APPENDIX C
MASTER PLAN LANGUAGE SUMMARY

Below is a listing of the Master Plan language that was adopted into the various community plans.

TABLE OF CONTENTS

POKAGON TOWNSHIP

Insert #1 Amend the Introduction, at to the end of Page 2

The Dowagiac River Watershed Project

Pokagon Township participated in a project planned to improve water quality in the Dowagiac River. The Dowagiac River Watershed Project focused on working to preserve the hydrology of the [Dowagiac] river while at the same time preserving the water quality and unique natural features in the watershed by:

X developing information materials about ways to protect the watershed;
X beginning to work one-on-one with municipalities to incorporate master plan and zoning changes that address the protection of the watershed; and
X developing resource atlases for municipalities within the watershed to assist local officials with making land use decisions based on natural features.

Accordingly, a number of amendments were made to this Plan in 2001 to reflect the natural resource and water quality aspects of the Dowagiac River and the Watershed Project.

Insert #2 Amend Natural Features, Page 5; add to beginning.

Value of Natural Features

There are some features in the Township that any resident would readily recognize as important to its character of the area and to their personal quality of life. These features are often natural ones; lakes, woods, wildlife, views, and other similar features. How these environmentally sensitive elements are included in the fabric of a community can have a profound influence on their value.

In Michigan, natural features are regulated through the Natural Resources and Environmental Protection Act (NREPA), known as Act 451 of 1994, as amended. Under the Act, the State of Michigan and, in some cases, local communities, have the power to regulate land uses in sensitive areas.

Generally, the value of natural features is either recognized as needing preservation, or they may simply be folded into the community and integrated into the cultural (man-made) landscape. With the wealth of environmentally sensitive features in Pokagon Township, a policy of simply setting these lands aside and

preventing development is not practical. Beyond the legal protections concerning compensation to private property owners for the public protection of lands are other, more practical considerations. Even if all of the sensitive lands were identified as being critical to the Township, and the Dowagiac River watershed, there simply are not the funds available to guarantee their ultimate protection.

Accordingly, it is necessary to develop a more reasoned approach. Clearly there are some resources which, if lost, would significantly detract from the environment and the township as a whole. But there are other resources which, while also valuable, can play other roles within individual developments and the township. This introduces the dual concepts of preservation and integration of natural features.

Preservation and Integration

Preservation measures apply to those features which are so sensitive or valued that any alteration may have negative impacts on aesthetics, property, or environmental quality. Development should either be prohibited or restricted to those projects which have only a slight effect on these features. An identified habitat for endangered plants or animals is an example of lands requiring preservation techniques. In many instances, the value of these features is so great that specific regulations might be necessary for their protection.

In areas where the natural features are an integral part of the community's character, but where minor changes only slightly impact the quality of life, *integration* may provide adequate protection. Integration allows natural features to co-exist with development, yet remain largely undisturbed. The community should carefully monitor land use in areas rich in these features.

Whether preservation or integration is desired, several of the tools that will be referred to in this paper are most effectively implemented by ensuring adequate site plan review requirements and standards are in place. The Zoning Acts state that a community may require the submission and approval of a site plan before authorization of a land use or activity regulated by the zoning ordinance. Before a site plan can be required, however, the ordinance must state which land uses or activities will need approval. Site Plan Review is required for all Special Land Uses and Planned Unit Developments.

Site plan review requirements detail what information must be included on a site plan when it is submitted for review. Although requiring significant natural features to be shown on a site plan is a first step in identifying environmentally sensitive features, this is not a means of preservation.

Site plan review standards, on the other hand, are the criteria that a Planning Commission must use when reviewing all site plans. These standards help establish guidelines on how environmentally sensitive features on a site are to be treated. An example of such a standard related to natural features is as follows:

> *Landscape Preservation - The landscape shall be preserved in its natural state, insofar as practicable, by minimizing tree and soils removal, and any grade changes shall be in keeping with the general appearance of neighboring developed areas. The Planning Commission may require that landscaping, buffers, or greenbelts be preserved and/or provided to ensure that proposed uses will be adequately buffered from one another and from surrounding property.*

It is important to remember that site plans are not generally required for individual home sites, but rather for larger sites consisting of many homes, or commercial or industrial development. Thus site plan requirements and standards are not considered to be comprehensive preservation or integration tools.

Insert #3 Amend Natural Features, Page 5; add to end of Topography

The presence of changes in topography is not always readily identified as a natural resource. Steep slopes and rolling hillsides -- unlike other resources such as groundwater -- do not have clearly defined public benefits. If disturbed, these areas cannot be restored. Maintaining stable slopes helps prevent non-point source pollution of water resources (particularly soil erosion) while preserving a distinctive feature of the local landscape.

Topographic relief can provide visual interest to an otherwise ordinary development project. Small hills and ravines can separate incompatible land uses and provide appealing views. The general uniformity of the topography in Pokagon Township highlights areas where any elevation differences exists, making their preservation more important.

Site plans are usually required to show elevation lines to enable the Township to properly review the development, particularly with respect to the need for drainage improvements. However, beyond drainage, topography can also play a valuable role in separating dissimilar land uses; grade changes can be nearly as effective as screen walls, landscaping, or other similar measures designed to make land uses compatible.

Insert #4 Amend Natural Features, Page 5; add to end of Woodlands

Unlike certain critical environmental areas, woodlands have been relatively ignored, despite their benefits to the public. As buffers and moderators of flooding, erosion, and noise and air pollution, woodlands are important to the region's quality of life. Since many of the larger woodlands have been removed, the value of remaining areas increases.

Some of the values of woodlands include:

X Providing a varied and rich environment for plants and animals. Forest layers, including canopy, branches, trunks, shrubs, and plants on the forest floor provide breeding, feeding, and refuge areas for many species of insects, birds, and mammals.

X Protecting watersheds and soils. Forest vegetation moderates the effects of winds and storms, stabilizes and enriches the soil, and slows runoff, allowing the forest floor to filter groundwater.

X Serving as buffers to the sights, sounds, and odors of civilization. Forests mute noise from roadways and other land uses, and absorb air pollutants.

X Providing visual relief along roadways. Aesthetically pleasing roadways with natural vegetation tend to be more popular than those with little vegetation or highway clutter.

The question should not be whether or not to develop woodlands, but rather how development will occur. Trees within the public domain are managed, to some degree, such as trees growing along streets. Mature roadside trees are sometimes considered hazardous, but always seen as attractive and valuable. To the extent possible, road improvements should respect and maintain these important landmarks, and their contribution to community identity.

Woodlands existing on private land deserve greater concern. Without some recognition of existing areas, the Township risks losing its remaining tree resources. Regulations designed to protect wooded areas can be difficult to enforce, if drawn too strictly. There are, however, reasonable regulations which can be drafted which do not necessarily address trees on existing, individual lots, but rather examines new building sites and attempts to restrict buildings to those areas most suited for development, thereby preserving significant tree stands.

This can be implemented though site plan review standards used by the planning commission in reviewing all site plans. Other provisions which might be useful include regulations that call for the replacement of trees that are not practical to maintain if they unduly restrict development of a site.

Insert #5 Amend Natural Features, Pages 5-6; add to end of Waterways and Wetlands

Add after first paragraph:

Planning is vital to water quality protection, just as water resources are vital to planning and guiding land use decisions at many levels. Water resources are part of a fragile system which is potentially at risk. The preservation of water quality is important for plant and animal life, tourism, and drinking water supplies. Specific regulations, such as those pertaining to soil erosion and sedimentation control practices, protection of wetland areas, increased water body setbacks, the use of greenbelts or buffers, and density reductions are among the techniques that can assist in protecting water quality.

A combination of poor soils unsuitable for septic systems, a high water table, and an increasing amount of rural development may begin to threaten the quality of an area's water supplies.

The Dowagiac River is one of the most heavily groundwater fed rivers of its size in the State of Michigan. The Dowagiac River exhibits cold year-round temperatures and stable year-round flows. Previous examinations of the groundwater availability have revealed that nearly the entire Dowagiac River Watershed may be classified as being vulnerable to groundwater contamination. Consequently, any activity which compromises either surface water or groundwater quality can have a direct effect on the river.

Surface water features - lakes, streams, rivers, and ponds - are directly affected by land development. Soil erosion, impermeable surfaces (such as parking lots and roofs), soil contamination, and recreational activities can each affect surface water quality.

Non-Point Source Pollution

Non-point source pollution poses one of the greatest threats to surface water. Rather than occurring from one major source, like a sewage treatment plant or industrial use, non-point source pollution results from rainfall or snowmelt moving over and through the ground. As this runoff moves, it picks up and carries away natural and human-made pollutants. These are deposited into lakes, rivers, wetlands, ponds, and groundwater.

In the Dowagiac River Watershed sources of non-point contamination include a combination of agricultural practices, lawn chemicals, soil erosion, and stormwater runoff. Of these, control of impervious surfaces (such as roofs and roads), from which stormwater runoff flows is an area where local governments may have a significant influence.

Impervious Surfaces

Impervious surfaces may cover anywhere from five to ten percent or more of a site. Smaller sites may have significantly higher coverages, particularly those with commercial and industrial uses with large parking areas. Not only quantity, but also quality of runoff from normal precipitation may change considerably, as lawns, roads, and parking lots rinse clean. Other unnatural water sources are added, such as construction cleanup, car washing, or lawn watering.

Stormwater, Soil Erosion, and Sedimentation

Ideally, stormwater can be managed in a fashion which will not substantially alter the natural drainage flows, especially as it relates to the quantity of runoff (from rainfall) versus infiltration within a watershed. As more development takes place, either on large projects or on small home sites, the disturbed land loses its ability to hold soil in place. Natural vegetative cover is replaced by roof tops, roadways, parking lots, and other impervious surfaces. The increase in impervious area will greatly increase the rate and volume of runoff and decrease water infiltration into the ground.

As a result of these newly developed impervious areas, rainfall can easily overcome the ability of soil to remain in place. As rainfall hits the disturbed soil it has two choices; if on flat ground some may percolate into the groundwater; the remainder will either pond on the site, or find the most direct route available to run off the site, taking soil and pollutants along with it in the form of stormwater.

The Township should ensure that post-development rates of runoff not exceed pre-development runoff rates. This is generally accomplished by detaining or retaining stormwater to control the rate at which runoff is allowed to leave the development site. If stormwater facilities are properly designed, significant water quality benefits can also be realized. Various stormwater management alternatives can be employed to accomplish these objectives.

Improper drainage flows can create erosion and sedimentation problems, resulting in the loss of fertile topsoil, filling of lakes and streams, increased flooding, damage to aquatic habitat and animals, and structural damage to buildings and roads. Soil erosion and sedimentation controls are needed to ensure that development activities do not permit soil to be transported from the site to existing or planned drainage systems. A variety of methods exist to assist in achieving this objective, the most visible of which are silt fences which may be seen surrounding many development sites. Where the potential for erosion is high, it is critical not only that controls be in place prior to the start of development, but that such controls be maintained throughout the development process.

The purpose of Part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act (P.A. 451 of 1994, as amended) is to control soil erosion and to protect the waters of the state from sedimentation. This law requires that a permit be obtained for all earth changing activities that disturb one or more acres of land or is within 500 feet of a lake or stream. To obtain the permit, a soil erosion and sedimentation control plan must be submitted that effectively reduces soil erosion and sedimentation and identifies factors that may contribute to soil erosion and sedimentation. In Cass County, permits are obtained from the Cass County Court House.

Add to end of second paragraph of Waterways and Wetlands

Wetlands

"Wetland" is the collective term for marshes, swamps, bogs, and similar areas often found between open water and upland areas. Part 303 of the Natural Resources and Environmental Protection Act (NREPA) defines a wetland as:

> *Land characterized by the presence of water at a frequency and duration sufficient to support, and that under normal circumstances does support, wetland vegetation or aquatic life and is commonly referred to as a bog, swamp, or marsh…*

In the past, people viewed wetlands as wastelands --sources of mosquitoes, flies, and unpleasant odors. They believed wetlands should be avoided, or better yet, eliminated. This negative view, combined with the demand for more developable land, resulted in the destruction of large areas of wetlands. Owners and developers drained their wetlands, and converted them to farmland, or filled them for housing developments or industrial facilities.

Of the estimated 11 million acres of wetlands that stood in Michigan 150 years ago, only 3 million acres remain. Only one-fourth of the original 400,000 acres of coastal wetlands now line Michigan shores.

Attitudes towards wetlands have changed with the discovery that wetlands are valuable natural resources providing many important benefits to people and their natural environment. Wetlands help improve water quality, provide important fish and wildlife habitat and support hunting and fishing activities.

Wetlands contribute to the quality of other natural resources, such as inland lakes, ground water, fisheries, and wildlife, as well as to the Dowagiac River and its tributaries. Wetlands store excess water and nutrients; control floods, and slow the filling of rivers, lakes and streams with sediment. In addition, acre for acre, wetlands produce more wildlife and plants than any other Michigan land cover type.

More specifically, benefits of wetlands include:

X Reducing flooding by absorbing runoff from rain and melting snow and slowly releasing excess water into rivers and lakes. (One-acre, flooded to a depth of one foot, contains 325,851 gallons of water.)

X Filtering pollutants from surface runoff, trapping fertilizers, pesticides, sediments, and other potential contaminants and breaking them down into less harmful substances, improving water clarity and quality.

X Recharging groundwater supplies when connected to underground aquifers.

X Contributing to natural nutrient and water cycles, and producing vital atmospheric gases, including oxygen and serving as nutrient traps, when next to inland lakes or streams

X Providing commercial and recreational values to the economy, by producing plants, game birds (ducks, geese) and fur-bearing mammals. Survival of certain varieties of fish directly depend on wetlands, requiring shallow water areas for breeding, feeding and escape from predators.

State Regulation

Part 303 of NREPA seeks to protect wetland resources through regulating land which meets the statutory definition of a wetland, based on vegetation, water table, and soil type. Wetland areas subject to regulation by the MDEQ include wetlands, regardless of size, which are contiguous to, or are within 500 feet of the ordinary high water mark of, any lake, stream, or pond; wetlands which are larger than five acres and not contiguous to any lake, stream, or pond; and those wetlands which are not contiguous to any lake, stream or pond, but are essential to the preservation of natural resources.

Certain activities will require a permit from the MDEQ on a site which satisfies the wetland definition, including:

X filling or placing of material in a wetland;
X draining of water from a wetland;
X removal of vegetation, including trees, if such removal would adversely affect the wetland;
X constructing or maintaining a use or development in a wetland; and/or
X dredging or removing soil from a wetland.

Generally, wetlands must be identified through individual site determinations. Accordingly, the low lying areas or wetlands shown on the Wetlands map (Map 3) should be considered only for planning purposes and represent only indications of where some of these areas may be located.

Local Regulation

Wetlands that are not included within the states regulatory authority may be subject to local controls. A comprehensive regulatory program at the local level requires a community to accurately map all of the wetlands that will be subject to local regulation. Regulations pertaining to wetland protection generally mirroring the states are permitted if such an inventory is conducted.

Another, less comprehensive, and sometimes equally effective process, will include a requirement for a wetland determination. This determination can be conducted by the Michigan Department of Environmental Quality (MDEQ) or a qualified firm or individual and be submitted as part of any site plan review. Wetlands found during the determination that are not subject to state regulation may be identified.

The zoning ordinance may include a number of provisions that would encourage developers to preserve unregulated wetlands. Normally, the most effective methods are based on an incentive process that would give developers either full or partial credit for wetland areas in density calculations. For example, the density for a 20 acre site with 3 acres of wetlands could be calculated by giving full density credit for the 17 unaffected acres, and 50 percent credit, or 12 acres for the wetlands area, for a total site of 182 acres for which density is calculated.

Similarly, bonus densities could be provided for preserved wetland areas. This process works well in Open Space Development regulations that provide incentives for preservation of open space and/or natural features.

Insert #6 Amend Natural Features, Page 12; add to end of Soils

Soils are not the sole consideration in reviewing suitability for development. A combination of poor soils unsuitable for septic systems, a high water table, and an increasing amount of rural development may

begin to threaten the quality of an area's groundwater supplies. Any substance that is placed or injected in the ground has the potential to affect groundwater quality.

In Pokagon Township, as well as the rest of the Dowagiac River watershed, there is direct relationship between surface water and groundwater. As noted earlier, the Dowagiac River is one of the most heavily groundwater fed rivers of its size in the State of Michigan. Nearly the entire Dowagiac River Watershed may be classified as being vulnerable to groundwater contamination. Consequently, any activity which compromises either surface water or groundwater quality can have a direct effect on the river.

Even some activities normally considered environmentally sound, such as golf courses, can actually threaten groundwater. These uses often require relatively large amounts of lawn chemicals and can cause temporary drawdowns of the water table, affecting nearby uses. Directly applying these chemicals to the ground presents an uninterrupted opportunity for groundwater contamination. A recent report by the Geophysics Study Committee of the Commission on Physical Sciences, Mathematics, and Resources (National Research Council) stated:

> Groundwater contamination may be localized or spread over a large area, depending on the nature and source of the pollutant and on the nature of the groundwater system. A problem of growing concern is the cumulative impact of contamination of a regional aquifer from nonpoint sources (i.e., those that lack a well defined single point of origin), such as those created by intensive use of fertilizers, herbicides, and pesticides. In addition, small point sources, such as numerous domestic septic tanks or small accidental spills from both agricultural and industrial sources, threaten the quality of regional aquifers.

The *State of Michigan Comprehensive Groundwater Protection Program,* published by the Michigan Department of Environmental Quality reports that:

> (A)bout half of all Michigan residents depend on groundwater as their primary source of fresh drinking water - either through public water supply systems or private drinking water wells. For many communities, groundwater is the only possible source of fresh water for drinking. Cleanup of groundwater contamination sites is expensive and slow, and often creates hardships for the persons affected.

Previous examinations of areas of groundwater vulnerability within the Dowagiac River Watershed have revealed that nearly the entire watershed may be classified as vulnerable. This is reflected in great part by the fact that the Dowagiac River itself is heavily dependent on groundwater flows.

The following describes some of the more prevalent threats to groundwater.

Septic Systems

Because septic systems are underground, they are often ignored, even by people who use them. But with septic systems, out of sight should not mean out of mind. Groundwater protection will become increasingly important as population densities in areas not served by public utilities continue to increase. In the watershed contaminated groundwater has a potentially devastating effect. As a result, maintaining appropriate densities of development and proper disposal of sanitary sewer wastes are critical factors in ensuring the adequacy and quality of domestic water sources.

Not all sites are suitable for septic systems. Of primary concern is the soil at the site. Soils that are too coarse or too fine can limit the effectiveness of the treatment system. A shallow, seasonally high water table or bedrock can also cause problems. Some of these problems can be overcome by altering the design of the septic system.

Where they are properly sited, such as in sparsely populated areas and in soils with good drainage above the water table, septic tanks generally pose little or no hazard. *However, even where septic systems are well drained, they may eventually pollute the groundwater*. An improperly sited, designed, installed or operated septic system can pollute drinking and surface water. In such situations, sewage may contaminate wells in the area or move to the land surface, or both.

A problem of growing concern is the cumulative impact of contamination of a regional aquifer from nonpoint sources, including septic systems, among others. For example, the Environmental Protection Agency in 1980 found that about a third of all septic tank installations were not operating properly and that the consequent pollution both above and below ground is substantial. Their conclusion was that the solution to groundwater contamination from septic systems, beyond better engineered on-site facilities or improved maintenance, may lie in better
land-use control and in effective regulations for septic tank installation.

Accordingly, lowering land use densities, or requiring connections to public sanitary sewer for higher density residential development, may be the best land use controls available to moderate this potential problem.

Point Sources

Some sources of potential groundwater contamination are somewhat easier to identify. They include industrial operations which may use hazardous chemicals, landfills, gasoline filling stations, and other direct sources of contaminates. For the most part, these sources are heavily regulated by the state or federal government.

Other, larger sites, may also be considered point sources. Where there are larger, contiguous areas having a combination of poor soils unsuitable for septic systems, a high water table, an increasing amount of rural development, and a large number of intensive livestock operations, these areas can threaten the quality of the groundwater supplies.

Examples of places which may increase concerns relative to groundwater reservoirs include:

- X Existing sites identified by Act 307 or the Michigan Public Acts of 1982, as amended (The Michigan Environmental Response Act) and Michigan Department of Environmental Quality identified LUST (Leaking Underground Storage Tanks) sites;
- X Existing licensed landfills (active or inactive);
- X Industrially used or zoned sites;
- X Existing residential development that equals or exceeds a gross density (total acres divided by number of dwelling units) of one unit for every one and one-half (1.5) acres; or
- X Existing agricultural development totaling more than five hundred (500) acres.

Insert #7 Amend Policy Plan, Page 52; Reorganize and reword Open Space - Recreation

Separate Open Space - Recreation into two Policy headings as follows:

Open Space: Use Policy numbers 1-2, 5-8; Recreation: Use Policy numbers 3-4, 9

Reword specific Policies as follows:

1. The Land Use Plan shall be used to encourage the appropriate integration of natural features into development plans.

5. The Land Use Plan shall be used to encourage the preservation of extensive, critical areas of natural features through zoning regulations and by providing incentives for preservation where appropriate.

6. The Land Use Plan shall encourage open space, including the use of vegetative buffers and increased setbacks, along the Dowagiac River, existing drainage ways, and other bodies of water within the township.

Insert #8 Amend Land Use Classifications, Page 54; Amend Agriculture

Amend Pokagon Township Land Use Plan Update; Land Use Classifications, Agriculture, to read in full as follows:

Agriculture
The Agricultural land use classification is intended to assist in the preservation of agricultural lands and production. The lands covered by this classification generally contains large parcels of land, and will permit the raising of livestock and horticultural crops. Only farm homesteads will be permitted by right in these areas. Detached single family homes that are not farm homesteads will be approved only through the application of the Conditional Land Use procedure of the Township Zoning Ordinance, and will be limited in size. Parcel splits will be regulated to ensure that large parcels continue to be available for farm use.

Many of the properties encompassed by this land use classification are included in the A prime agricultural soils, as noted on Map 6, and a number are currently used for agricultural production, and enrolled in the Farmland Preservation Act (PA 116). Prime farmland soils are delineated by the U.S. Department of Agriculture (U.S.D.A.) because of their major importance in meeting the Nation's short and long-term needs for food and fiber. The U.S.D.A. recommends that municipalities, as well as individuals, encourage the wise use of these lands because of the limited supply of high quality farmland.

The preservation of existing, viable agricultural areas is needed not only to preserve the rural character of the Township, but to protect an important part of the region's economic base. Approximately 11,538 acres, or 52.1 percent of the Township is planned for continued agricultural use, including the acreage purchased by the Pokagon Indians.

Insert #9 Amend Land Use Classifications, Page 54; Add to end of Open Space Preservation

Insert the following after the first sentence in Open Space Preservation; remainder to read as in the Plan, with the second sentence beginning a new paragraph after the inserted text.

On the surface, it would appear as though open space needs no specific definition; the term itself should be sufficiently descriptive. However, when determining the method of regulation of open space the term may serve several purposes.

Open spaces can serve several purposes. Each purpose has distinctive characteristics that allows open space to perform various functions, either singly or in combination. A clear understanding of these purposes is necessary to determine which regulations should apply in various situations.

X Cultural Open Space

Cultural open spaces are those which are clearly man-made and are generally carefully maintained, such as the campgrounds and golf courses noted above. Others may include large open spaces around institutional or other large land uses, down to the well-manicured lawns found in suburban style housing developments. Agricultural fields may generally also be considered in this description. Cultural open spaces have many functions, such as improving aesthetics, highlighting or calling attention to specific uses, defining driveway and sign locations, and others.

X Transitional Open Space

A transitional open space is one that occurs between cultural uses. For example, a front yard for a home acts as open space between the roadway and the home. This is also an example of how open spaces can serve more than one function. In this case, a transitional open space can provide visual relief and improve safety by removing obstructions from the view of drivers.

X Natural Open Space

Some open spaces are by their mere presence natural. Natural resources within open spaces can encompass many elements including, but not limited to wetlands, areas of dramatic topography, forests, and water bodies. The wealth of natural features contained within open spaces in the Dowagiac River Watershed and throughout Pokagon Township is valuable to maintaining the area's rural character.

Natural features within open spaces also have positive environmental effects by helping to protect ground and surface waters through the reduction of soil erosion, flooding, and nutrient over-loading in water bodies. Further environmental benefits of these open spaces come in the form of the preservation of wildlife habitat, improved air quality, and noise reduction.

Insert #10 Amend Land Use Classifications, Page 55; Add to end of Estate Residential

Land Development Options

In order to permit the best use of the Estate Residential classification and preserve open spaces, the Township may consider regulations that can provide the proper means to transition between various levels of development, from agricultural to other, higher density residential uses. The Estate Residential areas can also make a significant contribution to the township's rural character. The following land development options may be considered by the Township in reviewing development proposals within this classification.

Lot Widths

Increasing lot widths can have the effect of separating the distance between homes to allow for a more "open" feeling. Other provisions for these lots could also include greater setback requirements and regulations minimizing urban vegetation (manicured lawns, flower gardens, etc.) and preservation of larger trees in areas visible from the roadway.

However, simply changing the district requirements would mean that the width requirements would apply to all roadways. Therefore, to make this regulation more effective, and to discourage development along the roadway, a companion change to encourage development throughout the site may be needed. This would require changing the applicable zoning requirements along certain defined roadways (generally county arterial roads).

This could be accomplished by decreasing the lot frontage required on roads that are part of the development project. Again, this does not imply that the site density needs to be greater, only that the lot widths for interior streets be less than what is required along the arterial roadway. Implementing these provisions requires adoption of an overlay district that would apply to residential zone districts along arterial roadways. Lots fronting on the interior streets would only be required to have the normal widths and setbacks.

Development Setbacks

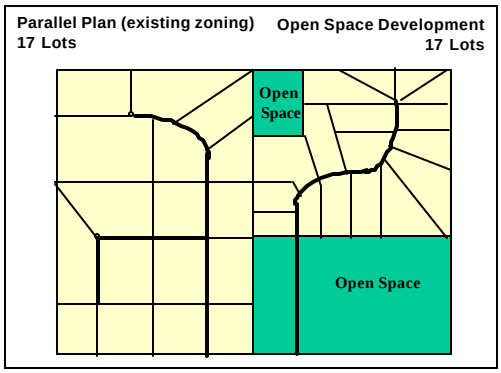
Another effective provision could require a minimum development setback for residential or other projects of more than a single lot. The setback would require that no building or building envelope for the development could be nearer to the arterial roadway than 200-300 feet. (Obviously, this provision would be more difficult to apply to individual home sites.)

Other provisions applying to this setback area would be that no native or natural vegetation be removed from the setback, nor any grading or changes in topography occur, except that necessary for entrance roads.

The Ordinance could allow the Planning Commission to modify this requirement if the developer demonstrated that the clearing of existing vegetation or reduction of the setback would contribute significantly to the purpose and objectives of the development. Or, the Planning Commission could reduce the setback if existing landscaping provided a natural screen, or the proposed development provided a landscape screen. There should, however, still be some minimum setback.

This provision would also have to include some allowance for lot variations within the development so that the overall density permitted by the Ordinance could be maintained.

Open Space Development



There could be further incentives for the clustering of residential units, also known as Open Space Development. Under this development technique the allowable density is based on a parallel plan showing reasonable and permissible development under existing zoning. While Open Space Development may increase the net density for a smaller area of a larger parcel, the overall density would still fall into the requirements of the existing zoning.

It would also allow for the preservation of significant natural features, provide open space for recreation, or allow the continuation of farming on interior land areas. To preserve the roadside character, some or all of the required open space could be placed abutting the roadway.

Offering of incentives to developers for using this development technique is appropriate. The basic incentive to which developers will most readily respond is an increase in the number of units which could be permitted over the base density calculated under the parallel plan. This is generally considered a development, or density bonus.

The amount of the bonus may vary depending on the nature of the development, and they may be used in combinations of one or more different incentives. As an example, incentives may include an increase in the number of units if:

X additional open space is provided, beyond that normally gained in the lowering of individual lot sizes;
X a community wastewater and/or domestic water system is used (avoiding the need for septic systems and individual wells);
X recreational amenities are provided, such as tennis courts, club house, etc.;
X walkways, trails, or bike paths are included within the development; and/or
X significant areas of active agricultural lands are preserved.

Greenways

Greenways are open spaces used to conserve and enhance natural and cultural resources. Greenways may also provide recreational opportunities, aesthetic benefits, and linkages for users between open space and recreational facilities. Establishment of a greenway adjacent to the Dowagiac River, for example, would provide significant benefits from both an environmental, as well as a community character perspective.

Greenways can also:

X Tie park components together to form a cohesive park, recreation, and open space system;
X Emphasize harmony with the natural environment;
X Preserve an attractive environment for residents, businesses, and visitors (It seems highly unlikely that the meandering Colorado River in the Grand Canyon National Park would be visited by thousands of people every year if its banks were lined with homes and businesses.);
X Allow uninterrupted and safe pedestrian movement between parks throughout the community;
X Protect areas inappropriate for development such as flood plains, wetlands, and steep slopes;
X Promote tourism and can enhance the local economy;
X Foster a greater awareness and appreciation of historic and cultural heritage;
X Provide people with a resource-based outdoor recreational opportunity and experience;
X Promote a sense of place and regional identity;
X Provide an effective and sensible growth management tool; and
X Enhance property values.

SILVER CREEK TOWNSHIP

Note: At the time of the production of this document, the Master Plan was in draft form.

[From Chapter 1 Introduction]

Silver Creek Township participated in a project planned to improve water quality in the Dowagiac River. The *Dowagiac River Watershed Project* focused on working to preserve the hydrology of the Dowagiac River while at the same time preserving the water quality and unique natural features in the watershed by:

- developing information materials about ways to protect the watershed;
- working one-on-one with municipalities to incorporate master plan and zoning changes that address the protection of the watershed; and
- developing resource atlases for municipalities within the watershed to assist local officials with making land use decisions based on natural features.

Accordingly, a number of elements of this Plan reflect the natural resource and water quality aspects of the Dowagiac River and the Watershed Project.

[From Chapter 4 Goals and Objectives]

Natural Features and the Environment

Goal: Strive to protect environmental resources, such as rivers, lakes, wetlands, & woodlands from the negative impacts of new development.	
Objectives	
1	The Township, through review of development plans, will ensure that development takes place in an environmentally consistent and sound manner by minimizing the potential for flood hazard, soil erosion, and disturbances to the natural drainage network, and protecting the quality of surface and groundwater resources, open space areas, wetlands, and woodlands.

Goal: Strive to protect environmental resources, such as rivers, lakes, wetlands, & woodlands from the negative impacts of new development.	
2	Through zoning and growth management policies, the Township will establish guidelines to protect its surface waters. Specifically, develop a waterfront zoning district(s) through which such guidelines can be enforced.
3	The Township will work with public agencies and private landowners to encourage reforestation and wildlife habitat improvement programs on public and private lands.
4	Through zoning, site plan review, and education, the Township will encourage approaches to land development that effectively integrate the preservation of natural features such as soils, topography, steep slopes, hydrology, air quality, unique views and vistas, and natural vegetation into the process of site design.
5	The Township should use appropriate ordinances to protect its natural features or determine other methods of maintaining and enhancing these features.
6	For all types of development, the Township will work with County and State officials to develop improved standards regarding the suitability of soils for septic system placement and use. In those locations containing soils which are not conducive to acceptable on-site septic use and/or may result in the degradation of ground water, institute one of the following depending upon the nature of the proposed project and potential ground water impact: a) Decrease development densities to levels consistent with the loading capabilities of area soils. b) Require connection to a municipal sanitary system where available.
7	Through appropriate watershed management planning, the Township will promote the highest feasible quality of groundwater.
8	Through site plan review, the Township will discourage practices which would alter the natural, valuable function of wetlands, including those not protected under the State of Michigan Wetlands Protection Act (P.A. 203 of 1979 [*now Part 303 of Act 451, as amended*].

[Taken from Chapter 5 Existing Land Use]

Existing land use and land cover information is essential to the purpose and development of a community's Master Plan. Such information helps define the true character of a community by providing a current "snapshot" of the existing physical conditions. For this Plan, land uses and land cover were mapped using information from the Dowagiac River Watershed Analysis provided by Western Michigan University in 2001. This information was also field verified using geographic information system technology, and a visual field survey. The Existing Land Use/Land Cover Map in included in this chapter.

Agriculture

Agriculture is by far the most predominant land use in Silver Creek Township. With active agricultural land occupying approximately 52% of the total land area, farming plays a substantial role in Silver Creek Township's employment and economic activity. Surprisingly, the amount of agricultural land in the Township has increased in recent years. In 1996, the Township had approximately 11,100 acres of its total land area devoted to the agricultural industry. Today however, the amount of agricultural land has increased by nearly 4 percent, or roughly 421 acres. The Township did experience a 784-acre loss in farmland between 1978 and 1996 however, which is mostly due to the increase in housing development at that time.

In terms of development patterns, much of the Township is divided into large parcels. The fact that many of these large parcels have remained un-split has allowed major portions to remain as an active agricultural land use. This is evident on the Existing Land Use Map which exhibits the large amount of agricultural land scattered throughout the Township. The amount and location of active farmland in a community is often dependent on a number of variables such as soils, topography (how steep the land is), climate (the amount of rainfall) and other natural variables. Soils however generally have the greatest impact on a community's ability to produce crops. As seen on the Prime Farmland Map, silver Creek Township has a great deal of soil which is classified as "Prime" or "Unique" by the U.S. Soil Conservation Service. These soils include those considered to be the best suited for the purposes of crop production. This issue is discussed further in Chapter 6.

Vacant Lands

Vacant Lands are areas of Silver Creek Township that are void of both man made development and/or significant natural features such as forested areas or water bodies. Many times, vacant lands are the result of fallow or abandoned farm fields, or open fields that were once wooded and have been cleared in anticipation of development. This may be the case in Silver Creek Township where an *increase* in the amount vacant land occurred between 1996 and 2001. In 1996, there were an estimated 1,400 acres of non-forested open land, and by 2001 that number had increased to approximately 1,441 acres, which accounts for roughly 6.5% of the total land area. This makes vacant lands the fourth largest land use (or lack of use for a better term) in the Township.

The major concentration of vacant land is located south of Downey Street, between M-51 and the Dowagiac River. Some of the vacant land may be attributable to land locked parcels, areas of misidentified land use or land that is not being actively used by the owner of the parcel. An example of the last situation might be a homeowner has 10 acres of land and has a house on the front two acres and has left the remaining back 6 acres unmaintained or unmown. This would be registered as four acres of residential and six acres of vacant land.

Natural Features

As part of the Dowagiac River Watershed area, Silver Creek Township has an abundance of natural features, which contribute greatly to the community's quality of life. These features provide a ecosystem for a number of animal species and include a significant amount of forested areas, a number of large, quality lakes, the Dowagiac River, and numerous wetland areas. With a combined area of over 6,764 acres, or roughly 30 percent of the Township's total land area, natural features and the second most predominant land use. These features are of high importance not only to the wildlife in Silver Creek, but also make the community a beautiful place for people. These pristine natural features are one of the Township's most valuable resources, and should be preserved and protected as such.

Forested Lands

Surprisingly, for a community with a large percent of agricultural lands, open space and water, forested lands, or woodlands, are the second largest land use at over 4,100 acres. Upon closer inspection of the land form in Silver Creek Township, a vast majority of forested land in the Township is located along the Dowagiac River. Township sections 27 and 24 are mostly comprised of forested lands. Pockets of smaller forested land can be found strewn throughout the township.

Unlike other critical environmental areas, woodlands have been relatively ignored, despite their benefits to the public. As buffers and moderators of flooding, erosion, and noise and air pollution, woodlands are important to the region's quality of life. Much of the woodlands within the township lie either in small parcels, usually left from agricultural clearing, or in larger areas where farms have not been established and where intensive development has not yet occurred.
Some of the values of woodlands include:

- Providing a varied and rich environment for plants and animals. Forest layers, including canopy, branches, trunks, shrubs, and plants on the forest floor provide breeding, feeding, and refuge areas for many species of insects, birds, and mammals.
- Protecting watersheds and soils. Forest vegetation moderates the effects of winds and storms, stabilizes and enriches the soil, and slows runoff, allowing the forest floor to filter groundwater.
- Serving as buffers to the sights, sounds, and odors of civilization. Forests mute noise from freeways and factories, and absorb air pollutants.
- Providing visual relief along roadways. Aesthetically pleasing roadways with natural vegetation tend to be more popular than those with little vegetation or highway clutter.

Lakes and Rivers

The interconnected system of lakes and rivers are an important asset to Silver Creek Township. With the exception of a small area in Section 5 of Silver Creek Township, all water flows into the Dowagiac River Watershed. Environmentally sensitive natural feature such as watersheds in the Township are important to the continued health and well being of the township residents. A total of 6.3 percent of the Township's land area is devoted to the following lakes and rivers:

Indian Lake	Priest Lake
Magician Lake	Grabemeyer Lake
Dewey Lake	Dowagiac River
Cable Lake	Dowagiac Creek
Crooked Lake	Silver Creek

Wetlands

Wetlands in Silver Creek Township make up 5.3% of the Township's land area, or approximately 1,200 acres. Much of the wetlands are near existing bodies of water, such examples as the couple of large depressions in the Sister Lakes area, and around the area of Indian Lake.

Part 303 of the Natural Resources and Environmental Protection Act (NREPA) defines a wetland as:

> *"Land characterized by the presence of water at a frequency and duration sufficient to support, and that under normal circumstances does support, wetland vegetation or aquatic life and is commonly referred to as a bog, swamp, or marsh.."*

"Wetland" is the collective term for marshes, swamps, bogs, and similar areas often found between open water and upland areas.

In the past, people viewed wetlands as wastelands --sources of mosquitoes, flies, and unpleasant odors. They believed wetlands should be avoided, or better yet, eliminated. This negative view, combined with the demand for more developable land, resulted in the destruction of large areas of wetlands. Owners and developers drained their wetlands, and converted them to farmland, or filled them for housing developments or industrial facilities.

Attitudes towards wetlands have changed with the discovery that wetlands are valuable natural resources providing many important benefits to people and their natural environment. Wetlands help improve water quality, provide important fish and wildlife habitat and support hunting and fishing activities.

Wetlands contribute to the quality of other natural resources, such as inland lakes, ground water, fisheries, and wildlife, as well as to the Dowagiac River and its tributaries. Wetlands store excess water and nutrients; control floods, and slow the filling of rivers, lakes and streams with sediment. In addition, acre for acre, wetlands produce more wildlife and plants than any other Michigan land cover type.

LAGRANGE TOWNSHIP

Regional Perspective

Dowagiac River Watershed Project

The purpose of the Dowagiac River Watershed Project is to work with landowners and local units of government to implement mechanisms for guiding land use decisions that will preserve and protect the natural resources of the watershed.

The project is funded in part by a grant from the Michigan Department of Environmental Quality in accordance with its Non-Point Source Program to address issues related to the quality of water resources throughout the State. The Cass County Conservation District administers the project.

The Dowagiac River Watershed is located in southwestern Michigan and encompasses a total area of 287 square miles. The river system is one of the most heavily ground-fed rivers of its size in Michigan. With this distinction comes a river that exhibits cold year-round temperatures and stable year-round flows. It has the potential of being one of the most productive cold water fisheries in Michigan, if not the entire Midwest.

LaGrange Township is within the Dowagiac River Watershed. As a whole, the watershed includes parts of three counties (Berrien, Cass, and Van Buren Counties) and contains in whole or in part 16 townships, 2 cities, and 2 villages, as shown in Figure 5.

Geographic Features

Soils

Limitations on Residential Construction

Limitations on development are best observed via study of the soils. The *Soil Survey of Cass County,*

Michigan indicates four types of limitations: severe surface slope, septic tank absorption, dwelling limitations, and high water table. Table 10 displays the percentage of the Township limited for residential construction.

Table 10 Types of Soil Limitations, LaGrange Township, 1991

Type of Soil Limitation	Percent of Township
Severe Slopes	6.1%
Septic Absorption Field	63.4%
Dwelling Construction	19.5%
High Water Table	15.8%

Source: U.S.D.A, Soil Conservation Service, 1991

Natural Features

Forests

Forested lands are scattered across LaGrange Township and are found adjacent to almost all land uses. Whereas in some communities in northern Michigan, large forest stands equal to a square mile can be found, woodlands in LaGrange Township are typically less than 160 contiguous acres. Relatively little forested land has been lost since 1978, just a little over 90 acres.

Woodlands add to the rural character of the area as well as:

- Providing a varied and rich environment for plants and animals. Forest layers, including canopy, branches, trunks, shrubs, and plants on the forest floor provide breeding, feeding, and refuge areas for many species of insects, birds, and mammals.

- Protecting watersheds and soils. Forest vegetation moderates the effects of winds and storms, stabilizes and enriches the soil, and slows runoff, allowing the forest floor to filter groundwater.

- Serving as buffers to the sights, sounds, and odors of civilization. Forests mute noise from freeways and factories, and absorb air pollutants.

- Providing visual relief along roadways. Aesthetically pleasing roadways with natural vegetation tend to be more popular than those with little vegetation or highway clutter.

In LaGrange Township, woodlands are valued natural resources and recognized by residents and local government officials alike as needing protection.

Wetlands

Wetlands are defined as:

> *"Land characterized by the presence of water at a frequency and duration sufficient to support, and that under normal circumstances does support, wetland vegetation or aquatic life and is commonly referred to as a bog, swamp, or marsh.."*

"Wetland" is the collective term for marshes, swamps, bogs, and similar areas often found between open water and upland areas. In the past, people viewed wetlands as wastelands --sources of mosquitoes, flies, and unpleasant odors. They believed wetlands should be avoided, or better yet, eliminated. This negative

view, combined with the demand for more developable land, resulted in the destruction of large areas of wetlands. Owners and developers drained their wetlands, and converted them to farmland, or filled them for housing developments or industrial facilities. Of the estimated 11 million acres of wetlands that stood in Michigan 150 years ago, only 3 million acres remain.

The wetlands that remain in LaGrange Township are found along water bodies and are generally larger than 5 acres in size. The number of wetlands has not been significantly altered over the past 20 years.

Attitudes towards wetlands have changed with the discovery that wetlands are valuable natural resources providing many important benefits to people and their natural environment. Wetlands help improve water quality, provide important fish and wildlife habitat and support hunting and fishing activities. The importance of these environmentally sensitive lands to water quality and the overall environment in the Township has brought them to the forefront of planning concern.

Wetlands contribute to the quality of other natural resources, such as inland lakes, ground water, fisheries, and wildlife, as well as to the Dowagiac River and its tributaries. Wetlands store excess water and nutrients; control floods, and slow the filling of rivers, lakes and streams with sediment. In addition, acre for acre, wetlands produce more wildlife and plants than any other Michigan land cover type.

More specifically, benefits of wetlands include:

- Reducing flooding by absorbing runoff from rain and melting snow and slowly releasing excess water into rivers and lakes. (One-acre, flooded to a depth of one foot, contains 325,851 gallons of water.)

- Filtering pollutants from surface runoff, trapping fertilizers, pesticides, sediments, and other potential contaminants and breaking them down into less harmful substances, improving water clarity and quality.

- Recharging groundwater supplies when connected to underground aquifers.

- Contributing to natural nutrient and water cycles, and producing vital atmospheric gases, including oxygen and serving as nutrient traps, when next to inland lakes or streams

- Providing commercial and recreational values to the economy, by producing plants, game birds (ducks, geese) and fur-bearing mammals. Survival of certain varieties of fish directly depend on wetlands, requiring shallow water areas for breeding, feeding and escape from predators.

Water

The water bodies, including lakes, streams, and drains, in the Township are an important and fragile resource. They include:

- Lake LaGrange
- Kelsey Lake
- Stone Lake
- Diamond Lake
- Mill Pond
- Dowagiac Creek
- Pokagon Creek

There is an integral relationship between water resources, water quality and land use.

Residential uses	people live by water bodies for aesthetics and recreation
Agricultural uses	water bodies are often part of a farm
Industrial use	water is often used for processing and wastewater discharge

Planning is vital to water quality protection, just as water resources are vital to planning and guiding land use decisions at many levels. Certain land uses require access to water; others isolation from it. Individual landowners, whether residential, agricultural, or industrial, are rarely aware of the complexity of water resources or of the effect their actions may have. This lack of awareness, coupled with the economic and cultural value of water resources, creates a need for action by the community.

Water resources are part of a fragile system which is potentially at risk. Generally, protection and/or improvement of water quality takes place in two arenas; surface water quality - lakes, streams, rivers and ponds - and groundwater quality. The preservation of water quality is important for plant and animal life, tourism, and drinking water supplies.

A combination of poor soils unsuitable for septic systems and an increasing amount of rural development may begin to threaten the quality of the area's water supplies.

LaGrange Township is located within the Dowagiac River Watershed. In the Dowagiac River Watershed these two elements are closely linked. The Dowagiac River, a surface water feature, is one of the most heavily groundwater fed rivers of its size in the state of Michigan. The Dowagiac River exhibits cold year-round temperatures and stable year-round flows. Consequently, any activity which compromises either surface water or groundwater quality can have a direct effect on the River.

Non-point source pollution poses one of the greatest threats to surface water. Rather than occurring from one major source, like a sewage treatment plant or industrial use, non-point source pollution results from rainfall or snowmelt moving over and through the ground. As this runoff moves, it picks up and carries away natural and human-made pollutants. These are deposited into lakes, rivers, wetlands, ponds, and groundwater.

In rural areas, sources of non-point contamination include a combination of agricultural practices, lawn chemicals soil erosion, and stormwater runoff. Of these, control of impervious surfaces (such as roofs and roads) from which stormwater runoff flows is an area where local governments may have a significant influence.

Ideally, stormwater can be managed in a fashion which will not substantially alter the natural hydrologic regime, especially as it relates to the quantity of runoff (from rainfall) versus infiltration within a watershed. As more development takes place, either on large projects, or on small home sites, the disturbed land loses its ability to hold soil in place. Natural vegetative cover is replaced by roof tops, roadways, parking lots, and other impervious surfaces. The increase in impervious area will greatly increase the rate and volume of runoff and decrease water infiltration into the ground.

In proximity to water features, construction and other activities can decrease water quality through soil erosion and removal of filtering vegetation. Buffer zones around surface water features where vegetation removal or soil disturbance is minimized can help maintain water quality.

Goals and Objectives

The goals, objectives, and strategies provided in this section are based upon a wide range of concerns expressed by Township residents. The following is intended to summarize community desires and provide specific strategies for implementation.

Goal #1: ***To retain the viability of agriculture in LaGrange Township as an important part of the local economy and for its contribution to the rural character of the community.***
Objective: Preserve agricultural lands and the rural character of the community.

"*Farmland and farming operations are vital environmental and economic resources to LaGrange Township, Cass County, and the State of Michigan. Agricultural is the second largest industry in Michigan and is the second most diverse in the nation. Our productive farmland is critical to that economic and environmental resource base and must be valued as important and irreplaceable in land use planning. Once agricultural land is fragmented or converted to other land uses, it is almost impossible to reassemble or convert back."*

Strategies: 1. Discourage the splitting of large parcels into small parcels in a manner that would restrict or preclude agricultural activities.

2. Extension of public utilities into agricultural areas will be discouraged, unless necessary for reasons of public health.

3. Direct development to areas of the Township designated for non-agricultural use and away from areas of the Township designated for prime agricultural use.

4. Minimize and discourage expansion of residential land use on prime agricultural lands.

5. Residential land uses shall be permitted on agricultural lands only when there is a demonstrated need for such housing.

6. Identify areas on the Future Land Use Plan to be maintained as permanent agricultural areas. These areas would be selected on the basis of having at least three out of four of the following characteristics important for agricultural districts: 1) currently in cultivation; 2) enrolled in PA 116; 3) prime farmland soils; and/or 4) parcels over 40 acres in size.

7. Implement sliding scale zoning in the Prime Agricultural zoning district.

Goal #2: ***To promote a logical, diverse, and environmentally sensitive, pattern of residential development.***
Objective: Recognize the need for areas of rural living *and* the preservation of open space.

"*Open space and natural features are an integral part of the environment, and positively affect the health and welfare of township residents. The preservation of open space is critical to retaining the quality of life experienced by those who live in LaGrange Township."*

Strategies: 1. Provide for a variety of types and density of residential development/ housing in the township.

2. Promote the clustering of residential housing as an incentive to preserve open space.

3. Limit urban development (medium and high-density residential and non-residential development) to suitable areas, such as:

a) Sites served by public utilities (e.g., water, sewer, and gas);
b) Sites served by state highways (e.g., M-62 and M-60);
c) Sites where adequate public services are available (e.g., police, fire, and emergency ambulance, and recreational areas); and
d) Sites not identified as having floodplain, wetlands, and prime farmland characteristics.

4. Buffer areas of dissimilar land uses by use of adequate landscaping, open space, or other means to limit potential conflicts between them.

Goal #3: ***To protect the natural environment within LaGrange Township.***
Objective: Protect woodlands, wetlands, and groundwater recharge areas.
"LaGrange Township must lead efforts that foster the appropriate development of land within the community that does not degrade the environment. The community has spoken in regards to this issue as shown in the results of the Community Visioning Meeting and Attitude Survey."

The Township's woodlands, wetlands, and groundwater recharge areas, especially those within the Dowagiac River Watershed, should be preserved because they offer benefits to the community as a whole; such as:
- reduce flooding by holding storm water;
- reduce the amount of runoff, and thus, sedimentation of area steams;
- reduce aging of Diamond Lake, Kelsey Lake, Lake LaGrange, and Mill Pond by retaining nutrients;
- filter sediments and pollutants;
- provide suitable habitat for threatened and endangered species, as well general wildlife;
- protect the public health by ensuring a clean supply of drinking water; and
- provide natural areas for education, research, and recreation.

Strategies: 1. Utilize 1996 Existing Land Use/Cover Map created by Western Michigan University as a baseline for generalized wetland areas and groundwater recharge areas to select areas appropriate for development and/or protection.

2. Designate a "Conservation Overlay" zone in the zoning ordinance adjacent to all water bodies. These areas have physical characteristics which make development difficult or impossible. These lands may contain wetlands, floodplains, steep topography, or other physical constraints. Development will be reasonably restricted within these areas to:

a) Protect natural resources.
b) Direct future development.
c) Provide recreational areas.
d) Protect the general health and welfare of the public.

3. Initiate the protection of wetlands in the township through site plan review standards.

4. Promote connected greenways that will allow recreational opportunities for the residents as well as provide for environmental protection along the major water bodies in LaGrange Township. The Township desires greenways to:

-Tie park components together to form a cohesive park, recreation, and open space system;
- Emphasize harmony with the natural environment;
- Preserve an attractive environment for residents, businesses, and visitors
- Allow uninterrupted and safe pedestrian movement between parks throughout the community
- Protect areas inappropriate for development such as flood plains, wetlands, and steep slopes
- Promote tourism and enhance the local economy
- Foster a greater awareness and appreciation of historic and cultural heritage
- Provide people with a resource-based outdoor recreational opportunity
- Promote a sense of place and regional identity
- Provide an effective and sensible growth management tool
- Enhance property values
-

Greenways are open spaces used to conserve and enhance natural and cultural resources. Greenways may also provide recreational opportunities, aesthetic benefits, and linkages for users between open space and recreational facilities. Greenways can be developed for many different types of recreational travel. Most notable are hiking, walking, jogging, and bicycling. To provide a more year round use of these greenway systems, the trails could accommodate cross-country skiing and/or horseback riding.

5. Appoint at least one person to serve as a liaison to the Dowagiac River Watershed Project. The volunteer shall work closely with the Cass County Conservation District with public education and community planning issues.
   a) Cooperate with adjacent communities to develop programs that protect the watershed.
   b) The community can help communicate the tax benefits of land donation (e.g., a gift of land is tax deductible if it is made to statewide or local land trust, governmental entity, or any other nonprofit, charitable organizations under Section 501(c)(3) of the Internal Revenue Code).
   c) Private foundations and governmental agencies can be solicited to purchase wetlands and/or accept land donations from property owners. Conservation easements can be encouraged.

Land Use Plan

Zoning Ordinance Update

Much of the Master Plan's future implementation will depend on zoning regulation. Upon adoption of this Plan, therefore, the LaGrange Township Zoning Ordinance should be reviewed and updated, as needed and outlined below, to ensure that the necessary tools are in place to support the recommendations and policies contained in this document.

1. Cluster zoning options, including density bonus incentives, should be incorporated into the ordinance.

2. Sliding scale zoning should be incorporated into the Prime Agricultural (A-P) Zoning District, with the stipulation that, in order to preserve agricultural viability in the Township, residential lots shall be:

a. Taken from land unsuited for farming where available;
b. Clustered to allow continued agricultural use of the remainder of the acreage;
c. Situated and buffered with existing and/or new natural features between housing sites and agricultural activities so that residential land use will not interfere with agricultural activities;
d. On lots not larger than two acres.

3. Designate a "Conservation Overlay" zone in the zoning ordinance adjacent to all water bodies to protect water quality.

a. Water Body Setbacks—Regulations may specify a minimum 100-foot setback for structures and septic systems from the shoreline.
b. Vegetative Buffers—Setback requirements may include the preservation of at least a 25-foot wide native, uncleared vegetation buffer strip immediately adjacent to a water body.
c. Boat storage and dock facilities may also be regulated.
d. Greenbelts or vegetated buffers are an effective way to address soil erosion and the effects of runoff on surface water quality. The attraction of surface water for residential or other land uses often leads to the desire for additional views to the water by clearing vegetation along streambanks and lake shore lines. This contributes to reduced water quality and may lead to the eventual loss of aesthetic value.

4. Site Plan Review Standards and Requirements should be updated to address the preservation of woodlands and wetlands. *Site plan review requirements* detail what information must be included on a site plan when it is submitted for review. Although requiring significant natural features to be shown on a site plan is a first step in identifying environmentally sensitive features such as woodlands and wetlands, this is not a means of preservation. *Site plan review standards,* on the other hand, are the criteria that a Planning Commission must use when reviewing all site plans. These standards help establish guidelines on how environmentally sensitive features on a site are to be treated. An example of such a standard related to natural features is as follows:

Landscape Preservation - The landscape shall be preserved in its natural state, insofar as practicable, by minimizing tree and soils removal, and any grade changes shall be in keeping with the general appearance of neighboring developed areas. The Planning Commission may require that landscaping, buffers, or greenbelts be preserved and/or provided to ensure that proposed uses will be adequately buffered from one another and from surrounding property.

WAYNE TOWNSHIP

Insert #1 Amend the Introduction, to the end of Page i

The Dowagiac River Watershed Project

Wayne Township participated in a project planned to improve the water quality in the Dowagiac River. The Dowagiac River Watershed Project focused on working to preserve the hydrology of the [Dowagiac] river while at the same time preserving the water quality and unique natural features in the watershed by:

- Developing information materials about ways to protect the watershed;
- Beginning to work one-on-one with municipalities to incorporate master plan and zoning changes that address the protection of the watershed; and
- Developing resource atlases for municipalities within the watershed to assist local officials with making land use decisions based on natural features.

Accordingly, a number of amendments were made to this Plan in 2001 to reflect the natural resource and water quality aspects of the Dowagiac River and the Watershed Project.

Insert #2 Amend Chapter 4, Natural Features, Page 16; add to end of Soils section.

Prime Farmland Soils

Prime farmland soils are delineated by the U.S.D.A. because of their major importance in meeting the Nation's short and long-term needs for food and fiber. The U.S.D.A. recommends that municipalities, as well as individuals, encourage the wise use of these lands because of the limited supply of high quality farmland. This limited supply of high quality farmland is especially apparent in Wayne Township as indicated on Map 1, Prime Agricultural Land and Wetlands, of the 1993 Wayne Township Comprehensive Plan Update.

Limitations on Residential Construction

Limitations on development are best observed via a study of the soils. The *Soil Survey of Cass County, Michigan* indicates four types of limitations: severe surface slope, septic tank absorption, dwelling limitations, and high water table.

1. Severe Surface Slope

   Areas where slopes are 12% or greater require special site planning and should be avoided whenever possible.

2. Septic Tank Absorption

   The degree of soil limitations on septic tank absorption fields is shown on Map 2, Soil Suitability for Septic Tank Tile Field, of the 1993 Wayne Township Comprehensive Plan Update. Septic tank absorption fields limitations are considered "severe" or "unsuitable" if soil properties or site features are so difficult or so unfavorable to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

3. Dwelling Limitations

Ratings are created by the U.S.D.A. for the soil's ability to support the load of a three-story single family home. Ratings are based on soil properties, site features, and observed performance of the soil. A high water table, flooding, hilly or steep slopes, shrink-swell potential, and organic layers can cause movement of footings and affect the ease of excavation and construction. This information is of particular importance because it identifies areas of "severe" building limitations due to its soil properties and site features that are so unfavorable or so difficult to overcome, a special design and possible increases in construction cost will be required.

4. High Water Table

Soil where the water table is "apparent" or "high" usually has water within one to three feet of the surface during some portion of the year. These soils do not "perk" well and should be avoided for construction if other, more suitable sites are available.

Insert #3 Amend Natural Features, Page 16; add to the end of second paragraph of "Water Features"

Wetlands are defined as:

> *"Land characterized by the presence of water at a frequency and duration sufficient to support, and that under normal circumstances does support, wetland vegetation or aquatic life and is commonly referred to as a bog, swamp, or marsh . ."*

In the past, people viewed wetlands as wastelands-sources of mosquitoes, flies, and unpleasant odors. They believed wetlands should be avoided, or better yet, eliminated. This negative view, combined with a demand for more developable land, resulted in the destruction of large areas of wetlands. Owners and developers drained their wetlands, and converted them to farmland, or filled them for housing developments or industrial facilities. Of the estimated 11 million acres of wetlands that stood in Michigan 150 years ago, only 3 million acres remain.

Attitudes towards wetlands have changed with the discovery that they are valuable natural resources providing many important benefits to people and their natural environment. Wetlands improve water quality, provide important fish and wildlife habitat and support hunting and fishing activities. The importance of these environmentally sensitive lands to water quality and the overall environment in the Township has brought them to the forefront of planning concerns.

Wetlands contribute to the quality of other natural resources, such as inland lakes, ground water, fisheries, and wildlife, as well as the Dowagiac River and its tributaries. Wetlands store excess water and nutrients, control floods, and slow the filling of rivers, lakes, and streams with sediment. In addition, acre for acre, wetlands produce more wildlife and plants than any other Michigan land cover type.

More specifically, benefits of wetlands include:

- Reducing flooding by absorbing runoff from rain and melting snow and slowly releasing excess water into rivers and lakes. (One acre, flooded to a depth of one foot, contains 325,851 gallons of water).

- Filtering pollutants from surface runoff, trapping fertilizers, pesticides, sediments, and other potential contaminants and breaking them down into less harmful substances, improving water clarity and quality.
- Recharging groundwater supplies when connected to underground aquifers.
- Contributing to natural nutrient and water cycles, and producing vital atmospheric gases, including oxygen and serving as nutrient traps, when next to inland lakes or streams.
- Providing commercial and recreational values to the economy, by producing plants, game birds (ducks and geese), and fur-bearing mammals. Survival of certain varieties of fish directly depends on wetlands, requiring shallow water areas for breeding, feeding, and escape from predators.

Water

As mentioned in a previous section, waterbodies, including lakes, streams, and drains, in the Township are an important and fragile resource. They include:

Cook Lake
Pine Lake
Mill Pond
Twin Lakes
The Dowagiac River and its tributaries

There is an integral relationship between water resources, water quality and land use.

Residential uses	people live by waterbodies for aesthetics and recreation
Agricultural uses	water is often part of a farm
Industrial use	water is often used for processing and wastewater discharges

Planning is vital to water quality protection, just as water resources are vital to planning and guiding land use decisions at many levels. Certain land uses require access to water; others isolation from it. Individual landowners, whether residential, agricultural, or industrial, are rarely aware of the complexity of water resources or of the effect their actions may have. This lack of awareness, coupled with the economic and cultural value of water resources, creates a need for action by the local jurisdiction.

Water resources are part of a fragile system that is potentially at risk. Generally, protection and/or improvement of water quality takes place in two arenas: surface water quality- lakes, streams, rivers and ponds- and groundwater quality. The preservation of water quality is important for plant and animal life, tourism, and drinking water supplies. A combination of poor soils unsuitable for septic systems and an increasing amount of residential development may begin to threaten the quality of the area's water supply. Wayne Township is located within the Dowagiac River Watershed. In this watershed, the two elements of water quality are closely linked. The Dowagiac River, a surface water feature, is one of Michigan's most heavily groundwater fed rivers of its size in the state. The Dowagiac River exhibits cold year-round temperatures and stable year-round flows. Consequently, any activity, which compromises either surface water or groundwater quality, can have a direct effect not only on the River and its tributaries, but also on drinking water.

Water Body Setbacks

In proximity to water features, construction and other activities can decrease water quality through soil erosion and removal of filtering vegetation. Buffer zones around surface water features where vegetation removal or soil disturbance is minimized can help maintain water quality.

Setbacks from inland lakes and streams can be established through the zoning ordinance. Regulations may specify a minimum 100-foot setback for structures and septic systems from the shoreline. Setbacks will generally mirror the minimum requirements of the Natural Rivers Act, which provides a basis for setbacks.

Insert #4 Amend Natural Features, add to the end of Page 18.

Forest

Forested land is mainly located in the northeast section of Wayne Township with some scattered stands located throughout the rest of the township. While many townships in northern Michigan have large woodlands equal to a square mile in size, the woodlands in Wayne Township are typically less than 160 acres and are not contiguous with one another. There is however, one major continuous area of wooded land, located in the northeast corner of the Township, mainly existing as a result of the steep topography in that area.

Woodlands add to the rural character of the area as well as:

- Providing a varied and rich environment for plants and animals. Forest layers, including canopy, branches, trunks, shrubs, and plants on the forest floor provide breeding, feeding, and refuge areas for many species of insects, birds, and mammals.
- Protecting watersheds and soils. Forest vegetation moderates the effects __ winds and storms, stabilizes and enriches the soil, and slows runoff, allowing the forest floor to filter groundwater.
- Serving as buffers to the sights, sounds, and odors of civilization. Forests mute noise from roadways and industrial uses, and absorb air pollutants.
- Providing visual relief along roadways. Aesthetically pleasing roadways with natural vegetation tend to be more popular than those with little vegetation or roadway clutter.

The Wayne Township Planning Commission identified existing woodlands as valued natural resources and recognized the need for protecting these valuable commodities.

Greenways

Promote connected greenways that will allow recreational opportunities for the residents as well as provide for environmental protection along the major waterbodies in Wayne Township. The Township desires greenways to:

- Tie park components together to form a cohesive park, recreation, and open space system;
- Emphasize harmony with the natural environment;
- Preserve an attractive environment for residents, businesses, and visitors (It seems highly unlikely that the meandering Colorado River in the Grand Canyon National Park would be visited by thousands of people every year if its banks were lined with homes and businesses.)
- Allow uninterrupted and safe pedestrian movement between parks
- Protect areas not suitable for development, such as flood plains, wetlands, and steep slopes
- Promote tourism and enhance the local economy
- Foster a greater awareness and appreciation of historic and cultural heritage
- Provide people with a resource-based outdoor recreational opportunity and experience
- Promote a sense of place and regional identity
- Provide an effective and sensible growth management tool
- Enhance property values

Greenways are open spaces used to conserve and enhance natural and cultural resources. Greenways may also provide recreational opportunities, aesthetic benefits, and linkages for users between open space and recreational facilities. Greenways can be developed for many different types of recreational travel. Most notable are hiking, walking, jogging, and bicycling. To provide a more year round use of these greenway systems, the trails could accommodate cross-country skiing and/or horseback riding.

Vegetative Buffers

Setback requirements may include the preservation of at least a 25-foot wide native, uncleared, vegetation buffer strip immediately adjacent to the shoreline. Boat storage and dock facilities may also be regulated. Some communities also enforce similar setbacks for agricultural operations and livestock management.

Greenbelts or vegetated buffers are an effective way to address soil erosion and the effects of runoff on surface water quality. The attraction of surface water for residential or other land uses often leads to the desire for additional views to the water by clearing vegetation along streambanks and lake shorelines. This reduces water quality and may lead to the eventual loss of aesthetic value.

Vegetative buffers improve water quality by:

Reducing sediment, heavy metals, and other toxic substances
Stabilizing streambanks and wetland edges from erosion
Providing fish and wildlife habitat
Improved riparian scenery
Reducing water temperature
Increasing aquatic species diversity

The social benefits of vegetative buffers include:

Increased recreational fishing opportunities
Increased safety for bodily contact
Improved drinking water quality
Improved wildlife viewing
Improved riparian scenery

Some of the relevant factors to consider when determining the size of a buffer include:
the *quality* of stream or wetland to be protected;
intensity of the adjacent land use;
quality or *density* of the buffer;
the *function* of the buffer;
soil type and how surface water filters into the ground;
types and amount of *vegetative cover* and how it stabilizes the soil; and
slope of the land within the zone and how significant it is for retaining sediment from reaching the stream, lake, or wetland.

In general, smaller buffers may be adequate when the buffer is in good condition (e.g. dense native vegetation, undisturbed soils). When the water body or resource is of a low functional value (highly disturbed, invaded by non-native species such as purple loosestrife) and the adjacent land use has low impact potential (park land or very low density residential development) the buffer width should be much larger. Larger buffers will provide water quality protection for high impact land uses such as highly developed commercial areas dominated by large parking lots (highly impervious surfaces).

Insert #5 Amend Existing Land Use; add to end of Land Use Inventory By Township Section, page 31.

(This amendment included a table and graphs on land use change from 1978 to 1996.)

Insert #6 Amend Existing Land Use; add to end of <u>Agricultural Land</u>, page 33.

Agricultural Land

Agriculture is the predominant land use in Wayne Township. The Township had 12,327 acres as of 1996, according to the GIS Analysis done by the GIS Research Center at Western Michigan University. In 1978, Wayne Township had 13,311 acres dedicated to agricultural purposes. There was a loss of 984 acres over that 18 year period to other land uses; most obviously to residential which saw an increase of 785 acres during that same 18 year period. Agriculture still accounts for 55% of the township's land use, yet that number has continued to decline from the 60% agricultural lands that were in the township during the 1978.

How does the loss of farmland and building of new homes affect agriculture and the character of a community? The effects of non-agricultural development on existing farm operations are particularly troublesome issues. New development can make daily farming operations difficult and sometimes dangerous. New residents in farming areas may not understand the basic farming needs. As a result, farmers are forced to contend with increased traffic and nuisance complaints by new neighbors who object to slow moving vehicles on roadways, noise, dust, odors, and late hours of operations. As development pressures build, so will additional complaints regarding agricultural practices.

Land development in agricultural areas can be expensive to support and can result in conflicts between new residents and farmers. Community costs to support public services such as roads, schools, sewers, fire and police protection can many times outweigh the benefit the community receives in tax revenues from residential uses. A cost of community services study may be necessary to inform both local decision makers and the public of hidden development costs.

Agricultural lands do not require the extent of services that residential, commercial, and industrial uses do. Farm fields do not send ears of corn to school, require an extensive transportation network, request public water and sewer, or demand police and fire services. For example, a study conducted in Scio Township, near Ann Arbor, revealed that for every tax dollar new non-agricultural development contributed to the community, $1.40 was required for services. Conversely, agricultural land only required $.62 in services for every dollar contributed.

Insert #7 Amend GOALS AND OBJECTIVES; replace existing following goals, page 41.

GOAL: AGRICULTURAL PRODUCTION

Protect the existing areas of prime and unique agricultural lands for the continuation of agricultural production in Wayne Township.
Objectives

1. Avoid extension of utilities within agricultural areas, to discourage non-farm uses in such areas unless necessary for reasons of public health, safety and welfare
2. Direct any future residential development in agricultural lands into areas of marginal farmland
3. Encourage farmers to work with the Natural Resources Conservation Service to adopt Best Management Practices
4. Limit the number of land divisions for the purpose of non-agricultural uses.

GOAL: RESIDENTIAL DEVELOPMENT

Open space and natural features are an integral part of the environment, and positively affect the health and welfare of township residents. The preservation of open space is critical to retaining the quality of life experienced by those who live in Wayne Township. The promotion of logical, diverse, and environmentally sensitive patterns of residential development shall be the intent of future development.

Objectives:

1. Provide for a variety of types and density of residential development/housing in the township.
2. Promote the clustering of residential housing as an incentive to preserve open space.
3. Limit urban development (medium to high-density residential development and non-residential development) to suitable areas, such as:
   - Sites served by public utilities
   - Sites served by state highways
   - Sites where adequate public services are available (e.g., police, fire, and emergency ambulance, and recreational areas); and
   - Sites not identified as having floodplain, wetlands, and prime farmland characteristics.

Insert #8 Amend Chapter 7 GOALS AND OBJECTIVES; add to end, page 44.

GOAL: NATURAL RESOURCES

Through land use regulation and planning, promote the conservation and efficient use of the Township's natural resources, including woodlands, water features, wetlands and open spaces.

Objectives:

Water quality

1. Ensure that development takes place in an environmentally consistent manner by minimizing the potential for flood hazard, soil erosion, and disturbances to the natural drainage network, and protecting the quality of surface and groundwater resources, wetlands, and woodlands.
2. Base future development densities on soil suitability for septic systems. In areas where soil tests indicate less than desirable suitability, one of the following actions will be appropriate depending upon the nature of the proposed project and potential ground water impact:

- Decrease the development densities to levels that would be conducive to the soil suitability
- Require a centralized, on-site, sanitary waste water system capable of removing contaminants prior to discharge
- Require connection to a municipal sanitary system

3. Through site plan review, discourage development practices that would alter the natural, valuable function of wetlands, including those not protected by the Michigan Wetlands Protection Act (P.A. 203 of 1979 [*now part of 303 of Act 451, as amended]*).
4. Through permit application, site plan review, and enforcement procedures, require the satisfactory reclamation of lands after the removal of natural resources such as sand, gravel, soil, rocks, or minerals

Natural Features

1. Through zoning, site plan review, and education, encourage land development that integrates the preservation of natural features such as soils, topography, steep slopes, hydrology, air quality, unique views and vistas, and natural vegetation into the site and building design.
2. Through zoning, provide for the preservation and maintenance of trees and other wooded vegetation as sites are developed.

HAMILTON/DECATUR JOINT PLAN

(Decatur Township and Village and Hamilton Township)

The master plan was not available digitally for this report. In the future, this master plan should be available on line at www.vbco.org or contact Decatur Township, Hamilton Township or Decatur Village to view the plan.