

According to Agricultural Census data nearly 300,000 new farms have begun operations during the past decade. Compared with all farms nationwide, these new arrivals tend to have more diversified production, fewer acres, lower total-dollar sales, and operators who also work off-farm. Interestingly, many of these operations are located in decidedly urban and suburban areas. Black Creek's proximity to the Fox Cities and Green Bay provides opportunities for directly marketing specialty agricultural products to local consumers.

Examples of specialty agricultural products include:

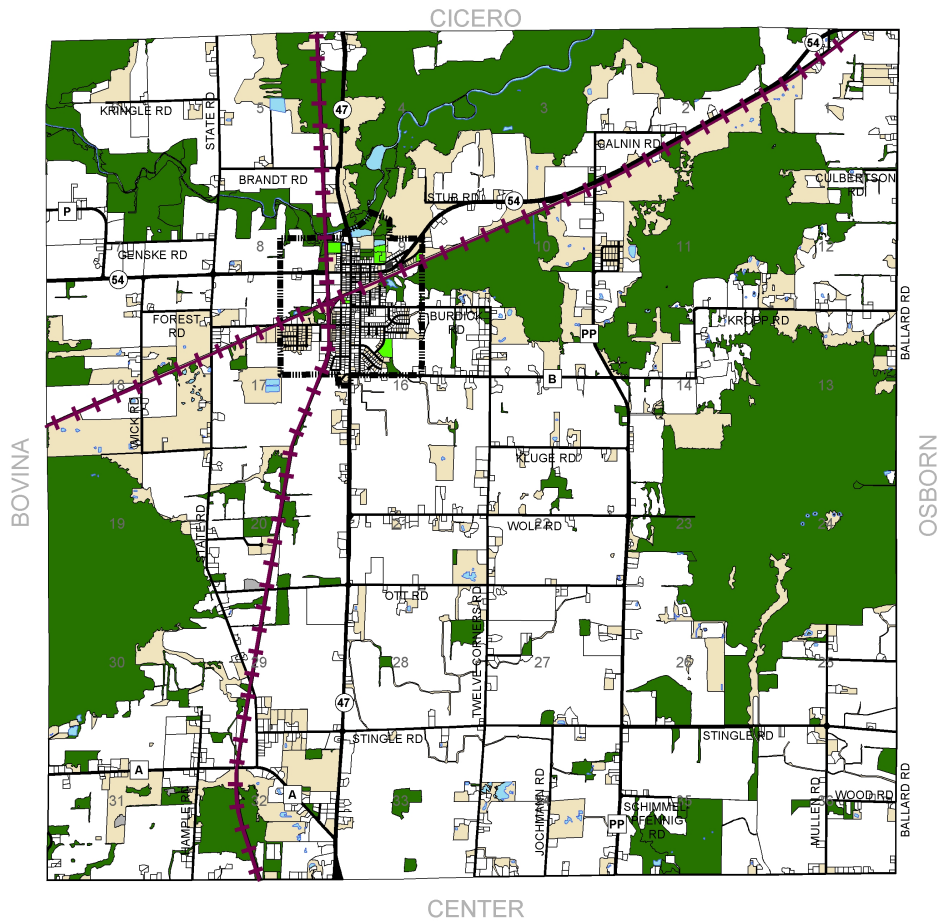
- Agroforestry
- Aquaculture products
- Alternative Grains and Field Crops
- Industrial, Energy and Non-food Crops
- Native Plants and Ecofriendly Landscaping
- Organic milk and cheese
- Organic produce
- Ornamental and Nursery Crops
- Post-harvest Handling and Processing
- Medicinal and Culinary Herbs
- Raising of non-traditional farm animals (llama, ostrich, bison, etc.)
- Seeds and Plant Breeding
- Specialty, Heirloom, and Ethnic Fruits and Vegetables

~~This chapter has focused on traditional agricultural operations (e.g. crop and family farming) with some information provided about Concentrated Animal Feeding Operations. Specialty or niche farming is an opportunity for local farmers to capitalize on in order to ensure that farming can remain a productive part of the Town's future. Given Black Creek's central location between Green Bay (and surrounding cities) and Appleton (and surrounding cities), Black Creek has the opportunity to market itself to these population centers to bring customers to the Town seeking products like:~~









- ~~• Organic milk and cheese from local dairy operations~~
- ~~• Organic vegetables and produce (sold locally at the Farmer's Market in the Village)~~
- ~~• Wine and juices (modeled after operations in Door County, subject to climate and soil limitations)~~
- ~~• Aquaculture products~~
- ~~• Pumpkin Patches~~
- ~~• Energy generated by local wind farms~~
- ~~• Walnuts, maple syrup and pine trees (for landscaping or holidays) from local tree farms~~
- ~~• Horse Farms (offering boarding and perhaps trail access (e.g. rail to trail conversion) to ride—capitalizing again on market in Green Bay and Appleton)~~

NATURAL FEATURES

BLACK CREEK


$$1'' = 4000'$$

LEGEND

-  RIGHT-OF-WAYS
 CANADIAN CENTRAL RAILROAD
 PARKS AND RECREATION
 WOODLANDS / WETLANDS
 QUARRIES / PITS
 UNDEVELOPED LAND (Non-Farmed)
 OPEN WATER AREAS
 VILLAGE OF BLACK CREEK BOUNDARY



LOCATION- F:\GIS\11094A02\DRAWINGS\natural_features_11x17.mxd
SOURCE: EAST CENTRAL WISCONSIN REGIONAL PLANNING COMMISSION
OUTAGAMIE COUNTY

ORGANIC AGRICULTURE

Organic farming is a particularly attractive specialty farm option given that organic food is the fastest growing segment of the agricultural industry. Products that once occupied a boutique marketplace niche are becoming mainstream as consumers seek healthier alternatives to conventional farm produce. Organic and specialty farming counter the notion that farms must become very big or be lost to development. They provide a profitable choice for small, family farmers.

COMMUNITY SUPPORTED AGRICULTURE⁴

Community Supported Agriculture (CSA) is a system in which a farm operation is supported by shareholders who share both the benefits and risks of food production. CSAs consist of a community of individuals who pledge support to a farm operation so that the farmland becomes the 'community's farm', with the growers and consumers providing mutual support and sharing the risks and benefits of food production. Typically, members pledge in advance to cover the anticipated costs of the farm operation and farmer's salary. In return, they receive shares in the farm's bounty throughout the growing season, as well as satisfaction gained from reconnecting to the land and participating directly in food production. Members also share in the risks of farming, including poor harvests due to unfavorable weather or pests. By direct sales to community members, who have provided the farmer with working capital in advance, growers receive better prices for their crops, gain some financial security, and are relieved of much of the burden of marketing.



Courtesy Kellner Back Acre Garden [CSA](#), Denmark, WI

NO-TILL FARMING

In conventional tillage, soil is turned to a depth of eight to twelve inches with a plow. Subsequently, the plot is disked at least twice more to prepare the seedbed before planting takes place. In no-till, the first three steps in conventional cultivation are dispensed with. Planting is done right *through* the residues of previous plantings and weeds with a device (usually a coulter) that cuts a slot a few inches wide, followed by equipment that places the seeds and closes the trench.



Courtesy University of Wisconsin-Extension

Extensive field-scale research and more than five hundred farm operations in the U.S. have demonstrated how diverse crop rotations can make no-till profitable. Crop diversity keeps pests such as weeds, insects and diseases in check, and techniques such as precise nutrient placement, accurate seeding, and proper variety selection enhance crop competitiveness. No-till farming also conserves soil moisture allowing for enhanced crop production. A properly implemented no-till saves water, uses little or no fertilizers and pesticides, increases yield, and is more profitable than conventional techniques.

⁴ Excerpted from United States Department of Agriculture, Alternative Farming Systems Information Center, 2015.

PURCHASE AND TRANSFER OF DEVELOPMENT RIGHTS

Another means of preserving agricultural (and natural) land is through the establishment of a purchase of development rights (PDR) or transfer of development rights (TDR) program. Such programs ‘send’ development from farmland and natural resource areas to designated ‘receiving’ areas within a community. Advantages of these approaches include just and fair compensation for landowners, permanent protection of farmland and natural resources, and voluntary participation.

Purchase of Development Rights

In a PDR program, a land trust, local government, or other organization offers to purchase the development rights on a parcel. The landowner is free to decline the offer or negotiate a higher price. When the development rights to a farm are sold, the landowner typically receives payment equal to the difference between the fair market value of the land and the price the land would command for agricultural use. Upon payment, a conservation easement is recorded on the property deed. The easement stays with the land in perpetuity.

The landowner retains the right to occupy and make economic use of the land for agricultural purposes, but gives up the right to develop the property in the future. Farmers are not compelled to sell their development rights. The main disadvantage of PDR is cost. Development rights can be expensive, so funding for a PDR program must to be selectively targeted in order to protect the agricultural land that is most worthy of preservation. As a result, not every farmer who wants to sell his or her development rights will be able to do so.

Table 7.1: Purchase of Development Rights	
Strengths	Limitations
<ul style="list-style-type: none">▪ <u>Permanently protects land from development</u>▪ <u>Landowner is paid to protect land</u>▪ <u>Local governments can target locations effectively</u>▪ <u>Land remains in private ownership and on the tax rolls</u>▪ <u>Program is voluntary</u>	<ul style="list-style-type: none">▪ <u>Can be costly for local unit of government, therefore land is protected at a slower rate</u>▪ <u>Land remains in private ownership – typically no public access</u>▪ <u>Since program is voluntary, it may be difficult to preserve large tracts of contiguous land</u>

Transfer of Development Rights

TDR involves transferring development rights from one piece of property to another. In this approach, a landowner is compensated for selling his/her development rights. However, rather than simply eliminating these rights, they are transferred to another property in the community that is targeted for development. That landowner of the ‘targeted property’ is free to develop the land and may use the transferred rights to develop at a greater density or intensity (e.g., smaller lot sizes to locate more homes in a single area). This approach preserves farmland and natural

areas in designated sending zones while allowing for more intensive development to occur in the receiving zones.

Table 7.2: Transfer of Development Rights	
Strengths	Limitations
<ul style="list-style-type: none">▪ Permanently protects land from development▪ Landowner is paid to protect their land▪ Local governments can target locations effectively▪ Low cost to local unit of government▪ Utilizes free market mechanisms▪ Land remains in private ownership and on tax roll	<ul style="list-style-type: none">▪ Can be complex to manage▪ Receiving area must be willing to accept higher densities▪ Difficult program to establish▪ Program will not work in areas where there is little to no development pressure on the area to be preserved

SHORELAND AND WETLAND ZONING

Shorelands and wetlands are often viewed as valuable recreational and environmental resources. These areas provide for storm water retention and habitat for various types of fish and wildlife. Development in these areas may have an adverse effect on water quality, wildlife habitat and storm water drainage. In addition, it may also result in increased development and maintenance costs to protect from the occurrence of flooding and high water, increased flood insurance premiums, extensive site preparation, and maintenance and repairs of roads and sewers.

The State of Wisconsin requires that every county adopt a Shoreland/Wetland Ordinance to address the problem associated with development in these areas. *Development in shoreland areas is generally permitted, but specific design techniques must be considered. Development in floodplain areas is strictly regulated and in some instances, not permitted.* The authority to enact and enforce these types of zoning provisions is set forth in Ch. 59.97 Wisconsin Statutes and Wisconsin Administrative Codes NR115.116 and NR 117, and is established in the Outagamie County Zoning Ordinance.

Outagamie County administers its Shoreland/Wetland Ordinance in unincorporated areas of the County. These areas would include those areas along Black Creek, Duck Creek and the Burma Swamp that are within the Town Black Creek. Moreover, the Town's *Future Land Use Map* seeks to preserve these valuable resources and wildlife habitats by directing development elsewhere.

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Natural Resources and Environmental Concerns

The variety and abundance of natural resources within a community play a significant role in attracting development, providing recreational opportunities, and maintaining a high quality of life among residents. A correlation exists between the presence and prevalence of open space and the positive feelings people have about their community. The Town and Village of Black Creek benefits from a rich mosaic of landscapes, with a greater diversity of ecosystems than most communities in the region. Its natural environment includes upland hardwood forests, riparian systems, wetlands, glacial features, mineral deposits, and large expanses of prime agricultural soils, among others.

The purpose of this section of the chapter is to describe the natural resources present within the two communities, identify those at greatest risk of loss due to development pressure, develop a plan for their sustainable use, and identify a means by which to preserve them for the future.

~~Natural resources help to determine the potential for development. Geology, topography, drainage patterns, floodplains, wetlands, and soil characteristics are among the natural and environmental features that determine if an area is physically suitable for specific types of development. Likewise, natural resources provide important recreational benefits for hunting, fishing, birding, hiking, snowshoeing, and other outdoor activities.~~

~~Preservation of natural resources (wetlands, surface and ground water, woodlands, shorelines) is an important priority for the Black Creek community. These resources provide recreation opportunities and scenic vistas that enhance the quality of life for the residents.~~

ECOLOGICAL LANDSCAPE

The state has been divided into ~~sixteen~~¹⁶ ecological landscapes. Ecological landscapes have unique combinations of physical and biological characteristics that make up the ecosystem, such as climate, geology, soils, water, vegetation. These landscapes differ in the levels of biological productivity, habitat suitable for wildlife, and the presence of rare species and natural communities. The characteristics of the ecological landscape should be considered in land use and management.

The Black Creek community is primarily located in the Central Lake Michigan Coastal ecological landscape; however, a portion of the northwest corner of the community lies in the Northern Lake Michigan Coastal ecological landscape.

For more information on Black Creek's unique ecological landscape and how ecological landscapes affect land use and management, visit: <http://dnr.wi.gov/landscapes/>.

Town Survey Results

In the community survey, Town residents indicated that local woodlands, grasslands, rivers, streams, wetlands and marsh areas are important for their environmental quality benefits, recreation benefits, habitat benefits and scenic benefits.

In a follow-up question, 91% of Town residents consider water quality an important or very important local issue.

77% of Town residents indicated that preservation of natural areas was important or very important.

76% of Town residents believe habitat protection for fish and wildlife is important.

74% believe locally grown food is important.

73% of Town residents believe the preservation of the area's scenic quality is important.

GEOLOGY AND TOPOGRAPHY

Outagamie County is located in the Eastern Ridges and Lowlands geographic province of Wisconsin. The topography is characterized as flat to gently rolling with several northeasterly trending escarpments as the dominant landscape features. The topography of Black Creek can be characterized as flat to gently rolling uplands interrupted by broad depressions. Elevation in the Village is approximately 800 feet above mean sea level. Elevations in the Town range from about 850 feet above mean sea level to about 780 feet along Duck Creek and about 765 feet above mean sea level along Black Creek.

Sedimentary rocks underlie the land surface in Outagamie County. The Black Creek community and surrounding area has dolomitic limestones and sandstones, as the uppermost layers below the land surface.

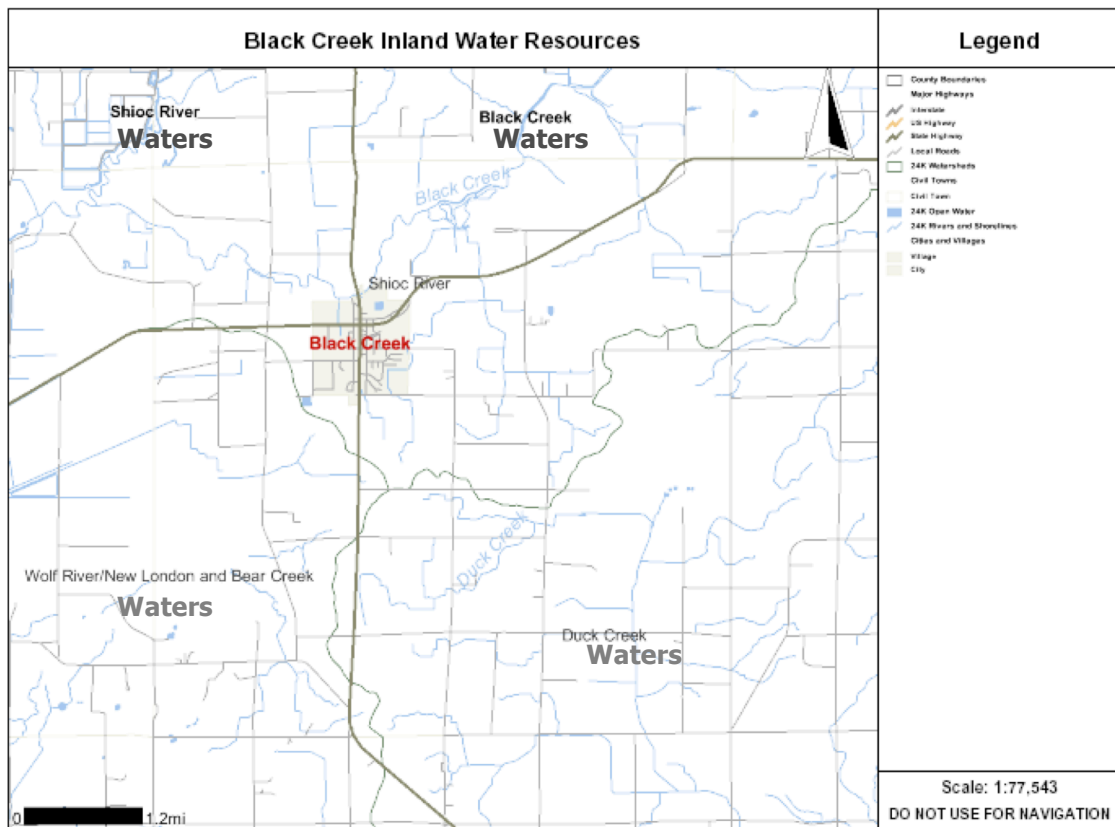
Water Quality Management Plans are being replaced by the State of the Basin Reports. For the Black Creek area, *The State of the Wolf Basin*, WDNR PUBL WT-664-2001 and the *Lower Fox River Basin Integrated Management Plan*, WDNR PUBL WT-666-2001, are available.

WATER FEATURES AND WATERSHEDS

The state is divided into three major river basins each identified by the primary water body into which the basin drains. These three basins are the Lake Superior Basin, Mississippi River Basin, and the Lake Michigan Basin. Black Creek is located in the Lake Michigan Basin. There are 24 hydrological based subdivisions of the larger major basins of the state. These subdivisions are classified as *water management units*. The

Black Creek community is located in two of these *water management units*, the Wolf River and the Lower Fox. The *water management units* are further subdivided into watersheds. Black Creek is located in three watersheds, Shioc River, Duck Creek, and Wolf River/New London and Bear Creek.

The Wolf River/New London/Bear Creek watershed spans over west central Outagamie County and covers 145 square miles. This watershed includes the mainstream of the Wolf River from the confluence of the Shioc River to the City of New London.



The Shioc River watershed holds the east, west and mainstream Shioc River and is approximately 53 miles in its entirety. The Shioc River is a tributary to the Wolf River, having its headwaters in Shawano County and flowing south and west to meet the Wolf River in Outagamie County, north of Shiocton.

The ~~Duck Creek~~ watershed is 152 square miles in size; approximately 62 percent lies within Outagamie County and 38 percent is located in Brown County. The Duck Creek watershed was selected as a Priority Watershed Project in 1994 and a Priority Watershed Plan was completed in 1997. This watershed includes Beaver Dam Creek, Duck Creek, Lancaster Creek, Trout Creek, and an unnamed creek, locally known as Thornberry Creek.

~~The Duck, Apple and Ashwaubenon Priority Watershed Project~~ joined approximately 80 similar watershed projects statewide in which nonpoint source control measures are being planned and implemented.

<http://dnr.wi.gov/org/gmu/lowerfox/surfacewaterfiles/watersheds/lfox05.html>

Duck Creek originates in Burma Swamp, a large wetland (approximately 2000 acres) located in central Outagamie County, significant portions of which are in the Black Creek Community. Approximately 64 miles of named and unnamed streams are located in the watershed and all enter Green Bay at or near the mouth of Duck Creek.

SHORELINES

Shoreland areas in the Black Creek community are limited. The *Shoreland/Wetland Ordinance* adopted by Outagamie County regulates shoreland uses and development by requiring a permit for any filling or grading activity within 300' of any navigable stream as a minimum to protect the stream from harmful impacts. Black Creek supports the county's efforts to protect shorelands.

GROUNDWATER AND AQUIFERS

Groundwater resources in Black Creek are generally plentiful. The groundwater is linked directly to the surficial glacial deposits and underlying bedrock structure. The Black Creek area contains two groundwater aquifers: the water table aquifer and the Cambrian sandstone aquifer.

The water table aquifer is present in all areas of the Town and consists of glacial sediments deposited by several glacial advances that covered portions of Outagamie County. The thickness of this aquifer is variable, being greatest in pre-glacial bedrock valleys and least over topographic highs in the bedrock surface. Ancient glacially deposited sand and gravel streambeds typically can transmit adequate amounts of water for private well systems.

The sandstone aquifer is present below the water table aquifer, and consists of sandstone bedrock overlain by Prairie du Chien dolomite bedrock. The dolomite acts as a leaky confining layer over the sandstone aquifer. The Cambrian sandstone aquifer is the thickest and most widely used aquifer in the township.

Along the Town's east border outcrops the St. Peter sandstone, which is present in townships east and south of the Town of Black Creek. The St. Peter sandstone is a major drinking water aquifer in those townships. The water level in both the Cambrian and the St. Peter sandstone aquifers in northeast Wisconsin has been lowered significantly, as population pressures have resulted in increased pumping of these aquifers. The drawdown created by the high capacity wells in the lower Fox River Valley almost approaches the Black Creek area.

Water levels in the aquifer in the Green Bay area will rise in the future, as a number of the suburbs are planning to change over to surface water sources. Increased groundwater pumping, however, in the Kaukauna to Neenah area could eventually affect water levels in the sandstone aquifer in the Black Creek area.

Elevated arsenic levels are associated with wells near the western outcroppings of the St. Peter sandstone. The Black Creek Community is located within a

WDNR defined “Arsenic Advisory Area,” which coincides with the western edge of the St. Peter Sandstone formation. Numerous residents within the Town have had high levels of naturally occurring arsenic show up in their wells. In fact, the testing demonstrates that the concentration of arsenic in residential wells in Black Creek is quite significant. The 2000-2003 sample testing results are presented in the table below.

Drawdown in Sandstone Aquifer

Decline in Potentiometric Surface Since Development

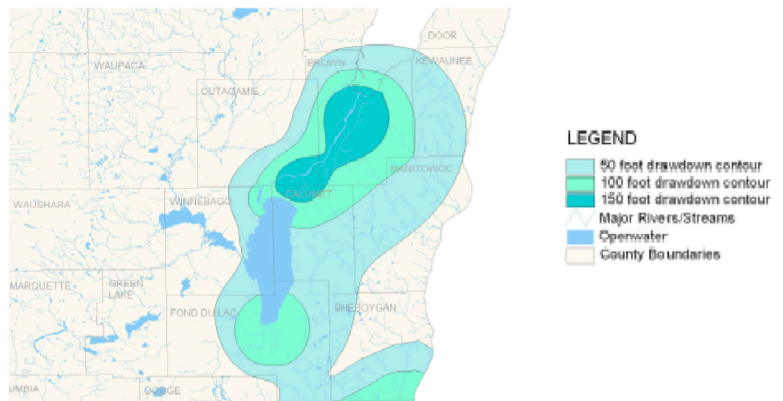


Table 7.3: Arsenic Testing Results

Arsenic Range (PPB)	Town of Black Creek (2000)	Town of Black Creek (2003)	Town of Cicero (2000)	Town of Osborn (2000)	Town of Center (2003)	Town of Bovina (2000)
> 100	0	0	0	1	1	0
> 50	4	1	1	2	8	0
> 20	11	6	1	7	18	0
> 10	31	15	9	12	36	2
> 5	43	18	20	29	55	10
> 3	51	24	29	40	64	18
< 3	58	9	39	88	62	22
Total	109	33	68	128	126	40

Note: Number of samples in given range is cumulative except <3 ppb.

Source: WDNR, 2004

Source: WDNR, 2004

Number of samples in given range is cumulative except <3 ppb.

The arsenic problem has been caused by high capacity wells drawing down the St. Peter sandstone aquifer’s water level so that the top of the St. Peter sandstone is exposed to oxygen. This frees arsenic to move through the water table into private local wells. The decision by the Green Bay suburbs to change over to surface water sources will result in a rebound of the water level in the sandstone aquifer, which will improve the arsenic situation in some wells.

The Wisconsin Geological and Natural History Survey prepared a statewide map of groundwater susceptibility for contamination. This map is intended to illustrate the ease with which a contaminant can enter the groundwater based on depth to bedrock, bedrock type, depth to water table, soil characteristics and surface deposits. Although the map is not intended for site-specific

use, it indicates that area groundwater is not readily susceptible to contamination. This does not mean that groundwater cannot be polluted, only that the likelihood of it being polluted from within the Town is not highly probable. It is possible groundwater could be contaminated by a pollutant entering the groundwater in an area of recharge beyond the Town limits. ~~A copy of this map is available on-line at: <http://www.uwex.edu/wgnhs/gwmap.htm>.~~

Residential development can have many impacts on both the quality of local groundwater and the amount of water needed by a community. Good planning can balance the need for residential development with protection of both the health of well being of residents and the quality and quantity of water resources. Techniques to minimize the effects of development on groundwater resources include:⁵

- Using *raingardens* to encourage infiltration of stormwater and recharge to groundwater.
- Minimizing paved surfaces such as driveways. This can be achieved with driveway maximum length standards that have the added benefit of providing better access to residences for fire and police protection.
- Requiring the use of advanced wastewater treatment systems, such as nitrate removal systems, in vulnerable groundwater areas.
- Educating homeowners on the need for proper maintenance of private well and onsite wastewater treatment systems, periodic testing of private well water, and planning for eventual well, pump or drain field replacements.
- Placing private wells upgradient from onsite wastewater treatment system on the same or neighboring property to prevent recycling of wastewater into private wells.
- Strongly encouraging or require water conservation and use of water saving devices such as low-flow showerheads and toilets within homes.
- Strongly encouraging conservation or cluster subdivisions due to their groundwater benefit associated with less developed and that requires less fertilized lawns and landscaping.
- Providing education on natural landscaping and other low water demand vegetation.
- Providing opportunities, such as Clean Sweep Programs, for residents to properly dispose of hazardous household products.
- Requiring periodic maintenance of onsite wastewater treatment systems if they are used.

WHAT IS A RAINGARDEN?

A raingarden is an attractive native plant garden with a special purpose; to reduce the amount of stormwater entering our beautiful Wisconsin waters. It is constructed as a place to direct stormwater from your roof, and landscaped with beautiful native Wisconsin plant species.

By creating a raingarden on your property, you can help reduce the amount of stormwater that enters local streams, rivers and lakes. You can use rain the way nature intended, instead of throwing this resource away. A raingarden is a natural way for you to help solve our stormwater pollution problems.

For more information visit...
<http://clean-water.uwex.edu/pubs/raingarden/gardens.pdf>

⁵ Groundwater and its Role in Comprehensive Planning, Comprehensive Planning and Groundwater Fact Sheet 3, Wisconsin Groundwater Coordinating Council, July 2002.

Given the relatively low density of development in the Town, it is not feasible to establish a municipal water system. Monitoring and education will be critical to addressing arsenic issues. Additional information about this issue is presented in the “Issues and Concerns” section of this chapter.

WETLANDS

Wetlands act as a natural filtering system for sediment and nutrients such as phosphorus and nitrates. They also serve as a natural buffer, protecting shorelines and stream banks from erosion. Wetlands are also essential in providing wildlife habitat, flood control, and groundwater recharge. Due to these benefits, county and state regulations place limitations on the development and use of wetlands and shorelands. Wetland areas in Black Creek are shown on the *Natural Features Map*.

The *Shoreland/Wetland Ordinance* adopted by Outagamie County regulates shoreland uses and development within 1,000 feet from the ordinary high water mark of a lake, pond or flowage, and within 300 feet from the ordinary high water mark of a navigable river or stream.

For almost three decades, the U.S. Army Corps of Engineers has had the authority over the placement of fill materials in virtually all wetlands of five acres or greater. However, on January 9, 2001, the U.S. Supreme Court limited federal jurisdiction over isolated wetlands under the Clean Water Act of 1972. This Court decision now limits the jurisdiction of the U.S. Army Corps of Engineers to cover only wetlands that are directly associated with navigable waterways—lakes, streams and rivers. Since the State of Wisconsin’s jurisdiction over wetlands is tied to federal statutes, as many as 4 million acres of wetland were affected by this decision, including some wetland areas in the Black Creek community.

In response to this U.S. Supreme Court decision the State of Wisconsin recently passed legislation giving the Wisconsin Department of Natural Resources (DNR) authority to regulate those wetlands that were formerly tied to federal legislation. As in the past, anyone interested in filling a wetland is required to obtain a permit.

Wetlands in the Town and Village of Black Creek principally occupy stream bottoms. Those mapped by the WDNR on its *Wisconsin Wetland Inventory Maps* are primarily found along Duck Creek and Black Creek. Other isolated wetlands are found in depressions or along drainageways, and typically occupy less than 100 acres. These wetlands exhibit diversity in hydrologic and vegetative characteristics. The most extensive wetlands are forested areas with wet soils. These lowland areas support mixed hardwood deciduous plant communities.

As part of the Outagamie County Stormwater Management Ordinance that is currently being developed to address the additional EPA Phase II requirements, the County is proposing wetland delineation to be required on all new development projects. This will provide better information on the exact location of wetlands and will likely result in better protection and improved water quality.

FLOODPLAINS

Floodplains serve many important functions related to flood and erosion control, water quality, groundwater recharge and fish and wildlife habitats. Areas susceptible to flooding are considered unsuitable for development because of risks to lives and property. Revised in 1984, the *Flood Insurance Rate Map* for the unincorporated areas of Outagamie County identifies extensive areas

adjacent to Duck Creek and Black Creek, as areas subject to flooding. The map above illustrates these and other floodplain areas.

Outagamie County has adopted a floodplain zoning ordinance requiring certain land use controls in designated flood hazard areas. The existence of this ordinance makes residents of the Town eligible to participate in the Federal Flood Insurance Administration's Insurance Program. The flood insurance program requires all structures constructed or purchased in a designated flood hazard area, with loans from federally insured banks, to be covered by a flood insurance policy. Generally, areas susceptible to flooding are considered unsuitable for development due to potential health risks and property damage. Therefore, the *Future Land Use Maps* discourages development in these areas.