

McHENRY~LAKE COUNTY SOIL & WATER CONSERVATION DISTRICT

NATURAL RESOURCES INFORMATION REPORT
23-091-4551

December 29, 2023



This report has been prepared for:
Gloria Foxman

Contact Person:
Amy Henry

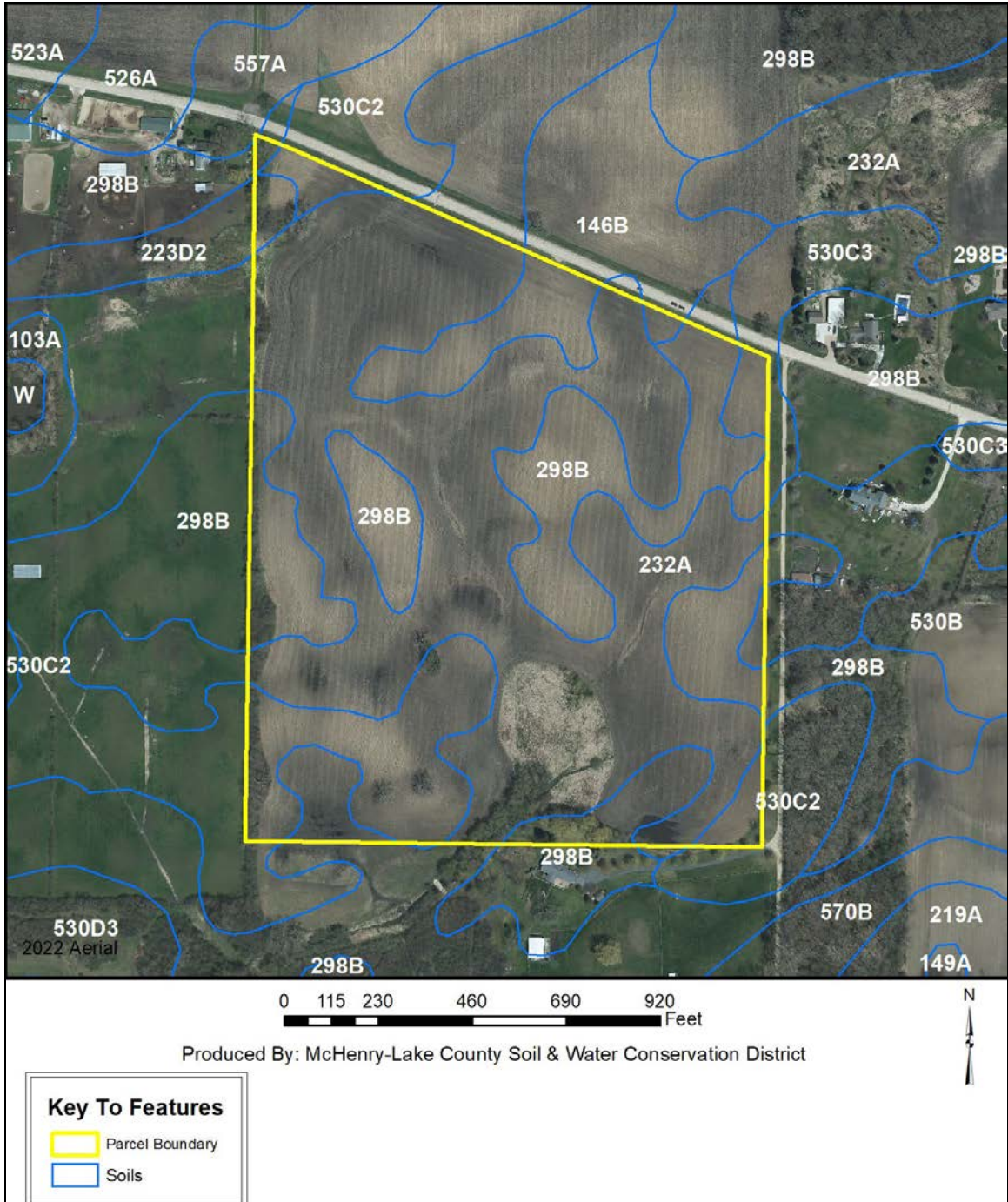
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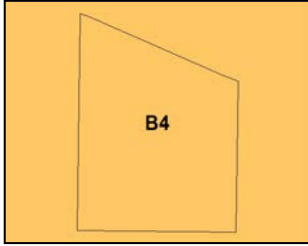
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EXECUTIVE SUMMARY OF NRI REPORT #23-091-4551

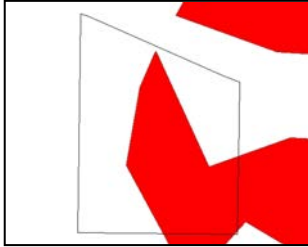
It is the opinion of the McHenry-Lake County Soil and Water Conservation District Board of Directors that this report as summarized on these pages are pertinent to the requested zoning change.



Groundwater Contamination Potential and Recharge Areas:



Aquifer Sensitivity Map (*This is the area beneath the soil profile down to bedrock)
The Geologic features map indicates the parcel is comprised of B4 geologic limitations. B4 has a moderately high contamination potential.

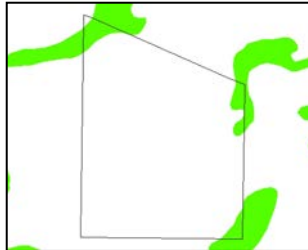


Sensitive Aquifer Recharge Areas (Includes the soil profile and underlying geology).
The Sensitive Aquifer Recharge Map indicates 16.73 acres of the parcel is within a Sensitive Aquifer Recharge Area (identified in red).

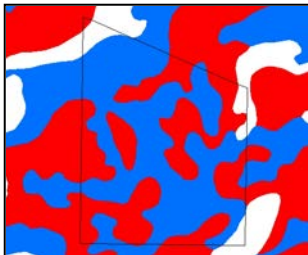
Soil Leachability Map (This is only the soil profile within the parcel from the surface down to approx. 5 feet).
The Soil Leachability Index indicates there are no soils with moderate or high leaching potentials for fertilizers (includes household use) identified.

Soil Permeability Map (This is only the soil profile within the parcel from the surface down to approx. 5 feet. Soil permeability is a reflection of the speed in which water (with or without pollutants) can move through the soil profile.)
The USDA-NRCS Soil Survey Map of the area indicates the parcel does not contain highly permeable soils.

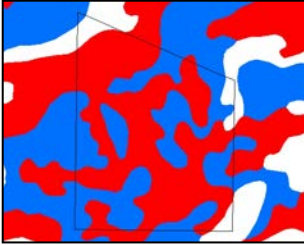
Soil Limitations (This evaluates the parcel from the surface down to approximately 5 feet.):



Erosion Ratings
The NRCS Soils Survey indicates 1.92 acres or 4.53% of the parcel contains Highly Erodible Soils (identified in green). The McHenry-Lake SWCD has staff members certified in Sediment and Erosion Control and can aid the petitioner by reviewing erosion control plans and make recommendations.

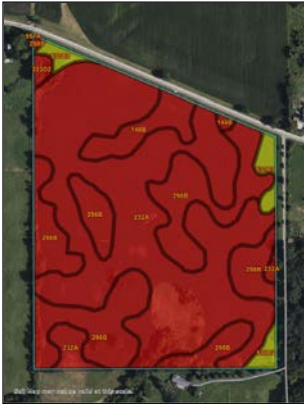


Prime Farmland Soils
The Natural Resources Conservation Service (NRCS) Soil Survey indicates 16.13 acres or 37.93% of the parcel is comprised of prime farmland soils (identified in red) and 24.46 acres or 57.54% of the parcel is comprised of Prime when Drained Soils (identified in blue).



Hydric Soils

The NRCS Soil Survey indicates 24.46 acres or 57.54% of the parcel contains hydric soils (identified in red), and 16.13 acres or 37.93% of the parcel contains somewhat poorly drained soils (identified in blue). There were no organic soils or soils with a water table greater than 4 feet below the surface identified on the parcel.



Ground Based Solar Arrays

The NRCS Soils Survey indicates 40.9 acres or 96.2% of the parcel has severe limitations for Soil Anchored Solar Arrays (identified in red). The reason for the limitation can be found on page 22 of the report.

Floodplain Information:

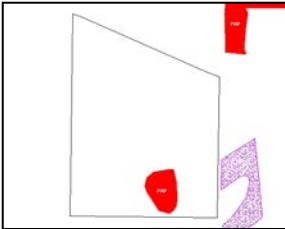
The Flood Insurance Rate Map

Indicates the parcel is outside the 100-year floodplain.

Flood of Record Map (Hydrologic Atlas)

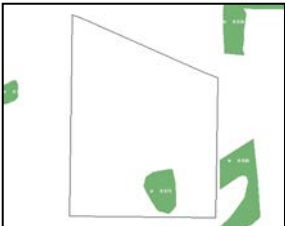
The Flood of Record Map for this area indicates there has not been previous flooding on the parcel.

Wetland Information:



USDA-NRCS Wetland Inventory

The NRCS Wetlands Inventory identifies 1.86 acres of farmed wetland pasture on the parcel (identified in red).



ADID Wetland Inventory

The ADID Wetland Study indicates 1.86 acres of Wetland K873 is on the parcel. Wetland K873 requires 50 feet of buffer in accordance with the McHenry County Stormwater Ordinance.

*As we were not provided a site plan for the solar development, we are unaware if the applicant plans to impact this wetland area. If impacts are planned, the applicant is encouraged to work with the McHenry County Department of Planning & Development and the U.S. Army Corps of Engineers on permitting requirements.

Cultural Resources: None identified.



Preserved or Recognized Ecological Sites: Office maps indicate McHenry County Natural Areas Inventory Site – Mt. Thabor Marsh West, is southeast of the parcel. Mt. Thabor Marsh West is a 22.8 acre, unprotected, Basin Marsh, which is threatened by Cattail expansion and Reed Canary Grass.

Woodlands: The site visit conducted on 12/20/2023 identified 2 large oak trees in the corn field located in the southern portion of the parcel, west of the wetland. As we were not provided a site plan for the solar development, we are unaware if the applicant plans to impact these trees. Existing mature trees should be preserved whenever possible. Woodlands provide a large number of benefits such as wildlife habitat, erosion control, air and water quality improvements, as well as aesthetic values. Construction activities can indirectly destroy trees. Oak trees are particularly susceptible to long term, permanent damage caused by construction activities and require special consideration.

Agricultural Areas: Office Maps indicate there are no State designated agricultural area on the parcel.

Land Evaluation Site Assessment (LESA): The Land Evaluation Score for the parcel is 83.77. A Site Assessment was not completed due to the remaining agricultural Zoning.

ADDITIONAL CONCERNS

The Board recommends that areas between panels and within the buffers, be planted to a native prairie mix to help increase water infiltration and reduce runoff from the site. It is recommended that a planting and maintenance plan be developed with the landowner to ensure that noxious weeds are controlled, and native plantings are properly installed and managed. The petitioner should refer to the planting requirements of the Illinois Department of Natural Resources and McHenry County Department of Planning & Development.

We do not have record of an Agriculture Mitigation Agreement with the Illinois Department of Agriculture on file. The agreement addresses decommissioning of the site after the lifespan of the facility has been reached. It is recommended that all panels, piles, transformers, underground lines, and fencing be completely removed from the site. If underground lines are to remain, they should have at least 5 feet of cover to adequately allow farming operations to commence after the facility's removal. A template can be found on the Illinois Department of Agriculture's website.



NATURAL RESOURCE INFORMATION REPORT (NRI)

| | | |
|--|--|-----------|
| NRI Report Number | 23-091-4551 | |
| Applicant's Name | Gloria Foxman | |
| Size of Parcel | 42.52 acres | |
| Zoning Change | A-1 Conditional Use for Solar Facility | |
| Parcel Index Number(s) | 13-28-200-013 | |
| Common Location | Undefined | |
| Contact Person | Amy Henry | |
| <i>Copies of this report or notification of the proposed land-use change were provided to:</i> | <i>yes</i> | <i>no</i> |
| The Applicant | | x |
| The Contact Person | x | |
| The Local/Township Planning Commission | | x |
| The Village/City/County Planning and Zoning Department or Appropriate Agency | x | |
| The McHenry-Lake County Soil & Water Conservation District | x | |

Report Prepared By: *Spring M. Duffey*

Position: *Executive Director*

| <i>Contents</i> | <i>Page</i> |
|--|-------------|
| PURPOSE & INTENT..... | 3 |
| PARCEL LOCATION..... | 4 |
| ARCHAEOLOGIC/CULTURAL RESOURCES INFORMATION..... | 5 |
| ECOLOGICALLY SENSITIVE AREAS..... | 5 |
| WOODLANDS..... | 9 |
| GEOLOGIC INFORMATION..... | 10 |
| AQUIFER SENSITIVITY MAP..... | 10 |
| SENSITIVE AQUIFER RECHARGE AREAS..... | 11 |
| SOILS INFORMATION..... | 13 |
| SOILS MAP..... | 14 |
| SOIL MAP UNIT DESCRIPTIONS..... | 15 |
| SOILS INTERPRETATIONS EXPLANATION..... | 15 |
| SOIL LEACHABILITY..... | 16 |
| SOIL PERMEABILITY..... | 16 |
| SOIL EROSION & SEDIMENT CONTROL..... | 17 |
| PRIME FARMLAND SOILS..... | 19 |
| GROUND BASED SOLAR ARRAYS..... | 20 |
| AGRICULTURAL AREAS..... | 25 |
| LAND EVALUATION AND SITE ASSESSMENT (LESA)..... | 26 |
| DRAINAGE, RUNOFF AND FLOOD INFORMATION..... | 27 |
| FLOOD OF RECORD MAP..... | 29 |
| 2 FOOT TOPOGRAPHIC MAP..... | 30 |
| FLOOD INSURANCE RATE MAP..... | 31 |
| WATERSHED PLANS..... | 32 |
| WETLAND INFORMATION..... | 34 |
| NRCS WETLAND MAP..... | 35 |
| ADID WETLANDS..... | 36 |
| HYDRIC SOILS..... | 38 |
| WETLAND AND FLOODPLAIN REGULATIONS..... | 40 |
| THREATENED & ENDANGERED SPECIES..... | 41 |
| GLOSSARY..... | 42 |
| REFERENCES..... | 44 |

PURPOSE AND INTENT

The purpose of this report is to inform officials of the local governing body and other decision-makers with natural resource information. This information may be useful when undertaking land use decisions concerning variations, amendments or relief of local zoning ordinances, proposed subdivision of vacant or agricultural lands and the subsequent development of these lands. This report is a requirement under Section 22.02a of the Illinois Soil and Water Conservation Districts Act.

The intent of this report is to present the most current natural resource information available in a readily understandable manner. It contains a description of the present site conditions, the present resources, and the potential impacts that the proposed change may have on the site and its resources. The natural resource information was gathered from standardized data, on-site investigations and information furnished by the petitioner. This report must be read in its entirety so that the relationship between the natural resource factors and the proposed land use change can be fully understood.

Due to the limitations of scale encountered with the various resource maps, the property boundaries depicted in the various exhibits in this report provide a generalized

representation of the property location and may not precisely reflect the legal description of the PIQ (Parcel in Question).

This report, when used properly, will provide the basis for proper land use change decisions and development while protecting the natural resource base of the county. It should not be used in place of detailed environmental and/or engineering studies that are warranted under most circumstances, but in conjunction with those studies.

The conclusions of this report in no way indicate that a certain land use is not possible, but it should alert the reader to possible problems that may occur if the capabilities of the land are ignored. Any questions on the technical data supplied in this report or if anyone feels that they would like to see more additional specific information to make the report more effective, please contact:

**McHenry-Lake County Soil & Water
Conservation District
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E-mail: Spring.Duffey@il.nacdnet.net**

PARCEL LOCATION

Location Map for Natural Resources Information Report # 23-091-4551
In the Northeast Quarter of Section 28, Township 44 North, Range 7 East, on 42.52 acres.
This parcel is located on the south side of Lucas Road, east of the intersection of Illinois Route 47 and Lucas Road, McHenry County, IL.



ARCHAEOLOGIC/CULTURAL RESOURCES

Simply stated, cultural resources are all the past activities and accomplishments of people. They include the following: buildings; objects made or used by people; locations; and less tangible resources, such as stories, dance forms, and holiday traditions. The Soil and Water Conservation District most often encounters cultural resources as historical properties. These may be prehistoric or historical sites, buildings, structures, features, or objects. The most common type of historical property that the Soil and Water Conservation District may encounter is non-structural archaeological sites. These sites often extend below the soil surface, and must be protected against disruption by development or other earth moving activity if possible. Cultural resources are *non-renewable* because there is no way to “grow” a site to replace a disrupted site.

Landowners with historical properties on their land have ownership of that historical property. However, the State of Illinois owns all of the following: human remains, grave markers, burial mounds, and artifacts associated with graves and human remains.

Non-grave artifacts from archaeological sites and historical buildings are the property of the landowner. The landowner may choose to disturb a historical property, but may not receive federal or state assistance to do so. If an earth moving activity disturbs human remains, the landowner must contact the county coroner within 48 hours.

Office maps indicate there are no known historical features on the parcel in question. (PIQ)

ECOLOGICALLY SENSITIVE AREAS

What is Biological Diversity and Why Should it be Conserved?¹

Biological diversity, or biodiversity, is the range of life on our planet. A more thorough definition is presented by botanist Peter H. Raven: “At the simplest level, biodiversity is the sum total of all the plants, animals, fungi and microorganisms in the world, or in a particular area; all of their individual variation; and all of the interactions between them. It is the set of living organisms that make up the fabric of the planet Earth and allow it to function as it does, by capturing energy from the sun and using it to drive all of life’s processes; by forming communities of organisms that have, through the several billion years of life’s history on Earth, altered the nature of the atmosphere, the soil and the water of our Planet; and by making possible the sustainability of our planet through their life activities now.” (Raven 1994)

¹Taken from *The Conservation of Biological Diversity in the Great Lakes Ecosystem: Issues and Opportunities*, prepared by the Nature Conservancy Great Lakes Program 79W, Monroe Street, Suite 1309, Chicago, IL 60603, January 1994

It is not known how many species occur on our planet. Presently, about 1.4 million species have been named. It has been estimated that there are perhaps 9 million more that have not been identified. What is known is that they are vanishing at an unprecedented rate. Reliable estimates show extinction occurring at a rate several orders of magnitude above “background” in some ecological systems. (Wilson 1992, Hoose 1981)

The reasons for protecting biological diversity are complex, but they fall into four major categories.

First, loss of diversity generally weakens entire natural systems. Healthy ecosystems tend to have many natural checks and balances. Every species plays a role in maintaining this system. When simplified by the loss of diversity, the system becomes more susceptible to natural and artificial perturbations. The chances of a system-wide collapse increase. In parts of the midwestern United States, for example, it was only the remnant areas of natural prairies that kept soil intact during the dust bowl years of the 1930s. (Roush 1982)

Simplified ecosystems are almost always expensive to maintain. For example, when

synthetic chemicals are relied upon to control pests, the target species are not the only ones affected. Their predators are almost always killed or driven away, exasperating the pest problem. In the meantime, people are unintentionally breeding pesticide-resistant pests. A process has begun where people become perpetual guardians of the affected area, which requires the expenditure of financial resources and human ingenuity to keep the system going.

A second reason for protecting biological diversity is that it represents one of our greatest untapped resources. Great benefits can be reaped from a single species. About 20 species provide 90% of the world's food. Of these 20, just three, wheat, maize and rice-supply over one half of that food. American wheat farmers need new varieties every five to 15 years to compete with pests and diseases. Wild strains of wheat are critical genetic reservoirs for these new varieties.

Further, every species is a potential source of human medicine. In 1980, a published report identified the market value of prescription drugs from higher plants at over \$3 billion. Organic alkaloids, a class of chemical compounds used in medicines, are found in an estimated 20% of plant species. Yet only 2% of plant species have been screened for these compounds. (Hoose 1981)

The third reason for protecting diversity is that humans benefit from natural areas and depend on healthy ecosystems. The natural world supplies our air, our water, our food and supports human economic activity. Further, humans are creatures that evolved in a diverse natural environment between forest and grasslands. People need to be

reassured that such places remain. When people speak of "going to the country," they generally mean more than getting out of town. For reasons of their own sanity and well being, they need a holistic, organic experience. Prolonged exposure to urban monotony produces neuroses, for which cultural and natural diversity cure.

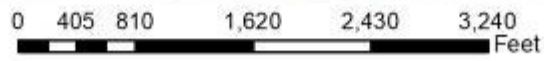
Historically, the lack of attention to biological diversity, and the ecological processes it supports, has resulted in economic hardships for segments of the basin's human population.

The final reason for protecting biological diversity is that species and natural systems are intrinsically valuable. The above reasons have focused on the benefits of the natural world to humans. All things possess intrinsic value simply because they exist.

Biological Resources Concerning the Subject Parcel

As part of the Natural Resources Information Report, staff checks office maps to determine if any nature preserves are within 500 feet of the parcel in question. If there is a nature preserve in the area, then that resource will be identified as part of the report. The SWCD recommends that every effort be made to protect that resource. Such efforts should include, but are not limited to erosion control, sediment control, stormwater management, and groundwater monitoring.



Office maps indicate McHenry County Natural Areas Inventory Site – Mt. Thabor Marsh West (DOR12), is southeast of the parcel. Mt. Thabor Marsh West is a 22.8 acre, unprotected, Basin Marsh, which is threatened by Cattail Expansion and Reed Canary Grass.



Produced By: McHenry-Lake County Soil & Water Conservation District



Key To Features

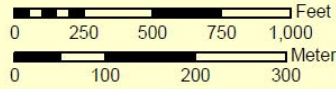
-  Parcel Boundary
-  McHenry County Natural Areas Inventory

Mt. Thabor Marsh West

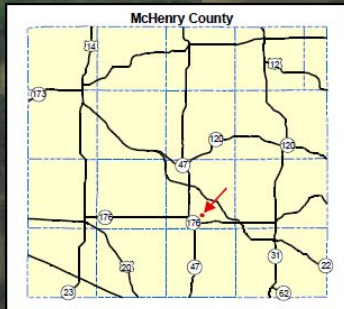
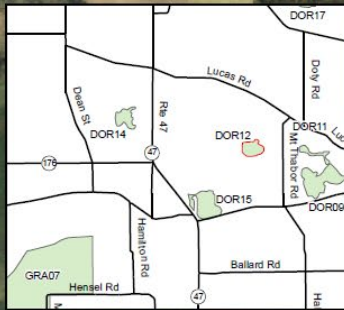
DOR12



MCCD-NRM
Base map: 2001 aerial photo
Site last visited: 1998
Map Date: 3/9/05



Township: Dorr
Section: 27
Former ID: K941



WOODLANDS

The site visit conducted on 12/20/2023 identified 2 large oak trees in the corn field located in the southern portion of the parcel, west of the wetland. Existing mature trees should be preserved whenever possible. Woodlands provide a large number of benefits such as wildlife habitat, erosion control, air and water quality improvements, as well as aesthetic values. Construction activities can indirectly destroy trees. Oak trees are particularly susceptible to long term, permanent damage caused by construction activities and require special consideration. It is also recommended that invasive non-native species be removed whenever possible.

Native woodlands are no longer a common occurrence throughout much of McHenry County. Although forests originally covered nearly 40% of Illinois, today only about 12% of the state is forested, with most of this being secondary growth (Ill. Natural History Survey Reports, Nov/Dec 1993, No. 324). The composition of Illinois forests has changed markedly over the past three decades. 97% of the timberland is classified as hardwood forest. The forest acreage continues to increase from 4.2 million acres in 1985 to 4.3 million acres in 1998. (IL Forest Development Council News, IL DNR, Winter 2001/Volume 2, No. 1). Oak-hickory forests, which had made up half of the acreage, have declined by 14%, and make up 2.1 million acres. This decline is largely a result of wildfire suppression that allows maples to take over. Thus, the acres of maple-beech forest have risen more than 40-fold from 1962 to 1985, to one quarter of the total forest area, 696 thousand acres. Dutch elm disease and the conversion of forested bottomlands to agriculture have resulted in huge declines in the elm-ash-cottonwood forests, 906 thousand acres, falling from one third - one sixth of the Illinois forest area. Elm accounts for the greatest number of individual trees – 412 million. Other species groups with more than 100 million trees include hickory, red oak, sugar/black maple, ash, hackberry, and black cherry.

Woodlands provide many benefits such as wildlife habitat, erosion control, air and water quality improvements, and aesthetic values. Forests are responsible for much of the

biological diversity in the state. Many species are dependent upon forests for food & shelter, including threatened/endangered species.

One of the most serious problems facing Illinois forests is the invasion of exotic plants and animals. Some of the most damaging plants includes European buckthorn, multiflora rose, honeysuckle, purple loosestrife, and garlic mustard.

Many trees, particularly hardwoods (especially oaks) are extremely sensitive to construction-induced disturbances. The area most susceptible to damage is within the "drip radius," the ground surface directly beneath the leafy canopy of the tree. Many trees have an extensive system of feeder roots, located within one foot of the surface, and supply the tree with the majority of its moisture and nutrient needs.

Construction activities can negatively impact trees in several different ways. Earth-moving activities that stockpile soil near trees can suffocate tree roots that, although buried, require oxygen. Vehicle traffic can compact the soil to a point where the roots no longer function effectively. Grading activities for road cuts and foundations can cause a localized drop in the water table, placing the trees under stress. The placement of pavement or stormwater management facilities near established trees can also radically change soil moisture. The removal of the accumulated organic materials normally present on a woodland floor, and the subsequent establishment of turf lawns, can drastically affect the soil temperature and nutrient balance. Injury to the bark of a tree can increase the chance of the tree being subjected to a potentially harmful disease.

If existing trees are to be maintained in a healthy state, the appropriate planning is necessary. Someone with a working knowledge of forestry should assess existing trees to determine which trees should be protected. Some tree species are not considered desirable due to their aggressive growth, behavior, and limited value to local wildlife. Proper management of woodlands and open space includes the selective elimination of such trees and replacement by more desirable species. **Trees that are to be saved should be marked and**

protected with snow fencing or similar material, installed around the drip radius, to prevent root damage, and vehicle traffic should be minimized around the drip line. Contractors should be informed of the intention to preserve trees and be expected to conduct their work accordingly.

Tree damage resulting from construction activities may not be apparent for a number of years. While it is recognized that some tree loss is unavoidable, this should be minimized to the extent possible. It is highly recommended that trees lost to development activity be replaced by younger specimens of the native trees now found on the PIQ.

GEOLOGIC INFORMATION

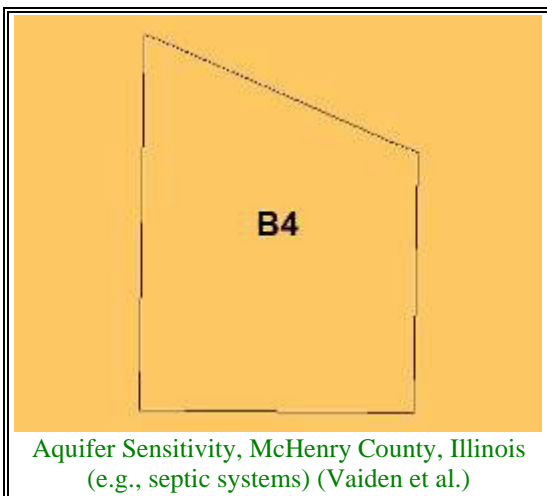
Geology and the Proposed Land Use

As density of septic systems increases, the concern for pollution potential of local groundwater rises. Local geology plays an important role in determining the pollution potential. Groundwater pollution potential is an important factor when determining a specific area's suitability for a given land use. The local geology, is an important element of the natural resource base. This information, when compared to soils information, gives a clearer picture of conditions on this parcel.

Geological data comes from the Illinois State Geological Survey Circular 559, *Geologic Mapping for Environmental Planning, McHenry County, Illinois*.

The Geologic features map indicates the parcel is comprised of B4 geologic limitations.

B-4: Geologic limitations. The potential for contamination is moderately high. Groundwater in these thin sand and gravel deposits is not commonly tapped for water resource; however, contaminated groundwater may flow into aquifers of adjoining units, or it may migrate through the sand and gravel, especially along the contact with underlying fine-grained deposits, and discharge on slopes or into surface-water bodies. (Contains less than 20 feet fine-grained materials overlying less than 20 feet Henry sand and gravel.)



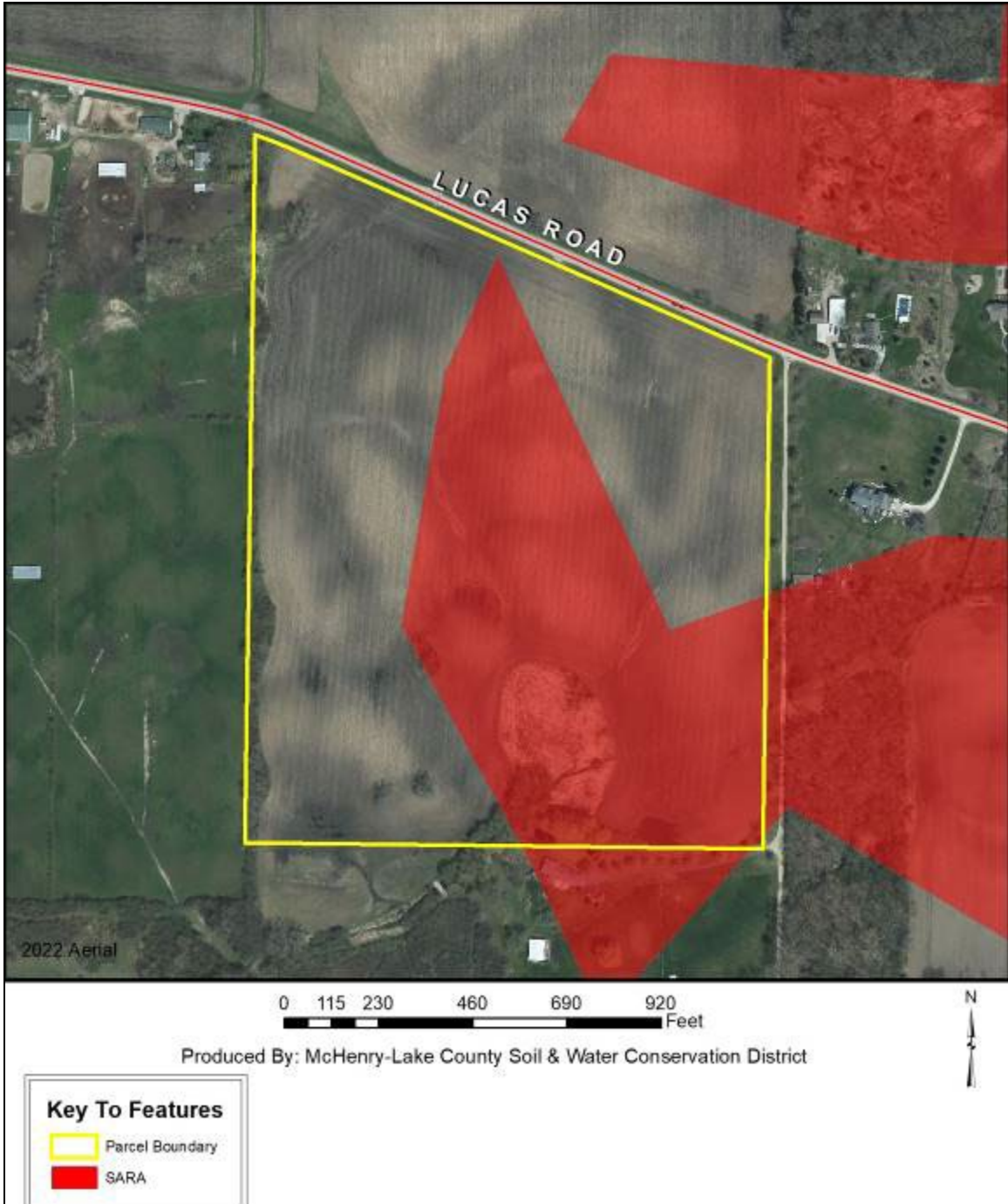
SENSITIVE AQUIFER RECHARGE AREAS

Developed for McHenry County in 2008 and revised in 2018 is the “McHenry County Sensitive Aquifer Recharge Areas” map. Because McHenry County is 100% reliant on groundwater and has been experiencing groundwater quantity/quality issues, the county board in 1995 authorized a groundwater investigation/report titled “County of McHenry Groundwater Resources Management Plan”. Many facts in that report startled decision makers. For example, the report found that in 2000, one township was withdrawing groundwater at unsustainable rates and by 2030 if status-quo, three townships would be doing the same and that three other townships would be approaching that unsustainability. In 2007, the County Board hired a full time Water Resources Manager and authorized the creation of the McHenry County Groundwater Task Force. The Recharge Subcommittee of the Groundwater Task Force was charged with identifying areas within the county that could be considered to have high potential for recharge of shallow groundwater and develop recommendations for protecting those areas in terms of both quantity and quality. The original main basis for the map identifying recharge is areas of high or moderately high potential for aquifer contamination as identified in the Illinois State Geological Survey’s Circular 559, “Geologic Mapping for Environmental Planning, McHenry County, IL”. In a meeting of the recharge subcommittee, Illinois State Geological Survey and Illinois State Water Survey, it was determined that the areas of high or moderately high potential for aquifer contamination could be qualified by using soil properties. The plan was to remove from the high and moderately high areas those soils with slow permeability, steep slopes and hydric soils that discharge groundwater. Using Table 6 of the Soil Survey of McHenry County a digital layer was developed of soil properties:

- Restricted permeability
- Slopes 4% or greater (except if the soil had excessive permeability, it was not included)

Also digitized were groundwater discharge hydric soils. NRCS Illinois Area 3 Resource Soil Scientists in 2002 developed a hydric soil recharge/flow through/discharge guide to use when designing wetland restoration. Because recharge/flow through/discharge is very complex and changes depending on the year only soils that were thought to be generally only groundwater discharge were used.

Subsequent to the original map development, 3D groundwater modeling has occurred and provided more precise groundwater flow data and thus was the basis for the 2018 map update. (*Information Courtesy of the McHenry County Groundwater Taskforce – Recharge Subcommittee.*)



The map indicates 16.73 acres of the parcel is within a sensitive aquifer recharge area.

SOILS INFORMATION

Importance of Soils Information

Soils information comes from Natural Resources Conservation Service Soil Maps and Descriptions for McHenry County. This information is important to all parties involved in determining the suitability of the proposed land use change.

Each soil polygon is given a number, which represents its soil type. The letter found after the soil type number indicates the soils slope class.

Each soil map unit has limitations for a variety of land uses such as septic systems, buildings with basements, and buildings without basements. It is important to remember that soils do not function independently of each other. The behavior of a soil depends upon the physical properties of adjacent soil types, the presence of artificial drainage, soil compaction, and its position in the local landscape.

The limitation categories (slight, moderate or severe) indicate the potential for difficulty in using that soil unit for the proposed activity and, thus, the degree of need for thorough soil borings and engineering studies. A limitation does not necessarily mean that the proposed activity

cannot be done on that soil type. It does mean that the reasons for the limitation need to be thoroughly understood and dealt with in order to complete the proposed activity successfully. A severe limitation indicates that the proposed activity will be more difficult and costly to do on that soil type than on a soil type with a moderate or slight rating.

Soil survey interpretations are predictions of soil behavior for specified land uses and specified management practices. They are based on the soil properties that directly influence the specified use of the soil. Soil survey interpretations allow users of soil surveys to plan reasonable alternatives for the use and management of soils.

Soil interpretations do not eliminate the need for on-site study and testing of specific sites for the design and construction for specific uses. They can be used as a guide for planning more detailed investigations and for avoiding undesirable sites for an intended use. The scale of the maps and the range of error limit the use of the soil delineations.


Natural Resources Conservation Service Soil Survey Map of Area



Produced By: McHenry-Lake County Soil & Water Conservation District



Key To Features

-  Parcel Boundary
-  Soils

Soil Map Unit Descriptions

| Symbol | Description | Acres | Percent |
|--------|---|-------|---------|
| 146B | ELLIOTT SILT LOAM 2 TO 4 PERCENT SLOPES | 2.12 | 4.98% |
| 223D2 | VARNA SILT LOAM 6 TO 12 PERCENT SLOPES ERODED | 0.35 | 0.82% |
| 232A | ASHKUM SILTY CLAY LOAM 0 TO 2 PERCENT SLOPES | 24.46 | 57.54% |
| 298B | BEECHER SILT LOAM 2 TO 4 PERCENT SLOPES | 14.01 | 32.95% |
| 530C2 | OZAUKEE SILT LOAM 4 TO 6 PERCENT SLOPES ERODED | 0.91 | 2.14% |
| 530C3 | OZAUKEE SILTY CLAY LOAM 4 TO 6 PERCENT SLOPES SEVERELY ERODED | 0.67 | 1.57% |

*SOURCE: National Cooperative Soil Survey

Soil Interpretations Explanation

Nonagricultural

General

These interpretative ratings help engineers, planners, and others to understand how soil properties influence behavior when used for nonagricultural uses such as building site development or construction materials. This report gives ratings for proposed uses in terms of limitations and restrictive features. The tables list only the most restrictive features. Other features may need treatment to overcome soil limitations for a specific purpose.

Ratings come from the soil's "natural" state, that is, no unusual modification occurs other than that which is considered normal practice for the rated use. Even though soils may have limitations, an engineer may alter soil features or adjust building plans for a structure to compensate for most degrees of limitations. Most of these practices, however, are costly. The final decision in selecting a site for a particular use generally involves weighing the costs for site preparation and maintenance.

Soil properties influence development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Soil limitation ratings of slight, moderate, and severe are given for the types of proposed improvements that are listed or inferred by the petitioner as entered on the report application and/or zoning petition. The most common types of building limitation that this

report gives limitations ratings for is: septic systems. It is understood that engineering practices can overcome most limitations for buildings with and without basements, and small commercial buildings. Limitation ratings for these types of buildings are not commonly provided. Organic soils, when present on the parcel, are referenced in the hydric soils section of the report. This type of soil is considered to be unsuitable for all types of construction.

Limitations Ratings

1. **Slight** - This soil has favorable properties for the use. The degree of limitation is minor. The people involved can expect good performance and low maintenance.
2. **Moderate** - This soil has moderately favorable properties for the use. Special planning, design, or maintenance can overcome this degree of limitation. During some part of the year, the expected performance is less desirable than for soils rated slight.
3. **Severe or Very Severe** - This soil has one or more properties that are unfavorable for the rated use. These may include the following: steep slopes, bedrock near the surface, flooding, high shrink-swell potential, a seasonal high water table, or low strength. This degree of limitation generally requires major soil reclamation, special design, or intensive maintenance, which in most situations is difficult and costly.

SOIL LEACHABILITY

Rating Criteria

The leaching index values are derived from the USDA-NRCS Leaching Index Values, McHenry County, Illinois table. The soil types were evaluated on the ability for herbicides/pesticides and nutrients to move through the soil profile and into the groundwater.

Leaching Index Value 1 – These soils have a low potential of leachable materials (herbicides/pesticides) reaching the bottom of the soil profile.

Leaching Index Value 2 – These soils have a moderate potential of leachable materials (herbicides/pesticides) reaching the bottom of the soil profile.

Leaching Index Value 3 – These soils have a high potential of leachable materials (herbicides/pesticides) reaching the bottom of the soil profile.

Soil Leachability

| Symbol | Soil Leachability | Acres | Percent |
|-------------------------------|-------------------|-------|--------------|
| 146B | Low | 2.12 | 4.98% |
| 223D2 | Low | 0.35 | 0.82% |
| 232A | Low | 24.46 | 57.54% |
| 298B | Low | 14.01 | 32.95% |
| 530C2 | Low | 0.91 | 2.14% |
| 530C3 | Low | 0.67 | 1.57% |
| Total Moderate to High | | - | 0.00% |

SOIL PERMEABILITY

Soil permeability is the quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality.

For the purposed of the NRI Report, those soils which have “rapid” to “very rapid” permeability, have been identified as “highly permeable.”

Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow 0.0 to 0.01 inch
 Very slow 0.01 to 0.06 inch
 Slow 0.06 to 0.2 inch
 Moderately slow 0.2 to 0.6 inch
 Moderate 0.6 inch to 2.0 inches
 Moderately rapid 2.0 to 6.0 inches
 Rapid 6.0 to 20 inches
 Very rapid more than 20 inches

Highly Permeable Soils

| Symbol | Highly Permeable | Acres | Percent |
|-------------------------------------|------------------|-------|--------------|
| 146B | no | 2.12 | 4.98% |
| 223D2 | no | 0.35 | 0.82% |
| 232A | no | 24.46 | 57.54% |
| 298B | no | 14.01 | 32.95% |
| 530C2 | no | 0.91 | 2.14% |
| 530C3 | no | 0.67 | 1.57% |
| Total Highly Permeable Soils | | - | 0.00% |

SOIL EROSION & SEDIMENT CONTROL

Erosion is the wearing away of the soil by water, wind, and other forces. Soil erosion threatens the Nation's soil productivity and contributes the most pollutants in our waterways. Water causes about two thirds of erosion on agricultural land. Four properties, mainly, determine a soil's erodibility:

1. Texture
2. Slope
3. Structure
4. Organic matter content

Slope has the most influence on soil erosion potential when the site is under construction. Erosivity and runoff increase as slope grade increases. The runoff then exerts more force on the particles, breaking their bonds more readily and carrying them farther before deposition. The longer water flows along a slope before reaching a major waterway, the greater the potential for erosion.

Soil erosion during and after this proposed construction can be a primary non-point source of water pollution. Eroded soil during the construction phase can create unsafe conditions on roadways, decrease the storage capacity of lakes, clog streams and drainage channels, cause deterioration of aquatic habitats, and increase

water treatment costs. Soil erosion also increases the risk of flooding by choking culverts, ditches and storm sewers, and by reducing the capacity of natural and man-made detention facilities.

The general principles of erosion and sedimentation control measures include:

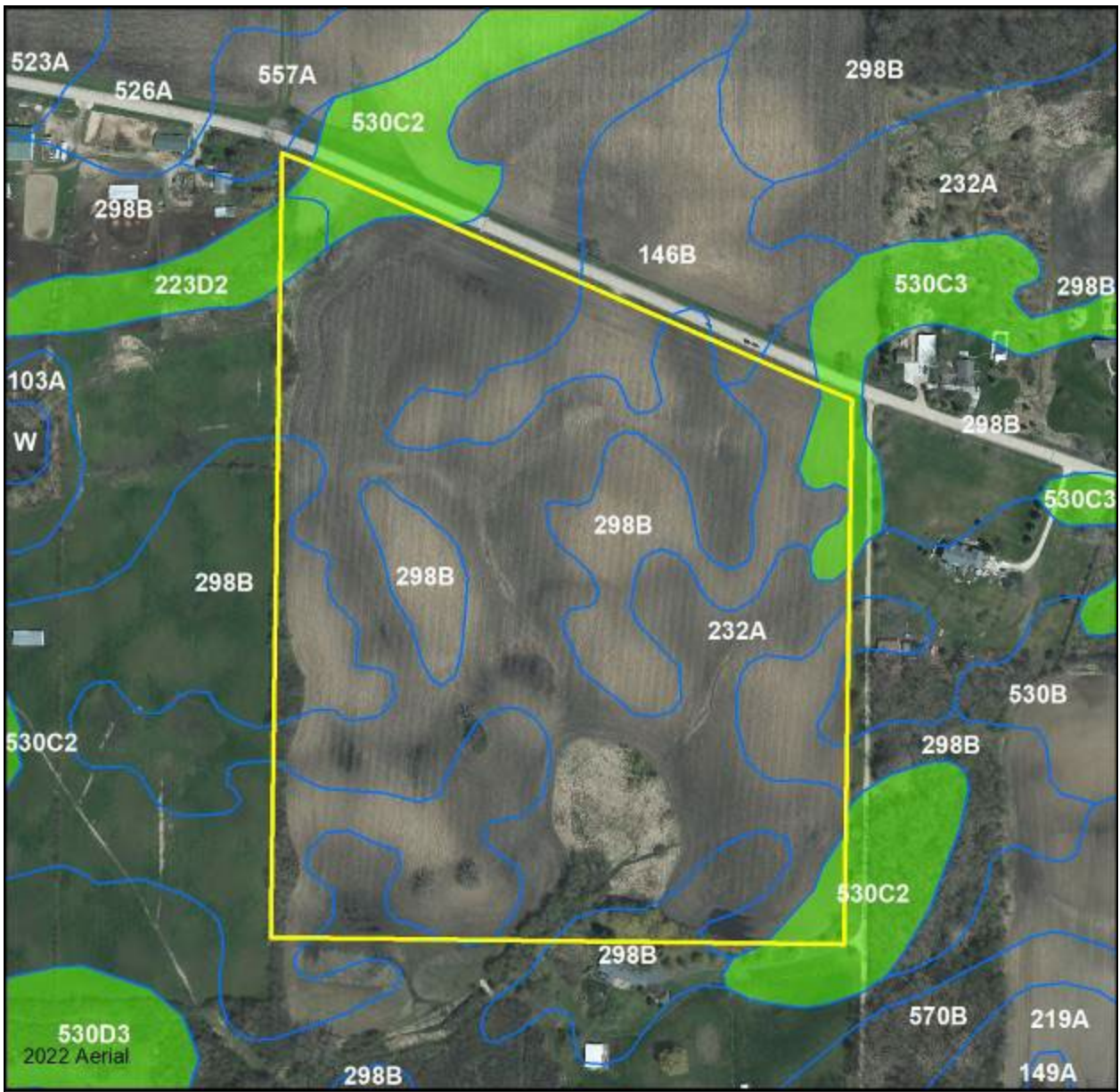
- reducing or diverting flow from exposed areas, storing flows or limiting runoff from exposed areas,
- staging construction in order to keep disturbed areas to a minimum,
- establishing or maintaining or temporary or permanent groundcover,
- retaining sediment on site and
- properly installing, inspecting and maintaining control measures.

Erosion control practices are useful controls only if they are properly located, installed, inspected and maintained.

The SWCD recommends an erosion control plan for all building sites, especially if there is a wetland or stream nearby.

Highly Erodible Soils (HEL)

| Symbol | Slope | HEL | Acres | Percent |
|------------------------------------|-------|-----|-------------|--------------|
| 146B | 2-4% | no | 2.12 | 4.98% |
| 223D2 | 6-12% | yes | 0.35 | 0.82% |
| 232A | 0-2% | no | 24.46 | 57.54% |
| 298B | 2-4% | no | 14.01 | 32.95% |
| 530C2 | 4-6% | yes | 0.91 | 2.14% |
| 530C3 | 4-6% | yes | 0.67 | 1.57% |
| Total Highly Erodible Soils | | | 1.92 | 4.53% |



Produced By: McHenry-Lake County Soil & Water Conservation District



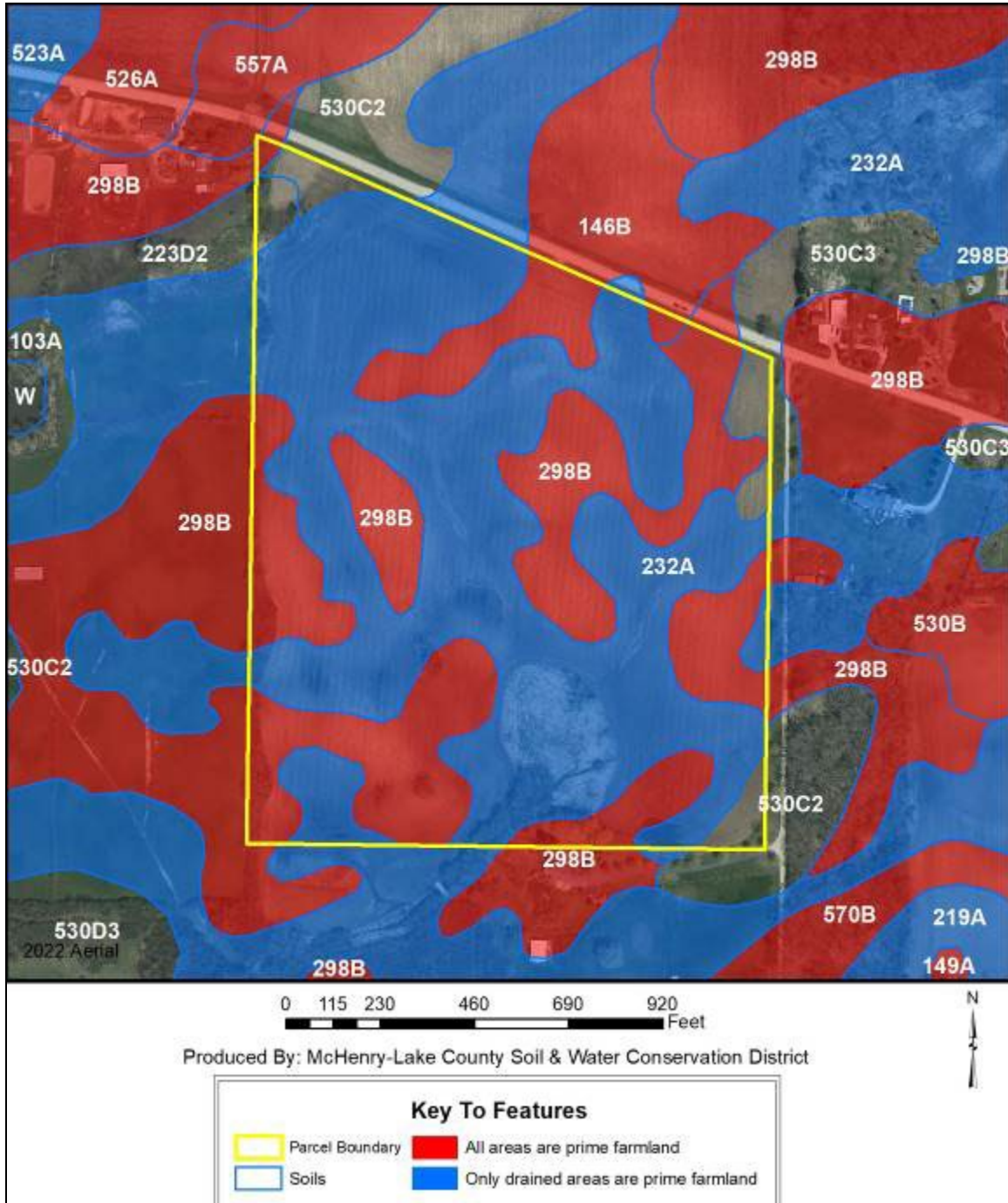
Key To Features

| | | | |
|---|-----------------|---|-----------------------------------|
|  | Parcel Boundary |  | Highly Erodible Soils (C+ Slopes) |
|  | Soils | | |

PRIME FARMLAND SOILS

Prime farmland soils are an important resource to McHenry County. Some of the most productive soils in the United States occur locally. Each soil map unit in the United States is assigned a prime or non-prime rating. Prime agricultural land does not need to be in the production of food & fiber.

Section 310 of the NRCS general manual states that urban or built-up land on prime farmland soils is not prime farmland. The percentages of soils map units on the parcel reflect the determination that urban or built up land on prime farmland soils is not prime farmland.



Prime Farmland Soils

| Symbol | Prime | Acres | Percent |
|---------------------------------|---------------------------------------|--------------|---------------|
| 146B | All areas are prime farmland | 2.12 | 4.98% |
| 223D2 | Not Prime Farmland | 0.35 | 0.82% |
| 232A | Only drained areas are prime farmland | 24.46 | 57.54% |
| 298B | All areas are prime farmland | 14.01 | 32.95% |
| 530C2 | Not Prime Farmland | 0.91 | 2.14% |
| 530C3 | Not Prime Farmland | 0.67 | 1.57% |
| Total Prime | | 16.13 | 37.93% |
| Total Prime When Drained | | 24.46 | 57.54% |

GROUND-BASED SOLAR ARRAYS, SOIL-PENETRATING ANCHOR SYSTEMS

Description

Ground-based solar arrays are sets of photovoltaic panels that are not situated on a building or pole. These installations consist of a racking system that holds the panel in the desired orientation and the foundation structures that hold the racking system to the ground. Two basic methods are used to hold the systems to the ground, based on site conditions and cost. One method employs driven piles, screw augers, or concrete piers that penetrate into the soil to provide a stable foundation. The ease of installation and general site suitability of soil-penetrating anchoring systems depends on soil characteristics such as rock fragment content, soil depth, soil strength, soil corrosivity, shrink-swell tendencies, and drainage. The other basic anchoring system utilizes precast ballasted footings or ballasted trays on the soil surface to make the arrays too heavy to move. The site considerations that impact both basic systems are slope, slope aspect, wind speed, land surface shape, flooding, and ponding. Other factors that will contribute to the function of a solar power array include daily hours of sunlight and shading from hills, trees or buildings.

Soil-penetrating anchoring systems can be used where the soil conditions are not limited. Installation of these systems requires some power equipment for hauling components and either driving piles, turning helices, or boring holes to install the anchoring apparatus.

Soils can be a non-member, partial member or complete members of the set of soils that are limited for "Ground-based Solar Panel Arrays". If a soil's property within 150 cm (60 inches) of the soil surface has a membership indices greater than zero, then that soil property is limiting and the soil restrictive feature is identified. The overall interpretive rating assigned is the maximum membership indices of each soil

interpretive property that comprise the "Ground-based Solar Panel Array" interpretive rule. Minor restrictive soil features are identified but not considered as part of the overall rating process. These restrictive features could be important factors where the major restrictive features are overcome through design application.

Soils are placed into interpretive rating classes per their rating indices. These are not limited (rating index = 0), somewhat limited (rating index greater than 0 and less than 1.0), or very limited (rating index = 1.0).

Numerical ratings indicate the degree of limitation. The ratings are shown in decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil has the least similarity to a good site (1.00) and the point at which the soil feature is very much like known good sites (0).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

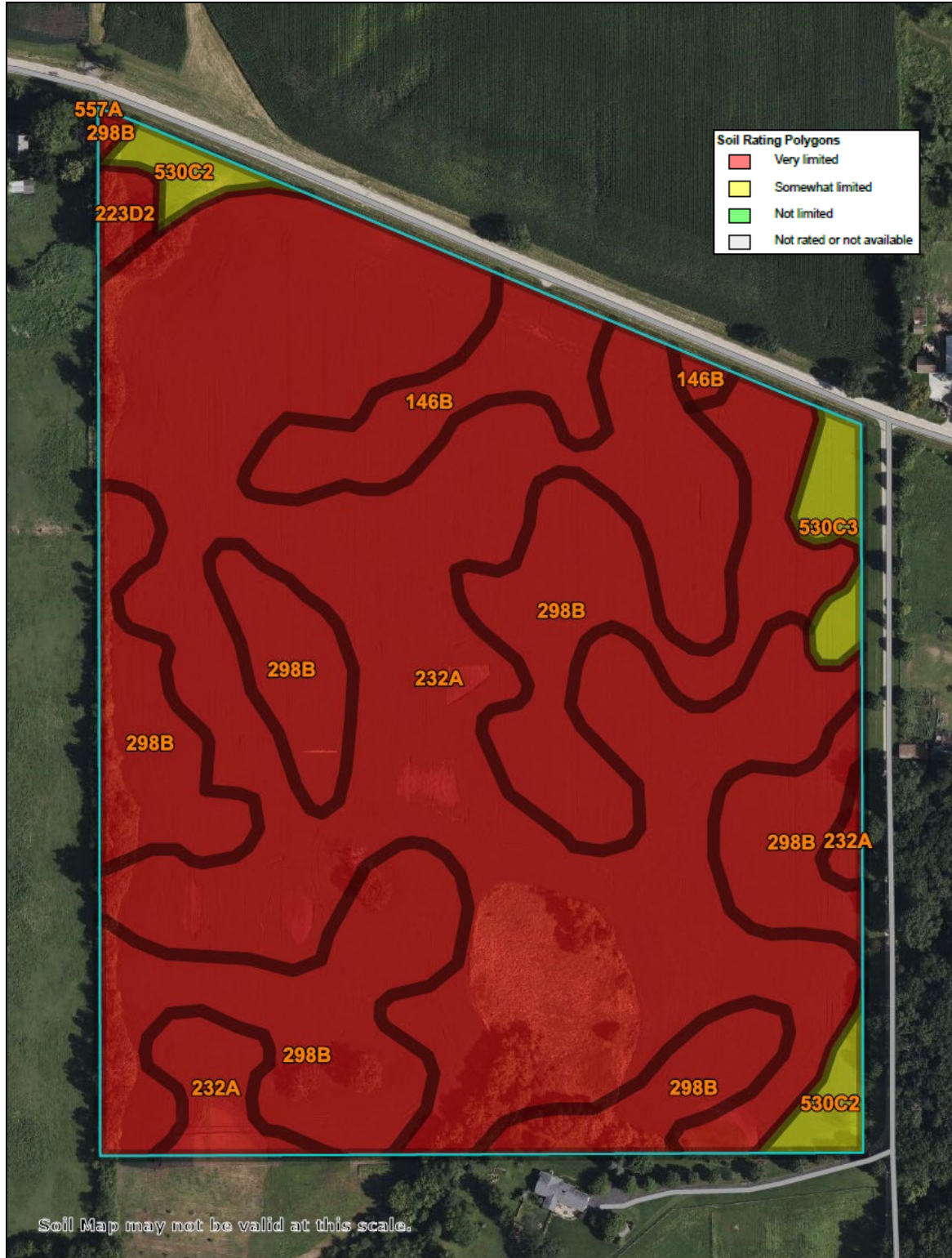
Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation

may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

References:

Canada, S. 2012. Corrosion impacts on steel piles. Solarpro. Solarprofessional.com.

Romanoff, Melvin. 1962. Corrosion of Steel Piling in Soils. Journal of Research of the National Bureau of Standards. (Volume 66C, No. 3). July/September, 1962.



Solar Arrays, Soil-based Anchor Systems

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|-----------------|---|--------------|--------------------------|---------------------------------|--------------|----------------|
| 146B | Elliott silt loam, 2 to 4 percent slopes | Very limited | Elliott (94%) | Low strength (1.00) | 2.1 | 4.9% |
| | | | | Steel corrosion (0.75) | | |
| | | | | Depth to saturated zone (0.75) | | |
| | | | | Frost action (0.50) | | |
| | | | | Hillslope position (0.25) | | |
| | | | Ashkum, drained (4%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Shrink-swell (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | Orthents, clayey (1%) | Shrink-swell (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Steel corrosion (0.75) | | |
| | | | | Frost action (0.50) | | |
| | | | | Hillslope position (0.25) | | |
| 223D2 | Varna silt loam, 6 to 12 percent slopes, eroded | Very limited | Varna, eroded (92%) | Low strength (1.00) | 0.3 | 0.8% |
| | | | | Steel corrosion (0.75) | | |
| | | | | Frost action (0.50) | | |
| | | | | Hillslope position (0.13) | | |
| | | | | Shrink-swell (0.05) | | |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI | | |
|-----------------|---|--------------|--------------------------|--|--------------|----------------|------|-------|
| | | | Ashkum, drained (8%) | Ponding (1.00) Depth to saturated zone (1.00) Shrink-swell (1.00) Frost action (1.00) Low strength (1.00) | | | | |
| 232A | Ashkum silty clay loam, 0 to 2 percent slopes | Very limited | Ashkum, drained (92%) | Ponding (1.00) Depth to saturated zone (1.00) Shrink-swell (1.00) Frost action (1.00) Low strength (1.00) | 24.5 | 57.6% | | |
| | | | Peotone, drained (5%) | Ponding (1.00) Depth to saturated zone (1.00) Shrink-swell (1.00) Frost action (1.00) Low strength (1.00) | | | | |
| | | | Orthents, clayey (2%) | Shrink-swell (1.00) Low strength (1.00) Steel corrosion (0.75) Frost action (0.50) Hillslope position (0.25) | | | | |
| 298B | Beecher silt loam, 2 to 4 percent slopes | Very limited | Beecher (90%) | Frost action (1.00) Low strength (1.00) | | | 14.0 | 32.9% |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|-----------------|---|------------------|--------------------------------|---------------------------------|--------------|----------------|
| | | | | Depth to saturated zone (0.99) | | |
| | | | | Steel corrosion (0.75) | | |
| | | | | Hillslope position (0.13) | | |
| | | | Ashkum, drained (6%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Shrink-swell (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | Orthents, clayey (2%) | Shrink-swell (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Steel corrosion (0.75) | | |
| | | | | Frost action (0.50) | | |
| | | | | Hillslope position (0.25) | | |
| 530C2 | Ozaukee silt loam, 4 to 6 percent slopes, eroded | Somewhat limited | Ozaukee, eroded (96%) | Steel corrosion (0.75) | 0.9 | 2.2% |
| | | | | Frost action (0.50) | | |
| | | | | Low strength (0.50) | | |
| | | | | Hillslope position (0.13) | | |
| 530C3 | Ozaukee silty clay loam, 4 to 6 percent slopes, severely eroded | Somewhat limited | Ozaukee, severely eroded (96%) | Steel corrosion (0.75) | 0.7 | 1.6% |
| | | | | Frost action (0.50) | | |
| | | | | Low strength (0.39) | | |
| | | | | Slope shape across (0.20) | | |
| | | | | Hillslope position (0.13) | | |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|------------------------------------|---|--------------|--------------------------|---------------------------------|--------------|----------------|
| 557A | Millstream silt loam, 0 to 2 percent slopes | Very limited | Millstream (85%) | Frost action (1.00) | 0.0 | 0.0% |
| | | | | Steel corrosion (0.75) | | |
| | | | | Depth to saturated zone (0.75) | | |
| | | | | Shrink-swell (0.25) | | |
| | | | | Low strength (0.14) | | |
| | | | Dunham (6%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (0.83) | | |
| | | | | Steel corrosion (0.75) | | |
| Totals for Area of Interest | | | | | 42.5 | 100.0% |

| Rating | Acres in AOI | Percent of AOI |
|------------------------------------|--------------|----------------|
| Very limited | 40.9 | 96.2% |
| Somewhat limited | 1.6 | 3.8% |
| Totals for Area of Interest | 42.5 | 100.0% |

AGRICULTURAL AREAS

The Agricultural Areas Conservation and Protect Act became effective July 1, 1980. The purpose of the Act is to provide a means by which agricultural land may be protected and enhanced as a viable segment of the State's economy and as an economic and environmental resource of major importance. Established Ag Areas tend to influence adjacent and surrounding land use changes since they are voluntary in nature and petitioned before the County Board for approval. Ag Areas are considered a high commitment to agriculture. Designated Ag Areas limit land

utilization to specified agricultural uses within their designated boundaries. Ag Areas allow landowners limited benefits such as immunity from locally enacted ordinances, which would limit farming operations and immunity from special tax assessments from local units of government.

Office Maps indicate there are no State designated agricultural areas on or adjacent to the parcel.

LAND EVALUATION & SITE ASSESSMENT (LESA)

The Land Evaluation and Site Assessment system is a tool designed to evaluate the viability of agricultural lands where changes in land-use are proposed. LESA was developed as a decision-making tool used by the Zoning Board of Appeals, City Councils or County Boards to help make unbiased decisions of proper land-use. The LESA system was developed by the USDA-NRCS and takes into consideration local conditions such as physical characteristics of the land, compatibility of surrounding land-uses, urban growth factors, and land-use policies determined by local government. LESA was designed to be used in conjunction with the county's land-use plan, zoning ordinances, and other policies being used to decide land-use changes.

Decision makers use the Land Evaluation and Site Assessment (LESA) System to determine the suitability of a land use change and/or a zoning request as it relates to agricultural land. The LESA System is a two step procedure that includes:

- ◆ Land Evaluation (LE), soils value
- ◆ Site Assessment (SA), land use

Land Evaluation (**LE**) encompasses information regarding soils found on the site and their suitability for agricultural purposes. McHenry County soils consist of 73 different soil series ranging from gravely loams to wet muck soils and from highly productive agricultural soils to

high quality gravel deposits. For purposes of the Land Evaluation portion of the LESA system, each soil is assigned a relative value number, from 0 to 100, a 0 being the worst soils for crop production, 100 the best. Parcels containing higher percentages of higher valued soils will rate higher on the overall LESA score while those containing higher percentages lowered value soils will rate lower in the overall LESA score. McHenry County SWCD provides a weighted average of the soils using a simple, mechanical, unbiased method of determining agricultural suitability of soils on site.

Site Assessment (**SA**) identifies and weighs 10 criteria, other than soils information, that contributes to the quality of a site for agricultural uses. The determination to include the specific site assessment factors directly resulted from the following:

- ◆ McHenry County Zoning Ordinance,
- ◆ 2030 Land Use Plan,
- ◆ Other adopted county policies.

In summary, the LESA evaluation addresses all factors, including soils information, together to provide a rational, consistent, and unbiased determination of the impact to agriculture from the proposed land use and zoning changes.

LAND EVALUATION (LE) WORKSHEET

Land Evaluation Score

| Symbol | LE Score | Acres | Percent | Weighted Ave |
|------------------------------------|----------|-------|---------|--------------|
| 146B | 86 | 2.12 | 4.98% | 4.28 |
| 223D2 | 73 | 0.35 | 0.82% | 0.60 |
| 232A | 88 | 24.46 | 57.54% | 50.64 |
| 298B | 78 | 14.01 | 32.95% | 25.70 |
| 530C2 | 71 | 0.91 | 2.14% | 1.52 |
| 530C3 | 66 | 0.67 | 1.57% | 1.04 |
| Total Land Evaluation Score | | | | 83.77 |

Explanation of the LE Worksheet:

Symbol: is the soil type of the polygon on the soils map.

Percentage and Acreage: the percentages of the parcel, and the area that the soil polygon represents.

LE Score: the numeric value from 0 - 100 that is assigned that soil unit

Weighted Ave: The acreage multiplied by the value of that soil unit.

DRAINAGE, RUNOFF AND FLOOD INFORMATION

U.S.G.S Topographic maps give information on elevations, which are important mostly to determine slopes, drainage directions, and watershed information.

Elevations determine the area of impact of floods of record. Slope information determines steepness and erosion potential. Drainage directions determine where water leaves the PIQ, possibly impacting surrounding natural resources.

Watershed information is given for changing land use to a subdivision type of development on parcels greater than 10 acres.

What is a watershed?

Simply stated, a watershed is the area of land that contributes water to a certain point. The point that we use on these reports is usually the point where water exits the parcel. The point is marked with a "O." The watershed boundary is drawn in using the following marking: (— • • —). Often times, water will flow off the parcel in two or more directions. In that case, there is a watershed break on the parcel. (— • • —), and there are two or more watersheds on the parcel.

The watershed boundary is important because the area of land in the watershed can now be calculated using an irregular shape area calculator such as a dot counter or planimeter.

Using regional storm event information, and site specific soils and land use information, the peak stormwater flow through the point marked "O" for a specified storm event can be calculated. This value is called a "Q" value (for the given storm event), and is measured in cubic feet per second (CFS).

When construction occurs, the Q value naturally increases because of the increase in impermeable surfaces. This process decreases the ability of soils to accept and temporarily hold water. Therefore, more water runs off and increases the Q value.

Theoretically, if each development, no matter how large or small, maintains their preconstruction Q value after construction by the installation of stormwater management systems,

the streams and wetlands and lakes will not suffer damage from excessive urban stormwater.

For this reason, the McHenry County SWCD recommends that the developer for intense uses such as a subdivision calculate the preconstruction Q value for the exit point(s). A stormwater management system should be designed, installed, and maintained to limit the postconstruction Q value to be at or below the preconstruction value.

Importance of Flood Information

A floodplain is defined as land adjoining a watercourse (riverine) or an inland depression (non-riverine) that is subject to periodic inundation by high water. Floodplains are important areas demanding protection since they have water storage and conveyance functions which affect upstream and down stream flows, water quality and quantity, and suitability of the land for human activity. Since floodplains play distinct and vital roles in the hydrologic cycle, development that interferes with their hydrologic and biologic functions should be carefully considered.

Flooding is both dangerous to people and destructive to their properties. The following maps, when combined with wetland and topographic information, can help developers and future homeowners to "sidestep" potential flooding or ponding problems.

FIRM is the acronym for the Flood Insurance Rate Map, produced by the Federal Emergency Management Agency. These maps define flood elevation adjacent to tributaries and major bodies of water, and superimpose that onto a simplified USGS topographic map. The scale of the FIRM maps is generally dependent on the size and density of parcels in that area. (This is to correctly determine the parcel location and flood plain location.) The FIRM map has three (3) zones. A is the zone of 100 year flood, zone B is the 100 to 500 year flood, and zone C is outside the flood plain.

The Hydrologic Atlas (H.A.) Series of the Flood of Record Map is also used for the topographic information. This map is different from the FIRM map mainly because it will show isolated,

or pocketed flooded areas. McHenry County uses both these maps in conjunction with each other for flooded area determinations. The Flood of Record maps, show the areas of flood for various years. Both of these maps stress that the recurrence of flooding is merely statistical. That is to say a 100-year flood may occur twice in one year, or twice in one week, for that matter.

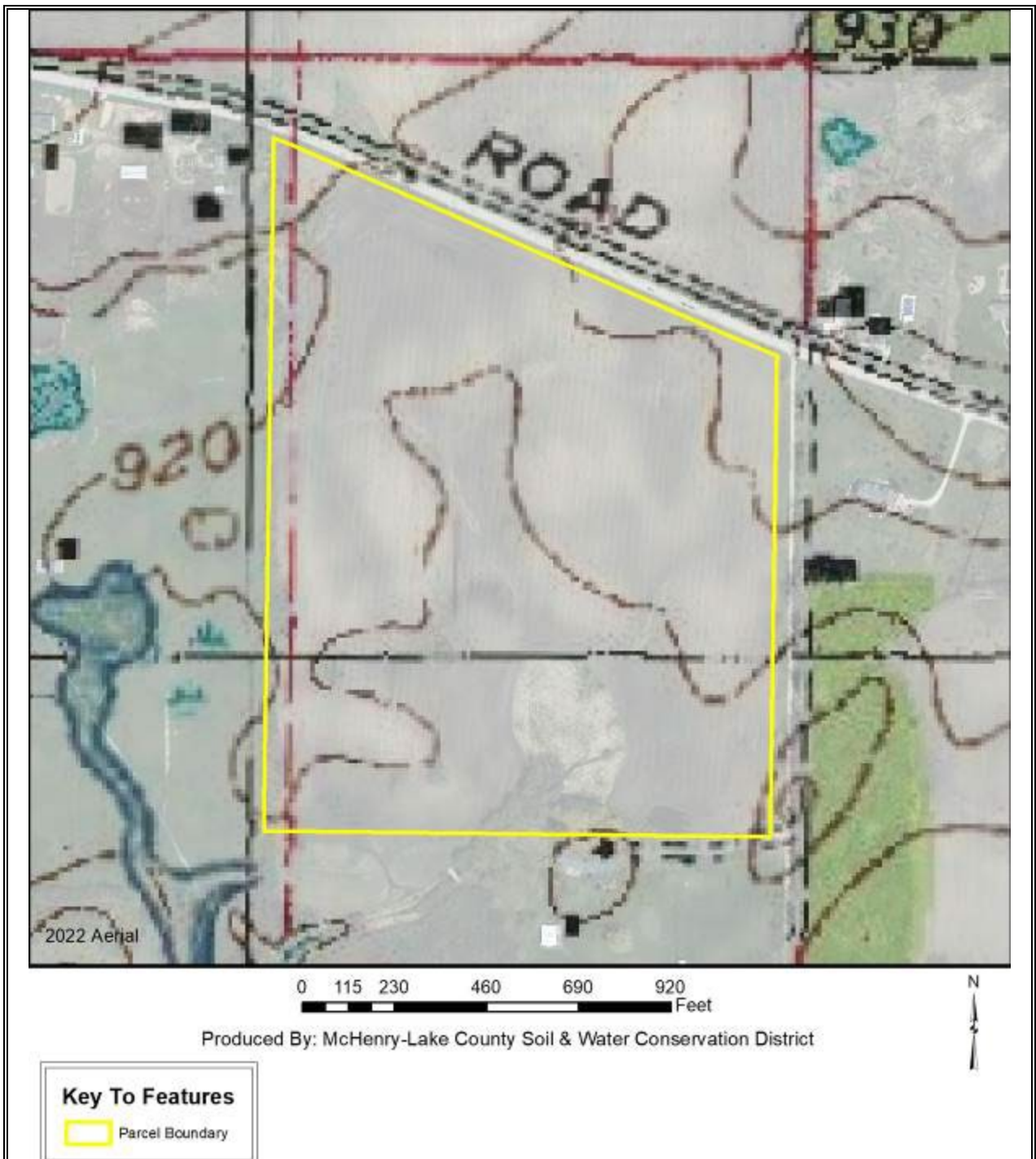
It should be noted that greater floods than those shown on the two maps are possible. The flood boundaries indicated provide a historic record only until the map publication date. Additionally, these flood boundaries are a function of the watershed conditions existing when the maps were produced. Cumulative changes in runoff characteristics caused by urbanization can result in an increase in flood height of future flood episodes.

Floodplains play a vital role in reducing the flood damage potential associated with an urbanizing area and, when left in an undisturbed state, also provide valuable wildlife habitat benefits. If it is the petitioner's intent to conduct floodplain filling or modification activities, the petitioner and the Unit of Government

responsible need to consider the potentially adverse effects this type of action could have on adjacent properties. The change or loss of natural floodplain storage often increases the frequency and severity of flooding on adjacent property.

If the available maps indicate the presence of a floodplain on the PIQ, the petitioner should contact the IDOT-DWR and FEMA to delineate a floodplain elevation for the parcel. If a portion of the property is indeed floodplain, applicable state, county and local regulations will need to be reflected in the site plans.

Another indication of flooding potential can be found in the soils information. Hydric soils indicate the presence of drainageways, areas subject to ponding, or a naturally occurring high water table. These need to be considered along with the floodplain information when developing the site plan and the stormwater management plan. If the site does include these hydric soils and development occurs, thus raising the concerns of the loss of water storage in these soils and the potential for increased flooding in the area.



Flood of Record Map Showing Topographic Information

This parcel is located on relatively flat topography (slopes 0 to 12%) involving high and low areas (elevation ranges from 912' above sea level to 936' above sea level). An erosion control system should include a sedimentation basin to address exiting concentrated flows during construction. The same area used for a sedimentation basin during construction can be used for a stormwater retention system after construction.

During construction, temporary vegetation can decrease erosion on the slopes if the area is to be mass graded.

Also, the flood of record for this area indicates the parcel has not previously flooded.



Produced By: McHenry-Lake County Soil & Water Conservation District

Key To Features

-  Parcel Boundary
-  2 Ft Contours



Produced By: McHenry-Lake County Soil & Water Conservation District

| Key To Features | |
|---|--|
|  | Parcel Boundary |
| FEMA Floodplain | |
| Flood Zone | |
|  | 0.2 PCT ANNUAL CHANCE FLOOD HAZARD |
|  | 100 yr |
|  | 100 yr with base flood elevations determined |
|  | 100 yr with 1-3 ft. flood depths |
|  | 100 yr usually sheet flow |

Federal Emergency Management Agency: Flood Insurance Rate Map Panel 17111C0200J

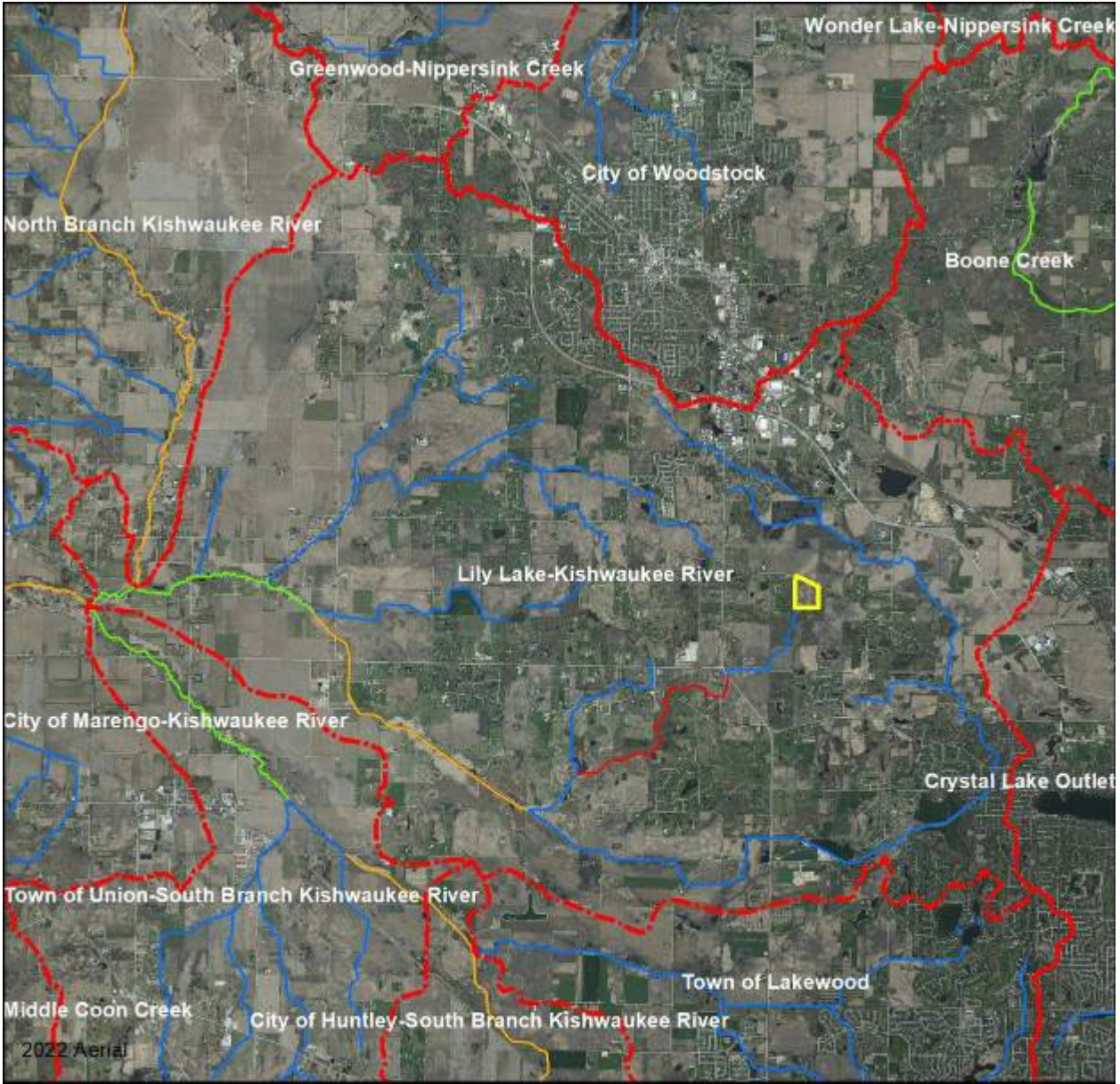
The map indicates the parcel is outside the 100-year floodplain.

WATERSHED PLANS

Watershed and Subwatershed Information




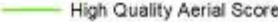
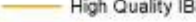

A watershed is the area of land that drains into a specific point including a stream, lake or other body of water. High points on the Earth's surface, such as hills and ridges define watersheds. When rain falls in the watershed, it flows across the ground towards a stream or lake. Rainwater carries any pollutants it comes in contact with such as oils, pesticides, and soil. Everyone lives in a watershed. Their actions can impact natural resources and people living downstream. Residents can minimize this impact by being aware of their environment and implications of their activities, implementing practices recommended in watershed plans and educating others about their watershed.

The parcel is within the Lily Lake Subwatershed (HUC 12 – 070900060205) of the Kishwaukee River Watershed, which encompasses 124,802.04 acres of McHenry County. This watershed has an active planning group, which can help the petitioner to limit negative impacts to the watershed from activities performed on this parcel. The petitioner is encouraged to contact the Kishwaukee River Ecosystem Partnership.



Produced By: McHenry-Lake County Soil & Water Conservation District

Key To Features

| | | |
|---|---|--|
|  Parcel Boundary |  HUC 12 Watersheds | Rivers & Streams |
| | | High Quality Streams |
| | |  Stream |
| | |  High Quality Aerial Score |
| | |  High Quality IBI |
| | |  High Quality T&E Species |

WETLAND INFORMATION

Importance of Wetland Information

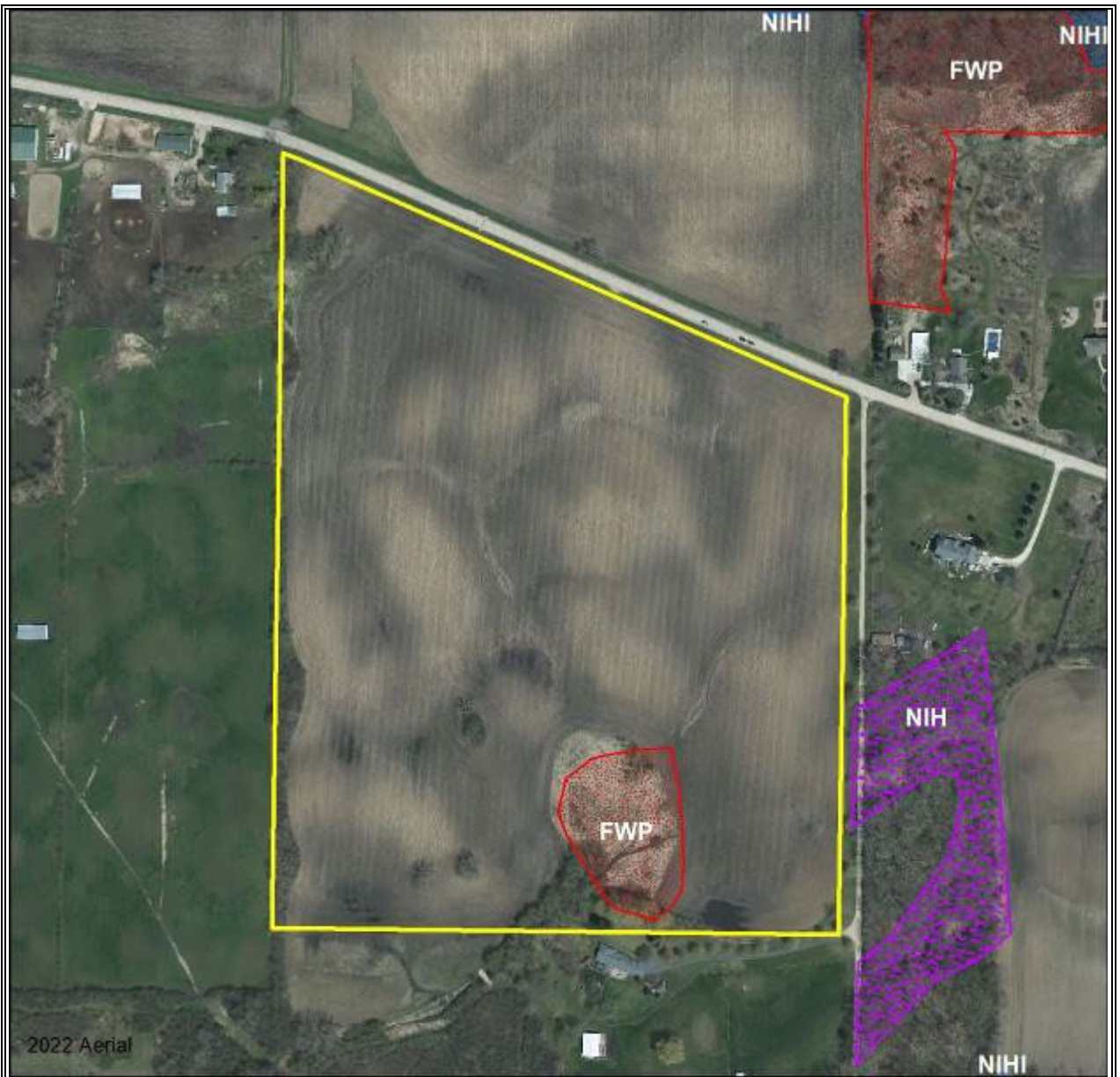
Wetlands function in many ways to provide numerous benefits to society. They control flooding by offering a slow release of excess water downstream or through the soil. They cleanse water by filtering out sediment and some pollutants, and can function as rechargers of our valuable groundwater. They also are essential breeding, rearing, and feeding grounds for many species of wildlife.

These benefits are particularly valuable in urbanizing areas as development activity typically adversely affects water quality, increases the volume of stormwater runoff, and increases the demand for groundwater. In an area where many individual homes rely on shallow groundwater wells for domestic water supplies, activities that threaten potential groundwater recharge areas are contrary to the public good. The conversion of wetlands, with their sediment trapping and nutrient absorbing vegetation, to biologically barren stormwater detention ponds can cause additional degradation of water quality in downstream or adjacent areas.

It has been estimated that over 95% of the wetlands that were historically present in Illinois have been destroyed while only recently has the true environmental significance of wetlands been fully recognized. America is losing 100,000 acres of wetland a year, and has saved 5 million acres total (since 1934). One acre of wetland can filter 7.3 million gallons of water a year. These are reasons why our wetlands are high quality and important.

This section contains the NRCS (Natural Resources Conservation Service) Wetlands Inventory, which is the most comprehensive inventory to date. The NRCS Wetlands Inventory is reproduced from an aerial photo at a scale of 1" equals 660 feet. The NRCS developed these maps in cooperation with U.S. EPA (Environmental Protection Agency,) and the U.S. Fish and Wildlife Service, using the National Food Security Act Manual, 3rd Edition. The main purpose of these maps is to determine wetland areas on agricultural fields and areas that may be wetlands but are in a non-agriculture setting.

The NRCS Wetlands Inventory in no way gives an exact delineation of the wetlands, but merely an outline, or the determination that there is a wetland within the outline. For the final, most accurate wetland **determination** of a specific wetland, a wetland **delineation** must be certified by NRCS staff using the National Food Security Act Manual (on agricultural land.) On urban land, a certified wetland delineator must perform the delineation using the ACOE 1987 Manual. *See the glossary section for the definitions of "delineation" and "determination."*



Produced By: McHenry-Lake County Soil & Water Conservation District

| Key To Features | |
|---|----------------|
| Parcel Boundary | Farmed Wetland |
| Farmed Wetland Pasture | |
| Non-inventoried Hydric Soil | |
| Non-inventoried Soil With Hydric Inclusions | |
| Prior Converted | |
| Wetland | |

Natural Resources Conservation Service: Wetland Inventory Map.

The map identifies 1.86 acres of FWP: Farmed Wetlands Pasture on the parcel.

ADID (ADVANCED IDENTIFICATION OF AQUATIC RESOURCES)

Wetlands are some of the most productive and diverse ecological systems on Earth. The unique characteristics of plants, soils, and water distinguish these systems. Marshes, wet meadows, fens and bogs are some of the common wetland types found within McHenry County. There are also various streams scattered throughout the county, including several that rank among the highest quality in Illinois.

These wetlands, lakes and streams provide needed habitat and food for fish and wildlife. Diverse plants both common and rare can be found in wetlands, and over 40 percent of Illinois' threatened and endangered plant and animal species rely on wetlands.

Wetlands have many other roles. They are critical to the control of flooding by storing vast quantities of runoff water during floods, and releasing it slowly to rivers and streams as the floodwater recedes. This in turn helps to prevent erosion in downstream channels, aids in groundwater recharge, and stabilizes the baseflow in streams and rivers. Wetlands are also crucial in protecting water quality. Wetlands that border lakes and streams prevent erosion by holding soil in place and deflecting erosive flows and waves. They also remove sediment, nutrients, and toxic chemicals from runoff water.

Other benefits include groundwater recharge, discharge of clean water, recreation, enhancement of natural aesthetics and serve as buffers between adjacent developments.

This program designed by the EPA (Environmental Protection Agency), is intended to improve awareness of the functions and values of wetlands and other U.S. waters. It is also intended to inform landowners and developers that high quality sites may not be suitable for the disposal of dredged or fill material. These ADID projects can also provide guidance on the long-term protection and management of aquatic resources.

The wetland boundaries shown are not jurisdictional delineations. Any proposed drainage work in wet areas requires a certified wetland determination.

The ADID study indicates 1.86 acres of Wetland K873 on the parcel. Wetland K873 requires 50 feet of buffer in accordance with the McHenry County Stormwater Ordinance. (Map shown on next page.)



Produced By: McHenry-Lake County Soil & Water Conservation District



| Key To Features | |
|---|-------------------------|
|  | Parcel Boundary |
|  | farmed wetland |
|  | high functional wetland |
|  | high quality lake |
|  | high quality wetland |
|  | lake |
|  | wetland |

Hydric Soils

Soils information gives another indication of flooding potential. The soils map on this page indicates the soil(s) on the parcel that the Natural Resources Conservation Service indicates as hydric. Hydric soils by definition have seasonal high water at or near the soil surface and/or have potential flooding or ponding problems. All hydric soils range from poorly suited to unsuitable for building. One group of the hydric soils, are the organic soils, which formed from dead organic material. Organic soils are unsuitable for building because of not only the high water table, but also their subsidence problems.

It is also important to add the possibility of hydric inclusions in a soil type. An inclusion is a soil polygon that is too small to appear on these maps. While relatively insignificant for agricultural use, hydric soil inclusions become more important to more intense uses such as a residential subdivision.

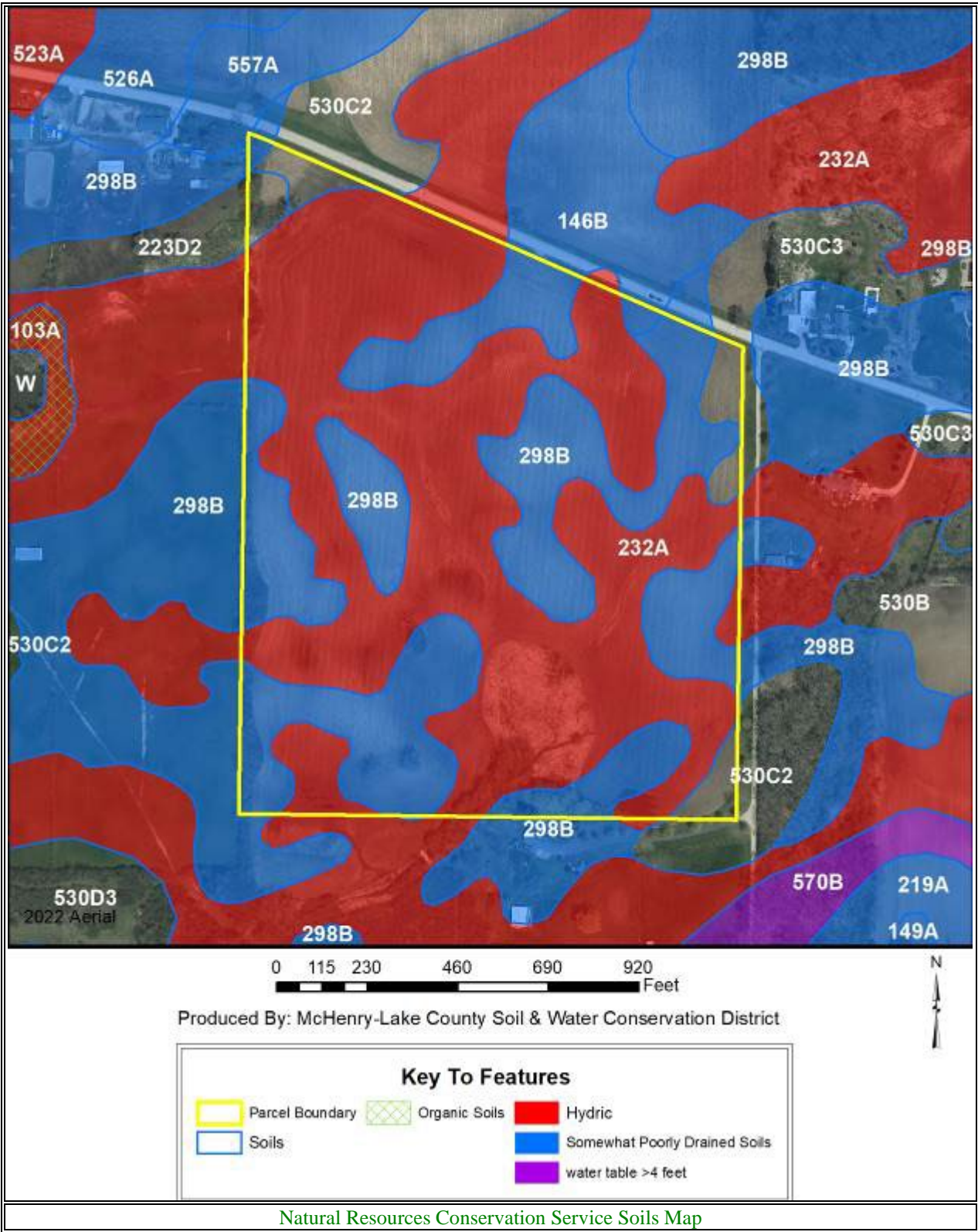
While considering hydric soils and hydric inclusions, it is noteworthy to mention that subsurface agriculture drainage tile occurs in almost all poorly drained and somewhat poorly drained soils. Drainage tile expedites drainage and facilitates farming. It is imperative that these drainage tiles remain undisturbed. A damaged subsurface drainage tile may return original hydrologic conditions to all of the areas that drained through the tile (ranging from less than one acre to many square miles.)

For an intense land use, such as a subdivision, the McHenry County SWCD recommends the following:

1. A topographical survey with 1 foot contour intervals to accurately define the flood area on the parcel.
2. An intensive soil survey to define most accurately the locations of the hydric soils and inclusions
3. A drainage tile survey on the area to locate the tiles that must be preserved.

Hydric, Organic, Somewhat Poorly Drained, and Soils with a Water Table > 4 Ft.

| Symbol | Hydric | Hydric Location | Organic | Somewhat Poorly Drained | Water Table >4 Ft | Acres | Percent |
|---|--------|------------------|---------|-------------------------|-------------------|--------------|---------------|
| 146B | No | | No | Yes | No | 2.12 | 4.98% |
| 223D2 | No | | No | No | No | 0.35 | 0.82% |
| 232A | Yes | flat, till plain | No | No | No | 24.46 | 57.54% |
| 298B | No | | No | Yes | No | 14.01 | 32.95% |
| 530C2 | No | | No | No | No | 0.91 | 2.14% |
| 530C3 | No | | No | No | No | 0.67 | 1.57% |
| Total Hydric Soils | | | | | | 24.46 | 57.54% |
| Total Organic Soils | | | | | | - | 0.00% |
| Total Somewhat Poorly Drained Soils | | | | | | 16.13 | 37.93% |
| Total Soils with a Water Table >4 Ft. | | | | | | - | 0.00% |



WETLAND AND FLOODPLAIN REGULATIONS

PLEASE READ THE FOLLOWING IF YOU ARE PLANNING TO DO ANY WORK NEAR A STREAM (THIS INCLUDES SMALL UNNAMED STREAMS), LAKE, WETLAND OR FLOODWAY.

The laws of the United States and the State of Illinois assign certain agencies specific and different regulatory roles to protect the waters within the State's boundaries. These roles, when considered together, include protection of navigation channels and harbors, protection against flood way encroachments, maintenance and enhancement of water quality, protection of fish and wildlife habitat and recreational resources, and, in general, the protection of total public interest. Unregulated use of the waters within the State of Illinois could permanently destroy or alter the character of these valuable resources and adversely impact the public. Therefore, please contact the proper regulatory authorities when planning any work associated with Illinois waters so that proper consideration and approval can be obtained.

WHO MUST APPLY

Anyone proposing to dredge, fill, rip rap, or otherwise alter the banks or beds of, or construct, operate, or maintain any dock, pier, wharf, sluice, dam, piling, wall, fence, utility, flood plain or flood way subject to County, State or Federal regulatory jurisdiction should apply for agency approvals.

REGULATORY AGENCIES:

- ◆ **Wetlands or U.S. Waters:** U.S. Army Corps of Engineers, Chicago District, 231 S. LaSalle St., Suite 1500 Chicago, IL 60604 Phone: (312) 846-5330
- ◆ **Isolated Wetlands and Floodplain:** McHenry County Department of Planning & Development Stormwater Division, 2200 N. Seminary Ave., Woodstock, IL 60098 Phone: (815) 334-4560
- ◆ **Flood plains:** Illinois Department of Natural Resources \ Office of Water Resources, 201 W. Center Court, Schaumburg, IL 60196-1096, phone (847).705.
- ◆ **Water Quality \ Erosion Control:** Illinois Environmental Protection Agency, Division of Water Pollution Control, Permit Section, Watershed Unit, 2200 Churchill Road, Springfield, IL 62706, phone (217).782.0610.

COORDINATION

We recommend Early coordination with the regulatory agencies BEFORE finalizing work plans. This allows the agencies to recommend measures to mitigate or compensate for adverse impacts. Also, the agency can make possible environmental enhancement provisions early in the project planning stages. This could reduce time required to process necessary approvals.

CAUTION: Contact with the United States Army Corps of Engineers is strongly advised before commencement of any work in or near a water of the United States. This could save considerable time and expense. Persons responsible for willful and direct violation of Section 10 of the River And Harbor Act of 1899 or Section 404 of the Federal Water Pollution Control Act are subject to fines ranging up to \$27,500 per day of violation and imprisonment for up to one year or both.

THREATENED & ENDANGERED SPECIES

The State of Illinois provides habitat for 500 threatened and endangered species, including 356 plants and 144 animals. Twelve counties in Illinois have 50 or more endangered species, 5 of which are in northeastern Illinois. ("Endangered Species of Illinois," by the U.S. Fish & Wildlife Service, IDOC Division of Natural Heritage & Endangered Species Protection Board).

Approximately 40% of the state's listed species depend on wetlands for survival. The two main causes for species decline are the loss of habitat and the degradation of habitat. While habitat loss is the primary reason species become endangered, the effects of habitat change are not always seen overnight. It is seldom simply a case of individual animals or plants being killed. More often, habitat loss and the resulting species declines are indirectly caused and are the result of cumulative impacts over a period of time.

It is because of this slow encroachment of habitat degradation, fragmentation and loss that wildlife habitat must be looked at on a greater scale than just

the site. Cumulative impacts occur because a small amount of damage is being done over here and little over there and no one is looking at the whole picture. Thus, the villages and county are strongly encouraged to look at habitat management on a regional scale.

THERE IS A POSSIBILITY FOR ENDANGERED SPECIES ON THE SITE. IF A REQUEST HAS NOT ALREADY BEEN SUBMITTED, THE PETITIONER SHOULD ASK THE ILLINOIS DEPARTMENT OF NATURAL RESOURCES TO CHECK THIS PARCEL FOR THE PRESENCE OF THREATENED OR ENDANGERED SPECIES. SHOULD ANY SUCH SPECIES BE IDENTIFIED AS UTILIZING THIS PARCEL, THE PETITIONER WILL BE NOTIFIED ACCORDINGLY. FOR MORE INFORMATION ON HOW TO REQUEST AN ENDANGERED SPECIES CHECK ON THIS PARCEL, PLEASE VISIT www.dnrecocat.state.il.us/ecopublic.

GLOSSARY

AGRICULTURAL PROTECTION AREAS (AG AREAS) - Allowed by P.A. 81-1173. An AG AREA consists of a minimum of 350 acres of farmland, as contiguous and compact as possible. Petitioned by landowners, AG AREAS protect for a period of ten years initially, then reviewed every eight years thereafter. AG AREA establishment exempts landowners from local nuisance ordinances directed at farming operations, and designated land can not receive special tax assessments on public improvements that do not benefit the land, e.g. water and sewer lines.

AGRICULTURE - The growing, harvesting and storing of crops including legumes, hay, grain, fruit and truck or vegetable including dairying, poultry, swine, sheep, beef cattle, pony and horse production, fur farms, and fish and wildlife farms; farm buildings used for growing, harvesting and preparing crop products for market, or for use on the farm; roadside stands, farm buildings for storing and protecting farm machinery and equipment from the elements, for housing livestock or poultry and for preparing livestock or poultry products for market; farm dwellings occupied by farm owners, operators, tenants or seasonal or year around hired farm workers.

B.G. - Below Grade. Under the surface of the Earth.

BEDROCK - Indicates depth at which bedrock occurs. Also lists hardness as rippable or hard.

FLOODING - Indicates frequency, duration, and period during year when floods are likely to occur.

HIGH LEVEL MANAGEMENT - The application of effective practices adapted to different crops, soils, and climatic conditions. Such practices include providing for adequate soil drainage, protection from flooding, erosion and runoff control, near optimum tillage, and planting the correct kind and amount of high quality seed. Weeds, diseases, and harmful insects are controlled. Favorable soil reaction and near optimum levels of available nitrogen, phosphorus, and potassium for individual crops are maintained. Efficient use is made of available crop residues, barnyard manure, and/or green manure crops. All operations, when combined efficiently and timely, can create favorable growing conditions and reduce harvesting losses -- within limits imposed by weather.

HIGH WATER TABLE - A seasonal high water table is a zone of saturation at the highest average depth during the wettest part of the year. May be apparent, perched, or artesian kinds of water tables.

Water Table, Apparent - A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water Table, Artesian - A water table under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.

Water Table, Perched - A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

DELINEATION - For Wetlands: A series of orange flags placed on the ground by a certified professional that outlines the wetland boundary on a parcel.

DETERMINATION - A polygon drawn on a map using map information that gives an outline of a wetland.

HYDRIC SOIL - This type of soil is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part (USDA Natural Resources Conservation Service 1987)

INTENSIVE SOIL MAPPING - Mapping done on a smaller more intensive scale than a modern soil survey to determine soil properties of a specific site, e.g. mapping for septic suitability.

LAND EVALUATION AND SITE

ASSESSMENT (L.E.S.A.) - LESA is a systematic approach for evaluating a parcel of land and to determine a numerical value for the parcel for farmland preservation purposes.

MODERN SOIL SURVEY - A soil survey is a field investigation of the soils of a specific area, supported by information from other sources. The kinds of soil in the survey area are identified and their extent shown on a map, and an accompanying report describes, defines, classifies, and interprets the soils. Interpretations predict the behavior of the soils under different used and the soils' response to management. Predictions are made for areas of soil at specific places. Soils information collected in a soil survey is useful in developing land-use plans and alternatives involving soil management systems and in evaluating and predicting the effects of land use.

PALUSTRINE - Name given to inland fresh water wetlands

PERMEABILITY - Values listed estimate the range (in rate and time) it takes for downward movement of water in the major soil layers when saturated, but

allowed to drain freely. The estimates are based on soil texture, soil structure, available data on permeability and infiltration tests, and observation of water movement through soils or other geologic materials.

PIQ - Parcel in question

POTENTIAL FROST ACTION - Damage that may occur to structures and roads due to ice lens formation causing upward and lateral soil movement. Based primarily on soil texture and wetness.

PRIME FARMLAND - Prime farmland soils are lands that are best suited to food, feed, forage, fiber and oilseed crops. It may be cropland, pasture, woodland, or other land, but it is not urban and built up land or water areas. It either is used for food or fiber or is available for those uses. The soil qualities, growing season, and moisture supply are those needed for a well managed soil economically to produce a sustained high yield of crops. Prime farmland produces in highest yields with minimum inputs of energy and economic resources, and farming the land results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 5 percent. (Source USDA Natural Resources Conservation Service)

PRODUCTIVITY INDEXES - Productivity indexes for grain crops express the estimated yields of the major grain crops grown in Illinois as a single percentage of the average yields obtained under basic management from several of the more productive soils in the state. This group of soils is composed of the Muscatine, Ipava, Sable, Lisbon, Drummer, Flanagan, Littleton, Elburn and Joy soils. Each of the 425 soils found in Illinois are found in Circular 1156 from the Illinois Cooperative Extension Service.

SEASONAL - When used in reference to wetlands indicates that the area is flooded only during a portion of the year.

SHRINK-SWELL POTENTIAL - Indicates volume changes to be expected for the specific soil material with changes in moisture content.

SOIL MAPPING UNIT - A map unit is a collection of soil areas of miscellaneous areas delineated in mapping. A map unit is generally an aggregate of the delineations of many different bodies of a kind of soil or miscellaneous area but may consist of only one delineated body. Taxonomic class names and accompanying phase terms are used to name soil map units. They are described in terms of ranges of soil properties within the limits defined for taxa and in terms of ranges of taxadjuncts and inclusions.

SOIL SERIES - A group of soils, formed from a particular type of parent material, having horizons that, except for texture of the A or surface horizon, are similar in all profile characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineralogical and chemical composition.

SUBSIDENCE - Applies mainly to organic soils after drainage. Soil material subsides due to shrinkage and oxidation.

TERRAIN - The area or surface over which a particular rock or group of rocks is prevalent.

TOPSOIL - That portion of the soil profile where higher concentrations of organic material, fertility, bacterial activity and plant growth take place. Depths of topsoil vary between soil types.

WATERSHED - An area of land that drains to an associated water resource such as a wetland, river or lake. Depending on the size and topography, watersheds can contain numerous tributaries, such as streams and ditches, and ponding areas such as detention structures, natural ponds and wetlands.

WETLAND - An area that has a predominance of hydric soils and that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances does support, a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions.

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