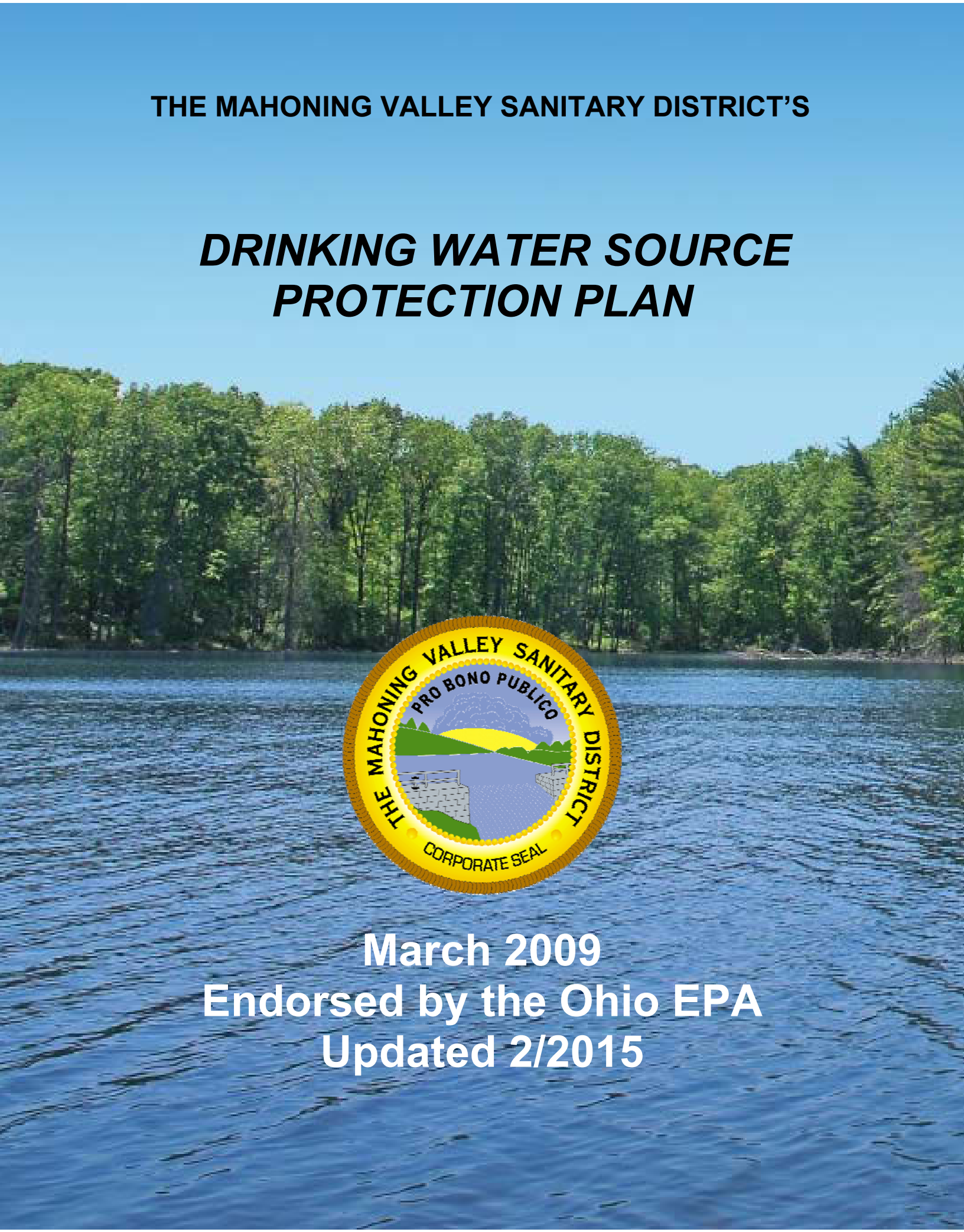
THE MAHONING VALLEY SANITARY DISTRICT'S

DRINKING WATER SOURCE PROTECTION PLAN



March 2009
Endorsed by the Ohio EPA
Updated 2/2015

DRINKING WATER SOURCE PROTECTION PLAN

MEANDER WATER

MVSD • YOUR COMMUNITY WATER SUPPLY
Member Cities: Youngstown and Niles
www.meanderwater.org

The Mahoning Valley Sanitary District

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Ohio EPA Review of
The Mahoning Valley Sanitary District's
DRINKING WATER SOURCE PROTECTION PLAN

Endorsement Statement

PROTECTIVE STRATEGIES:

Ohio EPA endorses the Mahoning Valley Sanitary District's Drinking Water Source Protection Plan as meeting the requirements of Ohio's Source Water Protection Program. The Plan describes the intent to establish septic tank regulations, including periodic cleaning and maintenance, and investigation programs to be conducted by county boards of health. Filter strips and other agricultural Best Management Practices on land adjacent to water courses will be instituted by June 2010 and the purchase of buffer zones will be ongoing. De-icing practices on roads within the Corridor Management Zone will be reviewed to reduce the seasonal levels of chlorides in the source water. Educational materials will be developed and distributed, and information about source water protection will be included in the Consumer Confidence Report by July of each year. Signage in Trumbull and Mahoning Counties near tributaries will be installed by June, 2010. Negotiations with the US Army Corps of Engineers are underway to coordinate the use of water from Berlin Reservoir in the event of an emergency. And there has been coordination with the local fire departments and the County Emergency Management Agencies to ensure awareness and protection of the water draining towards the intake. The protection plan will be reviewed every year beginning in March, 2009.

DRINKING WATER SOURCE PROTECTION PLAN

PRE AMBLE

The Mahoning Valley Sanitary District has prepared a Drinking Water Source Protection Plan. The purpose of this plan is intended to identify sensitive water courses and to provide the strategies to reduce the risk of contamination and sedimentation to the Meander Reservoir. This plan also enlists various local communities and governmental agencies to help develop and implement protective source water management activities as part of the plan. Through their local assistance The Mahoning Valley Sanitary District will be able to reduce the potential for contamination and sedimentation while continuing to provide safe and potable water for over 200,000 people in Mahoning and Trumbull Counties. Provided below is a Source Water Management Activities Chart depicting the protective plan strategies to be implemented.

DRINKING WATER SOURCE MANAGEMENT ACTIVITIES CHART

Activity	Responsible Party	When Implemented	Comments
SOURCE WATER MANAGEMENT ACTIVITIES			
Storm Water Runoff and Nonpoint Illicit Discharges Storm Water Management Program is being implemented by listed responsible parties. (p. 35)	Trumbull County, Mahoning County, village of Lordstown, city of Canfield, Mineral Ridge, Weathersfield, Elsworth, Jackson, Austintown, and Canfield Townships	Mahoning County and Townships established March 3, 2003 and ongoing. Trumbull County and Townships established Plan March 5, 2003.	Storm Water Mgt Plans include public education, detection and elimination of illicit discharges, and oversight of construction sites (to prevent sediment and chemicals from being washed into storm sewers and natural drainage pathways). (p. 35)
New Development The land surrounding Meander Reservoir is a fenced-in fish and game refuge with no public access	Mahoning Valley Sanitary District	Established 1926 and ongoing.	MVSD will explore zoning for property adjacent to or including waterways within CMZ. (p. 35-36)
Illicit Septic Tank Discharge Establish septic tank regulations, including periodic cleaning and maintenance, and investigation programs to be conducted by county boards of health. (p. 35)	Mahoning and Trumbull County Boards of Health	Ongoing	
Agricultural Runoff Promote filter strips and other agricultural BMPs on land adjacent to water courses. Purchase buffer zones.	Soil and Water Conservation Districts for Mahoning and Trumbull Counties PWS/Western Reserve Land Conservancy	Ongoing Ongoing	Pursue funding via Farm Bill and contact property owners to make them aware of potential. Purchases contingent upon funds being available and property owners willing to sell.
Roadway Runoff Review de-icing practices on roads within the CMZ	City, township and county road maintenance crews, and ODOT	Ongoing Mahoning County has a BMP in place.	To reduce the seasonal levels of chlorides in the source water
EDUCATION AND OUTREACH			
Brochures	With assistance from Ohio EPA, County Soil and Water Districts, the County Engineer's office, and AWARE	Ongoing	Sample copies included in Appendix H.
Posters and Public Education Materials	See above	Completed	Sample copies included in Appendix H.

Activity	Responsible Party	When Implemented	Comments
News Releases	By the relevant cities, townships, and local government agencies	As needed	Distribute to *The Vindicator* and *Tribune Chronicle*
Source Water Protection Presentations	See above; also, the Trumbull and Mahoning SWEET Teams	As requested	
Annual Customer Confidence Report (CCR) Include information on source water protection in CCR.	Public water system operators	By July 1st of each year	Goes to all water customers
Water/Sewer Utility Bills Include information on source water protection in utility bills	Niles, Youngstown and McDonald	Per the appropriate billing cycle	Includes customers in Mineral Ridge, Lordstown, Austintown, Jackson
Signage	Trumbull and Mahoning Counties, Townships, and ODOT	Completed	Goal: to install near tributary to water courses
CONTINGENCY PLANNING			
Emergency Supply Berlin Reservoir	PWS, Fire Departments, Mahoning and Trumbull County EMAs	Pump Station and Pipeline completed March 1958	Negotiations currently underway with USACE to use Berlin Reservoir as needed via 9-mile aqueduct operated by MVSD (p. 39)
Emergency Response addressed in updated Contingency Plan (Appendix I)	[See above]	Updated Annually	Local fire departments and County EMAs notified of location of intakes and of the need to keep runoff from fires/chemical spills from entering storm sewers or natural drainage ways
SOURCE WATER MONITORING			
Monitoring Reservoir Sample Sites Raw water is sampled at 18 locations throughout MVSD (pp. 40-41)	PWS	Once a month	Results are available upon request
Participation in Homeland Security Water Protection Research (pp. 41-45)	PWS Trumbull and Mahoning Counties	To be determined	

Protection Plan Updates
MVSD commits to reviewing the Drinking Water Source Protection Plan every year, beginning with March 2009.

Evaluating Effectiveness
In the March Annual review, a determination will be made on the progress which has been made with regard to the protective strategies and their implementation. Efforts will be made to make sure existing and proposed activities are being attained or will be attainable.

TABLE OF CONTENTS

MVSD DRINKING WATER SOURCE PROTECTION PLAN

TABLES

Figures

Mahoning Valley Sanitary District
Drinking Water Source Protection Plan

EXECUTIVE SUMMARY

Drinking Water Source Assessment and Protection. The following report for the Mahoning Valley Sanitary District (MVSD) was compiled as part of the Drinking Water Source Protection Plan (DWSPP). This Plan is intended to identify drinking water protection areas and provide information on how to reduce the risk of contamination of the waters within those areas. The goal of the Plan is to ensure the long term availability of abundant and safe drinking water for the present and future citizens of the Mahoning Valley.

The Safe Drinking Water Act Amendment of 1996 established the National Source Water Assessment and Protection Program, targeting drinking water sources for all public water systems in the United States. A public water system is a facility that provides drinking water to 15 or more service connections or that regularly serves at least 25 people a day for at least 60 days a year, whether from an underground well or spring, or from an above ground stream, lake, or reservoir. The requirement does not address residential wells or cisterns. In Ohio there are approximately 5,800 public water systems.

Protection Areas. The drinking water source protection plan area for the MVSD surface water source is shown in Figure 1. The Water Source Protection Plan was developed from a source water assessment performed by the OEPA in April of 2003. Possible impacts to the surface water source include agricultural runoff from row crop agriculture and animal feedlot operations, oil and gas wells, roadway runoff, road/rail stream crossings, failing home and commercial septic systems, spills, and new housing and commercial development that could increase runoff from roads, parking lots and their properties.

Protective Strategies. The ultimate goal of a source water assessment is to identify potential impacts to source water quality so that implementation of protective strategies will better protect the drinking water source. The MVSD has been recognized for its approach of obtaining lands adjacent to Meander Reservoir, limiting public access, and implementing spill containment protection.

Further strategies for protecting Meander Reservoir should include controlling home and commercial septic discharges and runoff from residential, commercial, agricultural and animal feedlot areas, controlling runoff from housing/commercial development construction sites, increasing public awareness of drinking water protection in the area, and coordinating with local emergency response agencies.

There is also the continuation of investigations into the sources and causes of winter blooms of Synura algae (associated with finished water taste and odor problems) and other possible algae blooms.

Potential Contaminant Sources/Hazardous Waste Generators. The MVSD has developed an inventory of potential contaminant sources which in some cases may also be Hazardous Waste Generators. A listing of these sites can be found in Table1 along with a map of their location. The reservoir should also continue to be monitored for potential zebra and Quagga mussels infestation. During the 2014 year unidentified mussels were located in the Reservoir near the dam and spillway.

Beginning in 2007, the MVSD and other jurisdictions comprising the protection areas have met to develop a local protection plan to protect the source of drinking water. Public meeting and watershed protection plan committee meetings have been held to compile data and develop protective strategies involving the protection of the watershed and reservoir. Information from these meetings was utilized in the development of this Plan.

Plan Evaluation. Evaluation of the plan will be done through the lessons learned, through the tracking of progress and by documenting the activities that have been implemented. The Plans annual review will detail this information and modifications will be made as necessary.

Mahoning Valley Sanitary District Public Water System
Source Water Protection Area Corridor Management Zone

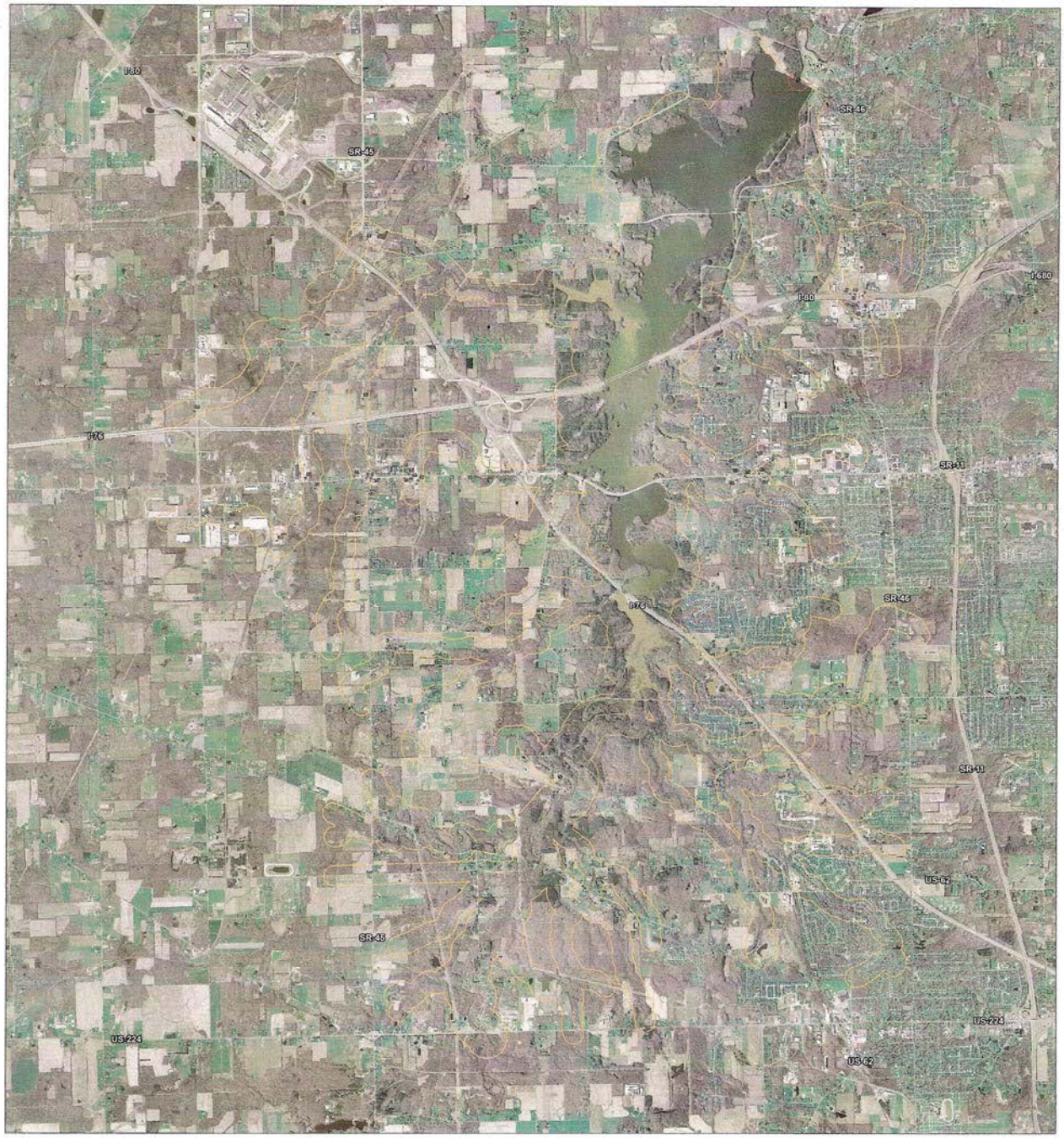


Figure 1

Table 1. Hazardous Waste Generators

	Unique ID	Source Name & Address	Type
1	LUST050995600 LUST050995602 LUST050995601	Speedway 8242 871 N. Canfield Niles Road Youngstown, OH 44515	Gas Station
2	LUST500023900 LUST500023901	Fuel Mart #730 5301 76 Dr Youngstown, OH 44515	Gas Station
3	LUST500052000 LUST500052001 LUST500052002	Travel Centers of America Inc. 5400 76 Dr Youngstown, OH 44514	Gas Station/Service Center
4	LUST501121400 LUST501121401	Youngstown Developmental Ctr 4891 E County Line Road Mineral Ridge, OH 44440	Leaking Underground Tank
5	LUST501216800	Enterp Investmts/ltv Engergy Prod 8900 Mahoning Avenue North Jackson, OH 44451	Commercial/Industrial
6	LUST502110400 LUST502110401	R&R Inc. 44 Victoria Road Austintown, OH 44515	Commercial
7	LUST502145000	Fyda Truck Equipment 5260 76 Dr Austintown, OH 44515	Commercial
8	LUST503173900	White Star Investments Inc. 11022 Mahoning Ave North Jackson, OH 44451	Commercial
9	LUST504133500	BP 06259 10982 Mahoning RD North Jackson, OH 44451	Gas Station
10	LUST506100200	Oms #26 475 Victoria Road Youngstown, OH 44515	Commercial
11	LUST508003000	Superior Beverage Group 425 Victoria Road Austintown, OH 44515	Commercial
12	LUST508127200	Bailey RD Outpost Garage-ODOT 385 Bailey Road North Jackson, OH 44451	ODOT Garage
13	LUST508187000	Dealerships Inc 10535 Mahoning Avenue North Jackson, OH 44451	Auto Dealership
14	LUST508262400	John May 9180 Mahoning & Lipkey North Jackson, OH 44451	Commercial
15	OHD061731196	Sunoco Station North 825 Canfield Niles RD Youngstown, OH 44515	Gas Station
16	OHD091628040	Superior Auto Body 51 Fitch Blvd Youngstown, OH 44515	Auto body repair shop
17	OHD180028219	United Brake 102 Maple Ave Youngstown, OH 44515	Commercial

18	OHD981192917	Ohio Nat'l Guard Maint 26 475 Victoria Road Youngstown, OH 44515	Ohio National Guard facility
19	OHD981784002	Delphi Packard 44 500 Victoria Road Youngstown, OH 44515	Industrial
20	OHD982070641	WMI Medical OH 12201 Council Drive North Jackson, OH 44451	Commercial
21	OHD982627051	JC Auto 10 Harold Street Youngstown, OH 44515	Auto Dealer or repair
22	OHD986966893	Sovereign Circuits 12080 DeBartolo Drive North Jackson, OH 44451	Commercial/Industrial
23	OHD987037025	BP Oil Site 6259 10982 Mahoning North Jackson, OH 44451	Gas Station
24	OHD987043007	Sand Blasting Specialist 6585 Mahoning Avenue Youngstown, OH 44515	Commercial/Industrial
25	CEM0509	Brunsteter Cemetery, OH	Cemetery
26	D7801811	Penn-Ohio Pallet SR 45 North Jackson, OH 44451	Commercial
27	D7801811	P.A.M. Transport Bailey Road North Jackson, OH 44451	Fleet/truck/bus terminals
28	D7801811	Truck Specialist Inc. Bailey Road North Jackson, OH 44451	Auto repair shops/body shops
29	D7801811	National Industrial Lumber Co Rosemont Road North Jackson, OH 44451	Hardware/lumber/parts stores
30	D7801811	Electrical Substation Mahoning Avenue North Jackson, OH 44451	Electrical Substations (Transformers)
31	D7801811	Industrial Complex/Stockpiles Mahoning Avenue North Jackson, OH 44451	Industrial/Material stockpiles
32	D7801811	Kwik Fill Gas Station Mahoning Avenue North Jackson, OH 44451	Gas Stations (existing/abandoned/historical)
33	D7801811	Greentree Gardens SR 45 North Jackson, OH 44451	Greenhouses/Nurseries
34	D7801811	K.T.R.E. Mahoning Avenue North Jackson, OH 44451	Auto repair shops/body shops
35	D7801811	George's Last Resort SR 45 North Jackson, OH	Auto repair shops/body shops

36	D7801811	First Choice Trucking and Repair Inc. Mahoning Avenue North Jackson, OH	Auto repair shops/body shops
37	D7801811	Hickory Hill Farm Gibson Road Geeburg, OH	Animal Feedlots
38	D7801811	Crory Road Landfill Crory Road Canfield, OH 44406	Municipal landfills
39	D7801811	Sheban Strip Mine Ellsworth, OH	Mines: abandoned
40	D7801811	Seven Mile Inn Mahoning Avenue West Austintown, OH 44515	Septic Systems (discharging to surface water)
41	D7801811	Restaurant Mahoning Avenue Lipkey Corner, OH	Septic Systems (discharging to surface water)
42	D7801811	Hardrive Asphalt Plant Union Street Mineral Ridge, OH 44440	Asphalt/cement/concrete plants
43	D7801811	Remington Freight Lines 3697 Ohltown-McDonald Road Mineral Ridge, OH 44440	Fleet/truck/bus terminals
44	D7801811	Ohltown United Methodist Church Ohltown Road Mineral Ridge, OH	Cemetery
45	D7801811	New Deal Motors Canfield Niles Road Mineral Ridge, OH 44440	Car/boat/camper dealerships
46	D7801811	Cerni Motor Sales Cerni Place Austintown, OH 44515	Fleet/truck/bus terminals
47	D7801811	Pacific Pride Gas Station Cerni Place Austintown, OH 44515	Gas Stations (existing/abandoned/historical)
48	D7801811	Pilot Travel Center SR 46 Austintown, OH 44515	Gas Stations (existing/abandoned/historical)
49	D7801811	BP Gas Station SR 46 Austintown, OH 44515	Gas Stations (existing/abandoned/historical)
50	D7801811	Ohio Edison W Austintown Turner Road West Austintown, OH 44515	Electrical Substations (Transformers)
51	D7801811	TNT Motors Mahoning Avenue West Austintown, OH 44515	Car/boat/camper dealerships
52	D7801811	Disko's Autobody Mahoning Avenue West Austintown, OH 44515	Auto repair shops/body shops
53	D7801811	Connolly's Garden Center Mahoning Avenue West Austintown, OH 44515	Greenhouses/Nurseries

54	OHD000674648	Sunoco Service Station 379 N Main Street Mineral Ridge, OH 44440	Gas Stations (existing/abandoned/historical)
55	OHD000723569	Laurel Pipe Line Co Ellsworth Ellsworth & Bailey Road Ellsworth, OH 44416	Pipe Line
56	OHD000810283	Pittsburgh Canfield Corp 460 W Main Street Canfield, OH 44406	Commercial/Industrial
57	OHD000816579	Tru Green Corp 1336 Seaborn Street Mineral Ridge, OH 44440	Commercial/Industrial
58	OHD009865825	Dart Trucking Co Inc 61 Railroad St. Canfield, OH 44406	Fleet/truck/bus terminals
59	OHD009865825	Centric Group Inc 61 Railroad St. Canfield, OH 44406	Commercial/Industrial
60	OHD010850147	Curtlander Auto Sales 1428 Salt Springs Road Niles, Ohio 44446	Car/boat/camper dealerships
61	OHD016106221	Grein Auto Body 129 S Canfield Road Youngstown, OH 44515	Auto repair shops/body shops
62	OHD020632808	East Ohio Gas Co, Austintown Station 9686 New Road North Jackson, OH 44451	Gas
63	OHD039460860	Mahoning County JVS Diesel 7300 N Palmyra Canfield, OH 44406	School
64	OHD058388570	Cubbison Co 380 Victoria Road Youngstown, OH 44512	Commercial/Industrial
65	OHD059051243	White Metal Rolling and Stamping 3724 Union St. Mineral Ridge, OH 44440	Commercial/Industrial
66	OHD061731196	Sunoco Service Station 825 N Canfield Niles RD Youngstown, OH 44515	Gas Stations (existing/abandoned/historical)
67	OHD068892785	Toth and Company Inc 6799 Crory Road Canfield, OH 44406	Commercial/Industrial
68	OHD070757117	Sunoco Service Station 560 W. Main Street Canfield, OH 44406	Gas Stations (existing/abandoned/historical)
69	OHD076767953	Contract Produce Services Inc. 250 Railroad St. Canfield, OH 44406	Commerical
70	OHD083329318	ATEC Industries, Inc. 7055 Herbert Rd Canfield, OH 44406	Commercial/Industrial

71	OHD097946040	Rood Trucking Co. 3505 Union Street Mineral Ridge, OH 44440	Fleet/truck/bus terminals
72	OHD981195225	Mold Tech Accu Tech Div 3519 Union St Mineral Ridge, OH 44440	Commercial/Industrial
73	OHD981539927	Courtney-Harvey 580 W Main St Canfield, OH 44406	Car/boat/camper dealerships
74	OHD981779903	Standard LaFarge 450 W Main Street Canfield, OH 44406	Slag
75	OHD982428161	Ohio Dept of Trans 501 W Main Street Canfield, OH 44406	Transportaiton
76	OHD982621617	Niles Tube Co Inc. 301 McKees Lane Niles, OH 44446	Commerical/Industrial
77	OHD982637761	Builders Transport Inc. 11550 Mahoning Avenue North Jackson, OH 44451	Fleet/truck/bus terminals
78	OHD986976611	Automobile Specialty Co 151 Bailey Road North Jackson, OH 44451	Auto repair shops/body shops
79	OHD986979029	Don and Joes Ellsworth Autobody 10955 Akron Canfield Road Ellsworth, OH 44416	Auto repair shops/body shops
80	OHD986980217	Star Extruded Shapes Inc 3 Industrial Park Drive Canfield, OH 44406	Commercial/Industrial
81	OHD986983328	Vanex Tube Corp 301 McKees Lane Niles, OH 44446	Commercial/Industrial
82	OHD986998342	Tamarkin 375 Victoria RD Youngstown, OH 44515	Commercial/Industrial
83	OHD986998409	Auto Specialty 3798 Main Street Mineral Ridge, OH 44440	Auto repair shops/body shops
84	OHD987009966	PIC 445 W Main Street Canfield, OH 44406	Commercial
85	OHD987037306	BP Oil Co Site 6124 5502 Mahoning Ave Youngstown, OH 44515	Gas Stations (existing/abandoned/historical)
86	OHD987048976	Builders Transport Inc 3484 Union Street Mineral Ridge, OH 44440	Fleet/truck/bus terminals
87	OHD987053592	MAC Door 11675 Mahoning Ave North Jackson, OH 44451	Commercial
88	OHD987055076	Mahnen Machinery 545 N Canfield Niles RD Austintown, OH 44515	Commercial/Industrial

89	OH0000018242	Envirco Transportation Inc 61 ½ Railroad St. Canfield, OH 44406	Fleet/truck/bus terminals
90	OH0001191444	Clark Store No. 1869 3650 Main Street Mineral Ridge, OH 44440	Gas Stations (existing/abandoned/historical)
91	OH0001369511	Canfield Ford Mercury Inc. 366 West Main Street Canfield, OH 44406	Car/boat/camper dealerships
92	OH0001369545	Ohio Edison – Salt Springs Sub 5020 Salt Springs Road Youngstown, OH 44440	Electrical Substations (Transformers)

BENEFITS OF A DRINKING WATER SOURCE PROTECTION PLAN

It helps the MVSD to protect and provide the safest and highest quality drinking water to its customers at the lowest possible cost.

- √ It acknowledges the importance of a Drinking Water Source Protection Plan and implements the development of a strategic plan to protect the reservoir's water quality.
- √ It establishes strategies to minimize the potential threats to our source of drinking water.
- √ It helps to plan for expansion, development, zoning and emergency response issues.
- √ It can provide more opportunities for funding in order to improve infrastructure, purchase land in the protection area, and other improvements to the reservoir.

Provided in Appendix A is the Board of Directors' Resolution on authorizing the development of a Drinking Water Source Protection Plan for the MVSD and its' local communities served. It was resolved by the Board to provide measures and practices to reduce sources of contamination and to protect the surface water as an essential source of fresh water for the public. The plan is to also enlist the support of state and local governmental agencies and public to protect the water supply as a natural resource used for drinking water.

INTRODUCTION

This Plan presents the Drinking Water Source Protection Plan (DWSPP) developed for the Meander watershed, a sub-watershed of the Mahoning River watershed located in Northeast Ohio, Figure 2. The goal of the DWSPP is to address the causes and sources of water quality impairment within the watershed. The DWSPP will act as a source of guidance towards lessening environmental perturbations and creating an improved quality of water within the Meander Watershed through recommended goals for education, preservation/protection, restoration, reduction of bacteria, sedimentation and storm water, increased data collection, the creation of model ordinances and the securing of riparian easements and purchase of adjacent properties to the MVSD.

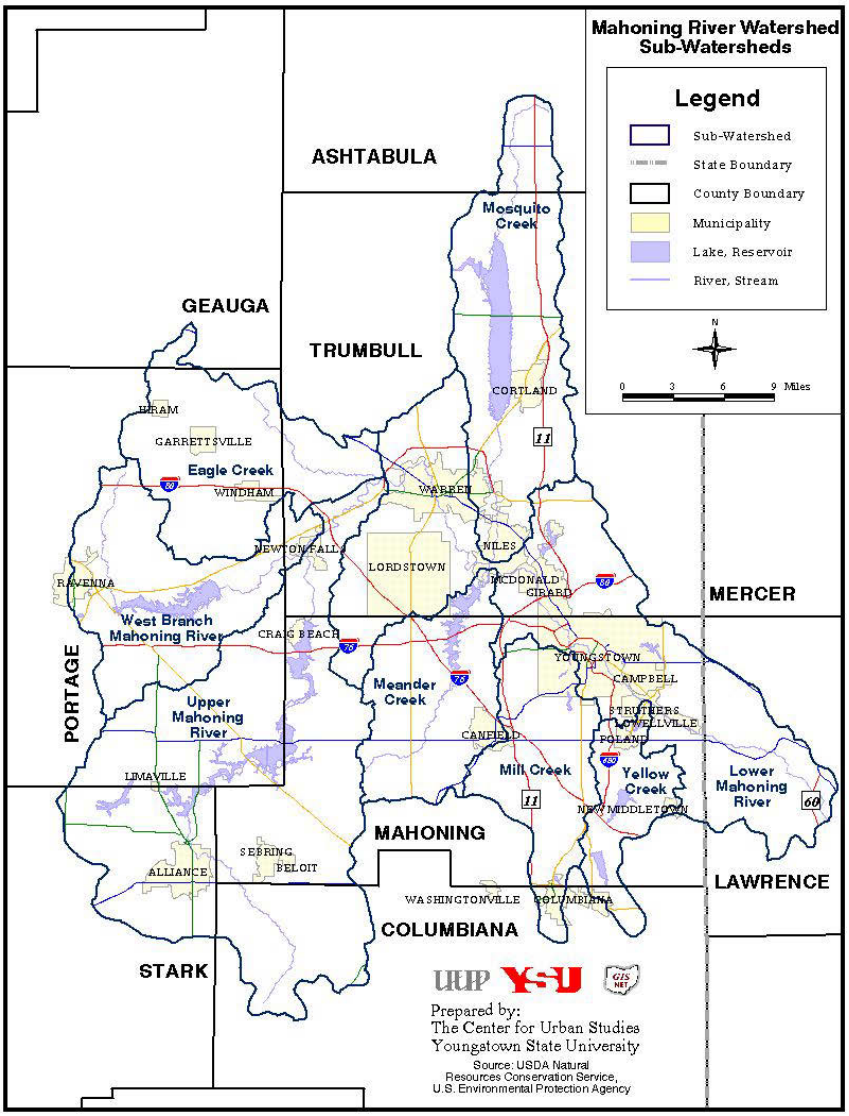


Figure 2 - Location of Meander Creek Watershed in Relation to Mahoning River Watershed.

The Meander drainage basin is one of eight sub-basins of the Mahoning River Drainage Basins. The Meander sub-watershed covers 86.5 square miles of the 1,132 square miles of the Mahoning River Watershed. Major tributaries to the Meander drainage basin are Morrison Run, Saw Mill Creek, West Branch and Sulfur Run.

The Meander Creek Reservoir serves as the surface water source for the MVSD Public Water System. The reservoir is approximately 7 miles in length with a drainage area of 86.5 square miles. Downstream of the reservoir dam, Meander Creek flows into the Mahoning River. The water system intake is located slightly more than 3 miles from the mouth. The protection area for the MVSD is contiguous with the Meander Creek Reservoir watershed. The average fall of Meander Creek from headwaters to the reservoir intake is 26 feet per mile. Annual average precipitation in the protection area is approximately 36 inches, of which an estimated 13 inches become surface runoff.

According to the 1996 Ohio EPA Biological and Water Quality Study of the Mahoning River Basin, the topography of the Mahoning River drainage area encompasses most of Mahoning County and portions of Columbiana, Stark, Portage, Geauga, and Trumbull Counties in Ohio, plus the western portion of Lawrence County in Pennsylvania. Natural stream flows of the Mahoning River have been altered by an extensive reservoir system constructed for flow augmentation, temperature and flood control, and water supply. Nine low head dams along the lower main stem have altered natural stream morphology to create sufficient pool depth for industrial water intakes. In the lower main stem, stream flow regulation results in higher summer minimum flows than winter minimum flows, opposite that of most natural streams in Ohio.

Meander Creek is a small to medium size tributary of the Mahoning River, impounded throughout much of its length by the Meander Creek Reservoir. The reservoir was constructed from 1928 -1932 to provide drinking water to the cities of Youngstown and Niles.

The Mahoning River watershed lies within the gently rolling glacial plateau of the Erie/Ontario Lake Plain ecoregion. Most of the streams in this area are perennial and shallow cutting. Varying thickness of glacial drift was deposited over Pennsylvanian shales and Missippian sandstones during the Pleistocene era. The preglacial valleys within the underlying bedrock shales and sandstone were also buried by glacial clays, sands, and gravels. The watershed exhibits a mosaic of cropland, pasture, woodland and urban development.

Figure 3 shows the land use for the MVSD protection area, and includes the Berlin Reservoir watershed. The predominant land use in the Meander Creek Reservoir watershed is deciduous forest in 39% of the area. Agricultural uses such as pasture/hay (26%) and row crop (15%) account for the majority of the remaining protection area. The percentage cover for other land uses in both watersheds is found in Table 2.

Soils in the Meander Creek Reservoir protection area include those in the Mahoning-Ellsworth-Trumbull, Geeburg-Remsen-Trumbull, Loudonville-Muskingum-Dekalb, and Bogart-Jimtown associations. These consist of nearly level to gently sloping to steep soils, moderately well drained, to poorly drained that have fine-textured subsoil (Trumbull associations), are moderately deep over sandstone or siltstone (Loudonville-Muskingum-Dekalb), or have gravelly subsoil (Bogart-Chili-Jimtown) on stream terraces and uplands.

The quality of the water in a stream can change under different precipitation and flow conditions. Both high flow and low flow conditions can result in water quality problems and impacts to the source water. Typically heavy rains and high flows result in more materials dissolved and suspended in the runoff or re-suspended from the stream bottom and banks. The higher flows result in faster travel times for any contaminant plume, however the greater volume of water results in a lower concentration (given the same amount of material) relative to low flow conditions. Conversely, low flow conditions in a stream result in slow travel times and more concentrated contaminant plumes, and can exacerbate problems such as low dissolved oxygen and algal blooms. In addition, the inflow of ground water to the stream will bring with it any dissolved contaminants.

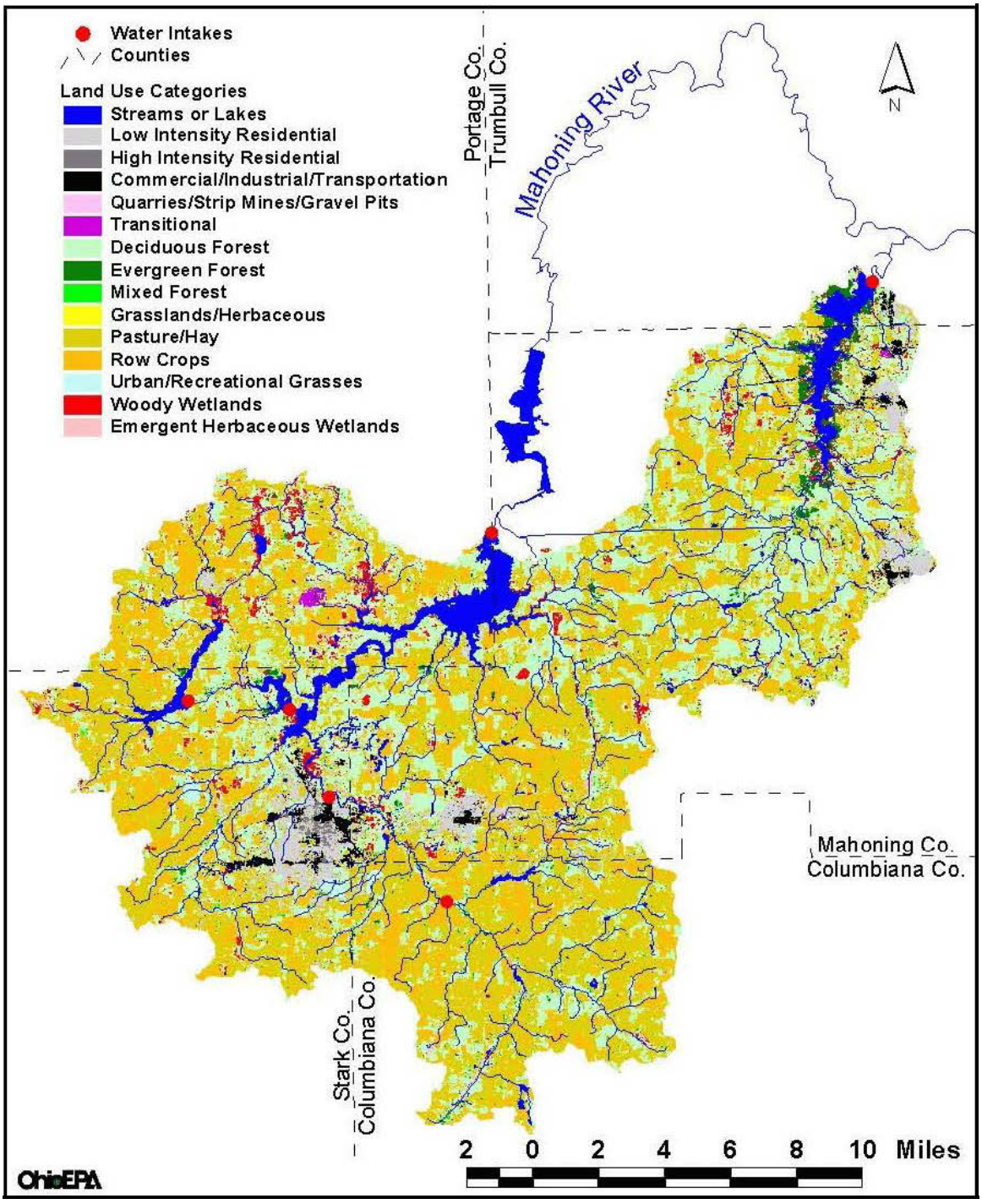


Figure 3 – Land Use in the MVSD Drinking Water Source Protection Area

Table 2. Land Use Categories and Percentages in the MVSD Protection Area

Categories	Percentage of Berlin Lake Watershed	Percentage of Meander Creek Watershed	Percentage of both Watersheds
Open Water	3.83	4.65	4.04
Low Intensity Residential	4.00	4.24	4.06
High Intensity Residential	0.39	0.20	0.34
Commercial/Industrial/Transportation	1.16	1.97	1.36
Quarries/Strip Mines/Gravel Pits	0.02	0.00	0.01
Transitional	0.12	0.10	0.12
Deciduous Forest	27.64	39.38	30.60
Evergreen Forest	0.78	3.62	1.49
Mixed Forest	0.48	0.47	0.48
Grasslands/Herbaceous	0.00	0.09	0.02
Pasture/Hay	34.65	26.23	32.53
Row Crops	23.01	15.38	21.09
Urban/Recreational Grasses	0.26	0.01	0.20
Woody Wetlands	2.69	2.57	2.66
Emergent Herbaceous Wetlands	0.97	1.10	1.00

STEPS TO BE TAKEN TO DEVELOP A DRINKING WATER SOURCE PROTECTION PLAN

Drinking Water Source Protection involves two efforts:

Assessment. The MVSD's assessment was completed by the Ohio EPA in April 2003, and information from that report has been incorporated into the protection plan. It includes:

- Delineation of the protection area. This outlines the areas around the public water supply reservoir and information associated with the drainage basin assessment.

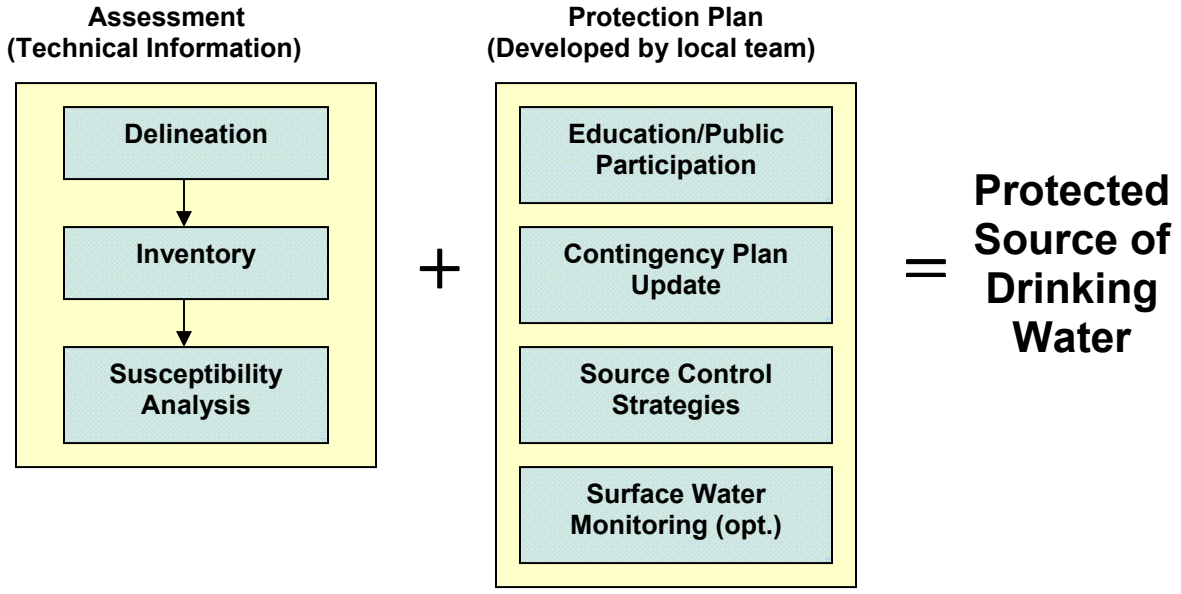
- Potential contaminant source inventory. This identifies potential contaminant sources in and around the protection area that could pose a threat to drinking water.

- Susceptibility analysis. This determines how susceptible the reservoir is to contamination. A susceptibility of low, moderate or high is assigned based on the hydro geologic setting, potential contaminant sources and a review of the water quality data.

- Protective strategies.

Protection Plan. This plan is developed by the MVSD and interested parties, and explains how the drinking water source will be protected using strategies tailored to various communities. It Includes:

- Education strategies
- Contingency Plan update
- Site-specific strategies
- Surface water monitoring plan



PROTECTION TEAM

Communities with successful protection plans formed a protection team to help develop and implement the plan. The protection team provides a broader level of oversight and includes individuals familiar with protective strategies. Team members include: water supply staff, emergency response personnel, local public officials and local governmental representatives from supporting agencies and organizations, and concerned citizens.

All members of the protection team should become familiar with the MVSD's Drinking Water Source Assessment Report. A copy of the plan has been provided to the local fire department.

The MVSD's Protection Team was formed in June of 2007 and the members are listed in Table 3.

Quarterly Meetings. In an effort to track the progress of source water protection strategies of Meander Reservoir, quarterly meetings will be held at the Mahoning Valley Sanitary District with key designated representatives or their alternate(s).

Table 3. MVSD's Protection Team

LAST	FIRST	AFFILIATION	PHONE NUMBER	ADDRESS	E-MAIL
Dyer	Stephanie	EASTGATE	330-779-3800	City Centre One, 100 Federal St. Suite 1000 Youngstown, OH 44503	Sdyer@eastgatecog.org
Frost	Andy	AUSTINTOWN FIRE DEPT.	Dispatch 330-799-3243	384 N. Canfield-Niles Road Youngstown, OH 44515	iishfire188@aol.com
Williams	Bob	AUSTINTOWN FIRE DEPT.	330-799-8502	384 N. Canfield-Niles Road Youngstown, OH 44515	fire197@austintowntwp.com
Green	Julie M.	TRUMBULL CO. COMMISSIONERS	330-675-2480	347 North Park Avenue Warren, OH 44481	CEGreen@CO.TRUMBULL.OH.US
Czayka	Alex	WRLC	440-773-5582	P.O. Box 314 Novelty, OH 44072	aczayka@wrlandconservancy.org
Hospodar	Nancy & Bob	DIEHL LAKE	330-547-2476	11210 Diehl Lake Drive Berlin Center, OH 44401	nanaseven1@msn.com
Jamison	Jonathan	MVSD	330-652-3614	PO Box 4119 Youngstown, OH 44515	jon.jamison@meanderwater.org
Jones	Clark	MC HAZMAT	330-740-2200	700 Industrial Road Youngstown, OH 44509	cljones@mahoningcountyoh.gov
Smith	Randy	TRUMBULL COUNTY ENGINEER	330-675-2640	650 N. River Road, NW Warren, OH 44483	highway@co.trumbull.oh.us
Ginnetti	Patrick	MAHONING COUNTY ENGINEER	330-799-1581	940 Bears Den Road Youngstown, OH 44511	pginnetti@mahoningcountyoh.gov
Martin	Dave	McDONALD PLANNING COMM.		305 W. 3rd Street McDonald, OH 44437	endi@logorugs.com

May	Denise	DIEHL LAKE	330-540-8991	11262 Diehl Lake Drive Berlin Center, OH 44401	mayonthelake@aol.com
McGuire	Sean	MC SOIL & WATER	330-740-7995	850 Industrial Road Youngstown, OH 44509	
		OHIO EPA	614-644-3020	Lazarus Government Center, 50 W. Town St., Ste 700 Columbus, OH 43215	
Migliozzi	Frank	DIST. BOARD OF HEALTH-TC	330-675-2489	176 Chestnut Street Warren 44483	fmigliozzi@tcbh.org
Nageotte	Greg	OHIO DNR	614-265-6619	2045 Morse Rd., Bldg. B-3 Columbus, OH 43229	
Niemiec	Ronald	DIEHL LAKE	330-547-0091	11381 Raccon Ridge Berlin Center, OH 44401	niem1775@hotmail.com
Pugh	Randy	MINERAL RIDGE FIRE DEPT.	330-675-2730	1451 Propsect St. Mineral Ridge, OH 44440	
Pugh	David	MINERAL RIDGE ADMINISTRATOR		1451 Prospect St. Mineral Ridge, OH 44440	
		Mill Creek Metro Parks	330-702-3000	P.O. Box 596 Canfield, OH 44406	
		DIST. BOARD OF HEALTH-MC	330-270-2855	50 Westchester Drive Youngstown, OH 44515	
Slusarczyk	Cindy	LORDSTOWN WATER	330-824-2481	1455 Salts Springs Rd Warren, OH 44481	waterclerk@lordstownvillage.com
Newhard	John	MCGIS	330-740-2455	21 W. Boardman St., Suite 106 Youngstown, OH 44503	vnewhard@mahhoningcountyoh.gov

Verner	Scott	T C SANITARY ENGINEER	330-675-7787	842 Youngstown-Kingsville Road Vienna, OH 44473	severner@co.trumbull.oh.us
Vigorito	Anthony	MVSD	330-652-3614	PO Box 4119 Youngstown, OH 44515	anthony.vigorito@meanderwater.org
Smith	Mary Helen	MC BOARD OF HEALTH		50 Westchester Drive Youngstown, OH 44515	mhsmith@mahoninghealth.org
Vrable-Bryan	Kathleen	MC SOIL & WATER	330-740-7995	850 Industrial Road Youngstown, OH 44509	kvrable-bryan@mahoningcountyoh.gov
Waldron	Don	TC HAZMAT	330-675-2666	1453 Youngstown-Kingsville Rd. Vienna, OH 44473	hm101@embarqmail.com
Ginnetti	Patrick	M C SANITARY ENGINEER	330-793-5514	761 Industrial Road Youngstown, OH 44509	pginnetti@mahoningcountyoh.gov
Wilson	Mike	TC SOIL & WATER	330-637-2056	520 W. Main St., Suite 3 Cortland, OH 44410	wilson.m@embarqmail.com
		LORDSTOWN COUNCIL	330-824-2507	1455 Salt Springs Rd Lordstown, OH 44480	

SECURITY

The MVSD has its own security detail to monitor and perform surveillance of the District's water storage facilities, the Meander Reservoir, pipelines and water treatment plant buildings. The assistance of local outside Police Forces and Emergency Task Forces are also available. Security and surveillance provisions have also been incorporated into the District's existing offsite facilities and the plant grounds. Security and surveillance will continue to be incorporated into
Capital Improvements as they take place.

The MVSD has also joined an organization known as InfraGard. InfraGard is a Federal Bureau of Investigation (FBI) program that began as a local effort to gain support from the information technology industry and academia investigative efforts in the cyber arena. InfraGard and the FBI have developed a relationship of trust and credibility in the exchange of information concerning various terrorism, intelligence, criminal, and security matters. The local InfraGard website is http://www.nocinfragard.org with a chapter in Cleveland, Ohio.

InfraGard is an information sharing and analysis effort serving the interests and combining the knowledge base of a wide range of members. At its most basic level, InfraGard is a partnership between the FBI and the private sector. InfraGard is an association of businesses, academic institutions, state and local governmental entities and law enforcement agencies, and other participants dedicated to sharing information and intelligence to prevent hostile acts against the United States.

GOALS AND OBJECTIVES

The goal of InfraGard is to promote ongoing dialogue and timely communication between members and the FBI. InfraGard members gain access to information that enables them to protect their assets and in turn give information to government that facilitates its responsibilities to prevent and address terrorism and other crimes.

The relationship supports information sharing at national and local levels and its objectives are as follows:

- Increase the level of information and reporting between InfraGard members and the FBI on matters related to counterterrorism, cyber crime and other major crime programs.
- Increase interaction and information sharing among InfraGard members and the FBI regarding threats to the critical infrastructures, vulnerabilities, and interdependencies.
- Provide members value-added threat advisories, alerts, and warnings.
- Promote effective liaison with local, state and federal agencies, to include the Department of Homeland Security.
- Provide members a forum for education and training on counterterrorism, counterintelligence cyber crime and other matters relevant to informed reporting of potential crimes and attacks on the nation and U.S. interests.

Critical Infrastructures and Key Resources

Critical infrastructures are physical and cyber-based systems that are essential to the minimum operations of the economy and the government. InfraGard has Subject Matter Experts around the country in each of the following 13 categories of critical infrastructures, as recognized by the National Infrastructure Protection Plan:

- Agriculture and Food
- Banking and Finance
- Chemical
- Defense Industrial Base

- Drinking Water and Wastewater Treatment Systems
- Emergency Services
- Energy
- Information Technology
- National Monuments and Icons
- Postal and Shipping
- Public Health and Healthcare
- Telecommunications
- Transportation Systems

Key resources are individual targets whose destruction would not endanger security on a national scale, but would create local disaster or profoundly damage national morale. InfraGard organization is also comprised of Subject Matter Experts in the following categories:

- Commercial Facilities
- Commercial Nuclear Reactors, Materials, and Waste
- Dams
- Government Facilities

Code of Ethics

As a member of InfraGard, it is MVSD's responsibility to:

- Promote the protection and advancement of the critical infrastructure of the United States of America.

- Cooperate with others in the interchange of knowledge and ideas for mutual protection.

- Support the education of members and the general public to enhance their understanding of information security and national information infrastructure issues.

- Serve in the interests of InfraGard and the general public in a diligent, loyal, honest manner, and not knowingly aid or be a party to any illegal or improper activities.

- Maintain the confidentiality, and prevent the use for competitive advantage at the expense of other members, of information obtained in the course of my involvement with InfraGard, which includes but is not limited to:

    Information concerning the business of a fellow member or company,

    or

    Information identified as proprietary, confidential or sensitive.

- Abide by the National and Local Chapter Bylaws.

Protect and respect the privacy, civil, property, and intellectual property rights of others.

ENFORCEMENT OF PLAN BY WATERSHED STAKEHOLDERS

Upon endorsement by the Ohio Environmental Protection Agency, identified stakeholders, and local public officials will be asked to provide signatures for the acceptance and to pursue the implementation of the Drinking Water Source Protection Plan.

The MVSD will provide copies of the DWSPP to the stakeholders for their endorsement along with sample legislation. The following is a list of government stakeholders:

City of Youngstown
City of Niles
Village of McDonald
Mahoning and Trumbull Soil and Water Conservation District
Board of Mahoning and Trumbull County Commissioners
Mahoning and Trumbull County District Board of Health
Mahoning and Trumbull County Emergency Management Agencies
Eastgate Regional Council of Governments
Austintown Township and Police and Fire Departments
Weathersfield Township and Police and Fire Departments
Canfield Township
Mill Creek MetroParks
Youngstown State University
City of Canfield
Village of Lordstown
Howland Township
Liberty Township
Vienna Township
Brookfield Township
Hubbard Township
Milton Township
Jackson Township Police and Fire Departments
Ellsworth Township
Ohio Department of Transportation
Mahoning and Trumbull County Engineers
Mahoning and Trumbull County Sanitary Engineer's Departments
AWARE

The DWSPP will be submitted to the government stakeholders by early 2009 and it is expected that endorsement will be granted by summer or late in 2009. After the DWSPP has been endorsed by the government stakeholders, a thirty day public comment period will be advertised and comments will be addressed. After the comments are approved the Plan will be submitted to the Ohio EPA for their endorsement. This Plan will be subject to periodic reviews and revisions will be made as needed.

DISTRIBUTION LIST

A draft copy of the MVSD's DWSPP has been provided to the organizations listed below and is also available at: http://www.meanderwater.org

- City of Youngstown
- City of Niles
- Village of McDonald
- Mahoning and Trumbull Soil and Water Conservation District
- Youngstown State University
- Mahoning and Trumbull County District Board of Health
- Eastgate Regional Council of Governments
- Ohio EPA ~ Division of Surface Water
- Mahoning and Trumbull County Engineers
- Austintown Township Parks
- Recycling Division of Mahoning County/The Green Team
- Mahoning River Consortium
- Audubon Society of the Mahoning Valley
- Mahoning and Trumbull County Emergency Management
- Mahoning County GIS Department
- Ohio State University Extension
- City of Canfield
- Mahoning and Trumbull County Sanitary Engineer
- Mahoning and Trumbull County Commissioners
- Mahoning and Trumbull County Planning Department
- Main Branch Youngstown/Mahoning County Library
- Weathersfield Township
- Village of Lordstown
- Canfield Township
- Howland Township
- Liberty Township
- Vienna Township
- Brookfield Township
- Hubbard Township
- Milton TownshipJackson Township
- Ellsworth Township
- Austintown Township
- AWARE

ABOUT THE MAHONING VALLEY SANITARY DISTRICT

The Mahoning Valley Sanitary District (MVSD) is a political subdivision of the State of Ohio established under the authority of the Sanitary Act of Ohio and governed by the Ohio Revised Code Chapter 6115, for the purpose of providing a public water supply to the member cities of Youngstown and Niles. The organization of the MVSD consists of a Court of Jurisdiction composed of one Common Pleas Judge from Mahoning County and one from Trumbull County. Each member city appoints two Directors, one by the Mayor and one by Council. The Board of Directors has broad powers to carry out the purposes of the MVSD under ORC 6115. MVSD has its' own legal counsel.

Historical. The MVSD was created in 1926 and the Official Plan adopted in 1927. Construction was started in 1929 and the facilities put in service July 1932. Construction costs were paid from the proceeds of MVSD bonds which were paid from assessments levied by the MVSD against the real property of the member cities. Due to increased area water use, plans for expansion, known as Amendment No. 1 of the Official Plan, were approved in 1950 and completed in 1961. This program included an intake and pumping station at Berlin Reservoir, 9 mile pipeline to Meander Creek, and increased pumping, settling and filter facilities at the plant. The capacity of the water facilities was established at 60 M.G.D*. through the plant improvement. (*Million Gallons Daily)

Area Served. While the MVSD furnishes water only to the two member cities of Youngstown and Niles, and to McDonald as agent of the member cities, these cities supply water to the surrounding metropolitan area including Girard, Canfield, Lordstown, Craig Beach, and Mineral Ridge, and portions of ten townships. The population now served is 220,000. A map of the service areas is provided in Appendix O.

Supply. Meander Creek is seven miles long, covers 2,010 acres with 40 miles of shoreline, and has a capacity, at spillway elevation 905, of 10 billion gallons. A rubber blander provides 1 billion gallons additional storage. The watershed area is 86.5 square miles. The dam is 50 feet high, 3,550 feet long, with 260 feet of spillway. District owned land includes 5,500 acres enclosed by 35 miles of fence. The land is reforested with 4 million evergreens, and serves as a fish and game refuge with no public access permitted. The safe yield of Meander Reservoir is 30 M.G.D. Berlin Reservoir, 30 billion gallon capacity, owned by the U.S. Government serves as an auxiliary supply. A District pumping station was constructed at Berlin and 9 miles of 30" to 48" pipeline delivers the water to Meander Creek.

Capacity and Use. With the Berlin supply and enlarged facilities provided under Amendment No. 1, average design capacity of the works was increased from 30 M.G.D. to 50 M.G.D. with peak output of 60 M.G.D. Youngstown uses 72% of the total, Niles 26%, and McDonald 2%.

Capital Improvements. The District's Official Plan was amended in May of 2007 through the Court of Jurisdiction and various capital improvements are being sought in conjunction with this plan.

DRINKING WATER SOURCE PROTECTION AREA

Identification of Critical Areas

The **Drinking Water Source Protection Area, (protection area)** for an inland stream is defined as the drainage area upstream of the point where the water is withdrawn from a surface source such as a stream, lake or reservoir. The protection area for the MVSD Meander Creek Reservoir is fan-shaped and encompasses 86.5 square miles. The protection area is subdivided into a corridor and an emergency management zone. An illustration of the Meander Creek Reservoir protection area and corridor management zone for the MVSD public water system is shown in Figure 4. The emergency management zone is shown in Figure 5.

The **Corridor Management Zone, (CMZ)** is the area within 1,000 feet of each bank of Meander Creek Reservoir, starting from the intake and extending to a point approximately 4 miles upstream of the reservoir, a distance of approximately 10 miles from the intake. The corridor management zone also includes tributaries of Meander Creek Reservoir. On tributaries the width of the corridor management zone is 500 feet from each bank. The length of the corridor management zone on a tributary is 10 stream miles from the intake. For example, a tributary four miles in length that enters the reservoir six miles upstream of the intake would be completely within the corridor management zone. A tributary stream entering eight miles from the intake would have only two miles of its stream length within the corridor management zone.

The **Emergency Management Zone, (EMZ)** is defined as an area in the immediate vicinity of the surface water intake in which the public water system operator has little or no time to respond to a spill. The boundary of the emergency management zone is delineated in cooperation with the water supplier. Figure 6 shows the boundary of the emergency management zone for the MVSD Public Water System. The corridor and emergency management zones are the focus of field and windshield surveys to inventory potential contaminant sources.

In the immediate area of the EMZ is a tributary known as Sulfur Run. This tributary allows for the drainage of an area that was formerly mined which contributes sub-surface drainage. Efforts should be made to monitor and develop a specific site plan to combat any potential source of contamination from this tributary.

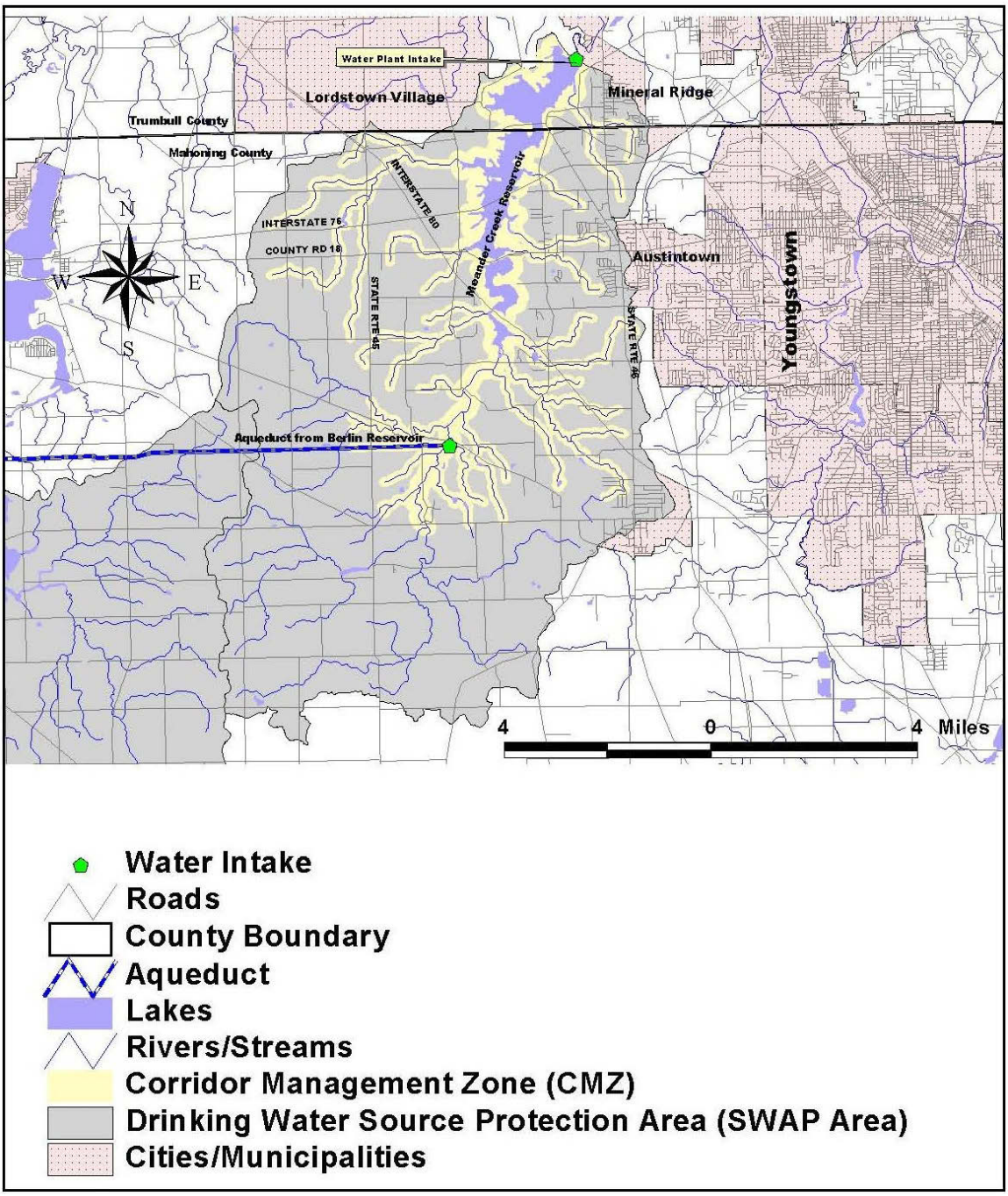


Figure 4 - MVSD Meander Creek Drinking Water Source Protection Area and Corridor Management Zone

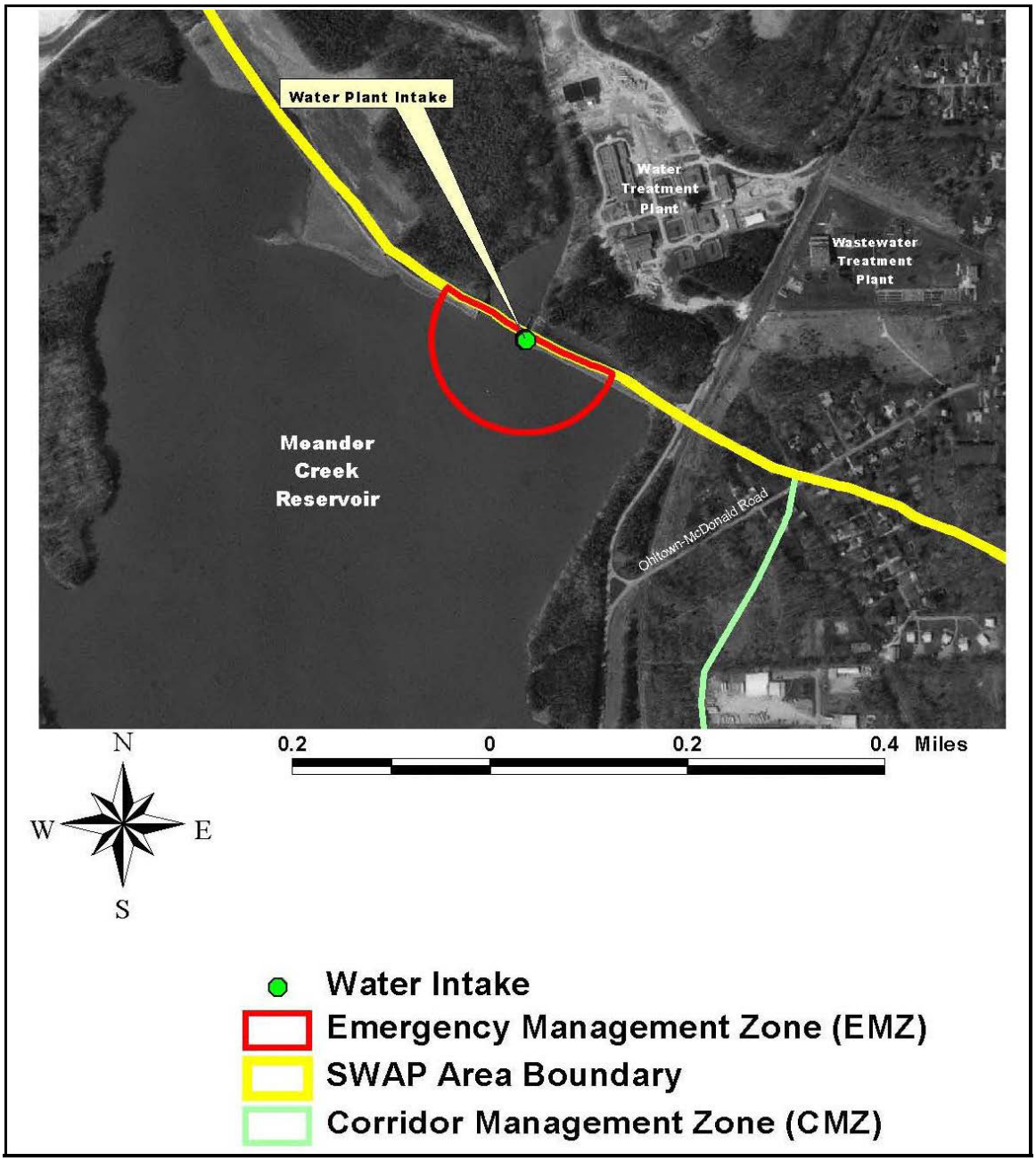


Figure 5 - MVSD Meander Creek Reservoir Emergency Management Zone (EMZ)

Potential Contaminant Sources

A review of available regulated facility data bases and a field survey of the corridor management zone indicate that 54 contaminant sources and 182 oil and gas wells are present in the corridor management zone. None are within the emergency management zone. Table 4 provides a list of the identified potential contaminant sources in the vicinity of the corridor management zone. A map of potential contaminant sources in the corridor management zone is shown in Figure 6 and Figure 7 provides a map of oil and gas wells and pipelines within the protection area and corridor management zone.

Sulfur Run, a small tributary stream entering the Meander Creek Reservoir just south of the water treatment plant, may also be considered as a potential contaminant source as it has been noted to contain home septic system effluent and storm water runoff. Additionally, a 72 inch sanitary sewer that carries wastewater from the Village of Canfield to the Meander Creek Wastewater Treatment Plant also crosses the drinking water source protection area. The Meander Wastewater Treatment Plant is owned by the Mahoning County Board of Commissioner and operated by the Mahoning County Sanitary Engineer's Department. The Plant's discharge is downstream of Meander Reservoir.

It is important to note that this inventory represents potential contaminant sources, and includes any source that has the potential to release a contaminant to surface or ground waters in the protection area. It is beyond the scope of this study to determine whether any specific potential source is actually releasing a contaminant, or to what extent any potential source(s) may be contributing to the overall pollutant load. The information derived from these databases should be verified and updated before initiating efforts for a specific contaminant source plan.

The transportation network is a potential source of contamination through vehicular accidents that release hazardous materials. Approximately 219 miles of roads, including a nine mile section of the Ohio Turnpike, and eight miles of rail lines traverse the MVSD Meander Creek Reservoir protection area, creating a total of 145 road and eight rail crossings of Meander Creek, the reservoir, or its tributaries within the corridor management zone. Approximately 4.9 miles of roads and 2,400 feet of rail are within 100 feet of a stream in the corridor management zone. Ninety-five of the road crossings and four of the rail crossings occur within the corridor management zone. Approximately 18 miles of oil and gas pipeline traverse the corridor management zone, with 5,000 feet of pipeline within 100 feet of a stream creating a total of 19 crossings.

Susceptibility Analysis

For the purposes of source water assessments, all surface waters are considered to be susceptible to contamination. By their nature surface waters are accessible and can be readily contaminated by chemicals and pathogens with varying travel times from source to the intake. Based on the information compiled for this assessment, the MVSD Meander Creek Reservoir protection area is susceptible to agricultural runoff from row crop agriculture and animal feedlots, oil and gas wells, failing home and commercial septic systems, new housing and commercial development that could increase runoff from roads and parking lots, and numerous road crossings over the Meander Creek Reservoir and its tributaries.

It is important to note that this assessment is based on available data, and therefore may not reflect current conditions in all cases. Water quality, land uses and other activities that are potential sources of contamination may change with time and without notice. While the source water for the MVSD Public Water System is considered moderately susceptible to contamination, historically, the MVSD Public Water System has effectively treated this source water to meet and comply with all drinking water quality standards and regulations.

Nonpoint Source Pollution

What is Nonpoint Source Pollution?

Question: Have you ever thought of where the motor oil that drips from a car ends up?

Answer: It is washed away with rainwater and finds its way into surface or ground water. When people think of water pollution, they usually visualize a large industrial plant discharging a mucky sludge into a river. Though this type of pollution is environmentally damaging, it is usually not the major factor contributing to water contamination. The majority of pollutants that are found in water are not derived from a direct source, such as an industrial plant pipe, but from sources "dispersed" throughout the environment. These dispersed sources are known as non point sources (NPS).

NPS pollution comes from many sources in both urban and rural areas. Runoff from cropland, parking lots, lawns, mines, and septic systems often contribute to NPS pollution. NPS pollutants are transported to the surface and ground water by precipitation. During large storms, the runoff to surface water and infiltration to ground water increases and so does the rate of NPS movement (or transport).

Agricultural Influences

A significant source of NPS pollution comes from the addition of excessive agricultural chemicals to farm fields. Fertilizers and herbicides, such as atrazine, are applied to fields to enhance crop yield. However, only limited concentrations of these chemicals are needed to be effective. Excess compound will remain in the soil. Here, these compounds may degrade or adhere to soil particles. Any compound remaining unattached to the soil will eventually travel to a water source via runoff.

Nitrate is a compound often found in surface waters adjacent to croplands and pastures. Nitrate is an oxidized species of the element nitrogen, and is considered toxic at levels above 10mg/L. It is derived from manufactured fertilizers, organic wastes, and legume crops. Nitrate is easily transported to water sources when it is added to the soil at rates exceeding what the natural environment removes. Accumulation of nitrate and other compounds in lakes, for example, may cause eutrophication. This results in a reduction in the dissolved oxygen content of the water, thus killing off much of the animal and plant life and can lead to algae blooms.

Urban Influences

NPS pollution is not only present in agricultural settings, but also occurs in urban areas. Such origins of NPS pollution are fertilizers from lawns and gardens, street runoff, and construction sites. Vegetation, which normally slows the rate at which contaminants travel, is scarce in urbanized areas compared to rural regions. This can lead to a faster contamination rate where more highly concentrated pollutants are transported into surrounding water reserves.

Evidence for this rapid runoff can be observed during any rainstorm where sheets of water glide across roadways. Any pollutant such as oil, gas, road salt, sediments, etc. is washed into storm sewers eventually making its way to local streams. The high population density of urban areas can potentially increase the concentration of pollutants when compared with less populated rural areas.

Best Management Practices

Methods to reduce or eliminate the effect of NPS pollution on the water supply can be achieved through best management practices (BMPs). BMPs are a management strategy that incorporates both engineering and cultural techniques that have been proven effective and practical in reducing water contamination. BMPs are usually carried out in an agricultural location, but can also be used successfully in urban areas.

BMPs are used extensively in pest, nutrient, and waste management. Timely application of fertilizers and pesticides, as well as specific applicator rates can substantially reduce NPS pollution problems. This type of approach works for the farmer with 1000 acres or the homeowner with a small garden.

Another commonly used type of BMP is the construction of filter strips (riparian corridors). Filter strips are tracts of land surrounding fields that border a surface water source. The strips contain natural vegetative growth such as trees, grasses, and shrubbery. Filter strips act as a buffer between the field and the water. The strips remove contaminants (nutrients) before they enter the water supply. They also significantly reduce the sediment flowing into adjacent surface water bodies. The Ohio State University Extension in your county can provide more detailed information on the BMPs appropriate for your area.

Wetlands behave in much the same manner as filter strips. Natural wetlands, such as swamps and marshes, trap and/or filter sediment, nutrients, and other NPS pollutants. They protect surface water from runoff of fields, mines, and various other rural and urban sources. Because wetlands behave as a natural water cleansing system, it is imperative that preservation efforts for these areas continue.

Sediments

All runoff from the rural and urban areas leads to sediment entering the area's source water reservoirs. These sediments are either removed by the water purification process or end up in the reservoir eventually reducing the storage capacity. Every precaution needs to be taken to reduce sediment sources from entering storm water runoff and protect the Communities water sources. The Public and a wide arrange of property owners need to embrace their Watershed Protection Plan and take the necessary actions to protect their water source. Sediment runoff sources must be stopped prior to entering a water course.

Summing It All Up

As you may have already concluded, NPS pollution comes from a myriad of places.

Anything we discard will eventually arrive in our water reserves. We must take responsibility and care when applying chemicals to the ground and discarding our wastes. To limit the contamination of our waters, we must guard the natural filtering systems. Finally, we must always remember that just because NPS pollution may be out of sight does not mean it should be out of mind!

If you have any questions on how to protect water quality in your home or town, or have questions on how to get in touch with the appropriate agencies, please contact:

The Ohio Department of Natural Resources Division of Water
2045 Morse Road, Bldg. B
Columbus, Ohio 43229-6693
Phone: (614) 265-6740 Fax: (614) 265-6767
E-mail: water@dnr.state.oh.us

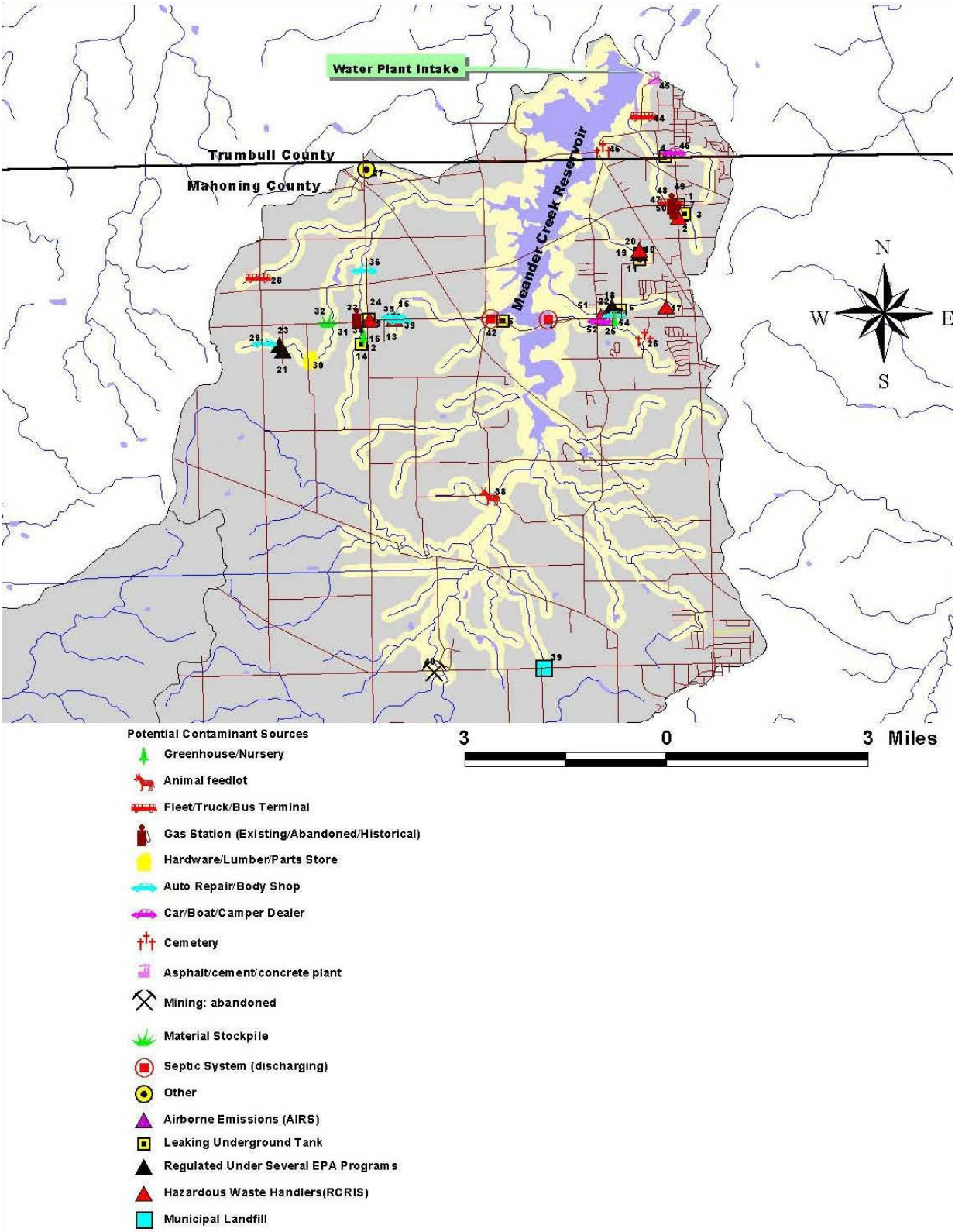


Figure 6 - Potential Contaminant Sources in the MVSD Drinking Water Source Protection Area

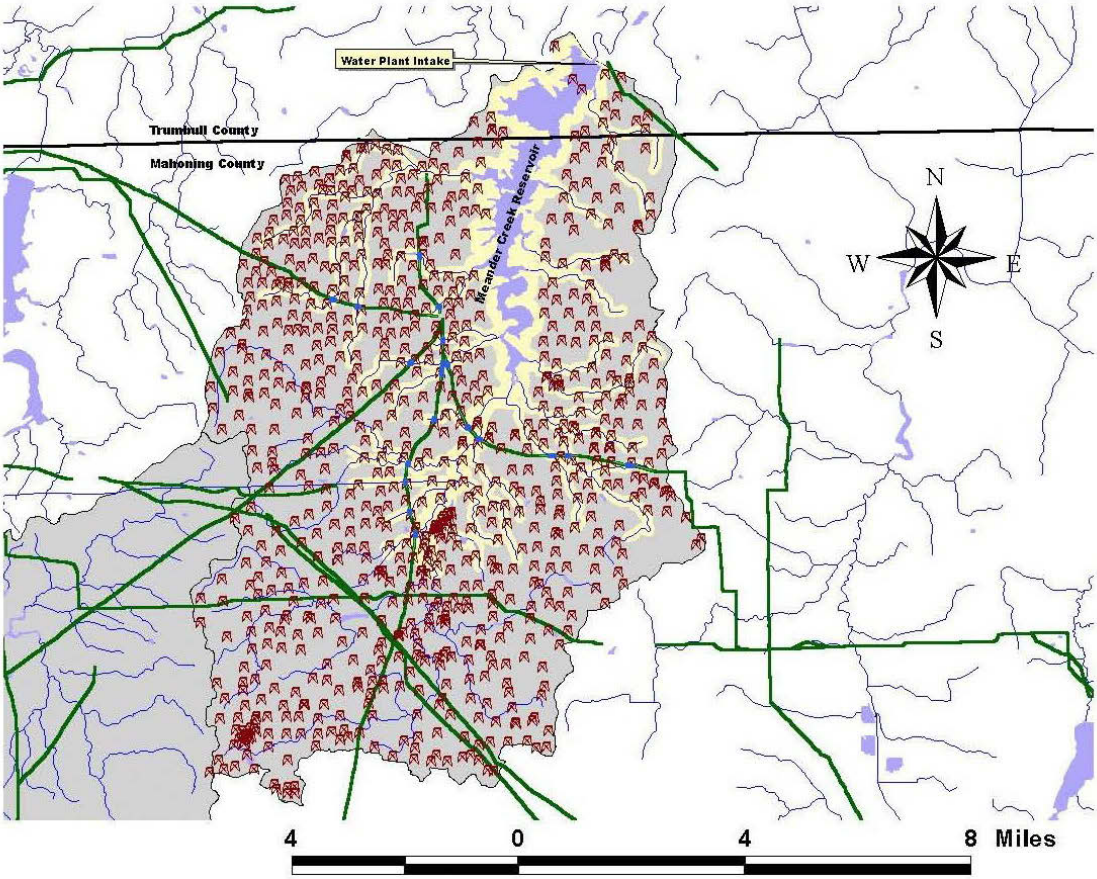


Figure 7 - Oil & Gas Production in the MVSD Drinking Water Source Protection Area

Potential Contaminant Source Control Strategies

The goal of this section is to develop protective strategies for the potential contaminant sources in the MVSD's protection area and responsible parties. Provided below is the method and results established by the Protection Team in developing and implementing the protection plan.

First we will list the potential contaminant sources in our protection area.

Secondly, we will identify the protective strategies the community will use to protect its drinking water from the types of potential contaminant sources identified (Appendix A provides protective strategies).

Third, a timeline for implementing this strategy (when initiated, how frequently updated) is listed.

Fourth, the name and/or title of the person responsible for implementing or tracking the implementation of the strategy.

Table 4

Potential Contaminant Source	Priority/ Level of Threat	Timeline for Implementation	Who Will Implement?
Storm Water Runoff	1	In Place	Water & Soil Dist./County Engineers
New Development	2	In Place	Water & Soil Dist.
Illicit Septic Tank Discharge	3	June 2010	Boards of Health
Non-point Illicit Discharges	4	June 2010	Boards of Health/OEPA
Agricultural Runoff	5	June 2010	Water & Soil Dist. /USDA
Spills	6	February 2009	MVSD/Hazard Mat/EMAs
Gas & Oil Wells	7	June 2010	ODNR/Water & Soil Dist.
Roadway Runoff	8	In place	Ohio Turnpike, ODOT, county and township

A complete implementation schedule can be found in Appendix B.

Protection Strategies – See Appendix C for suggested protective strategies for potential contaminant sources.

Annual Review

Finally, an annual review shall be prepared by March 31 of each year indicating the progress being made with regards to the protective strategies and their implementation.

PROTECTIVE STRATEGIES - SURFACE WATER

Source water protection efforts for MVSD should focus on controlling home and commercial septic discharges, storm water runoff, and runoff from agricultural and animal feedlot areas. This can be accomplished via educational efforts and implementation of best management practices. County Extension agents are an excellent resource for assisting the agricultural community with controlling agricultural runoff, and staff from local and county health offices can instruct homeowners in proper maintenance of their septic systems. The OEPA, Water and Soil Conservation Districts, County Engineers and Township Road Departments can enforce storm water protection programs. The MVSD is has established the approach of obtaining lands adjacent to Meander Reservoir and limiting public access. Efforts should also be focused on controlling runoff from housing/commercial development construction sites, increasing public awareness of drinking water protection in the area, and coordinating with local emergency response agencies. Continuation of investigations into the sources and causes of algae blooms (associated with finished water odor problems) is recommended. Further, the MVSD should continue to monitor for the potential of zebra mussel infestation.

Other source water protection efforts include:

Education and Outreach: Informing people who live, work, or own property within the protection area about the benefits of drinking water protection is very important. Although some communities develop their own educational outreach resources, assistance is available at no cost from various agencies. For example, staff from Ohio EPA's Office of Pollution Prevention can visit businesses (free of charge) and provide recommendations on how they can modify their processes, materials and practices to generate less pollution in a cost-effective and technically feasible manner. An effort should be made to educate homeowners and businesses of the potential threat their activities can pose to the water supply. Education could also focus on increasing public awareness of illegal dumping and drinking water protection.

Oil and Gas Production: Provide education (material/meetings) to owners and land owners on proper operation and maintenance. Develop an early warning system for accidental spills and releases.

Transportation Routes: There is a potential for spills along roads within the protection area. The MVSD has contacted the local fire department and local emergency planning agency about the location of the drinking water source protection area, so that strategies can be developed to prevent spilled materials from impacting the Meander Creek Reservoir. Spill Containment Systems shall be constructed in the area of bridges where it is economically feasible. Such systems already exist on the bridges over I-80 and the Ohio Turnpike. Information on the operation of these facilities is provided in Appendix D & E. Contacts are also listed.

Emergency Response Planning: The MVSD should prepare a plan that includes early warning of spills and coordination of response and remediation activities for spills that may enter Meander Reservoir. This plan should include emergency response actions for Meander Creek and the reservoir, such as the placement of absorbent booms to control oil spills, or the ability to mechanically add oxygen to oxidize chemicals with a high oxygen demand. Different response plans could be developed for different types of contamination. The emergency response plan may also contain strategies for dealing with unexpected levels of runoff containing chemicals such as fertilizers and pesticides from adjacent land uses. Though it may be less catastrophic than a major spill, this kind of contamination is more prevalent and is harder to detect and contain. An emergency action plan can be found in Appendix I.

Zoning Ordinances: A water protection zoning ordinance is a regulatory control that typically places some restrictions or standards on activities conducted within a specified zone (such as the corridor management zone and/or the emergency management zone). Such ordinances enable municipalities to require people who live or work in this area to avoid contaminating the source of the MVSD's drinking water. Ordinances can help ensure best management practices are being employed at local businesses and can help reduce the volume of contaminants stored within the protection area. The MVSD may want to consider working with

the counties, townships, and municipalities in the protection area to develop zoning overlays that require specific standards for chemical storage, handling of waste materials, and other source control strategies.

Coordination with Existing Activities: Many local groups are engaged in programs that complement a public water system's drinking water source protection efforts. Working with groups such as the Natural Resources Conservation Service, the Soil and Water Conservation Service, the Farm Bureau, or a local watershed planning organization ensures coordination of their respective programs. The Mahoning River Consortium is one such group that the MVSD should consider coordinating protection activities. Information is available on the internet at the following website: http://www.mahoningriver.co.trumbull.oh.us. Another organization that the MVSD is participating with in the protection activities is AWARE. A MVSD Representative will attend regular meetings with the Mahoning River Consortium and AWARE.

The MVSD and stakeholders within the protection area are encouraged to develop a local program to protect the source waters. A local program is capable of responding to changing conditions within the watershed and can bring together the local governments and stakeholders needed for an effective protection effort. Source water protection efforts could benefit the community by allowing the MVSD water treatment plant to more fully use its surface water resource.

Septic System Discharges: The Mahoning and Trumbull County Boards of Health shall pursue means to have owners of onsite systems inspect and clean their septic systems on a regular basis. Water quality violations shall be investigated and remedied through regulations and state law. The Trumbull and Mahoning County Boards of Health shall implement septic tank regulations in protecting the Meander Reservoir form illicit discharges from septic system including periodic cleaning and regular maintenance of these systems. County policies can be found in Appendix O and P.

Storm Water Programs: To address pollution, U.S. EPA expanded the Clean Water Program by designating for regulation storm water discharges in urbanized areas. The goal of these regulations is to improve the quality of the storm water discharges and therefore protect water quality of the area. Both Trumbull and Mahoning Counties and designated communities are required to prepare a Storm Water Management Program (SWMP). As part of this program these counties and communities Storm Water Management Program must address a minimum of six (6) control measures:

1. Public education and outreach
2. Public involvement/participation
3. Illicit discharge detection and elimination
4. Construction site storm water runoff control
5. Post construction storm water management
6. Pollution Prevention and good housekeeping for operations

The ultimate goal of the SWMP is to detect illicit discharges and eliminate them through the implementation of best management practices (BMPs) which are to be established by the local communities. Essential communities to assist in the protection and management of storm water are Village of Lordstown, City of Canfield, Mineral Ridge, Ellsworth, Jackson, Austintown and Canfield Townships. County policies can be found in Appendix Q and R.

Riparian Easements/Land Acquisition/Buffer Zones:

There are several ways water course ways can be protected. Methods that can be utilized to protect water courses are by developing buffer zones through either purchasing land, enacting zoning ordinances, and/or acquiring riparian easements. Purchasing land adjacent to and including water courses would aid in preventing land from being developed and would aid in protection by maintaining buffer zones. The District shall make attempts to purchase land from property owners who may be interested in selling. Enacting zoning ordinances that establish set backs (distance) from water course ways can also provide protection. Finally acquiring riparian easements that maintain areas of vegetation and forested strips will act as a sponge, filtering sediments, contaminants and excess waste before it reaches streams. Efforts should be made to develop buffer zones to protect our streams and ultimately our water source. There are some

organizations and funding available to assist in a program to maintain buffer zones. These programs are to be explored in aiding in the protection of the water source.

It is essential that buffer zones maintain their natural vegetations and not be disturbed by its removal. The buffer width called for by various riparian forest buffer specifications ranges from 33 feet to 1,640 feet but a minimum buffer of 100 feet on both sides of the stream is recommended for sufficient protection. Detailed information on a Riparian Buffer Zone can be found in Appendix F. Buffer Zones can be established through riparian easements. Sample language on Riparian Easements can be found in Appendix E.

The specific location where buffer zones would be focused is along the major tributaries of Morrison Run, Sulphur Creek (if the property has not been developed yet), Meander Creek (itself), the West Branch, and Saw Mill Run.

The District plans to promote the enacting of riparian setback resolutions by attending the Townships of Austintown, Jackson, Ellsworth, Canfield, and Weathersfield meetings and seeking their support.

Potential sources of funding in purchasing riparian easements or property adjacent to water courses is through the Ohio Public Works Commission – Clean Ohio Fund, the Green Space Conservation Program, Foundations, the Western Reserve Conservancy or the District's budgetary line items.

EDUCATION AND OUTREACH

The overall goal of this section is to describe how the Protection Team will use education and outreach strategies to make people who live and work in the protection area aware of how their activities can impact the source of drinking water, and what they can do to help prevent contamination. The Protection Team shall educate the community by using a phased approach.

Educating the Public Officials – Public Officials are probably the first group of people who should understand and support protection planning efforts, because many of them could be key figures in promoting, developing and implementing a protection plan. Some of these officials are a part of the Protection Team.

Who? – Police and Fire departments, EMS, Township Trustees, County Commissioners, County Engineers and Sanitary Engineers, Boards of Health, Water and Soil Conservation Districts and the OEPA.

How? – Setting up meetings to present and discuss protection planning with public officials; review the drinking water source protection plan.

Educating the General Community and Customers
Educating the general community and customers helps to obtain the acceptance and support that will enable community leaders to proceed.

Who? – The community in and around the Mahoning Valley Sanitary District.

How?
- Updating the Potential Contaminant Source Inventory
- Articles in local newspapers, newsletters
- Brochures about SWPP and SWAP
- Public Educational Meetings
- Presentations before local groups, schools
- Discussions on radio and local TV shows
- Plant Tours

Educating People who live and work in the protection area
People who live and work in the protection area should be aware of how their activities can impact surface water and what they can do to prevent contamination.

Who? – People who live, work, own property or operate businesses in the protection area.

How?
- Enclosures with the water bill or CCR
- Posters in the workplace and community boards
- Employee awareness training
- Signs along transportation routes in the protection area
- Letters to businesses/residents in the area
- Brochures in stores that inform customers how to safely dispose of hazardous products
- Posters in the public areas (libraries, parks)
- Fact Sheets

A variety of public educational materials are available through various organization and governmental services. A listing of available educational materials is provided in Appendix H.

The Protection Team shall review the implementation of the education and outreach program annually to determine its success and effectiveness.

Table 5

Education and Outreach Strategies	Target Audience	Time line for Implementation	Who will implement this strategy?
Brochures	GP/CU/ST	June 2009	Ohio EPA, Water and Soil District, County Engineer's Dept., AWARE
Posters	GP/CU	Completed	Ohio EPA, Water and Soil District, County Engineer's Dept., AWARE
Public Education Materials and Programs	GP/CU/ST	Completed	Ohio EPA, Water and Soil District, County Engineer's Dept., AWARE
News Releases	GP/CU	As Needed	Vindicator, Tribune Chronicle
Presentations	GP/CU	As Needed	All Protection Team Members
Annual Customer Confidence Report (CCR)	CU	By July 1st every year	MVSD
Water/sewer Utility Bills	CU	Per the appropriate billing cycle	Mineral Ridge, Lordstown, Mahoning County - Austintown, Jackson
Signage	GP/CU	June 2010	ODOT/County Engineers/MVSD
Government Agency Programs	GP/CU	Ongoing	All Protection Team Governmental Members

Target Audience: Customers (CU), General Public (GP), Students (ST), Other (write out).

Educational Websites

A great deal of information on programs and details of safe guarding the watershed are available through various websites. A listing of sites can be found in Appendix H.

CONTINGENCY PLAN

Financial Mechanism

The Mahoning Valley Sanitary District has an established mechanism for seeking financial rate adjustments to their rate structure to accommodate operational, maintenance and capital costs. In order to seek an adjustment, the District must go before a Court of Jurisdiction comprised of a Judge from each Court of Common Pleas of Mahoning and Trumbull County. The District can go before the Court on an annual basis and seek emergency rates through the Court if necessary. If a rate adjustment would be needed to finance a contingency alternative, the Mahoning Valley Sanitary District would seek one through the Court of Jurisdiction. However, as part of the District's rate structure it has incorporated a capital reserve fund that could serve as a financial mechanism to assist in a contingency alternative.

Another possible option would be to seek financial assistance through loans or the sale of notes and bonds.

Drinking Water Shortage/Emergency Response

The goal of this section is to identify how the MVSD will prepare for and respond to various drinking water shortages or emergencies that may occur. Most of this information is included in the MVSD's Emergency Action and Mutual Aid Plans, which addresses every kind of emergency and can be found in Appendix I. Provided below are various programs which address drinking water shortages or emergencies.

Droughts – Provided in Appendix J are the stages of conservation measures to be imposed by the MVSD during conditions of a drought.

Drinking Water Shortage – Short Term Loss of Source and Long Term Water Supply Planning

For a short and long term loss of source of water, the District would immediately implement water emergency (stage 4) conservation measures as listed in the drought plan. Water would be available from existing reservoirs for part of a day. Alternative sources of water should be evaluated for use if necessary as outlined in the Alternate Sources of Water provided in Appendix K and the following water emergency procedures should be implemented:

Assess Impacts

The first stage of most water shortage plans usually includes voluntary cutbacks. Make sure all stages of your water shortage plans are complete, including all mandatory cutbacks, before you have to carry out the plan. Remember to think health and safety first!

Water Emergency Procedures

The following measures should be taken in the event of a complete water outage:

1. **Fix it immediately**, keep the public informed, and let users in the area know, so that they can take precautions to minimize cross-connections and other hazards.

2. If it appears that the outage or shortage will not be short-lived, the District would **contact local water purveyors to access alternate sources of water and the County EMAs** to initiate the process of acquiring water tankers for potable water. The District would insure a safe chlorine residual in the tankers before distributing the water to citizens. The water system may want to have some bottled water available until water trailers are on-site.

3. The system would **implement rationing**. The rationing notice should be posted at prominent locations such as City Hall, water office, post office, and grocery stores. A notice should also be published through newspapers and the electronic media. Non-essential businesses such as carwashes and laundries should be curtailed. Outside uses of water such as watering lawns and filling of swimming pools should be prohibited. It should be recommended that major inside uses such as clothes washing be postponed until service is restored.

4. If there have been lines with no water or negative pressures, a precautionary boil order should be issued by the water system until line tests on two consecutive days show the lines to be safe. Chlorine residuals should be increased.

5. The water system may have to valve off portions of the distribution system until towers are refilled. Valved-off areas have the potential for external contamination to enter the system through leaking joints or cracked pipe. Before placing a valved-off area back in service, the system should issue a precautionary boil order, increase the chlorine residual throughout the system and obtain safe bacteriological samples from representative areas of the system on two consecutive days. The precautionary boil order may be lifted once the required safe samples are obtained.

6. The system should be repressurized slowly to avoid water hammer and the potential for further damage to the lines.

7. **Air should be bled from lines** as they refill since entrapped air can impede flows and may cause further line damage. Water lines should be flushed as needed.

Alternate Water Sources for Public Water Systems Emergencies

The following steps are offered to provide guidance when evaluating temporary alternate water sources for emergency use (drought, contamination, spills, etc.). An emergency condition exists when a total loss of water occurs.

Inventory and identify temporary water sources. These include:

1. Emergency interconnections with adjacent Public Water System for portions of the distribution systems through adjacent sources of water. See alternate Sources of Water listed in Appendix K.
2. Providing bottle water or water bought from another community and brought by water tankers to a centralize distribution points.
3. For a long term outage - activate raw water sources for surface water treatment from the Mahoning River.
4. Evaluate potential hazardous contamination sources.
5. Evaluate temporary intake location and the means of transporting the raw water to the treatment facilities.

The MVSD uses the following order of preference for approval of water sources:

1. Meets Drinking Water Standards.
2. Meets all primary standards with secondary violations.
3. Has primary violations (additional notification and provision of bottled water may be required).

Water quality sampling and acceptance will be coordinated for alternate sources of water by the MVSD. Currently the Mahoning Valley Sanitary District is working with the US Army Corps of Engineers to secure

a water contract to have Berlin Reservoir as an emergency water source. Steps are being taken through the renewal of the Water Resource Development Act to permit contract language allowing the Mahoning Valley Sanitary District to have access to water from Berlin Reservoir through the US Army Corps of Engineers.

The Mahoning Valley Sanitary District is also scheduling a sediment survey of the bottom of the reservoir in order to determine its capacity and the impact of sediment deposits. Depending on the results a determination will need to be made on if the District will need to take a course of action in removing any deposits of sediments.

Spill Response

Procedures are in place for the kinds of catastrophic spills that can reasonably be expected in the reservoir. The chain-of-command, notification procedures and response actions are provided in the MVSD's Drinking Water Supply Contingency Plan and the Emergency Action Plan in Appendix I. Local Fire departments or hazardous materials response teams can be reached at the phone numbers listed in the Drinking Water Supply Contingency Plan.

Ohio EPA's Division of Emergency and Remedial Response is capable of providing expertise and assistance related to prevention, containment, and clean-up of chemical spills. The Ohio EPA Emergency Response, 24-hour Phone Number is1-800-282-9378.

Additional information can be found in Appendix L involving Spill Prevention, Control and Clean-up.

Surface Water Monitoring

The goal of this section is to assess the need for surface water monitoring. Surface water monitoring is always necessary and provides information that leads to effective protective strategies. It also provides hard evidence of the success (or failure) of those strategies. Success can be translated into continued support, and failure can lead to finding something else that works.

The desirability of surface water monitoring depends on: 1) the susceptibility of the reservoir, 2) the presence of contaminants and point sources, and 3) the protective strategies selected to protect the reservoir. A surface water monitoring program and check list on this monitoring program is in place. A check list on monitoring can be found in Appendix M.

Finally under the Safe Drinking Water Act additional monitoring for unregulated contaminants will be added through laws from the US and Ohio EPA.

Biological and Chemical Monitoring In Meander Creek and Its' Tributaries

In 1994, Ohio EPA conducted a biological and water quality study of the Mahoning River watershed. No sites were studied within the Meander Creek Reservoir drinking water source protection area. Results from the 2000-2002 Youngstown State University studies of the Meander Creek Reservoir did not indicate any chemical parameters of concern.

Watershed Protection Plan Stream Monitoring Program

The MVSD has an ongoing Stream Monitoring Program. There are 18 locations including the MVSD raw water sample point. Sample #8 is not collected at this point due to access to the sample and safety. There are samples collected below this point.

These are the sample locations:

1. Berlin Dam
1a. Superior
2. Gibson
3. Sulphur Run
4. 7 Mile Run
5. Sawmill Creek
6. Crory Road
7. Mine Special
8. Route 45 @ Dunedin
9. Western Reserve Road
10. Berlin Station Road
11. Route 45 @ Diehl Lake
12. Gault South
13. Gault North
14. Route 18 Lipkey
15. Morrison Run
16. MVSD
17. Plaza Ditch

Creek Sample Route - A complete description is maintained by MVSD.

HOMELAND SECURITY WATER PROTECTION RESEARCH

Research Focus – The main focus of water protection research is on improving the nation's ability to protect from and respond to terrorist attacks on our water and wastewater infrastructure. The thematic research areas include:

- Protection and prevention research, which involves developing tools and methods to address the vulnerabilities of drinking water and wastewater systems.
- Detection research, which involves developing tools and methodologies to detect, confirm, and measure accidental and intentional contamination events, and support the development of a laboratory network.
- Containment and mitigation research, which involves supporting the development of planning tools for contamination events, and tools and methodologies for responding to and mitigating such events.
- Decontamination and water treatment research, which involves developing a better understanding of the treatment and decontamination of water infrastructure and contaminated water.

Homeland security research also consists of testing and evaluating commercially available detection, monitoring, treatment, and decontamination technologies. The technologies are tested per the manufacturer's specifications and evaluated to determine whether they perform as advertised. The results help those working in the water sector make decisions regarding the suitability of these technologies for their needs.

Protection and Prevention – This research focuses on the risks faced by drinking water utilities in order to better understand threats, system vulnerabilities, consequences of the threats, and mitigation. Given the differences in water source, system size, treatment, and water distribution, each water utility faces unique vulnerabilities to terrorist threats. Homeland security research provides technical support to the Office of Water's efforts to develop improved vulnerability assessment tools.

Detection – This research can be divided into two main categories: 1) support for contamination warning systems (CWSs) for timely detection of contamination events and 2) confirmation of events through sampling and analysis.

The research supports the Office of Water's Water Security Initiative (WSi) for developing a robust, comprehensive surveillance and monitoring program to address intentional contamination. The WSi CWS has the following components: 1) online water quality monitoring, 2) sampling and analysis, 3) public health surveillance, 4) enhanced security monitoring, and 5) consumer complaint surveillance. CWSs integrate monitoring and surveillance data from multiple detection streams to enable early detection of contamination in drinking water distribution systems. The development of a well-designed drinking water contamination warning system reduces public health risks due to contamination incidents and reduces the economic consequences that result from contamination.

The research program contributes to the online water quality monitoring, public health surveillance, and sampling and analysis components. Testing of commercial sensors in EPA test pipe loops has indicated the types of sensors that can identify the changes in water quality as a result of contamination events. These sensors are currently used in the first WSi pilot city (Cincinnati, Ohio) and are expected to be used in future pilots. The research program is also contributing to the CWS public health syndromic surveillance data that are coupled with water quality data.

Following the detection of a contamination incident, analytical methods are needed to confirm the event and identify and quantify the contaminant. The research program provides validated methods and protocols for use by the laboratories in the Environmental Response Laboratory Network.

Containment and Mitigation – This research focuses on developing methods to minimize exposure to consumers after a contamination event, determining levels of contaminants that consumers may be exposed to in drinking water, and evaluating the use of modeling to contain and flush a system in order to mitigate the event. Research under this theme also includes determining the acceptable exposure levels for water contaminated with chemical warfare agents or toxic industrial chemicals.

Decontamination and Water Treatment – This research can be divided into the following categories:

1. Decontamination and treatment protocols, technologies, and tools (e.g., Threat Ensemble Vulnerability Assessment [TEVA] support tools)
2. Persistence of contaminants, including microbial inactivation
3. Pipe loop studies, including transformation by-products in pipes and infrastructure
4. Risk communication tools to respond to terrorist events
5. Risk-based cleanup goals to assist in managing, cleaning up, and mitigating hazards in the aftermath of a terrorist event

Future Research – Scientists from the Centers for Disease Control and Prevention and homeland security research program continue to work together to improve the process of biological agent disinfection and decontamination. This work is coupled with evaluating the suitability of surrogate organisms as substitutes for bio-threat agents in research studies.

In response to suggestions made by the National Academy of Sciences and the Science Advisory Board, message mapping tools will be modified as necessary in order to take into account the findings from behavioral science studies. The modifications should help the public and public officials better communicate following a terrorist attack.

Future detection work will include testing sensors for the introduction of radiological and biological contaminants. The optimal number and placement of sensors used as part of a CWS is a result of the development of tools by the National Homeland Security Research Center (NHSRC) and its partners (University of Cincinnati, Sandia National Laboratories, and Argonne National Laboratory).

In addition, as work on protection and detection matures, water protection research will increase its focus on treatment, contingency planning, decontamination, and recovery in the event of attacks on water and wastewater systems. The program also plans to increase research on evaluating and responding to radiological attacks.

Directives – Following the terrorist attacks of September 11, 2001, EPA developed and initiated a research program to comply with the Public Health Security and Bioterrorism Preparedness and Response Act (2002). The Act amends the Safe Drinking Water Act and its 1996 amendments by adding the following requirements: drinking water systems serving more than 3,300 persons are required to perform vulnerability assessments, and EPA is required to conduct research and review the methods and the means to prevent, detect, and respond to contamination by various chemical, biological, and radiological agents. In addition to the Safe Drinking Water Act amendments, a number of Homeland Security Presidential Directives (HSPDs) drive our water protection research.

- **HSPD-7:** Critical Infrastructure Identification, Prioritization, and Protection designates EPA as the sector-specific lead agency for critical water infrastructure safety and security, and encourages the development of risk management strategies to address terrorist events.
- **HSPD-9:** Defense of United States Agriculture and Food directs EPA to develop a fully coordinated surveillance and monitoring program to provide early detection and to develop a nationwide laboratory network to support monitoring and response requirements.
- **HSPD-10:** Biodefense in the 21st Century reaffirms EPA's role, adding a clear directive for the Agency's lead in decontamination efforts. With input from stakeholders, NHSRC and the Office of

Water collaborated on identifying water security needs and challenges documented in the Water Security Research and Technical Support Action Plan (Action Plan). The Action Plan was reviewed by the National Research Council of the National Academy of Sciences in 2003–2004. This was followed by a second review by the National Research Council (published in 2007) to evaluate EPA's existing research and make recommendations for short- and long-term planning.

Products – Water protection research leads to the development of tools and methodologies such as RAM-W, the Risk Assessment Methodology for Water, which helps protect drinking water and wastewater facilities from threats and attacks. Researchers produce reports, journal articles, protocols, and computer-based tools related to water infrastructure protection. These products are based on scientific research and technology evaluations. The products and expertise are widely used in preventing, preparing for, and recovering from public health and environmental emergencies that arise from terrorist attacks.

Products are categorized by the research focus areas of protection and prevention, detection, containment and mitigation, and decontamination and water treatment. Some examples of products are listed below:

Protection and Prevention – Products in this category include several risk assessment tools and methodologies such as RAM-W, the Risk Assessment Methodology for Water, that have been developed to aid drinking water systems. Future efforts in this area will update the existing water tools to comply with the Department of Homeland Security's Risk Analysis and Management for Critical Asset Protection (RAM-CAP) program, which measures the risk for all sectors against a national framework.

Another available product that aids in protection and prevention is the Blast Vulnerability Assessment Tool. This tool, developed in collaboration with the Army Corps of Engineers, supports water utilities in assessing the vulnerability of their systems to explosives. Future work in this area will be to add a module for underground storage tanks. A preliminary report on the impact of a radiological dispersion device on water and wastewater systems was developed and is "For Official Use Only." Future work in prevention and protection will focus on analyzing radionuclide exposure effects along with their fate and transport properties.

Detection – Products in this category have been developed to help rapidly detect and identify contamination. These products include evaluations of various sensors, analytical methods, and computer models. For example, the Threat Ensemble Vulnerability Assessment (TEVA) program developed software to optimally place sensors, TEVA-Sensor Placement Optimization Tool (SPOT), and event detection software, TEVA CANARY, which attempts to trace a contamination event back to the point of entry. These tools not only support the CWS but provide dual benefits as water systems can use them to monitor and optimize water quality. TEVA-SPOT can also economically maximize public health protection.

The Standardized Analytical Methods for Environmental Restoration Following Homeland Security Events, (SAM), Rev 3.1 (Nov 2007) is a compilation of methods for the analysis of chemical, biological, and radiological contaminants in water. The SAM has been incorporated into regional response plans.

Containment and Mitigation – Products in this category help to limit the extent of contamination and/or human exposure. For example, provisional advisory levels (PALs) are being developed to provide decision makers with guidance on acceptable exposure levels to water contaminated with chemical warfare agents or toxic industrial chemicals. To date, health-based draft PALs have been developed for more than 40 priority agents, with 15 to 24 exposure values for each.

Decontamination and Water Treatment – One of EPA's more important challenges in dealing with a contamination threat is how to treat, contain, and dispose of contaminated water. Depending on where the contaminant is introduced, this may involve actions within source waters, drinking water treatment plants, distribution systems, or points downstream. Contaminated materials that cannot be

decontaminated or treated (including piping, filter medium, and water) will need to be disposed of properly. Furthermore, the physical infrastructure of the water distribution system will require decontamination before it is reused. To evaluate the efficacy of various decontamination methods, a series of pilot-scale tests have been conducted, using the pipe loop system located at EPA's Test and Evaluation facility. These tests evaluate the containment, decontamination, and treatment of contaminants by using pipe loops simulating drinking water distribution system to:

- Evaluate several decontamination methods for their effectiveness in removing different contaminants from a drinking water distribution system
- Determine the optimal decontamination condition (e.g., flow rate, reagent concentration, pH) of each decontamination method for each contaminant
- Investigate the effect of pipe materials on the performance of the decontamination technique

Examples of products that aid in decontamination and water treatment include reports documenting the outcome of the above-mentioned tests.

In addition, the EPANET-MSX, which is a modeling simulation tool that has expanded upon the commonly used EPANET computer code, was developed to more accurately model the fate and transport of multiple chemical species in the bulk flow and the interactions of these chemicals on the walls of pipe networks. This simulation tool can be used to model the impacts of various decontamination methods.

Homeland security research has led to the development of several risk-related tools. Specifically, computer programs have been developed to evaluate electronic public health syndromic surveillance data in order to identify potential disease outbreaks early. The message mapping tool was developed to enable members of the emergency response and environmental protection communities to quickly and concisely deliver the most pertinent information about an emergency. A video on message mapping explains how responders and other stakeholders can develop message maps as part of their strategy for responding to terrorist threats and other disasters. In addition, the Support for Environmental Rapid Risk Assessment (SERRA) database has been developed to accelerate the risk assessment process and to support emergency response. SERRA contains an extensive compilation of scientific information designed to specifically assist in managing, cleaning up, and mitigating hazards in the aftermath of a terrorist event.

Note that, given the availability of resources to date, research has focused primarily on the higher risk needs for drinking water. Research on wastewater will increase in the future.

Technology Testing and Evaluations – Several detection technologies related to water security have been evaluated. These technologies include:

- Enzymatic test kits
- Immunoassay test kits
- Multi-parameter water quality probes
- Portable cyanide analyzers
- Rapid polymerase chain reactors
- Rapid toxicity testing systems

Decontamination technologies are also being evaluated. These technologies include filtration systems for wastewater treatment and reverse osmosis point-of-use devices.

Stakeholders – The primary user of water protection research products is the Office of Ground Water and Drinking Water's Water Security Division. The Water Security Division develops methodologies and guidance to help drinking water and wastewater systems protect against contamination events, detect these events as rapidly as possible, and respond to such events to minimize impacts and protect the

public. These methodologies, ultimately used by water and wastewater systems, are based on the science developed by NHSRC in collaboration with multiple partners. Other stakeholders that use water protection research products and expertise include the Office of Solid Waste and Emergency Response, EPA regions, state and local authorities, and drinking water and wastewater utilities.

Drinking Water Quality Monitoring Summary

Available chemical and biological water quality data collected from the streams in the MVSD protection area and sampling results from finished water reported to Ohio EPA by the public water supplier were evaluated to characterize water quality. A review of the MVSD's public water system compliance monitoring data from 1991-2002 revealed that the system had no health based or maximum contaminant level (MCLs) violations. Table 6 lists contaminants where at least one result was above the level of detection and does not include all contaminants tested for by the public water system. The table also includes data from the MVSD's participation in Ohio EPA's Pesticide Special Study (1995-1999). Low levels of several pesticides were detected in the MVSD finished water, indicating that local land use activities are impacting the source water.

MVSD personnel monitor raw water daily for pH, turbidity, alkalinity, hardness, fluoride and manganese. Raw water samples are collected monthly for chlorides, and periodically for phosphates, iron, and chemical oxygen demand (COD). Sixteen sites within the watershed are monitored on a monthly basis for pH, turbidity, alkalinity, hardness, and fluoride. Raw water samples for common synthetic organic compounds (SOCs) are collected in the spring, and Giardia/Cryptosporidium monitoring began in 2006 and will continue until September 2008. Plant personnel report that turbidity levels in the raw water typically increase after rainfall events. Raw water chloride levels have also increased in the last few years. During summer months, the reservoir is treated on occasion with copper sulfate to reduce summer algae populations and associated taste/odor problems.

Annual monitoring of water is performed in accordance with the Youngstown State University recently completed a two year study of the "cucumber" odor problem that has occurred at times during winter months. Three sites in the reservoir were sampled weekly during the winter for secchi disk transparency (turbidity), temperature, suspended solids, conductivity, pH total phosphorus, soluble phosphorus, ammonia nitrogen, nitrate/nitrite nitrogen, silica, chlorophyll a, chlorophyll c, pheophytin, t2,c4-heptadienal (cause of "fishy" odor), t2,c6-nonadienal (cause of "cucumber" odor), and enumeration of the common types of algae. Blooms of Synura algae underneath ice cover correlated with the "cucumber' odor and concentrations of t2,c6-nonadienal. During these periods, water treatment plant personnel utilize additional carbon to effectively remove the taste/odor problems caused by the algae. Additional studies to identify the factors contributing to the increases of these algal populations are forthcoming.

It should be recognized that sampling results presented in this report can only provide information on the quality of the water at the time the sample was collected. Water quality may change over time due to a number of reasons. Therefore, it is recommended that the reader also consult the most recent Consumer Confidence Report (CCR) for the MVSD public water system. All public water systems are required to annually prepare and distribute the CCR to their customers. The report is a good source of information on health effects associated with detected contaminants and contains information on the community's drinking water, including the source of the water, contaminants detected, the likely sources of detected contaminants, and the potential health effects of contaminants at levels above the drinking water standards. Additional parameters to be monitored shall be required in the future under the Federal/ State Water Drinking Act.

Table 6. Water Quality Monitoring Summary of Treated Water
Mahoning Valley Sanitary District Public Water System

Ohio EPA Public Water System Compliance Monitoring Database (1991- 2002)
Ohio EPA Pesticide Special Study (May 1995 - March 1999)

Contaminant) (units	Levels Found	Primary MCL	Exceeds MCL [1]	Typical Source
Inorganic Contaminants				
Barium (mg/l)	0.010 - 0.016	2	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Beryllium (µg/l)	1.0	4	No	Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries
Fluoride (mg/l)	0.85 - 1.59	4	No	Erosion of natural deposits; Water additive which promotes strong teeth
Nitrate (mg/l)	0.03 - 2.7	10	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Sulfate (mg/l)	53.0 - 65.0	none	NA[2]	Erosion of natural deposits; decomposition product of organic matter; discharge from mining and industrial waters; detergents in sewage; component of precipitation in metropolitan areas
Radioactive Contaminants				
Beta/photon emitters (pCi/L)	4.0 - 8.0	AL=50	No	Decay of natural and man-made deposits
Synthetic Organic Contaminants including Pesticides and Herbicides				
Alachlor [3] (µg/l)	0.05 - 0.65	2	No	Herbicide runoff
Atrazine [3] (µg/l)	0.11 - 0.56	3	No	Herbicide runoff
Metolachlor [3] (µg/l)	0.06 - 0.37	none	NA	Pesticide runoff
Metribuzin [3] (µg/l)	0.04 - 0.16	none	NA	Pesticide runoff
Simazine [3] (µg/l)	0.22 - 0.72	4	No	Herbicide runoff
Cyanazine [3] (µg/l)	0.11 - 0.20	none	NA	Pesticide runoff
Volatile Organic Contaminants				
Carbon tetrachloride (µg/l)	1.10	5	No	Discharge from chemical plants and other industrial activities
TTHMs [Total Trihalomethanes] (µg/l)	34.3 - 117.0	80	No[4]	By-product of drinking water chlorination
Bromodichloromethane (µg/l)	0.5 - 5.0	none	NA[4]	By-product of drinking water chlorination
Chloroform (µg/l)	21.1 - 113.0	none	NA[4]	By-product of drinking water chlorination
Bromoform (µg/l)	0.5 - 59.0	none	NA[4]	By-product of drinking water chlorination
Dibromochloromethane (µg/l)	0.5 - 2.0	none	NA[4]	By-product of drinking water chlorination
Dibromoacetic Acid (µg/l)	3.6	none	NA[4]	By-product of drinking water chlorination
Dichloroacetic Acid (µg/l)	18.3 - 51.6	none	NA[4]	By-product of drinking water chlorination

Table 6. Water Quality Monitoring Summary of Treated Water
Mahoning Valley Sanitary District Public Water System

Ohio EPA Public Water System Compliance Monitoring Database (1991- 2002)
Ohio EPA Pesticide Special Study (May 1995 - March 1999)

Contaminant) (units	Levels Found	Primary MCL	Exceeds MCL [1]	Typical Source
Trichloroacetic Acid (µg/l)	2.1 – 5.4	none	NA[4]	By-product of drinking water chlorination
Monochloroacetic Acid (µg/l)	4.1 – 5.8	none	NA[4]	By-product of drinking water chlorination

MCL = Maximum Contaminant Level (AL = Action Level).

[1] MCL set by federal or state drinking water standards. A sampling result that exceeds the MCL value does not necessarily indicate a violation by the public water system. MCL violations for many contaminants are based on a running annual average.

[2] Secondary Maximum Contaminant Level (SMCL) for this parameter. SMCLs are non-health-related limits.

[3] Data includes Ohio EPA Pesticide Special Study results (1995-1999). For the study, samples were analyzed using an immunoassay (IA) method and by USEPA Method 507, a gas chromatograph (GC) method. The immunoassay results are only estimations of the actual concentration values. The IA test kits tend to overestimate concentrations, due to cross reactivity of chemically similar pesticides (e.g. atrazine and simazine).

[4] Total Trihalomethanes (TTHMs): (MCL = 80 µg/l) calculated as the sum of the concentrations of Bromodichloromethane, Dibromochloromethane, Bromoform, and Chloroform. Five Haloacetic Acids (HAA5): (MCL = 60 µg/l) calculated as the sum of the concentrations of Monochloroacetic acid, Dichloroacetic acid, Trichloroacetic acid, Monobromoacetic acid, and Dibromoacetic acid.

Protection Plan Updates

MVSD commits to reviewing the Drinking Water Source Protection Plan every year, beginning with March 2009. Any revisions of the Protection Plan will be documented on the front cover by adding "Revised [date]" beneath the date at the bottom of the page.

- Protection Team members and contact numbers shall be kept current.

- Pollution Source Control Strategies:
  New potential contaminant sources shall be addressed with new potential contaminant source control strategies.

- Education and Outreach:
  A review of the success and notification of the public for the protection area shall be analyzed. Education materials shall continue to be distributed.

- Drinking Water Shortage/Emergency Response:
  Updates to the Drinking Water Shortage/Emergency Response Plan shall be made or distributed.

- Surface Water Monitoring:
  Are there new water quality, potential contaminant source, or land use issues that would influence the need to conduct or not to conduct surface water monitoring?

Potential Contaminant Source Inventory

MVSD recommends that re-inventorying the protection area be performed at least every 5 years and updates be made at shorter intervals, especially where development has been rapid. A list of regulatory and non-regulatory items found in Appendix N should be reviewed.

Drainage Basin Maps

In Appendix S the following list of drainage basin maps of interest are provided:

Meander Creek Reservoir Sub-watershed Basin Map
Mahoning River Watersheds
Meander Creek Watershed Drinking Water Distribution Maps
Meander Creek Watershed Wetland Mitigation Opportunities
Meander Creek Watershed Industrial and Municipal Point Source Discharges

APPENDICES

APPENDIX A

BOARD OF DIRECTORS
THE MAHONING VALLEY SANITARY DISTRICT

RESOLUTION NO. 5656

August 29, 2007

Authorizing the Development of a Source Water Protection Policy for The Mahoning Valley Sanitary District.

WHEREAS, The Mahoning Valley Sanitary District recognizes the importance of its surface water source as a natural resource used for drinking water, and

WHEREAS, it is within the responsibility of The Mahoning Valley Sanitary District, as a public water supplier, to consider the health, safety and welfare of its customers; and

WHEREAS, surface water contamination can and does occur as a consequence of a variety of land use activities; and

WHEREAS, it is desirable to preserve and protect the quality and quantity of our surface water resources to assure a continued safe, adequate, and useable supply both now and in the future is available to the public and industry; and

WHEREAS, the protection of current and potential future sources of surface water used for drinking water is worthwhile from the standpoint of resource protection; and

WHEREAS, state, county and municipal laws and regulations provide for the control of sources of contamination; and

WHERAS, state and local agencies have developed programs to assist in the control of sources of contamination; and

WHEREAS, state and local government officials, are available to assist The Mahoning Valley Sanitary District in the development of a Source Water Protection Plan;

NOW THEREFORE BE IT RESOLVED that The Mahoning Valley Sanitary District does hereby agree to take action to: (1) protect the Source Water Protection Area and (2) take steps to update the zone of contribution to the surface water(s) in compliance with the State of Ohio Source Water Protection Program; and

BE IT ALSO RESOLVED that The Mahoning Valley Sanitary District requests the establishment of a Source Water Protection Plan in order to deter potential sources of future contamination; and therefore

BE IT ALSO RESOLVED that The Mahoning Valley Sanitary District shall take action to implement a source water protection plan in conjunction with other state and local governmental agencies and public participants to protect it's surface water supply as a natural resource used for drinking water. It is also the intent of The Mahoning Valley Sanitary District to provide measures and practices to reduce sources of contamination and protect the surface water as an essential source of fresh water for the public.

ADOPTED: August 29, 2007
Resolution No. 5656

BOARD OF DIRECTORS

President VAUGHN

Director BLAIR

Director SZMAJ

Director SYLVESTER

Secretary's attestation on page 3.

I, Alan Tatalovich, Secretary of The Mahoning Valley Sanitary District hereby certify that the foregoing is a true and correct copy of Resolution No. 5656 unanimously adopted by the Board of Directors, or by a quorum necessary of the Board of Directors of The Mahoning Valley Sanitary District at a meeting held at its office in Weathersfield Township, Trumbull County, Ohio, on August 29, 2007.

IN WITNESS WHEREOF, I have affixed my signature and attached the seal of The Mahoning Valley Sanitary District this 29th day of AUGUST 2007.

Alan Tatalovich, Secretary
The Mahoning Valley Sanitary District

Attachment: Outline for Development of a Water Source Protection Policy.

Attachment
The Mahoning Valley Sanitary District

SOURCE WATER PROTECTION POLICY

PREAMBLE:

Statement of Purpose

The purpose of a Source Water Protection Policy is to set forth the policies and administrative procedures that will be used by The Mahoning Valley Sanitary District to protect the municipal water supply.

Background

Surface water is an essential source of fresh water for the public water supply provided by The Mahoning Valley Sanitary District.

Virtually any activity on the surface of the ground which involves hazardous substances may contaminate the surface water. Once polluted, surface water becomes difficult to clean and more costly. The natural microorganisms which help break down some pollutants on the surface of the ground and in the top soil layers are not present (or not present in sufficient quantities) in surface water.

The State of Ohio Environmental Protection Agency Watershed Protection Program is encouraging all public water suppliers to develop a local Source Water Protection Plan Program. A complete program submission includes the following key elements:

- Defining roles and duties of government units, water supply agencies and other key personnel.
- Delineating a Watershed Protection Area for each water supply source.
- Identifying potential and existing contaminant sources within each Watershed Protection Area.
- Utilizing management approaches for protection of the surface water, including but not limited to education and regulatory approaches.
- Creating contingency plans for public water supply sources including the location of alternate drinking water sources.
- Encouraging public participation.

In order to develop a Source Water Protection Plan, each of the above-mentioned elements must be addressed. Also a wide range of management strategies, including land use planning, zoning, subdivision controls, interagency cooperation and community education may be useful in a Source Water Protection Program Plan.

It is the intent of The Mahoning Valley Sanitary District, with the assistance of other local governmental agencies to alert persons applying for land use, building, or subdivision approvals about state and local requirements for environmental protection. Any land uses or activities which may pose a threat to the public water supply and surface water shall be properly managed to minimize the possibility of contamination.

It is also the intent of The Mahoning Valley Sanitary District, with the assistance of other local governmental agencies and the public to educate property owners, developers and the farming industry on the sources of contamination that can be contributed by these parties.

APPENDIX B

IMPLEMENTATION

Activity	Responsible Party	When Implemented	Comments
SOURCE WATER MANAGEMENT ACTIVITIES			
Storm Water Runoff and Nonpoint Illicit Discharges Storm Water Management Program is being implemented by listed responsible parties. (p. 35)	Trumbull County, Mahoning County, village of Lordstown, city of Canfield, Mineral Ridge, Weathersfield, Elsworth, Jackson, Austintown, and Canfield Townships	Mahoning County and Townships established March 3, 2003 and ongoing. Trumbull County and Townships established Plan March 5, 2003.	Storm Water Mgt Plans include public education, detection and elimination of illicit discharges, and oversight of construction sites (to prevent sediment and chemicals from being washed into storm sewers and natural drainage pathways). (p. 35)
New Development The land surrounding Meander Reservoir is a fenced-in fish and game refuge with no public access	Mahoning Valley Sanitary District,	Established 1926 and ongoing.	MVSD will explore zoning for property adjacent to or including waterways within CMZ. (p. 35-36)
Illicit Septic Tank Discharge Establish septic tank regulations, including periodic cleaning and maintenance, and investigation programs to be conducted by county boards of health. (p. 35)	Mahoning and Trumbull County Boards of Health	By June 2010	
Agricultural Runoff Promote filter strips and other agricultural BMPs on land adjacent to water courses. Purchase buffer zones.	Soil and Water Conservation Districts for Mahoning and Trumbull Counties PWS/Western Reserve Land Conservancy	By June 2010 Ongoing	Pursue funding via Farm Bill and contact property owners to make them aware of potential. Purchases contingent upon funds being available and property owners willing to sell.
Roadway Runoff Review de-icing practices on roads within the CMZ	City, township and county road maintenance crews, and ODOT	By June 2010 Mahoning County has a BMP in place.	To reduce the seasonal levels of chlorides in the source water
EDUCATION AND OUTREACH			
Brochures	With assistance from Ohio EPA, County Soil and Water Districts, the County Engineer's office, and AWARE	By June 2009	Sample copies included in Appendix H.
Posters and Public Education Materials	See above	Completed	Sample copies included in Appendix H.
News Releases	By the relevant cities, townships, and local	As needed	Distribute to *The Vindicator* and *Tribune Chronicle*

Activity	Responsible Party	When Implemented	Comments
	government agencies		
Source Water Protection Presentations	See above; also, the Trumbull and Mahoning SWEET Teams	As requested	
Annual Customer Confidence Report (CCR) Include information on source water protection in CCR.	Public water system operators	By July 1st of each year	Goes to all water customers
Water/Sewer Utility Bills Include information on source water protection in utility bills	Niles, Youngstown and McDonald	Per the appropriate billing cycle	Includes customers in Mineral Ridge, Lordstown, Austintown, Jackson
Signage	Trumbull and Mahoning Counties, Townships, and ODOT	By June 2010	Goal: to install near tributary to water courses
CONTINGENCY PLANNING			
Emergency Supply Berlin Reservoir	PWS, Fire Departments, Mahoning and Trumbull County EMAs	Pump Station and Pipeline completed March 1958	Negotiations currently underway with USACE to use Berlin Reservoir as needed via 9-mile aqueduct operated by MVSD (p. 39)
Emergency Response addressed in updated Contingency Plan (Appendix I)	[See above]	Contingency Plan updated as of October 2008 Emergency responders notified by June 2009	Local fire departments and County EMAs notified of location of intakes and of the need to keep runoff from fires/chemical spills from entering storm sewers or natural drainageways
SOURCE WATER MONITORING			
Monitoring Reservoir Sample Sites Raw water is sampled at 18 locations throughout MVSD (pp. 40-41)	PWS	Once a month	Results are available upon request
Participation in Homeland Security Water Protection Research (pp. 41-45)	PWS Trumbull and Mahoning Counties	To be determined	

Protection Plan Updates

MVSD commits to reviewing the Drinking Water Source Protection Plan every year, beginning with March 2009.

Evaluating Effectiveness

In the March Annual review, a determination will be made on the progress which has been made with regard to the protective strategies and their implementation. Efforts will be made to make sure existing and proposed activities are being attained or will be attainable.

APPENDIX C

SUGGESTED PROTECTIVE STRATEGIES

AGRICULTURAL POTENTIAL CONTAMINANT SOURCES

The following activities apply to most agricultural potential contaminant sources in the protection area.

- ☐ Work with County Extension Service, the Soil and Water Conservation District, and/or the Natural Resource Conservation Service to provide copies of fact sheets covering best management practices for: nutrient management; pesticide use; pest management; waste oil disposal; safe chemical handling; and/or safe chemical storage.
- ☐ Work with the local fuel and heating oil supplier to promote spill prevention and cleanup promote awareness.
- ☐ Work with the local farm chemical supplier to promote safe chemical storage and handling.
- ☐ Work with the local Future Farmers of America members to distribute educational materials or best management practices information.
- ☐ Purchase the property within the protection area if it becomes available.
- ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.

The following activities apply to specific agricultural potential contaminant sources in the protection area.

Potential Contaminant Source	Potential Strategies
Crops	☐ Work with the property owner on enrolling in the Conservation Reserve Program. ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Livestock	☐ Monitor a concentrated animal feeding operations compliance with Ohio Department of Agriculture rules. ☐ Work with local livestock owners to determine the placement of animal waste disposal areas or areas for burying dead livestock. ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Farm Chemical Distributor	☐ Work with the local farm chemical supplier to promote safe chemical storage, handling and disposal. ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Greenhouses/ Nurseries	☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Logging (Silviculture)	☐ Work with the logging company and property owners to plan/design/implement methods to control impacts to surface and ground water. ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.

MUNICIPAL POTENTIAL CONTAMINANT SOURCES
The following activities apply to most municipal potential contaminant sources in the protection area.

- ☐ Install secondary containment around above ground storage tanks and/or chemical storage areas.
- ☐ Obtain hazardous materials handling training for staff.
- ☐ Evaluate and update materials handling procedures.
- ☐ Implement "just-in-time" ordering for chemicals.
- ☐ Maintain compliance with Bureau of Underground Storage Tank Regulations rules.
- ☐ Maintain compliance with hazardous waste storage and disposal rules.
- ☐ Provide fact sheets covering best management practices for handling waste liquids.
- ☐ Implement best management practices at municipal facilities.
- ☐ Work with Ohio EPA to identify and implement pollution prevention strategies.
- ☐ Evaluate and close fire cisterns or other municipally owned wells.
- ☐ Conduct routine sewer inspections, maintenance & upgrades.
- ☐ Work to ensure salt and other material stockpiles are kept covered and on an impervious surface.
- ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.

The following activities apply to specific municipal potential contaminant sources in the protection area.

Potential Contaminant Source	Potential Strategies
Artificial Ground Water Recharge Area	☐ Develop and implement a plan to ensure recharge does not contaminate ground water. ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Composting/ Yard Waste Facilities	☐ Install containment to minimize impacts to surface and ground water. ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Recycling Facilities	☐ Install containment to minimize impacts to surface and ground water. ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Storm Water Basins	☐ Develop and implement a plan to ensure infiltration from storm water basins does not contaminate ground water. ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Wastewater Application Sites	☐ Monitor compliance with existing regulations through inspections and/or contact with regulatory agencies (Ohio EPA). ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Junk Yard: Auto and Scrap	☐ Consider an ordinance requiring auto salvage and scrap yards to install containment to minimize impacts to surface and ground water. ☐ Work with the owner or operator to plan/design/implement methods to control impacts to surface and ground water. ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Landscaping Firms	☐ Work with the owner to promote proper yard chemical use awareness among the customers. ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.

COMMERCIAL and INDUSTRIAL POTENTIAL CONTAMINANT SOURCES

The following activities apply to most commercial/industrial potential contaminant sources in the protection area.

- ☐ Monitor compliance with existing regulations through inspections and/or contact with regulatory agencies (such as the local fire department, State Fire Marshall, or the Ohio EPA).
- ☐ Consider an ordinance requiring facilities storing or using chemicals within the protection area to register with the municipality.
- ☐ Consider an ordinance requiring new underground storage tanks, above ground storage tanks or chemical storage areas installed in the protection area to meet higher spill prevention standards.
- ☐ Provide owners or operators with copies of fact sheets covering best management practices for handling waste liquids.
- ☐ Provides owners or operators with copies of material on underground storage tank maintenance.
- ☐ Encourage local businesses to investigate and implement pollution prevention strategies.
- ☐ Consider developing or changing zoning to control future growth within the protection area.
- ☐ Provide owners or operators with copies of fact sheets covering best management practices for handling waste liquids; spill prevention; pollution prevention; or applicable rules.
- ☐ Provide owners or operators with copies of material on equipment maintenance.
- ☐ Provide owners or operators with copies of material on underground storage tank maintenance.
- ☐ Provide educational material during routine inspections.
- ☐ Work with business owners or operators to implement a "just-in-time" ordering system for chemicals.
- ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.

The following activities apply to specific commercial/industrial potential contaminant sources in the protection area.

Potential Contaminant Source	Potential Strategies
Car Washes	☐ Work with the owner or operator to plan/design/implement methods to control impacts to surface and ground water. ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Gas Stations	☐ Monitor compliance with Bureau of Underground Storage Tank Regulations rules. ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Fleet / Truck / Bus Terminals	☐ Monitor compliance with Bureau of Underground Storage Tank Regulations rules. ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Golf Courses	☐ Work with the owner or operator to implement an Integrated Pest Management System. ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Gravel Pits & Quarries; Other surface Mines	☐ Purchase closed gravel pits or quarries within the protection area for development as parks. ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Heating Oil Companies	☐ Monitor compliance with Bureau of Underground Storage Tank Regulations rules. ☐ Work with the supplier to promote spill prevention and cleanup promotes awareness among its customers. ☐ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Junk Yards; Auto And Scrap	☐ Consider an ordinance requiring auto salvage and scrap yards to install containment to minimize impacts to surface and ground water. ☐ Work with the owner or operator to plan/design/implement methods to control impacts to surface and ground water. Control impacts to surface

	and ground water. □ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Landscaping Firms	□ Work with the owner to promote proper yard chemical use awareness among the customers. □ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.

WASTE DISPOSAL RELATED POTENTIAL CONTAMINANT SOURCES **The following activities apply to various waste disposals related potential contaminant sources in the protection area.**	
Potential Contaminant Source	**Potential Strategies**
Inactive / Closed Landfills	□ Monitor compliance with state environmental regulations. □ Work with the owner or operator to plan/design/implement methods to control impacts to surface and ground water. □ Work with the owner or operator to develop a strategy for beneficial future use of the property, such as a links style golf course. □ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Active Landfills	□ Monitor compliance with state environmental regulations □ Work to ensure local officials are aware that new or expanded Construction and Demolition Debris, Industrial, Municipal, and Residential Landfills are prohibited within the protection area. □ Work with the owner or operator to plan/design/implement methods to control impacts to surface and ground water. □ Work with the owner or operator to develop a strategy for beneficial future use of the property, such as a links style golf course. □ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Unknown Status Landfills	□ Work with Ohio EPA to determine the status of the landfill and if it poses a threat to surface and ground water. □ Identify and work with property owners to limit or eliminate access to properties used for illegal dumping. □ Provide local residents with information on illegal dumping and how to prevent or report it. □ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Cemeteries	□ Work with the manager to implement an Integrated Pest Management System. □ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Unused Wells	□ Work with property owners to properly seal unused wells. □ Contact the local health department about unused wells in the surrounding area. □ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.
Septic Systems	□ Monitor compliance with state and local environmental regulations. □ Work with owner or operator to implement methods to control impacts to surface and ground water. □ Abandon failing system and replace or construct sanitary sewers. □ OTHER SOURCE CONTROL STRATEGIES MAY BE AVAILABLE.

APPENDIX D

O.D.O.T. CALLOUT RESPONSIBILITIES TRUMBULL COUNTY

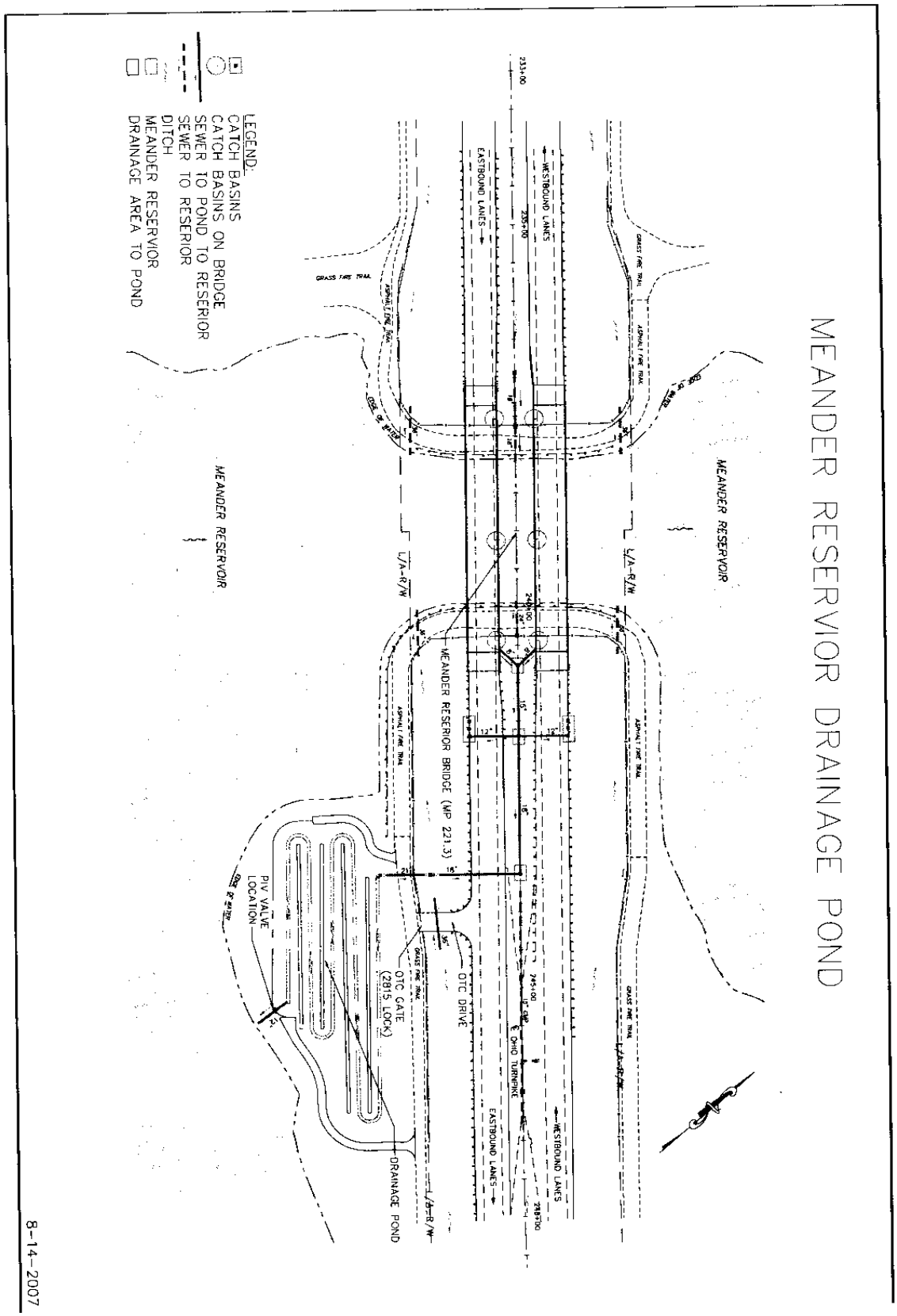
Effective April 1, 2008 the following supervisors are on call for the following months:

NAME	WORK PHONE	CELL
JOE PARTHMER	330-221-1748	330-719-6167
MIKE ROZZO	330-221-1747	330-770-7487

APPENDIX E

OHIO TURNPIKE COMMISSION'S HAZARDOUS SPILL PROCEDURES FOR MEANDER CREEK RESERVOIR

- Notify the Berea Telecommunications Center (Berea).
- Refer to the orange Emergency Response Guide Book in the OTC vehicle.
- Follow procedures learned in awareness/operations training for spill containment.
- Go to access gate at east end of bridge and enter drainage pond area.
- Walk to the left around the drainage pond area and close the red Personal Indicator Valve (PIV) valve. The PIV valve has a window that reads CLOSED or OPEN. The valve should be turned until it cannot be turned anymore and reads CLOSED.
- There are two ditch drains on the east end of the bridge and two ditch drains on the west end of the bridge that flow directly to the reservoir. The drainage to the four drains is from the 220.7 milepost to the 222.5 milepost.
- Depending on the location of the spill check one or all of the four ditch line drains leading to the reservoir for hazardous product. In any hazardous product is in a ditch contain it using accepted practices learned in your awareness/operations training.
- The Berea Telecommunications center will notify the Mahoning Valley Sewer District (330-799-6315) at of any spill that may impact the Meander Reservoir.


MEANDER RESERVIOR DRAINAGE POND
LEGEND:
CATCH BASINS
CATCH BASINS ON BRIDGE
SEWER TO POND TO RESERIOR
SEWER TO RESERIOR
DITCH
MEANDER RESERVIOR
DRAINAGE AREA TO POND
MEANDER RESERVOIR
MEANDER RESERIOR BRIDGE (MP 221.3)
WESTBOUND LANES
EASTBOUND LANES
OHIO TURNPIKE
OTC DRIVE
OTC GATE (2815 LOCK)
PIV VALVE LOCATION
DRAINAGE POND
GRASS FIRE TRAIL
ASPHALT FIRE TRAIL
L/A-R/W
8-14-2007

APPENDIX E (1)

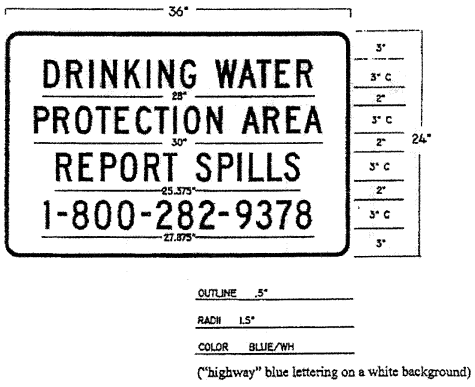
DRINKING WATER PROTECTION SIGNS NOW AVAILABLE

The Ohio EPA has worked with the Ohio Department of Transportation (ODOT) to develop a standard drinking water protection area road sign. The purpose of these signs are to provide a general awareness of the protection area to people who live, work, or are passing through the area, and also to provide the Ohio EPA emergency response phone number (1-800-282-9378) so that spills can be quickly reported. The community may request that a local emergency response number be placed on the sign instead of Ohio EPA's number, such as 9-1-1. ODOT has agreed to erect and maintain these signs on state highways/roads that intersect the five year time of travel (protection area) for community public water systems serving populations greater than 500 at no cost to the system.

If a public water system wishes to place signs on roads other than state roads or highways, it is requested that they use the sign design specifications shown below. Additional signs may be placed on an access road to the reservoir, on county or township roads that intersect the surface water protection area, or in parking lots or loading docks in the surface water protection area. The signs may be smaller than the specified size, but the colors should be the same (blue lettering on a white background). ODOT feels very strongly that a consistent sign design would provide uniformity across the state and would not confuse motorists.

Ohio Department of Transportation District Traffic Contacts – April, 2007

District	District Phone	Counties	Major City
District 4 Akron	**(800) 603-1054**	**Ashtabula, Mahoning, Portage, Stark, Summit, Trumbull**	**Akron**
District Contact:	**Ken Greene**		
Phone:	**(330) 786-3145**		
e-mail	**Ken.Greene@dot.state.oh.us**		



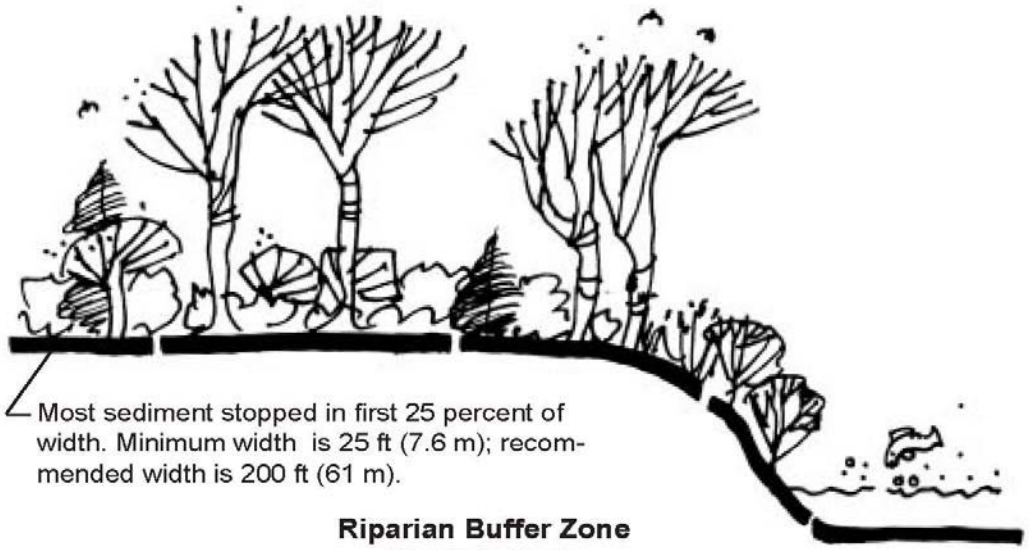
PRIMARY USE: Reduce pollution into streams.
ADDITIONAL USES: Reduce erosion; wildlife habitat; aethetics; provide shade to control water temperature.

RIPARIAN BUFFER ZONE

What is it? A riparian forest buffer is an area of trees, usually accompanied by shrubs and other vegetation, along a stream, river, or shoreline that is managed to maintain the integrity of the waterway, to reduce pollution, and to provide food, habitat, and thermal protection for fish and wildlife.

Purpose

Riparian forest buffers slow and filter nutrients and sediments out of stormwater before they reach the waterway. Forest buffers also stabilize streambanks and floodplains, reducing erosion. The cool stream temperatures maintained by riparian trees are essential for the survival of many fish and other aquatic species. Leaves and fallen logs and branches provide food and habitat for many organisms that are critical to the aquatic food chain. Riparian forest buffers can also attract birds and wildlife, providing important habitat and migration corridors for many species.



Riparian Buffer Zone
Section View

Limitations

Runoff into the buffer zone should not be channeled. Livestock should be prevented from entering the zone.

Materials

Existing natural vegetation is usually preferred. Planted stock may be used.

Installation

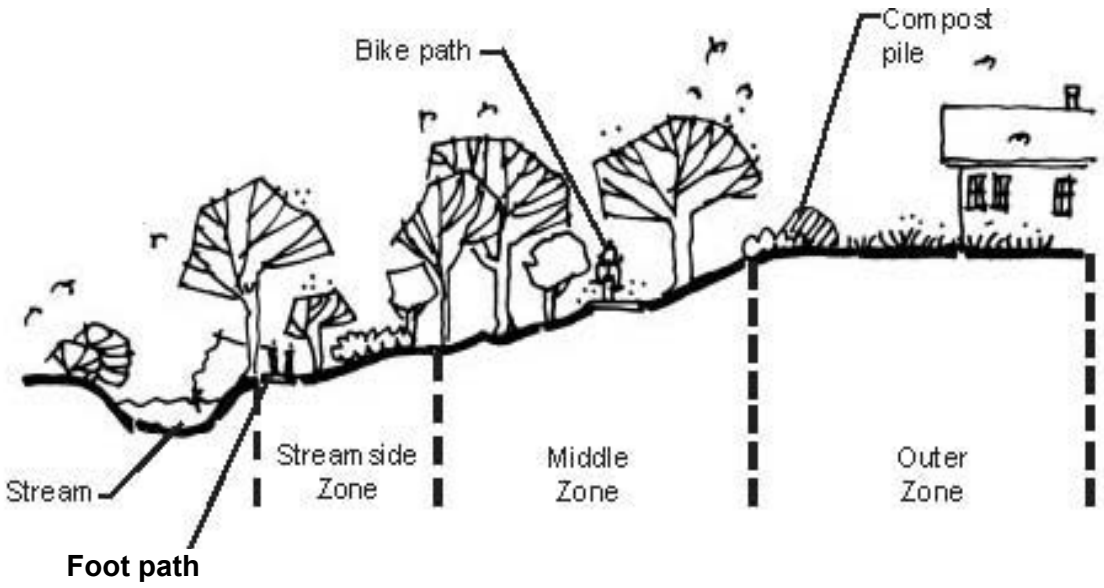
Buffer zone width is variable, depending upon location, erosion potential and slope. It should be wide enough so that no transported sediment is visible in the first (streamside) 25 percent of the zone.

Supplemental Information

RIPARIAN BUFFER ZONE

Additional Considerations and Drawings:

An effective urban riparian forest buffer can be viewed as three zones. The diagram below provides an example of the three zones, each of which performs a different function and has a different recommended width, vegetative cover, and use. The buffer width called for by various riparian forest buffer specifications ranges from 20200 ft (6-60 m), but a minimum buffer of 100 ft (30 m) on both sides of the stream is recommended for sufficient protection of the stream. This usually amounts to a buffer that is 3 to 5 mature trees wide on each side of the stream.



Three Zone Urban Stream Buffer System Section View

Supplemental Information

RIPARIAN BUFFER ZONE

Additional Considerations:

Characteristics	Streamside Zone	Middle Zone	Outer Zone
Function	Protect the physical integrity of the stream ecosystem	Provide distance between upland development and streamside zone	Prevent encroachment and filter backyard runoff
Width	Minimum of 25 ft (8 m) plus wetlands and critical habitat	50 – 100 ft (15 to 30 m) depending on stream order, slope and 100 year floodplain	25 ft (8 m) minimum setback to structures
Vegetative Target	Undisturbed mature forest; reforest if grass	Managed forest, some clearing allowable	Forest encouraged, but usually turfgrass
Allowable Uses	Very restricted e.g. flood control, footpaths, etc.	Restricted e.g. some recreational uses, some stormwater BMP's, bike paths	Unrestricted e.g. residential uses, including lawn, garden, compost, yard wastes, most stormwater BMP's

Relative effectiveness of different vegetation types for providing specific benefits.

	Vegetation Type		
Benefit	**Grass**	**Shrub**	**Tree**
Stabilize bank erosion	Low	High	High
Filter sediment	High	Low	Low
Filter nutrients, pesticides, microbes			
• Sediment bound • Soluble	High Medium	Low Low	Low Medium
Aquatic habitat	Low	Medium	High
Wildlife habitat			
• Range/pasture/prairie wildlife • Forest wildlife	High Low	Medium Medium	Low High
Economic products	Medium	Low	Medium
Visual diversity	Low	Medium	High
Flood protection	Low	Medium	High

Supplemental Information

RIPARIAN BUFFER ZONE

Additional Considerations:

Buffer width depends on both the character and the needs of the site.

Stabilize eroding banks -On smaller streams and lakes, good erosion control may require only the width of the bank to be covered with shrubs and trees. Extending buffer vegetation beyond the bank is necessary where more active bank erosion is occurring.

Filter sediment and sediment-attached contaminants from runoff - For slopes less than 15%, most sediment settling occurs within a 25-30 ft (8-9.25 m) wide buffer of grass. Greater width may be required for shrub and tree vegetation, on steeper slopes, or where sediment loads are particularly high.

Filter soluble nutrients and pesticides from runoff -Width up to 100 ft (30 m) or more may be necessary on steeper slopes and less-permeable soils to obtain sufficient capacity for infiltration of runoff, and vegetation and microbial uptake of nutrients and pesticides.

Provide shade, shelter, and food for aquatic organisms - Warm water fisheries may require only very narrow buffers, except where shade and temperature control is needed to discourage algae blooms. Width up to 100 ft (30 m) in trees may be needed for adequate shade and water temperature control for cold water fisheries in warmer climates.

Wildlife habitat - Width required is highly dependent upon desired species. For example, Nebraska NRCS Standards call for a minimum of 45 ft (14 m) of grass to promote upland game birds. Generally, larger animals have greater minimum width requirements, particularly interior forest species. Narrower width may be acceptable where a travel corridor is desired for connecting larger areas of habitat.

Source: NRCS Planning & Design Manual, NRCS.

APPENDIX G

Model Resolution for Townships of Mahoning and Trumbull Counties
to Establish Riparian Setbacks
Adapted from the Chagrin River Watershed Partners' Riparian Setback Model Ordinance
(Updated 11/3/2005)

WHEREAS, flooding is a significant threat to property and public health and safety, and vegetated riparian areas lessen the damage from flooding by slowing the water velocity, enabling water to soak into the ground, and by providing temporary storage of over bank flood flow; and,

WHEREAS, streambank erosion is a significant threat to property and public health and safety, and vegetated riparian areas stabilize streambanks and provide resistance to erosive forces both within streams and on adjacent lands; and,

WHEREAS, the protection of riparian areas results in the presence of plants best suited to each individual environment along a stream, with proven capability for survival and regeneration at no cost; and,

WHEREAS, vegetated riparian areas filter and trap sediments, chemicals, salts, septic discharge, and other pollutants from runoff and flood waters, thus protecting surface and ground water quality; and,

WHEREAS, vegetated riparian areas can provide a dense tree canopy that helps to maintain and improve the stability of watercourse temperature, thus protecting aquatic ecosystems, and helps to reduce the presence of aquatic nuisance species; and,

WHEREAS, the protection of riparian areas can result in a diverse and interconnected riparian corridor that provides habitat to a wide array of wildlife; and,

WHEREAS, the woody debris from fallen, damaged, and cut trees increases flood levels and damage to bridges in [community] and neighboring communities; and,

WHEREAS, sedimentation of eroded soil adversely affect aquatic communities and incurs removal costs to downstream communities; and,

WHEREAS, there are watershed-wide efforts to minimize flooding and stream bank erosion in the [watershed to which community belongs] watersheds to protect and enhance the water resources of [major watercourse to which community drains] and their tributaries and [community] recognizes its obligation as a part of these watersheds to minimize flooding and stream bank erosion by controlling runoff within its borders; and,

WHEREAS, the Alliance for Watershed Action and Riparian Easements (AWARE); the Eastgate Regional Council of Governments; the Mahoning County Soil & Water Conservation District; the Mahoning County Engineer; the Ohio Environmental Protection Agency; and the U.S. Environmental Protection Agency recommend riparian setbacks as a valuable tool in an overall management program for flood risk reduction, erosion control, water quality control, and aquatic habitat protection; and,

WHEREAS, studies undertaken by, and reviewed by, the Ohio Environmental Protection Agency and other independent scientific bodies recommend the minimum width for riparian setbacks; and,

WHEREAS, the Board of Trustees of [community] has reviewed and adopted the recommendations of the above government agencies, and the Board of Trustees finds that in order to minimize encroachment on watercourses and the need for costly engineering solutions to protect

structures and reduce property damage and threats to the safety of watershed residents; to protect and enhance the scenic beauty of [community]; and to preserve the character of [community], the quality of life of the residents of [community], and corresponding property values, it is necessary and appropriate to regulate structures and uses within a riparian setback along the banks of designated watercourses in [community]; and,

WHEREAS, Section 519.02 of the Ohio Revised Code grants townships the legal authority to adopt land use measures for promoting public health and safety of its citizens.

WHEREAS, 40 C.F.R. Parts 9, 122, 123, and 124, referred to as NPDES Storm Water Phase II, require designated communities, including [community], to develop a Storm Water Management Program to address the quality of storm water runoff during and after soil disturbing activities. The Mahoning County Storm Water Management Program was adopted on March 6, 2003.

NOW, THEREFORE, BE IT RESOLVED by the Board of Trustees of [community], County of Mahoning, State of Ohio, that:

SECTION 1: Resolution Article XXXX Riparian Setbacks, is hereby adopted to read in total as follows:

ARTICLE XXXX
RIPARIAN SETBACKS

XXXX.01 PURPOSE AND SCOPE

A. It is hereby determined that the system of rivers, streams, and other natural watercourses within the [community] contributes to the health, safety, and general welfare of the residents of the [community]. The specific purpose and intent of this regulation is to regulate uses and developments within riparian setbacks that would impair the ability of riparian areas to:

1. Reduce flood impacts by absorbing peak flows, slowing the velocity of flood waters, and regulating base flow.

2. Assist stabilizing the banks of watercourses to reduce woody debris from fallen or damaged trees, stream bank erosion, and the downstream transport of sediments eroded from watercourse banks.

3. Reduce pollutants in watercourses during periods of high flows by filtering, settling, and transforming pollutants already present in watercourses.

4. Reduce pollutants in watercourses by filtering, settling, and transforming pollutants in runoff before they enter watercourses.

5. Provide watercourse habitats with shade and food.

6. Reduce the presence of aquatic nuisance species to maintain a diverse aquatic system.

7. Provide habitat to a wide array of wildlife by maintaining diverse and connected riparian vegetation.

8. Benefit the [community] by minimizing encroachment on watercourse channels and the need for costly engineering solutions such as gabion baskets and rip rap to protect structures and reduce property damage and threats to the safety of watershed residents; and by contributing to the scenic beauty and environment of the [community], and thereby preserving the character of the [community], the quality of life of the residents of the [community], and corresponding property values.

B. The following regulation has been enacted to protect and enhance these functions of riparian areas by providing reasonable controls governing structures and uses within a riparian setback along designated watercourses in the [community].

XXXX.02 APPLICABILITY, COMPLIANCE & VIOLATIONS

A. This regulation shall apply to all zoning districts.
B. This regulation shall apply to all structures and uses on lands containing a designated watercourse as defined in this regulation, except as provided herein.
C. No approvals or permits shall be issued by the [community] without full compliance with the terms of this regulation.

XXXX.03 CONFLICTS WITH OTHER REGULATIONS & SEVERABILITY

A. Where this regulation imposes a greater restriction upon land than is imposed or required by any other provision of law, regulation, contract, or deed, the provisions of this regulation shall control.

B. This regulation shall not limit or restrict the application of other provisions of law, regulation, contract, or deed, or the legal remedies available thereunder, except as provided in Section

XXXX.03 (A) of this regulation.

C. If any clause, section, or provision of this regulation is declared invalid or unconstitutional by a court of competent jurisdiction, validity of the remainder shall not be affected thereby.

XXXX.04 DEFINITIONS

For the purpose of this regulation, the following terms shall have the meaning herein indicated:

A. CAPTURED OR CHANNELIZED STREAMS: Streams that are considered captured or channelized are those that are constructed in waters of the U.S. or connect two waters of the U.S., and they possess a defined ordinary high water mark (OHW), and they possess a defined channel and evidence of stream flow.

B. COMMUNITY: Throughout this regulation, this shall refer to [community] or its designated representatives, boards, or commissions.

C. DAMAGED OR DISEASED TREES: Trees that have split trunks; broken tops; heart rot; insect or fungus problems that will lead to imminent death; undercut root systems that put the tree in imminent danger of falling; lean as a result of root failure that puts the tree in imminent danger of falling; or any other condition that puts the tree in imminent danger of being uprooted or falling into or along a watercourse or onto a structure.

D. DESIGNATED WATERCOURSE: A watercourse within the [community] that is in conformity with the criteria set forth in this regulation.

E. FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA): The agency with overall responsibility for administering the National Flood Insurance Program.

F. IMPERVIOUS COVER: Any paved, hardened, or structural surface regardless of its composition including but not limited to buildings, roads, driveways, parking lots, loading/unloading areas, decks, patios, and swimming pools.

G. NATURAL STREAM CHANNEL DESIGN: Practices undertaken to stabilize stream systems by restoring natural function and morphology. Natural channel design stream restoration and/or streambank stabilization projects should comply with principles laid out in the following publications:

Stream Corridor Restoration: Principles, Processes, and Practices
The Federal Interagency Stream Restoration Working Group, October 1998.

Applied River Morphology, Second Edition, Dr. Dave Rosgen, October 2002.

NRCS Field Office Technical Guide, Natural Resource Conservation Service

H. NOXIOUS WEED: Any plant species defined by the Ohio Department of Agriculture as a “noxious weed” and listed as such by the Department. For the purposes of this regulation, the most recent version of this list at the time of application of this regulation shall prevail.

I. 100-YEAR FLOODPLAIN: Any land susceptible to being inundated by water from a base flood. The base flood is the flood that has a one percent or greater chance of being equaled or exceeded in any given year.

J. OHIO ENVIRONMENTAL PROTECTION AGENCY: Referred throughout this regulation as the "Ohio EPA."

K. ORDINARY HIGH WATER MARK: The point of the bank or shore to which the presence and action of surface water is so continuous as to leave a district marked by erosion, destruction or prevention of woody terrestrial vegetation, predominance of aquatic vegetation, or other easily recognized characteristic. The ordinary high water mark defines the bed of a watercourse.

L. RIPARIAN AREA: Naturally vegetated land adjacent to watercourses that, if appropriately sized, helps to stabilize streambanks, limit erosion, reduce flood size flows, and/or filter and settle out runoff pollutants, or performs other functions consistent with the purposes of this regulation.

M. RIPARIAN SETBACK: The real property adjacent to a designated watercourse located in the area defined by the criteria set forth in this regulation.

N. SOIL AND WATER CONSERVATION DISTRICT: An entity organized under Chapter 1515 of the Ohio Revised Code referring to either the Soil and Water Conservation District Board or its designated employee(s), hereinafter referred to as [county] SWCD.

O. SOIL DISTURBING ACTIVITY: Clearing, grading, excavating, filling, or other alteration of the earth’s surface where natural or human made ground cover is destroyed and which may result in, or contribute to, erosion and sediment pollution.

P. SUBSTANTIAL DAMAGE: Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would be equal to, or would exceed, 50% of the market value of the structure before the damage occurred.

Q. WATERCOURSE: Any brook, channel, creek, river, or stream having banks, a defined bed, and a definite direction of flow, either continuously or intermittently flowing.

R. WETLAND: Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs, and similar areas. (40 CFR 232, as amended).

XXXX.05 ESTABLISHMENT OF DESIGNATED WATERCOURSES AND RIPARIAN SETBACKS

A. Designated watercourses shall include those watercourses meeting any ONE of the following criteria:

1. All watercourses draining an area greater than ½ square mile, OR

2 All watercourses draining an area less than ½ square mile and having a defined bed and bank. In determining if watercourses have a defined bed and bank, the [community] may consult with a

representative of the [county] SWCD or other technical experts as necessary. Any costs associated with such consultations may be assessed to the applicant, OR

3. All previously natural watercourses that are channelized, enclosed by pipe, or captured.

B. Riparian setbacks on designated watercourses are established as follows:

1. A minimum of 120 feet on either side of all watercourses draining an area greater than 20 square miles and up to 300 square miles.

2. A minimum of 75 feet on either side of all watercourses draining an area greater than ½ square mile and up to 20 square miles.

3. A minimum of 25 feet on either side of all watercourses draining an area less than ½ square mile and having a defined bed and bank as determined by the [community] in Section XXXX.05 of this regulation.

C. Riparian Setback Map. The [community] shall create a map identifying designated watercourses and their riparian setbacks. Said map is attached hereto and made part of this regulation and is identified as Exhibit A. The following shall apply to the Riparian Setback Map:

1. It shall be used as a reference document and the information contained therein shall be believed to be accurate.

2. It shall be a guide only.

3. Nothing herein shall prevent the [community] from making additions, amendments, revisions, or deletions from the Riparian Setback Map from time to time as may be necessary.

4. If any discrepancy is found between the Riparian Setback Map and this regulation, the criteria set forth in Section XXXX.05 (A) and (B) shall prevail.

D. The following conditions shall apply in riparian setbacks:

1. Riparian setbacks shall be measured in a horizontal direction outward from the ordinary high water mark of each designated watercourse.

2. Riparian setbacks shall be measured in a horizontal direction outward from the outside diameter of the outermost pipe.

3. Riparian setback shall be measured in a horizontal direction outward from the center of the captured stream.

4. Except as otherwise provided in this regulation, riparian setbacks shall be preserved in their natural state.

5. Where the 100-year floodplain is wider than a minimum riparian setback on either or both sides of a designated watercourse, the minimum riparian setback shall be extended to the outer edge of the 100-year floodplain. The 100-year floodplain shall be defined by FEMA. If a FEMA defined floodplain does not exist for a designated watercourse, the [community] may require a site-specific floodplain delineation in conformance with standard engineering practices and approved by the [community]. Any costs associated with reviewing this site-specific floodplain delineation may be assessed to the applicant.

6. Where a wetland is identified within a minimum riparian setback, the minimum riparian setback width shall be extended to the outermost boundary of the wetland. Wetlands shall be delineated through a site survey prepared by a qualified wetlands professional retained by the landowner using delineation

protocols accepted by the U.S. Army Corps of Engineers at the time an application is made under this regulation. Any costs associated with reviewing these delineations may be assessed by the [community] to the applicant.

XXXX.06 APPLICATIONS AND SITE PLANS

A. The applicant shall be responsible for delineating riparian setbacks as required by this regulation and shall identify such setbacks on a site plan included with all subdivision plans, land development plans, and/or zoning permit applications submitted to the [community]. The site plan shall be prepared by a professional engineer, as determined by the [community] and shall be based on a survey of the affected land. Two (2) copies of the site plan shall be submitted. The site plans shall include the following information:

1. The boundaries of the lot with dimensions.

2. The locations of all designated watercourses.

3. The limits, with dimensions, of the riparian setbacks.

4. The existing topography at intervals of two (2) feet.

5. The location and dimensions of any proposed structures or uses, including proposed soil disturbance, in relationship to all designated watercourses.

6. North arrow, scale, date, and stamp bearing the name and registration number of the qualified professional who prepared the site plan.

7. Other such information as may be necessary for the [community] to ensure compliance with this regulation.

B. The [community] may, in reviewing the site plan, consult with the [county] SWCD or other such experts. Any costs associated with this review may be assessed to the applicant. The site plan shall not take the place of a soil erosion and sedimentation control plan and/or a storm water pollution prevention plan.

C. If soil disturbing activities will occur within 50 feet of the outer boundary of the applicable riparian setback as specified in this regulation, the riparian setback shall be clearly identified by the applicant on site with construction fencing as shown on the site plan. Such identification shall be completed prior to the initiation of any soil disturbing activities and shall be maintained throughout soil disturbing activities.

D. No approvals or permits shall be issued by the [community] prior to identification of riparian setbacks on the affected land in conformance with this regulation.

XXXX.07 PERMITTED STRUCTURES AND USES WITHOUT ZONING CERTIFICATE

The following structures and uses are permitted in the riparian setback without a zoning certificate. No structures or uses permitted under this regulation shall allow trespass on, or public access to, privately held lands.

1. Recreational Activity. Hiking, fishing, hunting, picnicking, and similar passive recreational uses, as permitted by federal, state, and local laws.

2. Removal of Damaged or Diseased Trees. Damaged or diseased trees may be removed.

3. Revegetation and/or Reforestation. Riparian setbacks may be revegetated and/or reforested with native, noninvasive plant species. A list of invasive plant species and suitable alternatives can be found in Appendix XX of this regulation.

4. Water Supply Wells. Water supply wells for the purpose of serving permitted structures or uses on lots of record shall be allowed.

XXXX.08 PERMITTED STRUCTURE AND USES WITH ZONING CERTIFICATE

The following structures and uses may be permitted in a riparian setback, subject to the approval of an application for a zoning certificate by the Zoning Inspector and in accordance with the following regulations and such other applicable regulations contained in this zoning resolution. When granting Zoning Certificates for the following uses, the Zoning Inspector may, for good cause, attach such conditions as it deems appropriate. Certificates issued under this regulation are issued to the applicant only, shall not be transferred, and shall be void if not implemented within one (1) year of issuance.

1. Crossings: Crossings of designated watercourses through riparian setbacks with roads, driveways, easements, bridges, culverts, utility service lines, or other means may be permitted provided such crossings minimize disturbance in riparian setbacks and mitigate any necessary disturbances. Such crossings shall be designed by a professional engineer and only be undertaken upon approval of a Crossing Plan by the [community] Zoning Inspector. Any costs associated with review of Crossing Plans may be assessed to the applicant. If work will occur below the ordinary high water mark of the designated watercourse, proof of compliance with the applicable conditions of a US Army Corps of Engineers Section 404 Permit (either a Nationwide Permit, including the Ohio State Certification Special Conditions and Limitations, or an Individual Permit, including Ohio 401 water quality certification), shall also be provided to the [community]. Proof of compliance shall be the following:

a. A site plan showing that any proposed crossing conforms to the general and special conditions of the applicable Nationwide Permit, or
b. A copy of the authorization letter from the U.S. Army Corps of Engineers approving activities under the applicable Nationwide Permit, or
c. A copy of the authorization letter from the U.S. Army Corps of Engineers approving activities under an Individual Permit.

2. Streambank Stabilization Projects. Streambank stabilization projects along designated watercourses may be allowed, provided that such measures use natural stream channel design principles. Such streambank stabilization measures shall only be undertaken upon approval of a Streambank Stabilization Plan by the Zoning Inspector. Any costs associated with review of Streambank Stabilization Plans may be assessed to the applicant. If streambank stabilization work is proposed below the ordinary high water mark of the designated watercourse, proof of compliance with the applicable conditions of a US Army Corps of Engineers Section 404 Permit (either a Nationwide Permit 13, including the Ohio State Certification Special Conditions and Limitations, or an Individual Permit, including Ohio 401 water quality certification) shall be provided to the [community]. Proof of compliance shall be the following:

a. A site plan showing that any proposed crossing conforms to the general and special conditions of Nationwide Permit 13, or
b. A copy of the authorization letter from the U.S. Army Corps of Engineers approving activities under Nationwide Permit 13, or,
c. A copy of the authorization letter from the U.S. Army Corps of Engineers approving activities under an Individual Permit.

XXXX.09 USES PROHIBITED IN RIPARIAN SETBACKS

Any use not authorized under this regulation shall be prohibited in riparian setbacks. By way of example, the following uses are specifically prohibited, however, prohibited uses are not limited to those examples listed here:

A. Construction. There shall be no buildings or structures of any kind.

B. Dredging or Dumping. There shall be no filling, dredging, or dumping of soil, spoils, liquid, or solid materials.

C. Fences and Walls: There shall be no fences or walls, except as permitted under this regulation.

D. Roads or Driveways. There shall be no roads or driveways, except as permitted under this regulation.

E. Motorized Vehicles. There shall be no use, parking, or storage of motorized vehicles, except as permitted under this regulation.

F. Disturbance of Natural Vegetation: There shall be no disturbance of natural vegetation within riparian setbacks except for the following:

1. Maintenance of lawns, landscaping, shrubbery, or trees existing at the time of passage of this regulation.
2. Cultivation of lawns, landscaping, shrubbery, or trees in accordance with an approved Landscaping Plan submitted in conformance with this regulation.
3. Conservation measures designed to remove damaged or diseased trees or to control noxious weeds or invasive species.

G. Parking Spaces or Lots and Loading/Unloading Spaces for Vehicles: There shall be no parking spaces, parking lots, or loading/unloading spaces.

H. New Surface and/or Subsurface Sewage Disposal or Treatment Areas. Riparian setbacks shall not be used for the disposal or treatment of sewage, except as necessary to repair or replace an existing home sewage disposal system in accordance with local health district regulations.

I. Storm Water Retention and Detention Facilities: Riparian setbacks shall not be used for storm water retention and detention facilities

XXXX.10 NON-CONFORMING STRUCTURES OR USES IN RIPARIAN SETBACKS

A. A non-conforming use, existing at the time of passage of this regulation and within a riparian setback, that is not permitted under this regulation may be continued but shall not be changed or enlarged unless changed to a use permitted under this regulation.

B. A non-conforming structure, existing at the time of passage of this regulation and within a riparian setback, that is not permitted under this regulation may be continued but shall not have the existing building footprint or roofline expanded or enlarged.

C. A non-conforming structure or use, existing at the time of passage of this regulation and within a riparian setback, that has substantial damage and that is discontinued, terminated, or abandoned for a period of two (2) years or more may not be revived, restored, or re-established.

XXXX.11 VARIANCES WITHIN RIPARIAN SETBACKS

A. The Board of Zoning Appeals may grant a variance to this regulation as provided herein. In granting a variance, the following conditions shall apply:

1. In determining whether there is unnecessary hardship with respect to the use of a property or practical difficulty with respect to maintaining the riparian setback as established in this regulation, such as to justify the granting of a variance, the Board of Zoning Appeals shall consider the potential harm or reduction in riparian functions that may be caused by a proposed structure or use.

2. The Board of Zoning Appeals may not authorize any structure or use in a Zoning District other than those authorized in the Zoning Code.

3 Variances shall be void if not implemented within one (1) year of the date of issuance.

B. In making a determination under Section XXXX.10 (A) of this regulation, the Board of Zoning Appeals may consider the following:

1. The natural vegetation of the property as well as the percentage of the parcel that is in the 100-year floodplain. The criteria of Article XXXX Flood Damage Prevention may be used as guidance when granting variances in the 100-year floodplain.

2. The extent to which the requested variance impairs the flood control, erosion control, water quality protection, or other functions of the riparian setback. This determination shall be based on sufficient technical and scientific data.

3. The degree of hardship, with respect to the use of a property or the degree of practical difficulty with respect to maintaining the riparian setback as established in this regulation, placed on the landowner by this regulation and the availability of alternatives to the proposed structure or use.

4. Soil-disturbing activities permitted in the riparian setback through variances should be implemented to minimize clearing to the extent possible and to include Best Management Practices necessary to minimize erosion and control sediment.

5. The presence of significant impervious cover, or smooth vegetation such as maintained lawns, in the riparian setback compromises its benefits to the [community]. Variances should not be granted for asphalt or concrete paving in the riparian setback. Variances may be granted for gravel driveways when necessary.

6. Whether a property, otherwise buildable under the ordinances of the [community], will be made unbuildable because of this regulation.

C. In order to maintain the riparian setback to the maximum extent practicable, the Board of Zoning Appeals may consider granting variations to other area or setback requirements imposed on a property by the Zoning Code.

D. In granting a variance under this regulation, the Board of Zoning Appeals, for good cause, may impose such conditions that it deems appropriate to maintain the purposes of this regulation.

XXXX.12 PROCEDURES FOR VARIANCES & APPEALS

Any applicant seeking a variance to the conditions imposed under this regulation or an appeal to an administrative decision made under this regulation, follow procedures as set forth in Article XXXX Section XXXX Page XX.

XXXX.13 INSPECTION OF RIPARIAN SETBACKS

A. The identification of riparian setbacks shall be inspected by the [community]:

B. Prior to soil disturbing activities authorized under this regulation. The applicant shall provide the [community] with at least fifteen (15) working days written notice prior to starting such soil disturbing activities.

C. Any time evidence is brought to the attention of the [community] that uses or structures are occurring that may reasonably be expected to violate the provisions of this regulation.
XXXX.14 PENALTY

A. Any person who shall violate any section of this regulation shall be guilty of a minor misdemeanor of the fourth degree and, upon conviction thereof, shall be subject to punishment as provided in Section 519.99 of the Ohio Revised Code and shall be required to restore the riparian setback through a restoration plan approved by the Board of Zoning Appeals.

B. The imposition of any other penalties provided herein shall not preclude the [community] from instituting an appropriate action or proceeding in a Court of proper jurisdiction to prevent an unlawful development, or to restrain, correct, or abate a violation, or to require compliance with the provisions of this regulation or other applicable laws, ordinances, rules, or regulations, or the orders of the [community] Zoning Inspector.

APPENDIX H

Education and Outreach Materials

Source Water Protection Education Brochure
This is a tri-folding brochure that Ohio EPA can personalize for any Public Water System.

Example News Releases
Ohio EPA can assist with providing a map of any Public Water System's Protection Area.

Drinking Water Source Protection Area Road Signs

Educational Materials

- **Aware Posters/Pamphlets**
- **Ohio EPA website/Fact Sheets**
- **Ohio EPA – Drinking Water Security Posters**
- **Ohio EPA – Storm Water Permitting**
- **ODOT Road Signs**
- **Public Announcements**
- **Trumbull Soil & Water Conservation District Literature & Website**
- **Mahoning Soil & Water Conservation District Literature & Website**
- **Trumbull County Sanitary Engineer's – A guide for Sanitary Sewer Extensions**
- **United State Department of Agriculture – The Conservation Program Literature**
- **Zoning Ordinances**


DRINKING WATER SECURITY
report suspicious activity
at reservoirs
at utilities
at water mains
WE'RE ALL IN THIS TOGETHER
FOR EMERGENCIES :
FOR MORE INFORMATION :
EPA United States Environmental Protection Agency
www.epa.gov/safewater/security
Office of Water (4606)
EPA 810-F-03-001
April 2003


DRINKING WATER SECURITY
report suspicious activity
watch out!
help out!
report it!
PROTECT
DRINKING
WATER
101
WE'RE ALL IN THIS TOGETHER
FOR EMERGENCIES:
FOR MORE INFORMATION:
EPA United States Environmental Protection Agency
www.epa.gov/safewater/security
Office of Water (4606)
EPA 810-F-03-004
April 2003

OhioEPA

District Offices

CDO **Central District Office**
122 South Front St.
Columbus, Ohio 43215
(614) 728-3778
FAX: (614) 728-3898
1-800-686-2330

NEDO **Northeast District Office**
2110 E. Aurora Road
Twinsburg, Ohio 44087
(330) 425-9171
FAX: (330) 487-0769
1-800-686-6330

NWDO **Northwest District Office**
347 North Dunbridge Road
Bowling Green, Ohio 43402
(419) 352-8461
FAX: (419) 352-8468
1-800-686-6930

SEDO **Southeast District Office**
2195 Front Street
Logan, Ohio 43138
(740) 385-8501
FAX: (740) 385-6490
1-800-686-7330

SWDO **Southwest District Office**
401 East Fifth Street
Dayton, Ohio 45402-2911
(937) 285-6357
FAX: (937) 285-6249
1-800-686-8930

OhioEPA

Division of Drinking and Ground Waters
P.O. Box 1049
Columbus, Ohio 43216-1049
(614) 644-2752
24-Hour Emergency # 1-800-282-9378

OhioEPA

State of Ohio Environmental Protection Agency

Partners in Protection

Keeping Our Drinking Water System Secure

To protect the public's drinking water supply, law enforcement officials and local drinking water systems must work together to develop protocols for patrolling water systems and reporting and investigating any security breaches.

A ***credible threat*** is an event that indicates potential contamination of a water supply. Trespassing, vandalism and thefts must be treated as credible threats until investigated and proven otherwise.

The following are ***crimes*** under the federal Safe Drinking Water Act.

- Tampering with a public water system; punishable by up to 20 years in prison and up to $1,000,000 fine.

- Attempting to tamper or threatening to tamper with a public water system; punishable by up to 10 years in prison and up to $100,000 fine.

Tampering is defined as introducing a contaminant into a public water system with the intention of harming persons, or interfering with the operations of a water system with the intent to harm.

So, how do you build an effective drinking water security program? Here are some tips.

- Be sure all personnel know the locations of water treatment plants, water tanks, raw water supplies, security perimeters and other vulnerable areas within the water treatment and supply system.

- Implement regular patrols of the areas mentioned above. Be sure all personnel are informed of any new infrastructure or changes in security systems and procedures.

- If there is a security breach, activate the water system's emergency response or contingency plan, follow all local procedures and immediately alert:

  - the public water system;

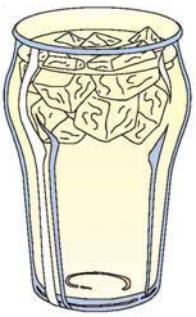
  - local law enforcement office;

  - Ohio EPA, Division of Drinking and Ground Waters (district office); and

  - if terrorism is suspected, the FBI.

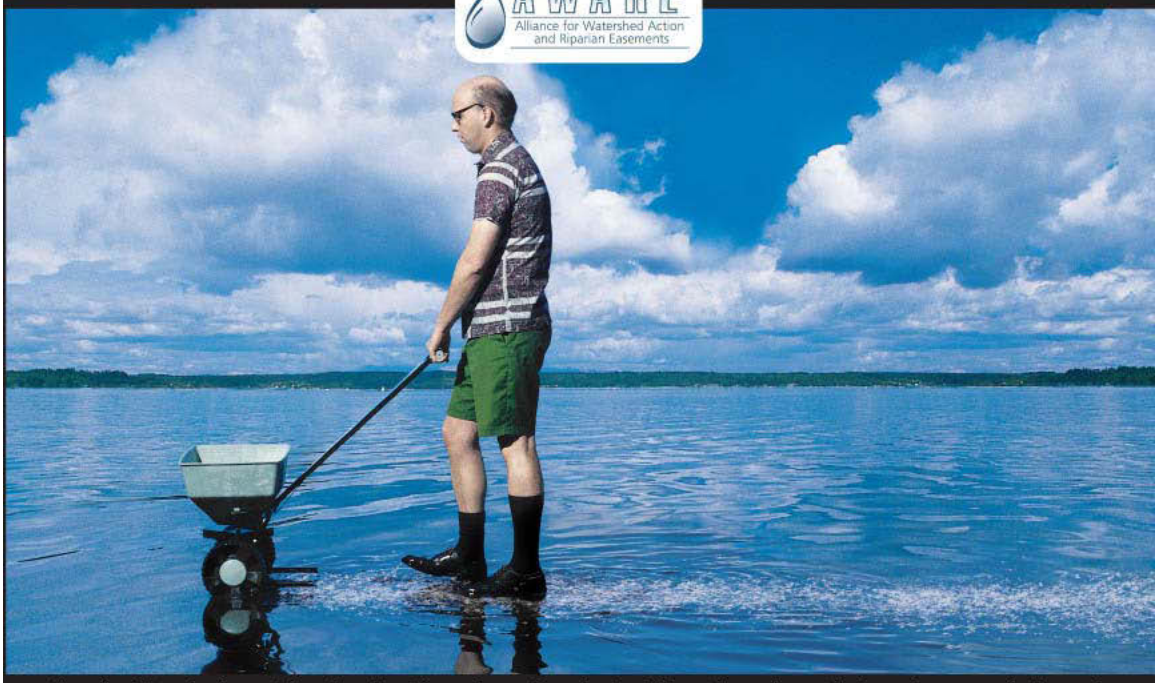
- Be aware of the penalties and fines assessed to anyone who tampers with a public water system.

Ohio EPA's Division of Drinking and Ground Waters is pleased to foster relationships between public drinking water systems and Ohio's law enforcement officials. When it comes to safe drinking water, we all have a stake in it.



WHEN YOU'RE FERTILIZING THE LAWN, REMEMBER YOU'RE NOT JUST FERTILIZING THE LAWN.

AWARE
Alliance for Watershed Action and Riparian Easements



You fertilize the lawn. Then it rains. The rain washes the fertilizer along the curb, into the storm drain, and directly into our Mahoning County lakes, streams and ponds. This causes algae to grow, which uses up oxygen that fish need to survive. So if you fertilize, please follow directions and use sparingly.

CLEAN WATER IS IMPORTANT TO ALL OF US

It's up to all of us to make it happen. In recent years, sources of water pollution like industrial wastes from factories have been greatly reduced. Now, more than 60 percent of water pollution comes from things like cars leaking oil, fertilizers from farms and gardens, and failing septic tanks. All these sources add up to a big pollution problem. But each of us can do small things to help clean up our water too. And that adds up to a pollution solution!

Why do we need clean water?

Having clean water is of primary importance for our health and economy. Clean water provides recreation, commercial opportunities, fish habitat, drinking water and adds beauty to our landscape. All of us benefit from clean water. And all of us have a role in getting and keeping our lakes, rivers, marine and ground waters clean.

What's the problem with fertilizer?

Fertilizer isn't a problem if it's used carefully. If you use too much fertilizer or apply it at the wrong time, it can easily wash off your lawn or garden into storm drains and then flow untreated into lakes or streams. Just like in your garden, fertilizer in lakes and streams makes plants grow. In water bodies, extra fertilizer can mean extra algae and aquatic plant growth. Too much algae harms water quality and makes boating, fishing and swimming unpleasant. As algae decay, they use up oxygen in the water that fish and other wildlife need.

CLEAN WATER TIPS:

How can you fertilize and help keep our waters clean?

Here are some options:

- Use fertilizers sparingly. Many plants do not need as much fertilizer or need it as often as you might think.
- Don't fertilize before a rain storm.
- Consider using organic fertilizers; they release nutrients more slowly.
- Use commercially available compost or make your own using garden waste. Mixing compost with your soil means your plants will need less chemical fertilizer and puts your waste to good use. Commercial compost and soil amendments may be available from your solid waste or wastewater utility as well as your local garden store.
- For more information on fertilizing alternatives and composting, call your County Extension's Master Gardeners program or the number in your community listed below.

This information is brought to you by Alliance for Watershed Action and Riparian Easement, AWARE, Mahoning County OH. Text and photo provided by the Pugent Sound Action Team and the Water Quality Consortium.

AWARE
Alliance for Watershed Action and Riparian Easements

WEBSITE: www.watershed.cboss.com • 330.740.7995 • 330.702.3000 • EMAIL: askswcd@mahoningcountyoh.gov

WHEN YOU'RE WASHING YOUR CAR IN THE DRIVEWAY, REMEMBER YOU'RE NOT JUST WASHING YOUR CAR IN THE DRIVEWAY.

AWARE
Alliance for Watershed Action and Riparian Easements

All the soap, scum, and oily grit runs along the curb. Then into the storm drain and directly into our Mahoning County lakes, streams and ponds. And that causes pollution, which is unhealthy for fish. So how do you avoid this whole mess? Easy. Wash your car on grass or gravel instead of the street. Or better yet, take it to a car wash where the water gets treated and recycled.

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It's up to all of us to make it happen. In recent years, sources of water pollution like industrial wastes from factories have been greatly reduced. Now, more than 60 percent of water pollution comes from things like cars leaking oil, fertilizers from farms and gardens, and failing septic tanks. All these sources add up to a big pollution problem. But each of us can do small things to help clean up our water too. And that adds up to a pollution solution!

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What's the problem with car washing?

There's no problem with washing your car. It's just how and where you do it. Most soap contains phosphates and other chemicals that harm fish and water quality. The soap, together with the dirt and oil washed from your car, flows into nearby storm drains which run directly into lakes, rivers or marine waters. The phosphates from the soap can cause excess algae to grow. Algae look bad, smell bad, and harm water quality. As algae decay, the process uses up oxygen in the water that fish need.

CLEAN WATER TIPS:

How can you wash your car and help keep our waters clean?

Here are some options:

- Use soap sparingly. Use a hose nozzle with a trigger to save water.
- Pour your bucket of soapy water down the sink when you're done, not in the street. Or wash your car on a grassy area so the ground can filter the water naturally.
- Best of all, take your car to a commercial car wash, especially if you plan to clean the engine or the bottom of your car. Most car washes re-use wash water several times before sending it to the sewer system for treatment.
- To find out more about the impacts from washing your vehicle and what you can do to prevent water pollution, call the number in your community listed below.

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WHEN YOUR PET GOES ON THE LAWN, REMEMBER IT DOESN'T JUST GO ON THE LAWN.

AWARE
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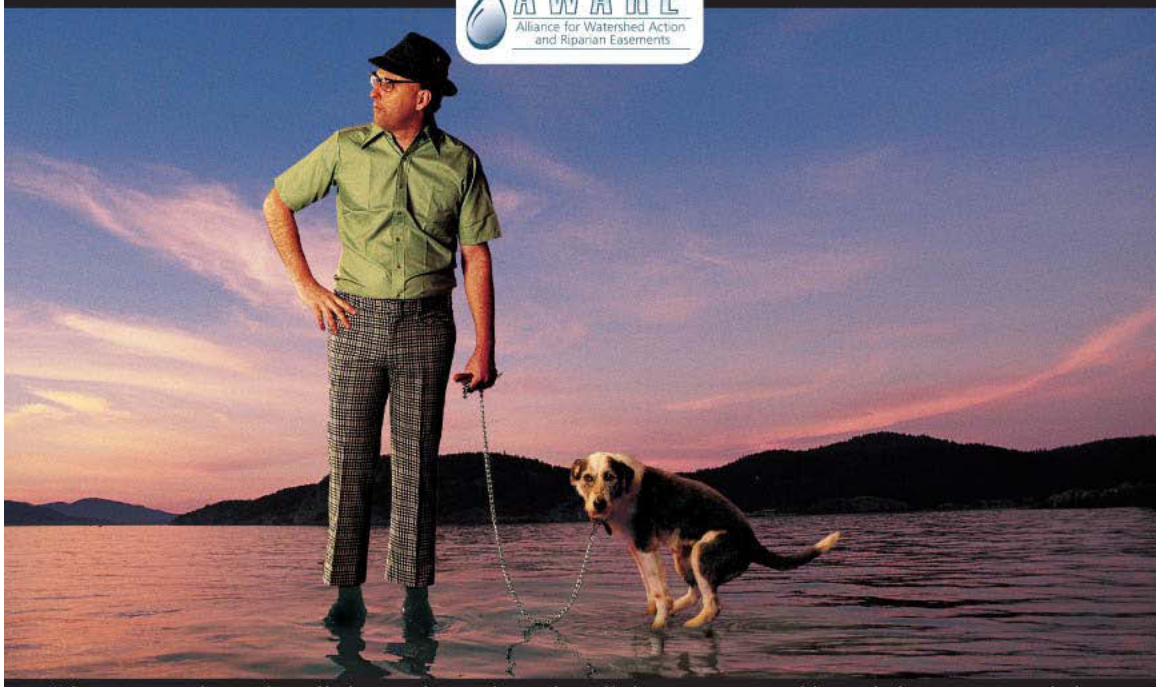

When our pets leave those little surprises, rain washes all that pet waste and bacteria into our storm drains. And then pollutes our Mahoning County waterways. So what to do? Simple. Dispose of it properly (preferably in the toilet). Then that little surprise gets treated like it should.

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What's the problem with pet waste?

It's a health risk to pets and people, especially children. It's a nuisance in our neighborhoods. Pet waste is full of bacteria that can make people sick. If it's washed into the storm drain and ends up in a lake, stream or marine water, the bacteria ends up in the fish. People who eat those fish can get very sick. Unless people take care of it, the waste enters our water with no treatment.

CLEAN WATER TIPS:

How can you get rid of pet waste and help keep our waters clean? Here are some options:

- Scoop it up and flush it down the toilet. That's best because then your community sewage treatment plant or your septic system treats the pet waste.
- Seal the waste in a plastic bag and throw it in the garbage. (This is legal in most areas, but check local laws.)
- Bury small quantities in your yard where it can decompose slowly. Dig a hole one foot deep. Put three to four inches of waste at the bottom of the hole. Cover the waste with at least eight inches of soil. Bury the waste in several different locations in your yard and keep it away from vegetable gardens.
- To find out more about the problems of pet waste and what you can do to prevent water pollution, call the number of your local community listed below.

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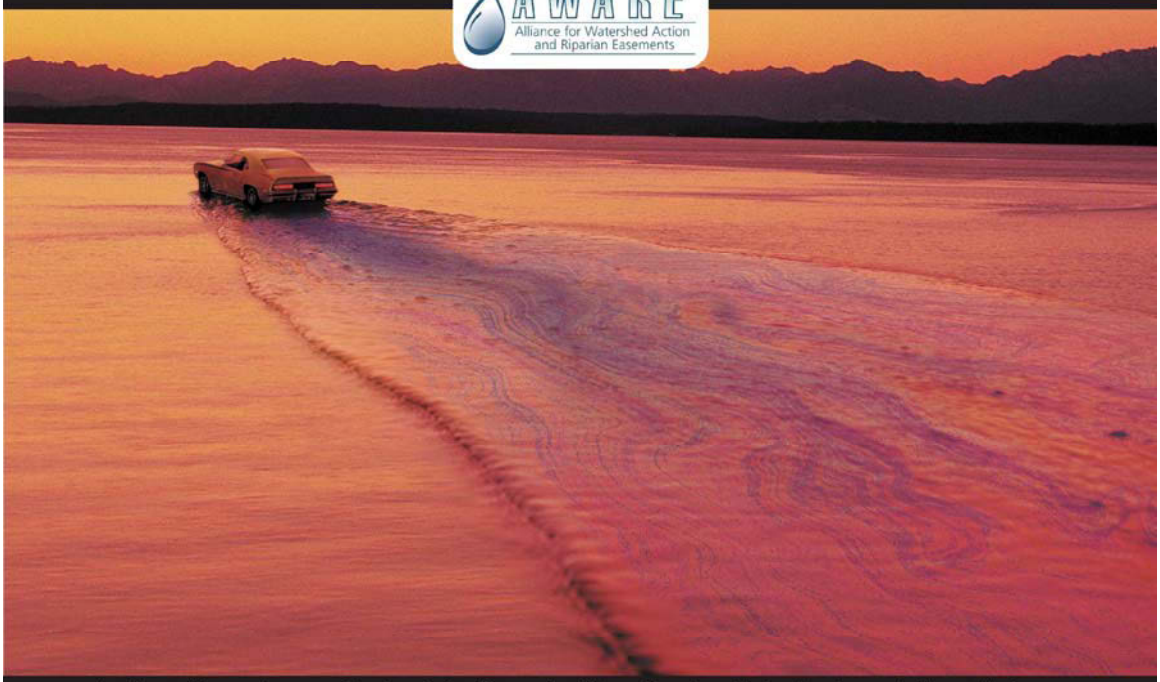
WHEN YOUR CAR'S LEAKING OIL ON THE STREET, REMEMBER IT'S NOT JUST LEAKING OIL ON THE STREET.

AWARE
Alliance for Watershed Action and Riparian Easements



Leaking oil goes from car to street. And is washed from the street into the storm drain and into our Mahoning County lakes, streams and ponds. Now imagine the number of cars in the area and you can imagine the amount of oil that finds its way from leaky gaskets into our water. So please, fix oil leaks.

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What's the problem with motor oil?

Oil does not dissolve in water. It lasts a long time and sticks to everything from beach sand to bird feathers. Oil and other petroleum products are toxic to people, wildlife and plants. One pint of oil can make a slick larger than a football field. Oil that leaks from our cars onto roads and driveways is washed into storm drains, and then usually flows directly to a lake or stream. Used motor oil is the largest single source of oil pollution in our lakes, streams and rivers. Americans spill 180 million gallons of used oil each year into our waters. This is 16 times the amount spilled by the Exxon Valdez in Alaska.

CLEAN WATER TIPS:

How can you use and change your motor oil and help keep our waters clean? Here are some options:

- Stop drips. Check for oil leaks regularly and fix them promptly. Keep your car tuned to reduce oil use.
- Use ground cloths or drip pans beneath your vehicle if you have leaks or are doing engine work. Clean up spills immediately. Collect all used oil in containers with tight fitting lids. Do not mix different engine fluids.
- Never dispose of oil or other engine fluids down the storm drain, on the ground or into a ditch.
- Recycle used motor oil. Many auto supply stores and gas stations will accept used oil.
- Buy recycled (re-refined) motor oil to use in your car.
- To find out more about where you can take used oil for recycling, call the Department of Ecology's 1-800-RECYCLE line or the number in your community listed below.

This information is brought to you by Alliance for Watershed Action and Riparian Easement, AWARE, Mahoning County OH. Text and photo provided by the Pugent Sound Action Team and the Water Quality Consortium.

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APPENDIX I

EMERGENCY ACTION PLAN

I. **PURPOSE:**

The MVSD will provide a written plan outlining those designated actions and procedures that must be implemented during emergency situations as defined in Section II below. The immediate implementation of this plan by Supervision, and other workers will ensure the safety of employees and others on the premises in so far as possible. Building locations, job title responsibilities, communication and alarm measures, routes of evacuation, outside agency assistance plus employee training and availability of the plan are key elements of this process. Also, the plan will comply with the provisions of OAC 3745-85-01 Contingency Plans (see attached Contingency Plan requirements) C.F.R. 1910.38 and the Ohio Public Employment Risk Reduction Rules pertaining to this subject. Copies of this plan will be readily available to employees and on file at assisting county/community agencies.

II. **SCOPE:**

The MVSD's Action Plan will apply to all local emergencies and the Plan is written to offer guidelines to non-specific, unforeseen, near-by emergencies. However, the specific situations covered in the Plan will include the below areas:

A. Chemical Exposures: i.e., Chlorine, anhydrous ammonia, hydrofluosilicic acid, caustic exposures, laboratory acids, hydrogen sulfide, methane and oxygen deficiencies.

B. Injury or Illnesses: i.e., Vehicle accidents, falls, confined space entry, contractor excavations and blood spills, also to include a pandemic event.

C. Weather Emergencies: i.e., Tornado, severe storms (lightening), earthquakes (Power outage), severe winter conditions (road icing and frost bite) and flooding.

D. Threats/Workplace Violence: i.e., direct verbal threats (employee, contractor, visitor or trespasser), bomb or telephone threats, avoidance awareness, handguns, police contracts, and internal security and communication measures, civil disturbances.

E. Property Security: Gates, alarms, locks, monitoring, police communications, damaged or missing property reports, terrorism.

F. Dam Emergencies: Advisory, Warning, Emergency, and Breach Conditions:
It is not within the scope of this Plan to exclusively deal with large scale emergencies such as disasters (a dangerous event that causes significant human and economic loss and demands a crisis response beyond the scope of any single agency or service. A disaster utilizes resources beyond those locally available) and catastrophes (a significant event that causes widespread disruption or destruction of basic life-support capabilities and the infra-structure of local government. In addition to significant human and economic loss, a catastrophe requires resources beyond those locally available). In those cases, the Mahoning Valley Sanitary District will report and assist within an assigned emergency operations plan role provided by the Trumbull and Mahoning County Emergency Management Agency or the Trumbull County Hazardous Material Team.

a. Reservoir Spills: Pollution and Contaminant spills to the Reservoir.

b. Power Outage

c. Mechanical Equipment Failure

d. Major Water Main Break

III. COMMUNICATION, EVACUATION AND RELATED STEPS TO INITIATE ACTION IN THE EVENT OF EMERGENCY:

A. Factors Impacting the Decision to Initiate the Plan:
The severity or imminent danger present at an incident and the personnel available at the scene may make it necessary for the first available trained employee to take action to protect lives, limit exposure or protect property or the public welfare. However, when time and conditions permit, management may, upon notification of an incident, call an immediate meeting of the Mahoning Valley Sanitary District Emergency Control Committee to fulfill their function as described below:

The Emergency Control Committee shall be responsible for emergency operations. Upon notice of an emergency, this Committee shall assemble immediately to appraise the situation, while assuring that all applicable emergency procedures are being triggered, including notification of appropriate agencies outside of the facility. During the emergency assignment of critical on-site personnel, their responsibilities, safety communications capability and plant security will be given high priority in the Emergency Operations Plan.

MEMBER'S NAME	**TITLE**
	Directors
Anthony Vigorito	Chief Engineer
Jonathan Jamison	Resident Engineer
John Nemet	Superintendent-Purification
Keith Rees	Chief of Operations
Ralph Miller	Chief of Security

When the emergency is brought under control or no longer exists, it will be the responsibility of this Committee to establish a Recovery Team to accomplish the following:

- Assess damage.
- Initiate clean-up and restoration.
- Write applicable follow-up reports.
- Assess the adequacy of emergency plan for future emergency.
- Refer employees **desiring** counseling for post traumatic syndrome or other personal reasons to the appropriate medical provider.

B. Communication Modes: The most expedient method of communication that can provide early warning to the immediate employees, contractors or members of the public who are exposed to the hazard will normally be used. Relay systems will be utilized to warn others of the emergency, to request assistance from other agencies or to notify management or government officials. The following modes will be considered in communicating:

- Direct verbal warning
- Audible and/or visual alarms
- Building/vehicle/portable radios/CB radios
- Telephones or cellular phones: 911 or for rescue, medical assistance, police or fire.
- PA systems
- Warning signs/barriers/locks, etc.
- Media Information: Any communications to the media should be made by the Chief Engineer. Other employees should avoid making statements to the media.

  During an emergency, all access to the facility is to be denied to the press and public. Should a media release be required, only the following four points should be initially outlined:

  - The nature and extent of the emergency incident.
  - Response actions underway.
  - Impact on off-site areas.
  - Coordination with off-site officials.

- Notification of injury/illness to the employee's immediate family should be made by the Chief Engineer or the District's designated Representative whenever possible. It is critical to only report the known facts and location of the employee. Do not surmise the severity of an injury or details relating to the cause of the injury/illness. Basic notification and assistance in helping the family member find transportation to the treatment center is the primary focus of the call.

- Notification of Fatality or Multiple Hospitalizations (three or more workers within eight hours): It is the responsibility of the Chief Engineer to report by telephone either of the above incidents within eight hours of receiving notification:

  P.E.R.R.P.
  13430 Yormouth Drive
  Pickerington, OH 43147
  Telephone: 1-800-671-6858
  Fax: 1-614-644-3133
  Fatality/Multiple Hospitalization Report Telephone 1-614-731-4380
  O.S.H.A. Division of Ohio
  Department of Industrial Relation
  2323 West 5th Avenue
  P.O. Box 825
  Columbus, OH 43216-0825
  Attention:
  Telephone: 1-800-671-6858(Columbus)
  1-614-644-2246(Columbus)
  1-800-828-1723(N.E. Ohio)

C. Building Evacuation/Building Shelter Areas: In the event of fire or other emergency that would necessitate the building being evacuated, all employees and visitors must exit immediately. Evacuation must be conducted in a safe, orderly manner and employees will then gather at their assigned grouping points. Alternate exit routes are to be used only if the primary route is blocked. Certain emergencies (i.e., tornado/severe storms) require that the employees will remain on the premises in a designated shelter area until conditions permit evacuation or the resumption of normal duties. Employees must be informed as to gathering points or shelter areas.

An evacuation plan diagram for the Mahoning Valley Sanitary District Buildings will be clearly posted.

- **Fire:**

In the event of a small fire (4' x 4'), utilize the proper fire extinguisher insuring a safe exit position in the event the fire gets out of your control. If the fire is beyond your control, evacuate buildings, and contact the local fire department immediately.

IV. SPECIFIC SITUATION EMERGENCY PROCEDURES AND RESPONSE GUIDELINES:

A. Chemical Exposure:

- Chemical spills in the laboratory should be handled in accordance with the procedures outlined in Mahoning Valley Sanitary District's Chemical Hygiene Plan and the associated Material Safety Data Sheets.

- Chemical spills in the chlorine building should be handled in accordance with the procedures outlined in Mahoning Valley Sanitary District's Process Safety Standard and the associated Material Safety Data Sheets.

- In the event of a large chemical release, all personnel in the immediate area are to be evacuated and Trumbull County Haz Mat should be notified by calling 911 or 675-2666. Injured personnel should be removed (if possible) from further chemical exposure and proper medical attention gathered.

- All employees who handle hazardous chemicals will be trained on the Mahoning Valley Sanitary District's Hazard Communication Program and the "Right to Know Law."

B. Injury or Illness: Should an employee, contract employee or visitor become seriously injured or ill while on the job or on the company premises, any nearby First Aid/CPR trained personnel may immediately assist within the scope of their training. Also, when time and conditions permit, the Chief Engineer should be notified and help make a decision to:

- Primary or secondary calls for outside medical assistance (911).

- Assist the employee in reaching medical assistance or family help.

Pandemic Event: See attached planning checklist and preparing for a Pandemic Influenza guide. It is a goal of the MVSD to develop a Pandemic Program in time that will comply with the planning checklist as best as possible.

C. Weather Emergencies: In case of severe weather or tornado, the notice to take cover will be given through the public address system, vehicle radios or cellular telephones. Severe weather alert radios will be continuously monitoring at the plant.

During a power outage, everyone should remain at their work station until told by their supervisor to evacuate the building or until the power comes back on. Back up power generators should function automatically at the plant. The Assistant Engineer is responsible for maintaining and testing generators using electrically qualified personnel. In case of plant closing/opening due to weather conditions the Chief Engineer will make the decision considering employee safety and operations. The intent is to keep the plant in operation. An announcement will be put on the radio, WRRO, AM 1440, Warren, and information will be given through employees calling into the facility.

Supervision, in the absence of instructions from higher management/emergency Control Committee, will make decisions in the face of imminent danger regarding:

- Power/equipment shut down and building conditions (i.e., occupancy, windows, egress/exit).
- Vehicle operations.
- Gates, evacuation, shelter areas, work continuation/cessation, valves/pipelines/tanks/pumps.
- Locating and accounting for personnel.
- Communications to employees, management or agencies.

D. Threats/Workplace Violence:

- **Direct Physical Threat:** Immediately step back to create space and attempt to remain calm (take a deep breath). Make eye contact and if no weapon is present, call for help and use loud, negative words. Try to avoid a struggle if possible. If a weapon is present and robbery is the motive, give the assailant what he wants without a negative, verbal or physical response. Attempt to break off contact as soon as possible and get to a third party or safe area. Try to avoid a situation where you are taken away in a vehicle. Mahoning Valley Sanitary District's Violence in the Workplace Awareness Program will provide more in depth training in this area. Report the threat to management as soon as possible.

- **Telephone and/or Bomb Threats:** All threats will be documented and immediately given to management (Note: see Attachments 1 and 2). Management will immediately determine whether outside agency involvement is necessary and make the appropriate contact. Otherwise, departmental or internal County agencies may be contacted.

  If a suspected bomb is found, warn others in the immediate area to evacuate and contact your immediate supervisor. Follow the response guidelines on Attachment 3.

E. Property Security:

One of the primary functions of the Emergency Control Committee shall be to identify security measures during and after emergencies. This security will be a key ingredient of the Operations Plan. This may be accomplished by either internal assignment and/or through the assistance of outside agencies (police). Each employee should fulfill basic security measures involving company property on his job site when those duties would

not place him in imminent danger. Following an emergency, supervision should file a "Capital Equipment Loss Report" for damaged or missing property with the District's Insurance Provider. (Note: see Attachment #4).

Whenever a crime is committed on the District premises, it should be reported immediately to a Supervisor and the local police department.

Networking: The MVSD will explore participating in a state program in which mutual aid assistance can be sought involving emergency situations. This program would involve possible outside assistance from other public and private water utilities.

F. Mineral Ridge Dam Emergencies

How to Classify Emergency Conditions

The classification of emergency conditions should be based upon:

- Severity of incident observations
- Monitoring data
- Prevailing conditions creating potential emergency situation

Classifications:

- **Advisory Condition**
- **Warning Condition**
- **Emergency Condition**
- **Breach Condition**

Advisory Condition

A Dam Advisory is declared when an unusual problem occurs at the dam, however failure is not imminent.

Examples:

1. Large and Unusual Crack
2. Large Sinkhole
3. Spillway Obstruction
4. Seismic Event
5. Bomb Threat
6. Slips
7. Boils
8. Bulges

Required Response

- Notify Local, County and State OEM
- Notify State Dam Safety Office/ODNR/OEPA
- Investigate
- Assess & Respond
- Mitigate

Warning Condition

A Dam Warning is declared when an event is occurring that adversely affects the dam but is controllable.
Examples:

1. Unsafe Water Level
2. Controllable Leakage
3. Developing Erosion
4. Settlement or Upheaval

Required Response

- Notify Local, County & State OEM
- Notify State Dam Safety Office/ODNR/OEPA
- Investigate
- Assess & Respond
- Mitigate

Dam Emergency Condition

A Dam Emergency Condition is declared when an event is occurring that adversely affects the dam and is uncontrollable.

Examples:

1. Water Overtopping Dam
2. Uncontrollable Leakage
3. Uncontrollable Erosion
4. Significant Settlement or Upheaval

Required Response

- Notify Local, County & State OEM
- Notify State Dam Safety Office / ODNR / OEPA
- Issue Public Warning
- Begin Evacuation
- Commence Emergency Actions

Dam Breach Condition

A Dam Breach is declared when a failure occurs which allows for uncontrollable discharge of water.
Examples:

Failure of Dam, Spillway, or Dike

Required Response

- Notify Local, County and State OEM
- Notify State Dam Safety Office / ODNR / OEPA
- Issue Public Warning
- Begin Evacuation
- Commence Emergency Actions

G. Reservoir Spills

Water pollution caused by spills is the contamination of bodies of water caused by human activities which can be harmful to humans, wildlife, organisms and plant life.

If the spill is on a waterway, time is extremely important. Call the authorities (Emergency Management Agency, Local Fire Department and HazMat team) immediately.

The only containment methods available for waterway spills are booms and skimmers. Booms are simply floating barriers used to either surround the product or divert it to a collection location. Skimmers use different methods to collect the spilled fluid, such as a rotating wheel, conveyor, weir dam or even a vacuum.

If the spilled product is heavier than water, vacuum trucks could be helpful in the cleanup.

The MVSD does have spill containment basins that were constructed to protect the Meander Reservoir for I-80 and the Turnpike. Storm water (if raining) and the spill would be directed to the spill containment system through an established piping system. A gate at the end of the containment basin shall be closed so no discharge shall occur to the Reservoir. The clean up of a spill could either occur prior to entering the spill containment basin or at the basin in itself.

H. Power Outage:

The MVSD has two separate electrical feeds from Ohio Edison. If a short-term power (less than 2 hours) outage should occur, the MVSD shall contact Ohio Edison's emergency number, and notify the Line Department of this situation. Ohio Edison will then need to transfer service manually at their substation adjacent to the District's property.

I. Mechanical Equipment Failure:

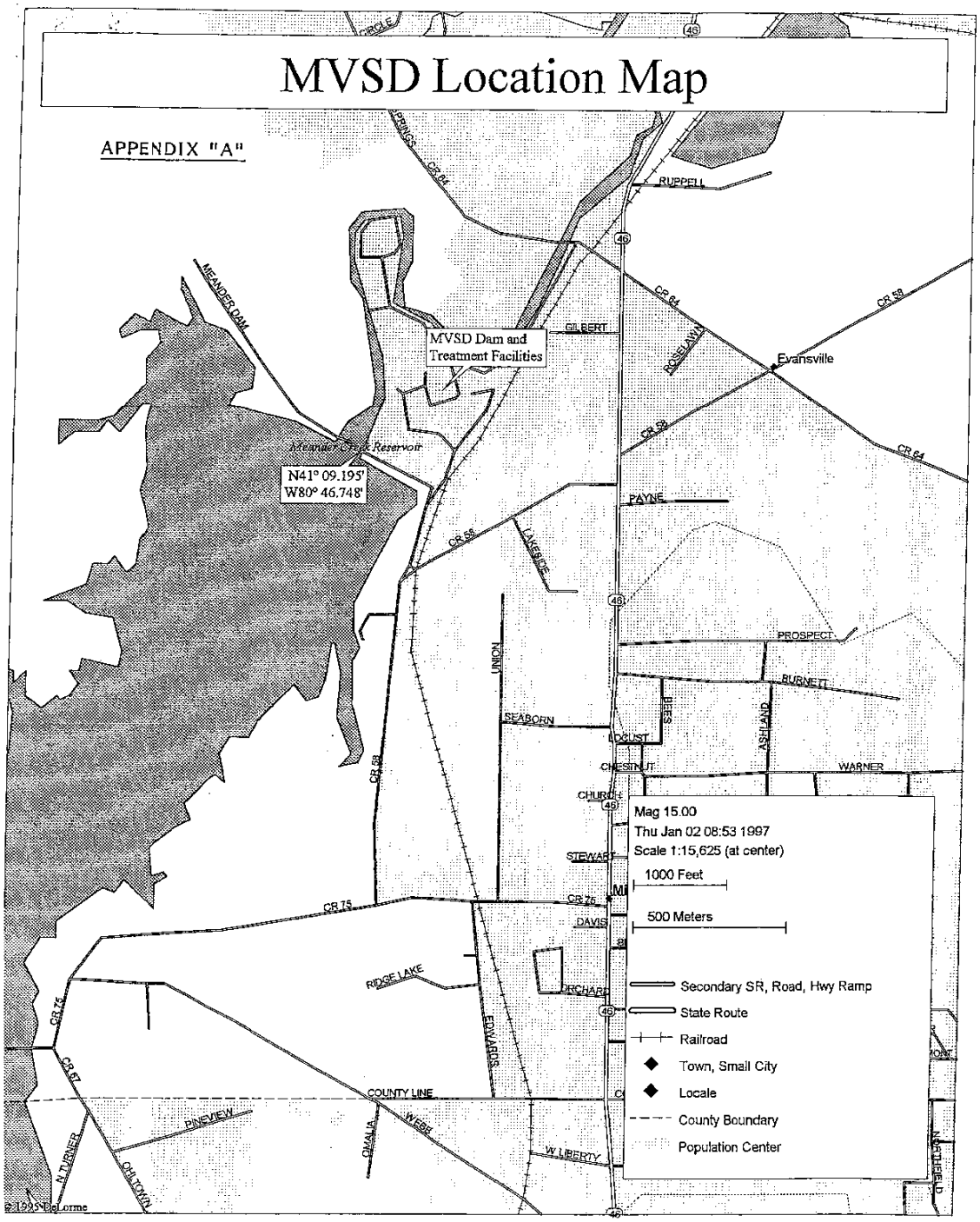
Unless otherwise necessary the MVSD personnel shall repair any mechanical equipment failures. If personnel is unable the District would then contact a contractor from its' emergency list.

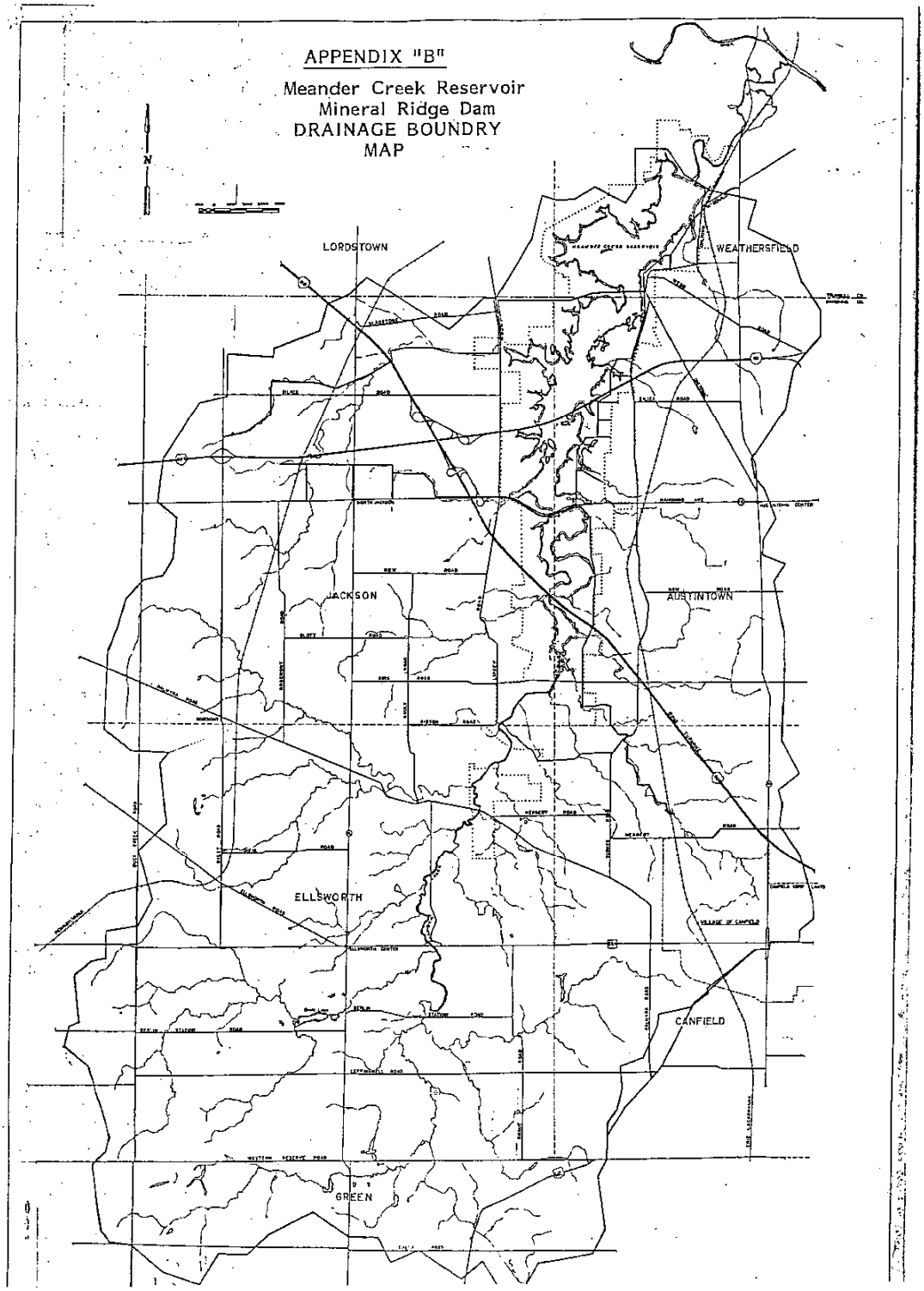
J. Major Water Main Breaks:

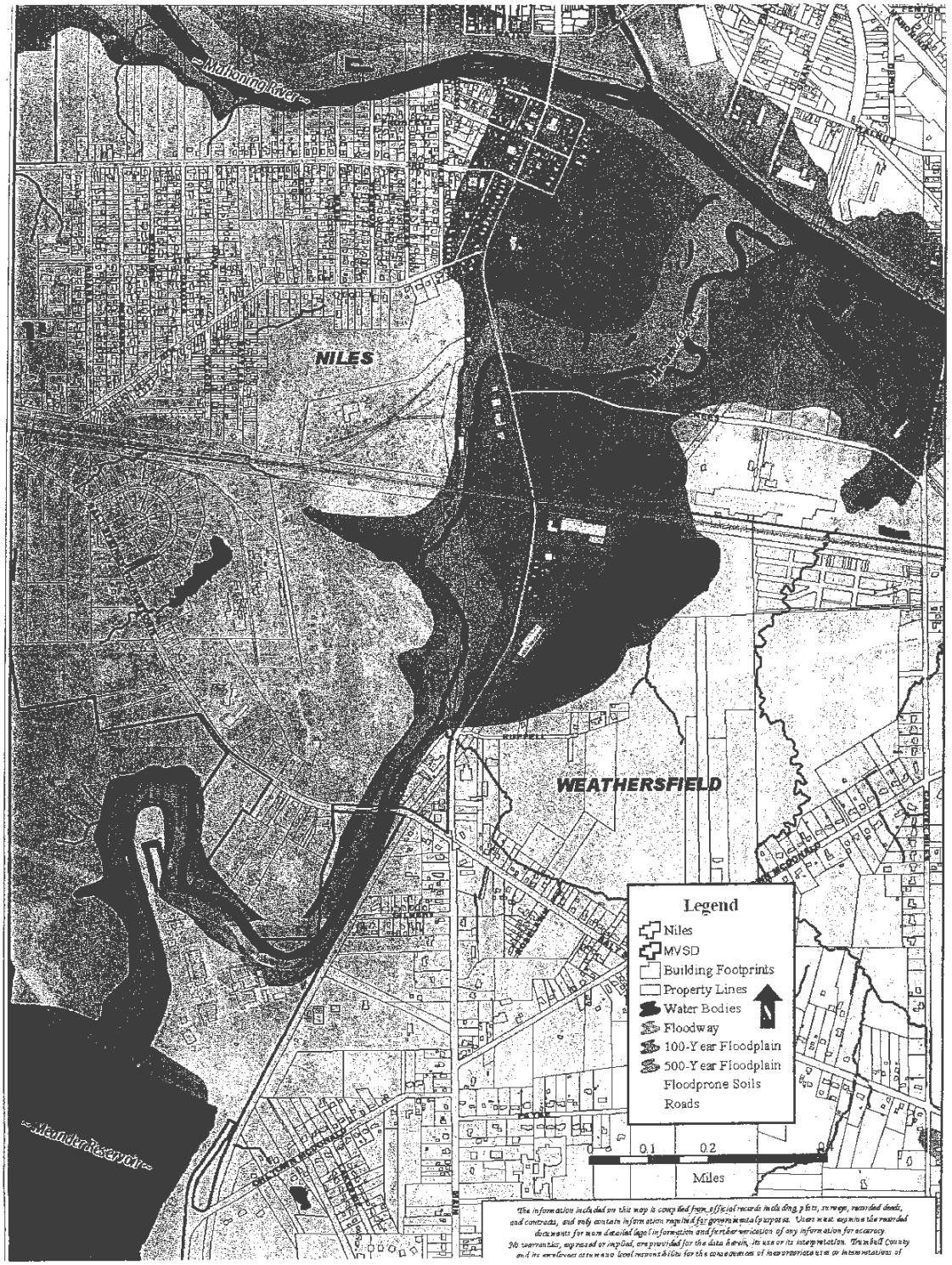
The MVSD will make every effort to isolate the location of the break before entirely shutting off water service. Major water main breaks will require immediate repair and if need be, the MVSD will utilize assistance from other governments/agencies and subcontractors.

EMERGENCY NOTIFICATION FLOWCHART

Observer
Dam Emergency Condition
↓
Chief Engineer/Resident Engineer→ Board of Directors
↓
911 / Emergency Management Agencies
330-675-2666 Trumbull County
330-744-2200 Mahoning County
Mutual Aid Team
↓
Ohio Emergency Management Agency
1-614-799-9538 (after hours); 1-614-889-7160 (Day time)
↓
Ohio Department of Natural Resources-Division of Water
1-614-799-9538 (after hours); 1-614-265-6731 (Day time)
Ohio Dam Safety Office 1-614-882-5489
ODNR Central Office 1-614-265-6737
↓
Ohio EPA Northeast District Office
1-800-282-9378


MVSD Location Map
APPENDIX "A"
MVSD Dam and Treatment Facilities
Meander Creek Reservoir
N41° 09.195'
W80° 46.748'
Evansville
RUPPELL
GILBERT
ROSEMAN
PAYNE
LAKESIDE
PROSPECT
BURNETT
SEABORN
ASHLAND
WARNER
CHESTNUT
CHURCH
STEWART
DAVIS
RIDGE LAKE
EDWARDS
COUNTY LINE
PINEVIEW
WEBB
W LIBERTY
OLD TOWN
N TURNER
MEANDER DAM
CR 64
CR 58
CR 55
CR 75
CR 67
Mag 15.00
Thu Jan 02 08:53 1997
Scale 1:15,625 (at center)
1000 Feet
500 Meters
Secondary SR, Road, Hwy Ramp
State Route
Railroad
Town, Small City
Locale
County Boundary
Population Center
©1995 DeLorme


APPENDIX "B"
Meander Creek Reservoir
Mineral Ridge Dam
DRAINAGE BOUNDRY
MAP
N
LORDSTOWN
WEATHERSFIELD
JACKSON
AUSTINTOWN
ELLSWORTH
CANFIELD
GREEN


Mahoning River
NILES
WEATHERSFIELD
Meander Reservoir
Legend
Niles
MVSD
Building Footprints
Property Lines
Water Bodies
Floodway
100-Year Floodplain
500-Year Floodplain
Floodprone Soils
Roads
0
0.1
0.2
Miles

EMERGENCY CONTACT LIST

Call Procedures: In the event of an emergency, calls shall be made in the following sequence:

Emergency Event	Who to Call / Order to Call
Water Main Break, 16" or larger	District Chief Engineer Resident Engineer Chief of Operations Affected Customer City(s)
Other Loss of System Pressure – Pump failure, etc	Affected Customer City(s) Supt.-Purification and/or Chief of Operations
Power Outage anywhere in the system	District Chief Engineer Resident Engineer Supt.-Purification and/or Chief of Operations Ohio Edison Electric
Fire / Explosion	911 Emergency (Fire Department / Ambulance / Mutual Aid Team) District Chief Engineer Supt.-Purification and/or Chief of Operations Resident Engineer
Reservoir Contamination/Spill	Chief of Security Fire Department (Hazmat team / Mutual Aid Team) District Chief Engineer Resident Engineer Superintendent of Purification Chief of Operations Clean Harbors Chemical Response Ohio EPA Emergency Response
Chlorine or other chemical leak	911 Emergency (Mineral Ridge Fire Department / Mutual Aid Team) District Chief Engineer Resident Engineer Supt.-Purification and/or Chief of Operations
Natural or Terrorist event causing any of the above	District Chief Engineer Chief of Security EMA / Mutual Aid Team

MVSD CRISIS MANAGEMENT CONTACTS

Title	Name	Work (Day)	Night	Cell / Pager / FAX
Chief Engineer	Anthony Vigorito	330-652-3614	330-718-0333	
Supt of Purification	John Nemet	330-652-3614	330-871-5683	330-606-6789
Chief of Operations	Keith D. Rees	330-652-3614	330-536-6429	330-718-2453
Resident Engineer	Jon Jamison	330-652-3614	330-519-1338	
Supt. of Pumping	Joseph Woodley	330-652-3614		
Chief of Security	Ralph M. Miller	330-652-3614	330-702-1462	330-718-0087
MVSD Director	Attorney Matthew Blair	330-544-4002	330-52-5562	330-718-8228
MVSD Director	Mr. James Sylvester	330-652-9080		330-719-8027
MVSD Director	Mr. Rufus Hudson	330-747-5460		330-519-3098
MVSD Director	Mr. Jamael Brown	330-740-2460		330-559-6498

EMERGENCY NOTIFICATION

AUSTINTOWN FIRE DEPARTMENT:	330-799-3243
AUSTINTOWN POLICE DEPARTMENT:	330-799-9721
ELLSWORTH FIRE DEPARTMENT:	330-538-3341
LORDSTOWN FIRE DEPARTMENT:	330-824-2545
LORDSTOWN POLICE DEPARTMENT:	330-824-2545
MINERAL RIDGE FIRE DEPARTMENT:	330-675-2730
NORTH JACKSON FIRE DEPARTMENT:	330-538-3023
NORTH JACKSON POLICE DEPARTMENT;	330-746-7100
WEATHERSFIELD POLICY DEPARTMENT:	330-675-9944
CITY OF NILES FIRE DEPARTMENT:	330-652-4321
CITY OF NILES POLICE DEPARTMENT:	330-652-2730
CITY OF YOUNGSTOWN POLICE DEPARTMENT:	330-747-7911
TRUMBULL COUNTY SHERIFF:	330-675-2500
TRUMBULL COUNTY BOARD OF HEALTH:	330-675-2489 330-652-2495

MAHONING COUNTY SHERIFF:			330-740-2370 330-799-9721
MAHONING COUNTY BOARD OF HEALTH:			330-270-2855
STATE HIGHWAY PATROL MAHONING:			330-533-6866
STATE HIGHWAY PATROL TRUMBULL:			330-744-5743
F.B.I.			330-965-2940
CITY OF YOUNGSTOWN:			
	Public Works:		330-742-8800
	Mayor's Office:		330-742-8701
	Water Commissioner:		330-742-8748 330-742-8746(asst)
CITY OF NILES:			
	Emergency Management Coordinator:		330-307-8329
	Mayor's Office:		330-652-3415
	Service Director:		330-544-9000
VILLAGE OF McDONALD:			
	Mayor's Office		330 530-5472
MAHONING COUNTY EMA:			330-740-2200 330-740-2188 FAX
TRUMBULL COUNTY DISASTER SERVICE AGENCY:			330-675-2666 330 675-2667 FAX
OHIO EPA:			
	NE District Office		330-425-9171
	Emergency Response:	spill hotline	1-800-282-9378
OHIO DNR:			
	Dam Safety		1-614-265-6731
	After Hours:		1-614-799-9538
OHIO EDISON:			
	Day/Non-Emergency:		330-747-4783
	Night/Emergency:		1-800-633-4766
GAS COMPANY:			
	Day/Non-Emergency:		1-800-362-7557
	Night/Emergency:		1-877-542-2630

CHEMICAL SPILL-EMERGENCY RESPONSE

CLEAN HARBORS
ENVIRONMENTAL SERVICES, INC.

2940 INDEPENDENCE ROAD
CLEVELAND, OH 44115
216-429-2401
800-343-5119

EMERGENCY RESPONSE
800-645-8265

OR

CHEMTRON CORP.
35850 SCHNEIDER COURT
AVON, OH 44011
440-937-6348

WATER DEPARTMENTS

YOUNGSTOWN WATER DEPARTMENT

330-743-5338 - Gene Leson
330-742-8760 – 24-Hour Emergency
330-743-5340 – Daniel Blakley, 330-506-0221 - Cell

NILES WATER DEPARTMENT

330-544-9029 - shop
330-544-4478 - Brian Paridon
330-506-8147 - cell
330-652-1853 – Joe Paris home
330-979-7752 – Joe Paris cell

GIRARD WATER DEPARTMENT

330-545-4208 – Marvin Sweitzer
330-545-0211 - Emergency 24 hour Police
330-545-3306 – Jerry Lambert
330-545-5857 – Office Main

CANFIELD WATER DEPARTMENT

330-533-1101 - # Transfers to the Police Department during off hours
330-533-3315 - Public Works Marty Glista
330-397-1430 – Joe Warino - Cell

McDONALD WATER DEPARTMENT

330-530-1640 - Shop
330-675-2730 – Emergency County Dispatch
330-503-2390 – Tom Domitrovich

330-503-5793 – Shawn Stevens
330-503-2393 – Wisdom Domitrovich – cell
330-503-2393- Michael Shuller

330-530-5472 – Office – Police Chief Ronghi
330-503-2402 – Cell
330-530-8048 – Home

330-530-5472 – Office – Mayor Glenn Holmes
330-503-2391 - Cell
330-530-4906 - Home

LORDSTOWN WATER DEPARTMENT

330-824-2402 – Bruce Platt
330-824-2545 - Emergency - Police
330-824-2332 - L. Bruce Platt - home 330-360-3116 – cell
330-360-2417 – Michael Minor – cell

MINERAL RIDGE WATER DEPARTMENT/TRUMBULL COUNTY SANITARY ENGINEERS

330-675-2775 - Office
330-675-7755 - Rex Fee
330-847-8800 – Rex Fee - home
330-509-9468 - Ron Watson - cell
330-568-1809 – Ron Watson – home
330-509-9489 – Scott Verner – cell
330-539-5983 – Scott Verner – home

MAHONING COUNTY SANITARY ENGINEERS

330-652-1782 – Meander Waste Water Treatment Plant
330-793-5514 – Main Office

MEDIA NOTIFICATION

RADIO STATIONS

WBBW-AM 330-783-1000 FAX 330-783-0060	WHOT-FM 330-783-1000 FAX 330-783-0060	WKBN-FM-98.9 330-729-2574 FAX 330 729-9991
WRRO-AM-1440 1-888-285-9640 FAX 1-216-901-1106	WYFM-Y103 330-783-1000 FAX 330-783-0060	WQXK-FM + WSOM-AM 330-783-1000 FAX 330-783-0060
WGFT-AM-1500 330-744-5115 FAX 330 744-2221	WICT-FM-95 330-448-5095 FAX 330-448-5055	WNCD-FM-93.3 330-729- 9990(day)/2557(night) FAX 330 729-9991

TELEVISION STATIONS

WFMJ-TV-21 330-744-8821 FAX 330 742-2472	WYTV-TV-33 330-788-4046 FAX 330 782-6661	WKBN-TV-27 330-788-2456 FAX 330 782-5261
WYFX-FOX 330-788-2456 FAX 330-782-5261	TIME WARNER CABLE 1-888-340-2502	ARMSTRONG CABLE 1-800-734-1146 FAX 330 726-0117

NEWSPAPERS

THE VINDICATOR 330-747-5500 FAX 330 747-6712	TRIBUNE CHRONICLE 330-841-1600 FAX 330-841-1721	

MUTUAL AID PLAN

In situations that would be considered a crisis or potential crisis the MVSD will seek the necessary resources to support the actions of the Incident or Tactical Commander. These resources would at the call of the Emergency Management Agency Director or his designee to mobilize as a support team or when necessary as the Unified Command Structure, those to be notified would be:

Mineral Ridge Fire Department
Austintown Township Fire Department
Jackson Township Fire Department
Village of Lordstown Fire Department
City of Niles Fire Department
City of Niles Emergency Management Agency
Trumbull County Emergency Management Agency
Mahoning County Emergency Management Agency
Trumbull County Board of Health
Mahoning County Board of Health
Trumbull County Sheriff's Department
Mahoning County Sheriff's Department
MVSD Board of Directors

Other Agencies that would be contacted in case of a crisis would be:

Ohio Environmental Protection Agency
Ohio Emergency Management Agency
Ohio Department of Natural Resources
US Army Corp of Engineers
US Coast Guard

Potential Threats or crisis to District Operations are:

Major Fire at Plant or Grounds
Major Chemical Releases or Spills (Chemicals present, Chlorine, Anhydrous Ammonia, Liquid Sodium Aluminate, Fluoride)
Explosion
Bomb Threat
An Act of God (Tornado, Lightning Strike, Flood, etc.)
Power outage (both Primary and Secondary Electric Feed)
Contamination
Terrorist Attack
Dam Failure

An on site operations center will be selected based on the crisis and utilized to support coordinated activities and the action plan by the resource agencies and departments notified.
Emergency Public Information will be addressed through the use of a Joint Public Information Center (JPIC) Local Media and the Emergency Alert System (EAS) will be used.

The following are critical elements (in order of priority) of the District:

Pump Station
Dam
Reservoir
Clear Well
Filter/Administration Buildings
Carbon, Ammonia and Fluoride Building, and Carbon Building
Head House (aka Chemical Building)

Youngstown Reservoir
Niles Standpipe
Berlin Pump Station

Key Personnel at the District are as follows:

Mr. Anthony Vigorito, Chief Engineer
Mr. John Nemet, Water Plant Supt. of Purification
Mr. Keith D. Rees, Water Plant Chief of Operations
Mr. Jonathan Jamison, Water Plant & Field Maintenance Resident Engineer
Mr. Joseph Woodley, Water Plant Supt of Pumping
Mr. Ralph M. Miller, Chief of Security
Board of Directors, Matthew J. Blair, James Sylvester, Rufus Hudson, and Jamael T. Brown

In response to a crisis District Building are numbered and a layout of such buildings is provided to the local aid communities (see Facility Map).

In cases of contamination an established sample program will be instituted through the guidance of the Ohio Environmental Protection Agency and if necessary, also the Boards of Health.

It also should be noted that a series of Bridges cross the drinking water source reservoir of Meander. The parties responsible for those bridges are as follows;

Ohltown Road – Trumbull County Engineer
I-80 – ODOT
Mahoning Avenue – Mahoning County Engineer
Turnpike – Ohio Turnpike Commission

In case of a listed crisis The Mahoning Valley Sanitary District shall put into effect their Emergency Action Plan to the extent necessary to address the given situation while seeking Mutual Aid.

EMERGENCY NOTIFICATION PROCEDURE FOR MINERAL RIDGE DAM

Area Person Responsible

Primary Local Contact Person

Anthony Vigorito, Chief Engineer
Work: 330-652-3614
Cell: 330-718-0333

Alternate Local Contact Person

Jonathan Jamison, Resident Engineer
Work: 330-799-6315, 330-652-3614
Cell: 330-519-1338

Emergency/Breach Condition
Evacuation Notification

This is the Mahoning Valley Sanitary District notifying you that an evacuation order for Mineral Ridge Dam has been given by ODNR at _____.
Please evacuate people downstream of the dam according to the County Emergency Operations Plan.

2. Begin evacuation procedures as outlined in the Emergency Action Plan.

3. Continue surveillance of the dam, maintain communication with authorities, and initiate other emergency actions as directed by the Dam Safety Engineer.

Advisory & Warning Condition
Standby Alert Notification

This is the Mahoning Valley Sanitary District advising you that we are starting constant surveillance of the Mineral Ridge Dam according to the Emergency Action Plan for this dam. We are notifying you, and the Dam Safety Officials of the Ohio Department of Natural Resources will inform you if a decision to evacuate or a cancellation of the standby alert has been made.

2. Continue surveillance and perform other procedures as outlined in the Emergency Action Plan.

3. Evaluate conditions at the dam and proceed in accordance with directions of the Dam Safety Engineer.

APPENDIX J
STAGES OF CONSERVATION MEASURES

Regulations for the Cities of Youngstown and Niles
Imposed During Conditions of Drought

STAGE 1: NORMAL WATER SUPPLY

The District's supply or distribution system is able to meet all the water demands of its customers in the immediate future.

STAGE 2: WATER ALERT

There is a probability that the District's supply or distribution system will not be able to meet all the water demands of its customers.

STAGE 3: WATER WARNING

There is a high probability that the District's supply or distribution system will not be able to meet all the water demands of its customers under **STAGE 2: WATER ALERT** requirements.

STAGE 4: WATER EMERGENCY

The District is experiencing a major failure of a supply, storage or distribution facility.

These regulations shall be imposed on the Cities of Youngstown and Niles in order to dictate necessary conservation measures required due to drought or any other shortage of supply that may call for the activation of an emergency plan for water conservation. The determination of Stage shall be made on a daily basis by the Resident Engineer of the Mahoning Valley Sanitary District in conjunction with the Chief Engineer of the Youngstown Water Department and the Superintendent of the Niles Water Department.

STAGE 1: NORMAL WATER SUPPLY

The District's supply or distribution system is able to meet all the water demands of its customers in the immediate future.

1. Water will be used for beneficial uses; all unnecessary and wasteful uses of water are prohibited.

2. Water shall be confined to the consumer's property and shall not be allowed to run off to adjoining property or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.

3. Prohibit free-flowing hoses for all uses including vehicle and equipment washing, ponds, evaporative coolers, and livestock water troughs. Attach automatic shut-off devices on any hose or filling apparatus in use.

4. Leaking consumer pipes or faulty sprinklers shall be repaired within three (3) days or less if warranted by the severity of the problem.

5. All pools, spas, and ornamental fountains/ponds should be equipped with a recirculation pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only for health maintenance, or structural considerations.

STAGE 2: WATER ALERT

There is a probability that the District's supply or distribution system will not be able to meet all the water demands of its customers.

1. Landscape irrigation shall be limited to a maximum of three days per week when necessary based on the following **ODD-EVEN** schedule:

> Customers with street addresses that end with an **ODD** number may only irrigate on Tuesdays, Thursdays, and Saturdays.
>
> Customers with street addresses that end with an **EVEN** number may only irrigate on Wednesdays, Fridays, and Sundays.
>
> No Irrigation shall be permitted on Mondays

2. Prohibit washing of streets, parking lots, driveways or sidewalks.

3. Restaurants shall serve water only upon specific request.

4. Leaking consumer pipes or faulty sprinklers shall be repaired within two (2) days or less if warranted by the severity of the problem.

5. All pools, spas, and ornamental fountains/ponds should be equipped with a recirculation pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only for health maintenance, or structural considerations. A customer request must be substantiated in writing by a pool consultant and approved by the District.

6. Reduce/minimize all vehicle washing.

7. No sewer flushing using potable water. (It is recommended that utilities use waste water plant effluent except for emergency maintenance).

8. All owners of pools who seek to fill or refill their pool during the year shall obtain an annual permit from the Commissioner of Water. The Commissioner of Water may, at his discretion, impose a surcharge for water used for pools under the conditions of a WATER ALERT.

9. Voluntary restrictions are requested through public education.

STAGE 3: WATER WARNING

There is a high probability that the District's supply or distribution system will not be able to meet all the water demands of its customers under **STAGE 2: WATER ALERT** requirements.

1. Landscape irrigation shall be limited to a maximum of one day per week when necessary based on the following **ODD-EVEN** schedule:

> Customers with street addresses that end with an **ODD** number may only irrigate on Saturdays.
>
> Customers with street addresses that end with an **EVEN** number may only irrigate on Sundays.
>
> No Irrigation shall be permitted Monday thru Friday.

2. Prohibit washing of buildings.

3. Prohibit water use for ornamental ponds and fountains.

4. Leaking consumer pipes or faulty sprinklers shall be repaired within one (1) day or less if warranted by the severity of the problem.

5. Washing of automobiles or equipment shall be done at a commercial establishment that uses recycled or reclaimed water.

6. Pool draining and refilling, filling of all pools, or topping off of existing pools shall be prohibited.

7. No fire hydrant flushing or flow testing (except in emergencies).

8. Terminate bulk water hauler sales (except to fill residential cisterns).

9. No potable water from the District's system shall be used for construction purposes such as dust control, compaction, or trench jetting.

10. Request mandatory restrictions through public education for all residential, industrial and commercial customers.

STAGE 4: WATER EMERGENCY

The District is experiencing a major failure of a supply, storage or distribution facility.

1. Landscape irrigation shall not be allowed.

2. Flushing of sewers or fire hydrants is prohibited except in the case of a dire emergency and for essential operations.

3. Prohibit washing of streets, parking lots, driveways, sidewalks, or buildings except as may be necessary for public health, sanitary, or fire protection services.

4. No potable water from the District's system shall be used to fill or refill new or existing swimming pools, artificial lakes, ponds, or streams until the WATER EMERGENCY is declared over.

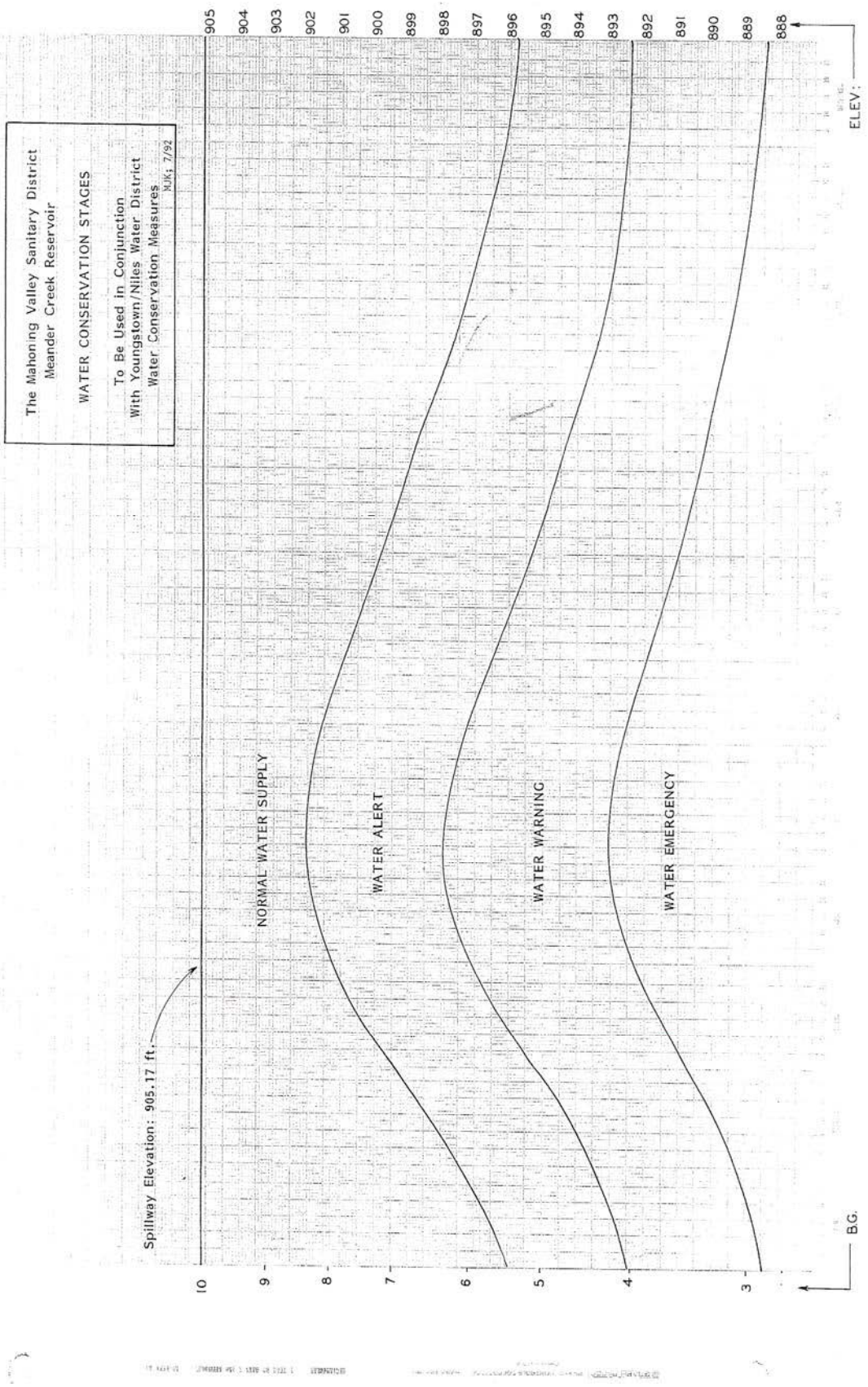
5. Prohibit water use for ornamental ponds and fountains.

6. Prohibit all washing of automobiles or equipment.

7. No potable water from the District's system shall be used for construction purposes such as dust control, compaction, or trench jetting.

8. Leaking consumer pipes or faulty sprinklers shall be shut off until repairs are made.

9. New connections to any system being supplied by the District's water will not be allowed.


The Mahoning Valley Sanitary District
Meander Creek Reservoir
WATER CONSERVATION STAGES
To Be Used in Conjunction
With Youngstown/Niles Water District
Water Conservation Measures
RJK; 7/92
Spillway Elevation: 905.17 ft.
NORMAL WATER SUPPLY
WATER ALERT
WATER WARNING
WATER EMERGENCY
B.G.
ELEV;
10
9
8
7
6
5
4
3
905
904
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APPENDIX K

Mahoning Valley Sanitary District
Member Cities of Niles and Youngstown
Alternate Sources of Water

Mahoning and Trumbull Counties

A number of alternate sources of water are available through water systems being interconnected at various locations in Mahoning and Trumbull Counties. Provide is a listing of interconnections with the various water systems in Mahoning and Trumbull County. Some of those interconnections could lead to direct emergency service in cases where there are water service outages. Other interconnections would have to be modified in order for water service to be provided during a water service outage.

Also provided is a description of the District's Distribution systems used to feed water to the member cities of Niles and Youngstown. It should be noted the Village of McDonald is serviced off the Youngstown 48 inch transmission line by way of a 12 inch line connection at the District's water plant and also by a 12 inch connection at County Line Road near Niles Carver Road. The Village of McDonald is then responsible to operate and maintain these 12 inch distribution lines to their Village.

Finally, it should be noted that these water system interconnections in many cases would be limited by the amount of water and pressure available in servicing areas where there would be a water outage or disruption of service.

Interconnections among Water Systems

City of Youngstown

The City of Youngstown has two direct connections with other water systems that are available for emergency service in cases where there are water service outages or disruption of service.

The two direct connections with other systems are as follows:

1) With Trumbull County/City of Girard at Logan and Tanglewood. This connection is through an 8 inch line with a master meter pit (6 inch meter) set to register water taken in either direction.

2) With Aqua Ohio at Doral and South Avenue. This connection is through a 12 inch line with water service in both directions and water only metered when flowing to Aqua Ohio.

The City of Youngstown has many other connections with other water purveyors which have a potential to provide emergency service. Two possible interconnections that could be modified to reroute water to portions of the City of Youngstown are:

1) With City of Girard at Belmont and E. Liberty Street. This connection is through an 8" line with water metered in one direction to the City of Girard. The Girard System is then connected to Trumbull County water system through a 12 inch line and meter at Belmont and Tibbetts-Wick. The County's meter pit allows water to be taken in either direction.

2) With Trumbull County and City of Niles at County Line Road and Niles Carver Road. This connection is through a 12 inch line with water only metered to Trumbull County's Mineral Ridge Water System. The County's Mineral Ridge Water System is also connected to the City of Niles System via a master meter at Ohltown-McDonald and SR 46 (aka Main Street). Water could be rerouted with some piping modifications in order for water service to be provided.

It should be also noted there are numerous locations where other Public and Private water systems parallel the City of Youngstown's water system which can be accessed indirectly from adjacent fire hydrants. This can occur with the Cities of Canfield and Hubbard, Trumbull County and Aqua Ohio, Inc. The City of Youngstown also has a connection with the City of Hubbard which is currently valved-off near Youngstown-Hubbard Road (aka SR62) and Jacobs Road and another on Coitsville Center Road (aka SR616). Currently Hubbard is fed by Aqua Ohio Inc. and there is the potential for Hubbard to feed water to parts of the City of Youngstown in times of emergency but this would require some piping modifications and proper notifications.

City of Niles

The City of Niles also has direct connections with other systems. They are as follows:

1) With Trumbull County (Mineral Ridge Water System)/City of Niles at Ohltown-McDonald and SR46 (aka Main Street). This connection is through a 12 inch line with water metered only in one direction; Niles to Trumbull County. The Mineral Ridge Water System is also connected with the City of Youngstown at County Line and Niles Carver Roads. Trumbull County could reverse flow with some meter pit modifications back to Niles from this interconnection.

2) With Trumbull County (Howland Water System) through a 12 inch connection at Deer Trail and Mines Road. This connection is through water metered only in one direction; Niles to Trumbull County. This in combination with item 4 below could result in water service being possibly routed back through Trumbull County's system but would require some piping modification.

3) With City of Warren/Trumbull County through an emergency water meter pit (6 inch meter) on Warren-Austintown Road. This connection is through an 8 inch Warren line in which water can be delivered in either direction. (Trumbull County/Niles to Warren or Vice Versa)

4) With Trumbull County Existing Connection: Old 82 and Henn Hyde Road-Howland Water System Existing Connection: Trumbull County at Niles-Vienna Road and Stillwagon Road. This connection is through a 12 inch line and passed through a pump station. Water could possibly be directed from the East to the West from a connection from a Private Water Source in Masury, Ohio (Aqua Ohio).

5) Niles can also float off the City of Youngstown's Water System from the MVSD plant connections.

There are also numerous locations where other Public water systems parallel the City of Niles' water system which could be accessed indirectly from adjacent fire hydrants. This can occur with the City of Warren in Howland Township and Village of McDonald in Weathersfield Township. There does exist within the Trumbull County's Howland Water System a connection with the City of Warren at North River Road and SR 46 involving a 12 inch water line with a master meter in which water can be transported. Water could possibly be routed through the County's system to the City of Niles through this interconnection in times of emergency but would require some piping modifications.

Village of McDonald

The Village has one direct connection to the City of Girard at Salt Springs Road and the Oak View Development through a 6 inch line and a meter pit.

There are several locations where the City of Niles Water System parallels the Village's which could be accessed indirectly from adjacent fire hydrants to aid in providing water in cases of need. There is also access to a hydrant with Trumbull County's water system on County Line Road near the Meadow Hill Development.

City of Girard/City of Niles

With a connection on SR422 through a 12 inch line feeding water from Niles to the City of Girard low service area. With some piping modification water could be rerouted to service a portion of Niles if need be from the interconnection being opened at Tibbetts Wick and Belmont Avenue opened.

City of Girard/Trumbull County/City of Youngstown

With Trumbull County and the City of Girard, a connection at Belmont Avenue (aka SR193) & Tibbetts-Wick Road is through a 12 inch line with a master meter pit set to register water in either direction.

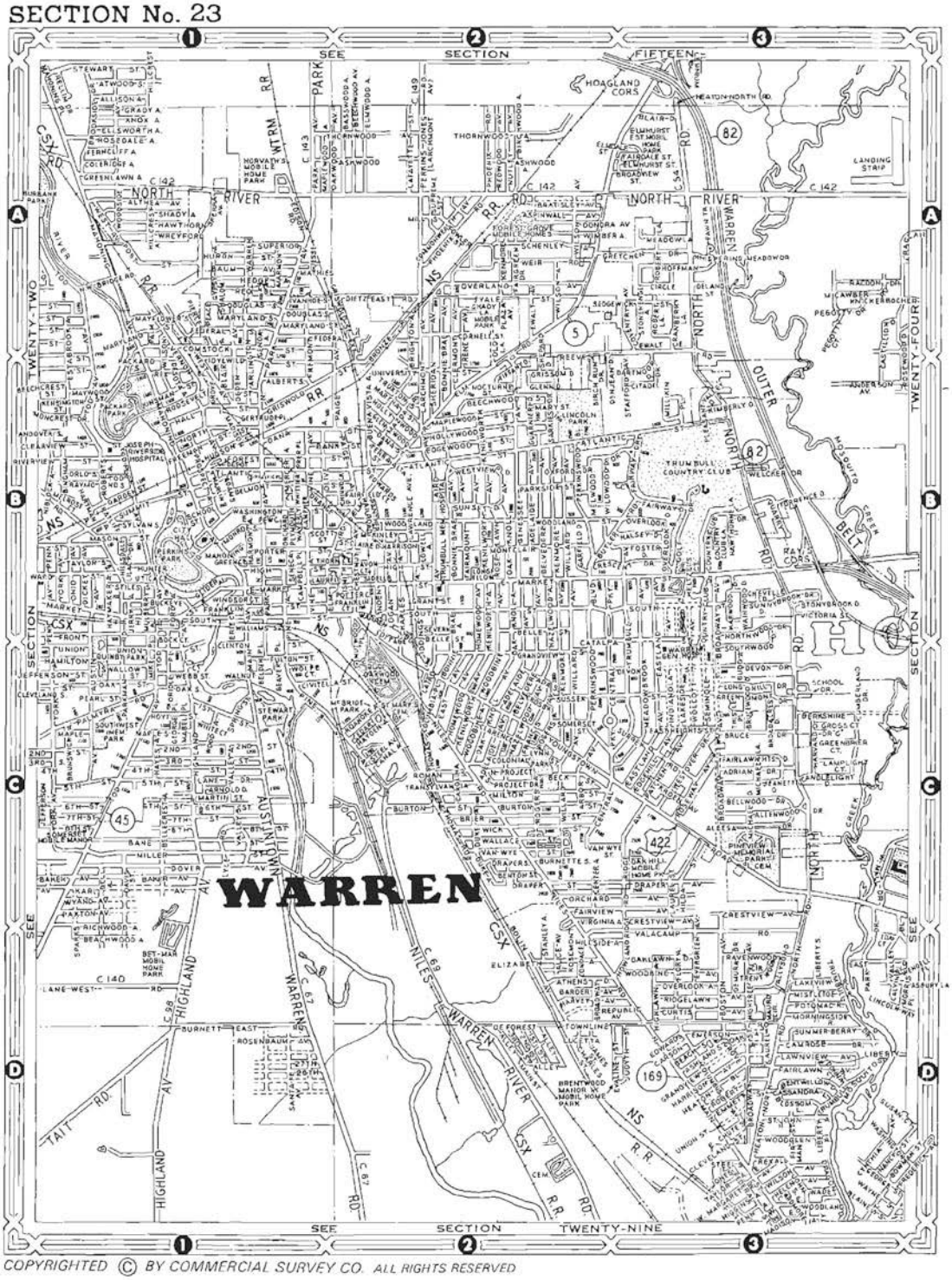
With the City of Youngstown and the City of Girard, a connection at East Liberty and Belmont Avenue (aka SR193) through an 8 inch line with a master meter pit to register water metered only in one direction to Girard

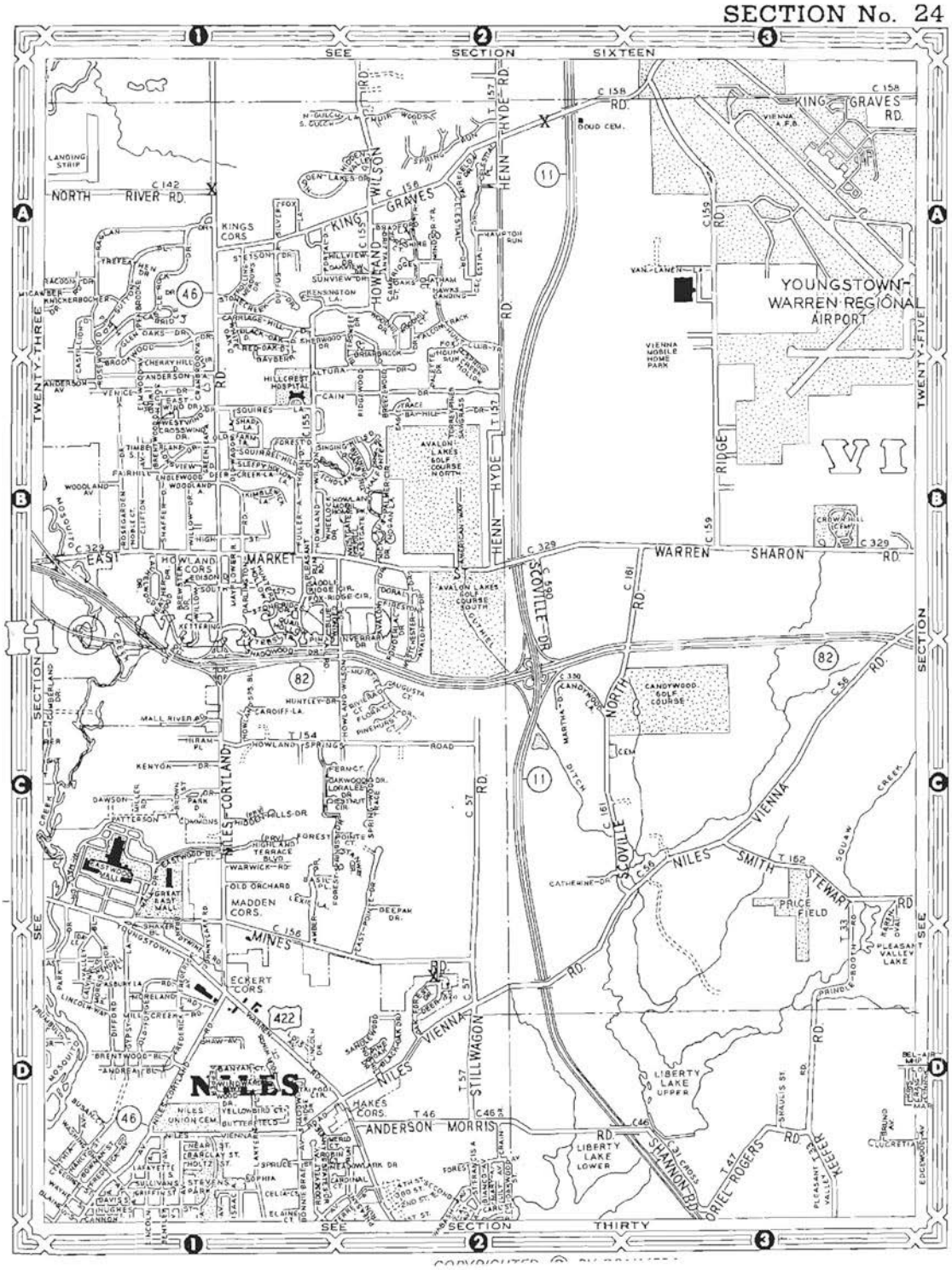
City of Warren/Trumbull County (Howland Water System)

A connection at North River Road and SR46 with Trumbull County/City of Niles and the City of Warren is through a 12 inch line with a master meter pit set to register water from Warren to Trumbull County.

Village of Lordstown

The Village of Lordstown's water system is interconnected with the City of Niles through MVSD with the City of Warren at the General Motors Facility.

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NORTH RIVER RD.
KING GRAVES RD.
HOWLAND WILSON
HENN HYDE RD.
YOUNGSTOWN-WARREN REGIONAL AIRPORT
VI
RIDGE RD.
WARREN SHARON RD.
EAST MARKET
HOWLAND SPRINGS ROAD
SCHOLLEY RD.
NORTH RD.
CANDYWOOD GOLF COURSE
AVALON LAKES GOLF COURSE NORTH
AVALON LAKES GOLF COURSE SOUTH
CORTLAND
MILES
MALL RIVER
GREAT EAST MALL
MADDEN CORS.
MINES RD.
ECKERT CORS.
NILES
NILES VIENNA RD.
STILLWAGON RD.
VIENNA NILES SMITH
STEWART RD.
PRICE FIELD
PLEASANT VALLEY LAKE
HAKES CORS.
ANDERSON MORRIS RD.
LIBERTY LAKE UPPER
LIBERTY LAKE LOWER
SHAWNON RD.
ORIEL ROGERS RD.
KEEFER RD.
KINGS CORS.
HILLCREST HOSPITAL
VIENNA MOBILE HOME PARK
CANDYWOOD CREEK
SQUAW CREEK
MILL CREEK
PLEASANT VALLEY RD.
BOOTH RD.
PRINDLE RD.
SHAUL'S ST.
BELAIR MANOR
EDGEWOOD AV.
CLUCRETIA
ANDERSON AV.
WOODLAND AV.
MILL CREEK PARK
STEVENS PARK
NILES UNION CEM.
CEM.
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82
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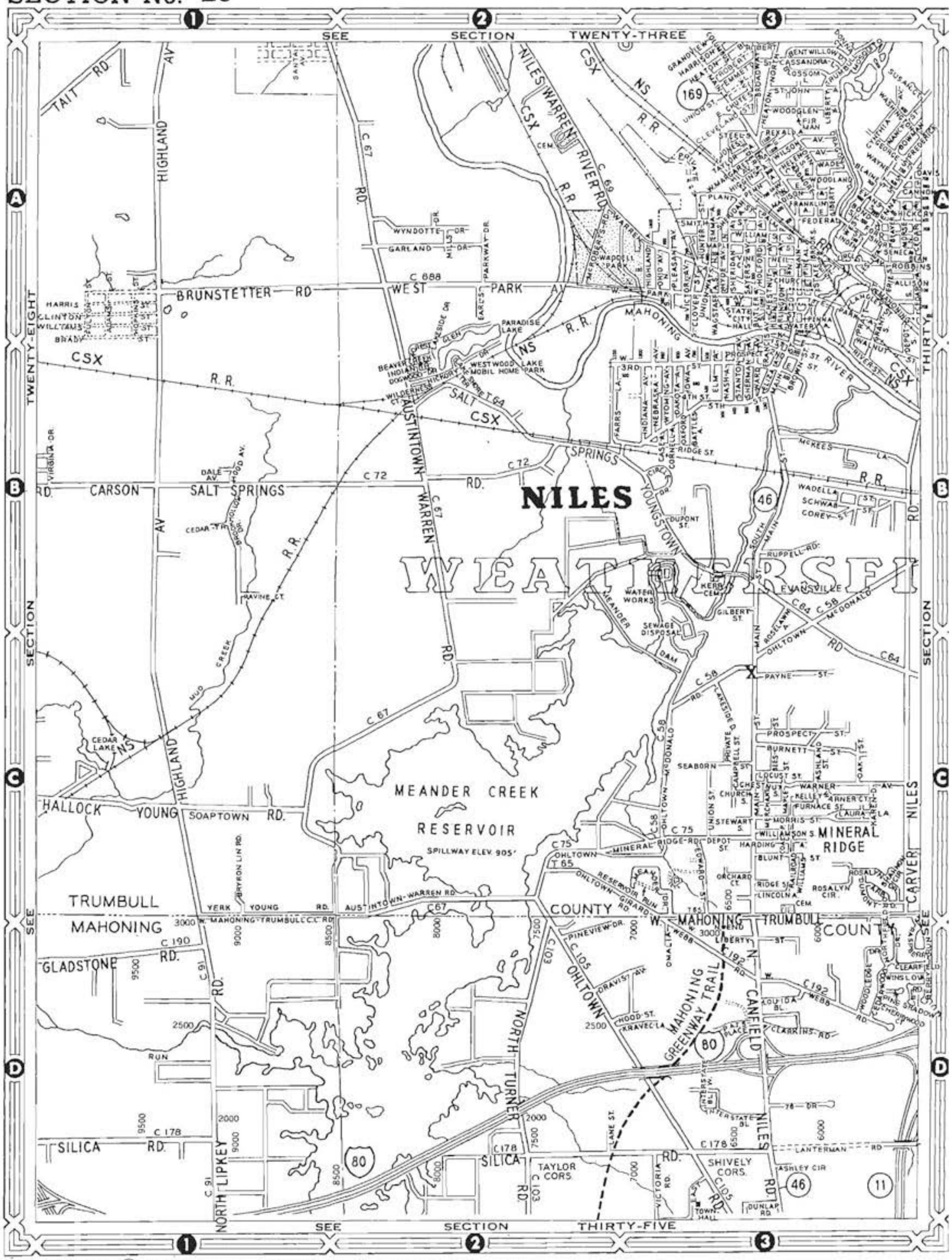
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NILES
WEATHERSFIELD
MEANDER CREEK
RESERVOIR
SPILLWAY ELEV. 905'
MINERAL
RIDGE
TRUMBULL
MAHONING
COUNTY
CSX
R.R.
NS
BRUNSTETTER RD
WEST PARK AV
CARSON
SALT SPRINGS
HIGHLAND AV
AUSTINTOWN WARREN RD.
NILES WARREN RIVER RD.
YOUNGSTOWN
MAHONING
HALLOCK YOUNG
SOAPTOWN RD.
GLADSTONE RD.
SILICA RD.
NORTH LIPKEY RD.
NORTH TURNER RD.
OHLTOWN
CANFIELD NILES RD.
CARVER
TAYLOR CORS.
SHIVELY CORS.
MAHONING GREENWAY TRAIL
WATER WORKS
SEWAGE DISPOSAL
EVANSVILLE
PROSPECT
BURNETT
PAYNE ST
DUPONT ST.
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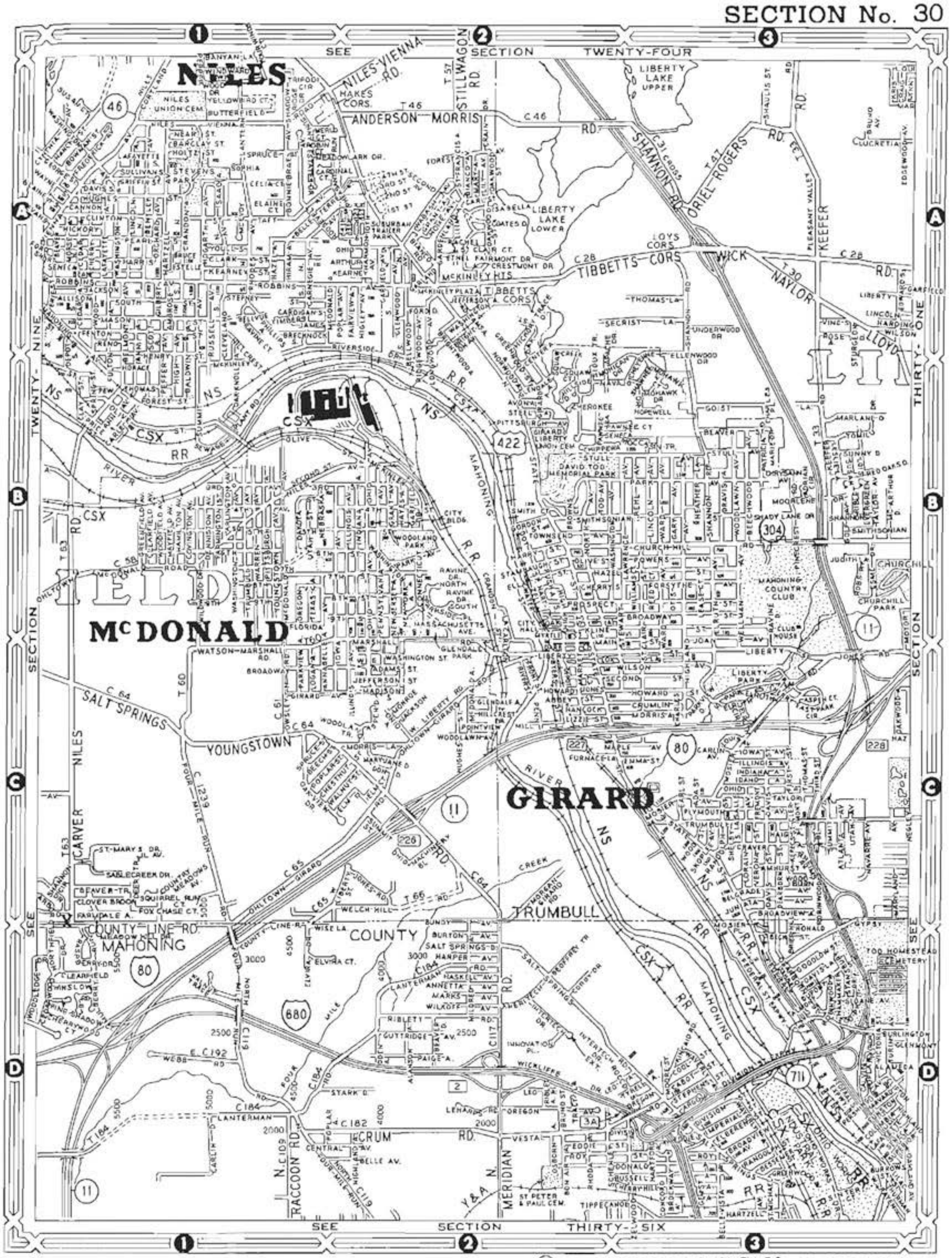
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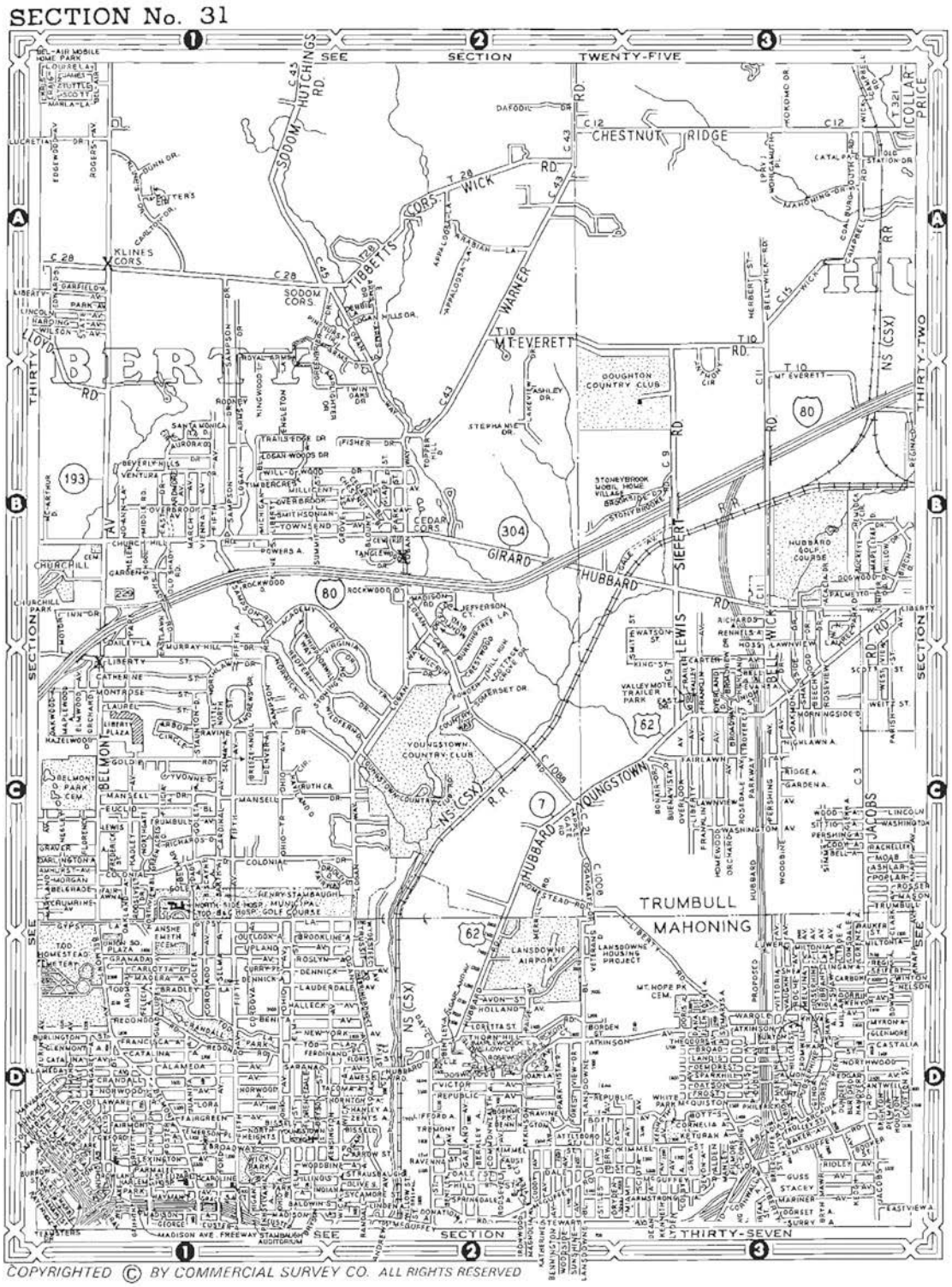
McDONALD
GIRARD
TRUMBULL COUNTY
MAHONING
LIBERTY LAKE UPPER
LIBERTY LAKE LOWER
MAHONING COUNTRY CLUB
DAVID TOD MEMORIAL PARK
LIBERTY PARK
CHURCHILL PARK
TOD HOMESTEAD CEMETERY
NILES UNION CEM.
ANDERSON MORRIS RD.
TIBBETTS-CORS
SALT SPRINGS
YOUNGSTOWN
COUNTY LINE RD.
MAHONING RIVER
NILES-VIENNA RD.
STILLWAGON RD.
SHANNON RD.
ORIEL ROGERS RD.
PLEASANT VALLEY
KEEFER
MERIDIAN
RACCOON RD.
CARVER
FOUR MILE RUN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SEE SECTION THIRTY-SEVEN
SECTION THIRTY-TWO
SECTION THIRTY
BERT
MT EVERETT
CHESTNUT RIDGE
WARNER RD
SODOM HUTCHINGS RD
TIBBETTS WICK RD
KLINES CORS
SODOM CORS
CEDAR CORS
GIRARD
HUBBARD RD
SIEPERT
LEWIS WICK RD
YOUNGSTOWN
TRUMBULL
MAHONING
JACOBS
BELMONT
NS (CSX) R.R.
YOUNGSTOWN COUNTRY CLUB
BOUGHTON COUNTRY CLUB
HUBBARD GOLF COURSE
LANSDOWNE AIRPORT
LANSDOWNE HOUSING PROJECT
MT HOPE PK CEM
STONEYBROOK MOBILE HOME VILLAGE
VALLEY MOTEL TRAILER PARK
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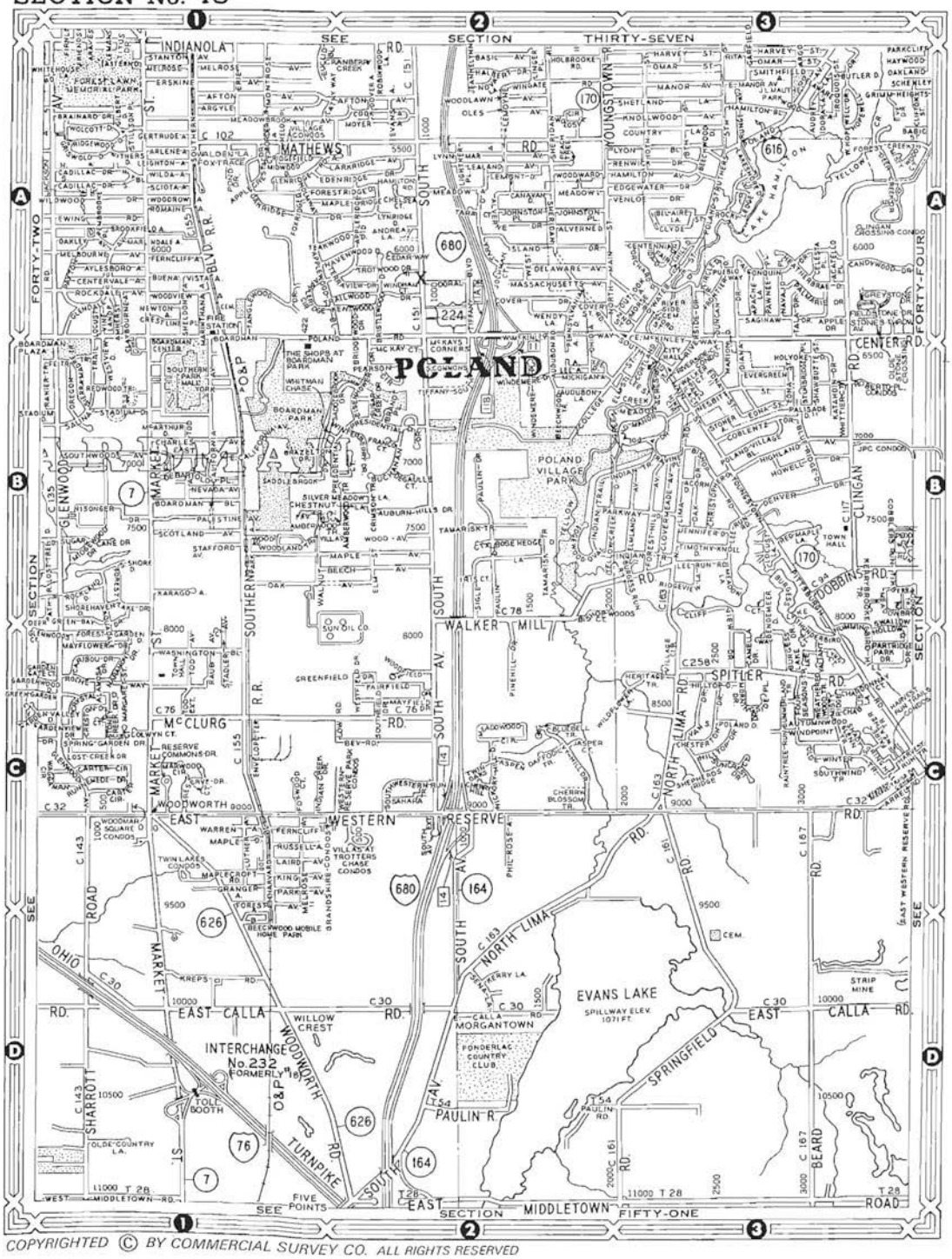
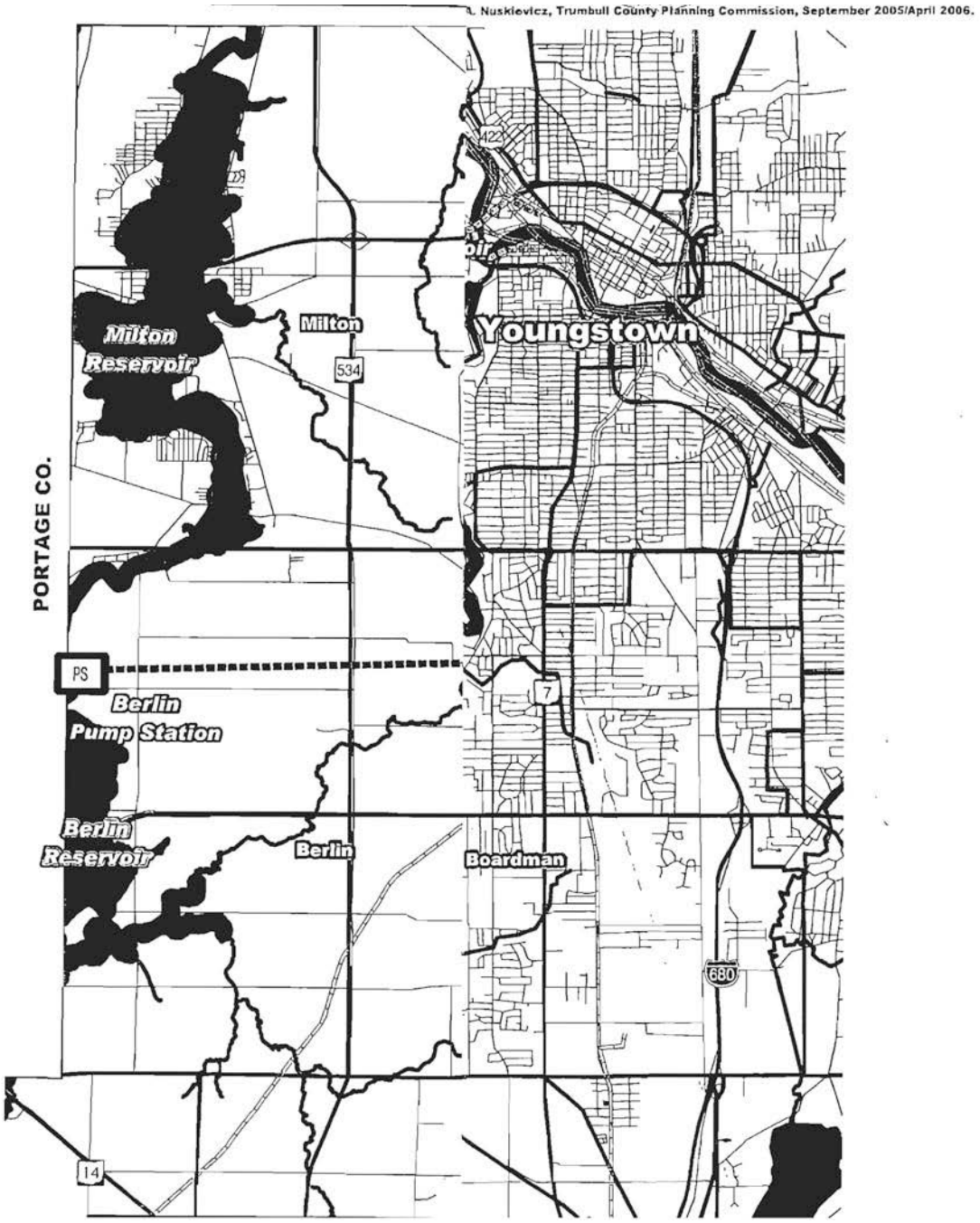
SECTION No. 43




L. Nuskievicz, Trumbull County Planning Commission, September 2005/April 2006.
Milton
Reservoir
Milton
534
Youngstown
PORTAGE CO.
PS
Berlin
Pump Station
7
Berlin
Reservoir
Berlin
Boardman
680
14

APPENDIX L
SPILL PREVENTION, CONTROL AND CLEANUP

Description

Many activities that occur at an industrial or commercial site have the potential to cause accidental or illegal spills. Preparation for accidental or illegal spills, with proper training and reporting systems implemented, can minimize the discharge of pollutants to the environment and waterways.

Spills and leaks are one of the largest contributors of pollutants to waterways. Spill prevention and control plans are applicable to any site at which hazardous materials are stored or used. An effective plan should have spill prevention and response procedures that identify potential spill areas, specify material handling procedures, describe spill response procedures, and provide spill clean-up equipment. The plan should take steps to identify and characterize potential spills, eliminate and reduce spill potential, respond to spills when they occur in an effort to prevent pollutants from entering the storm water drainage system or the Meander Reservoir, and train personnel to prevent and control future spills.

Approach

Pollution Prevention

- Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

- Develop a Spill Prevention Control and Countermeasure (SPCC) Plan. The plan should include:

  - Description of the facility, owner and address, activities and chemicals present

  - Facility map

  - Notification and evacuation procedures

  - Cleanup instructions

  - Identification of responsible departments

  - Identify key spill response personnel

- Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of process materials that are brought into the facility.

Suggested Protocols (including equipment needs)

Spill Prevention

- Develop procedures to prevent/mitigate spills to storm drain systems and waterways. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

- If consistent illegal dumping is observed at the facility:

  - Post "Drinking Water Protection Area Report Spills and Dumping" signs with a phone number for reporting illegal dumping and disposal.

  - Landscaping and beautification efforts may also discourage illegal dumping.

  - Bright lighting and/or entrance barriers may also be needed to discourage illegal dumping.

- Store and contain liquid materials in such a manner that if the tank is ruptured, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters, or groundwater.

- If the liquid is oil, gas, or other material that separates from and floats on water, install a spill control device (such as a tee section) in the catch basins that collects runoff from the storage tank area.

- Routine maintenance:

  - Place drip pans or absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Any collected liquids or soiled absorbent materials must be reused/recycled or properly disposed.

  - Store and maintain appropriate spill cleanup materials in a location known to all near the tank storage area; and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.

  - Sweep and clean the storage area monthly if it is paved, *do not hose down the area to a storm drain.*

  - Check tanks (and any containment sumps) daily for leaks and spills. Replace tanks that are leaking, corroded, or otherwise deteriorating with tanks in good condition. Collect all spilled liquids and properly dispose of them.

- Label all containers according to their contents (e.g., solvent, gasoline).

- Label hazardous substances regarding the potential hazard (corrosive, radioactive, flammable, explosive, and poisonous).

- Prominently display required labels on transported hazardous and toxic materials (per US DOT regulations).

- Identify key spill response personnel.

Spill Control and Cleanup Activities

- Follow the Spill Prevention Control and Countermeasure Plan.

- Clean up leaks and spills immediately.

- Place a stockpile of spill cleanup materials where it will be readily accessible (e.g., near storage and maintenance areas).

- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste. Physical methods for the cleanup of dry chemicals include the use of brooms, shovels, sweepers, or plows.

- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.

- Chemical cleanups of material can be achieved with the use of adsorbents, gels, and foams. Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.

- For larger spills, a private spill cleanup company or Hazmat team may be necessary.

Reporting

- Report spills that pose an immediate threat to human health or the environment to the Emergency Management Agency (EMA).

- Report spills to the Ohio EPA.

- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).

- Report spills to local agencies, such as the EMA and fire department; they can assist in cleanup.

- Establish a system for tracking incidents. The system should be designed to identify the following:

  — Types and quantities (in some cases) of wastes

  — Patterns in time of occurrence (time of day/night, month, or year)

  — Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)

  — Responsible parties

Training

- Educate employees about spill prevention and cleanup.

- Well-trained employees can reduce human errors that lead to accidental releases or spills:

  — The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur.

  — Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.

- Employees should be educated about aboveground storage tank requirements. Employees responsible for aboveground storage tanks and liquid transfers should be thoroughly familiar with the Spill Prevention Control and Countermeasure Plan and the plan should be readily available.

• Train employees to recognize and report illegal dumping incidents.

Other Considerations (Limitations and Regulations)

- A Spill Prevention Control and Countermeasure Plan (SPCC) is required for facilities that are subject to the oil pollution regulations specified in Part 112 of Title 40 of the Code of Federal Regulations or if they have a storage capacity of 10,000 gallons or more of petroleum. (Health and Safety Code 6.67)

- State regulations also exist for storage of hazardous materials (Health & Safety Code Chapter 6.95), including the preparation of area and business plans for emergency response to the releases or threatened releases.

- Consider requiring smaller secondary containment areas (less than 200 sq. ft.) to be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.

Requirements

Costs (including capital and operation & maintenance)

- Will vary depending on the size of the facility and the necessary controls.
- Prevention of leaks and spills is inexpensive. Treatment and/or disposal of contaminated soil or water can be quite expensive.

Maintenance (including administrative and staffing)

- This BMP has no major administrative or staffing requirements. However, extra time is needed to properly handle and dispose of spills, which results in increased labor costs.

Supplemental Information

Further Detail of the BMP
Reporting

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the facility and the effectiveness of BMPs. A good record keeping system helps the facility minimize incident recurrence, correctly respond with appropriate cleanup activities, and comply with legal requirements. A record keeping and reporting system should be set up for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. Incident records describe the quality and quantity of non-storm water discharges to the storm sewer or waterways. These records should contain the following information:

- Date and time of the incident
- Weather conditions
- Duration of the spill/leak/discharge
- Cause of the spill/leak/discharge
- Response procedures implemented
- Persons notified
- Environmental problems associated with the spill/leak/discharge

Separate record keeping systems should be established to document housekeeping and preventive maintenance inspections, and training activities. All housekeeping and preventive maintenance inspections should be documented. Inspection documentation should contain the following information:

- The date and time the inspection was performed
- Name of the inspector
- Items inspected
- Problems noted

- Corrective action required
- Date corrective action was taken

Other means to document and record inspection results are field notes, timed and dated photographs, videotapes, and drawings and maps.

Above Ground Tank Leak and Spill Control

Accidental releases of materials from above ground liquid storage tanks present the potential for contaminating storm water and waterways with many different pollutants. Materials spilled, leaked, or lost from tanks may accumulate in soils or on impervious surfaces and be carried away by storm water runoff.

The most common causes of unintentional releases are:

- Installation problems
- Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves)
- External corrosion and structural failure
- Spills and overfills due to operator error
- Leaks during pumping of liquids or gases from truck or rail car to a storage tank or vice versa

Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code. Practices listed below should be employed to enhance the code requirements:

- Tanks should be placed in a designated area.
- Tanks located in areas where firearms are discharged should be encapsulated in concrete or the equivalent.
- Designated areas should be impervious and paved with Portland cement concrete, free of cracks and gaps, in order to contain leaks and spills.
- Liquid materials should be stored in UL approved double walled tanks or surrounded by a curb or dike to provide the volume to contain 10 percent of the volume of all of the containers or 110 percent of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain or sump.
- For used oil or dangerous waste, a dead-end sump should be installed in the drain.
- All other liquids should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- Accumulated storm water in petroleum storage areas should be passed through an oil/water separator.

Maintenance is critical to preventing leaks and spills. Conduct routine inspections and:

- Check for external corrosion and structural failure.
- Check for spills and overfills due to operator error.
- Check for failure of piping system (pipes, pumps, flangers, coupling, hoses, and valves).

- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.

- Visually inspect new tank or container installation for loose fittings, poor welding, and improper or poorly fitted gaskets.

- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.

- Relocate accumulated storm water during the wet season.

- Periodically conduct integrity testing by a qualified professional.

Vehicle Leak and Spill Control

Major spills on roadways and other public areas are generally handled by highly trained Hazmat teams from local fire departments or emergency management agencies. The measures listed below pertain to leaks and smaller spills at vehicle maintenance shops.

In addition to implementing the spill prevention, control, and clean up practices above, use the following measures related to specific activities:

Vehicle and Equipment Maintenance

- Perform all vehicle fluid removal or changing inside or under cover to prevent the run-on of storm water and the runoff of spills.

- Regularly inspect vehicles and equipment for leaks, and repair immediately.

- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.

- Always use secondary containment, such as a drain pan absorbent booms or pads or drop cloth, to catch spills or leaks when removing or changing fluids.

- Immediately drain all fluids from wrecked vehicles.

- Store wrecked vehicles or damaged equipment under cover.

- Place drip pans or absorbent materials under heavy equipment when not in use.

- Use adsorbent materials on small spills rather than hosing down the spill.

- Remove the adsorbent materials promptly and dispose of properly.

- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.

- Oil filters disposed of in trashcans or dumpsters can leak oil and contaminate storm water. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.

- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

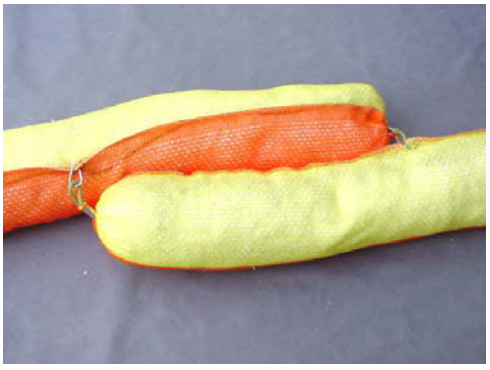
- Design the fueling area to prevent the run-on of storm water and the runoff of spills:
  - Cover fueling area if possible.
  - Use a perimeter drain or slope pavement inward with drainage to a sump.
  - Pave fueling area with concrete rather than asphalt.
- If dead-end sump is not used to collect spills, install an oil/water separator.
- Install vapor recovery nozzles to help control drips as well as air pollution.
- Discourage "topping-off of fuel tanks.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank.
- Use adsorbent materials on small spills and general cleaning rather than hosing down the area. Remove the adsorbent materials promptly.
- Carry out all Federal and State requirements regarding underground storage tanks, or install above ground tanks.
- Do not use mobile fueling of mobile industrial equipment around the facility; rather, transport the equipment to designated fueling areas.
- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Train employees in proper fueling and cleanup procedures.

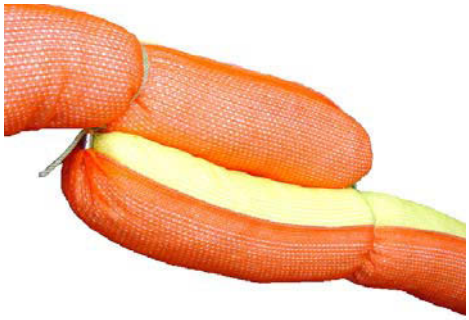
Industrial Spill Prevention Response

For the purposes of developing a spill prevention and response program to meet the storm water regulations, facility managers should:

- Integrate with existing emergency response/hazardous materials programs (e.g., Fire Department).
- Develop procedures to prevent/mitigate spills to storm drain systems.
- Identify responsible departments.
- Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.
- Address spills at municipal facilities, as well as public areas.
- Provide training concerning spill prevention, response and cleanup to all appropriate personnel.

MARINE BOOM





Absorbent Booms
To contain and absorb oil and fuel spills.

Can be used in bays, harbors, rivers and lagoons to protect shorelines, riverbanks, jetties, piers and outfalls.

Easy joining with snap hooks or rope tied to form any length. The heavy duty knitted outer cover provides tensile strength.

Natural buoyancy ensures continuous flotation before and after saturation with oil. Lightweight and easy to handle.

The outer mesh of the boom is strong and highly visible knitted polyethylene. Booms are available in lengths up to six meters.

Sizes
- 6m x 18cm (MB6180) w/ snap hooks
- 6m x 12.5cm (MB6125) w/ snap hooks
- 3m x 18cm (MB3180) w/ snap hooks
- 3m x 12.5cm (MB3125) w/ snap hooks

Also available with floats for long term deployment

Bilge Socks

The highly absorbent polypropylene sock floats on the water in the bilge waiting to absorb fuel and oil entering the bilge. A rope can be tied to the end of the sock for easy removal from the bilge.

- 400mm x 120mm (BS400)
- 650mm x 120mm (BS650)

Envirosorb Range

Rolls
Highly absorbent Envirosorb in bulk.

Regular and extra thick available.

Can be cut into various sizes to fit around industrial machinery or used to protect beaches and shorelines from oil spills.

regular thickness
40m x1.1m (MBBR401.1)
40m x 0.9m (MBBR40.9)
50m x 1m (MBBR501)

extra thick
40m x1.1m (MBR401.1)
40m x 0.9m (MBR40.9)
50m x 1m (MBR501)

Pads
For absorption of small spills and final clean-up of large spills. May be used for spills on water or under leaking pipes and machinery. Can be wrung out and re-used.

Pads are available in light or heavy grades.
- 45cm x 45cm regular (MBBP), packs 50, 100 or 200
- 45cm x 45cm extra thick (MBP), packs 50 or 100

Mats
- Larger in size
- 90cm x 90cm regular (MBBM), cartons of 80
- 90cm x 90cm extra thick (MBM), cartons of 40

Mini Booms
Commonly used in spill kits to absorb and contain ground spills at unloading bays, refueling facilities on factory floors and at service stations.

Used to surround leaking drums, protect drains, machinery and stock by containing, absorbing and diverting oil and fuel spills. Mini booms are identified by their size and polypropylene fabric outer.

Available in lengths up to 3.6 meters. Will float on water and can be used to contain and absorb spilt oil and fuel.

Poly Mops
Used to collect fuel and oil on water.

The poly mop while being efficient at recovering light fuels is also the best alternative to recover heavy oil.

The polypropylene webbed strands allow oil to penetrate into the mop and collect on the internal web fibers.

Oil has a natural attraction to the polypropylene strands and webbing allowing a single mop to recover up to 20 liters of heavy oil.

Sweep
The Global Sorbent sweep has webbing stitched into the top of the sweep for its entire length.

The webbing allows a sweeping action across thin slicks of rainbow sheens for the final cleanup of an oil spill.

Duraboom

DURABOOM's unique features:

The booms high tensile strength scrim or structural fabric is pre woven to the shape of the boom. The woven scrim is then coated with extremely high abrasion resistant polyurethane.

This unique process enables oil containment booms to be manufactured without welding or stitching materials together.

The buoyancy chamber is pre formed in the weaving process as is the chain pocket and handle connector. The boom has greater tensile strength than most other booms, higher abrasion resistance while remaining light weight and easy to handle.

DURABOOM has no weak points because it has no seams or welded joins.

This means that the **DURABOOM** is virtually indestructible and able to withstand the harshest handling.

A unique manufacturing process that eliminates longitudinal seam and joins

DURABOOM's unique and rugged construction is ideally suited to the harsh conditions of an oil spill. The booms innovative materials and structure provide excellent UV and hydrocarbon resistance. Most importantly, its high abrasion resistance and integral strength will ensure use for years beyond the lifetime of other booms.

GENERAL:
Fabric Weight : 800 gsm Polyurethane (U) or 900 gsm PVC
Boom Fabric : Woven polyester scrim coated with Polyurethane or PVC
Boom Color : Orange
UV Resistance : Excellent
Boom Connections : Extruded aluminum - ASTM standard
Operational Temperature : -20c to +60c
Buoyancy to Weight : 25:1
Anchor Points : 2 per section
Anchor System : 20 kg anchors
Towing Frames : 1 frame, buoy & 15 meters 5/8" polypropylene rope

APPENDIX M

Surface Water Monitoring Checklist

Please attach the following information to this section:

____ A map of the area showing: 1) the public water drainage basin, 2) the location of the source water protection area, 3) the locations of the proposed monitoring sites, 4) the contaminant sources, and 5) major transportation routes.

____ The proposed details of the monitoring points. The information must include the anticipated total well depth and screen lengths.

____ A description of the pollution source and a list of contaminants at each site intended to be monitored.

____ The sampling schedule and frequency of monitoring.

APPENDIX N

REGULATORY/NON-REGULATORY SOURCE CONTROL STRATEGIES

Regulatory

Chemical use reduction
Design standards
Drainage requirements
Growth controls and timing
Handling Regulations
Inspectors at construction sites
Land Banking
Land use agreements
Large lot zoning
Operating standards
Ordinances
Permits
Private well protection
Prohibition of land uses/sources
Purchase of development rights
Purchase of property rights
Reporting requirements and documentation
Restrictions
Septic cleaner ban
Septic system upgrades
Site plan review
Special permitting
Subdivision regulations and codes
Tax incentives
Toxic and Hazardous Material
Transfer of development rights
Zoning (Land use control)
Other

Non-Regulatory

Conservation easements
Contingency plans
Development rights
Household hazardous waste collection
Land purchase/transfer/donation
Memorandum of agreement
Memorandum of understanding
Pollution prevention programs
Public education programs for adults, kids
Surface and ground water monitoring
Training
Voluntary restrictions
Water conservation programs
Other

APPENDIX O

Trumbull County Stormwater Management Plan

APPENDIX P

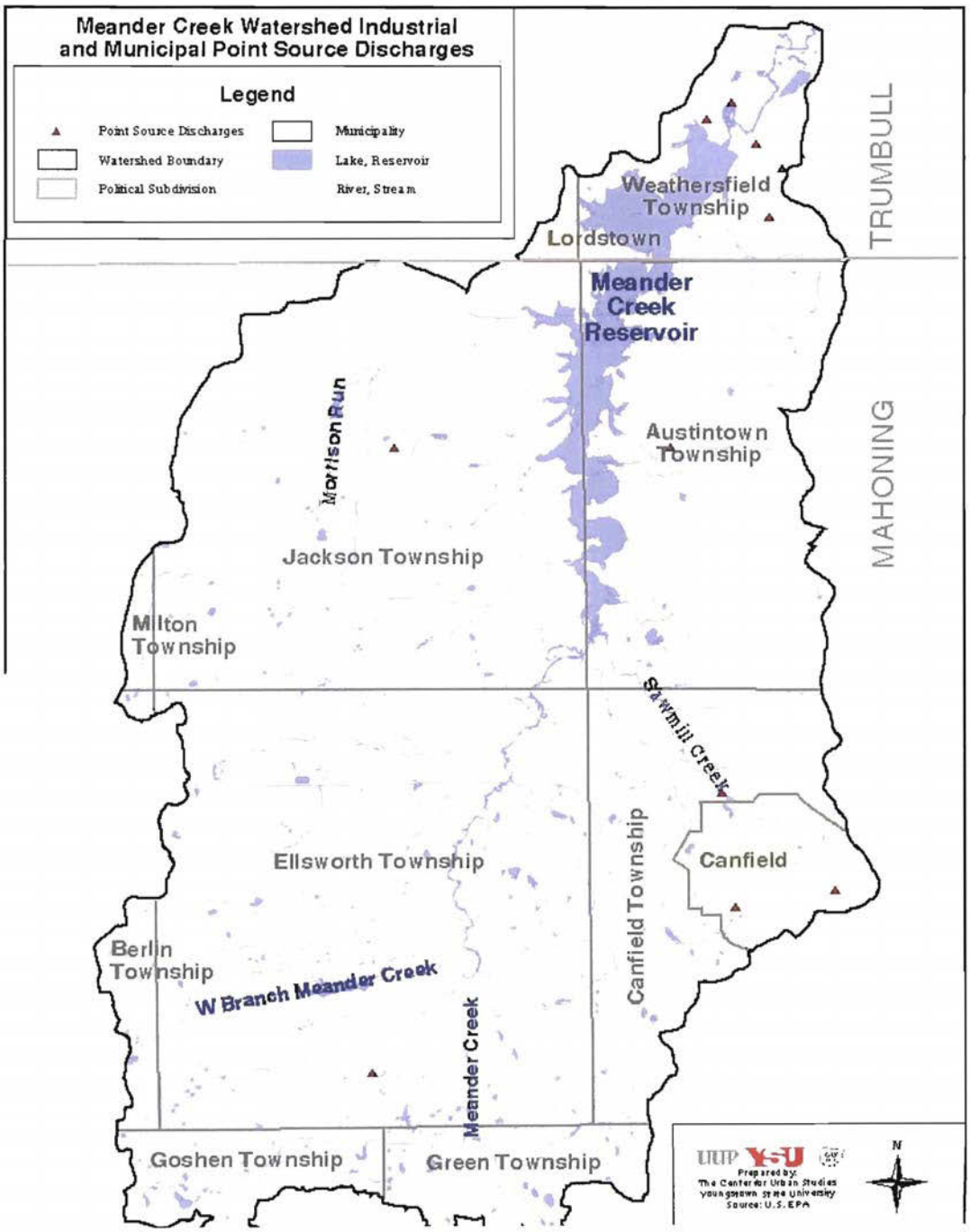
Mahoning County Stormwater Management Plan

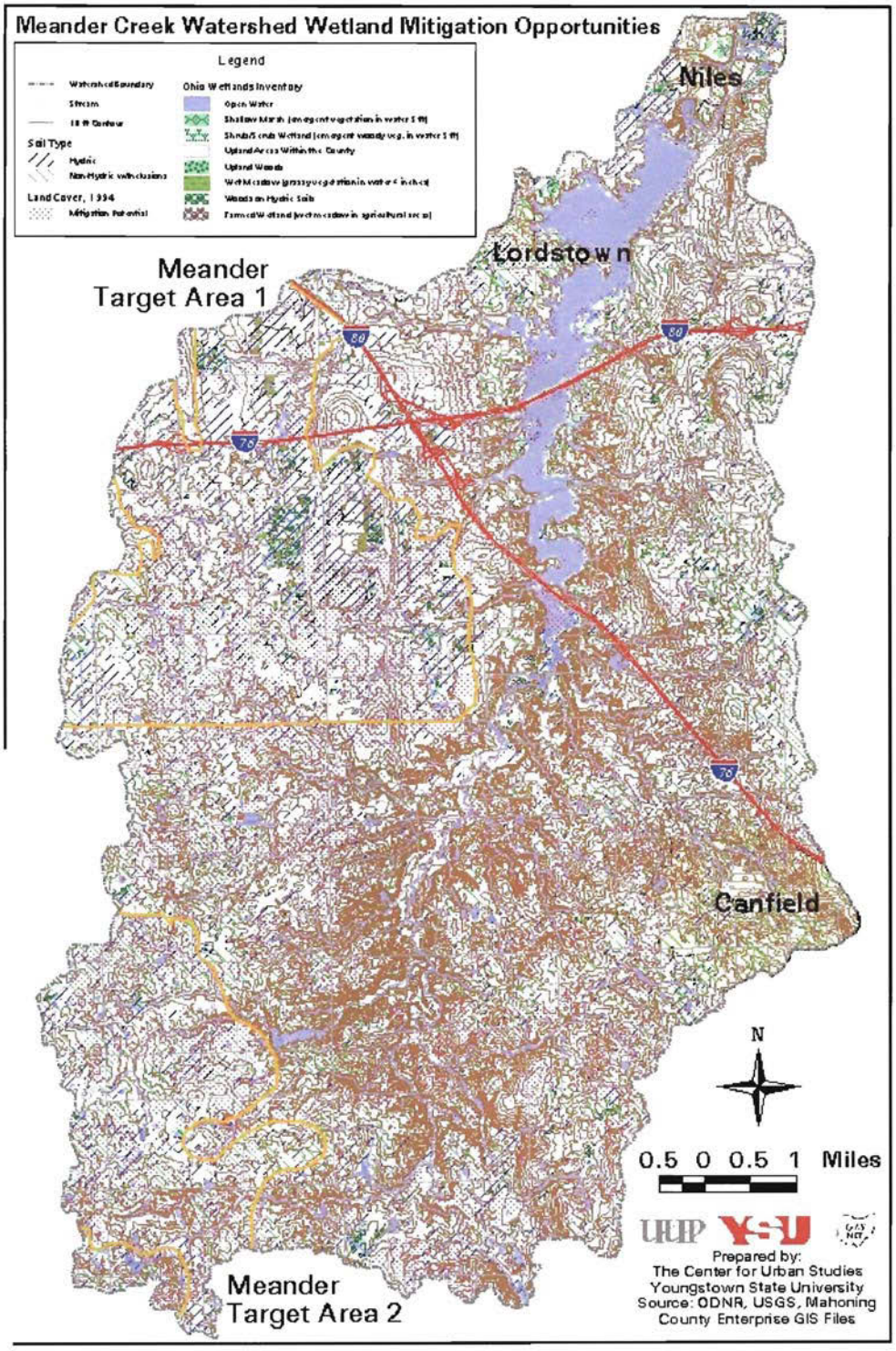
APPENDIX Q

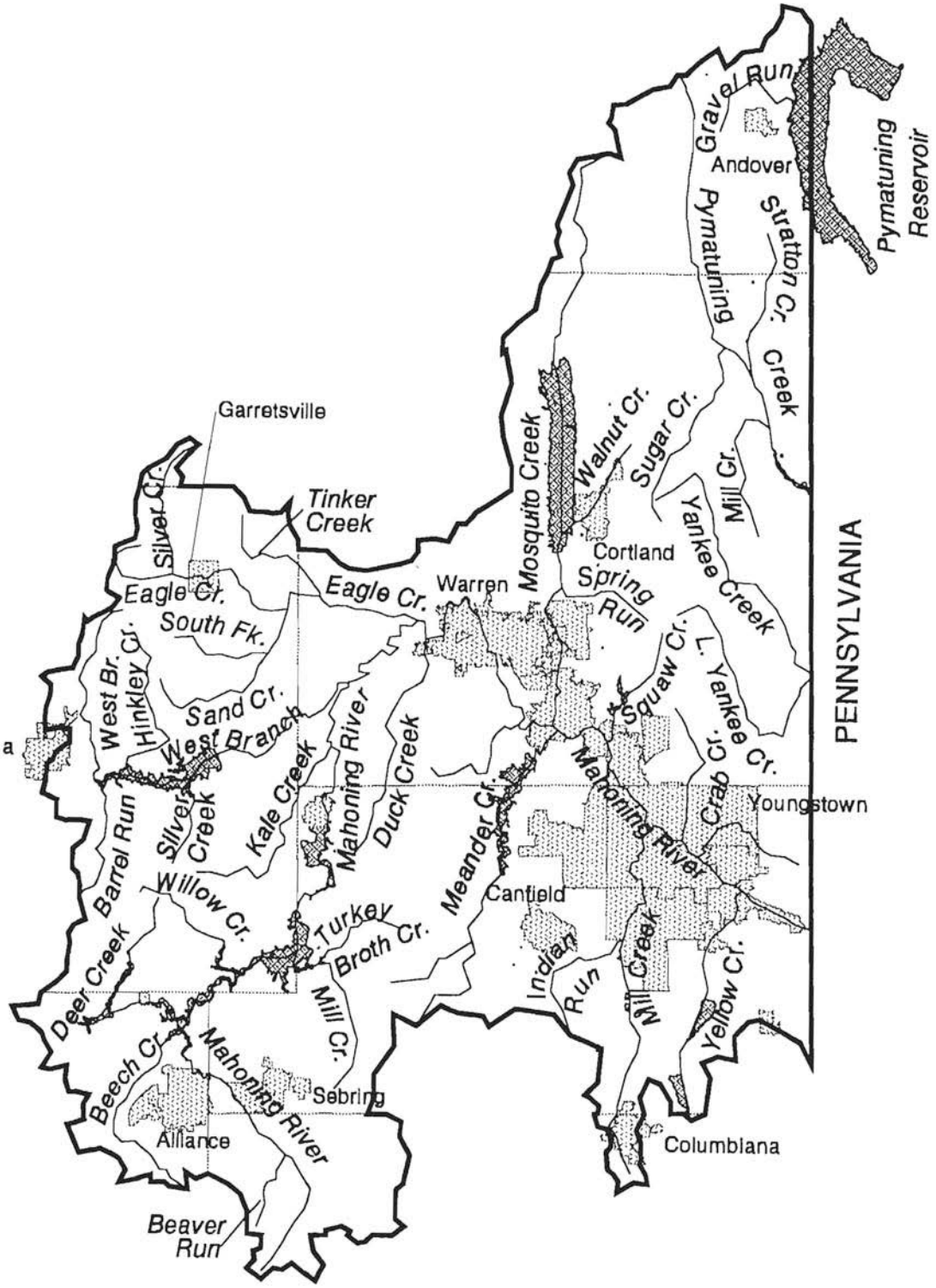
APPENDIX R

APPENDIX S

DRAINAGE BASIN MAPS OF INTEREST, GEOLOGICAL SURVEYS (TOPOGRAPHY) MAPS, AND MINE MAPS


Meander Creek Watershed Industrial and Municipal Point Source Discharges
Legend
Point Source Discharges
Watershed Boundary
Political Subdivision
Municipality
Lake, Reservoir
River, Stream
TRUMBULL
MAHONING
Weathersfield Township
Lordstown
Meander Creek Reservoir
Austintown Township
Morrison Run
Jackson Township
Milton Township
Sawmill Creek
Canfield Township
Canfield
Ellsworth Township
Berlin Township
W Branch Meander Creek
Meander Creek
Goshen Township
Green Township
Prepared by:
The Center for Urban Studies
youngstown state University
Source: U.S. EPA
N


Meander Creek Watershed Wetland Mitigation Opportunities
Legend
Soil Type
Land Cover, 1994
Ohio Wetlands Inventory
Niles
Lordstown
Meander
Target Area 1
Canfield
Meander
Target Area 2
N
0.5 0 0.5 1 Miles
Prepared by:
The Center for Urban Studies
Youngstown State University
Source: ODNR, USGS, Mahoning
County Enterprise GIS Files


Gravel Run
Andover
Pymatuning Reservoir
Pymatuning
Stratton Cr.
Creek
Garretsville
Silver Cr.
Tinker Creek
Mosquito Creek
Walnut Cr.
Sugar Cr.
Mill Cr.
Yankee Creek
Cortland
Eagle Cr.
Warren
Eagle Cr.
Spring Run
South Fk.
West Br.
Hinkley Cr.
Sand Cr.
West Branch
Squaw Cr.
L. Yankee Cr.
PENNSYLVANIA
Mahoning River
Duck Creek
Kale Creek
Silver Creek
Meander Cr.
Mahoning River
Crab Cr.
Youngstown
Barrel Run
Willow Cr.
Turkey
Broth Cr.
Cantield
Deer Creek
Indian Run
Mill Creek
Yellow Cr.
Mill Cr.
Beech Cr.
Mahoning River
Sebring
Alliance
Columbiana
Beaver Run