INTRODUCTION

The natural features of the Town of May, which include the St. Croix River, bluffs, lakes, wetlands, streams, rolling terrain, wooded areas, and groundwater dependent natural resources, such as farm land, are important features that attracted early settlement and continue to attract residents today. These natural features are important to the Town of May not only for their natural beauty, but as a means of providing a natural habitat and a sense of place and identity for the community.

TOPOGRAPHY

The Town of May’s glaciated topography is evident in its rolling terrain, steep slopes, ravines, bluff lines along the St. Croix River, rich farmlands, and gravel resources. Numerous wetland depressions, lakes, streams, escarpments, variable soils and extensive tree cover create a scenic physical setting.

SOILS

The Town of May is comprised of three main series of soils: Anoka, Mahtomedi, and Santiago. The Natural Resource Conservation Service, a division of the U.S. Department of Agriculture, has published an Official Soils Series Descriptions (OSD). The OSD is a national collection of more than 20,000 detailed soil series descriptions, covering the United States and other areas served by USDA-NRCS. The descriptions, in a text format, serve as a national standard. The OSD has been used in detailing the soils of the Town of May.

The Anoka series is located in the southwest corner of the Town. The Anoka series consists of very deep, well drained soils that formed in sandy and coarse-loamy glacial outwash on outwash plains, stream terraces, and lake plains. These soils have moderate permeability, and slopes range from 0 to 18 percent. Surface runoff is very low to low. Across the series, mean annual precipitation is about 28 inches, and mean annual air temperature is about 44 degrees Fahrenheit. The majority of this soil series is cropped to corn, soybeans, and alfalfa. Significant areas are in forest or wooded pasture. Native vegetation was deciduous forest with oaks being the major species and aspen being a common secondary species.
Generalized Soils

Soil Types
- Anoka
- Mahtomedi
- Santiago
- Townships Boundary
- Sections
- Parcels
- Railway
- Roads
- Rivers
- Streams
- Water

This map is for planning purposes only.
The Mahtomedi series is located in a large portion of the southeast portion and northwest corner of the town. The Mahtomedi series consists of very deep, excessively drained, rapidly permeable soils formed in sandy outwash of Late Wisconsin Glaciation Age on glacial moraines and outwash plains. These upland soils have slopes ranging from 0 to 45 percent. Across the series, mean annual temperature is about 41 degrees Fahrenheit, and mean annual precipitation is about 28 inches. Most of this soil is in forest and some is in pasture. Native vegetation was mixed hardwood-coniferous forest.

The Santiago series is located from the northeast corner of the Town stretching through the central area of the Town to the Anoka series location. The Santiago series consists of well drained soils, which are deep to a densic contact. They formed in loess or silty lacustrine deposits and in the underlying dense sandy loam till on ground moraines, disintegration moraines, and end moraines. Permeability is moderate in the silty mantle, slow or moderately slow in the lower part of the solum, and very slow in the substratum. Slope ranges from 0 to 45 percent. Mean annual precipitation is about 30 inches, and mean annual air temperature is about 42 degrees Fahrenheit. Across the series, many areas of this soil are used for cropland. Corn, small grains, and hay are common crops. Some areas remain in woodland. Native vegetation is mixed hardwood forest with a few conifers. Common trees are sugar maple, American basswood, northern red oak, white ash, American elm, and quaking aspen, with some white pine and red pine.

SOIL ASSESSMENT AND SUITABILITY

The northwestern portion of the Town consists of soils with poor percolation capability, making the area less suitable for development. Soils with shallow depth to bedrock are found along the St. Croix River. Land with steep slopes exists throughout the Town, but primarily in the southeast. A variety of soil restrictions would preclude dense development in the Town without provision for sewer and water facilities.

Soil capability of a particular site is important in determining which uses are compatible with the environment. Soil fertility, permeability, stability, etc., limit certain types of development or use. Soil assessment is only an overview, and not site specific. This approximation of soil limitations should serve as a guide in planning.

Construction and development in the Town are based upon the provisions of on-site sewage disposal systems. The most prevalent restrictions for these systems are in areas where soils have steep slopes, shallow depth to bedrock, excessively slow percolation rates, and seasonal wetness.
Altering land with slopes in excess of 12 percent is environmentally hazardous and expensive. Shallow soils and steep slopes greatly reduce the capacity of the soil to retain water. Increasing the slopes may increase the already rapid runoff, produce severe gully erosion, damage the land, and can cause subsequent sedimentation to lakes and streams. Increased runoff can cause unstable stream flows and flooding problems in downstream areas. The intricate web of wetlands and drainageways in the Town is especially susceptible to sedimentation and flooding.

Permeability is the ability of water to seep through soil. Permeable soils contain pores or have openings that allow water to pass through. Excessively coarse soils, soils with bedrock close to the surface, or soils with a high water table are severely limited for many types of development. These soils are subject to pollution problems when used for on-site sewage disposal systems. Coarse soils percolate too rapidly and compact soils percolate too slowly. Development can increase flooding on soils with low permeability. These soils are also susceptible to excessive shrink-swell alterations with changes in moisture content. This can cause building foundations to crack and roadbeds to heave.

**WATERSHEDS**

A “watershed” refers to a particular area of land over which precipitation drains. They are named for the associated rivers and streams that eventually carry these waters. These large areas generally cross the boundaries of local jurisdictions. State legislation established organizations (watershed management organizations and watershed districts) to research, plan, and manage water resources within each respective watershed district.

The Town of May lies within three watershed management districts or management organizations. The Marine on St. Croix Watershed Management Organization and the Carnelian Marine Watershed District recently merged to create the Carnelian-Marine-St. Croix Watershed District (CMSCWD), which covers the northeastern and middle portion of the Town. CMSCWD recently completed a Comprehensive Wetland Management Plan. The Brown’s Creek Watershed District is located in the southwestern corner of the Town, and 160 acres of land located in the northwest corner of the Town is included in the Rice Creek Watershed District. The Brown’s Creek and Rice Creek watershed plans were approved by the Board of Water and Soil Resources (BWSR) in 2001 and 1997 respectively. Browns Creek Watershed District completed and adopted its Third Generation Watershed Management Plan in January 2007.

As identified in CMSCWD’s 2004 Natural Resource Inventory and Management Plan, and again in the 2007 Wetland Management Plan, the portion of May Township within the CMSCWD has some of the highest value, function and priority resources in the district.
Water Resources

DNR Protected Waters
- Natural Environment Lake
- Recreational Development Lake
- Wetlands

Other Water Resources
- NWI Wetlands

Rivers
Streams

Districts
- Shoreland District
- 100 Year Floodplain District
- St. Croix River Mngt District

This map is for planning purposes only.
WETLANDS AND FLOODPLAINS

There are a number of wetland depressions within the Town due to the glaciated topography. Because of these wetland depressions, certain areas of the Town are located within a floodplain. Floodplains are areas next to streams, rivers, wetlands and landlocked basins that are subject to seasonal flooding. On-site septic systems are not allowed within a flood plain, and development within the floodplains needs to be reviewed for its effect on, or the possibility of being affected by the water resource.

The Minnesota Department of Natural Resources has identified more than 30 wetlands in the Town of May as Protected Waters under their regulation. Additional wetlands have been identified through the National Wetland Inventory (NWI) and the May Township wetland inventory. These wetlands, plus others not yet identified, are protected by Federal, State, and local regulations. Local wetlands are concentrated in the north and west sections of the Town. They create a special flood hazard zone as identified by the Federal Insurance Administration. Wetlands in the Town of May account for 1930 acres of land, while floodplains account for 660 acres.

Wetland Assessment

The Carnelian-Marine-St. Croix Watershed District (CMSCWD) is currently completing a wetland assessment for the watershed district. The assessment classifies wetlands by order of importance, both for quality and need for restoration. Brown’s Creek and Rice Creek Watershed Districts have not yet completed wetland assessments.

Although the Town has mapped the NWI in this Comprehensive Plan, the NWI has not always proven reliable and thus, more accurate wetland inventories complied by the watershed districts are important tools to augment the NWI.

Once completed, the Town will utilize the wetland assessments when reviewing development proposals. Basins projected to be impacted by development per the NWI and wetland assessment will be more closely examined to determine if they indeed are wetlands, and if so, a delineation of that wetland shall be required.
**LAKES AND STREAMS**

The Department of Natural Resources (DNR) developed a classification system in the early 1970s to attribute appropriate development standards to its many different types of lakes. Lakes are divided into the following classifications based on a combination of factors:

**Natural Environment Lakes** usually have less than 150 total acres, less than 60 acres per mile of shoreline, and less than three dwellings per mile of shoreline. They may have some winter kill of fish; may have shallow, swamp shoreline; and are less than 15 feet deep.

**Recreational Development Lakes** usually have between 60 and 225 acres of water per mile of shoreline, between three and 25 dwellings per mile of shoreline; and are more than 15 feet deep.

**General Development Lakes** usually have more than 225 acres of water per mile of shoreline and 25 dwellings per mile of shoreline, and are more than 15 feet deep.

The DNR has classified 17 lakes and two stream corridors as protected waters within the Town of May. Classifications for the lakes and streams are shown on the Watershed Map and listed in the table below:

<table>
<thead>
<tr>
<th>Water Resource</th>
<th>DNR Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barker Lake</td>
<td>Natural Environment</td>
</tr>
<tr>
<td>Bass Lake</td>
<td>Natural Environment</td>
</tr>
<tr>
<td>Big Carnelian Lake</td>
<td>Recreational Development</td>
</tr>
<tr>
<td>Big Marine Lake</td>
<td>Recreational Development</td>
</tr>
<tr>
<td>Clear Lake</td>
<td>Natural Environment</td>
</tr>
<tr>
<td>East Boot</td>
<td>Natural Environment</td>
</tr>
<tr>
<td>West Boot</td>
<td>Natural Environment</td>
</tr>
<tr>
<td>Long Lake</td>
<td>Natural Environment</td>
</tr>
<tr>
<td>Lynch Lake</td>
<td>Natural Environment</td>
</tr>
<tr>
<td>Mays Lake</td>
<td>Natural Environment</td>
</tr>
<tr>
<td>Mud Lake</td>
<td>Natural Environment</td>
</tr>
<tr>
<td>Square Lake</td>
<td>Recreational Development</td>
</tr>
<tr>
<td>Staples Lake</td>
<td>Natural Environment</td>
</tr>
<tr>
<td>Terrapin Lake</td>
<td>Natural Environment</td>
</tr>
<tr>
<td>Turtle Lake</td>
<td>Natural Environment</td>
</tr>
<tr>
<td>Unnamed ID #38 - &quot;Maple Marsh&quot;</td>
<td>Natural Environment</td>
</tr>
<tr>
<td>Unnamed ID #41</td>
<td>Natural Environment</td>
</tr>
<tr>
<td>Unnamed to Big Carnelian Lake “Carnelian Creek”</td>
<td>Tributary Stream</td>
</tr>
<tr>
<td>Unnamed to St. Croix River “Willow Brook”</td>
<td>Tributary Stream</td>
</tr>
<tr>
<td>Brown’s Creek</td>
<td>Tributary Stream</td>
</tr>
</tbody>
</table>

Source: Minnesota Department of Natural Resources
To protect lakes and streams from the impacts of development, the Town has adopted a Shoreland Management Ordinance that provides for the orderly development and protection of shorelands. Shoreland areas within the Town of May are shown on the Watershed Map.

**VEGETATION**

The Town is located in the transitional zone between the original Big Woods of North America and the Prairie. The Big Woods consisted of oak, hard maple, elm, basswood, aspen, birch, hornbeam, butternut, wild cherry, hickory and black walnut. Shrubs and plants found in the Big Woods included prickly gooseberry, European buckthorn, honeysuckle, chokecherry, raspberries, wild sarsaparilla, sumac and dogwood.

Approximately 5,000 acres in May are wooded, providing windbreaks and a scenic landscape for homebuilding. The existing mixture of conifers and deciduous trees are a resource the community should protect.

**WILDLIFE**

Waterfowl are located throughout the Town. The Minnesota Department of Natural Resources (DNR) reports that the Mississippi River flyway is frequented by eagles and raptors, as well as migratory waterfowl. Local nesting waterfowl include mallard, blue-winged teal, wood duck, Canada goose, ruddy duck and coot. Wading birds observed in the Town include great blue herons, black crowned night herons, green herons, and American egrets. Pheasants are common in the open lands of May, and wild turkeys frequent many areas. Many varieties of songbirds are also present.

Mammals found in wooded areas include gray and red squirrels, cottontail rabbits, raccoon, chipmunks, skunks, mice, shrews, pocket gopher, striped gopher, woodchuck and many white-tailed deer. Wetland species found in the Town include muskrat, weasels, beaver and mink. Conversion of land from agricultural use to residential uses has a direct impact on wildlife because development reduces habitat and interrupts migration corridors. Local nature preserves, parks and the St. Croix River Valley provide excellent habitat for wildlife.

Along the St. Croix River, rare or endangered species are sometimes seen, including the bald eagle, golden eagle, American falcon, American osprey, and the sand hill crane. The Minnesota DNR Heritage Program has identified significant species of flora, fauna and vegetation communities throughout the Town. While no species are on the federal endangered list, eleven vegetation communities, three animals and three species of flora are of state significance. Blanding’s Turtle (threatened) and the red shouldered hawk (special concern) have been identified locally. Fortunately, many of the vegetation communities that are threatened are found
in lands dedicated to nature preservation. The Town will continue its efforts to protect plants and animals in their natural environment.

**LAND CONSERVATION (Preserving Open Space)**

The Town contains a variety of lands, that either by prescription, ownership or use, provide “open space.” Wilder Forest, Warner Nature Center, the Science of Museum of Minnesota, and Arcola Mills are large natural areas of nearly 1,900 total acres, held by their respective non-profits in “conservancy”, which allows for the preservation of these areas through low impact, mission-based programming and use.

In addition to “open space design” subdivisions, the Town will continue its support of the Washington County Land and Water Legacy Program. This program funds projects where landowners of qualifying lands are willing to sell their land, or the development interest in their land, to keep it in its natural state.

Large tracts of grass and wooded lands, used primarily in grazing operations, are held privately within the Town. The Kelley Land and Cattle Company, with nearly 2,500 acres in the Town, and two other agricultural operations of over 400 acres each, are examples of such lands. It is the hope of the Town that, if possible, the lands described above remain in their current usage and thus, will continue to provide the Town with expansive “open space” settings.

Finally, Big Marine Park Preserve, a designated County Regional Park, currently contains 700 of its statutorily defined 2,000 acres, and its first phase development is now complete. It contains the most pristine lands found around the lake.

**AGGREGATE RESOURCES**

Washington County contains a large amount of the seven-county Metropolitan Areas aggregate resources, including gravel and quarryable bedrock. The Town of May contains some significant pockets of this resource. Development in the Metropolitan Area has taken place in locations where aggregate resources exist prior to extraction of the resource, thereby diminishing the amount of aggregate available. This growth and development increases the need for the resource it is depleting.

The Town of May understands the importance of the aggregate resource. The Town currently has three operating aggregate mining facilities. Each of the existing mines has enough aggregate resources remaining to allow continued mining for decades to come.

The Land Use Section of the Comprehensive Plan addresses methods for preserving additional areas for aggregate resource extraction in a manner sensitive to the issues and concerns of the residents.