Wastewater Revolving Fund

City of Allegan

Project Plan

May 2009

2090149

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EXECUTIVE SUMMARY

This Project Plan is prepared on behalf of the City of Allegan, Michigan, for the purpose of obtaining a Wastewater State Revolving Fund (SRF) loan from the Michigan Department of Environmental Quality for the construction of improvements to the City's sewer system.

The following is a summary of the problems that presently exist within the City of Allegan sewer collection and pumping system:

1. Nine of the existing "can" pump stations were constructed in the 1970's and have not had any major upgrades or equipment replacement work done on them since their construction. Their process equipment has outlived its useful life and is in need of replacement. The underground steel dry wells housing the pumping equipment is showing signs of significant corrosion at several of the stations. Two of these stations are located within the 100 year floodplain and are subject to flooding. None of these stations has a permanent backup power generator and there is only one portable generator to service all of these stations.

2. The Eastern Avenue Pump Station, which serves the major industry in the City, Perrigo, has multiple issues which have affected its reliability. These include significant corrosion of the pumping equipment, lack of influent screening, capacity constraints and code compliance deficiencies. Recent events have caused the station to be unexpectedly shut down for a period of time for emergency repairs which almost required the shutting down of the Perrigo factories.

3. The Vernon Street Pump Station has reliability issues including frequent pump clogging and lack of an on site backup power generator.

4. There are numerous sewers in the City which are in structurally deficient condition due to their age (80 years old) and pipe material (vitrified clay). Sinkholes and other emergency conditions have resulted from these structure failures, which become very costly to fix in an emergency condition. The City has identified the areas of the sewer system which are the vintage that has had these problems and has televised key stretches of the sewers.

The proposed project would include the following elements:

Phase I (1st Quarter 2010)

- Replace the Eastern Avenue pump station with a new submersible pump station adjacent to the existing station.
- Add influent grinder to the Vernon Street pump station with a permanent, backup power generator.
- Purchase a portable backup power generator for the existing can stations.

Phase II (0 to 5 years).

- Replace the existing nine can stations. Raise the two stations in the floodplain above the 100 year flood level.
- Reline or replace the existing sewers which are structurally deficient.

The opinion of probable cost of Phase I of the proposed project is $790,000. The cost of Phase II of the project is estimated to be $3,210,000. The City wishes to finance the project cost with an SRF loan. If the entire project cost were financed with a SRF loan, the annual cost is estimated to be $256,589. The corresponding monthly cost for a typical residential customer is $4.85.

I. PROJECT BACKGROUND

A. Summary of Project Need

1. Compliance Status. The pumps stations and sewers are generally in compliance with the requirements of the NPDES permit. Recent events, however, at the Eastern Avenue pump station resulted in a near sewer backup and shutdown of the Perrigo factories due to equipment deficiencies. A failure of the sewer in Grand Street created a sinkhole which caused traffic issues. The recent flooding in September, 2008, resulted in the flooding of the Mill District pump station and its being taken out of service. The Vernon Street pump station has clogged and been out of service numerous times in the last year.

2. Orders of Enforcement Action. There are currently no orders of enforcement in place for the wastewater collection system.

3. Water Quality Problems. Water quality problems associated with the operation of the existing wastewater collection system have been minimized by emergency repairs of the pump stations/sewers when failure occurred. However, as the equipment and pipes continue to age, these incidents will only increase which will increase the chance of a sanitary sewer overflow to the Kalamazoo River, resulting in water quality problems.

4. Future Environment without Proposed Project. Without the construction of the proposed project, the water quality of the Kalamazoo River and basements served by the sewer collection system would be degraded during failure of a sewer, pump station, or flooding of a pump station.

B. Study Area Characteristics

1. Delineation of Study Area. The study area comprises the City of Allegan corporate limits with some customers outside of the City in Allegan Township. Figure 1 shows the study area. The existing sewer collection system is given in Figure 3.

2. Land Use in the Study Area. Zoning Maps for the City of Allegan and Allegan Township are included in Appendix C. Also attached in Appendix C are the Future Land Use Maps for the City of Allegan and Allegan Township.

City of Allegan

Land uses shown on the City's zoning map are primarily single family residential with commercial districts mostly found along the banks of the Kalamazoo River. There are several large manufacturing districts near the City of Allegan outer limits. The land uses presented in the Future Land Use map are very similar to those in the zoning map. The primary difference between the Zoning Map and the Future Land Use Map is that single family residential areas of low density will become permanent open space and future park lands rather than continuing as residential lands.

Allegan Township

Allegan Township consists primarily of agricultural/forestry zoned lands. Land along the Kalamazoo River throughout the entire Township is zoned single family residential except inside the city limits of Allegan. Significant areas of industrial, commercial, and multiple family residential zoned lands are mostly located in the southern half of the Township adjoining the City of Allegan.

C. Population Data.

The estimated population for the City of Allegan has been developed by the West Michigan Regional Planning Commission and is presented below.

Table 1
Population Data

Year	2000	2007	2017	2022	2027
City of Allegan Population	4,838	4,966	5,154	5,252	5,349

D. Existing Facilities.

The City of Allegan wastewater collection system consists of nine "can" pump station, five submersible pump stations, one portable backup power generator for these stations and approximately 27 miles of 6-inch, 8-inch, 12-inch, 18-inch and 24-inch gravity sewers. The sewers collect the sewage flow and the pump stations lift the flow from lower areas so that the flow arrives at the City Wastewater Treatment Plant. The sewers and pump stations are shown on Figures 1 and 2 in the appendix.

The sewer pipes consist of a mix of very old (80 years) clay pipes, to relatively new plastic pipes. The older, clay pipes are in poor structural condition and extensive lengths of the pipe are deep pipe (greater than 15 feet deep) located in the roadways. This makes repair of the pipes due to structural failure very difficult and expensive.

The existing can pump stations are between 30 and 40 years old. All of the equipment in the stations is original to them. An overview of the stations is summarized in Table 2 below. A detailed review of their condition was just completed by Prein&Newhof, including a site inspection of the stations.

Table 2

Can Pump Stations

Pump Station Name	Year Installed	Capacity (gpm)
Cherry Street	1977	100
Marshall Street	1977	100
Pingree Park	1977	180
Thomas St @ Ely	1977	200
Thomas St @ Jackson	1977	100
Mill District	1977	100
Water Street	1977	1,200
Truheat	1975	100
Swan	1970	210

The existing submersible pump stations are newer and in generally good condition with the exception of the Eastern Avenue station, which is a submersible station serving the largest portion of the City, including the Perrigo factories. Thus, it is the City's most critical pump station. The Eastern Avenue station has the following problems:

1. Pump metal deterioration due to variations in the sewage. The impellers of the pumps in this station have been deteriorated to the point where their capacity has been compromised.

2. Lack of influent screening/solids handling. The amount of solids in the pump station accumulates on the surface, forming a hard mat. The City regularly removes this mat (via vactor truck) out of the station, but the last time this happened both of the pumps sucked up enough of the accumulated solids that they both plugged, creating an emergency situation.

3. Deficiencies in Mechanical/Electrical/Access. The existing electrical system in the pump station does not contain proper ground fault circuits, creating a danger for City staff. The existing water pipes at the station are not properly protected from the potable water system, creating a cross connection. Access to the wet well for cleaning, vactoring and maintenance of the pumps is limited due to the existing structure over the wet well.

4. EPA reliability requirements. The capacity of the existing station does not meet current EPA reliability requirements in that neither pump has sufficient capacity for a 25 year storm event (both pump operate in high rain conditions).

The Vernon Street station's pumps clog on a regular basis due to high solids/rags content from the service area. An influent grinder is proposed to be installed at this station to remedy this.

Only one backup generator is available for all fourteen of the stations, with the exception of Eastern Avenue which has a permanent standby generator. When power outages occur, the City is required to go station-to-station with the one generator. Adding a permanent standby generator at Vernon Street and purchasing a second portable generator will greatly increase the reliability of the overall system.

Existing sewers that are known to be approximately 80 years old and made of clay pipe were televised in selected areas of the City. The results of this work showed structural deficiencies in the sewers. Some of these sewers are only 6-inches in diameter. The current minimum allowed diameter of sanitary sewer is 8-inches.

Figure 3 shows the existing sewers.

II. Analysis of Alternatives

A. Identification of Potential Alternatives - Sewers

1. No Action:

Under the "No Action" alternative, the existing problems experienced in the study area would continue and the eventual total failure of the system would result due to deterioration. The City of Allegan recognizes the need to make improvements to the sewer collection system to provide the necessary reliability to the system. Therefore, the no action alternative is unacceptable to consider further.

2. Optimum Performance of Existing Facilities:

The existing sewers are being operated as efficiently as is reasonably possible. However, the condition of the sewers makes it impossible for the City to provide reliable service to customers without making physical improvements to the system. Therefore, this alternative will not be considered further.

3. Rehabilitation of Existing Sewers:

Although no sanitary sewer overflows have been recorded in recent history in the Allegan sewer system, the system does experience operational difficulties due to the structural conditions of the existing sewers. Emergency repairs of failed sewers have taken place. Due to the depth of the sewers and their location in the roadways, emergency repairs of some of the sewers would be extremely difficult and could result in prolonged loss of service.

The existing sewers identified in Figure 3 are in need of rehabilitation due to their age and structural condition. It is assumed that these sewers will be rehabilitated sometime in the next 20 years as part of one or more projects. To rehabilitate the

sewers, it is proposed to perform cured-in-place (CIP) sewer lining of the sewers. This is the method requiring the least disruption of service, the least impact to the customers or the environment due to no excavation being required and is the method which will restore the structural integrity of the sewers while maintaining their flow capacity. The only exception to the CIP of the existing sewers is where the sewers are only 6-inches in diameter. The minimum required size of public sewers is 8-inches in diameter. Thus, any sewers that are 6-inches in diameter will be replaced by a new 8-inch sewer.

4. Replacement of Existing Sewers

In general, replacement of the existing sewers with a new sewer is not the preferred solution due to the added costs and disruption of constructing new gravity sewers. The exception to this is when the existing sewers are smaller diameter than the minimum standard.

B. Identification of Potential Alternatives – Pump Stations

1. No Action:

Under the "No Action" alternative, the existing problems experienced in the study area would continue and the eventual total failure of the system would result due to deterioration. The City of Allegan recognizes the need to make improvements to the pump stations to provide the necessary reliability to the system. Therefore, the no action alternative is unacceptable to consider further.

2. Optimum Performance of Existing Facilities:

The existing pump stations are being operated as efficiently as is reasonably possible. However, the condition, age and inability to continue to get spare parts for the pump

stations make it impossible for the City to provide reliable service to customers without making physical improvements to the system. Therefore, this alternative will not be considered further.

3. Rehabilitation of Existing Pump Stations

For the existing can stations, rehabilitation of the stations by replacing the equipment and making upgrades to the structure is generally not possible due to constraints of the existing steel can dry wells which house the equipment. The steel itself is in many cases corroded significantly and would be very difficult to attempt to rehabilitate. The size of the cans inside is prohibitively small to put replacement equipment in which meets current standards for capacity and confined space entry.

In the case of the Vernon Street pump station, the station is relatively new and in good condition. Thus, addition of an influent grinder and a backup power generator is the preferred option.

4. Replacement of Existing Pump Stations

For the existing can pump stations and the existing Eastern Ave. submersible pump station, complete replacement is the preferred option due to the scope of the existing problems at the stations and the difficulty in rehabilitating the station.

5. Regional Alternative

The project plan is required to include an investigation of any possible regional sewer system alternative. Because the items under consideration for this plan are the local collection and pumping system, regional alternatives do not come into play.

Therefore, this alternative will not be considered further.

C. Analysis of Principal Alternatives

1. Pump Stations

There is no other alternative for pumping of sewage other than constructing the improvements proposed to the existing stations.

2. Gravity Sewers

Relining existing gravity sewers restores their structural integrity while maintaining their capacity. This construction method does not require excavation to place new sewers, so the disruption to the environment and the residents is kept to a minimum. In addition, because no excavation or road replacement is required, this method of rehabilitating the sewers is significantly less expensive than replacing the sewers in kind.

A present worth monetary analysis of relining the sewers versus replacing the sewers has been done and is presented below. As given, Alternative 1, Rehabilitation of Existing Sewers is the most cost-effective option available (note that only the sewers proposed for relining have been evaluated in this analysis; the 6-inch sewers are not included as there is no option but to replace them with 8-inch sewers).

Table 3

Cost-Effective Analysis – Sewer Alternatives

	Alternate 1 Sewer Relining	Alternate 2 Sewer Replacement
Capital Costs (including ELAC)		
Piping	$595,560	$1,488,900
Equipment	$0	$0
Project Cost	$595,560	$1,488,900
Operation & Maintenance		
Annual O&M	$35,000	$35,000
20 yr Present worth of O&M	$455,280	$455,280
Salvage Value		
Salvage value at 20 years	$357,336	$893,340
Present worth of salvage	-$148,152	-$370,379
Total Present Worth	$902,688	$1,573,801
Equivalent Annual Cost	$69,397	$120,991

**Discount rate is 4.5%

3. Environmental Evaluation

The following is a synopsis of the environmental setting of the City of Allegan.

a. Cultural Resources

The proposed project would not impact existing structures in the City, with the exception of the existing water treatment plant building, or any previously undisturbed property. Therefore, no historic or archaeological sites will be impacted by the construction of the proposed project. The Michigan State Historic Preservation Office will be contacted for comments on the proposed project.

b. The Natural Environment

Climate: Climatological information was obtained from the National Weather Service Forecast Office located in Grand Rapids, Michigan through use of their web page. The nearby City of Grand Rapids reported the following:

Averages	Summer	Winter
High Temperature	80	32
Low Temperature	58	18
Mean Temperature	69	25
Precipitation (inches)	11.01	6.26
Seasonal Snowfall (inches)		72

Air Quality: The proposed project would not negatively impact the air quality of the City of Allegan. According the MDEQ, Air Quality Division, Allegan County is in attainment for all regulated pollutants in accordance with the Michigan State Implementation Plan.

Wetlands: A wetlands map containing most of Allegan county and the entire service area for the City of Allegan Water Treatment Plant as prepared by the National Wetlands Inventory and the USGS are included in Appendix F. The National Wetlands Inventory map was obtained from the Michigan Natural Features web site and illustrates various classifications of wetlands within Allegan County. The USGS wetlands maps were obtained from the US Fish and Wildlife Service website providing the National Wetlands Inventory. The improvements proposed in this Project Plan are not anticipated to impact wetlands. If any wetlands are encountered, a letter to the Michigan Department of Environmental Quality (MDEQ) Wetland Assessment Program will be prepared.

Coastal Zones: The study area does not lie within a coastal zone.

Floodplains: Federal Emergency Management Agency (FEMA) floodplain map is contained in Appendix A. Two of the existing stations are located in the floodplain. As part of the project, the top of the stations located in the floodplain will be raised to above the 100 year flood level.

Natural or Wild and Scenic Rivers: No natural or wild and scenic rivers were found in the Michigan Department of Natural Resources database for the project study area. The Kalamazoo River was not listed as a Natural or Wild and Scenic River by the Michigan Department of Natural Resources.

Major Surface Waters: The major surface water bodies within the project study area include: Kalamazoo River, Lake Allegan, Dumont Lake, and Miner Lake. The City of Allegan and its surrounding areas currently use groundwater as their source for drinking water because the surface water quality was highly variable due to seasonal and weather related events.

Recreational Facilities: The city, township and neighboring areas of Allegan have many outdoor activities to offer. Valley Township, to the immediate west of Allegan Township, is home to a large portion of the Allegan County State Game Area.

Within the City of Allegan there are also many places meant for recreational use. There is Mahan Park, a downtown park and there is Jaycee Park, Rossman Park, Hansen Park, and several walking and biking trails. Many of the parks are along the Kalamazoo River or provide public access to the river for a variety of water recreation. The largest recreational space is the Sports Complex which consists of

four baseball diamonds, two softball diamonds, four soccer fields, one football field, a skate park, and a one mile paved loop.

Topography: The study area is located on the banks of the Kalamazoo River. The highest elevation in the study area is roughly 850 feet. The water elevation at the Kalamazoo River range is roughly 615 feet to 625 feet as it flows northwest through the study area.

All surface water runoff in the study area is directed towards the Kalamazoo River, or flows into one of the surrounding lakes.

Geology: According to the Hydrogeologic Atlas of Michigan, the surficial geology of the study area consists of glacial sediments deposited by glacial outwash channels, medium and fine textured till, some areas of peat and muck, and post glacial alluvium. The thickness of the unconsolidated sediments ranges from approximately 400 to 600 feet in the vicinity of the Study area.

Soils: The soils in the study area may generally be described as belonging to a single predominant soil association: Perrinton-Coloma-Ithaca association. This association is described as, "Nearly level to steep, well drained, somewhat excessively drained, and somewhat poorly drained, loamy and sandy soils that formed in glacial till or outwash deposits." These soils are generally highly permeable, such that water tends to infiltrate the soils and runoff potential is low. A General Soil Map for the City of Allegan is attached as Appendix A. As a part of the final design process, soil borings will be obtained in select areas. These soil borings will be useful in determining soil types, depth to groundwater, and soil stability.

Agricultural Resources: Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to producing food, feed, forage, fiber, and oilseed crops. When treated and managed using acceptable farming methods, it has the soil quality, growing season, and moisture supply needed to economically produce a sustained high yield of crops. Prime farmland produces the highest yields with minimal inputs of energy and economic resources, and farming this land results in the least damage to the environment.

Prime farmland may now be cropland, pasture, or woodland, or it may be in other uses, but it is not urban and built-up land or water areas. No agricultural land is present within the study area as noted in the various zoning maps and future land use maps provided in Appendix C.

Fauna and Flora: According to the Michigan Natural Features Inventory web site, there are many different types of fauna and flora listed as being threatened or of special concern within the study area and the Kalamazoo River watershed. A complete list of these fauna and flora can be found in Appendix G.

Unique Features: The City of Allegan is unique in large part because it is home to the Perrigo Corporation. The City also possesses charm due to the age and character of the homes and businesses. The City is one of the governmental centers for Allegan County, therefore becoming the natural center of both the governmental and business sectors in the region. The Kalamazoo River gives Allegan part of its overall charm.

These qualities of the study area will not be adversely impacted by the proposed wastewater system improvements. Instead, the construction of the improvements

will ensure that the community will continue to have a sustainable wastewater collection system going forward into the future.

c. Implementability and Public Participation

The proposed project can be readily implemented. The City of Allegan owns all of the land/right-of-way required for the sewers. For the pump stations, in some cases additional land may be required, as in the case of the Eastern Avenue pump station. The City is currently negotiating to obtain this land. The public will be given a chance to review this project plan and comment in a formal public hearing.

III. SELECTED ALTERNATIVE

A. Description of Selected Alternative

The proposed project includes the following elements:

Phase I

- Construct a new submersible pump station to replace the existing Eastern Avenue pump station, maintaining the existing backup power generator.
- Purchase a portable, diesel powered, backup power generator that can be used to provide backup power to the existing nine can stations that have no generator.
- Install an influent grinder and permanent backup power generator at the Vernon Street pump station.

Phase II

- Reline approximately 10,635 feet of existing 8-inch gravity sanitary sewer as shown on Figure 3.

- Replace approximately 4,385 feet of existing 6-inch gravity sanitary sewer with 8-inch sewer as shown on Figure 3.

- Replace the nine existing can pump stations with new pump stations immediately adjacent to them.

Figure 2 shows the locations of the pump stations in the City.

Table 4 is a schedule for the proposed wastewater system improvement project.

Table 4
Proposed Project Schedule – Phase I

Milestone	Date
Submit Draft Project Plan to MDEQ	May 2009
Hold Public Hearing	June 2009
Submit Final Project Plan to MDEQ	July 1, 2009
Submit Plans and Specifications to MDEQ	September 2009
Submit User Charge System to MDEQ	July 2009
Receive Approval of Project Plan	August 2009
Receive Construction Permit	October 2009
Receive Construction Bids	October 2009
SRF Loan Awarded	December 2009
Begin Construction of Eastern Ave PS	January 2010
Initiation of Operation of Eastern Ave PS	September 2010

B. Monetary Cost Estimate

Table 5 is a cost opinion for the proposed wastewater system improvements. The project costs include construction costs, contingency costs and approximately 20% for project engineering and legal/financial/bond counsel.

Table 5
Total Project Cost Opinion

Project Element	Quantity/Capacity	Cost
Can Pump Station Improvements	Nine total	$1,460,000
Eastern Ave Pump Station	Lump Sum	$450,000
Portable Backup Generator	Lump Sum	$30,000
Vernon Street Pump Station	Lump Sum	$87,000
6-inch Sewer Replacement	4,385 feet	$438,500
Sewer Relining	10,635 feet	$425,400
Total Construction Cost		$2,890,900
Engineering, Legal, Administrative, Financial and Contingency		$1,109,100
Total Project Cost		$4,000,000

C. User Costs

The City is pursuing SRF loan funding for the estimated cost of $4,000,000. The SRF loan will be financed over a 20 year period, 2.5% interest. This loan will be obtained in multiple segments, but for the purpose of calculating users costs, we are assuming that the entire cost will be incurred at one time.

The expected Operation, Maintenance and Replacement Cost for the selected alternative is the same as the current budget for this operation. Thus, there is no impact to OM&R costs for the proposed work.

Table 6
User Cost

Description	Expense Opinion
Debt Retirement Yearly Cost	$256,589
O, M and R Yearly Cost	$0
Total Yearly Cost	$256,589

The City's residential customer base currently represents approximately 42% of the average billed sales, and there are currently 1,850 accounts in this customer category. A summary of the estimated project user costs is given below for each funding scenario.

Table 7
Estimated Typical Residential Monthly User Cost

Total Yearly Cost	$256,589
Estimated Monthly Cost for Residential User	$4.85

D. Disadvantaged Community

The median household income in the City of Allegan is $39,539, according to the US 2000 Census. At this income level the City of Allegan would not qualify as a disadvantage community under the SRF program.

E. Ability to Implement the Selected Alternative

Implementation of the proposed project is based on the assumption that the project will be financed by a low-interest loan from the SRF program. The City of Allegan has the necessary legal, institutional, financial, and managerial resources available to ensure the construction, operation and maintenance of the proposed facilities.

IV. ENVIRONMENTAL IMPACTS

A. General

The anticipated environmental impacts resulting from the construction of the selected plan include beneficial and adverse, short and long-term, and irreversible and irretrievable. The following is a discussion of the anticipated environmental impacts of the selected plan.

1. Beneficial and Adverse Impacts

Construction activities associated with the sewer system would occur primarily within existing road rights-of-way. Construction and equipment manufacturing related jobs would be generated, and local contractors would have an equal opportunity to bid on the construction contracts.

Noise and dust would be generated during construction of the project. Spoil from open excavation would be subject to erosion.

2. Short and Long-Term Impacts

The short-term adverse impacts associated with construction activities would be minimal, and mitigatable, in comparison to the resulting long-term beneficial impacts. Short-term impacts include traffic disruption, dust, and noise. No long-term negative impacts are anticipated.

B. Analysis of Impacts

1. Direct Impacts

The construction of the proposed project should have no effect on historical, archaeological, geographic, cultural or recreational areas, as all construction activities would be confined to existing developed sites and within road rights-of-way. Previously referenced figures show the proposed construction locations for the project.

The project will not detrimentally affect the water quality of the area, air quality, wetlands, endangered species, or wild and scenic rivers. No residents or businesses would be relocated.

2. Indirect Impacts

The proposed water facilities are sized to provide service for 20 years of future growth in the study area, based on current trends. Future growth in the study area will not greatly alter the character of the area. Future growth would be subject to conformance with the land use and zoning plans of the City of Allegan.

3. Cumulative Impacts

Providing a more reliable wastewater collection system with new, updated equipment and structures to the customers of the system would be the primary cumulative impact anticipated from the construction of the project.

V. MITIGATION

A. Short Term Construction Related Mitigation

Standard procedures used in the construction industry will be included in the construction contract documents to mitigate construction activities. These include traffic and safety hazard controls, dust control, noise control, soil erosion and sedimentation control, restoration of roads and disturbed right-of-way. The use of soil erosion and sedimentation controls, such as straw bales, sedimentation basins, and silt fence, will be part of the construction activities at the pump stations and in the collection system as needed. In general, all of the sewer work will be done without the need for excavation, as the relining process utilizes the existing sewer pipes as a carrier pipe for the new lining. Access to the existing sewer pipes for this process is from the surface, through existing manholes.

Construction equipment will be maintained in good condition to decrease noise. All haul roads and public roadways will be swept daily and maintained to assure residents access to the area.

B. Mitigation of Long Term Impacts

General construction activities will prohibit the disposal of soils in wetlands, floodplains, or other sensitive areas. Catch basins will be protected where earth changing activities will take place.

C. Mitigation of Indirect Impacts

The current trend in the City of Allegan is that the land use is largely dominated by residential properties. According to the City of Allegan's future plans for land use this will not change much. Considering that everyone in the city limits can access the wastewater system if they choose to connect a large increase in flow is not expected from inside the city limits.

New flows may come from outside the City such as Allegan, Valley, and Trowbridge Townships. A copy of the zoning and land use maps for the City of Allegan and for Allegan Township is included in Appendix C.

The City of Allegan ordinances can be found on their on-line website. General rules are the same as DEQ permits require, such as storm water containment, soil erosion and sedimentation control.

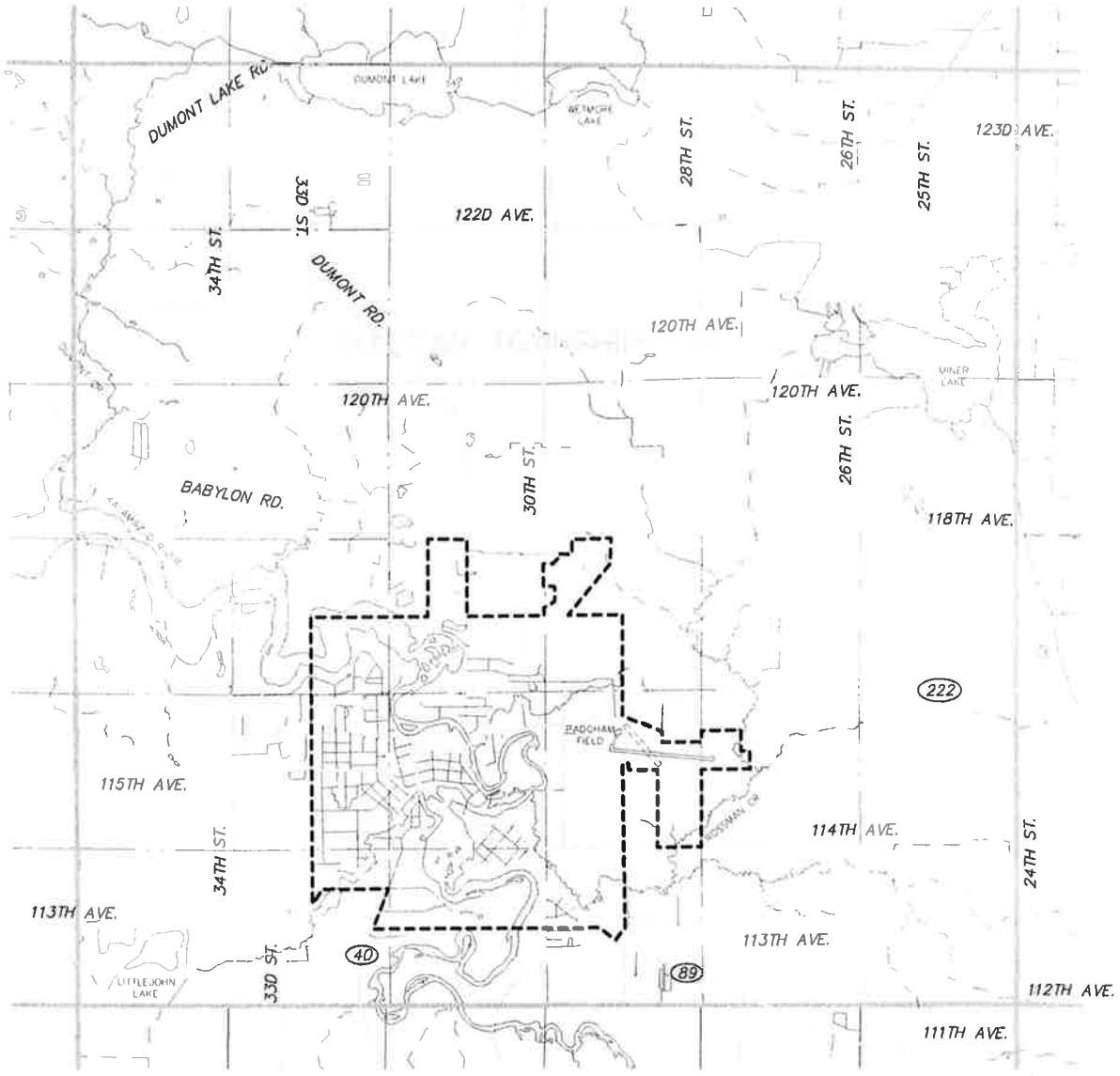
Planning and staging of construction could play a vital role in the success of the wastewater improvements. The existing system needs to be kept operational while the improvements are being constructed, tested and then placed in service.

VI. PUBLIC PARTICIPATION

A. Public Hearing on Selected Alternative

A public hearing will be held on the Draft Project Plan prior to its adoption by the City of Allegan City Council. A notice of public hearing will be published in the local newspaper 30 days before the hearing.

Figures



North

SCALE : NONE

LEGEND

———	TOWNSHIP BOUNDARIES
- - - - - -	ALLEGAN CITY LIMITS

CITY OF ALLEGAN

ALLEGAN COUNTY, MICHIGAN

WASTEWATER SYSTEM IMPROVEMENTS

STUDY AREA MAP

FIGURE 1

Prein&Newhof

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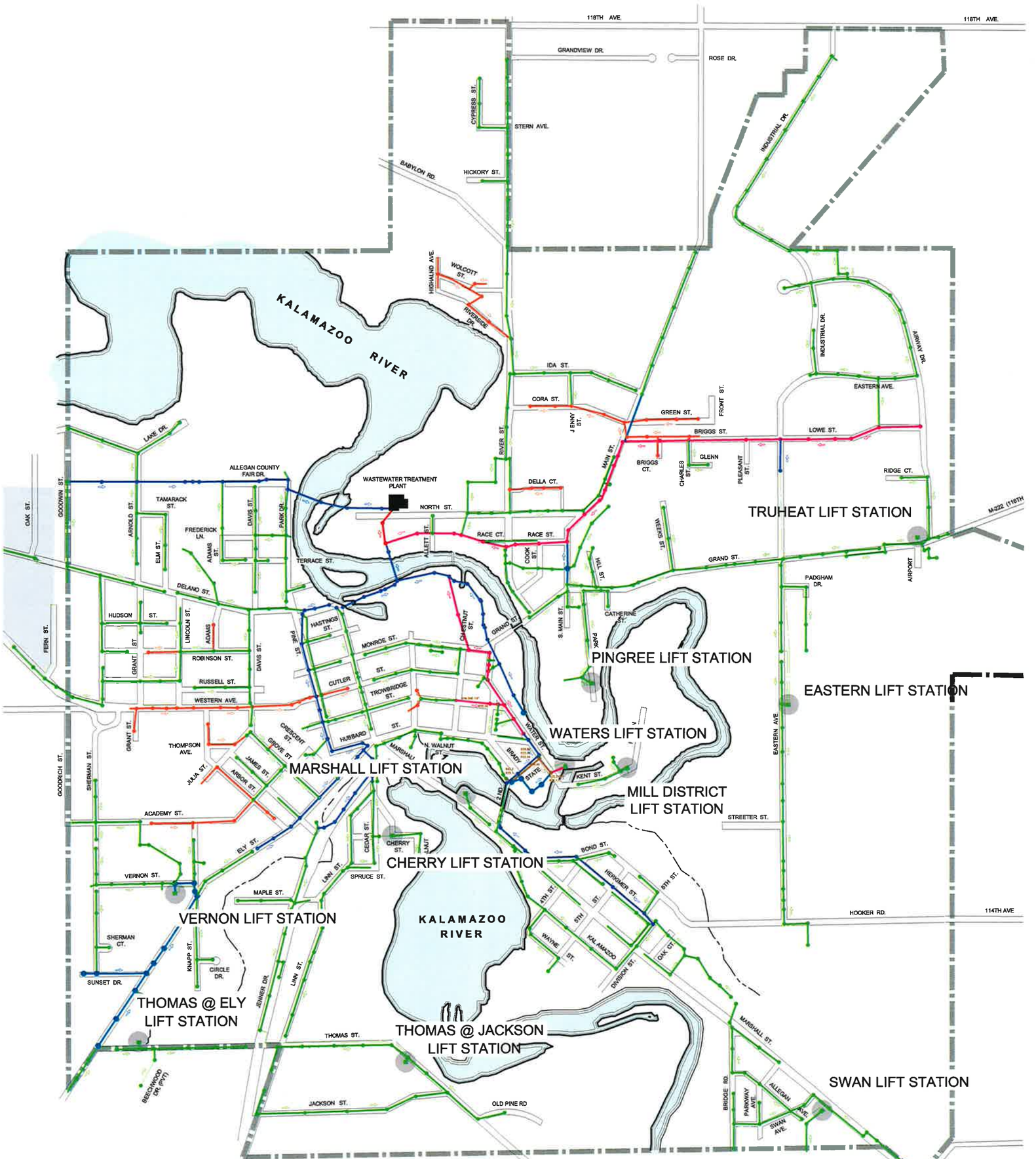

All Roads Lead To ALLEGAN
A Bridge Worth Crossing

CITY OF ALLEGAN

SANITARY SEWER LIFT STATION LOCATIONS

FIGURE 2

Prein&Newhof

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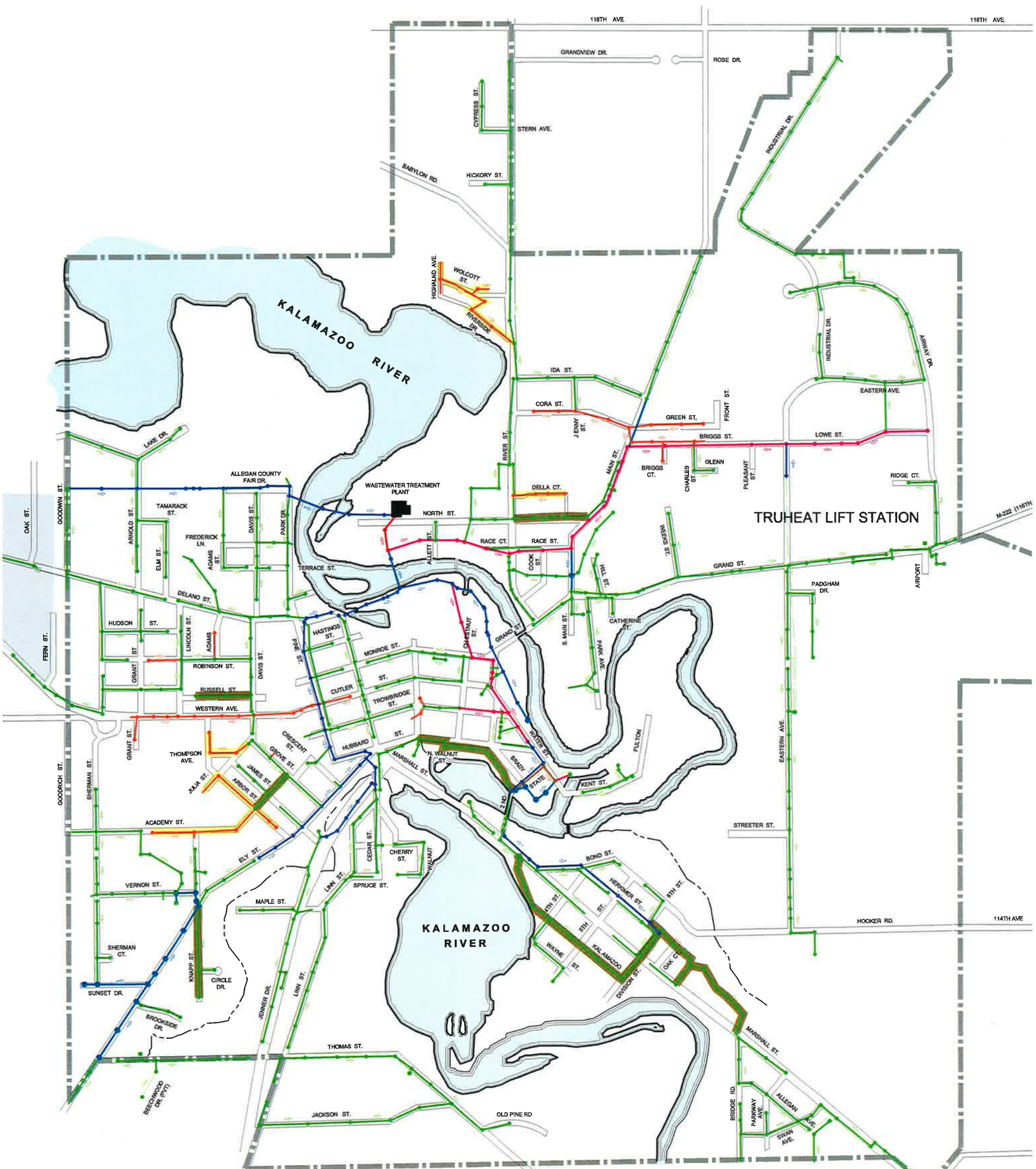

All Roads Lead To ALLEGAN
A Bridge Worth Crossing

CITY OF ALLEGAN

SANITARY SEWER REPLACEMENT / RELINING LOCATION

FIGURE 3

Prein&Newhof

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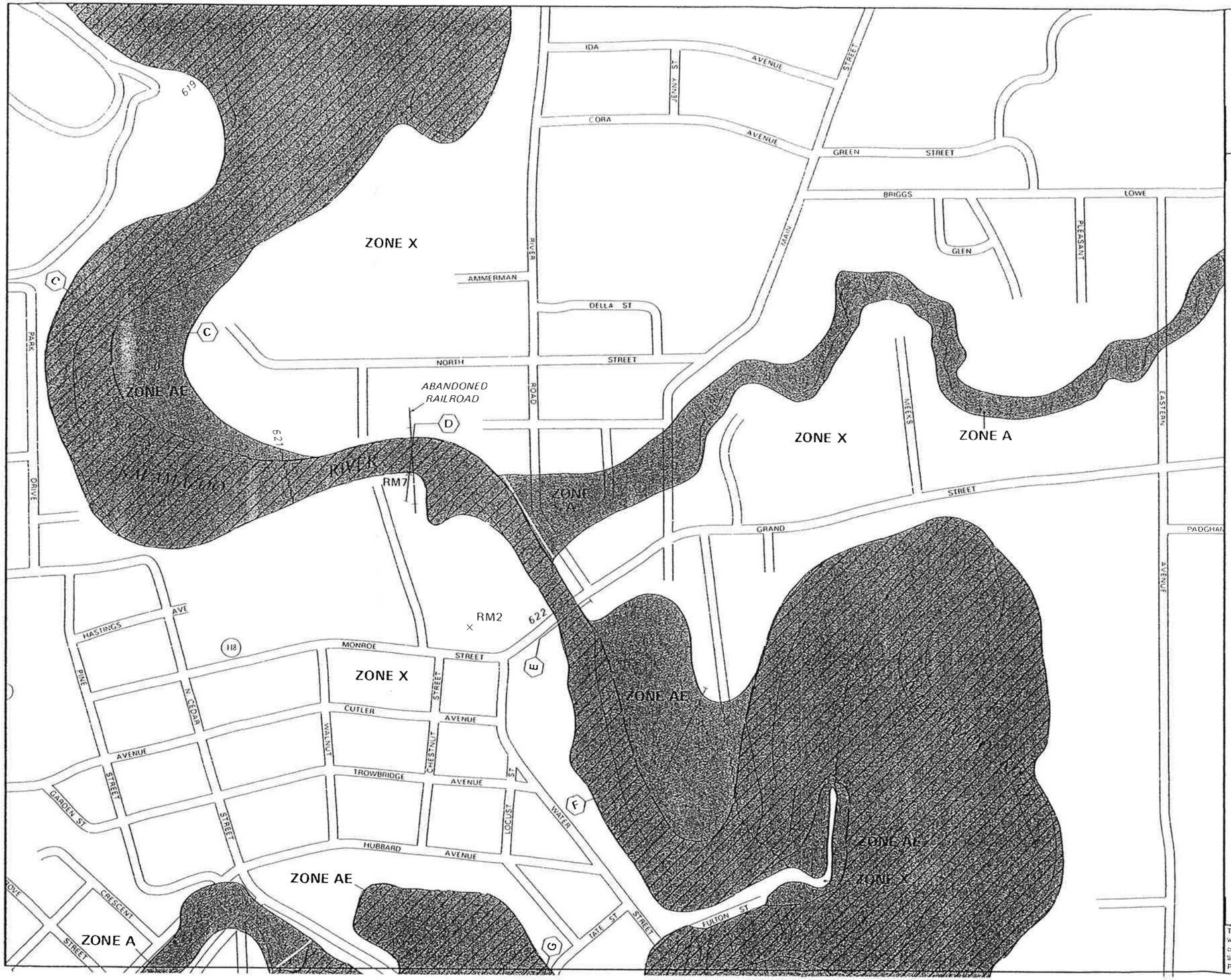


APPROXIMATE SCALE IN FEET

500 0 500

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CITY OF
ALLEGAN,
MICHIGAN
ALLEGAN COUNTY

(ONLY PANEL PRINTED)

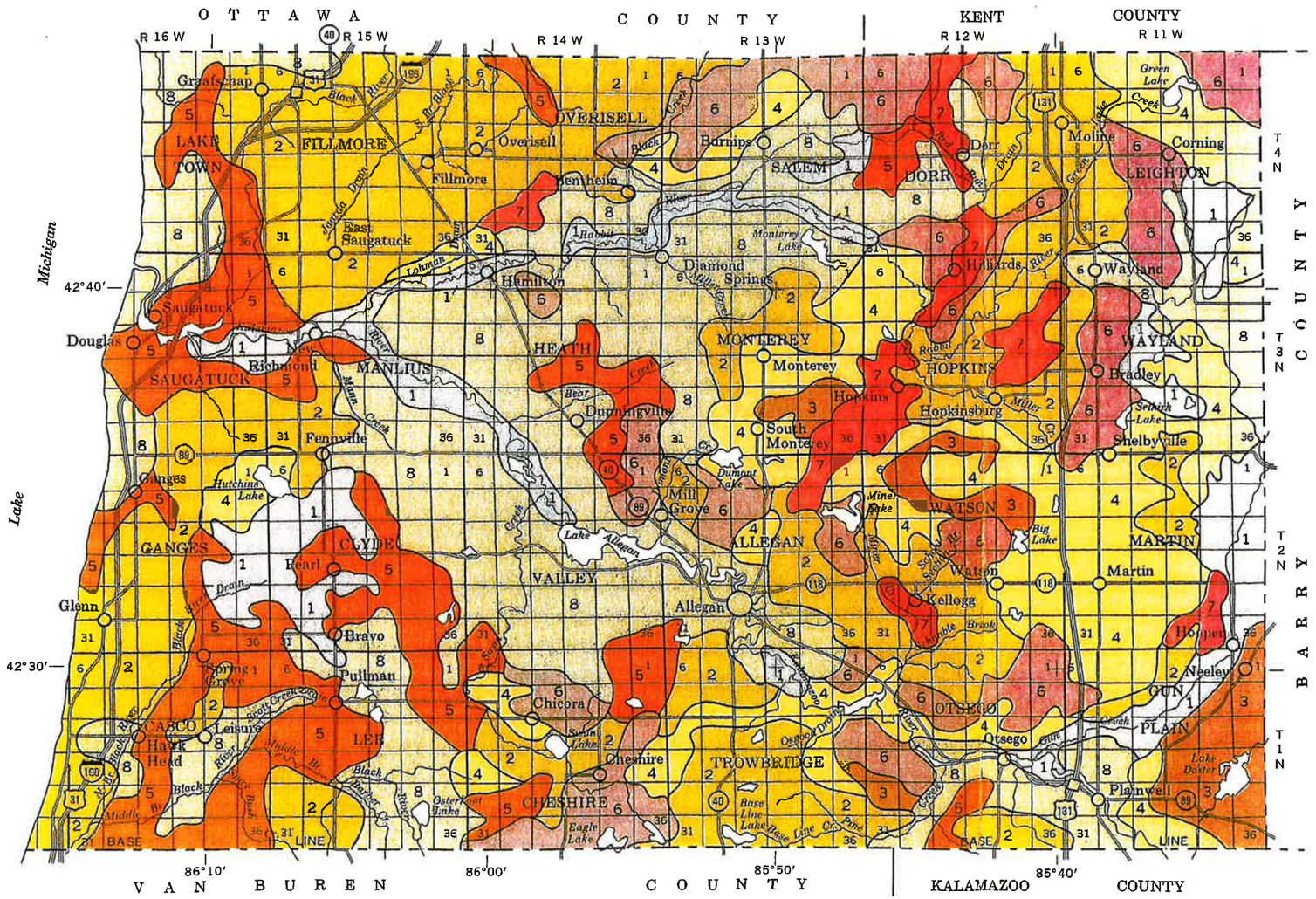
COMMUNITY-PANEL NUMBER
260003 0001 B

EFFECTIVE DATE:
MAY 4, 1989

Federal Emergency Management Agency

Appendix B

Soils Map



Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

LEGEND

1 — GLENDORA-ADRIAN-GRANBY association: Nearly level, poorly drained and very poorly drained soils formed in sandy and organic material; on flood plains, outwash plains, lake plains, and till plains

2 — CAPAC-RIMER-PIPESTONE association: Nearly level and undulating, somewhat poorly drained soils formed in loamy, sandy, and silty material; on moraines, till plains, lake plains, and outwash plains

3 — OSHTEMO-CHELSEA-OCKLEY association: Rolling to very hilly, well drained and somewhat excessively drained soils formed in loamy and sandy material; on moraines, outwash plains, terraces, and valley trains

4 — CHELSEA-OCKLEY-OSHTEMO association: Nearly level to gently rolling, somewhat excessively drained and well drained soils formed in sandy and loamy material; on moraines, outwash plains, terraces, and valley trains

5 — MOROCCO-NEWTON-OAKVILLE association: Nearly level and undulating, somewhat poorly drained, very poorly drained, well drained, and moderately well drained soils formed in sandy material; on outwash plains, lake plains, and beach ridges

6 — MARLETTE-CAPAC-METEA association: Nearly level to very hilly, moderately well drained, somewhat poorly drained, and well drained soils formed in loamy and sandy material; on moraines and till plains

7 — SEBEWA-COLWOOD-BRADY association: Nearly level, poorly drained and somewhat poorly drained soils formed in loamy, sandy, and silty material; on outwash plains, lake plains, valley trains, and terraces

8 — OAKVILLE association: Nearly level to steep, moderately well drained and well drained soils formed in sandy material; on outwash plains, lake plaines, dunes, moraines, and beach ridges

COMPILED 1984

N

SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
MICHIGAN AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

ALLEGAN COUNTY, MICHIGAN

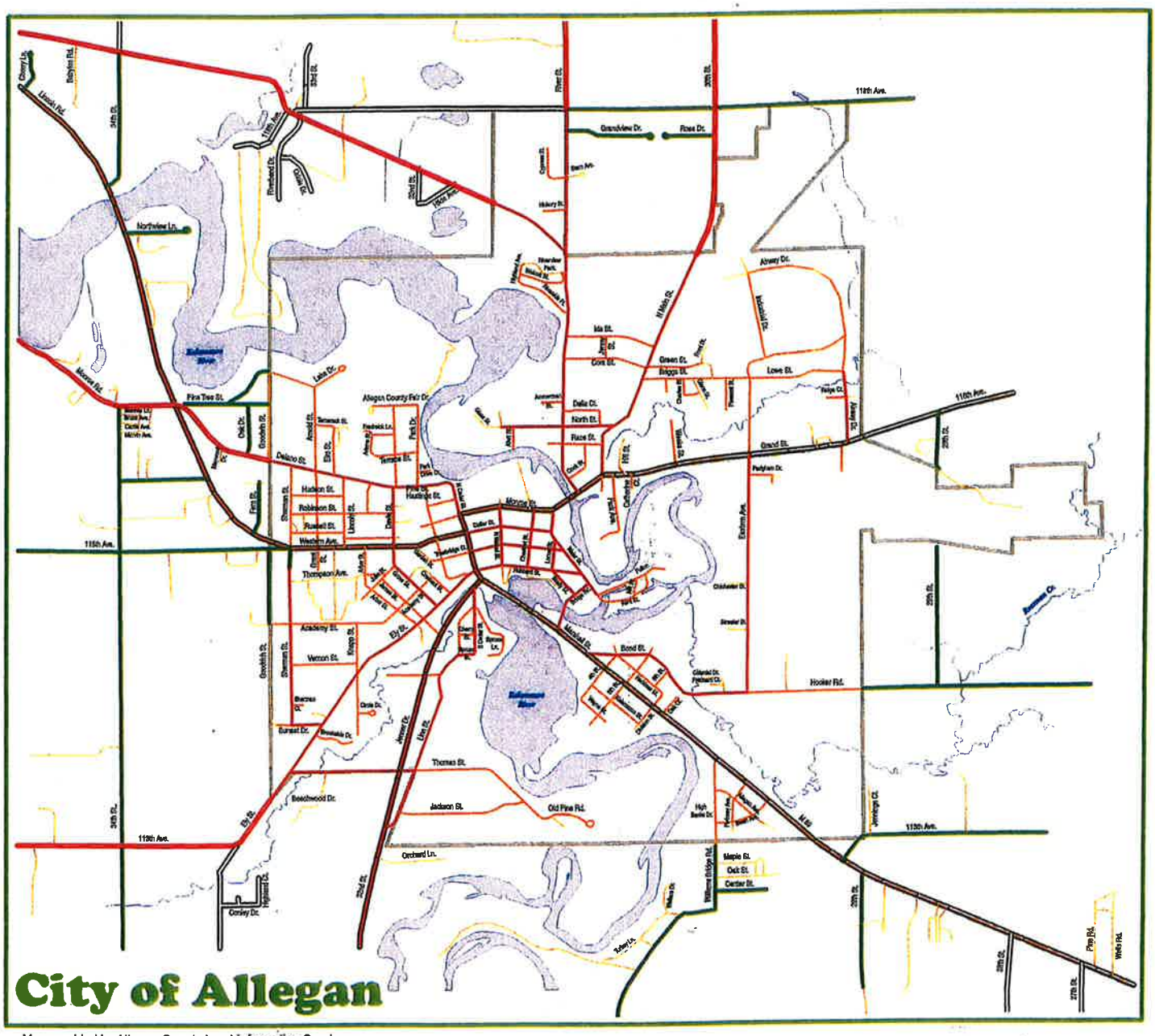
Scale 1:253,440

1 0 1 2 3 4 Miles

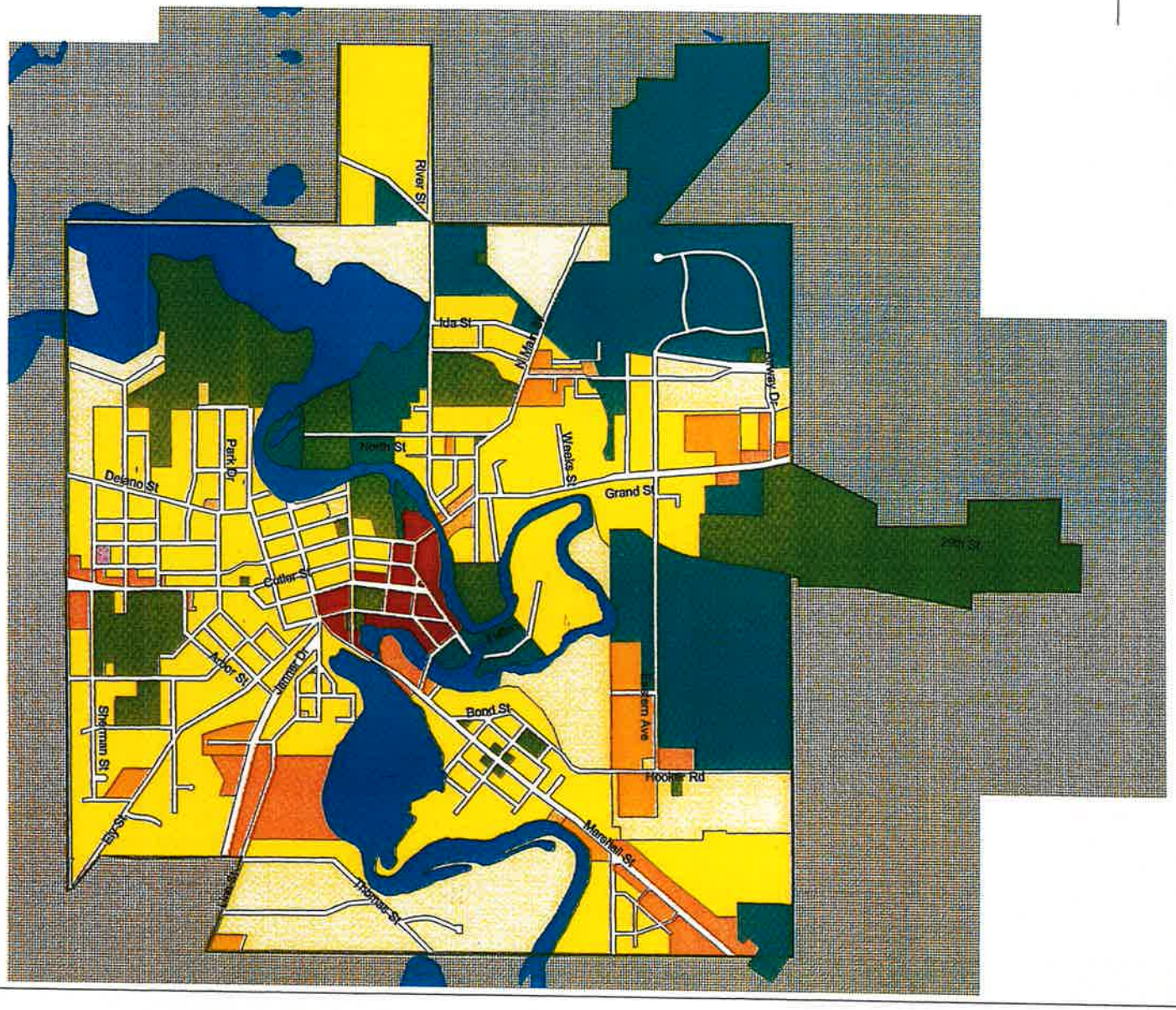
1 0 4 8 Km

Appendix C

Zoning/Land Use Maps City & Township



Map provided by Allegan County Land Information Services



MAP 6
Existing Land Use and Zoning

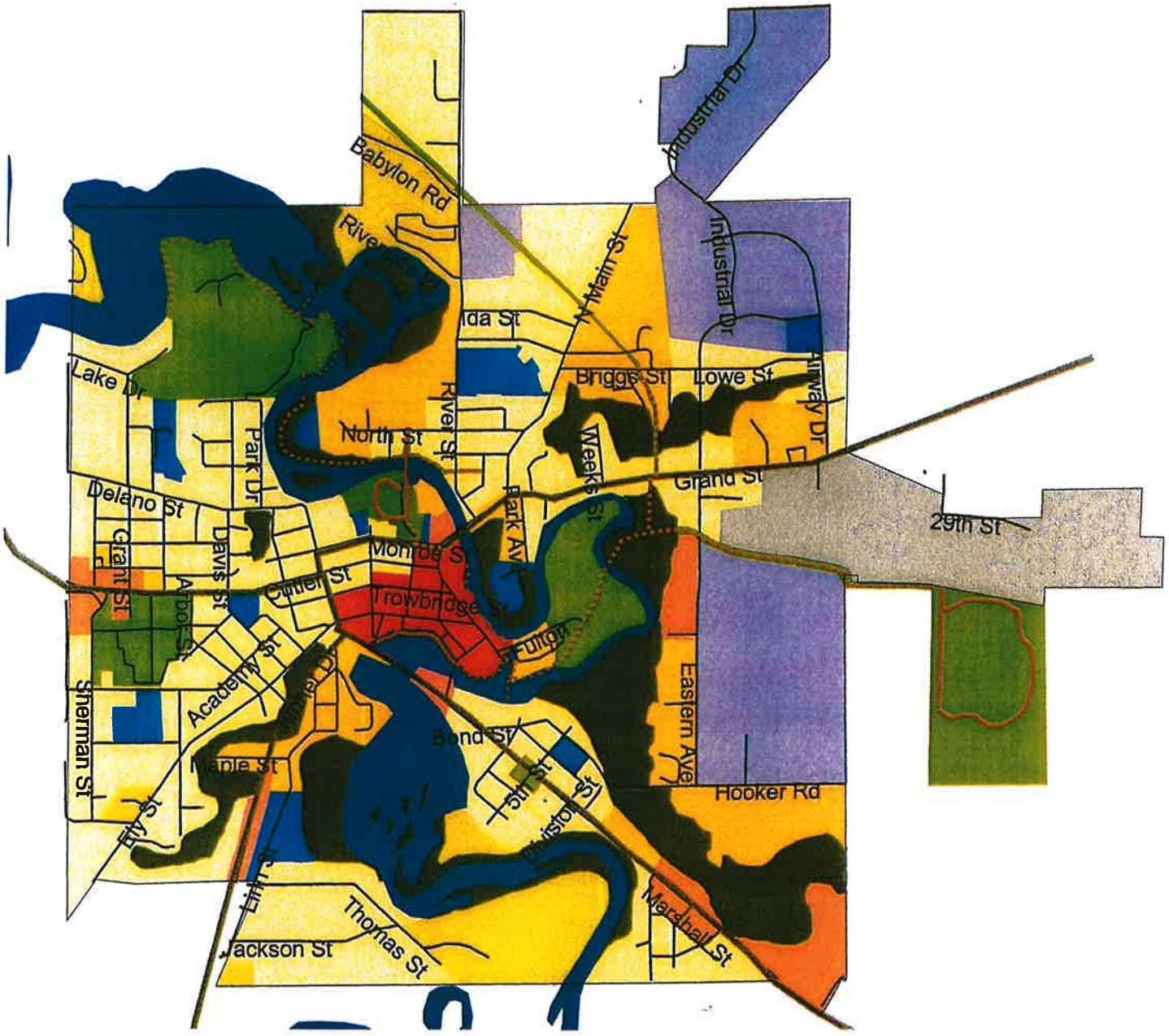
Allegan City Zoning
- CENTRAL BUSINESS DISTRICT
- GENERAL COMMERCIAL DISTRICT
- MANUFACTURING DISTRICT
- MOBILE HOME RESIDENTIAL DISTRICT
- MULTI-FAMILY DWELLING UNITS
- PUBLIC/GOVERNMENTAL LANDS DISTRICT
- RESTRICTED COMMERCIAL DISTRICT
- SINGLE FAMILY RESIDENTIAL - LOW DENSITY
- SINGLE FAMILY RESIDENTIAL - MED DENSITY
- WATER
- City Boundary

N
W E
S

Source: City of Allegan Zoning Ordinance and mapped by Allegan County.

December 11, 2002

Williams & Works
549 Ottawa Ave., N.W. Grand Rapids, MI 49503
Phone (616) 224-1500 Fax (616) 224-1501



MAP 8
Allegan Future Land Use

Future Land Use
- Airport
- Central Business District
- Civic
- Commercial Center
- Community Recreation
- Industrial
- Permanent Open Space
- Residential Mix
- River Overlook Residential
- Single Family Residential

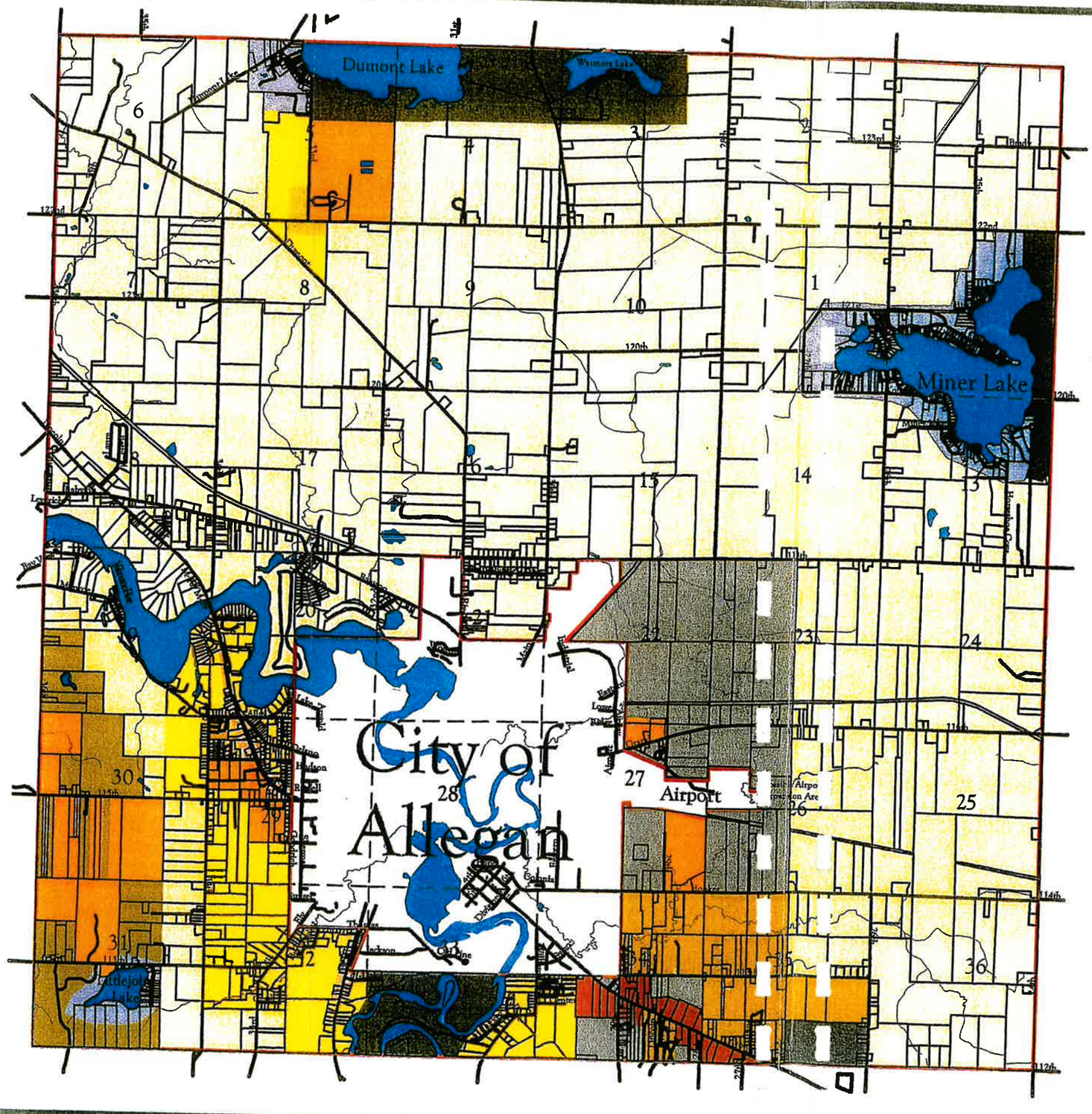
N
W E
S

February 2004

Source: The Future Land Use Map was developed through the ideas shared in the Community Futuring Workshop and multiple work sessions with the Master Plan Advisory Committee and the Planning Commission.

Williams & Works
549 Ottawa Ave., N.W. Grand Rapids, MI 49503
Phone (616) 224-1500 Fax (616) 224-1501

Allegan Township Future Land Use Map



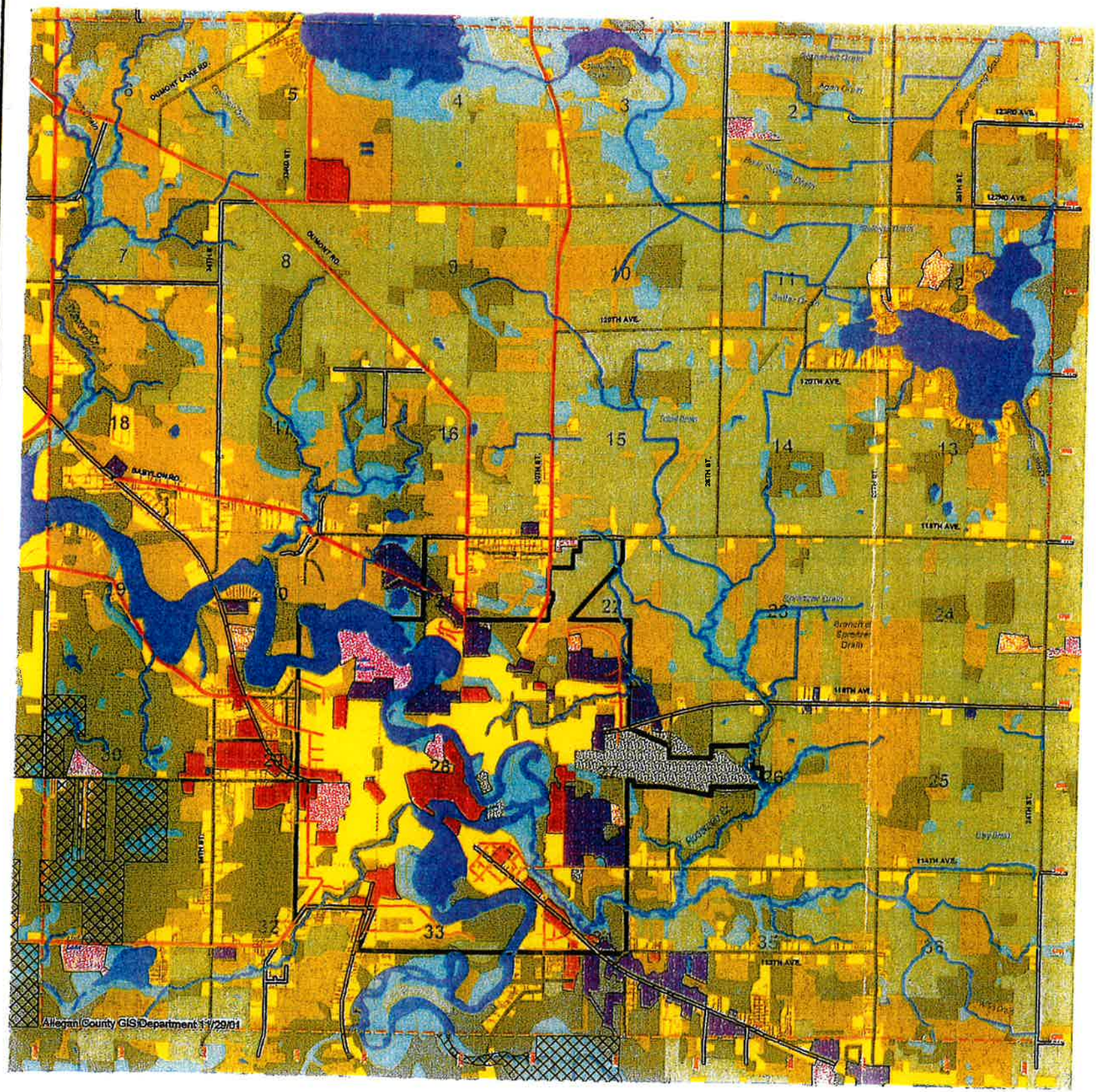
- Lake Residential
- Resource Protection
- Rural
- General Commercial-Light Industrial
- High Density Residential
- Industrial
- Low Density Residential
- Medium Density Residential
- Office/Local Retail
- Village Center
- Institutional/Public lands
- Manufactured Housing Community

Boundaries of each designation are approximate and meant to be interpreted as indefinite.

N
W E
S

Williams & Works

Base Map Source: Allegan County GIS Department



Allegan Township Land Use

N
W E
S

Legend

Source: GIS Research Center, WMU & Allegan County GIS Department (1996)

- Residential
- Commercial
- Industrial
- Allegan State Game Area
- Transportation Comm. & Utilities
- Extractive
- Non Forested Open Land Undeveloped
- Agriculture
- Forested
- Surface Water
- Wetlands
- Open Land Developed
- Barren Land

0 0.5 1 miles

Appendix D

Cost Opinions

CITY OF ALLEGAN
WASTEWATER SYSTEM
PROJECT PLAN
SEWERS COST OPINION

		Lineal Feet	Unit Price	Total Price
1	Sewer replacement (6" to 8"), including manholes, leads and restoration	4,385	$100	$438,500
2	Sewer relining with cured-in-place sewer liner (8")	10,635	$40	$425,400

Construction Total	$863,900
Engineering, Legal & Contingencies	$306,100
TOTAL SEWER COST	$1,170,000

CITY OF ALLEGAN
WASTEWATER SYSTEM
PROJECT PLAN
PUMP STATION COST OPINION

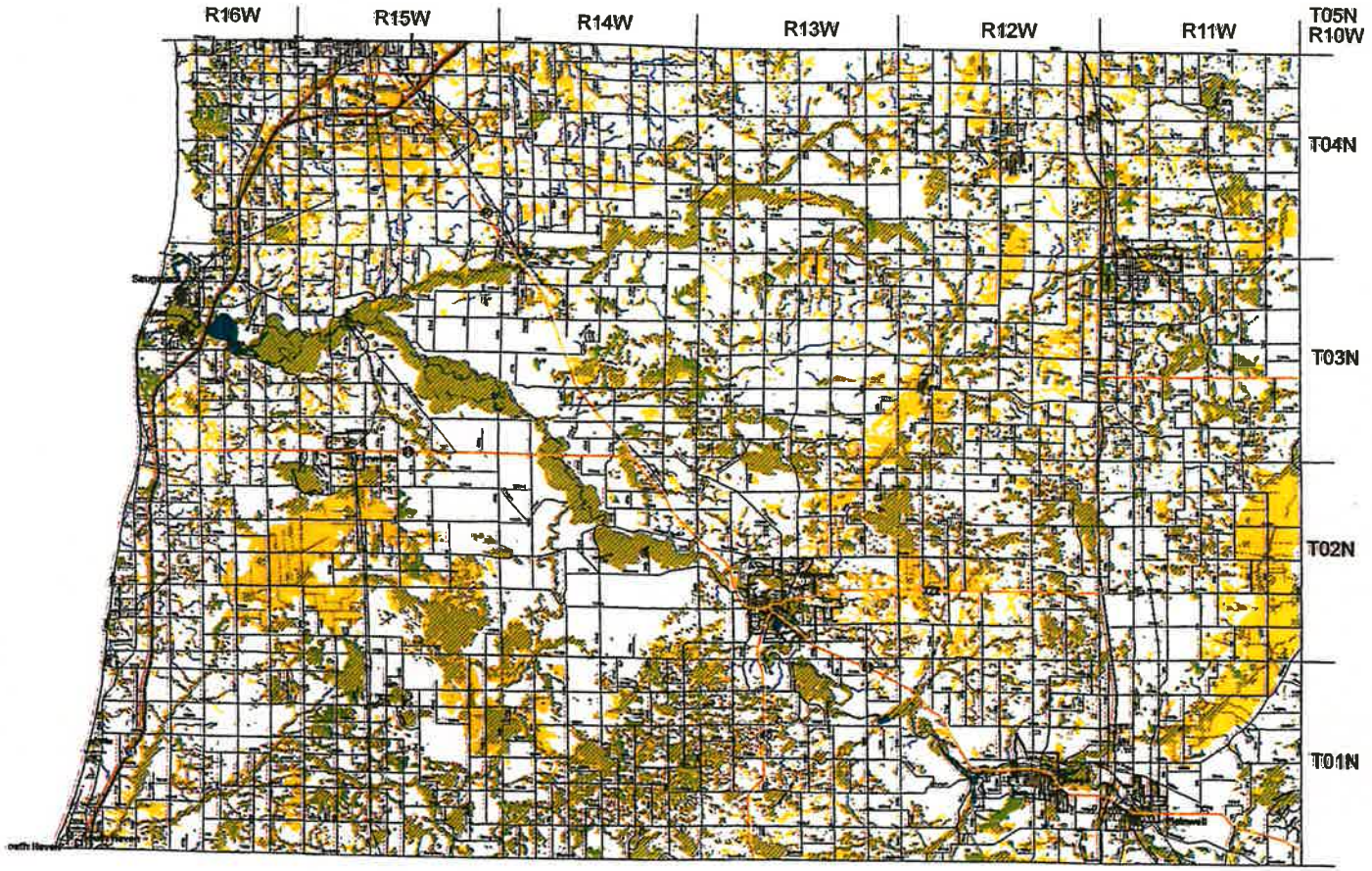
1	Eastern Ave (1,000 gpm submersible)	$450,000
2	Vernon Street (Influent Grinder, Standby Generator)	$87,000
3	Cherry St (100 gpm submersible)	$150,000
4	Marshall St. (100 gpm submersible)	$150,000
5	Pingree Park (180 gpm submersible)	$160,000
6	Thomas St @ Ely (100 gpm submersible)	$160,000
7	Thomas St @ Jackson (100 gpm submersible)	$150,000
8	Mill District (100 gpm submersible)	$150,000
9	Water Street (500 gpm submersible)	$220,000
10	Truheat (100 gpm submersible)	$150,000
11	Swan (210 gpm submersible)	$170,000
Subtotal		$1,997,000
Engineering, Legal & Contingencies		$803,000
TOTAL PUMP STATION COST		$2,800,000

*Note: All pump station costs assume a new wet well, pumps, valve pit, valves, electrical and piping with the exception of Vernon Street which is as noted

Appendix E

Wetland Map

Allegan County Final Wetland Inventory



Allegan County

Final Wetland Inventory

This Michigan Department of Environmental Quality (MDEQ) Wetland Inventory Map is intended to be used as one tool to assist in identifying wetlands and provides only potential and approximate location of wetlands and wetland conditions. The MDEQ produced this map from the following data obtained from other agencies or organizations:

1. The National Wetland Inventory (NWI) maintained by the United States Fish and Wildlife Service through interpretation of aerial photos and topographic data.
2. Land Cover as mapped by the Michigan Resource Inventory System (MIRIS), Michigan Department of Natural Resources, through interpretation of aerial photographs.
3. Soils as mapped by the United States Department of Agriculture, Natural Resource Conservation Service (NRCS).

This map is not intended to be used to determine the specific locations and jurisdictional boundaries of wetland areas subject to regulation under Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Only an on-site evaluation performed by the MDEQ in accordance with Part 303 shall be used for jurisdictional determinations. A permit is required from the MDEQ to conduct certain activities in wetlands regulated under Part 303.

More information regarding this map, including how to obtain a copy can be accessed at www.michigan.gov/deqwetlands.

Miles
0 0.5 1 2 3 4

Legend

- Interstate Highways
- US Highways
- State Highways
- Railways
- Open Water
- Rivers
- Drains
- Wetlands as identified on NWI and MIRIS maps
- Soil areas which include wetland soils
- Wetlands as identified on NWI and MIRIS maps and soil areas which include wetland soils
- County Boundary

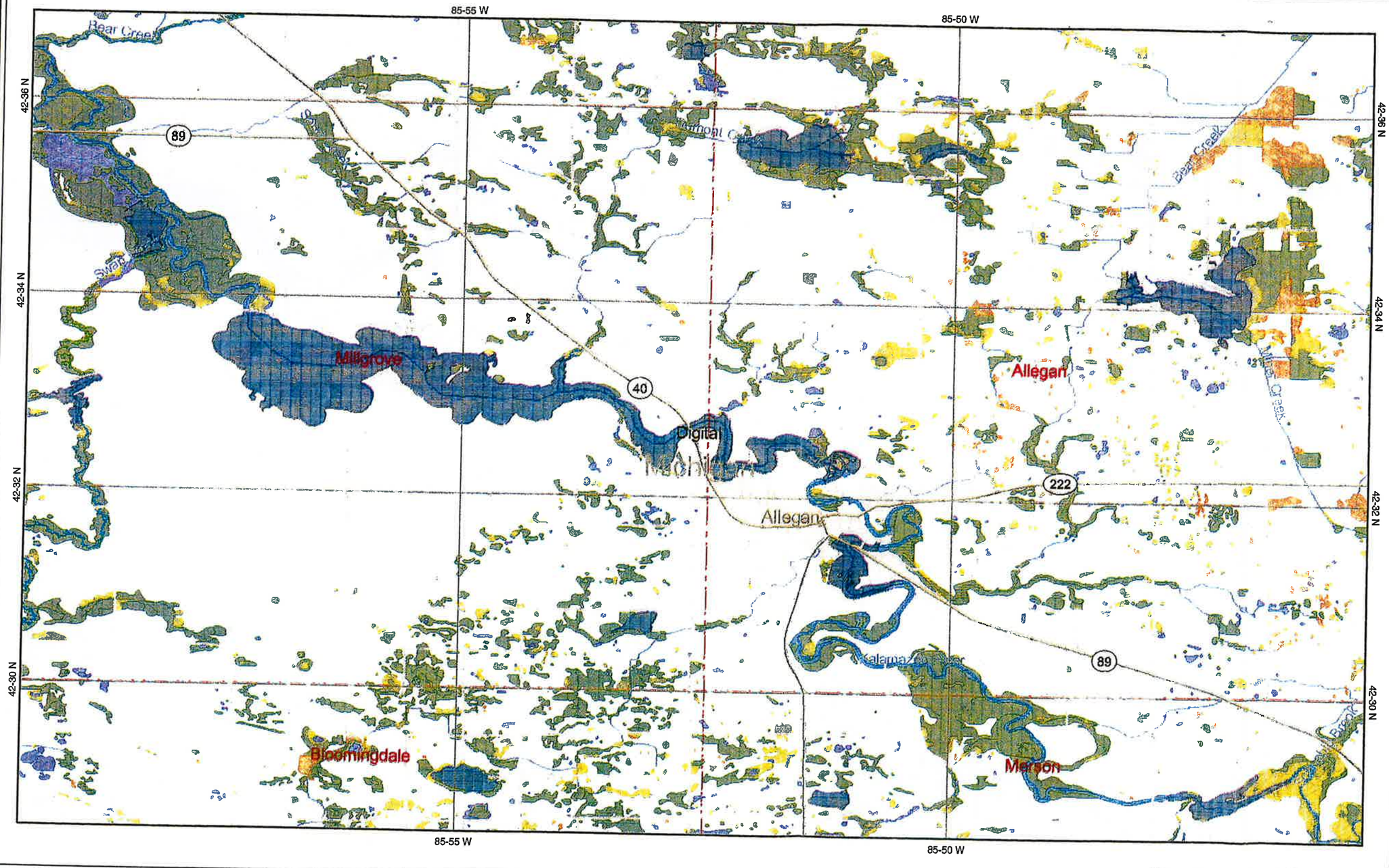
N
W E
S

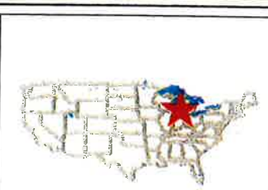
DEQ

Areas shown as wetlands, wetland soils, or open water on the map are potential wetlands and deserve further site investigation to verify if wetlands are actually present. This map may not identify all potential wetlands in a county (it may show wetlands that are not actually present and it may not show wetlands which are actually present). This map represents existing information that suggests the probability that a wetland may or may not exist in a given area and cannot be used to identify regulatory jurisdiction.

Compiled by MDEQ, December 18, 2006.

Allegan Township Wetlands



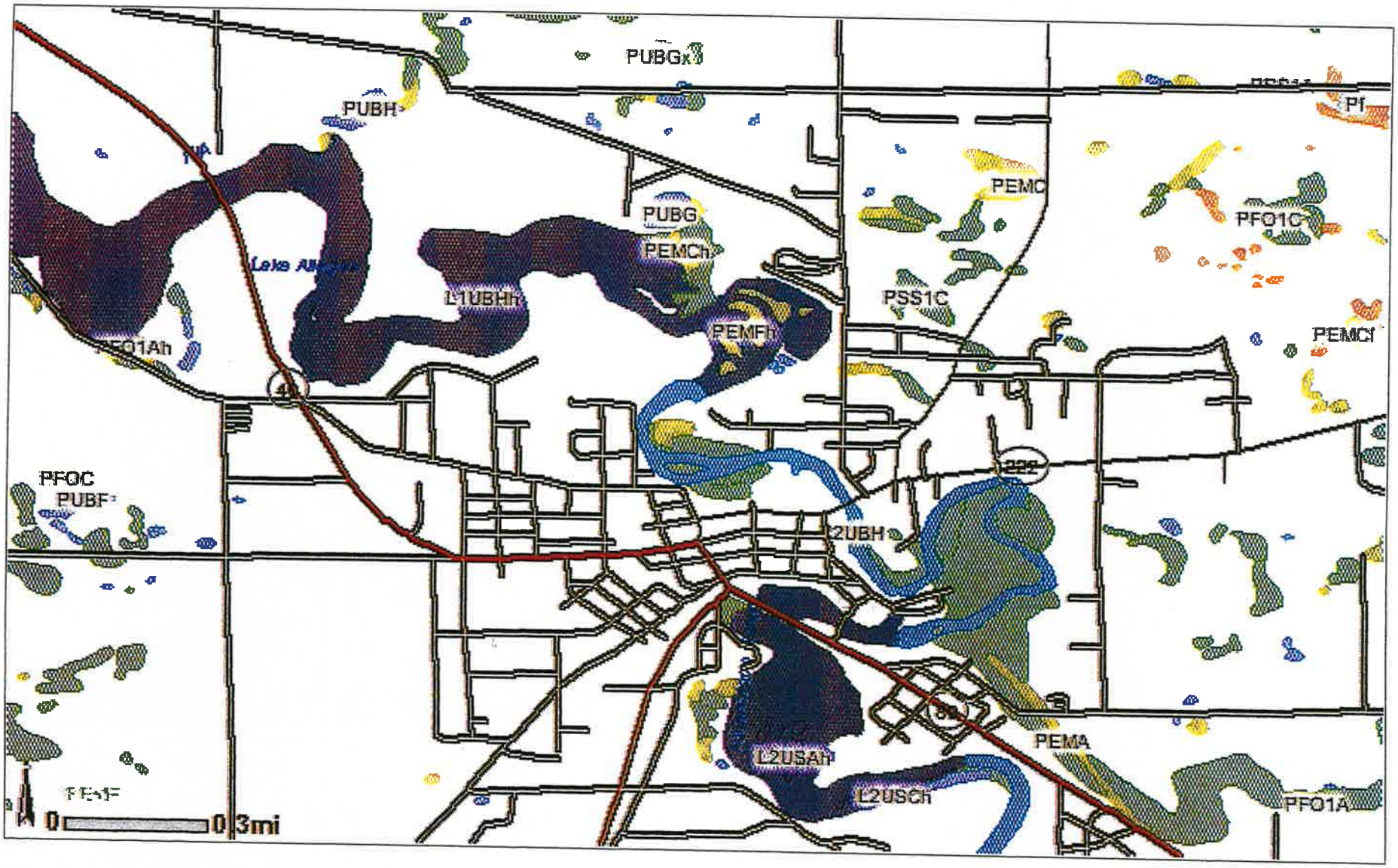


Legend

- Interstate
- Major Roads
- Other Road
- Interstate
- State highway
- US highway
- Roads
- Cities
- USGS Quad Index 24K
- Lower 48 Wetland Polygons
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine
- Lower 48 Available Wetland Data
- Non-Digital
- Digital
- No Data
- Scan
- NHD Streams
- Counties 100K
- Urban Areas 300K
- States 100K
- South America
- North America

Scale: 1:99,999

Map center: 42° 32' 42" N, 85° 52' 36" W

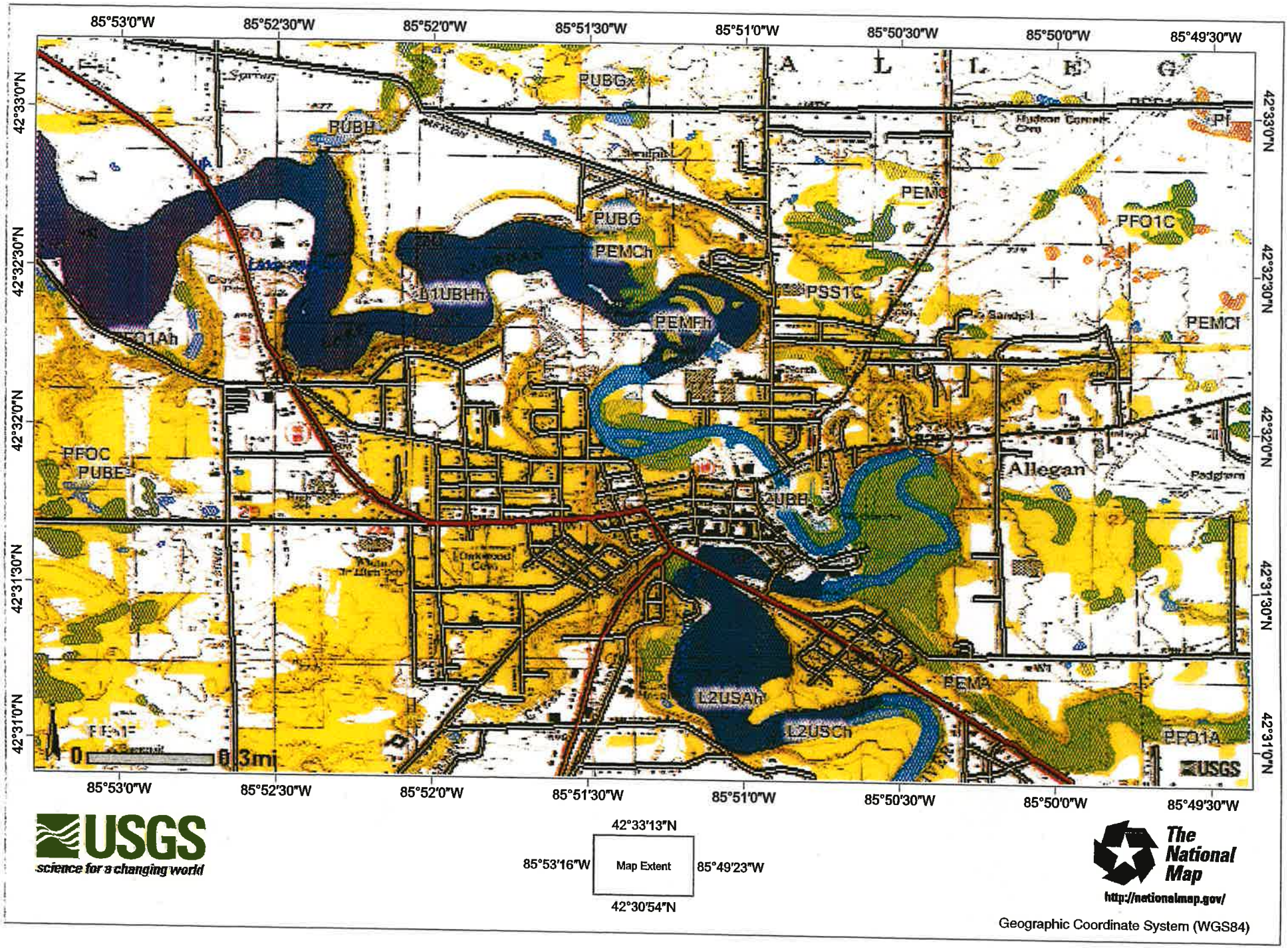


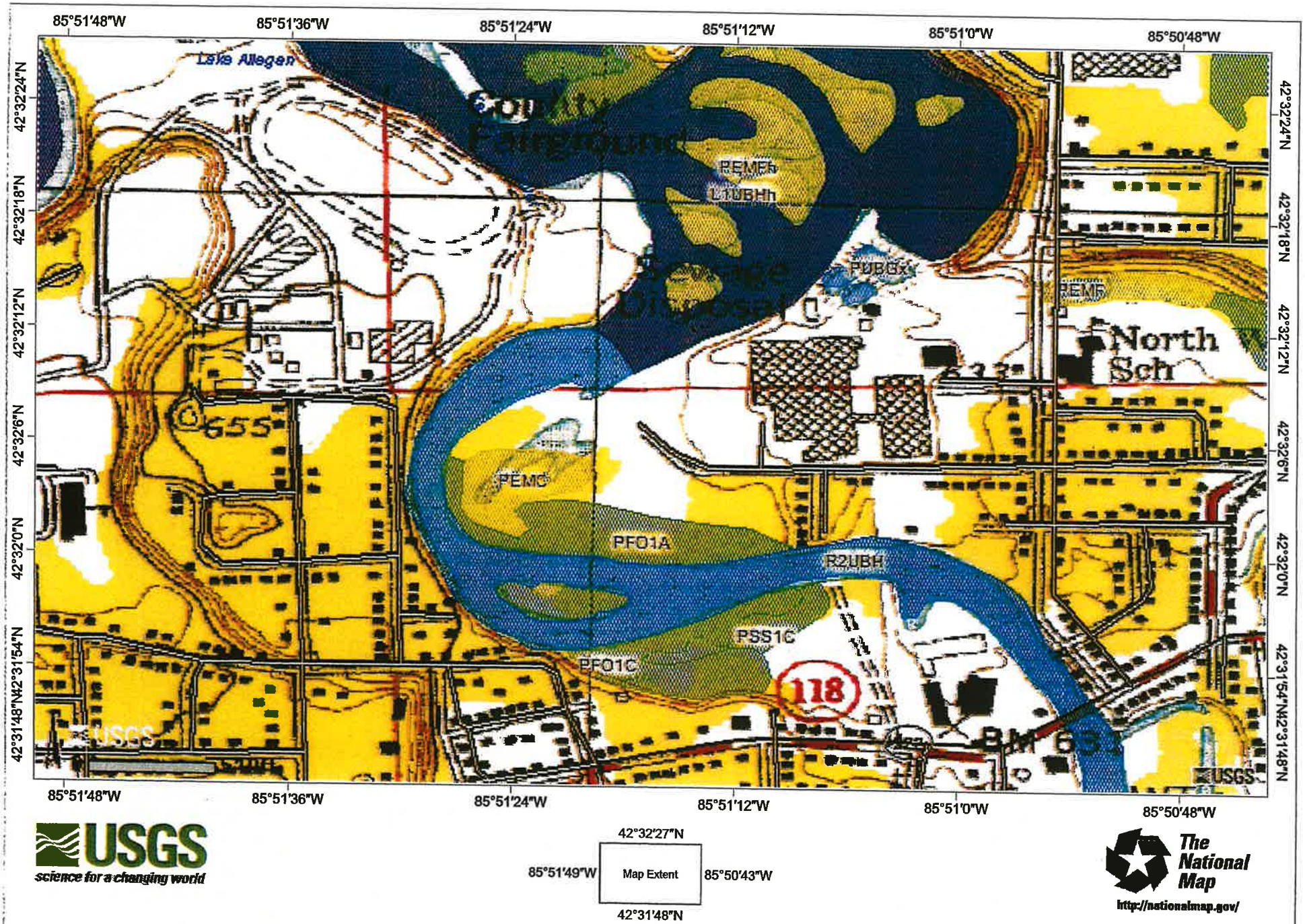
USGS
science for a changing world

42°33'13"N
85°53'16"W Map Extent 85°49'23"W
42°30'54"N

The National Map
http://nationalmap.gov/

Geographic Coordinate System (WGS84)


85°53'0"W
85°52'30"W
85°52'0"W
85°51'30"W
85°51'0"W
85°50'30"W
85°50'0"W
85°49'30"W
42°33'0"N
42°32'30"N
42°32'0"N
42°31'30"N
42°31'0"N
ALLEGAN
PUBGx
PUBH
PEMC
PFO1C
PUBG
PEMCh
L1UBHh
PSS1C
PEMFh
PEMCf
PFO1Ah
PFOC
PUBF
L2UBH
Allegan
PEMA
L2USAh
L2USCh
PFO1A
0
3mi
USGS
42°33'13"N
85°53'16"W
Map Extent
85°49'23"W
42°30'54"N
USGS
science for a changing world
The National Map
http://nationalmap.gov/
Geographic Coordinate System (WGS84)


85°51'48"W
85°51'36"W
85°51'24"W
85°51'12"W
85°51'0"W
85°50'48"W
42°32'24"N
42°32'18"N
42°32'12"N
42°32'6"N
42°32'0"N
42°31'54"N
42°31'48"N
Lake Allegan
PEMFh
L1UBHh
PUBGx
PEMF
North Sch
655
PEMC
PFO1A
R2UBH
PSS1C
PFO1C
118
USGS
USGS
science for a changing world
42°32'27"N
85°51'49"W
Map Extent
85°50'43"W
42°31'48"N
The National Map
http://nationalmap.gov/
Geographic Coordinate System (WGS84)

TOPOGRAPHIC MAPS

USGS Raster Graphics (Topo Maps)
No legend available

BOUNDARIES

US States

National Atlas States
National Atlas States
National Atlas States

TRANSPORTATION

County Road Labels (USGS)
No legend available

Michigan Roads (BTS)

- BTS Roads-Michigan Ferry Crossings
- BTS Roads-Michigan Interstates
- BTS Roads-Michigan Local Roads
- BTS Roads-Michigan Local Roads (Small Scale)
- BTS Roads-Michigan Secondary Roads
- BTS Roads-Michigan Trails
- BTS Roads-Michigan US/Major State Highways

State Highway Labels (USGS)
No legend available

US Highway Labels (USGS)
No legend available

US Road Labels (BTS)
No legend available

HYDROGRAPHY

National Atlas Stream Labels
No legend available

National Atlas Waterbody Labels
No legend available

Wetland Polygons (USFWS)

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ELEVATION

1/3 ArcSecond NE CONUS

1/9 ArcSecond NED Index

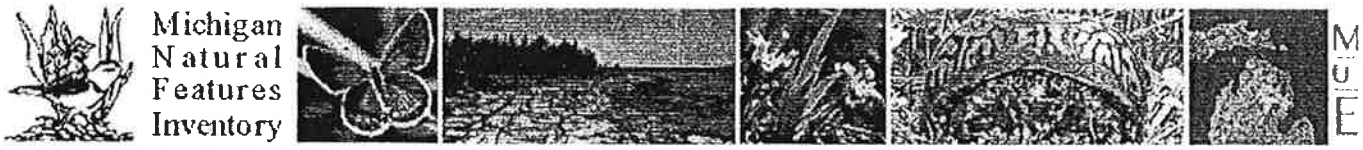
1/9 NED Index

NATURAL HAZARDS/WEATHER

Aerial Sept 16 2005 (NOAA)
No legend available

Appendix F

Flora and Fauna



County Element Data

Choose a new county

Allegan County

Current as of 9/19/2006

Scientific Name	Common Name	Federal Status	State Status
Acipenser fulvescens	Lake Sturgeon		T
Acris crepitans blanchardi	Blanchard's Cricket Frog		SC
Adlumia fungosa	Climbing Fumitory		SC
Alasmidonta marginata	Elktoe		SC
Alasmidonta viridis	Slippershell Mussel		SC
Ambystoma opacum	Marbled Salamander		T
Arabis missouriensis var. deamii	Missouri Rock-cress		SC
Baptisia lactea	White or Prairie False Indigo		SC
Bartonia paniculata	Panicled Screw-stem		T
Berula erecta	Cut-leaved Water-parsnip		T
Bog			
Buteo lineatus	Red-shouldered Hawk		T
Carex albolutescens	Greenish-white Sedge		T
Carex festucacea	Fescue Sedge		SC
Chlidonias niger	Black Tern		SC
Cirsium pitcheri	Pitcher's Thistle	LT	T
Cistothorus palustris	Marsh Wren		SC
Clemmys guttata	Spotted Turtle		T
Coastal plain marsh	Infertile Pond/marsh, Great Lakes Type		
Coregonus artedi	Cisco or Lake Herring		T
Cryptotis parva	Least Shrew		T
Cyclonaias tuberculata	Purple Wartyback		SC
Cyperus flavescens	Yellow Nut-grass		SC
Dendroica cerulea	Cerulean Warbler		SC
Dendroica discolor	Prairie Warbler		E
Dendroica dominica	Yellow-throated Warbler		T
Dry-mesic northern forest			
Dry-mesic southern forest			
Echinodorus tenellus	Dwarf Burhead		E
Elaphe obsoleta obsoleta	Black Rat Snake		SC
Eleocharis engelmannii	Engelmann's Spike-rush		SC
Eleocharis melanocarpa	Black-fruited Spike-rush		SC
Eleocharis microcarpa	Small-fruited Spike-rush		E
Eleocharis tricostata	Three-ribbed Spike-rush		T
Emys blandingii	Blanding's Turtle		SC
Erimyzon oblongus	Creek Chubsucker		E
Erynnis persius persius	Persius Duskywing		T
Eupatorium fistulosum	Hollow-stemmed Joe-pye-weed		T
Euphorbia commutata	Tinted Spurge		T
Flexamia delongi	Leafhopper		SC
Fuirena squarrosa	Umbrella-grass		T

Polygala cruciata	Cross-leaved Milkwort		SC
Polygonum careyi	Carey's Smartweed		T
Potamogeton bicupulatus	Waterthread Pondweed		T
Prairie fen	Alkaline Shrub/herb Fen, Midwest Type		
Protonotaria citrea	Prothonotary Warbler		SC
Psilocarya scirpoides	Bald-rush		T
Pycnanthemum verticillatum	Whorled Mountain-mint		SC
Pygarctia spraguei	Sprague's Pygarctia		SC
Rallus elegans	King Rail		E
Rhexia mariana var. mariana	Maryland Meadow-beauty		T
Rhexia virginica	Meadow-beauty		SC
Rhynchospora macrostachya	Tall Beak-rush		SC
Rhynchospora nitens	Short-beaked Baldrush		
Rhynchospora recognita	Globe Beak-rush		E
Rotala ramosior	Tooth-cup		SC
Scirpus hallii	Hall's Bulrush		T
Scirpus torreyi	Torrey's Bulrush		SC
Scleria reticularis	Netted Nut-rush		T
Scleria triglomerata	Tall Nut-rush		SC
Seiurus motacilla	Louisiana Waterthrush		SC
Sistrurus catenatus catenatus	Eastern Massasauga	C	SC
Sisyrinchium atlanticum	Atlantic Blue-eyed-grass		T
Sporobolus clandestinus	Dropseed		SC
Sporobolus heterolepis	Prairie Dropseed		SC
Strophostyles helvula	Trailing Wild Bean		SC
Terrapene carolina carolina	Eastern Box Turtle		SC
Tradescantia bracteata	Long-bracted Spiderwort		X
Trichostema dichotomum	Bastard Pennyroyal		T
Triphora trianthophora	Three-birds Orchid		T
Utricularia subulata	Zigzag Bladderwort		T
Venustaconcha ellipsiformis	Ellipse		SC
Wilsonia citrina	Hooded Warbler		SC
Zizania aquatica var. aquatica	Wild-rice		T