

# NATURAL FEATURES

## INTRODUCTION

The natural environment is a significant factor when planning for future land development. Circumstances such as steep slopes can prohibit the construction of a structure; wetlands may affect desired layout of a subdivision. Conversely, the natural environment can be impacted by land development. An example would be the increased water runoff and erosion potential caused by clearing vegetation. Thus, when preparing the Master Plan, it is important to examine the natural environment in order to determine where development is best suited, and where it should be discouraged.

In any environmentally sensitive area within a community, development should be prevented. Environmentally sensitive areas are lands whose destruction or disturbance will affect the life of a community by either:

1. Creating hazards such as flooding or slope erosion;
2. Destroying important public resources such as groundwater supplies and surface water bodies; or,
3. Wasting productive lands and non-renewable resources.

Each of these effects is detrimental to the general welfare of a community, resulting in social and economic loss.

The purpose of this chapter is twofold. First, the goal is to identify areas in the Township that are best suited for development. The focus is on areas that will minimize development costs and provide amenities without adversely impacting the existing natural systems. The second goal is to identify land that should be conserved in its natural state and is most suitable for conservation, open space, or recreation purposes.

Geology, woodlands, wetlands, topography, soil conditions, and water resources are among the most important natural features impacting land use in Larkin Township. Descriptions of these features follow.

The climate of Midland County is seasonal; the region experiences considerable changes in temperatures and precipitation throughout the year. The temperature range for Midland County in January is between 15 and 29 degrees Fahrenheit, in July it is between 60 and 83 degrees Fahrenheit. The average number of days below zero degrees Fahrenheit is 8, while the average number of days above 90 degrees Fahrenheit is 11. The average growing season in Midland County lasts 152 days. Midland County averages 29 inches of rainfall and 38 inches of snowfall per year.

## GEOLOGY

The geology of Midland County, as well as the entire Lower Peninsula of Michigan, is described in terms of quaternary geology and bedrock geology. Quaternary geology relates to materials deposited by continental glaciers while bedrock geology relates to sedimentary rocks underlying the glacial deposits.

The quaternary geology of the Township developed 10,000 to 12,000 years ago through continental glacial activity. As the glaciers melted and retreated from the landscape, large amounts of sand, gravel, clay, and loam were deposited. Massive glacial lakes formed at the front of the retreating glaciers. Midland County was among those areas submerged in glacial water.

The melting glacial water was laden with fine soil particles, which eventually settled to the bottom, creating clay and loam soils. The glacial melt water streams also deposited fine sands into the shallow glacial lakes. The sand channels are several miles wide in places, but the sand in them is generally only five to ten feet thick.

The sand deposits were further altered by wave action from these glacial "Great Lakes," creating small sand dunes and low beaches across the landscape as the water levels declined and the lakes retreated to their current area of coverage.

The sub-surface geology of Midland County is sedimentary bedrock that was laid down during the Pennsylvanian ages of the Paleozoic Era. Bedrock

is covered by glacial deposits and, depending upon the thickness of the glacial deposits, is located at depths from 40 to 300 feet below the surface. The bedrock was formed from ancient seas, which covered the area some 250 to 600 million years ago. The shallow marine seas deposited layers of silt, clay, sediments, marine animals, plants, coral, and other calcareous materials. These deposits formed sandstone, shale, coal, and limestone bedrock.

## WOODLANDS

Woodlands information for Larkin Township is derived from the Michigan Resources Information System (MIRIS) 1978 Land Use Cover Data provided by the Michigan Geographic Data Library (MiGDL). The MIRIS land use data separates woodlands into several categories which include:

- Aspen/Birch
- Pine
- Northern Hardwood
- Lowland Hardwood
- Christmas Tree Plantation

The Natural Features Map shows the general locations of these woodland types in Larkin Township. Given that the MIRIS date was produced in 1978, it is understood that significant alterations may have occurred which are not accurately represented on the Natural Features Map.

As shown on the map, a significant portion of the Township is wooded. Of the 20,139 total acres of the Township, more than 43% are covered with woodlands. The most common woodland type is Lowland Hardwood, which covers 6,192 acres, or 30.7%, of the Township. These Lowland Hardwoods can be found throughout the Township. Another common woodland type is Northern Hardwood, which covers 1,510 acres, or 7.5%, of the Township. These Northern Hardwoods are found in several large concentrations, as well as intermixed within the Lowland Hardwoods. None of the other three woodland types (Aspen/Birch, Pine and Christmas Tree Plantation) comprise more than 5% of the Township.

Because of many benefits associated with wooded areas, woodlands should be seen as a real asset to the Township. For human inhabitants, forested areas offer scenic contrasts within the landscape and provide recreational opportunities such as hiking and nature enjoyment. In general, woodlands improve the environmental quality of the whole community by reducing pollution through absorption, reducing the chances of flooding through greater rainwater infiltration, stabilizing, and enriching soils, moderating the effects of wind and temperature and providing habitats for wildlife.

## WETLANDS

Wetlands are often referred to as marshes, swamps, or bogs. The US Army Corps of Engineers defines wetlands as “those areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” In recent years, the development community has become increasingly aware of wetlands. Wetlands are closely related to high groundwater tables and serve to discharge or recharge aquifers. Additionally, wetlands support wildlife.

According to the MIRIS Land Cover Data, wetlands cover 840 acres, or 4.2%, of the Township (see Natural Features Map). The largest concentration of wetlands is found in the western portion of the Township, between Dublin and Sturgeon Roads. Another major wetland area is found near the northern border of the Township, east of Jefferson Avenue. Other wetland areas are scattered throughout the Township.

## TOPOGRAPHY

Topography, the configuration of a land area’s varying elevations, has very important planning implications. Land use and required maintenance depend to a large degree on slope, although today there are fewer restrictions on development in steep slope areas due to better construction and engineering techniques. Still, while steep slope can provide attractive views and recreational opportunities, building development can be adversely impacted.

Generally, the topography of Larkin Township is flat. Within the Township, only minor topographical features, such as creek beds and gently rolling hills, are found. The Soils and Topography Map shows the topography of Larkin Township through the mapping of 10 meter (33 foot) contour lines. A community with steep slopes and significant topographical features will be represented by a large number of tightly spaced contour lines. As can be seen by the map, the 10 meter contour lines in Larkin Township are not found in any tight concentration, but rather are fairly spread out. In terms of elevation, the lowest elevations, those below 190 meters (623 feet), are found in the southwest corner of the Township surrounding Sturgeon Creek. Several hills reaching elevations in excess of 210 meters (688 feet) are found in the south central portion of the Township. These hills represent the highest elevations of the Township.

Aside from a few areas of hills or creek beds, the generally flat topography that characterizes the majority of the Township poses few constraints to land development.

## SOIL CONDITIONS

When planning for types and intensity of future land uses, the condition of soil is one important factor that determines the carrying capacity of land. Soils most suitable for development purposes are well drained and are not subject to a high water table. Adequate drainage is important to minimizing stormwater impacts and the efficient operation of septic drain fields. Adequate depth to the water table is necessary to prevent groundwater contamination from septic systems or other non-point source runoff. The construction of roads, buildings and septic systems on poor soils requires special design considerations. In addition, costs for developing these sensitive areas are greater than in less constrained parts of the landscape. If developed improperly, the impacts to natural resources can be far reaching.

Hydric Soils information is obtained through Soil Survey Geographic (SSURGO) soils data, which is essentially the County Soil Survey prepared by the Natural Resource Conservation Service (NRCS) in digital format. The SSURGO soils data is available through the Michigan Geographic Data Library (MiGDL).

Hydric soils are soils with poor potential for development. These soils have high water tables and are often located within the floodplains of creeks or rivers. Areas with high concentrations of hydric soils have a wide range of limiting conditions such as seasonably high water tables, fair to poor bearing capacities, and medium compressibility and shear strength. The locations of hydric soils within Larkin Township are shown on the Soils and Topography Map. The map clearly shows that a large percentage of the Township is made up of hydric soils. In total, these soils cover 9,145 acres, or 45.4%, of the Township. The heaviest concentrations of hydric soils are found in the eastern and northwestern portions of the Township, with more scattered occurrences of hydric soils throughout the rest of the Township.

While soil constraints discussed in this section can be used as general guides for the planning process, it should not be used for development of specific sites. Detailed on-site investigations should be conducted prior to development.

