations, 1990-95

Year	# of Installed Wells	# of Installed Sewage Systems
1990	123	128
1991	171	176
1992	209	143
1993	223	171
1994	194	231
1995	263	173

There is growing concern that nonpoint source pollution from home sewage systems has affected groundwater potability for many of the 7,000 private water well users in Mahoning County. In

1995, 31 percent of private water wells tested at the request of mortgage lenders were positive for coliform bacteria, organisms which suggest sewage contamination of these water sources. Even more disconcerting, on properties with malfunctioning home sewage systems, the prevalence of coliform positive drinking water samples increased to 39 percent.

D. Goals and objectives

The goal of this plan is to protect, preserve, and restore water resource quality in Mahoning County watersheds through control of nonpoint source pollution from home sewage system. The goals and objectives of this plan are consistent with three of the Ohio NPS program objectives, viz.,

1. Develop an NPS education program for management agencies' staff, affected organizations, landowners, and the general public.
2. Establish a statewide monitoring program to track effects of NPS pollution and determine effectiveness of implemented projects.
3. Set a legislative agenda for NPS pollution to provide additional funding and necessary new regulations.

The objectives of this plan are sixfold:

1. Inspection and inventory of residential and commercial sewage systems in Mahoning County.
2. Development of a microcomputer database of home and commercial sewage systems, with applications enabling program staff to develop a preventive maintenance and inspection schedule.
3. Inspection and inventory of all septage land application disposal sites.

4. Initiation of a broad based educational campaign to inform homeowners, potential buyers, developers and realtors of the importance of proper sewage system maintenance and pollution prevention.
5. Initiation of an educational and corrective action enforcement program to eliminate pollution from malfunctioning sewage systems.
6. Enactment of sewage system maintenance and septage disposal regulations to ensure the long term success of the plan.

This plan will be carried out by members of the Environmental, Health Education & Assessment and Laboratory Divisions of the Mahoning County Board of Health with assistance from the Home Sewage Pollution Prevention Advisory Committee as well as other collaborating agencies.

II. County Description

A. Location

Mahoning County is located in northeastern Ohio. Bordering on Mercer and Lawrence Counties in Pennsylvania, and Trumbull, Columbiana, Portage and Stark Counties in Ohio, it is roughly equidistant from Pittsburgh and Cleveland (see Figure 2 in the Appendices).

B. Natural features

1. Ecoregion

The State of Ohio is composed of five "ecoregions". Ecoregions are land-surface areas that are grouped based on similarities in land use, potential natural vegetation, land surface form, and soils. These underlying factors determine the character of the watersheds and have a profound influence on the type and composition of biological communities in a stream or river and the manner in which human impacts are exhibited. Mahoning County lies within the Erie-Ontario Lake Plain ecoregion. This ecoregion is characterized by moderate to high relief intermediate between the rolling Eastern Corn Belt Plain (ECBP) ecoregion to the west and the hillier Western Allegheny Plateau (WAP) ecoregion to the south. Land use varies between cropland, pasture, livestock and forest lands; not as heavily agricultural as the Huron-Erie Lake Plain (HELP) ecoregion of northwest Ohio, nor as heavily forested as the WAP ecoregion. This area contains the major urban areas of Cleveland, Akron/Canton, and Youngstown, which are major centers of heavy industry in Ohio.

2. Size

Mahoning County contains approximately 265,000 land acres. The County water acreage consists of about 5,600 acres of lakes, including the 665-acre Lake Milton Reservoir and the 2,010-acre

Meander Creek Reservoir. In addition, about 15 percent of the 5,500-acre Berlin Reservoir lies in Mahoning County. Other main County lakes include McKelvey, Hamilton, Evans, Pine, Diehl, Newport, Glacier, Yellow Creek, and other smaller lakes. The County contains approximately 446 linear miles of major streams and rivers. In addition, numerous miles of County and privately-maintained ditches are used for land drainage.

3. Topography

Mahoning County's topography varies from relatively flat to gently rolling in the western portion of the county to more severely sloped areas in the central and eastern portions of the county. Not surprisingly, the topography near waterbodies (streams, rivers and lakes) generally becomes much more variable, as many of these waterbodies have adjacent areas that are steeply sloped. Elevations range from approximately 1300 feet mean sea level (msl) in the southwestern portion of the county to approximately 800 feet msl in the eastern portion of the county (where the Mahoning River enters Pennsylvania).

4. Geology and soils

The county contains approximately 265,000 land acres, approximately 30 percent is farmland and six percent is pastureland. One hundred-seventeen soil types have been identified in the county and are grouped into nine soil associations. The soils vary in drainage quality from well drained to poorly drained. Well drained, loamy soils that are suitable for farmland are predominant in the eastern part of the county. Poorly drained, clay soils are predominant in the western part. About 14 percent of the county's soils are moderately drained Canfield and Ellsworth silt loam. A large variety of different soils of varying qualities make up the remainder of Mahoning County. Soil characteristics are an

important factor in determining areas at increased risk for home sewage system failure, but by no means the only determining factor; age of the sewage system, size of the home lot, and system installation practices are equally important determinants of risk for system failure.

5. Water resources

Surface waters are affected by the soil type, geology, and topography of adjacent land, and the way people use the land. Land use, such as residential development and agricultural production, may increase the amount of sediment and other pollutants entering a body of water. The soils and terrain also influence the amount of runoff because of infiltration, percolation and water holding characteristics. With some soils, rainfall is more likely to run off, while other soils allow water to infiltrate more readily.

Mahoning County's largest watershed, the Mahoning River, drains the majority of the county via a number of creeks: Mill Creek, Meander Creek, Mosquito Creek, Crab Creek, and Yellow Creek. The basin drains from southeast to northeast in the western part of the county, and from the northwest to southeast in the eastern part. After crossing the Pennsylvania border, the Mahoning River flows southeast and joins the Beaver River, which flows into the Ohio River. Some of the southern townships of Mahoning County are drained by the Little Beaver Creek basin via Beaver Creek (Middle Fork), East Branch, Cherry Valley, Honey Creek, North Fork, and Bull Creek. Pine Lake is actually drained by creeks in the two watersheds.

The county water acreage consists of about 5,600 acres of lakes, including the 665-acre Lake Milton Reservoir and the 2,010-acre Meander Creek Reservoir. In addition, 15 percent of the 5,500-acre Berlin Reservoir lies in Mahoning County. Other main county lakes include McKelvey, Hamilton, Evans, Pine, Diehl, Newport, Glacier, and Yellow Creek and other smaller lakes. The county contains

approximately 446 linear miles of major streams and rivers (estimated from river basin maps, Ohio Department of Natural Resources (ODNR) Division of Water). In addition, numerous miles of county-maintained ditches and numerous miles of privately-maintained ditches are used for land drainage.

6. Air quality

Mahoning County is considered an attainment area with respect to five of the six measured air pollutants (suspended particulates, sulfur dioxide, carbon monoxide, oxides of nitrogen and lead). Violations of the standards for ozone still occur. The main sources for these violations are likely from automobile emissions and from industry, primarily in the Youngstown area.

7. Sensitive features

A review of the information at the Ohio Department of Natural Resources – Division of Natural Areas and Preserves indicates that Mahoning County is home to several threatened or endangered species of plants and animals. A listing of these species (by their common name) according to their status is provided below.

State Endangered – Heart-Leaf Plantain, Spreading Globe-Flower, Small Purple Fringed Orchid, Bald Eagle, Least Bittern, Northern Harrier, Flat-Leaved Rush, Spiral Pondweed.

State Threatened – Clinton's Wood Fern, Oak Fern, Simple Willow-Herb, Water-Starwort, Southern Woodrush, Leathery Grape-Fern, Woodland Horsetail, Speckled Wood-Lily.

Potentially Threatened – Radiate Sedge, Flattened Wild Oat Grass, Northern Fox Grape, Tall Manna-Grass, Closed Gentian, Leggett's Pinweed, Long Beech-Fern, Spotted Coral-Root, American Chestnut, Crinkled Hairgrass, Large Round-Leaved Orchid.

Species of (State)Special Interest – Virginia Rail, Sora.

Several of the species noted above have been found in multiple locations within the County. The portions of Mahoning County with a greater frequency of these species are the areas occupied by the following USGS quadrangles: Campbell, Columbiana, Lake Milton, and Youngstown. These findings are fairly typical for northeastern Ohio.

C. Land uses

Land use in Mahoning County is mixed, with most residential and industrial/commercial use concentrated in the northeastern corner of the County. In recent years, the rate of agricultural land conversion to residential development has accelerated. This conversion, when it is not accompanied by sewer and water line extensions, poses a threat to surface and ground water quality in areas of the County with poorly drained clay soils. Current proportional land use is presented in Table 2.

Table 2

Mahoning County Land Use, 1995

Residential	18%
Industrial/Commercial	6%
Agricultural	42%
Parks, Recreational and Forest Land	34%

D. Sewer service areas and unsewered areas

Mahoning County has twelve sewer districts. The location of these sewer districts is depicting in

Figure 3 in the Appendices. Four Mahoning County townships (Berlin, Ellsworth, Green and Goshen) are completely unsewered.

E. Water use

1. Water supply

Water use for each of Mahoning County's public water-supply systems is given in Table 3. For each water system this table presents an estimate of the population served, water source, estimated daily usage and treatment plant capacity.

The county's largest public-water system is the Mahoning Valley Sanitary District (MVSD) system, which uses Meander Creek Reservoir for its supply. The City of Youngstown purchases bulk water from this system. In addition to providing water service to Youngstown residents, both the City of Youngstown and MVSD sell water to other communities, including Canfield and Mineral Ridge and part of Boardman, Austintown, North Jackson, and certain municipalities in Trumbull County. Consumers' Ohio Water Company, a private company, serves over 36,000 residents in areas of Poland, Springfield, Beaver & Boardman Townships. The source of the water is Evans Lake in Springfield Township and their emergency back-up is Burgess Lake in Poland Township. Mahoning County has 14 other public water systems, including nine mobile home parks serviced by wells.

Ground water is used as a water source for rural household not served by Mahoning County public systems. Approximately 17 percent - or nearly 14,000 - of households obtain their water from private wells. Based on an estimated usage of 75 gallons per person per day, 3,292,050 gallons per day (gpd) from private wells are used. Additional private water uses include industry (2,531,341 gpd) and livestock use (543,200 gpd), mostly from ground water supplies. The remaining 83 percent of

households use public water systems, as identified in Table 3.

**Table 3
Water Use in Mahoning County, Ohio¹**

Public Water System	Population Served	Primate Water Source	Water Usage (GPD)²	Treatment Plant Capacity (GPD)
Youngstown	175,000	Surface Water	24,000,000	30,000,000
Consumers Ohio Water Company	43,960	Surface Water	4,397,000	5,487,000
Canfield	6,000	Surface Water	548,000	1,184,000
Campbell	9,997	Surface Water	1,080,000	1,834,000
Craig Beach Village	1,800	Ground Water	143,000	295,000
New Middletown	2,000	Ground Water	105,000	215,000
Sebring Village	8,100	Ground Water	780,000	1,260,000
Other ³	1,221	Ground Water	141,900	N/A

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¹Estimates from Ohio EPA; information is based on data available at time of publication.

²GPD = gallons per day.

³Includes mobile home parks and homeowners associations; treatment plant capacity figure not available.

2. Aquatic habitat

Habitat is defined as a place where an organism or community of organisms naturally lives or grows. Aquatic habitat can be found in virtually any aquatic resource (creeks, streams, wetlands, lakes and reservoirs), and since Mahoning County has an abundance of aquatic resources, there is a corresponding abundance of habitat. However, the quality of the habitat is a function of many things, such as the natural stream substrate, the amount of riparian area vegetation, and the amount of sediment and other pollutants in the water. Like most watersheds in Ohio, the Mahoning River watershed has areas of above average to exceptional aquatic habitat and areas of below average to severely degraded habitat. One factor which can influence the quality of aquatic habitat is the presence of inadequately treated sewage (such as from failing home sewage systems).

3. Recreation

Lakes and ponds in Mahoning County watersheds are important recreational sites for Mahoning County residents and visitors. The Mahoning County Board of Health licenses and monitors the water quality at several bathing beaches throughout the County:

Milton Township	-	Green Acres Campground Lake Lake Milton State Park Beach Lake Milton Boat Club
Beaver Township	-	Wildwood Lake
Green Township	-	High Chapparral Campground Lake Dreamie Acres Campground Lake Yellow Duck Lake
Goshen Township	-	Ponderosa Park Lake
Ellsworth Township	-	Western Reserve Campground Lake

F. Demographics/Socioeconomics

After declining from a high of 289,341 residents in 1980, Mahoning County's population is expected to stabilize at 268,051 by the end of the century. The number of households are expected to increase in Mahoning County during this time, while Youngstown's population and number of households will continue their decline. Since the catastrophic loss of jobs in the steel industry in the late 1970's and early 1980's, Mahoning County's poverty rate has remained above the State average; 20.7 percent of persons in Mahoning County lived in poverty in 1994 versus 15.6 percent of Ohioans. Detailed demographic and socioeconomic information is presented in the Appendices.

G. State water quality standards/designated uses

The Ohio EPA has published, and periodically updates, the water quality standards and designated uses for each waterbody in the state. Based on field data, each stream segment is assigned "designated uses" for three main areas: aquatic habitat, water supply, and recreation. These

designated uses characterize what that particular water body is capable of being "used" for. The water quality standards then set numerical criteria in order for that designated use to be maintained or achieved. For the Mahoning River watershed, the predominant designated uses are: warmwater aquatic habitat, agricultural and industrial water supply, and primary contact recreation. The only exceptions to these designated uses are: 1) Mill Creek, from Rt. 224 in Youngstown to the confluence with the Mahoning River has been also designated a State Resource Water, 2) Mud Creek (Trumbull Co.) has been designated as nuisance prevention (instead of warmwater aquatic habitat) and has a secondary contact recreation use (as opposed to primary contact), and 3) Silver Creek, a tributary of Eagle Creek, has been designated as coldwater aquatic habitat.

III. Problem Definition

A. Characterization of existing home sewage systems

1. Number of home sewage systems

The 1990 decennial census provides a reasonably accurate count of home sewage systems and water wells for each political subdivision of Mahoning County. This census-based count is presented in Table 4.

Table 4
Home Sewage Systems in Mahoning County, by Township

<u>Approx. # of Septic Systems</u>	
Austintown	1,278
Beaver	1,876
Berlin	632
Boardman	987
Canfield	1,270
Coitsville	588
Ellsworth	696
Goshen	955
Green	990
Jackson	607
Milton	723
Poland	839
Smith	1,202
Springfield	<u>1,719</u>
	14,362

Incorrect census survey responses and abandonment of home sewage systems when sanitary sewer became available subsequent to the census have introduced some error into these reported figures. However these estimates are an invaluable criterion for selection of critical areas for NPS pollution interventions.

2. Types of home sewage systems

Home sewage systems include nonmechanical systems (septic tanks) with discharge contained on the property through leach fields (on-lot) or discharge after treatment of effluent into receiving streams or roadside ditches (off-lot). Mechanical systems with aeration motors in may also allow on or off-lot discharge. Table 5 presents an estimate of the type of sewage systems in use at different points in time.

Table 5
Estimates of Household Sewage Disposal Systems in Use

	<u>Prior to 1980</u>	<u>1990</u>	<u>1995</u>
On-Lot	7,500	9,000	10,000
Off-Lot	1,500	4,000	5,000
Total	9,000	13,000	15,000

Systems commonly in use range from 250 to 3000 gallon primary treatment tanks constructed of inverted bell tile, metal or home-made brick, or precast concrete. The current approvable system for a typical three bedroom home consists of two 1,000 gallon precast concrete septic tanks.

3. Public complaints about malfunctioning home sewage systems

Under its nuisance abatement authority, the Board of Health receives and responds to citizen complaints about nuisances produced by malfunctioning home sewage systems. Not unexpectedly, sewage complaints exhibit seasonal variation and the occurrence of sewage complaints is proportionate to the distribution of home sewage systems in use in each township. Reported complaints in each township for a recent period are presented in Table 6.

Table 6
Sewage Complaints 1994 and 1995

<u>Township</u>		<u>1994</u>		<u>1995</u>
Austintown	5		12	
Beaver		4		10
Berlin		4		3
Boardman		6		5
Canfield		9		9
Coitsville		1		3
Ellsworth		1		0
Goshen		1		5
Green		5		4
Jackson		1		4
Milton		5		6
Poland		7		5
Sebring		2		1
Smith		9		5
Springfield		6		10

4. Estimates of home sewage system malfunction

Estimates of the numbers and amount of wastewater flow from malfunctioning home sewage systems may be developed from neighborhood surveys conducted in recent years and from results of real estate evaluations. In 1991, a Board of Health survey of 44 homes in Milton Township in an area that fronts on Lake Milton State Park identified 26 systems, or 58 percent, that were malfunctioning. The Board of Health also conducts septic system and water well evaluations at the request of mortgage lenders. In 1995, 27 percent of septic systems evaluated throughout the County under this program were found to be malfunctioning.

Using a range of 27 to 58 percent of the 14,362 home sewage systems reported in the 1990

census, one can estimate that between 3,878 and 8,330 systems in Mahoning County are discharging untreated or undertreated septage into yards, streams, ditches, ponds and groundwater at the current time. If one assumes that the average household of four persons produces 300 gallons of wastewater each day, then this untreated or undertreated wastewater discharge from home sewage systems in Mahoning County may amount to 1.2 to 2.5 million gallons each day.

C. Known impacts on specific stream segments

Water quality monitoring by the Ohio EPA indicates that all or parts of the following Mahoning County streams are affected by nonpoint source (NPS) pollution: Mahoning River (Meander Creek to Mill Creek; Mill Creek to Yellow Creek; Yellow Creek to the PA state line), Maylor Ditch, Mill Creek, Bear's Den Run, Ax Factory Run, Cranberry Run, Anderson's Run, Indian Run, Honey Creek and parts of Middle Fork Little Beaver Creek. These streams are affected by one or more of the following NPS pollution categories: surface coal mining, in place pollutants, pasture, channelization, dam construction, on-site wastewater treatment systems, urban sources, agriculture, storm sewers, construction sites and surface runoff.

As part of its nonpoint source pollution prevention program for home sewage systems, the Mahoning County Board of Health has begun to collect stream and other surface water samples in areas of high septic tank density in order to establish a baseline for measuring expected improvements in water quality after nonpoint source control measures are implemented under this plan.

D. Description of the home sewage system inventory/database program

Mahoning County Board of Health sewage program support staff have begun to establish a microcomputer-based database of home and semi-public (HB 110) sewage systems with applications

enabling program staff to develop a preventive maintenance and inspection schedule for all systems based on type of system, i.e. mechanical or non-mechanical, tank capacity and date of last pumping.

A local area network version of Paradox 3.5 currently employed by the Board of Health is used for data management and applications that will permit home and semi-public sewage program staff to track home and business owner compliance with the schedule of inspection and pumping requirements established in Board of Health regulations. The Board of Health currently contracts with the Ohio Environmental Protection Agency to carry out regular inspections of sewage systems with less than 20,000 gpd capacity under HB 110 authority. Development of this database has been greatly accelerated with the assistance of the Mahoning County Auditor, who has provided the Board of Health with access to digital information identifying the owners of nearly 14,000 properties reporting use of home sewage or water wells in the last decennial census.

E. Potential for sewer extension

Areas for potential sewer extension would meet one or more of the following criteria:

1. Areas currently adjacent to existing sanitary sewers with capacity available to accommodate the additional flow.
2. Targeted areas with widespread home sewage system failures if an extension is deemed feasible by the Sanitary Engineer for the County and new sewer service customers.
3. Privately financed housing subdivisions.

Areas meeting these criteria include the unincorporated areas adjacent to Sebring, Columbiana, Canfield, Boardman, Meander and New Middletown sewer districts (see Figure 4 in the Appendices).

F. Prioritization of critical areas

Critical areas to focus efforts for NPS pollution control and reduction will be determined using the following criteria:

1. The density of homes/commercial operations in an area utilizing on-lot sewage systems.
2. The age of homes in areas utilizing home sewage systems.
3. The proximity of homes and commercial operations to major watersheds.
4. Known or suspected areas of widespread malfunctioning/inadequate on-lot sewage systems.
5. Known or suspected areas of widespread land application of septage/sewage sludge.

Critical areas are depicted in Figure 4 in the Appendices.

IV. Goals and Objectives

The goal of this plan is to protect, preserve, and restore water resource quality in Mahoning County watersheds through control of nonpoint source pollution from home sewage system. The goals and objectives of this plan are consistent with three of the Ohio NPS program objectives, i.e.,

1. Develop an NPS education program for management agencies' staff, affected organizations, landowners, and the general public.
2. Establish a statewide monitoring program to track effects of NPS pollution and determine effectiveness of implemented projects.
3. Set a legislative agenda for NPS pollution to provide additional funding and necessary new regulations.

The objectives of the plan are sixfold:

1. Inspection and inventory of residential and commercial sewage systems in Mahoning County.
2. Development of a microcomputer database of home and commercial sewage systems, with applications enabling program staff to develop a preventive maintenance and inspection schedule.
3. Inspection and inventory of all septage land application disposal sites.
4. Initiation of a broad based educational campaign to inform homeowners, potential buyers, developers and realtors of the importance of proper sewage system maintenance and pollution prevention.
5. Initiation of an educational and corrective action enforcement program to eliminate pollution from malfunctioning sewage systems.
6. Enactment of sewage system maintenance and septage disposal regulations to ensure the long term success of the plan.

This plan will be carried out by members of the Environmental Health, Health Education & Assessment and Laboratory Divisions of the Mahoning County Board of Health with assistance from the Home Sewage Pollution Prevention Advisory Committee as well as other collaborating agencies.

This NPS pollution prevention plan will be carried out in the following manner:

1. Mahoning County Board of Health sanitarians will complete an inventory and inspection of home sewage systems in the 14 townships of Mahoning County, with priority given to Boardman, Austintown, Canfield, Poland, Springfield, Beaver, Milton and Jackson Townships within the Mill Creek, Meander, Lake Hamilton, Lake Milton and Berlin Lake watersheds.

Inventory and inspection will consist of homeowner interviews to solicit information about sewage system type (when no permit for the system is on file with the Board of Health), maintenance and repair history, and a visual inspection of the property and exposed components of the system, as well as dye testing in the event of visibly evident malfunctioning.

The purpose of this part of the project is to determine the number, location, history, age, and operational quality of the home sewage systems in Mahoning County. This information will be used to plan and implement the educational, corrective actions, and monitoring part of this program.

2. Mahoning County Board of Health sewage program support staff will establish a microcomputer-based database of home and semi-public (HB 110) sewage systems with applications enabling program staff to develop a preventive maintenance and inspection schedule for all systems based on type of system, i.e. mechanical or non-mechanical, tank capacity and date of last pumping.

A local area network version of Paradox 3.5 currently employed by the County Health Department will be used for data management and applications that will permit home and semi-public sewage program staff to track home and business owner compliance with the schedule of inspection and pumping requirements established in Board of Health regulations. The Board of Health contracts with the Ohio Environmental Protection Agency to carry out regular inspections of sewage systems with less than 20,000 gpd capacity under HB 110 authority.

3. Sampling of watercourses in critical areas for bacteriological and chemical analysis will take place early in the implementation phase of the plan in order to establish a baseline measurement of NPS impact. Subsequently, on a semi-annual basis water samples will be collected from these watercourses to determine an improved quality of water due to the implementation of the plan.

Baseline samples are to be collected during the first quarter of this project with semi-annual samples collected thereafter. In addition, all of these results will be compared to all prior test results from other agencies to provide a historical perspective.

4. The Mahoning County Board of Health will enact home sewage system preventive maintenance and inspection regulations in 1997. Staff of the Division of Environmental Health will develop regulations for adoption by the Board of Health which has statutory authority to adopt and enforce such regulations under Section 3709.21 of the Ohio Revised Code. These regulations will establish a schedule for inspection of home sewage systems by Board of Health sanitarians or private inspectors registered with the Board of Health based on systems age, type and required pumping frequency. Funds to continue this regulatory program after 319 funding ends will be derived from permit fees, real estate evaluations for mortgage lenders and local property tax revenues.

5. The Mahoning County Board of Health will complete an inventory and inspection of all sites used for septage land application and will propose regulations governing septage land application consistent with 40 CFR Part 503 to the Mahoning County General Health District Board of Health. An effective NPS control program for home sewage systems must include stricter regulation of septage land application. The existing regulatory program will be updated to insure that it is consistent with Part 503 standards.

6. The Mahoning County Board of Health and collaborating agencies will conduct a series of seminars for prospective home buyers, contractors, realtors and developers about the role of homesite and sewage system selection and maintenance.

7. Home sewage systems identified in the inventory will be inspected, pumped and if necessary

repaired, upgraded or abandoned in accordance with Mahoning County General Health District Board of Health regulations.

Board of Health sanitarians will use information from the program database and enforcement authority granted under Board of Health regulations to insure sewage system owner compliance with this objective.

Specifically, the corrective action procedure will consist of education with a verbal notification giving a time specific limit. For those remaining in non-compliance, an official notice and order will be issued followed by hearings with the county prosecutor's office if necessary.

The Board of Health realizes that a significant portion of the residents do not have the financial means to make extensive repairs or replacements to their home sewage systems. Therefore, the Board of Health proposes to work with the Ohio EPA Division of Environmental and Financial Assistance to establish a linked deposit loan program at participating lending institutions to provide below market rate home equity loans to qualifying individuals for system repairs or replacements.

In addition, the Board of Health has received Community Development Block Grant (CDBG) funds in 1996 to make grants to low income homeowners in Milton Township. The Board of Health will seek additional CDBG funds in future years to assist low income homeowners in other critical areas.

The Board of Health believe that ongoing financial assistance will improve the acceptance of and insure the long term success of the NPS pollution prevention plan.

V. Development of Recommended Solutions

A. Sanitary sewers

Extension of sanitary sewerage is the ultimate solution to NPS pollution from home sewage in

densely developed areas with a high prevalence of malfunctioning home sewage systems. However, the Mahoning County Sanitary Engineer is not able to predict the likelihood of sewer extension into those critical areas, such as Canfield Smith, and Beaver Townships, until the issue of annexation into the municipalities of Canfield, Sebring, Beloit and Columbiana in return for extension of public utilities into the unincorporated areas is resolved. Consequently, home sewage systems and water wells are installed in new subdivisions where extension of public utilities may be feasible. Under these circumstances, the Board of Health sees growth in these areas as an ongoing challenge to the Board's ability to assure safe on-site waste disposal and prevent NPS pollution until alternatives to this imperfect means of wastewater disposal are available.

B. Upgrading home sewage systems

Traditional home sewage systems with on-lot discharge are the preferred type of upgrade or replacement system if sanitary sewer is not accessible. Aeration systems and systems discharging off-lot are alternatives considered only if on-lot systems are not feasible. Off-lot discharge is permitted only by variance from Board of Health regulations; no new off-lot systems are currently permitted in special sanitary districts, e.g., in areas adjacent to lakes or reservoirs. When on-lot discharging systems are not feasible in these areas, holding tank permits may be granted by variance request as a last resort for the homeowner.

C. Process for identification and repair or replacement of failing systems

Malfunctioning home sewage systems are currently only identified by system owners themselves seeking permits for repair or replacement or by verified complaints from neighbors or local officials. Once proposed Board of Health regulations requiring periodic servicing and inspection of certain home

sewage systems are enacted, aeration-type systems will be inspected by manufacturer-authorized representatives on a regular basis.

The corrective action procedure for failing systems identified by inspection or complaint will consist of education with a verbal notification giving a time specific limit. For those remaining in non-compliance, an official notice and order will be issued followed by hearings with the county prosecutor's office if necessary. Home sewage system repairs or replacements must be carried out by contractors registered with the Mahoning County Board of Health. System installation and repair permits are granted to property owners only after system design and installation criteria contained in Ohio Administrative Code rules 3701-29 and Mahoning County Board of Health Individual Home Sewage Disposal regulations are met. The permitting process includes the following:

1. The property owner or potential buyer applies for a home sewage site evaluation. The applicant must provide a copy of the tax plate showing the lot size, layout of the home and other structures, and footages to the nearest road or intersection.
2. The lot is inspected by a Board of Health sanitarian who evaluates the lot's suitability for installation of a home sewage system. Factors considered during this review include soil type, topography, and natural drainage patterns.
3. The inspection report will note any limitations, recommendations and special conditions for sewage system installation and use which are then incorporated into the permit issued by the Board of Health prior to actual installation or repair.

D. Funding mechanism for improvement of home sewage systems

The Water Pollution Control Loan Fund (WPCLF) administered by Ohio EPA-DEFA is a source of

funding for home sewage system improvements. DEFA in cooperation with the Ohio Water Development Authority (OWDA) will make this fund available to finance improvements approved by the Mahoning County Board of Health that are in compliance with standards contained in the Ohio Administrative Code and Board of Health regulations. Incentives provided by a low interest, linked deposit loan program in conjunction with a stepped-up regulatory and educational outreach program will result in NPS reduction from home sewage systems. The linked deposit method of financing offers many advantages. It allows credit decisions to be made by experienced home loan officers. Further, it is more efficient for such loans to be managed by private lenders, who are themselves more accessible and well known to loan seekers.

Through the WPCLF linked deposit program, \$1,425,000, subject to the availability of funds, will be made available over the next three years for home sewage system improvements in Mahoning County.

Ohio EPA and OWDA will execute participating agreements with local lending institutions to link reduced interest rate deposits from the WPCLF in those institutions to equivalent reduced interest rate loans by the banks to homeowners who have septic permit approval and Certificates of Qualification from the Mahoning County Board of Health.

Information about financial assistance through Community Development Block Grant programs or the linked deposit program through the Ohio EPA Division of Environmental and Financial Assistance (DEFA) and participating local lending institutions will be made available to all homeowners issued septic permits.

Upon applying for a WPCLF linked deposit program loan from a participating lending institution,

the homeowner will present the Certificate of Qualification obtained from the Board of Health. The lending institution will review and process the application using their normal loan processing procedures. If approved, the lending institution may enter into a loan with the successful applicant, using the WPCLF linked deposit program as a source of financing. A flowchart depicting the loan application process is found in Figure 5 in the Appendices.

VI. Organization

A. Mahoning County Board of Health

The home sewage program, under which nonpoint source pollution control efforts are undertaken, is a program of the Environmental Health Division of the Mahoning County Board of Health.

The Mahoning County Board of Health exists to promote and protect the health of individuals and communities within Mahoning County. The Board of Health and staff pursue the goal of healthy people in healthy communities by working to fulfill these core public health functions:

- ◆ prevent epidemics
- ◆ protect the environment, the air, food, water, and housing
- ◆ promote healthy behaviors
- ◆ monitor the health status of the community
- ◆ mobilize community action for health
- ◆ respond to disasters
- ◆ assure the accessibility of medical care
- ◆ reach out to link high risk disadvantaged persons to needed services

- ◆ provide medical care when needed
- ◆ train health workers skilled in health promotion and disease prevention
- ◆ research innovative solutions to public health problems
- ◆ lead the development of sound health policy and planning

The Board of Health will issue Certificates of Qualification to homeowners who receive permits for home sewage systems and who wish to participate in the linked-deposit loan program. Participating homeowners will be expected to enter into an agreement with the Board of Health in which they agree to comply with Board of Health recommendations and requirements for home sewage system maintenance.

B. Ohio EPA-Division of Environmental and Financial Assistance

The Division of Environmental and Financial Assistance (DEFA) at the Ohio EPA, in cooperation with the Ohio Water Development Authority (OWDA), administers the Water Pollution Control Loan Fund (WPCLF). DEFA has developed the WPCLF linked deposit program, which can be used to provide funding through participating banks to eligible projects. DEFA and OWDA will authorize eligible banking institutions to participate in this program, and will monitor their activities to assure proper use of the WPCLF.

DEFA will also continue to work with the Mahoning County Board of Health through the implementation stage of this project. This work will involve monitoring the progress made by the county in addressing home sewage systems, monitoring the available water quality information to determine if the program is improving water quality, and reviewing the linked deposit process to see if

it can be improved. Near the end of the initial project period, the Ohio EPA-DEFA will evaluate the program results, and the availability of funds, to determine if the program should be extended.

C. Participating Lending Institutions

Lending institutions serving customers in Mahoning County will be invited to sign agreements with the Ohio EPA and OWDA in order to participate in the WPCLF Linked Deposit Program. These agreements commit the lending institutions to offer linked deposit loans only to homeowners with approval from the Board of Health for home sewage system improvements.

The lending institutions will conduct their normal credit reviews of applicants for linked deposit loans. The institution will execute a loan with the homeowner and will set the terms of the loan based on the typical terms that would be offered for such a loan minus the discount received by the institution on its linked deposit from Ohio EPA/OWDA. Monitoring and reporting requirements for lending institutions participating in the WPCLF linked deposit program are contained in their participating agreements with Ohio EPA/OWDA.

D. Mahoning County Sanitary Engineer

Board of Health and Sanitary Engineering staff meet regularly to review areas of for potential sewer extension and insure that home sewage systems in newly sewered areas are identified and properly abandoned in accordance with Board of Health and Ohio EPA regulations.

E. Home Sewage Pollution Prevention Advisory Committee

This committee made up of governmental, general public and representatives of appropriate organizations, was established in 1995 to provide guidance and assist in gaining community acceptance of this program. A list of individuals and organizations serving on the committee can be

found in the Appendices.

VII. Implementation

A quarterly schedule for implementation of objectives in the NPS pollution prevention plan is presented in the appendices. In addition, the low-interest loan program available to homeowners for repair or replacement of home sewage systems will begin in 1997 through participating lending institutions with funding support from the Ohio EPA-DEFA and OWDA.

Beginning in the last quarter of 1996, \$1,425,000 - subject to the availability of funds - will be made available through the WPCLF over the three years initial phase of the program for home sewage system improvements in Mahoning County. This will allow for the replacement of up to 50 systems in the first year, at an average cost of \$5,500 per system; 75 systems in the second year; and 100 systems in year three.

VIII. Evaluation Tools

A. Water quality monitoring plan

Board of Health sanitarians have selected approximately 30 sites for stream and other watercourse monitoring in critical areas (see Figure 6 in the Appendices). Baseline water quality in these areas has been established. Periodic resampling in these areas will enable the Board of Health to determine the impact of its efforts to control and prevent NPS pollution. Table 7 contains a complete list of water quality monitoring parameters.

Table 7

**Mahoning County Home Sewage Pollution Prevention Program
Water Resource Quality**

Testing Parameters

Fecal Coliform
Fecal Strep
Chlorides
Phosphorus
Total Dissolved Solids
Biological Oxygen Demand (BOD)
Dissolved Oxygen (Field)
Temperatures (Field)
PH (Field)

B. Quarterly/annual reporting

The Board of Health prepares quarterly and annual reports for the Ohio EPA Division of Water Nonpoint Source Pollution Prevention Program about program activities funded by the Board's Section 319 Clean Water Act grant. The Board of Health will report quarterly or semi-annually to the Ohio EPA-DEFA on the numbers of homeowners receiving Certificates of Qualification. These reports will also indicate: (i) the types of improvements included in the certificates, and (ii) the status of implementation of the projects funded through WPCLF linked deposit loans. An annual report will also be provided which provides a summary of the accomplishments of the program over the previous year in the watershed.

The participating lending institutions will identify to Ohio EPA-DEFA on the WPCLF Linked Deposit Investment Request Form the name, address, date and terms of the loan agreements, and the date of Board of Health certification for each loan applicant at the time the bank makes application for a WPCLF Linked Deposit.

The banks will also report quarterly to Ohio EPA-DEFA on the status of their WPCLF Linked

Deposit Program loans. These reports will indicate: (i) the amounts of funds dispersed to each eligible borrower, (ii) loans for which disbursements have been completed, and (iii) the status of loan repayments.

REFERENCES

1990 Census and 1992 Estimates of Ohio's Population: State, Counties, Cities, and Villages. 1994. Ohio Department of Development.

Estimated Water Use in Ohio, 1990, Public Supply Data. 1993. USGS. Open-File Report 93-72.

Ohio Nonpoint Source Management Program. 1993. ODNR.

State of Ohio Nonpoint Source Assessment: Volumes 1-6. 1990. Ohio EPA.

Acknowledgements

We wish to acknowledge the assistance of John Stamm, Extension Agent, Ohio State University Extension - Mahoning County, from whose draft publication about water resources in Mahoning County much of the information about water resources and quality is drawn.

APPENDICES

Figure 1: Watershed Map of Mahoning County

Figure 2: Map of Mahoning County's Location in Ohio

Demographic and Socioeconomic Characteristics of Mahoning County

Figure 3: Mahoning County Sewer Districts

Figure 4: Critical Areas for NPS Pollution Prevention

Figure 5: Linked Deposit Loan Program Flowchart

Figure 6: Surface Water Sampling Map of Mahoning County

Home Sewage Pollution Prevention Advisory Committee Membership

Project Work Plan

HOME SEWAGE POLLUTION PREVENTION
ADVISORY BOARD
4/8/96

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PROJECT WORK PLAN
Quarterly Summary
 Duplicate for Each Quarter

PROJECT TITLE: Nonpoint Pollution Source Reduction Through Inventory, Inspection and Preventative Maintenance of Home Sewage Systems in Mahoning County

QUARTER #: 2 **FROM:** 4/1/95 **THROUGH:** 6/30/95

OBJECTIVE #	ACTIVITY DESCRIPTION (Quantify)	FEDERAL \$	PRODUCTS
1	Continue with the inspection and inventory of home and commercial sewage systems (complete 10% of the systems in project area.	8,997	Number of home & commercial sites inspected/inventoried
2, 8	Continue entering the data obtained from the inspection and inventory of systems. Utilize the data for conducting educational and corrective enforcement programs.	6,986	Data entered, data used for enforcement actions and public education
7	Initiate the educational program working with collaborating agencies. Plan initial seminar for prospective home buyers, realtors ad developers.		Seminars planned
6	Initiate the inspection and inventory of septage land application disposal sites. (Inspect all locations)		No. of sites inspected
5, 6	Hold at least two meetings with Technical and Citizens Advisory Committees and write first drafts of Sewage System Maintenance Regulation and Septage Disposal Regulation.		No. of meetings held, draft regulations
.....			
TOTAL QUARTER ALLOCATION:		FEDERAL \$15,983	STATE \$ LOCAL \$ 11,222

PROJECT WORK PLAN
Quarterly Summary
 Duplicate for Each Quarter

PROJECT TITLE: Nonpoint Pollution Source Reduction Through Inventory, Inspection and Preventative Maintenance of Home Sewage Systems in Mahoning County

QUARTER #: 3 **FROM:** 7/1/95 **THROUGH:** 9/30/95

OBJECTIVE #	ACTIVITY DESCRIPTION (Quantify)	FEDERAL \$	PRODUCTS
1	Continue with the inspection and inventory of home and commercial sewage systems (complete 10% of the systems in project area.	8,997	Number of home & commercial sites inspected/inventoried
2, 8	Continue entering the data obtained from the inspection and inventory of systems. Utilize the data for conducting educational and corrective enforcement programs.	6,987	Data entered, data used for enforcement actions and public education
4	Collect samples from sentinel wells and watercourses for comparison to baseline samples.	1,925	No. of samples collected
7	Continue with the development of educational materials including brochures.		No. of materials produced; copies of each
7	Hold first annual education seminar for prospective home buyers, realtors and developers.		Meeting held
5, 6	Hold a meeting with the Technical and Citizens Advisory Committees to review initial comments on draft for sewage system maintenance and septage disposal regulations.		
.....			
TOTAL QUARTER ALLOCATION:		FEDERAL \$17,909	STATE \$ LOCAL \$ 12,935

PROJECT WORK PLAN
Quarterly Summary
 Duplicate for Each Quarter

PROJECT TITLE: Nonpoint Pollution Source Reduction Through Inventory, Inspection and Preventative Maintenance of Home Sewage Systems in Mahoning County

QUARTER #: 4 **FROM:** 10/1/95 **THROUGH:** 12/31/95

OBJECTIVE #	ACTIVITY DESCRIPTION (Quantify)	FEDERAL \$	PRODUCTS
1	Continue with the inspection and inventory of home and commercial sewage systems (complete 10% of the systems in project area.	8,996	Number of home & commercial sites inspected/inventoried
2, 8	Continue entering the data obtained from the inspection and inventory of systems. Utilize the data for conducting educational and corrective enforcement programs.	6,986	Data entered, data used for enforcement actions and public education
5, 6	Produce a final draft of proposed Sewage System Maintenance and Septage Disposal Regulations.		Copy of final draft published

.....
TOTAL QUARTER ALLOCATION: **FEDERAL \$15,982** **STATE \$** **LOCAL \$ 12,934**

PROJECT WORK PLAN
Quarterly Summary
 Duplicate for Each Quarter

PROJECT TITLE: Nonpoint Pollution Source Reduction Through Inventory, Inspection and Preventative Maintenance of Home Sewage Systems in Mahoning County

QUARTER #: 5 **FROM:** 1/1/96 **THROUGH:** 3/31/96

OBJECTIVE #	ACTIVITY DESCRIPTION (Quantify)	FEDERAL \$	PRODUCTS
1	Continue with the inspection and inventory of home and commercial sewage systems (complete 10% of the systems in project area.	9,498	Number of home & commercial sites inspected/inventoried
2, 8	Continue entering the data obtained from the inspection and inventory of systems. Utilize the data for conducting educational and corrective enforcement programs.	7,284	Data entered, data used for enforcement actions and public education
4	Collect samples from sentinel wells and watercourses for comparison to baseline sample and initial field sample.	2,022	No. samples collected
7	Continue development of educational programs.		Seminars planned, materials produced
5, 6	Hold a series of four public meetings to obtain comments on draft Sewage System Maintenance and Septage Disposal Regulations.		No. of meetings held
5, 6	Hold a meeting with Technical and Citizens Advisory Committees to review comments from public meetings on regulations.		Meeting held, summary of comments published
.....			
TOTAL QUARTER ALLOCATION:		FEDERAL \$18,804	STATE \$ LOCAL \$ 12,683

PROJECT WORK PLAN
Quarterly Summary
 Duplicate for Each Quarter

PROJECT TITLE: Nonpoint Pollution Source Reduction Through Inventory, Inspection and Preventative Maintenance of Home Sewage Systems in Mahoning County

QUARTER #: 6 **FROM:** 4/1/96 **THROUGH:** 6/30/96

OBJECTIVE #	ACTIVITY DESCRIPTION (Quantify)	FEDERAL \$	PRODUCTS
1	Continue with the inspection and inventory of home and commercial sewage systems (complete 10% of the systems in project area.	9,498	Number of home & commercial sites inspected/inventoried
2, 8	Continue entering the data obtained from the inspection and inventory of systems. Utilize the data for conducting educational and corrective enforcement programs.	7,284	Data entered, data used for enforcement actions and public education
5, 6	Finalize Sewage System Maintenance and Septage Disposal Regulations and propose to Board of Health for adoption.		
5, 6	Hold a meeting with the Technical and Citizen Advisory Committees to plan strategies for promoting public acceptance of proposed regulations. Initiate public promotion campaign.		Summary of strategies chosen
8	Initiate the education and corrective actions program for malfunctioning sewage systems. Send notices to 20% of system owners requiring repairs.		Educational activities, No. of notices sent to system owners needing repairs
7	Develop and distribute educational materials to septage haulers regarding new rules.		No. of haulers receiving materials
.....			
TOTAL QUARTER ALLOCATION:		FEDERAL \$ 16,782	STATE \$ LOCAL \$ 12,682

PROJECT WORK PLAN
Quarterly Summary
 Duplicate for Each Quarter

PROJECT TITLE: Nonpoint Pollution Source Reduction Through Inventory, Inspection and Preventative Maintenance of Home Sewage Systems in Mahoning County

QUARTER #: 7 **FROM:** 7/1/96 **THROUGH:** 9/30/96

OBJECTIVE #	ACTIVITY DESCRIPTION (Quantify)	FEDERAL \$	PRODUCTS
1	Continue with the inspection and inventory of home and commercial sewage systems (complete 10% of the systems in project area.	9,498	Number of home & commercial sites inspected/inventoried
2, 8	Continue entering the data obtained from the inspection and inventory of systems. Utilize the data for conducting educational and corrective enforcement programs.	7,284	Data entered, data used for enforcement action and public education
4	Collect samples from sentinel wells and watercourses for comparison to baseline sample and prior field samples.	2,022	No. samples collected
7	Hold the second annual seminar for prospective home buyers, realtors and developers.		Seminar held No. of participants
5, 6	Adoption and effective date of Sewage System Maintenance and Septage Disposal Regulations.		Regulation adopted
.....			
TOTAL QUARTER ALLOCATION:		FEDERAL \$18,804	STATE \$ LOCAL \$ 12,683

PROJECT WORK PLAN
Quarterly Summary
 Duplicate for Each Quarter

PROJECT TITLE: Nonpoint Pollution Source Reduction Through Inventory, Inspection and Preventative Maintenance of Home Sewage Systems in Mahoning County

QUARTER #: 8 **FROM:** 10/1/96 **THROUGH:** 12/31/96

OBJECTIVE #	ACTIVITY DESCRIPTION (Quantify)	FEDERAL \$	PRODUCTS
1	Continue with the inspection and inventory of home and commercial sewage systems (complete 10% of the systems in project area.	9,498	Number of home & commercial sites inspected/inventoried
2, 8	Continue entering the data obtained from the inspection and inventory of systems. Utilize the data for conducting educational and corrective enforcement programs.	7,284	Data entered, data used for enforcement action and public education
8	Continue with enforcement program for malfunctioning sewage systems and notify another 20% of the owners with malfunctioning sewage systems.		No. notices sent to owners of systems needing repair
6	Conduct inspections of septage disposal sites enforcing the newly adopted Septage Disposal Regulations.		No. of sites inspected No. of acres affected
.....			
TOTAL QUARTER ALLOCATION:		FEDERAL \$16,782	STATE \$ LOCAL \$ 12,682

PROJECT WORK PLAN
Quarterly Summary
 Duplicate for Each Quarter

PROJECT TITLE: Nonpoint Pollution Source Reduction Through Inventory, Inspection and Preventative Maintenance of Home Sewage Systems in Mahoning County

QUARTER #: 9 **FROM:** 1/1/97 **THROUGH:** 3/31/97

OBJECTIVE #	ACTIVITY DESCRIPTION (Quantify)	FEDERAL \$	PRODUCTS
1	Continue with the inspection and inventory of home and commercial sewage systems (complete 10% of the systems in project area.	10,001	Number of home & commercial sites inspected/inventoried
2, 8	Continue entering the data obtained from the inspection and inventory of systems. Utilize the data for conducting educational and corrective enforcement programs.	7,621	Data entered, data used for enforcement action and public education
4	Collect samples from sentinel water wells for comparison to baseline and previous field samples.	2,123	No. samples collected
8	Continue with educational and enforcement program for malfunctioning sewage systems. Initiate corrective action notifications to another 20% of malfunctioning sewage systems identified.		No. notices sent to owners of systems needing repair
.....			
TOTAL QUARTER ALLOCATION:		FEDERAL \$19,745	STATE \$ LOCAL \$ 13,317

PROJECT WORK PLAN
Quarterly Summary
 Duplicate for Each Quarter

PROJECT TITLE: Nonpoint Pollution Source Reduction Through Inventory, Inspection and Preventative Maintenance of Home Sewage Systems in Mahoning County

QUARTER #: 10 **FROM:** 4/1/97 **THROUGH:** 6/30/97

OBJECTIVE #	ACTIVITY DESCRIPTION (Quantify)	FEDERAL \$	PRODUCTS
1	Continue with the inspection and inventory of home and commercial sewage systems (complete 10% of the systems in project area.	10,000	Number of home & commercial sites inspected/inventoried
2, 8	Continue entering the data obtained from the inspection and inventory of systems. Utilize the data for conducting educational and corrective enforcement programs.	7,620	Data entered, data used for enforcement action and public education
7	Hold third training seminar for potential property owners, builders and developers.		Seminar held, No. of participants
8	Continue with educational and enforcement program for identified malfunctioning sewage systems. Initiate corrective actions and/or maintenance on 12% of the systems identified.		No. notices sent to owners of systems needing repair
.....			
TOTAL QUARTER ALLOCATION:		FEDERAL \$17,620	STATE \$ LOCAL \$ 13,317

PROJECT WORK PLAN
Quarterly Summary
 Duplicate for Each Quarter

PROJECT TITLE: Nonpoint Pollution Source Reduction Through Inventory, Inspection and Preventative Maintenance of Home Sewage Systems in Mahoning County

QUARTER #: 11 **FROM:** 7/1/97 **THROUGH:** 9/30/97

OBJECTIVE #	ACTIVITY DESCRIPTION (Quantify)	FEDERAL \$	PRODUCTS
1	Continue with the inspection and inventory of home and commercial sewage systems (complete 10% of the systems in project area.	10,001	Number of home & commercial sites inspected/inventoried
2, 8	Continue entering the data obtained from the inspection and inventory of systems. Utilize the data for conducting educational and corrective enforcement programs.	7,621	Data entered, data used for enforcement action and public education
8	Continue with educational and enforcement program for identified malfunctioning sewage systems. Initiate corrective actions and/or maintenance on 12% of the systems identified.	2,123	No. notices sent to owners of systems needing repair
4	Collect samples from sentinel water wells and watercourse locations for comparison to baseline and prior field samples.		No. samples collected
.....			
TOTAL QUARTER ALLOCATION:		FEDERAL \$19,745	STATE \$ LOCAL \$ 13,317

PROJECT WORK PLAN
Quarterly Summary
 Duplicate for Each Quarter

PROJECT TITLE: Nonpoint Pollution Source Reduction Through Inventory, Inspection and Preventative Maintenance of Home Sewage Systems in Mahoning County

QUARTER #: 12 **FROM:** 10/1/97 **THROUGH:** 12/31/97

OBJECTIVE #	ACTIVITY DESCRIPTION (Quantify)	FEDERAL \$	PRODUCTS
1, 8	Complete any remaining inspections and inventorying and enforcement actions.	10,000	Number of home & commercial sites inspected/inventoried
2	Complete database.	7,621	Database completed, copy of file
9	Draw final conclusions on program by comparison of data from water samples and inspection enforcement program.		Summary of conclusions published
5	Hold meetings with the Technical and Citizens Advisory Committees to review program and plan for continuation.		Summary of program review and plan for continuation published

.....
TOTAL QUARTER ALLOCATION: **FEDERAL \$ 17,621** **STATE \$** **LOCAL \$ 13,316**