Natural Resources Information Report: 1791

Prepared by: The Boone County Soil & Water Conservation District & reviewed by the board on July 9th, 2025

BOONE COUNTY SOIL AND WATER CONSERVATION DISTRICT

NATURAL RESOURCE INFOMATION REPORT

NRI Report Identification Number	1791
Applicant Information	Inkberry Solar, LLC
Location	Township 45N Section 23 Range 3E NE ¼ Section
Property Index Number	PIN: 03-23-200-014, 03-23-200-017
Acreage	Parcel: Approximately 48 acres Approximately 22+ acres planned
Applicant's Request	Special Use for Commercial Solar
Date	06/09/2025

REPORT PREPARED BY: Boone County SWCD

REPORT COMPLETED BY: Heather VanTilburg

POSITION: Resource Conservationist

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PURPOSE AND INTENT

This Natural Resource Information (NRI) report has been prepared by the Boone County SWCD. This report is a requirement under the Illinois Soil and Water Conservation District Act, 94 Act Ill Compiles Statutes, Chapter 70 Paragraph 405/1 Et Seq. and Illinois Revised Statutes, Chapter 5 paragraph 106 Et Seq.

This report presents natural resource information to officials of the local governing body and other decision-makers. Decisions concerning variations, amendments, or relief of local zoning ordinances may reference this report. Also, decisions concerning the future of a proposed subdivision of vacant or agricultural lands, and the subsequent development of these lands because of these decisions, may reference this report.

This report intends to present the most current natural resource information available in an understandable format. It contains a description of the present conditions and resources available and their potential impact on each other. This report when used properly will provide the basis for good land use change decisions and proper development while protecting the natural resource base of the county.

The interpretations of soil suitability for various uses are based on criteria published in the National Soils Handbook of the USDA - Natural Resource Conservation Service or on the appropriate county ordinances. Soil features and characteristics are as described in the Soil Survey of Boone County. The conclusions of this report in no way indicate the impossibility of a certain land use. However, it should alert the reader to possible problems that may occur if the capabilities of the land are ignored.

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.

Additional references are cited throughout the text of this report and are listed in the Reference Section. Most of these references are technical publications specific to one topic area.

Copies of the report were sent to:

- Inkberry Solar, LLC
- Boone County Planning Department
- On file at the Boone County Soil and Water Conservation District

Opinion of the Boone County SWCD Board

Inkberry Solar, LLC has submitted a request for a Natural Resource Information Report as part of an application for a special use for a solar farm. This parcel involves approximately 48 acres, with 22 of those acres planned for solar, located in section 23 of township 45N in range 3E. The parcel identification numbers are 03-23-200-014, 03-23-200-017.

The Boone County Soil & Water Conservation District Board has a

- ☐ Favorable
- ☒ Unfavorable
- ☐ Other: _____

opinion of the proposed land use change. The Board concerns are stated below. More detailed information is presented throughout the various sections of this document.

Signature of Board Chairman:

Bill Hall on 7-9-2025

Board Concerns:

The board has an unfavorable opinion due to the permanent displacement of prime farmland that is necessary for the implementation of this project and concerns about wet soils. Please see additional recommendations in the Boone County SWCD comments section of this report.

The board's opinion is strictly about the quality of farmland on the parcel, and the potential resource loss that could occur if the zoning change is implemented. It is meant to be a part of holistic zoning decisions, not in place of them. The board's policy is to vote unfavorably for parcels with LE scores greater than 69, unless there are significant barriers to farming present.

EXECUTIVE SUMMARY
NRI REPORT #1791

The Boone County Soil and Water Conservation District (SWCD) has completed this Natural Resource Information (NRI) Report #1791 in response to a special use request for a solar farm. The project involves approximately 48 acres, 22 of which is planned for solar use, located at PINs: 03-23-200-014 and 03-23-200-017. The site is located in Poplar Grove Township of Boone Co., State of Illinois.

The surrounding land use is agricultural and residential.

The purpose of the Natural Resources Information Report is to serve as a tool for determining appropriate land uses and the effect of particular land uses on the integrity of the natural resources present on or in the vicinity of the parcel.

According to the USDA Natural Resources Conservation Service Boone County Soil Survey, the site has the following soils:

Soil Type	Name	# of Acres	% of Total Acres	Land Evaluation
21B	Pecatonica silt loam, 2 to 5 percent slopes	3.3	7.0%	82
61A	Atterberry silt loam, 0 to 2 percent slopes	1.1	2.4%	95
152A	Drummer silty clay loam, 0 to 2 percent slopes	15	31.9%	100
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	3.7	7.9%	100
242A	Kendall silt loam, 0 to 2 percent slopes	4.1	8.6%	90
243B	St. Charles silt loam, 2 to 5 percent slopes	1.9	3.9%	85
278A	Stronghurst silt loam, 0 to 2 percent slopes	2.2	4.7%	90
279A	Rozetta silt loam, 0 to 2 percent slopes	1.3	2.7%	85
310B	McHenry silt loam, 2 to 4 percent slopes	4.4	9.3%	82
361C2	Kidder loam, 4 to 6 percent slopes, eroded	4.1	8.8%	69
3776A	Comfrey loam, 0 to 2 percent slopes, frequently flooded	6.0	12.8%	85

Land Evaluation - Land Evaluation encompasses information regarding soils found on the site and their suitability for agricultural purposes. 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 for crop production, 100 the best.

Land Evaluation Score: 88.3

Farmland Classification: Prime agricultural soils are an important resource to Boone County. Some of the most productive soils in the United States occur locally. Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops.

- All areas are prime farmland: 31.7%
- Prime farmland if drained: 68.3%

Hydric Soils: 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.

- Hydric Inclusions: 52.6%

Erosion and 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: Texture, Slope, Structure and Organic Matter Content.

- Slight: 71%
- Moderate: 29%

Shallow Excavation: Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

- Somewhat Limited: 31.7%
- Very Limited: 68.3%

Soil Features:

Depth to Any Soil Restrictive Layer: A restrictive layer is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impedes the movement of water and air through the soil or that restricts roots or otherwise provides an unfavorable root environment.

- >200 cm: 100%

Frost Action: Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity (Ksat), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures. The potential of frost action is expressed as low, moderate, or high.

- Moderate: 25.1%
- High: 74.9%

Risk of Corrosion - Steel: Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity and electrical conductivity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel in installations that are entirely within one kind of soil or within one soil layer. The risk of corrosion is expressed as low, moderate, or high.

- Low: 18.1%
- Moderate: 9.7%
- High: 72.2%

Risk of Corrosion – Concrete: Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens concrete. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the concrete in installations that are entirely within one kind of soil or within one soil layer. . The risk of corrosion is expressed as low, moderate, or high.

- Low: 75.4%
- Moderate: 21.2%

Soil Susceptibility to Compaction: Soils are rated based on their susceptibility to compaction from the operation of ground-based equipment for planting, harvesting, and site preparation activities when soils are moist. Soil compaction is the process in which soil particles are pressed together more closely that in the original state. Typically, the soil must be moist to be compacted because the mineral grains must slide together. Compaction reduces the abundance mostly of large pores in the soil by damaging the structure of the soil. Compaction also increases the soil strength which can limit root penetration and growth. The ability of soil to hold water is adversely affected by compaction since the large pores hold water. The degree of compaction of a soil is measured by its bulk density, which is the mass per unit volume, generally expressed in grams per cubic centimeter.

Interpretation ratings are based on soil properties in the upper 12 inches of the profile. Factors considered are soil texture, soil organic matter content, soil structure, rock fragment content, and the existing bulk density. Definitions of the ratings: Low - The potential for compaction is insignificant. This soil is able to support standard equipment with minimal compaction. Medium - The potential for compaction is significant. High - The potential for compaction is significant.

- Low: 31.9%
- Medium: 52.5%
- High: 16.6%

Local Roads and Streets: Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the number of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use.

- Somewhat Limited: 25.1%
- Very Limited: 74.9%

Solar Arrays, Soil Based Anchor Systems

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 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).

- Somewhat Limited: 25.1%
- Very Limited: 74.9%

Solar Arrays, Ballast Anchor Systems

Ballast anchor systems can be used in some places where soil-penetrating systems cannot, such as in shallow or stony soil. Also, since they do not penetrate the soil, ballast systems can be used where the soil is contaminated, and disturbance is to be avoided. The soil in the area must have sufficient strength to be able to support the vehicles that haul the ballast and the machinery to install it.

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 (1.0) and the point at which the soil feature is very much like known good sites (0).

- Somewhat Limited: 25.1%
- Very Limited: 74.9%

Water Features:

Hydrologic Soil Group: Based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms. The soils are assigned to four groups (A, B, C and D). Group A soils have high infiltration rates. Group B soils have a moderate infiltration rate when thoroughly wet. Group C soils have a slow infiltration rate when thoroughly wet. Group D soils have a very slow infiltration rate (high runoff potential) when thoroughly wet. If a soil is assigned to a dual hydrologic group (A/D B/D or C/D) the first letter is for drained areas and the second is for undrained areas.

- B: 31.7%
- B/D: 68.3%

Depth to Water Table- a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

- >200 cm: 29%
- 15 cm: 52.6%
- 38 cm: 15.7%
- 153 cm: 2.7%

Ponding- Ponding is standing water in a closed depression. The water is removed only by deep percolation, transpiration, or evaporation or by a combination of these processes. Ponding frequency classes are based on the number of times that ponding occurs over a given period. Frequency is expressed as none, rare, occasional, and frequent.

- None: 47.4%
- Occasional: 7.9%
- Frequent: 44.7%

Flooding- the temporary inundation of an area caused by overflowing streams or by runoff from adjacent slopes

- None: 87.2%
- Frequent: 12.8%

Drainage Class: The frequency and duration of wet periods under conditions similar to those under which the soil formed. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained.

- Well Drained: 31.7%
- Somewhat Poorly Drained: 15.7%
- Poorly Drained: 52.6%

Watershed Impacts: The PIQ is located in the Beaver Creek-Kishwaukee River Watershed. The PIQ is in the upper end of each watershed, and do not have any off-site contributary flow going through the area. Increased stormwater runoff from the site, and soil that erodes from the site, can degrade the water quality of the watershed and the downstream environment.

Biological Resources: The IL Department of Natural Resources Natural Resources Awareness Tool for applicators and other GIS maps in the office indicate twenty sensitive resources in the vicinity of the project. For a more detailed investigation, an EcoCAT Informational Request or Local Government Consultation Request report should be done.

Floodplain Review: FEMA's National Flood Hazard Layer shows there are no floodplains within the boundary of the proposed project area.

National Wetlands Inventory: According to the US Fish and Wildlife Service National Wetlands Inventory, there are mapped wetlands near the proposed project area.

Cultural Resource Review: There does not appear to have been a structure on the PIN number based on the Plats of 1886 and 1905.

Geologic Information: This site has the Galena Group bedrock formation, which is predicted to be 100 feet below the land surface.

Boone County SWCD Comments
NRI REPORT #1791

Adjacent Idle Areas

The installation of the solar panel farm will result in adjacent cropland areas being infeasible to farm. This includes buffer and setback area, as well as other areas outside the proposed chain link fence. Consider planting these areas to natives. Native species are preferred because of their abilities to enhance soil permeability and pollutant filtering, and their reduced needs for fertilizer, herbicides, irrigation, and mowing. They can also provide important habitat for pollinators and other wildlife habitat.

Agricultural Impact Mitigation Agreement

The Bureau of Land and Water Resources (BLWR) works with the various utility companies on projects (i.e., wind farms, pipelines and electric transmission lines) that impact agricultural land. Under this effort, the BLWR negotiates an Agricultural Impact Mitigation Agreement (AIMA) with utility companies to ensure that the land affected by those projects is restored to its pre-construction capabilities.

These documents help landowners to mitigate the many agricultural impacts that result from the construction of large cross-country oil/natural gas pipelines, electric transmission lines, solar facilities and wind farm projects. A copy of the executed AIMA is also provided to landowners to assist them in their negotiations with utility companies on their individual easement agreements. Wind Farm AIMAs are developed under the Wind Energy Facilities Agricultural Impact Mitigation Act.

AIMAs focus on the restoration aspect of impacts that result from major utility projects being constructed across a landowner's productive farmland. AIMAs are negotiated with the various utility companies prior to any construction in order to protect landowner's interests and address problems that result from the project's construction and/or subsequent restoration.

AIMAS can be located on the Illinois Department of Agriculture's website at https://www2.illinois.gov/sites/agr/Resources/AIMA/Pages/default.aspx.

Erosion Concerns

The proposed land use of this site is a solar farm. It is currently cropland. Soil disturbance will occur as a result of developing the site, which is moderately sloping and susceptible to erosion. The area of disturbance will be greater than one acre, so an IEPA NPDES permit will be required; as well as any City/County Permit requirements.

Soil disturbance can create soil erosion which must be properly managed to prevent adverse environmental impacts. Erosion from construction sites is a leading cause of water quality problems in Illinois. Problems caused by this sediment include:

- Increased flooding – Sediment build-up lowers the flow capacity of channels causing more frequent flooding in areas that rarely or never flooded before
- Financial burden to taxpayers - Sediment that finds its way into streets, storm sewers, and ditches result in additional maintenance costs for local, state and federal governments

- Water quality impairment - Sediment laden runoff transfers nutrients and other pollutants to downstream lakes and rivers degrading aquatic habitats and increasing costs for water treatment.

Simple but effective controls include preserving existing trees and grass where possible, using silt fence to trap sediment on the down slope sides of the area of disturbance, using a gravel drive used by all vehicles to limit tracking of mud onto streets, cleaning up sediment carried off-site by vehicles or storms, installing curb inlet controls, using downspout extenders to prevent roof runoff from eroding exposed soil, locating soil piles away from any roads or waterways, and reseeding or sodding the site as soon as possible. The materials (silt fence, stakes, gravel entrance, inlet controls, and grass seed) are easy to find and relatively inexpensive.

The Illinois Urban Manual is a resource of practices used throughout the State and can be accessed at http://www.aiswcd.org/ium/. The concept of these practices can be carried over to good housekeeping measures after development occurs and buildings are occupied to prevent stormwater runoff from becoming contaminated.

Native Plantings

Native plants like grasses and flowers provide critical habitat for many key species like the Rusty Patch Bumble Bee and Monarch Butterflies. These deep-rooted native species are preferred because of their abilities to enhance soil permeability and pollutant filtering and their reduced needs for fertilizer, herbicides, irrigation, and mowing. Unfortunately, loss and degradation due to the development of the land and an invasion of exotic species is a serious problem in Illinois.

Solar farms provide a unique opportunity for pollinator habitat establishment and native vegetation plantings. After the panels are installed, the land will be relatively untouched by cropping or other human development for the life of the panels, which could be 15+ years. Because these plants are native, they are also low maintenance and would not require the same amount of upkeep compared to a non-native species. It would also provide a better cover than gravel or rock because of its ability to filter pollutions form storm water and prevent contamination of groundwater. Specialized seed mixes with short grasses and flowers (less than 2 feet in height) should be used to prevent shading of the panels.

Soil Compaction

Soil compaction occurs when soil particles are pressed together, reducing the pore space between them. This increases the weight of solids per unit volume of soil (bulk density). Soil compaction occurs in response to pressure (weight per unit area) exerted by field machinery or animals. Other factors affecting compaction include the composition (texture, organic matter, plus clay content and type), soil water content and the number of passes by equipment. The risk for compaction is greatest when soils are wet. A dry soil is much more resistant to compaction than a moist or wet soil.

Compaction restricts rooting depth, which reduces the uptake of water and nutrients by plants. It decreases pore size, increases the proportion of water-filled pore space at field moisture, and decreases soil temperature. This affects the activity of soil organisms by decreasing the rate of decomposition of soil organic matter and subsequent release of

nutrients. Compaction decreases infiltration and thus increases runoff and the hazard of water erosion.

Sandy loam, loam, and sandy clay loam soils compact more easily than silt, silt loam, silty clay loam, silty clay, or clay soils. Compaction may extend to 20 inches. Deep compaction affects smaller areas than shallow compaction, but it persists because shrinking and swelling and freezing and thawing affect it less.

The persistence of soil compaction is determined by the depth at which it occurs, the shrink- swell potential of the soil, and the climate. As the depth increases, the more persistent the condition. The type and percentage of clay determine the shrink-swell potential. The greater the shrink-swell potential and number of wet/dry cycles, the lower is the duration of compaction at a particular depth. Freeze/thaw cycles also help decrease near surface compaction.

Soil organic matter promotes aggregation of soil particles. This increases porosity and reduces bulk density (i.e., compaction). It also increases permeability and may increase plant available water. Addition of manure, compost, or other organic materials including newspaper, and woodchips, can improve soil structure, helping to resist compaction. Compaction can be reduced by reducing the number of trips across an area, working with or on the soils when dry, reducing pressure of equipment, and maintaining organic matter in the soil.

Stormwater Runoff

Developments have both direct and indirect impacts on water bodies and other valuable natural features. These impacts occur both during construction and after the development is complete. Some impacts result from the direct modification or destruction of streams, lakes, and wetlands. Other impacts occur primarily offsite due to changes in the quality and quantity of runoff from the development.

Stormwater runoff is generated from impervious surfaces, particularly roadways and parking lots. Most modern developments route runoff from impervious surfaces directly into storm sewers or paved channels which effectively convey the pollutants, without any opportunity for infiltration or filtering, into receiving water bodies. These pollutants include dirt, pesticides, fertilizers, road salt, oil, detergents and gasoline that can harm fish and wildlife populations, kill native vegetation, foul drinking water supplies, and make recreational areas unsafe and unpleasant.

Stormwater retention/detention should be required as part of the development of the is parcel. Consider incorporating water quality BMP's in the landscape and design. These practices can also be accessed in the Illinois Urban Manual.

Tile Investigation

Subsurface drainage is used to remove excess water in poorly drained soils or areas impacted by heavy rain or storm events, such as a grassed waterway. These systems are very common in northern Illinois agricultural fields. When a subsurface drainage system is working correctly, these tiles can improve infiltration rates, reduce surface runoff, and increase water storage capacity of the soil in the fields. In cases where the tile fails upland drainage patterns can be compromised, field will hold standing water for days after a storm

event, and large holes where soil has washed into the tile line can appear. All of these problems make it hard for equipment to access the area. Prompt repair of any drain tile failure will keep the system in good working order and prevent permanent damage to it.

A tile inspection is recommended for this site in order to identify if and where there are tile lines, so they can be accurately located and maintained throughout the life of the solar facility to minimize potential future damages.

Wetlands

According to the U.S. Fish and Wildlife National Wetlands Inventory, there are wetlands near the site. A wetland is an area with wet soils (hydric soil type), that will support a dominance of water tolerant plants known as hydrophytic plants. Wetlands usually are wooded or uncropped areas with cattails, willows and other plants that grow well in wet soils or water. A wetland may also be an uncropped wet spot in a cropped field, an area abandoned for five or more years, or an area ponded long enough during the growing season (April 14 – October 23) to develop anaerobic conditions in the upper soil profile. Ponded conditions need to exist for one week during the growing season and saturation conditions need to exist for at least two weeks during the growing season. Small rivers, creek, ditches or drainage ways that are wetlands and were too small to be mapped out due to scale are still wetlands.

Soils with a high seasonal water table or floods frequently are generally considered hydric soils. Other small areas with a similar degree of wetness may also be considered hydric. These small areas are found in other soil types and are usually called “hydric inclusions”.

Wetlands are important because they catch sediment, nutrients, and pesticides that are carried by runoff water. Wetlands filter the water and the vegetation uses the nutrients and removes many of the pesticides from runoff. This improves water quality and is especially important in areas where groundwater supplies are recharged by wetlands. Flood protection in another benefit of wetlands, when water is stored in the wetland it can reduce downstream flooding. Migrating waterfowl use wetland for food, cover & nesting habitat, along with other game and non-game wildlife.

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.

Any proposed project or other activity should be designed to avoid and minimize any disturbance to the wetland, stream, or other aquatic area, as much as is practicable before applying for a permit from the Corps. Avoidance and minimization of impacts to wetlands or other aquatic areas can include locating any activity away from the wetland area, establishing buffer zones and protecting the quality of the water that may be discharged into wetlands.

****Any acreage discrepancies are due to the acres included with Right of Ways****

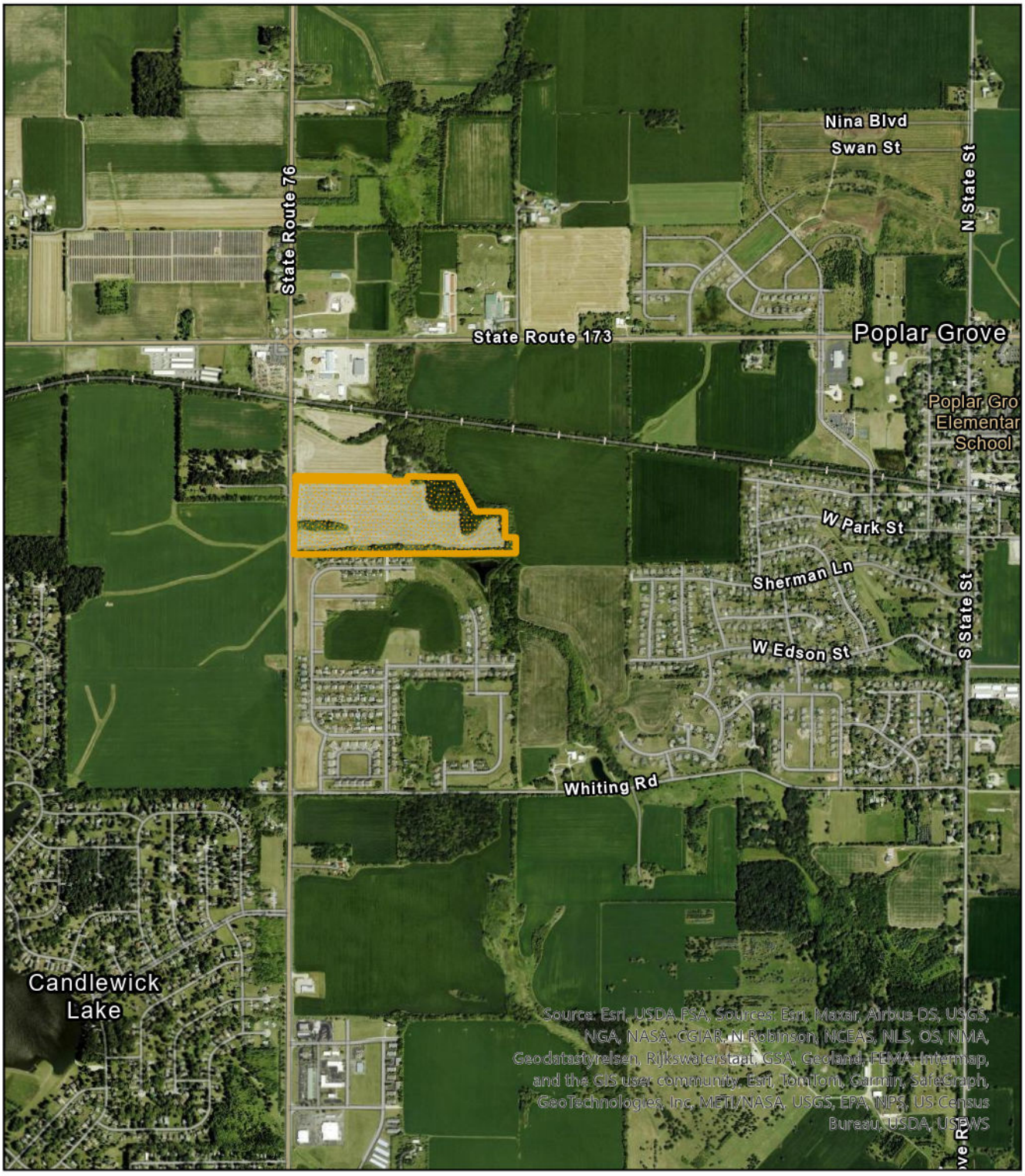
Thank you for taking the SWCD’s comments into consideration. If you have any questions about this report or its findings, please contact the Boone County Soil and Water Conservation District at (815) 544-3465 ext. 3

Sincerely,

Heather VanTilburg

Heather VanTilburg
Resource Conservationist

Report 1791 Location



Date: 06/09/2025	**Site Location:** **03-23-200-014, 03-23-200-017**
Photo By: VanTilburg	
County: Boone	
Comments: Facing east, entrance to proposed drive. An existing drive runs along the northern edge of the property line.	
Photo #: 01	

Date: 06/09/2025	**Site Location:** **03-23-200-014, 03-23-200-017**
Photo By: VanTilburg	
County: Boone	
Comments: Facing South near entrance. Proposed start of solar field near drive entrance.	
Photo #: 02	

Date: 06/09/2025	**Site Location: 03-23-200-014, 03-23-200-017**
Photo By: VanTilburg	
County: Boone	
Comments: Wide view of proposed solar field facing southeast.	
Photo #: 03	

Date: 06/09/2025	**Site Location: 03-23-200-014, 03-23-200-017**
Photo By: VanTilburg	
County: Boone	
Comments: Facing southeast—about halfway down the proposed drive. Beginning to see varying slopes to the northeast.	
Photo #: 04	

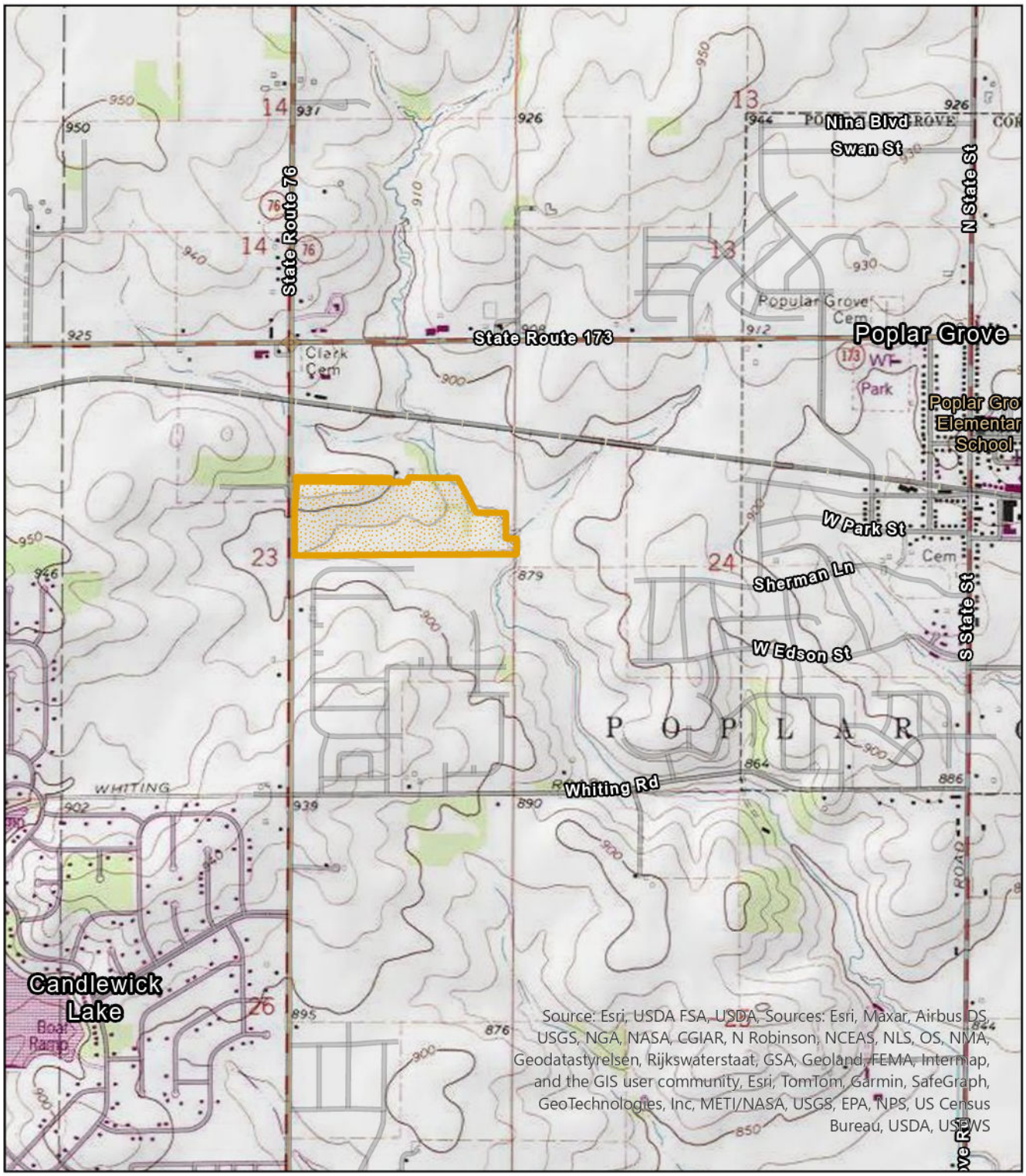
Date: 06/09/2025	**Site Location:** **03-23-200-014, 03-23-200-017**
Photo By: VanTilburg	
County: Boone	
Comments: Facing West	
Photo #: 05	

Date: 06/09/2025	**Site Location:** **03-23-200-014, 03-23-200-017**
Photo By: VanTilburg	
County: Boone	
Comments: Far northeast corner of site—facing southeast	
Photo #: 06	

Date: 06/09/2025	**Site Location:** **03-23-200-014, 03-23-200-017**
Photo By: VanTilburg	
County: Boone	
Comments: Northeast corner—facing northwest	
Photo #: 07	

Date: 06/09/2025	**Site Location:** **03-23-200-014, 03-23-200-017**
Photo By: VanTilburg	
County: Boone	
Comments: East side of site—facing southwest	
Photo #: 08	

Report 1791 Topographic

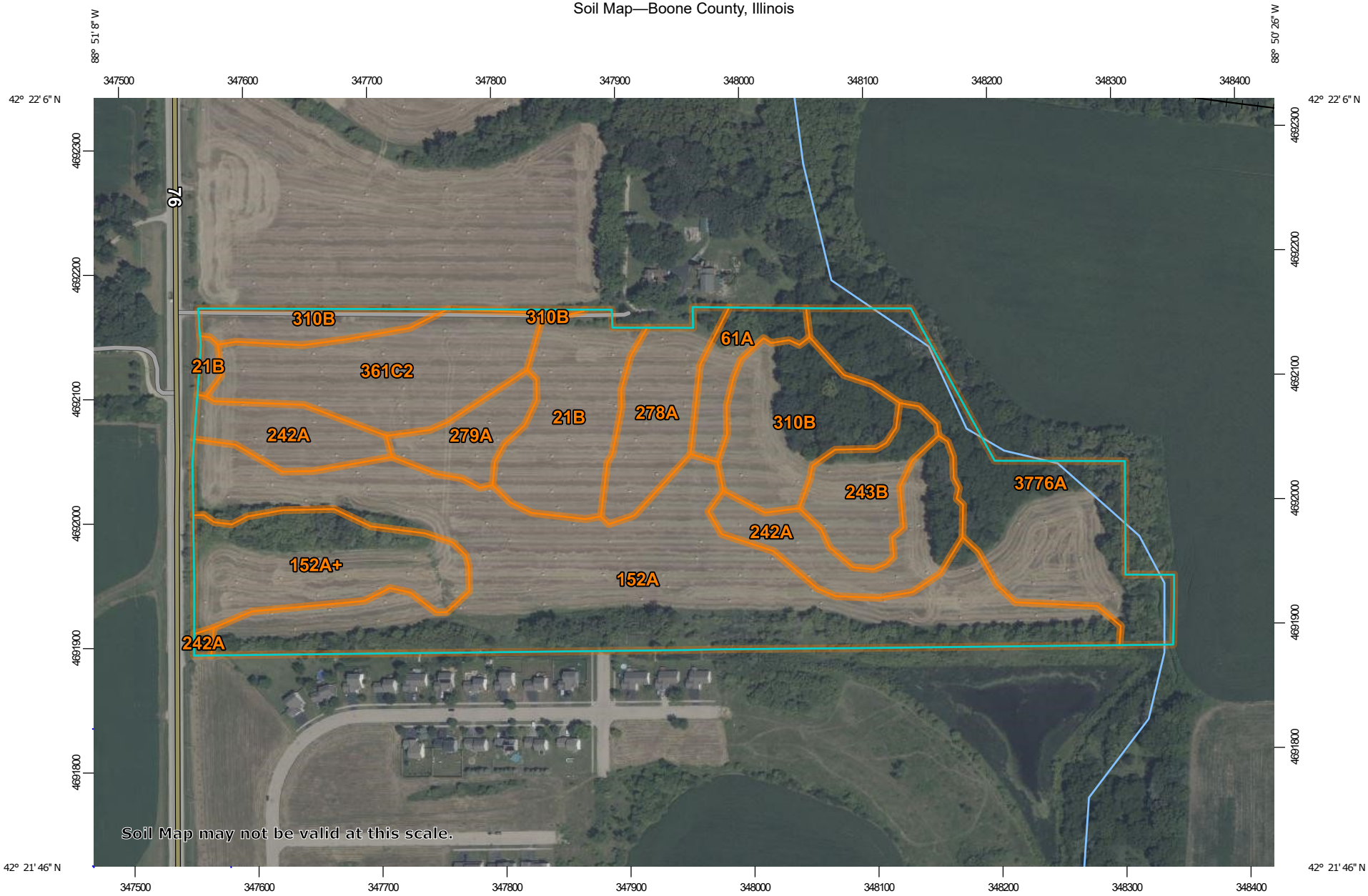


0 50 100 200 Miles

NRI 1791 Parcels

N

Soil Map—Boone County, Illinois



Map Scale: 1:4,350 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Boone County, Illinois
Survey Area Data: Version 18, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2023—Aug 16, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
21B	Pecatonica silt loam, 2 to 5 percent slopes	3.3	7.0%
61A	Atterberry silt loam, 0 to 2 percent slopes	1.1	2.4%
152A	Drummer silty clay loam, 0 to 2 percent slopes	15.0	31.9%
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	3.7	7.9%
242A	Kendall silt loam, 0 to 2 percent slopes	4.1	8.6%
243B	St. Charles silt loam, 2 to 5 percent slopes	1.9	3.9%
278A	Stronghurst silt loam, 0 to 2 percent slopes	2.2	4.7%
279A	Rozetta silt loam, 0 to 2 percent slopes	1.3	2.7%
310B	McHenry silt loam, 2 to 4 percent slopes	4.4	9.3%
361C2	Kidder loam, 4 to 6 percent slopes, eroded	4.1	8.8%
3776A	Comfrey loam, 0 to 2 percent slopes, frequently flooded	6.0	12.8%
Totals for Area of Interest		**47.2**	**100.0%**

Map Unit Description (Brief, Generated)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, provide information on the composition of map units and properties of their components.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

The Map Unit Description (Brief, Generated) report displays a generated description of the major soils that occur in a map unit. Descriptions of non-soil (miscellaneous areas) and minor map unit components are not included. This description is generated from the underlying soil attribute data.

Additional information about the map units described in this report is available in other Soil Data Mart reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the Soil Data Mart reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description (Brief, Generated)

Boone County, Illinois

Map Unit: 21B—Pecatonica silt loam, 2 to 5 percent slopes

Component: Pecatonica (90%)

The Pecatonica component makes up 90 percent of the map unit. Slopes are 2 to 5 percent. This component is on ground moraines. The parent material consists of thin layer of loess over paleosol formed in loamy till. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the F095XB010WI Loamy and Clayey Upland ecological site. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

Map Unit: 61A—Atterberry silt loam, 0 to 2 percent slopes

Component: Atterberry (98%)

The Atterberry component makes up 98 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats. The parent material consists of loess. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 15 inches during January, February, March, April, May. Organic matter content in the surface horizon is about 3 percent. This component is in the R115XC004IL Loess Upland Savanna ecological site. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria.

Component: Denny (1%)

Generated brief soil descriptions are created for major soil components. The Denny soil is a minor component.

Component: Sable (1%)

Generated brief soil descriptions are created for major soil components. The Sable soil is a minor component.

Component: Fayette (%)

Generated brief soil descriptions are created for major soil components. The Fayette soil is a minor component.

Component: Rozetta (%)

Generated brief soil descriptions are created for major soil components. The Rozetta soil is a minor component.

Map Unit: 152A—Drummer silty clay loam, 0 to 2 percent slopes

Component: Drummer, drained (94%)

The Drummer, drained component makes up 94 percent of the map unit. Slopes are 0 to 2 percent. This component is on outwash plains on plains. The parent material consists of loess over stratified loamy outwash. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 6 inches during January, February, March, April, May. Organic matter content in the surface horizon is about 6 percent. This component is in the R111XD020IN Ponded Depressional Sedge Meadow, Wet Outwash Mollisol, Wet Outwash Prairie ecological site. Nonirrigated land capability classification is 2w. This soil meets hydric criteria.

Component: Peotone, drained (3%)

Generated brief soil descriptions are created for major soil components. The Peotone, drained soil is a minor component.

Component: Harpster, drained (3%)

Generated brief soil descriptions are created for major soil components. The Harpster, drained soil is a minor component.

Map Unit: 152A+—Drummer silt loam, 0 to 2 percent slopes, overwash

Component: Drummer, overwash (92%)

The Drummer, overwash component makes up 92 percent of the map unit. Slopes are 0 to 2 percent. This component is on outwash plains, ground moraines. The parent material consists of loess over outwash. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is moderate. This soil is not flooded. It is occasionally ponded. A seasonal zone of water saturation is at 6 inches during January, February, March, April, May. Organic matter content in the surface horizon is about 3 percent. This component is in the R108XA013IL Wet Outwash Prairie ecological site. Nonirrigated land capability classification is 2w. This soil meets hydric criteria.

Map Unit: 242A—Kendall silt loam, 0 to 2 percent slopes

Component: Kendall (92%)

The Kendall component makes up 92 percent of the map unit. Slopes are 0 to 2 percent. This component is on outwash plains. The parent material consists of loess over outwash. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 15 inches during January, February, March, April, May. Organic matter content in the surface horizon is about 2 percent. This component is in the F108XA015IL Outwash Forest ecological site. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria.

Component: Brooklyn (2%)

Generated brief soil descriptions are created for major soil components. The Brooklyn soil is a minor component.

Component: Sable (2%)

Generated brief soil descriptions are created for major soil components. The Sable soil is a minor component.

Component: Vesser (2%)

Generated brief soil descriptions are created for major soil components. The Vesser soil is a minor component.

Component: Drummer (2%)

Generated brief soil descriptions are created for major soil components. The Drummer soil is a minor component.

Map Unit: 243B—St. Charles silt loam, 2 to 5 percent slopes

Component: St. Charles (95%)

The St. Charles component makes up 95 percent of the map unit. Slopes are 2 to 5 percent. This component is on outwash plains on uplands. The parent material consists of loess over stratified loamy outwash. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the F108XA015IL Outwash Forest ecological site. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Drummer (5%)

Generated brief soil descriptions are created for major soil components. The Drummer soil is a minor component.

Map Unit: 278A—Stronghurst silt loam, 0 to 2 percent slopes

Component: Stronghurst (97%)

The Stronghurst component makes up 97 percent of the map unit. Slopes are 0 to 2 percent. This component is on ground moraines. The parent material consists of loess. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 15 inches during January, February, March, April, May. Organic matter content in the surface horizon is about 2 percent. This component is in the F095XB005WI Moist Loamy or Clayey Lowland ecological site. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria.

Component: Sable (3%)

Generated brief soil descriptions are created for major soil components. The Sable soil is a minor component.

Map Unit: 279A—Rozetta silt loam, 0 to 2 percent slopes

Component: Rozetta (95%)

The Rozetta component makes up 95 percent of the map unit. Slopes are 0 to 2 percent. This component is on ground moraines, till plains. The parent material consists of loess. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 60 inches during February, March, April. Organic matter content in the surface horizon is about 2 percent. This component is in the F095XB010WI Loamy and Clayey Upland ecological site. Nonirrigated land capability classification is 1. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Atterberry (2%)

Generated brief soil descriptions are created for major soil components. The Atterberry soil is a minor component.

Component: Denny (1%)

Generated brief soil descriptions are created for major soil components. The Denny soil is a minor component.

Component: Keomah (1%)

Generated brief soil descriptions are created for major soil components. The Keomah soil is a minor component.

Component: Stronghurst (1%)

Generated brief soil descriptions are created for major soil components. The Stronghurst soil is a minor component.

Map Unit: 310B—McHenry silt loam, 2 to 4 percent slopes

Component: McHenry (90%)

The McHenry component makes up 90 percent of the map unit. Slopes are 2 to 4 percent. This component is on moraines on hills. The parent material consists of loess over loamy till. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the F095XB010WI Loamy and Clayey Upland ecological site. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 20 percent. There are no saline horizons within 30 inches of the soil surface.

Component: Kidder (5%)

Generated brief soil descriptions are created for major soil components. The Kidder soil is a minor component.

Component: Kendall (5%)

Generated brief soil descriptions are created for major soil components. The Kendall soil is a minor component.

Map Unit: 361C2—Kidder loam, 4 to 6 percent slopes, eroded

Component: Kidder, eroded (95%)

The Kidder, eroded component makes up 95 percent of the map unit. Slopes are 4 to 6 percent. This component is on moraines on hills. The parent material consists of loamy till. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the F095XB010WI Loamy and Clayey Upland ecological site. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 15 percent. There are no saline horizons within 30 inches of the soil surface.

Component: Fox (3%)

Generated brief soil descriptions are created for major soil components. The Fox soil is a minor component.

Component: Virgil (2%)

Generated brief soil descriptions are created for major soil components. The Virgil soil is a minor component.

Map Unit: 3776A—Comfrey loam, 0 to 2 percent slopes, frequently flooded

Component: Comfrey (90%)

The Comfrey component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains. The parent material consists of alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is frequently flooded. It is frequently ponded. A seasonal zone of water saturation is at 6 inches during January, February, March, April, May. Organic matter content in the surface horizon is about 6 percent. This component is in the R110XY029IL Ponded Floodplain Marsh, Wet Floodplain Sedge Meadow ecological site. Nonirrigated land capability classification is 3w. This soil meets hydric criteria.

Component: Millington (6%)

Generated brief soil descriptions are created for major soil components. The Millington soil is a minor component.

Component: Houghton (4%)

Generated brief soil descriptions are created for major soil components. The Houghton soil is a minor component.

Data Source Information

Soil Survey Area: Boone County, Illinois
Survey Area Data: Version 18, Aug 21, 2024

LAND EVALUATION

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:

(1) Land Evaluation (LE), soils value and (2) Site Assessment (SA), land use.

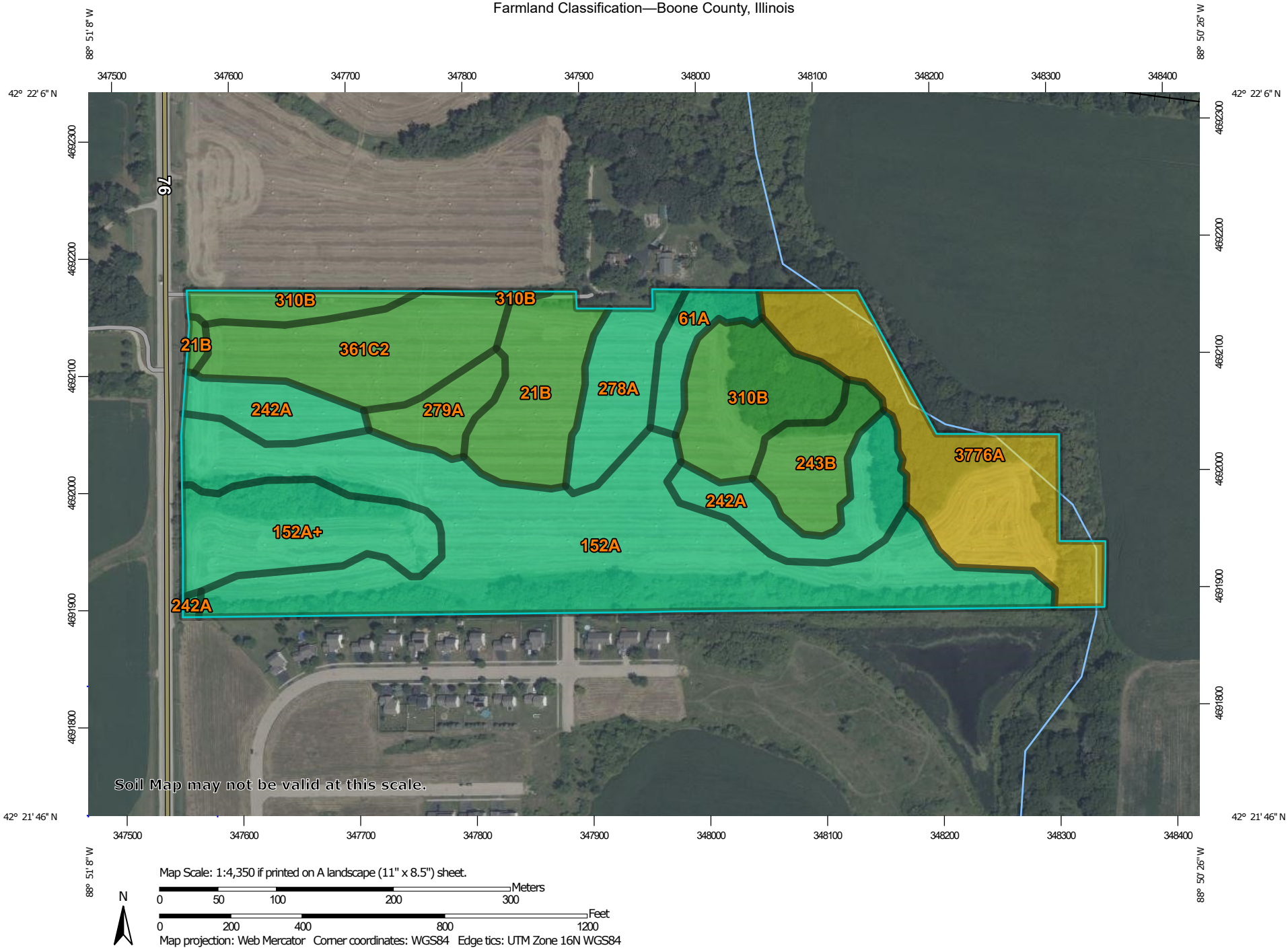
Land Evaluation encompasses information regarding soils found on the site and their suitability for agricultural purposes. Boone County soils consist of 78 different soil series ranging from excessively drained gravely sands to poorly drained muck soils and from highly productive agricultural soils to 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 for crop production, 100 the best. The Boone County SWCD provides a weighted average of the soils to determine the Land Evaluation, while the Boone County Planning Department provides the Site Assessment portion.

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

Soil Type	Prime Farmland	Productivity Index	# of Acres	% of Total Acres	Land Evaluation
21B	PRIME	112	3.3	7.0%	82
61A	PRIME	132	1.1	2.4%	95
152A	PRIME	144	15	31.9%	100
152A+	PRIME	144	3.7	7.9%	100
242A	PRIME	125	4.1	8.6%	90
243B	PRIME	121	1.9	3.9%	85
278A	PRIME	125	2.2	4.7%	90
279A	PRIME	120	1.3	2.7%	85
310B	IMPORTANT	114	4.4	9.3%	82
361C2	PRIME	95	4.1	8.8%	69
3776A	PRIME	124	6	12.8%	85

LAND EVALUATION SCORE: 88.3

Farmland Classification—Boone County, Illinois



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N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

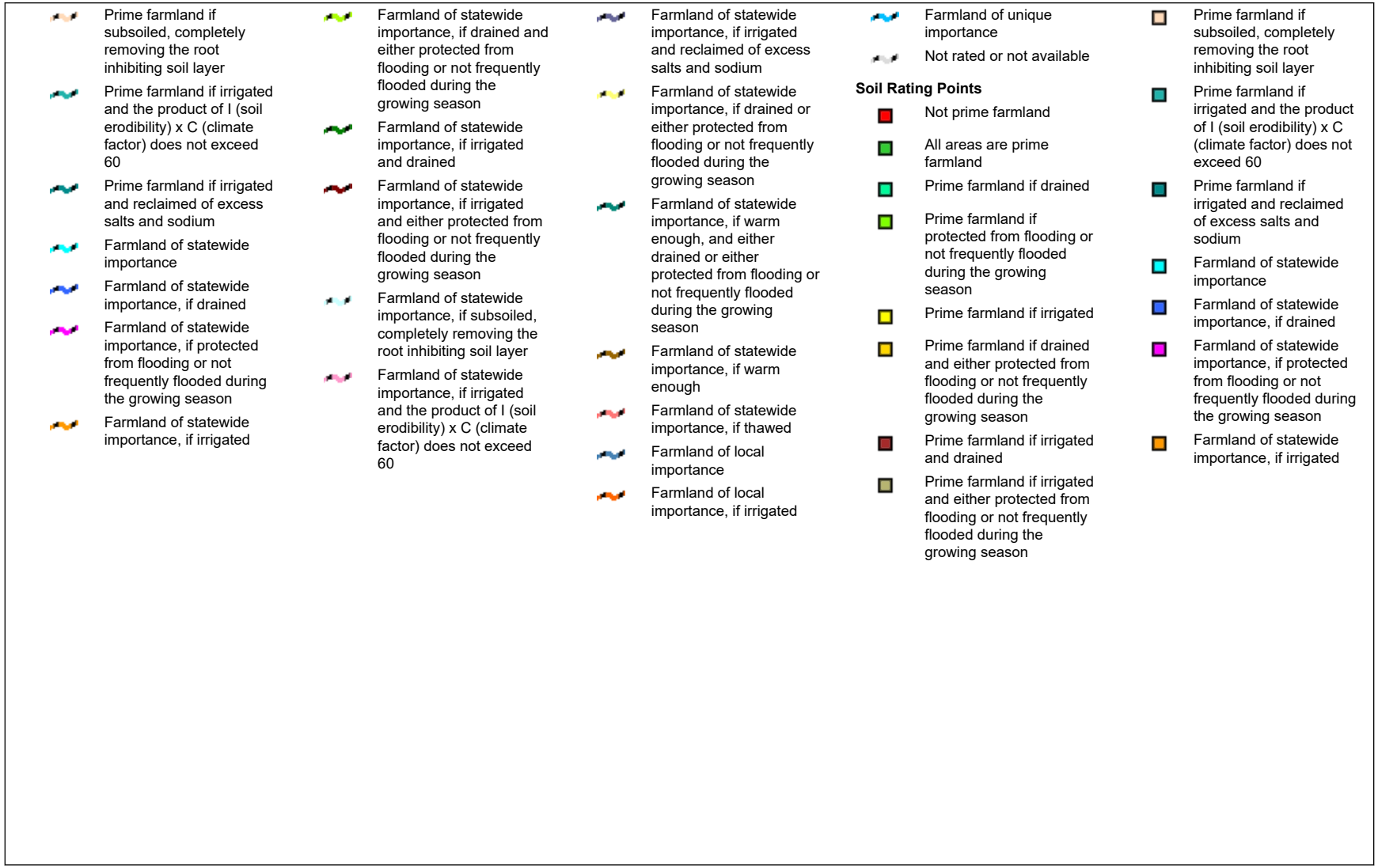
Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated
- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season


Prime farmland if subsoiled, completely removing the root inhibiting soil layer
Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Prime farmland if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance
Farmland of statewide importance, if drained
Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated
Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
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Farmland of local importance
Farmland of local importance, if irrigated
Farmland of unique importance
Not rated or not available
Soil Rating Points
Not prime farmland
All areas are prime farmland
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Prime farmland if protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated
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Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
Prime farmland if subsoiled, completely removing the root inhibiting soil layer
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Prime farmland if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance
Farmland of statewide importance, if drained
Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated

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- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:12,000.

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Web Soil Survey URL:
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Survey Area Data: Version 18, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2023—Aug 16, 2023

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Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
21B	Pecatonica silt loam, 2 to 5 percent slopes	All areas are prime farmland	3.3	7.0%
61A	Atterberry silt loam, 0 to 2 percent slopes	Prime farmland if drained	1.1	2.4%
152A	Drummer silty clay loam, 0 to 2 percent slopes	Prime farmland if drained	15.0	31.9%
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	Prime farmland if drained	3.7	7.9%
242A	Kendall silt loam, 0 to 2 percent slopes	Prime farmland if drained	4.1	8.6%
243B	St. Charles silt loam, 2 to 5 percent slopes	All areas are prime farmland	1.9	3.9%
278A	Stronghurst silt loam, 0 to 2 percent slopes	Prime farmland if drained	2.2	4.7%
279A	Rozetta silt loam, 0 to 2 percent slopes	All areas are prime farmland	1.3	2.7%
310B	McHenry silt loam, 2 to 4 percent slopes	All areas are prime farmland	4.4	9.3%
361C2	Kidder loam, 4 to 6 percent slopes, eroded	All areas are prime farmland	4.1	8.8%
3776A	Comfrey loam, 0 to 2 percent slopes, frequently flooded	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	6.0	12.8%
Totals for Area of Interest			**47.2**	**100.0%**

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

SOIL CONDITIONS AND DEGREE OF LIMITATIONS FOR PROPOSED USES

The proposed land use of this site is for a solar farm. The PIQ is currently farmed land. The maps included in this inventory are as follows:

- Local Roads and Streets
- Erosion and Sediment Hazards
- Shallow Excavation
- Sceptic Tank Absorption Fields
- Dwellings with Basement
- Dwellings Without Basements
- Small Commercial Buildings
- Soil Stabilities for Ground Based Solar Array System
- Other…

SOIL INTERPRETATIONS EXPLANATION:

A soil survey is prepared by soil scientists who determine the properties of soil and predict soil behavior for a host of uses. These predictions, often called soil interpretations, are developed to help users of soils manage the resource. 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. Ratings come from the soil's "natural" state, that is, no unusual modification of the site or soil material is made other than that which is considered normal practice for the rated use.

Even though soils may have limitations, and engineer may be able to alter soils features or adjust building plans for a structure to compensate for most degrees of limitation. 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.

Soils are placed in three or more classes according to their limitations or suitability's for certain engineering uses. Soils are rated for the uses expected to be important or potentially important to users of soil survey information. The rating system of slight, moderate, restrictive, severe and very 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. They are defined as follows:

SLIGHT (GREEN) This soil has favorable properties for the use. The degree of limitation is minor and can be overcome easily. Good performance and low maintenance can be expected.

MODERATE (YELLOW) 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.

RESTRICTIVE (ORANGE) This soil has restrictive properties for the use. This rating is given to soils that have rapid or very rapid permeability's. These soils are sandy or have sand and/or gravel within a depth which makes them poor filters of septic effluent.

SEVERE (RED) 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.

VERY SEVERE (BLUE) This soil rating is given to soils that have properties that are difficult or impossible to overcome or modify for the intended use.

SOIL EROSION AND 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
- 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.

Soil Map Unit	**Soil Name Slope ranges**	**Shallow Excavation**	**Erosion & Sediment Hazard**
21B	Pecatonica silt loam, 2 to 5 percent	Somewhat Limited	Moderate
61A	Atterberry silt loam, 0 to 2 percent	Very Limited	Slight
152A	Drummer silty clay loam, 0 to 2 percent	Very Limited	Slight
152A+	Drummer silt loam, 0 to 2 percent, overwash	Very Limited	Slight
242A	Kendall silt loam, 0 to 2 percent	Very Limited	Slight
243B	St. Charles silt loam, 2 to 5 percent	Somewhat Limited	Moderate
278A	Stronghurst silt loam, 0 to 2 percent	Very Limited	Slight
279A	Rozetta silt loam, 0 to 2 percent	Somewhat Limited	Slight

310B	McHenry silt loam, 2 to 4 percent	Somewhat Limited	Moderate
361C2	Kidder loam, 4 to 6 percent, eroded	Somewhat Limited	Moderate
3776A	Comfrey loam, 0 to 2 percent, frequently flooded	Very Limited	Slight

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 are 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.)

Soil Map Unit	Soil Name Slope ranges	Hydric Soil
21B	Pecatonica silt loam, 2 to 5 percent	No
61A	Atterberry silt loam, 0 to 2 percent	No
152A	Drummer silty clay loam, 0 to 2 percent	Yes
152A+	Drummer silt loam, 0 to 2 percent, overwash	Yes
242A	Kendall silt loam, 0 to 2 percent	No
243B	St. Charles silt loam, 2 to 5 percent	No
278A	Stronghurst silt loam, 0 to 2 percent	No
279A	Rozetta silt loam, 0 to 2 percent	No
310B	McHenry silt loam, 2 to 4 percent	No
361C2	Kidder loam, 4 to 6 percent, eroded	No
3776A	Comfrey loam, 0 to 2 percent, frequently flooded	Yes

*Indicates hydric inclusions may occur in draws or swales associated with the map unit

BUILDING LIMITATIONS:

Small Commercial Buildings - Ratings are for undisturbed soil for a small building of less than 3 stories without a basement. The foundation is assumed to be spread footings of reinforced concrete at a depth of 2 feet or the depth of maximum frost penetration, whichever is deeper.

Shallow Excavation - Shallow excavations are trenches or holes dug in the soil to a maximum depth of 5 or 6 feet. They are used for pipelines, sewer lines, telephone and transmission lines, basements, open ditches and the like. The excavations are most commonly made by a trenching machine or backhoe.

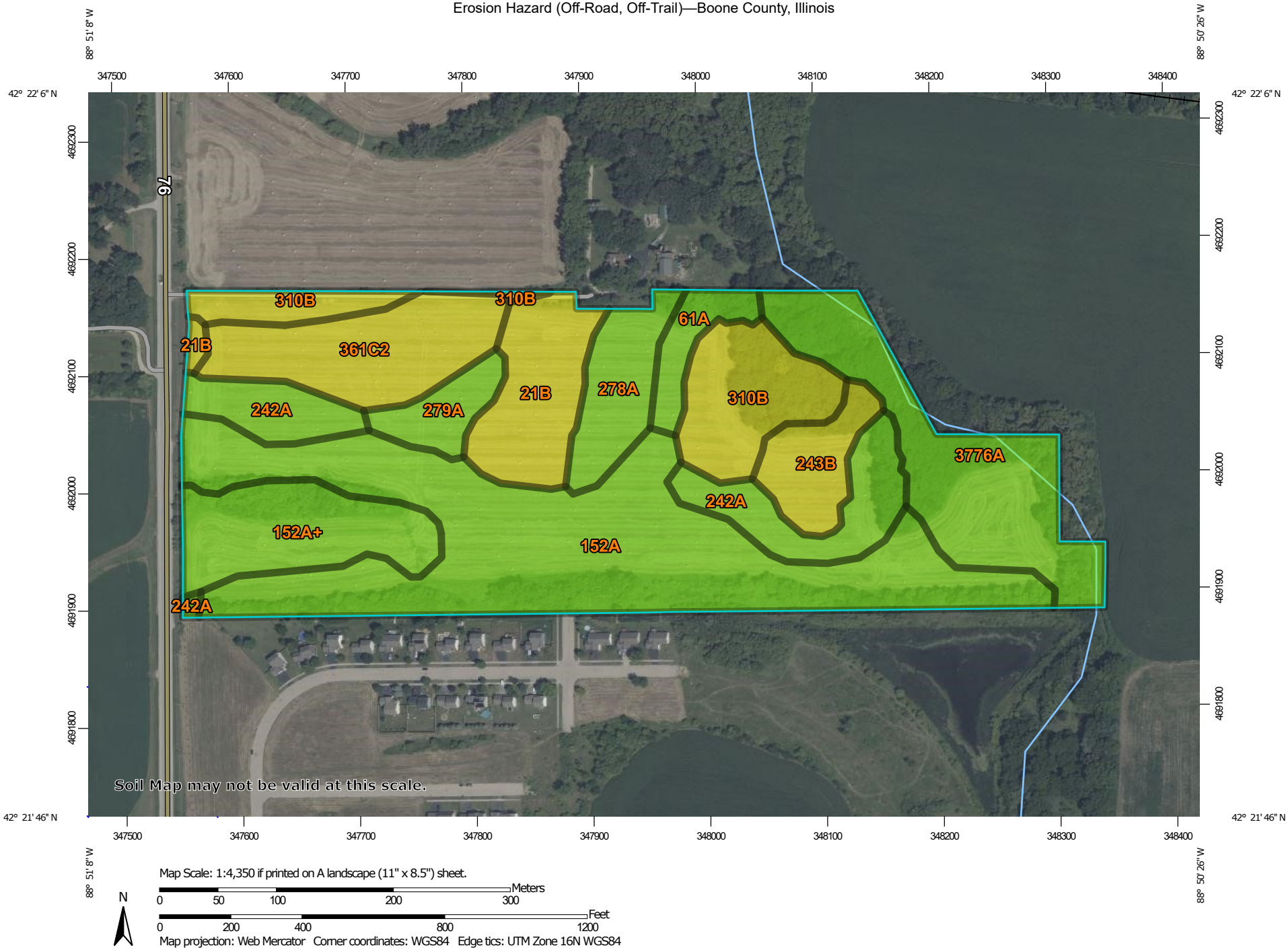
The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth and hardness of bedrock, bulk density of the soil and the number of large stones influence the ease of digging, filling, and compacting. Depth to the seasonal water table and flooding may restrict the time that the excavations can be made. Slope influences the ease of using digging machines. Soil texture and depth to water table influence the resistance to sloughing.

Soil Map Unit	Soil Name Slope ranges	Shallow Excavation	Small Commercial Buildings
21B	Pecatonica silt loam, 2 to 5 percent	Somewhat Limited	Somewhat Limited
61A	Atterberry silt loam, 0 to 2 percent	Very Limited	Very Limited
152A	Drummer silty clay loam, 0 to 2 percent	Very Limited	Very Limited
152A+	Drummer silt loam, 0 to 2 percent, overwash	Very Limited	Very Limited
242A	Kendall silt loam, 0 to 2 percent	Very Limited	Very Limited
243B	St. Charles silt loam, 2 to 5 percent	Somewhat Limited	Somewhat Limited
278A	Stronghurst silt loam, 0 to 2 percent	Very Limited	Very Limited
279A	Rozetta silt loam, 0 to 2 percent	Somewhat Limited	Somewhat Limited
310B	McHenry silt loam, 2 to 4 percent	Somewhat Limited	Not Limited
361C2	Kidder loam, 4 to 6 percent, eroded	Somewhat Limited	Somewhat Limited
3776A	Comfrey loam, 0 to 2 percent, frequently flooded	Very Limited	Very Limited

WEB SOIL SURVEY MAPS:

Additional maps and reports for proposed land uses are provided using USDA-NRCS Web Soil Survey, which provides up-to-date soils data and information produced by the National Cooperative Soil Survey. These maps and tables provide additional details about stabilities and limitations for specific proposed land uses for this PIQ. The ratings are listed in detail in each individual report.

Erosion Hazard (Off-Road, Off-Trail)—Boone County, Illinois



Map Scale: 1:4,350 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Very severe

Severe

Moderate

Slight

Not rated or not available

Soil Rating Lines

Very severe

Severe

Moderate

Slight

Not rated or not available

Soil Rating Points

Very severe

Severe

Moderate

Slight

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Boone County, Illinois
Survey Area Data: Version 18, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2023—Aug 16, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Erosion Hazard (Off-Road, Off-Trail)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
21B	Pecatonica silt loam, 2 to 5 percent slopes	Moderate	Pecatonica (90%)	Surface kw times slope times R index (0.28)	3.3	7.0%
61A	Atterberry silt loam, 0 to 2 percent slopes	Slight	Atterberry (98%)		1.1	2.4%
			Denny (1%)			
			Sable (1%)			
152A	Drummer silty clay loam, 0 to 2 percent slopes	Slight	Drummer, drained (94%)		15.0	31.9%
			Peotone, drained (3%)			
			Harpster, drained (3%)			
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	Slight	Drummer, overwash (92%)		3.7	7.9%
242A	Kendall silt loam, 0 to 2 percent slopes	Slight	Kendall (92%)		4.1	8.6%
			Brooklyn (2%)			
			Sable (2%)			
			Vesser (2%)			
			Drummer (2%)			
243B	St. Charles silt loam, 2 to 5 percent slopes	Moderate	St. Charles (95%)	Surface kw times slope times R index (0.06)	1.9	3.9%
278A	Stronghurst silt loam, 0 to 2 percent slopes	Slight	Stronghurst (97%)		2.2	4.7%
			Sable (3%)			
279A	Rozetta silt loam, 0 to 2 percent slopes	Slight	Rozetta (95%)		1.3	2.7%
			Denny (1%)			
310B	McHenry silt loam, 2 to 4 percent slopes	Moderate	McHenry (90%)	Surface kw times slope times R index (0.26)	4.4	9.3%
361C2	Kidder loam, 4 to 6 percent slopes, eroded	Moderate	Kidder, eroded (95%)	Surface kw times slope times R index (0.23)	4.1	8.8%
			Fox (3%)	Surface kw times slope times R index (0.33)		
3776A	Comfrey loam, 0 to 2 percent	Slight	Comfrey (90%)		6.0	12.8%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
	slopes, frequently flooded		Millington (6%)			
			Houghton (4%)			
Totals for Area of Interest					**47.2**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Slight	33.5	71.0%
Moderate	13.7	29.0%
Totals for Area of Interest	**47.2**	**100.0%**

Description

The ratings in this interpretation indicate the hazard of soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface. The ratings are based on slope, soil erosion factor K, and an index of rainfall erosivity (R). The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance.

The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," "severe," or "very severe." A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

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.

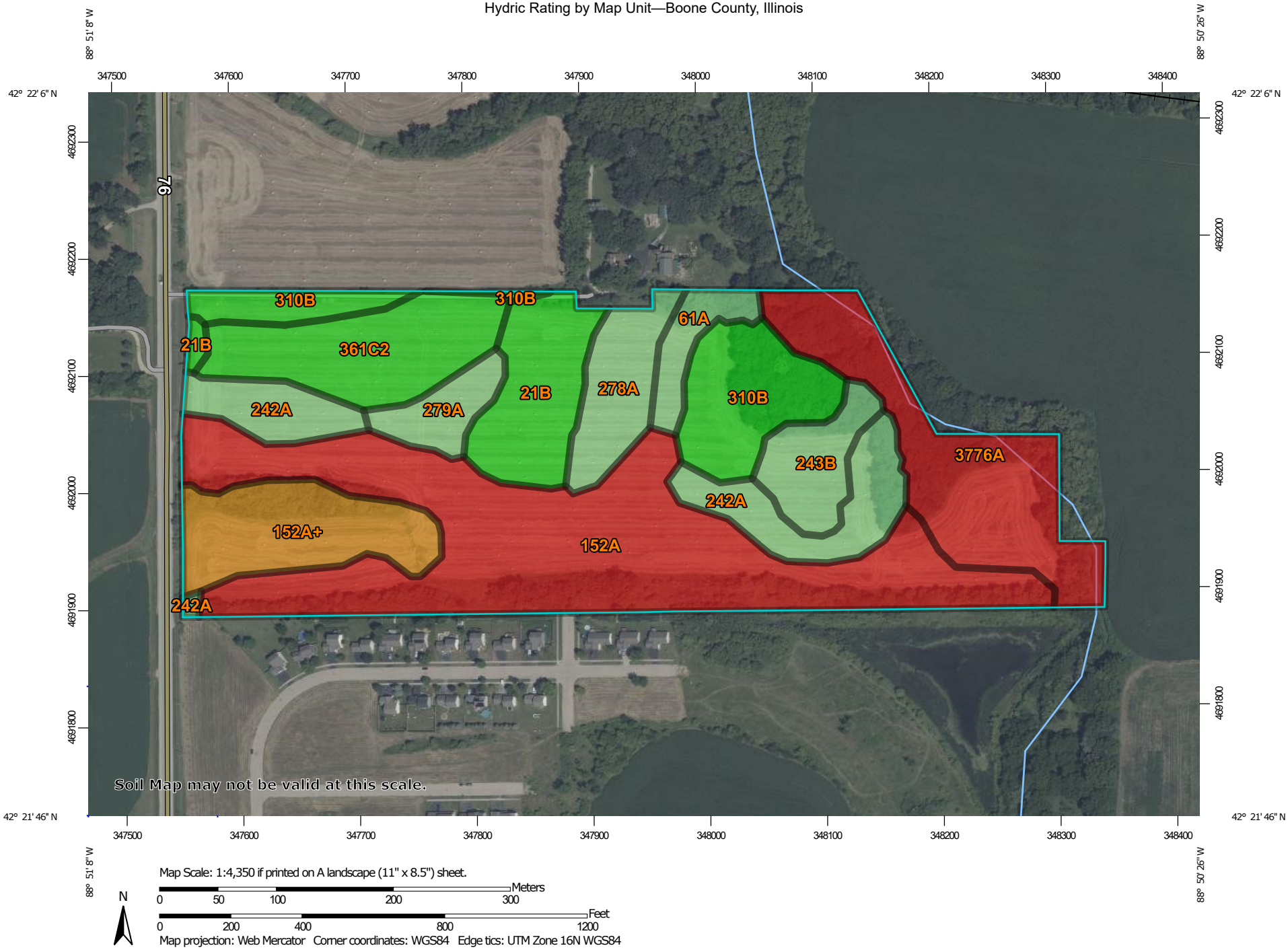
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydric Rating by Map Unit—Boone County, Illinois



Map Scale: 1:4,350 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Lines

- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Points

- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Boone County, Illinois
Survey Area Data: Version 18, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2023—Aug 16, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
21B	Pecatonica silt loam, 2 to 5 percent slopes	0	3.3	7.0%
61A	Atterberry silt loam, 0 to 2 percent slopes	2	1.1	2.4%
152A	Drummer silty clay loam, 0 to 2 percent slopes	100	15.0	31.9%
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	92	3.7	7.9%
242A	Kendall silt loam, 0 to 2 percent slopes	8	4.1	8.6%
243B	St. Charles silt loam, 2 to 5 percent slopes	5	1.9	3.9%
278A	Stronghurst silt loam, 0 to 2 percent slopes	3	2.2	4.7%
279A	Rozetta silt loam, 0 to 2 percent slopes	1	1.3	2.7%
310B	McHenry silt loam, 2 to 4 percent slopes	0	4.4	9.3%
361C2	Kidder loam, 4 to 6 percent slopes, eroded	0	4.1	8.8%
3776A	Comfrey loam, 0 to 2 percent slopes, frequently flooded	100	6.0	12.8%
Totals for Area of Interest			**47.2**	**100.0%**

Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

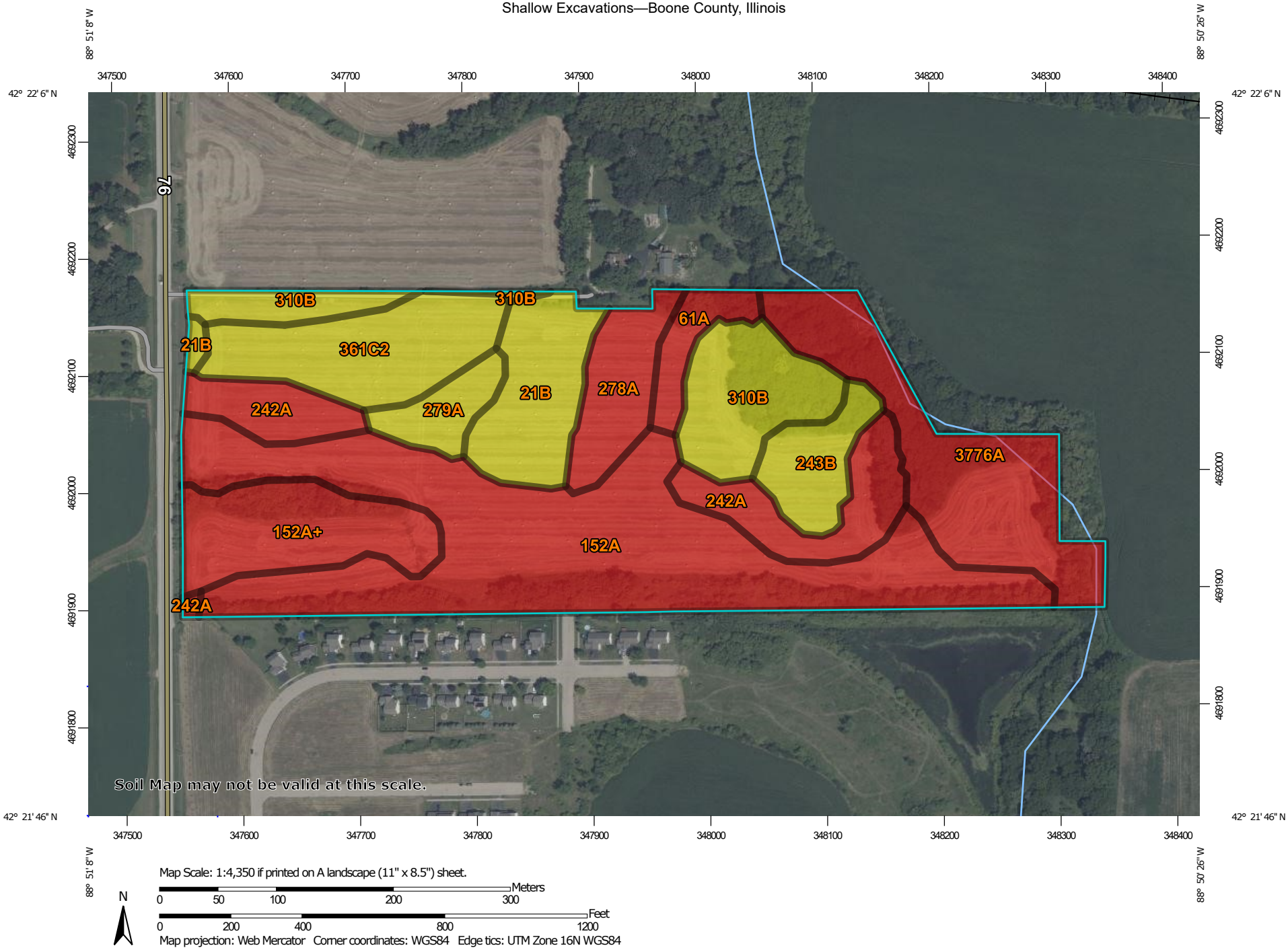
Rating Options

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Shallow Excavations—Boone County, Illinois



Map Scale: 1:4,350 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Lines

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Points

Very limited

Somewhat limited

Not limited

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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Soil Survey Area: Boone County, Illinois
Survey Area Data: Version 18, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2023—Aug 16, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Shallow Excavations

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
21B	Pecatonica silt loam, 2 to 5 percent slopes	Somewhat limited	Pecatonica (90%)	Dusty (0.05)	3.3	7.0%
				Unstable excavation walls (0.01)		
61A	Atterberry silt loam, 0 to 2 percent slopes	Very limited	Atterberry (98%)	Depth to saturated zone (1.00)	1.1	2.4%
				Dusty (0.09)		
				Unstable excavation walls (0.01)		
			Denny (1%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Dusty (0.12)		
				Unstable excavation walls (0.01)		
			Sable (1%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Dusty (0.09)		
				Unstable excavation walls (0.01)		
152A	Drummer silty clay loam, 0 to 2 percent slopes	Very limited	Drummer, drained (94%)	Ponding (1.00)	15.0	31.9%
				Depth to saturated zone (1.00)		
				Dusty (0.07)		
				Unstable excavation walls (0.01)		
			Peotone, drained (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Unstable excavation walls (0.08)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Dusty (0.07)		
				Too clayey (0.01)		
			Harpster, drained (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Dusty (0.07)		
				Unstable excavation walls (0.01)		
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	Very limited	Drummer, overwash (92%)	Ponding (1.00)	3.7	7.9%
				Depth to saturated zone (1.00)		
				Dusty (0.09)		
				Unstable excavation walls (0.01)		
242A	Kendall silt loam, 0 to 2 percent slopes	Very limited	Kendall (92%)	Depth to saturated zone (1.00)	4.1	8.6%
				Dusty (0.09)		
				Unstable excavation walls (0.01)		
			Brooklyn (2%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Dusty (0.09)		
				Unstable excavation walls (0.01)		
				Too clayey (0.01)		
			Sable (2%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
			Vesser (2%)	Depth to saturated zone (1.00)		
				Flooding (0.60)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Dusty (0.09)		
				Unstable excavation walls (0.01)		
			Drummer (2%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Dusty (0.09)		
				Unstable excavation walls (0.01)		
243B	St. Charles silt loam, 2 to 5 percent slopes	Somewhat limited	St. Charles (95%)	Dusty (0.06)	1.9	3.9%
				Unstable excavation walls (0.01)		
278A	Stronghurst silt loam, 0 to 2 percent slopes	Very limited	Stronghurst (97%)	Depth to saturated zone (1.00)	2.2	4.7%
				Dusty (0.10)		
				Unstable excavation walls (0.01)		
			Sable (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
279A	Rozetta silt loam, 0 to 2 percent slopes	Somewhat limited	Rozetta (95%)	Depth to saturated zone (0.15)	1.3	2.7%
				Dusty (0.07)		
				Unstable excavation walls (0.01)		
310B	McHenry silt loam, 2 to 4 percent slopes	Somewhat limited	McHenry (90%)	Dusty (0.04)	4.4	9.3%
				Unstable excavation walls (0.01)		
			Kidder (5%)	Dusty (0.02)		
				Unstable excavation walls (0.01)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
361C2	Kidder loam, 4 to 6 percent slopes, eroded	Somewhat limited	Kidder, eroded (95%)	Dusty (0.01)	4.1	8.8%
				Unstable excavation walls (0.01)		
			Fox (3%)	Dusty (0.02)		
				Unstable excavation walls (0.01)		
3776A	Comfrey loam, 0 to 2 percent slopes, frequently flooded	Very limited	Comfrey (90%)	Ponding (1.00)	6.0	12.8%
				Depth to saturated zone (1.00)		
				Flooding (0.80)		
				Dusty (0.04)		
				Unstable excavation walls (0.01)		
			Millington (6%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Flooding (0.80)		
				Dusty (0.04)		
				Unstable excavation walls (0.01)		
			Houghton (4%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Organic matter content (1.00)		
				Flooding (0.80)		
				Dusty (0.04)		
Totals for Area of Interest					**47.2**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very limited	32.2	68.3%
Somewhat limited	14.9	31.7%
Totals for Area of Interest	**47.2**	**100.0%**

Description

ENG - Engineering

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

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.

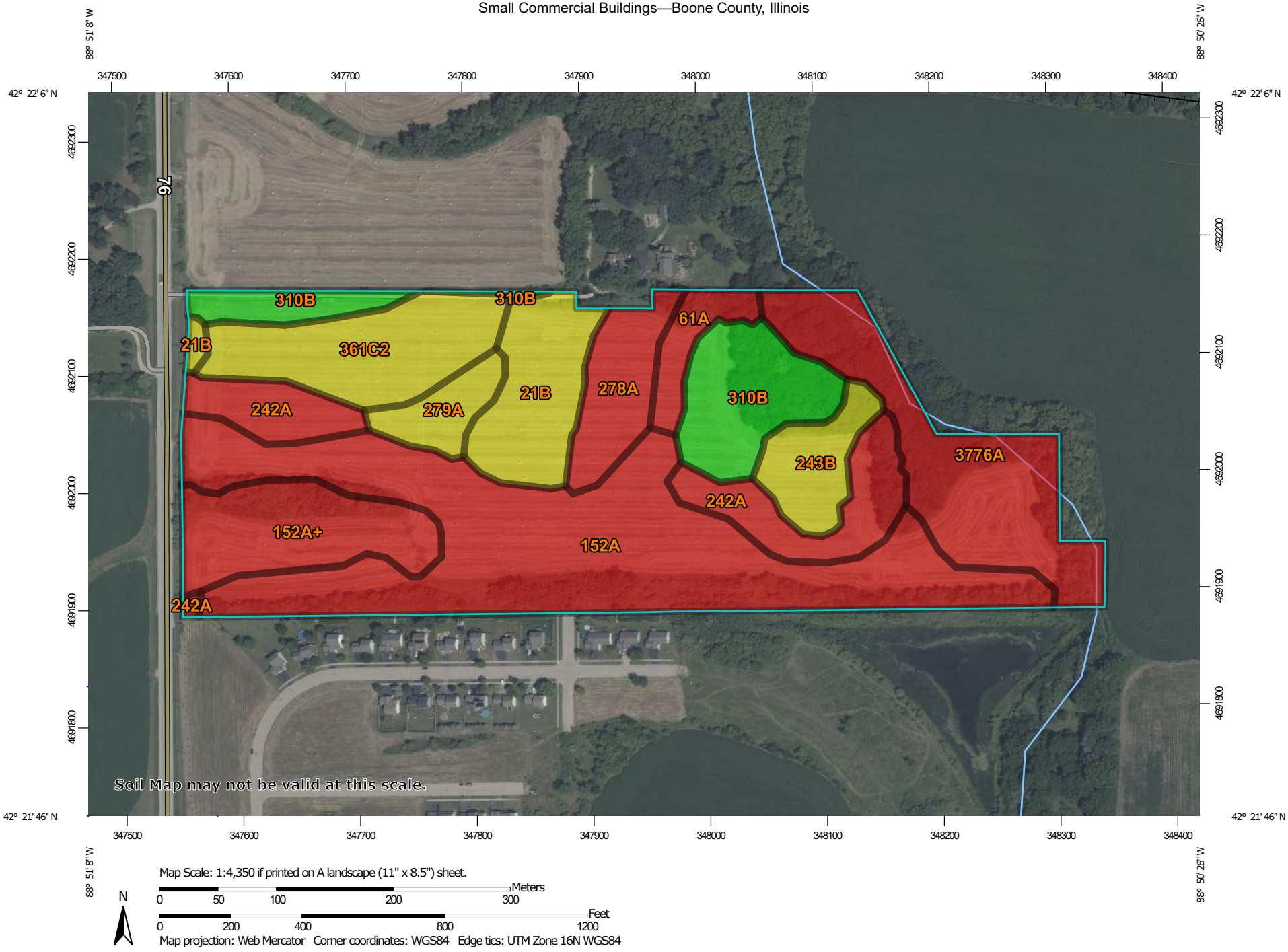
Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



Map Scale: 1:4,350 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Lines

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Points

Very limited

Somewhat limited

Not limited

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Boone County, Illinois
Survey Area Data: Version 18, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2023—Aug 16, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Small Commercial Buildings

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
21B	Pecatonica silt loam, 2 to 5 percent slopes	Somewhat limited	Pecatonica (90%)	Shrink-swell (0.10)	3.3	7.0%
61A	Atterberry silt loam, 0 to 2 percent slopes	Very limited	Atterberry (98%)	Depth to saturated zone (1.00)	1.1	2.4%
				Shrink-swell (0.17)		
			Denny (1%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Shrink-swell (0.78)		
			Sable (1%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Shrink-swell (0.42)		
152A	Drummer silty clay loam, 0 to 2 percent slopes	Very limited	Drummer, drained (94%)	Ponding (1.00)	15.0	31.9%
				Depth to saturated zone (1.00)		
				Shrink-swell (0.37)		
			Peotone, drained (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Shrink-swell (1.00)		
			Harpster, drained (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Shrink-swell (0.29)		
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	Very limited	Drummer, overwash (92%)	Ponding (1.00)	3.7	7.9%
				Depth to saturated zone (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
242A	Kendall silt loam, 0 to 2 percent slopes	Very limited	Kendall (92%)	Depth to saturated zone (1.00)	4.1	8.6%
				Shrink-swell (0.42)		
			Brooklyn (2%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Shrink-swell (1.00)		
			Sable (2%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Shrink-swell (0.50)		
			Vesser (2%)	Flooding (1.00)		
				Depth to saturated zone (1.00)		
				Shrink-swell (0.50)		
			Drummer (2%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Shrink-swell (0.50)		
243B	St. Charles silt loam, 2 to 5 percent slopes	Somewhat limited	St. Charles (95%)	Shrink-swell (0.36)	1.9	3.9%
278A	Stronghurst silt loam, 0 to 2 percent slopes	Very limited	Stronghurst (97%)	Depth to saturated zone (1.00)	2.2	4.7%
				Shrink-swell (0.42)		
			Sable (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Shrink-swell (0.50)		
279A	Rozetta silt loam, 0 to 2 percent slopes	Somewhat limited	Rozetta (95%)	Shrink-swell (0.14)	1.3	2.7%
310B	McHenry silt loam, 2 to 4	Not limited	McHenry (90%)		4.4	9.3%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
	percent slopes		Kidder (5%)			
361C2	Kidder loam, 4 to 6 percent slopes, eroded	Somewhat limited	Kidder, eroded (95%)	Slope (0.14)	4.1	8.8%
			Fox (3%)	Slope (0.14)		
3776A	Comfrey loam, 0 to 2 percent slopes, frequently flooded	Very limited	Comfrey (90%)	Ponding (1.00)	6.0	12.8%
				Flooding (1.00)		
				Depth to saturated zone (1.00)		
				Shrink-swell (0.35)		
			Millington (6%)	Ponding (1.00)		
				Flooding (1.00)		
				Depth to saturated zone (1.00)		
			Houghton (4%)	Ponding (1.00)		
				Subsidence (1.00)		
				Flooding (1.00)		
				Depth to saturated zone (1.00)		
				Organic matter content (1.00)		
Totals for Area of Interest					**47.2**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very limited	32.2	68.3%
Somewhat limited	10.6	22.4%
Not limited	4.4	9.3%
Totals for Area of Interest	**47.2**	**100.0%**

Description

ENG - Engineering

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification of the soil). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

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.

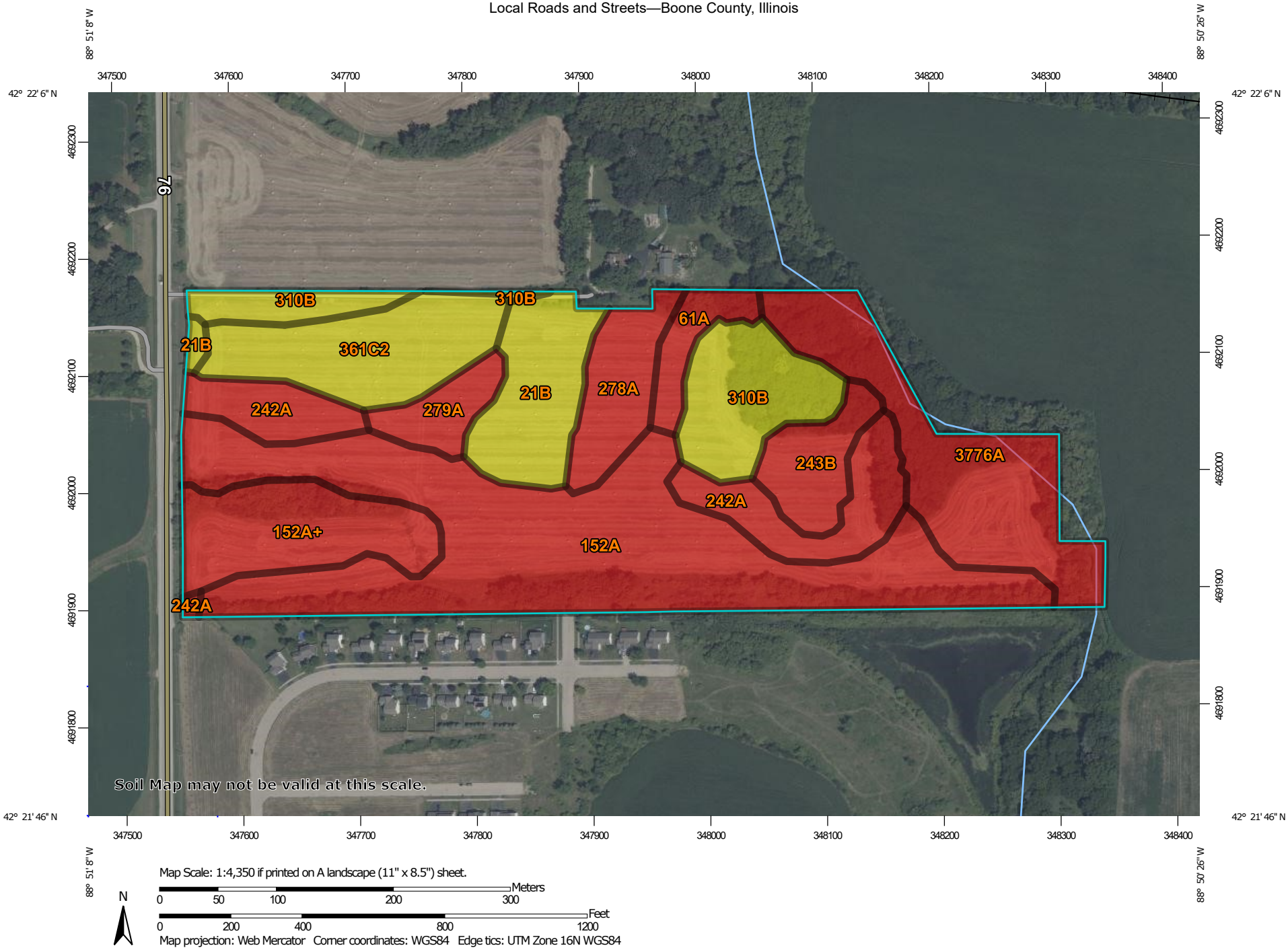
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Local Roads and Streets—Boone County, Illinois



Map Scale: 1:4,350 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Lines

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Points

Very limited

Somewhat limited

Not limited

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Boone County, Illinois
Survey Area Data: Version 18, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2023—Aug 16, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Local Roads and Streets

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
21B	Pecatonica silt loam, 2 to 5 percent slopes	Somewhat limited	Pecatonica (90%)	Frost action (0.50)	3.3	7.0%
				Shrink-swell (0.10)		
				Low strength (0.04)		
61A	Atterberry silt loam, 0 to 2 percent slopes	Very limited	Atterberry (98%)	Frost action (1.00)	1.1	2.4%
				Low strength (1.00)		
				Depth to saturated zone (0.94)		
				Shrink-swell (0.17)		
			Denny (1%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Shrink-swell (0.78)		
			Sable (1%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Shrink-swell (0.42)		
152A	Drummer silty clay loam, 0 to 2 percent slopes	Very limited	Drummer, drained (94%)	Ponding (1.00)	15.0	31.9%
				Depth to saturated zone (1.00)		
				Frost action (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Low strength (1.00)		
				Shrink-swell (0.37)		
			Peotone, drained (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Shrink-swell (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
			Harpster, drained (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Shrink-swell (0.29)		
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	Very limited	Drummer, overwash (92%)	Ponding (1.00)	3.7	7.9%
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
242A	Kendall silt loam, 0 to 2 percent slopes	Very limited	Kendall (92%)	Frost action (1.00)	4.1	8.6%
				Low strength (1.00)		
				Depth to saturated zone (0.94)		
				Shrink-swell (0.42)		
			Brooklyn (2%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Shrink-swell (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
			Sable (2%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Shrink-swell (0.50)		
			Vesser (2%)	Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Flooding (1.00)		
				Low strength (0.97)		
				Shrink-swell (0.50)		
			Drummer (2%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (0.96)		
				Shrink-swell (0.50)		
243B	St. Charles silt loam, 2 to 5 percent slopes	Very limited	St. Charles (95%)	Frost action (1.00)	1.9	3.9%
				Low strength (1.00)		
				Shrink-swell (0.36)		
278A	Stronghurst silt loam, 0 to 2 percent slopes	Very limited	Stronghurst (97%)	Frost action (1.00)	2.2	4.7%
				Low strength (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to saturated zone (0.94)		
				Shrink-swell (0.42)		
			Sable (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Shrink-swell (0.50)		
279A	Rozetta silt loam, 0 to 2 percent slopes	Very limited	Rozetta (95%)	Frost action (1.00)	1.3	2.7%
				Low strength (1.00)		
				Shrink-swell (0.14)		
			Denny (1%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Shrink-swell (0.98)		
310B	McHenry silt loam, 2 to 4 percent slopes	Somewhat limited	McHenry (90%)	Frost action (0.50)	4.4	9.3%
				Low strength (0.14)		
			Kidder (5%)	Frost action (0.50)		
361C2	Kidder loam, 4 to 6 percent slopes, eroded	Somewhat limited	Kidder, eroded (95%)	Frost action (0.50)	4.1	8.8%
			Fox (3%)	Frost action (0.50)		
3776A	Comfrey loam, 0 to 2 percent slopes, frequently flooded	Very limited	Comfrey (90%)	Ponding (1.00)	6.0	12.8%
				Depth to saturated zone (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Frost action (1.00)		
				Flooding (1.00)		
				Low strength (0.61)		
			Millington (6%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Flooding (1.00)		
				Low strength (0.21)		
			Houghton (4%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Subsidence (1.00)		
				Frost action (1.00)		
				Flooding (1.00)		
Totals for Area of Interest					**47.2**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very limited	35.4	74.9%
Somewhat limited	11.8	25.1%
Totals for Area of Interest	**47.2**	**100.0%**

Description

ENG - Engineering

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

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.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Physical Soil Properties

This table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity (Ksat), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates in the table are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity (Ksat) is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In this table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of organic matter in a soil can be maintained by returning crop residue to the soil.

Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and Ksat. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook."

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Reference:
United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. (http://soils.usda.gov)

Report—Physical Soil Properties

Physical Soil Properties–Boone County, Illinois														
Map symbol and soil name	**Depth**	**Sand**	**Silt**	**Clay**	**Moist bulk density**	**Saturated hydraulic conductivity**	**Available water capacity**	**Linear extensibility**	**Organic matter**	**Erosion factors**			**Wind erodibility group**	**Wind erodibility index**
										Kw	**Kf**	**T**		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
21B—Pecatonica silt loam, 2 to 5 percent slopes														
Pecatonica	0-3	0- 4- 7	66-75- 85	15-21- 27	1.20-1.40	4.23-14.11	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	3-10	0- 4- 7	66-77- 88	12-19- 27	1.20-1.40	4.23-14.11	0.22-0.24	0.0-2.9	0.2-0.5	.55	.55			
	10-18	1- 4- 7	66-73- 81	18-23- 31	1.20-1.60	4.23-14.11	0.20-0.22	0.0-2.9	0.5-1.0	.49	.49			
	18-26	25-40- 58	15-29- 40	27-31- 35	1.45-1.65	4.23-14.11	0.15-0.19	3.0-5.9	0.2-0.5	.24	.24			
	26-68	25-50- 65	17-19- 40	18-31- 35	1.45-1.65	4.23-14.11	0.15-0.19	3.0-5.9	0.0-0.5	.20	.20			
	68-80	23-35- 65	20-41- 50	15-24- 27	1.45-1.65	4.23-14.11	0.11-0.19	0.0-2.9	0.0-0.5	.32	.32			
61A—Atterberry silt loam, 0 to 2 percent slopes														
Atterberry	0-9	2- 5- 7	68-72- 78	15-23- 27	1.25-1.45	4.23-14.11	0.19-0.26	1.6-3.8	1.5-3.5	.37	.37	5	6	48
	9-17	2- 5- 7	69-77- 83	15-18- 27	1.40-1.60	4.23-14.11	0.17-0.21	1.5-3.6	0.1-1.0	.55	.55			
	17-48	2- 5- 7	60-63- 73	25-32- 35	1.35-1.55	4.23-14.11	0.16-0.20	3.1-5.1	0.1-0.5	.43	.43			
	48-60	2- 5- 7	66-74- 80	15-21- 27	1.30-1.50	4.23-14.11	0.17-0.22	1.5-3.6	0.1-0.5	.55	.55			

Physical Soil Properties–Boone County, Illinois														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
152A—Drummer silty clay loam, 0 to 2 percent slopes														
Drummer, drained	0-14	0- 8- 15	50-61- 73	27-31- 35	1.20-1.42	4.23-14.11	0.15-0.21	2.4-3.9	3.5-7.0	.24	.24	5	6	48
	14-41	0- 8- 15	50-61- 78	22-31- 35	1.20-1.50	4.23-14.11	0.14-0.20	2.7-5.5	0.5-2.7	.37	.37			
	41-47	15-35- 55	12-41- 70	15-24- 33	1.30-1.59	4.23-14.11	0.11-0.17	1.2-4.7	0.2-0.5	.37	.37			
	47-60	20-48- 65	3-31- 53	12-21- 32	1.45-1.65	4.23-14.11	0.10-0.16	0.8-4.2	0.0-0.4	.32	.32			
152A+—Drummer silt loam, 0 to 2 percent slopes, overwash														
Drummer, overwash	0-16	0- 3- 7	66-73- 80	20-24- 27	1.20-1.40	4.23-14.11	0.22-0.24	0.0-2.9	2.0-4.0	.37	.37	5	6	48
	16-30	0- 9- 15	50-60- 73	27-31- 35	1.10-1.30	4.23-14.11	0.21-0.23	0.0-2.9	5.0-7.0	.24	.24			
	30-57	0- 9- 15	50-64- 80	20-28- 35	1.20-1.45	4.23-14.11	0.21-0.24	3.0-5.9	0.0-1.0	.43	.43			
	57-63	15-35- 55	12-41- 70	15-24- 33	1.30-1.55	4.23-14.11	0.17-0.20	3.0-5.9	0.0-0.5	.37	.37			
	63-80	15-48- 80	0-31- 75	10-21- 32	1.40-1.70	4.23-14.11	0.11-0.19	0.0-2.9	0.0-0.5	.32	.32			

Physical Soil Properties–Boone County, Illinois														
Map symbol and soil name	**Depth**	**Sand**	**Silt**	**Clay**	**Moist bulk density**	**Saturated hydraulic conductivity**	**Available water capacity**	**Linear extensibility**	**Organic matter**	**Erosion factors**			**Wind erodibility group**	**Wind erodibility index**
										Kw	**Kf**	**T**		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
242A—Kendall silt loam, 0 to 2 percent slopes														
Kendall	0-7	0- 5- 10	65-75- 86	14-20- 25	1.30-1.50	4.23-14.11	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	7-11	0- 5- 10	65-73- 86	14-22- 25	1.35-1.55	4.23-14.11	0.20-0.22	0.0-2.9	0.1-1.0	.49	.49			
	11-51	0- 5- 10	55-64- 73	27-31- 35	1.30-1.50	4.23-14.11	0.14-0.18	3.0-5.9	0.1-0.5	.43	.43			
	51-58	30-40- 50	33-40- 50	15-20- 27	1.45-1.55	4.23-14.11	0.11-0.14	0.0-2.9	0.1-0.5	.37	.37			
	58-80	30-45- 55	25-40- 50	10-15- 20	1.55-1.75	4.23-14.11	0.11-0.15	0.0-2.9	0.1-0.3	.43	.43			
243B—St. Charles silt loam, 2 to 5 percent slopes														
St. charles	0-10	0- 5- 10	66-76- 82	18-19- 27	1.35-1.44	4.23-14.11	0.22-0.24	1.9-4.0	1.0-3.0	.37	.37	5	5	56
	10-30	0- 5- 10	55-64- 74	25-31- 35	1.42-1.47	1.41-14.11	0.18-0.22	3.2-5.6	0.1-0.5	.43	.43			
	30-49	20-40- 60	10-33- 53	20-27- 30	1.44-1.63	1.41-14.11	0.14-0.18	1.9-4.5	0.0-0.5	.37	.37			
	49-79	30-48- 70	12-42- 65	5-10- 25	1.41-1.70	4.23-42.34	0.11-0.19	0.3-3.3	0.0-0.3	.43	.43			
278A—Stronghurst silt loam, 0 to 2 percent slopes														
Stronghurst	0-7	1- 3- 5	68-77- 84	15-20- 27	1.25-1.45	4.23-14.11	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	7-11	1- 3- 5	70-75- 81	18-22- 25	1.30-1.50	4.23-14.11	0.20-0.22	0.0-2.9	0.5-1.0	.49	.49			
	11-47	1- 2- 4	61-67- 77	22-31- 35	1.30-1.55	4.23-14.11	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
	47-60	1- 2- 4	69-75- 79	20-24- 27	1.35-1.60	4.23-14.11	0.20-0.22	0.0-2.9	0.2-0.5	.49	.49			

Physical Soil Properties–Boone County, Illinois														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
279A—Rozetta silt loam, 0 to 2 percent slopes														
Rozetta	0-4	0- 4- 7	68-77- 85	15-19- 27	1.35-1.47	4.23-14.11	0.22-0.24	1.6-3.8	1.0-3.0	.37	.37	5	5	56
	4-11	0- 4- 7	66-77- 88	12-19- 27	1.44-1.48	4.23-14.11	0.22-0.24	0.7-3.7	0.1-1.0	.49	.49			
	11-21	0- 4- 7	58-65- 73	27-31- 35	1.38-1.48	4.23-14.11	0.18-0.22	3.2-5.9	0.0-0.5	.43	.43			
	21-50	0- 4- 7	64-68- 80	20-28- 30	1.35-1.47	4.23-14.11	0.20-0.22	2.1-4.1	0.0-0.5	.49	.49			
	50-60	0- 4- 7	65-72- 80	20-24- 28	1.33-1.41	4.23-14.11	0.20-0.22	2.1-3.8	0.0-0.5	.49	.49			
310B—McHenry silt loam, 2 to 4 percent slopes														
Mchenry	0-5	10-20- 30	50-64- 80	10-16- 22	1.46-1.48	4.23-14.11	0.22-0.24	0.9-2.8	1.0-3.0	.49	.49	5	5	56
	5-10	10-20- 30	50-64- 80	10-16- 22	1.48-1.52	4.23-14.11	0.22-0.24	0.9-2.8	0.5-1.5	.49	.49			
	10-22	5-15- 25	40-55- 72	22-30- 35	1.42-1.47	4.23-14.11	0.18-0.20	2.6-5.2	0.5-1.0	.37	.37			
	22-32	30-42- 55	15-33- 51	18-25- 30	1.42-1.64	4.23-14.11	0.15-0.19	1.7-4.1	0.5-1.0	.28	.28			
	32-37	45-55- 65	20-35- 47	8-10- 18	1.59-1.63	4.23-14.11	0.12-0.14	0.6-1.8	0.2-0.5	.43	.43			
	37-79	55-60- 70	18-30- 40	5-10- 15	1.45-1.67	14.11-42.34	0.06-0.13	0.3-1.4	0.0-0.5	.20	.32			
361C2—Kidder loam, 4 to 6 percent slopes, eroded														
Kidder, eroded	0-8	32-45- 52	33-42- 50	11-14- 20	1.39-1.50	4.23-14.11	0.16-0.24	0.7-1.6	1.0-3.0	.28	.28	5	5	56
	8-31	46-57- 65	6-18- 30	20-25- 30	1.58-1.65	4.23-14.11	0.11-0.19	1.4-3.1	0.0-0.5	.24	.24			
	31-79	48-66- 75	12-23- 38	6-11- 15	1.44-1.70	14.11-42.34	0.06-0.15	0.2-1.1	0.0-0.5	.15	.28			

Physical Soil Properties–Boone County, Illinois														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
3776A—Comfrey loam, 0 to 2 percent slopes, frequently flooded														
Comfrey	0-7	23-30- 45	28-48- 50	18-23- 27	1.20-1.40	4.23-14.11	0.20-0.24	0.0-2.9	5.0-7.0	.32	.32	5	6	48
	7-26	20-30- 45	20-44- 52	18-27- 35	1.20-1.40	4.23-14.11	0.16-0.22	3.0-5.9	2.0-5.0	.28	.28			
	26-37	15-19- 45	20-52- 55	18-29- 35	1.25-1.45	4.23-14.11	0.15-0.20	3.0-5.9	1.0-2.5	.37	.37			
	37-63	15-35- 55	13-40- 55	15-25- 32	1.30-1.50	4.23-14.11	0.12-0.19	0.0-2.9	0.5-1.5	.37	.37			

Data Source Information

Soil Survey Area: Boone County, Illinois
Survey Area Data: Version 18, Aug 21, 2024

Soil Features

This table gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage, or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity (Ksat), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high.* It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Report—Soil Features

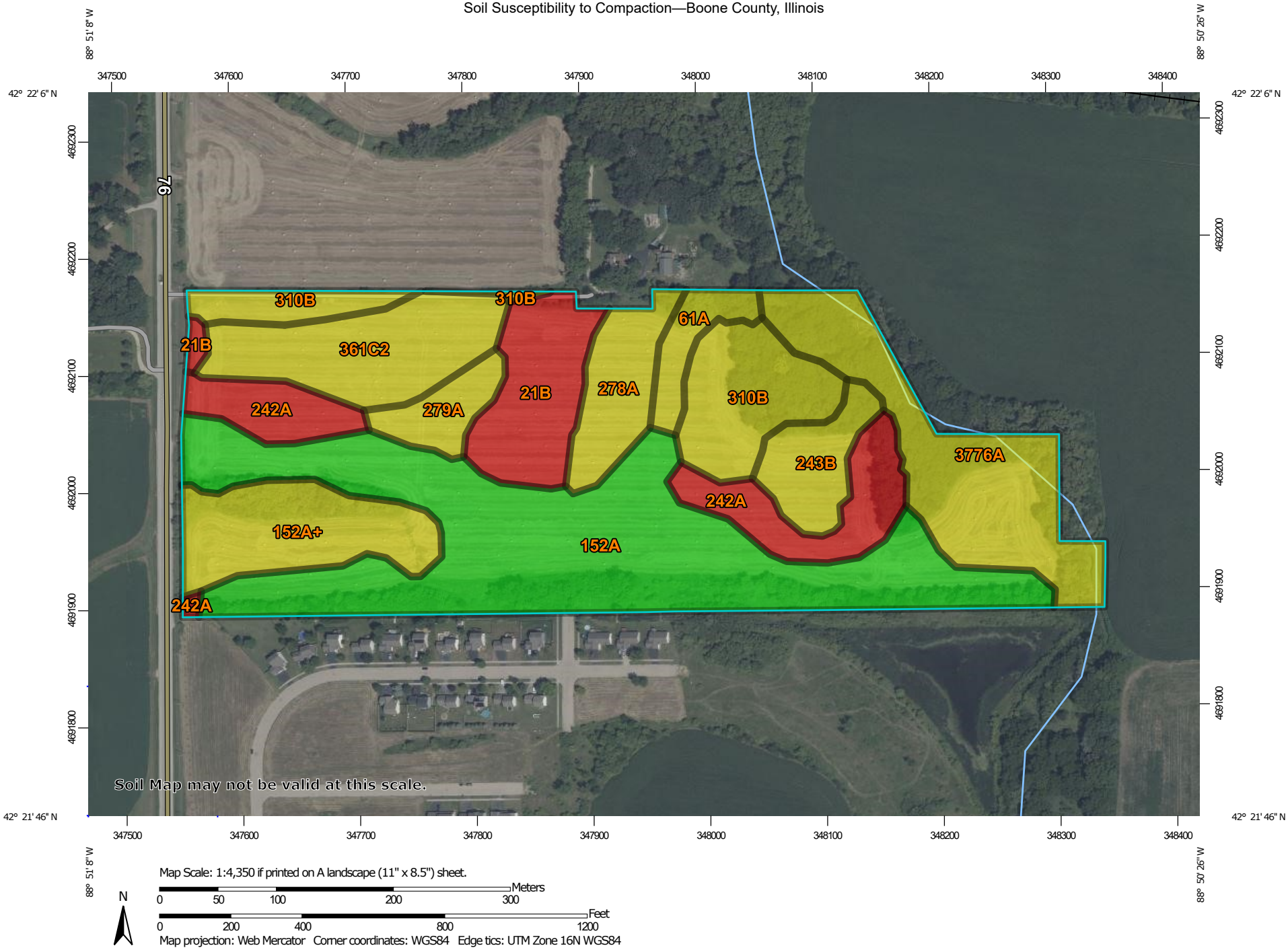
Soil Features–Boone County, Illinois									
Map symbol and soil name	Restrictive Layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		Low-RV-High	*Range*		*Low-High*	*Low-High*			
		In	*In*		*In*	*In*			
21B—Pecatonica silt loam, 2 to 5 percent slopes									
Pecatonica		—	—		0	—	Moderate	Moderate	Moderate
61A—Atterberry silt loam, 0 to 2 percent slopes									
Atterberry		—	—		0	0	High	High	Moderate
152A—Drummer silty clay loam, 0 to 2 percent slopes									
Drummer, drained		—	—		0	0	High	High	Low
152A+—Drummer silt loam, 0 to 2 percent slopes, overwash									
Drummer, overwash		—	—		0	—	High	High	Low
242A—Kendall silt loam, 0 to 2 percent slopes									
Kendall		—	—		0	—	High	High	Moderate

Soil Features–Boone County, Illinois									
Map symbol and soil name	Restrictive Layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		Low-RV-High	*Range*		*Low-High*	*Low-High*			
243B—St. Charles silt loam, 2 to 5 percent slopes									
St. charles		—	—		0	0	High	High	Moderate
278A—Stronghurst silt loam, 0 to 2 percent slopes									
Stronghurst		—	—		0	—	High	High	Low
279A—Rozetta silt loam, 0 to 2 percent slopes									
Rozetta		—	—		0	0	High	Moderate	Moderate
310B—McHenry silt loam, 2 to 4 percent slopes									
Mchenry		—	—		0	0	Moderate	Low	Low
361C2—Kidder loam, 4 to 6 percent slopes, eroded									
Kidder, eroded		—	—		0	0	Moderate	Low	Low
3776A—Comfrey loam, 0 to 2 percent slopes, frequently flooded									
Comfrey		—	—		0	—	High	High	Low

Data Source Information

Soil Survey Area: Boone County, Illinois
Survey Area Data: Version 18, Aug 21, 2024

Soil Susceptibility to Compaction—Boone County, Illinois



Map Scale: 1:4,350 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

High

Medium

Low

Not rated or not available

Soil Rating Lines

High

Medium

Low

Not rated or not available

Soil Rating Points

High

Medium

Low

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Boone County, Illinois
Survey Area Data: Version 18, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2023—Aug 16, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Soil Susceptibility to Compaction

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
21B	Pecatonica silt loam, 2 to 5 percent slopes	High	Pecatonica (90%)	Soil texture, 0-12 inches (1.00)	3.3	7.0%
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Bulk density-compactibility to 30cm (1.00)		
				Organic matter content, 0-30 cm (1.00)		
61A	Atterberry silt loam, 0 to 2 percent slopes	Medium	Atterberry (98%)	Soil texture, 0-12 inches (1.00)	1.1	2.4%
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Subaerial (1.00)		
				Organic matter content, 0-30 cm (0.88)		
			Denny (1%)	Soil texture, 0-12 inches (1.00)		
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Subaerial (1.00)		
				Organic matter content, 0-30 cm (0.89)		
			Sable (1%)	Soil texture, 0-12 inches (1.00)		
				Rock fragments, 0-12 inches (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Soil structure grade, 0-12 inches (1.00)		
				Subaerial (1.00)		
				Bulk density-compactibility to 30cm (0.45)		
152A	Drummer silty clay loam, 0 to 2 percent slopes	Low	Drummer, drained (94%)	Soil texture, 0-12 inches (1.00)	15.0	31.9%
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Subaerial (1.00)		
				Bulk density-compactibility to 30cm (0.23)		
			Peotone, drained (3%)	Soil texture, 0-12 inches (1.00)		
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Subaerial (1.00)		
				Organic matter content, 0-30 cm (0.22)		
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	Medium	Drummer, overwash (92%)	Soil texture, 0-12 inches (1.00)	3.7	7.9%
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Subaerial (1.00)		
				Bulk density-compactibility to 30cm (0.82)		
242A	Kendall silt loam, 0 to 2 percent slopes	High	Kendall (92%)	Soil texture, 0-12 inches (1.00)	4.1	8.6%
				Rock fragments, 0-12 inches (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Soil structure grade, 0-12 inches (1.00)		
				Bulk density-compactibility to 30cm (1.00)		
				Organic matter content, 0-30 cm (1.00)		
243B	St. Charles silt loam, 2 to 5 percent slopes	Medium	St. Charles (95%)	Soil texture, 0-12 inches (1.00)	1.9	3.9%
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Subaerial (1.00)		
				Organic matter content, 0-30 cm (0.95)		
278A	Stronghurst silt loam, 0 to 2 percent slopes	Medium	Stronghurst (97%)	Soil texture, 0-12 inches (1.00)	2.2	4.7%
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Organic matter content, 0-30 cm (1.00)		
				Subaerial (1.00)		
			Sable (3%)	Soil texture, 0-12 inches (1.00)		
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Bulk density-compactibility to 30cm (1.00)		
				Subaerial (1.00)		
279A	Rozetta silt loam, 0 to 2 percent slopes	Medium	Rozetta (95%)	Soil texture, 0-12 inches (1.00)	1.3	2.7%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Organic matter content, 0-30 cm (1.00)		
				Subaerial (1.00)		
			Denny (1%)	Soil texture, 0-12 inches (1.00)		
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Subaerial (1.00)		
				Organic matter content, 0-30 cm (0.88)		
310B	McHenry silt loam, 2 to 4 percent slopes	Medium	McHenry (90%)	Soil texture, 0-12 inches (1.00)	4.4	9.3%
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Organic matter content, 0-30 cm (1.00)		
				Subaerial (1.00)		
			Kidder (5%)	Soil texture, 0-12 inches (1.00)		
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Subaerial (1.00)		
				Organic matter content, 0-30 cm (0.91)		
361C2	Kidder loam, 4 to 6 percent slopes, eroded	Medium	Kidder, eroded (95%)	Soil texture, 0-12 inches (1.00)	4.1	8.8%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Organic matter content, 0-30 cm (1.00)		
				Subaerial (1.00)		
			Fox (3%)	Soil texture, 0-12 inches (1.00)		
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Organic matter content, 0-30 cm (1.00)		
				Subaerial (1.00)		
3776A	Comfrey loam, 0 to 2 percent slopes, frequently flooded	Medium	Comfrey (90%)	Soil texture, 0-12 inches (1.00)	6.0	12.8%
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Subaerial (1.00)		
				Bulk density-compactibility to 30cm (0.35)		
			Millington (6%)	Soil texture, 0-12 inches (1.00)		
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Bulk density-compactibility to 30cm (1.00)		
				Subaerial (1.00)		
Totals for Area of Interest					**47.2**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Medium	24.8	52.5%
Low	15.0	31.9%
High	7.4	15.6%
Totals for Area of Interest	**47.2**	**100.0%**

Description

SOH - Soil Health

Soils are rated based on their susceptibility to compaction from the operation of ground-based equipment for planting, harvesting, and site preparation activities when soils are moist. Soil compaction is the process in which soil particles are pressed together more closely that in the original state. Typically, the soil must be moist to be compacted because the mineral grains must slide together. Compaction reduces the abundance mostly of large pores in the soil by damaging the structure of the soil. This produces several effects that are unwanted in agricultural soils since large pores are most effective at transmitting water and air through the soil. Compaction also increases the soil strength which can limit root penetration and growth. The ability of soil to hold water is adversely affected by compaction since the large pores hold water. The degree of compaction of a soil is measured by its bulk density, which is the mass per unit volume, generally expressed in grams per cubic centimeter.

Compacted soils are less favorable for good plant growth because of high soil bulk density and hardness, reduced pore space, and poor aeration and drainage. Root penetration and growth is decreased in compacted soils because the hardness or strength of these soils prevents the expansion of roots. Supplies of air, water, and nutrients that roots need are also less favorable when compaction decreases soil porosity and drainage.

Interpretation ratings are based on soil properties in the upper 12 inches of the profile. Factors considered are soil texture, soil organic matter content, soil structure, rock fragment content, and the existing bulk density. Each of these is thought to contribute to resisting the susceptibility of a soil to compaction when present. Organic matter in the soil provides resistance to compaction and the resilience to ameliorate the effects with time. Soil structure adds strength as discrete aggregates and it is the aggregates that are deformed or destroyed by compactive forces, thus strong soil structure lowers the susceptibility to compaction. Similarly, rock fragments in the soil can bridge and provide a framework to resist compaction. Finally, if a soil is already fairly dense causing further compaction is more difficult.

Definitions of the ratings:

Low - The potential for compaction is insignificant. This soil is able to support standard equipment with minimal compaction. The soil is moisture insensitive, exhibiting only small changes in density with changing moisture content.

Medium - The potential for compaction is significant. The growth rate of seedlings may be reduced following compaction. After the initial compaction (i.e., the first equipment pass), this soil is able to support standard equipment with only minimal increases in soil density. The soil is intermediate between moisture insensitive and moisture sensitive.

High - The potential for compaction is significant. The growth rate of seedlings will be reduced following compaction. After initial compaction, this soil is still able

to support standard equipment, but will continue to compact with each subsequent pass. The soil is moisture sensitive, exhibiting large changes in density with changing moisture content.

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:

Adams, P.W. 1998. Soil Compaction on Woodland Properties. Oregon State University Extension Publication EC 1109.

Adams, P.W. 1981. Compaction of Forest Soils. Oregon State University Extension Publication PNW 217.

Boyer, Don. 1997. Guidelines for Soil Resource Protection and Restoration for Timber Harvest and Post-Harvest Activities. U.S Forest Service, Pacific Northwest Region, Watershed Management.

Geist, J.M.; Hazard, J.W.; Seidel, K.W. 1989. Assessing Physical Conditions of Some Pacific Northwest Volcanic Ash Soils After Forest Harvest. Soil Science Society of America Journal 53:946-950.

Froehlich, Henry A and David H. McNab. 1983. Minimizing Soil Compaction in Pacific Northwest Forests. Proceedings of Sixth North American Forest Soils Conference, University of Tennessee.

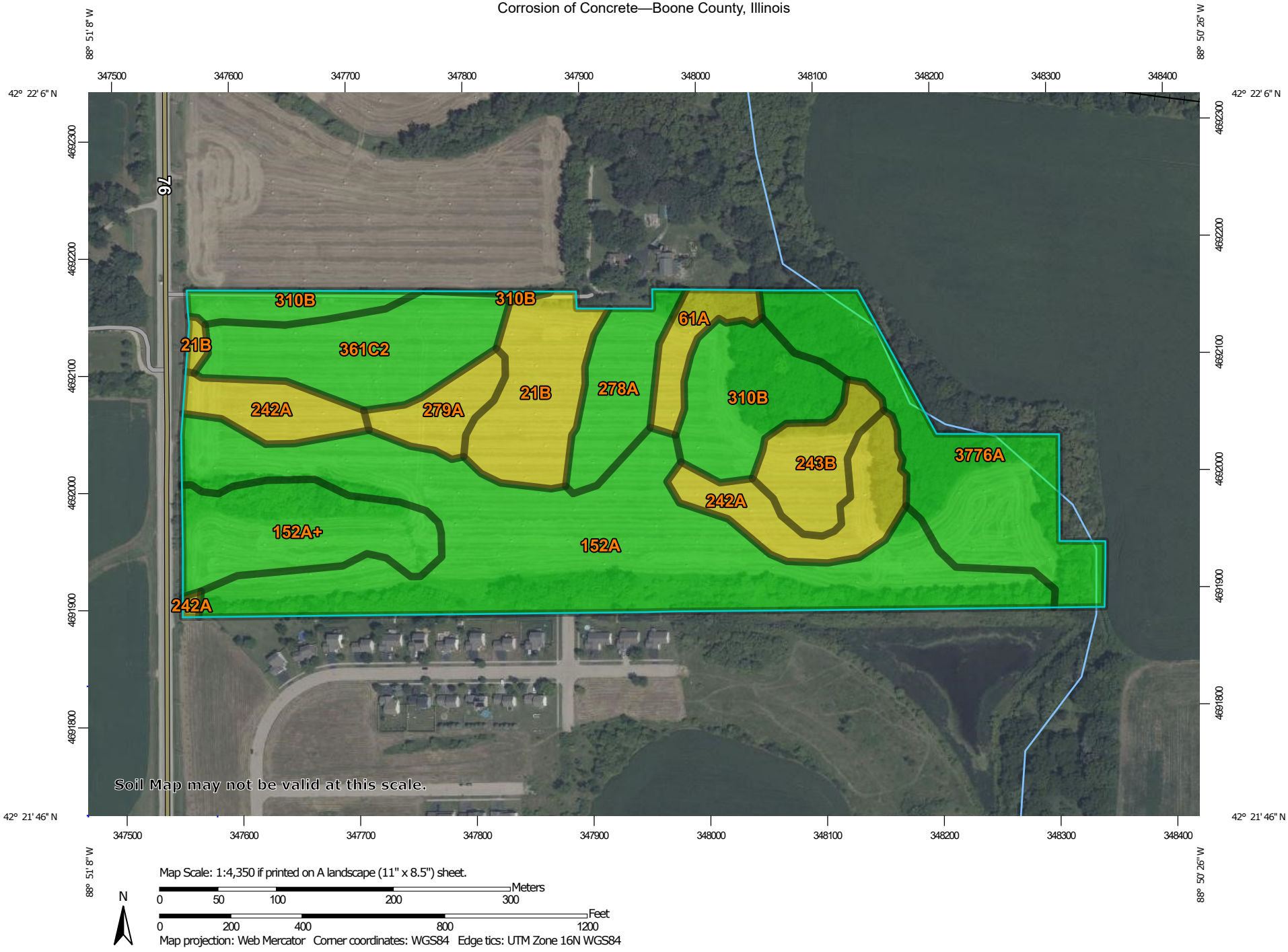
Page-Dumrose, Deborah S. 1993. Susceptibility of Volcanic Ash Influenced Soils in Northern Idaho to Mechanical Compaction. U.S. Forest Service Intermountain Research Station. Research Note INT-409.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



Map Scale: 1:4,350 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

High

Moderate

Low

Not rated or not available

Soil Rating Lines

High

Moderate

Low

Not rated or not available

Soil Rating Points

High

Moderate

Low

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Boone County, Illinois
Survey Area Data: Version 18, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2023—Aug 16, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Corrosion of Concrete

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
21B	Pecatonica silt loam, 2 to 5 percent slopes	Moderate	3.3	7.0%
61A	Atterberry silt loam, 0 to 2 percent slopes	Moderate	1.1	2.4%
152A	Drummer silty clay loam, 0 to 2 percent slopes	Low	15.0	31.9%
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	Low	3.7	7.9%
242A	Kendall silt loam, 0 to 2 percent slopes	Moderate	4.1	8.6%
243B	St. Charles silt loam, 2 to 5 percent slopes	Moderate	1.9	3.9%
278A	Stronghurst silt loam, 0 to 2 percent slopes	Low	2.2	4.7%
279A	Rozetta silt loam, 0 to 2 percent slopes	Moderate	1.3	2.7%
310B	McHenry silt loam, 2 to 4 percent slopes	Low	4.4	9.3%
361C2	Kidder loam, 4 to 6 percent slopes, eroded	Low	4.1	8.8%
3776A	Comfrey loam, 0 to 2 percent slopes, frequently flooded	Low	6.0	12.8%
Totals for Area of Interest			**47.2**	**100.0%**

Description

ENG

Engineering

AGR

Agronomy

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens concrete. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the concrete in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."

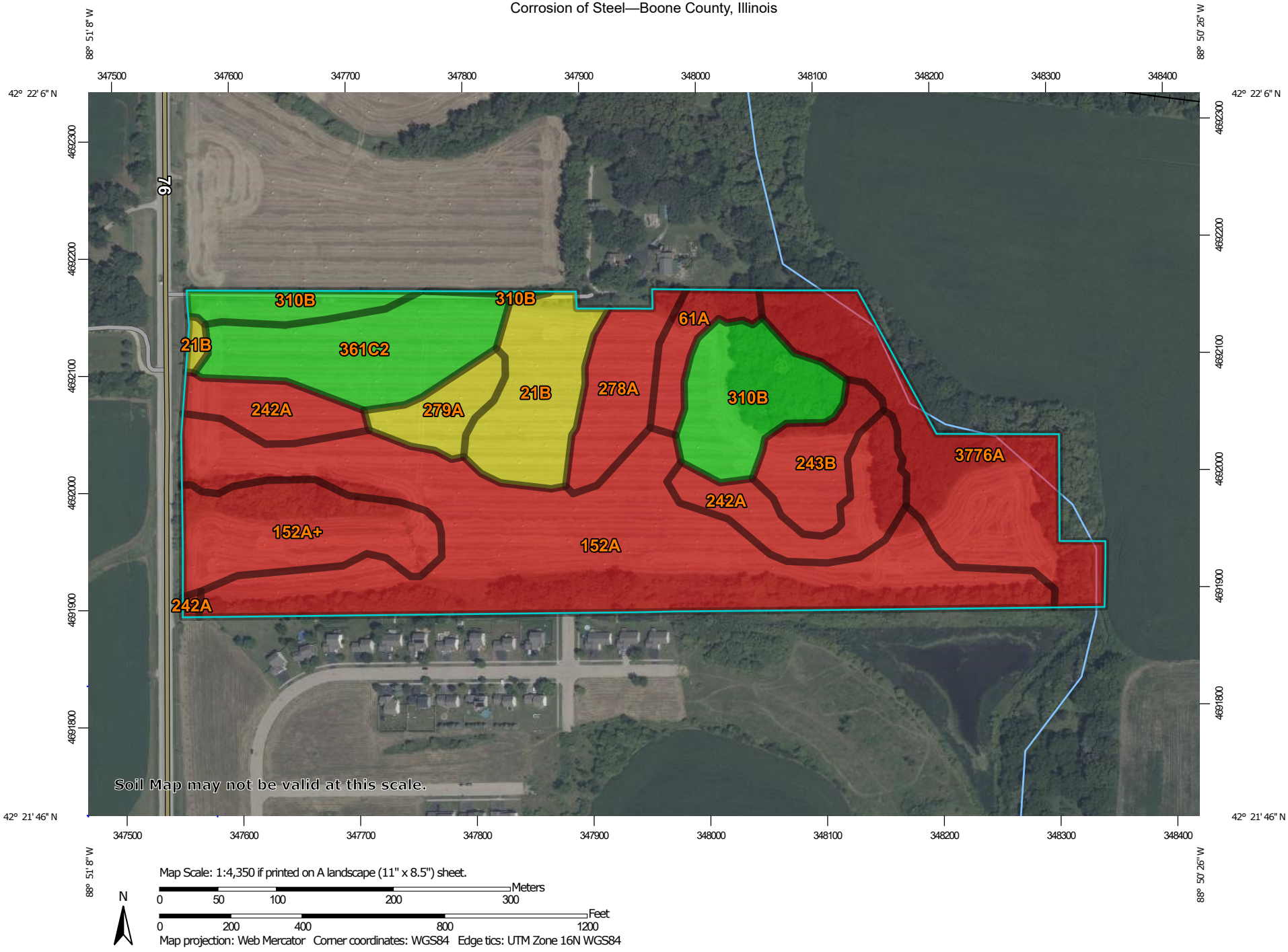
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Corrosion of Steel—Boone County, Illinois



Map Scale: 1:4,350 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

High

Moderate

Low

Not rated or not available

Soil Rating Lines

High

Moderate

Low

Not rated or not available

Soil Rating Points

High

Moderate

Low

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Survey Area Data: Version 18, Aug 21, 2024

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Date(s) aerial images were photographed: Jul 10, 2023—Aug 16, 2023

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Corrosion of Steel

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
21B	Pecatonica silt loam, 2 to 5 percent slopes	Moderate	3.3	7.0%
61A	Atterberry silt loam, 0 to 2 percent slopes	High	1.1	2.4%
152A	Drummer silty clay loam, 0 to 2 percent slopes	High	15.0	31.9%
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	High	3.7	7.9%
242A	Kendall silt loam, 0 to 2 percent slopes	High	4.1	8.6%
243B	St. Charles silt loam, 2 to 5 percent slopes	High	1.9	3.9%
278A	Stronghurst silt loam, 0 to 2 percent slopes	High	2.2	4.7%
279A	Rozetta silt loam, 0 to 2 percent slopes	Moderate	1.3	2.7%
310B	McHenry silt loam, 2 to 4 percent slopes	Low	4.4	9.3%
361C2	Kidder loam, 4 to 6 percent slopes, eroded	Low	4.1	8.8%
3776A	Comfrey loam, 0 to 2 percent slopes, frequently flooded	High	6.0	12.8%
Totals for Area of Interest			**47.2**	**100.0%**

Description

ENG

Engineering

AGR

Agronomy

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."

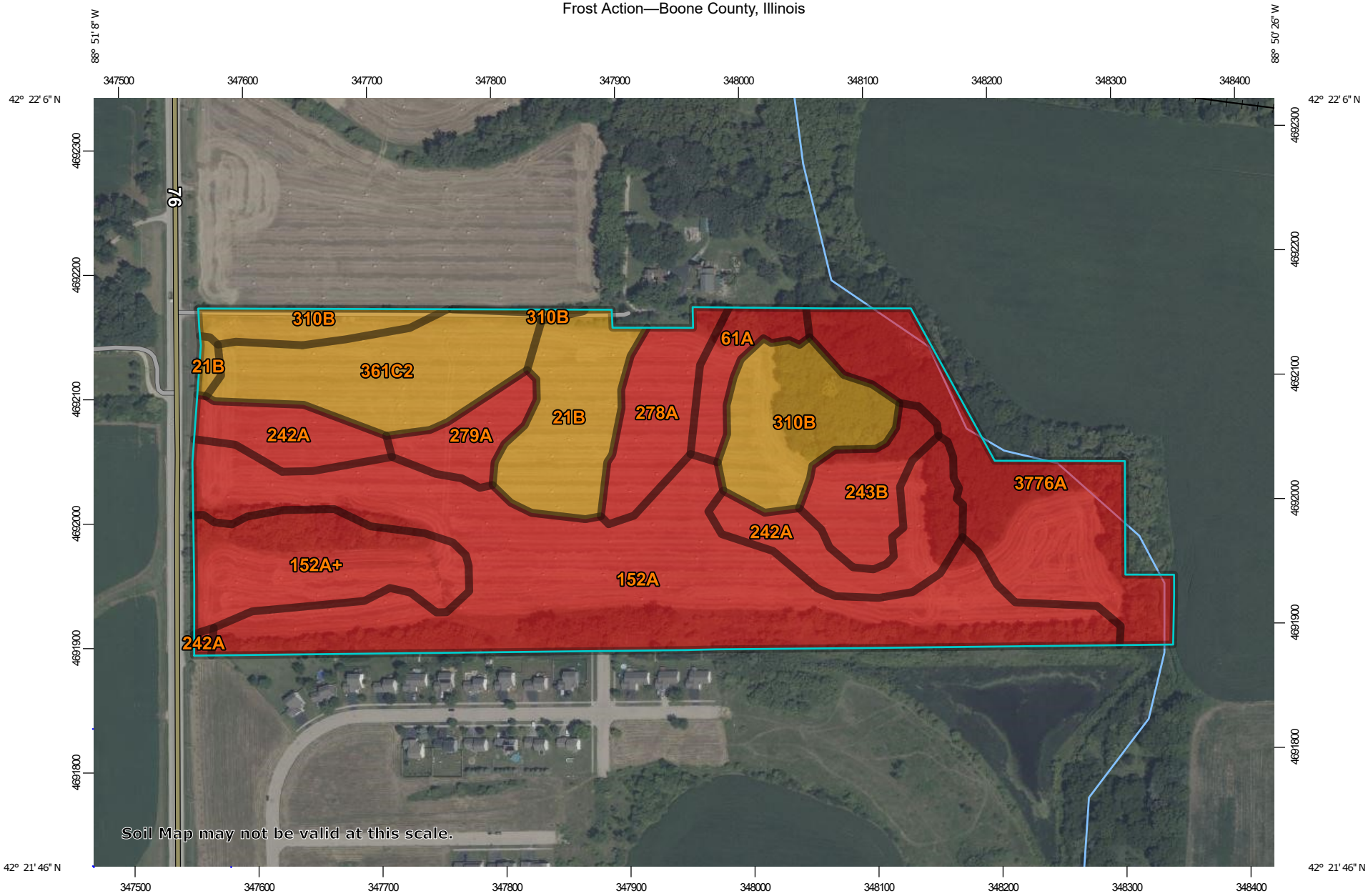
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Frost Action—Boone County, Illinois



Map Scale: 1:4,350 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

High

Moderate

Low

None

Not rated or not available

Soil Rating Lines

High

Moderate

Low

None

Not rated or not available

Soil Rating Points

High

Moderate

Low

None

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Survey Area Data: Version 18, Aug 21, 2024

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Frost Action

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
21B	Pecatonica silt loam, 2 to 5 percent slopes	Moderate	3.3	7.0%
61A	Atterberry silt loam, 0 to 2 percent slopes	High	1.1	2.4%
152A	Drummer silty clay loam, 0 to 2 percent slopes	High	15.0	31.9%
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	High	3.7	7.9%
242A	Kendall silt loam, 0 to 2 percent slopes	High	4.1	8.6%
243B	St. Charles silt loam, 2 to 5 percent slopes	High	1.9	3.9%
278A	Stronghurst silt loam, 0 to 2 percent slopes	High	2.2	4.7%
279A	Rozetta silt loam, 0 to 2 percent slopes	High	1.3	2.7%
310B	McHenry silt loam, 2 to 4 percent slopes	Moderate	4.4	9.3%
361C2	Kidder loam, 4 to 6 percent slopes, eroded	Moderate	4.1	8.8%
3776A	Comfrey loam, 0 to 2 percent slopes, frequently flooded	High	6.0	12.8%
Totals for Area of Interest			**47.2**	**100.0%**

Description

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity (Ksat), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

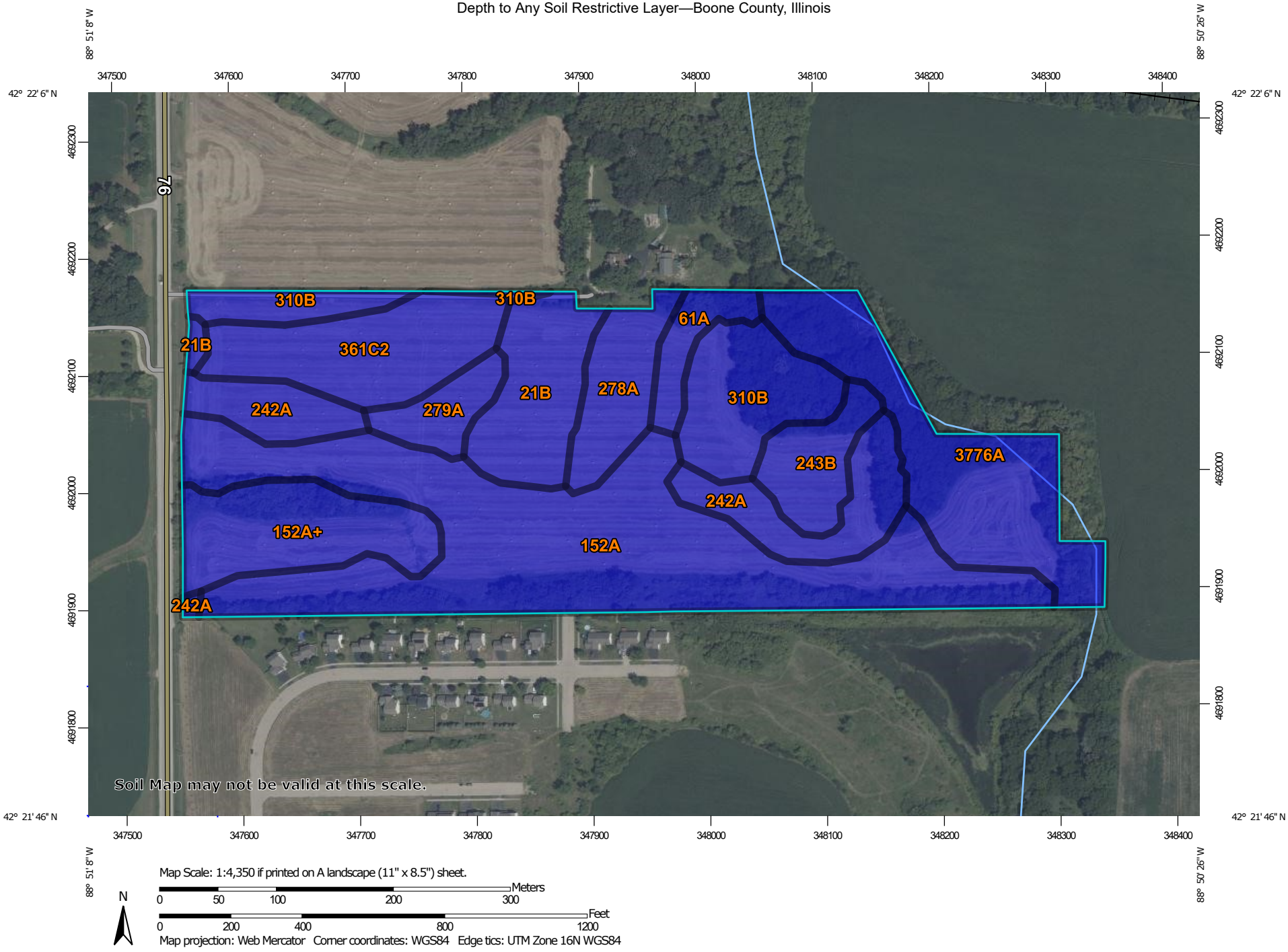
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Depth to Any Soil Restrictive Layer—Boone County, Illinois



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Lines

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Points

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Survey Area Data: Version 18, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2023—Aug 16, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Depth to Any Soil Restrictive Layer

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
21B	Pecatonica silt loam, 2 to 5 percent slopes	>200	3.3	7.0%
61A	Atterberry silt loam, 0 to 2 percent slopes	>200	1.1	2.4%
152A	Drummer silty clay loam, 0 to 2 percent slopes	>200	15.0	31.9%
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	>200	3.7	7.9%
242A	Kendall silt loam, 0 to 2 percent slopes	>200	4.1	8.6%
243B	St. Charles silt loam, 2 to 5 percent slopes	>200	1.9	3.9%
278A	Stronghurst silt loam, 0 to 2 percent slopes	>200	2.2	4.7%
279A	Rozetta silt loam, 0 to 2 percent slopes	>200	1.3	2.7%
310B	McHenry silt loam, 2 to 4 percent slopes	>200	4.4	9.3%
361C2	Kidder loam, 4 to 6 percent slopes, eroded	>200	4.1	8.8%
3776A	Comfrey loam, 0 to 2 percent slopes, frequently flooded	>200	6.0	12.8%
Totals for Area of Interest			**47.2**	**100.0%**

Description

A "restrictive layer" is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers.

This theme presents the depth to any type of restrictive layer that is described for each map unit. If more than one type of restrictive layer is described for an individual soil type, the depth to the shallowest one is presented. If no restrictive layer is described in a map unit, it is represented by the "greater than 200" depth class.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Water Features

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

The *months* in the table indicate the portion of the year in which a water table, ponding, and/or flooding is most likely to be a concern.

Water table refers to a saturated zone in the soil. The water features table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table. The kind of water table, apparent or perched, is given if a seasonal high water table exists in the soil. A water table is perched if free water is restricted from moving downward in the soil by a restrictive feature, in most cases a hardpan; there is a dry layer of soil underneath a wet layer. A water table is apparent if free water is present in all horizons from its upper boundary to below 2 meters or to the depth of observation. The water table kind listed is for the first major component in the map unit.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Report—Water Features

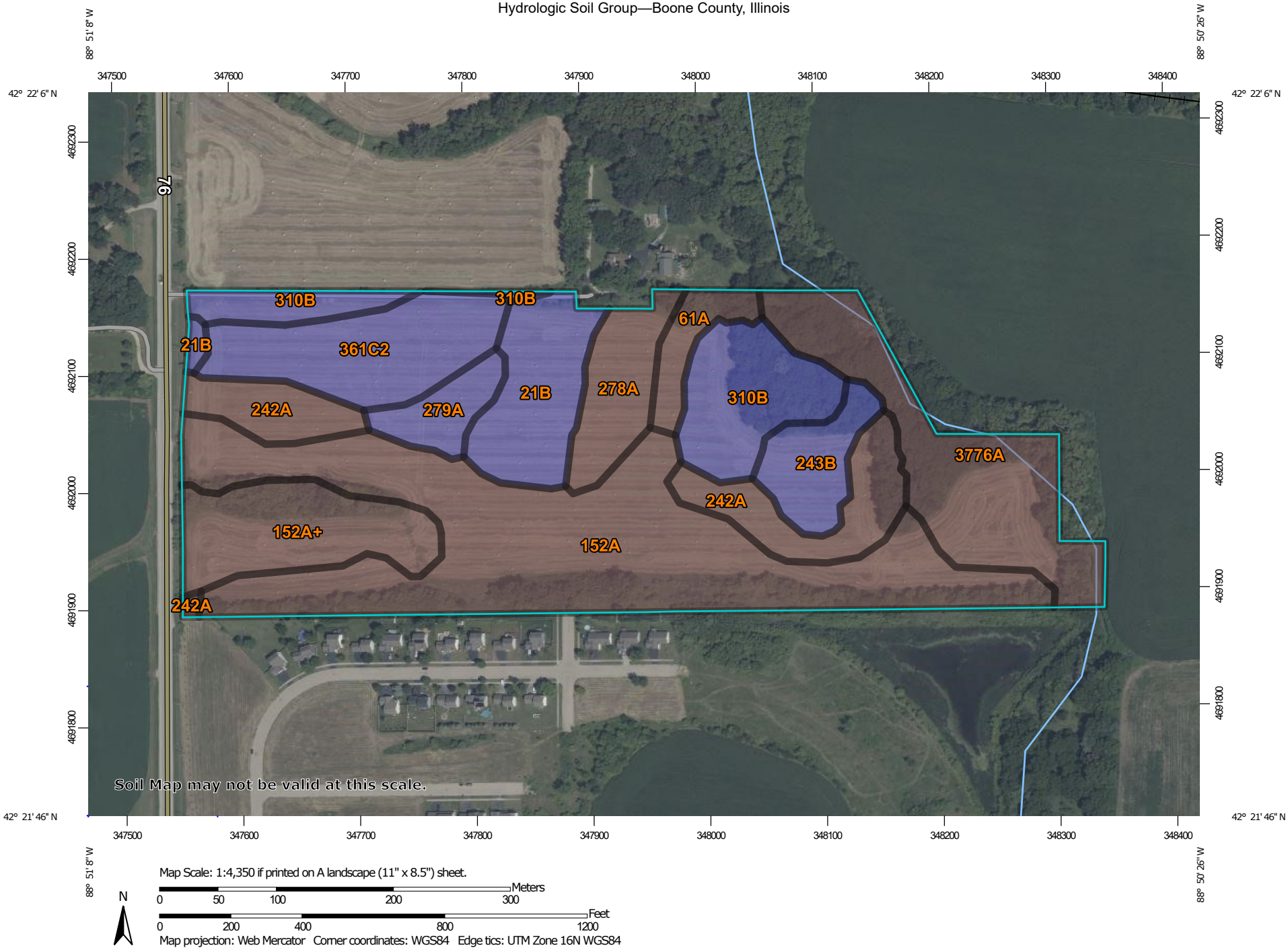
Map unit symbol and soil name	Hydrologic group	Surface runoff	Most likely months	Water table			Ponding			Flooding	
				Upper limit	Lower limit	Kind	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*		*Ft*				
21B—Pecatonica silt loam, 2 to 5 percent slopes											
Pecatonica	B	Low	Jan-Dec	—	—	—	—	—	None	—	None
61A—Atterberry silt loam, 0 to 2 percent slopes											
Atterberry	B/D	Low	Jan-May	0.5-2.0	6.0	Apparent	—	—	None	—	None
			Jun-Dec	—	—	—	—	—	None	—	None
152A—Drummer silty clay loam, 0 to 2 percent slopes											
Drummer, drained	B/D	Negligible	Jan-May	0.0-1.0	6.0	Apparent	0.0-0.5	Brief (2 to 7 days)	Frequent	—	None
			Jun-Dec	—	—	—	—	—	—	—	None
152A+—Drummer silt loam, 0 to 2 percent slopes, overwash											
Drummer, overwash	B/D	Negligible	Jan-May	0.0-1.0	6.0	Apparent	0.0-0.5	Brief (2 to 7 days)	Occasional	—	None
			Jun-Dec	—	—	—	—	—	—	—	None
242A—Kendall silt loam, 0 to 2 percent slopes											
Kendall	B/D	Low	Jan-May	0.5-2.0	6.0	Apparent	—	—	None	—	None
			Jun-Dec	—	—	—	—	—	None	—	None
243B—St. Charles silt loam, 2 to 5 percent slopes											
St. charles	B		Jan-Dec	—	—	—	—	—	None	—	None
278A—Stronghurst silt loam, 0 to 2 percent slopes											
Stronghurst	B/D	Low	Jan-May	0.5-2.0	6.0	Apparent	—	—	None	—	None
			Jun-Dec	—	—	—	—	—	None	—	None

Map unit symbol and soil name	Hydrologic group	Surface runoff	Most likely months	Water table			Ponding			Flooding	
				Upper limit	Lower limit	Kind	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*		*Ft*				
279A—Rozetta silt loam, 0 to 2 percent slopes											
Rozetta	B		Jan	—	—	—	—	—	None	—	None
			Feb-Apr	4.0-6.0	6.0	Apparent	—	—	None	—	None
			May-Dec	—	—	—	—	—	None	—	None
310B—McHenry silt loam, 2 to 4 percent slopes											
Mchenry	B	Low	Jan-Dec	—	—	—	—	—	None	—	None
361C2—Kidder loam, 4 to 6 percent slopes, eroded											
Kidder, eroded	B		Jan-Dec	—	—	—	—	—	None	—	None
3776A—Comfrey loam, 0 to 2 percent slopes, frequently flooded											
Comfrey	B/D	Negligible	Jan-May	0.0-1.0	6.0	Apparent	0.0-0.5	Brief (2 to 7 days)	Frequent	Brief (2 to 7 days)	Frequent
			Jun	—	—	—	—	—	—	Brief (2 to 7 days)	Frequent
			Jul-Oct	—	—	—	—	—	—	—	
			Nov-Dec	—	—	—	—	—	—	Brief (2 to 7 days)	Frequent

Data Source Information

Soil Survey Area: Boone County, Illinois
Survey Area Data: Version 18, Aug 21, 2024

Hydrologic Soil Group—Boone County, Illinois



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Boone County, Illinois
Survey Area Data: Version 18, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2023—Aug 16, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
21B	Pecatonica silt loam, 2 to 5 percent slopes	B	3.3	7.0%
61A	Atterberry silt loam, 0 to 2 percent slopes	B/D	1.1	2.4%
152A	Drummer silty clay loam, 0 to 2 percent slopes	B/D	15.0	31.9%
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	B/D	3.7	7.9%
242A	Kendall silt loam, 0 to 2 percent slopes	B/D	4.1	8.6%
243B	St. Charles silt loam, 2 to 5 percent slopes	B	1.9	3.9%
278A	Stronghurst silt loam, 0 to 2 percent slopes	B/D	2.2	4.7%
279A	Rozetta silt loam, 0 to 2 percent slopes	B	1.3	2.7%
310B	McHenry silt loam, 2 to 4 percent slopes	B	4.4	9.3%
361C2	Kidder loam, 4 to 6 percent slopes, eroded	B	4.1	8.8%
3776A	Comfrey loam, 0 to 2 percent slopes, frequently flooded	B/D	6.0	12.8%
Totals for Area of Interest			**47.2**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

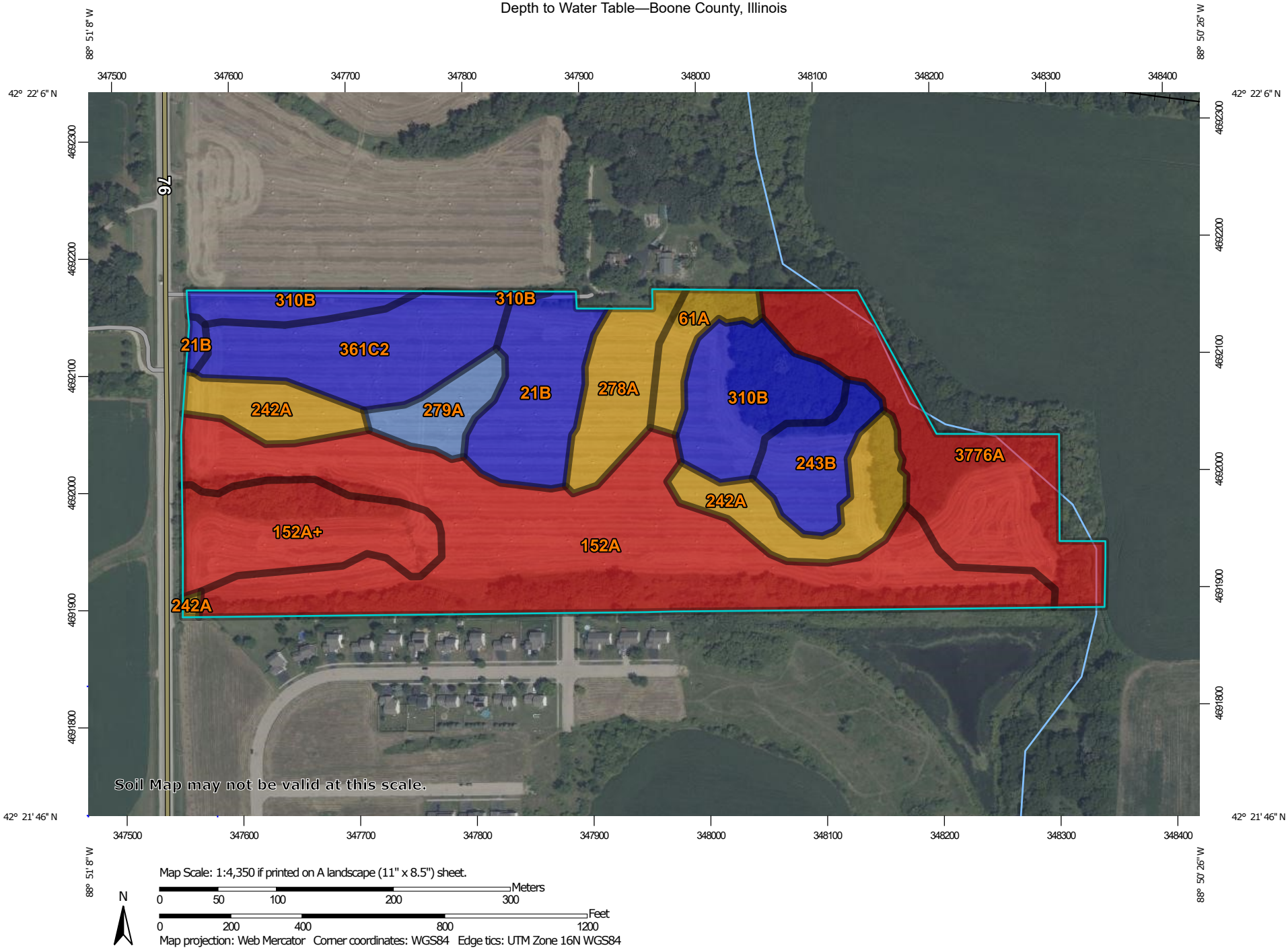
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Depth to Water Table—Boone County, Illinois



Map Scale: 1:4,350 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Lines

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Points

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Boone County, Illinois
Survey Area Data: Version 18, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2023—Aug 16, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Depth to Water Table

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
21B	Pecatonica silt loam, 2 to 5 percent slopes	>200	3.3	7.0%
61A	Atterberry silt loam, 0 to 2 percent slopes	38	1.1	2.4%
152A	Drummer silty clay loam, 0 to 2 percent slopes	15	15.0	31.9%
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	15	3.7	7.9%
242A	Kendall silt loam, 0 to 2 percent slopes	38	4.1	8.6%
243B	St. Charles silt loam, 2 to 5 percent slopes	>200	1.9	3.9%
278A	Stronghurst silt loam, 0 to 2 percent slopes	38	2.2	4.7%
279A	Rozetta silt loam, 0 to 2 percent slopes	153	1.3	2.7%
310B	McHenry silt loam, 2 to 4 percent slopes	>200	4.4	9.3%
361C2	Kidder loam, 4 to 6 percent slopes, eroded	>200	4.1	8.8%
3776A	Comfrey loam, 0 to 2 percent slopes, frequently flooded	15	6.0	12.8%
Totals for Area of Interest			**47.2**	**100.0%**

Description

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

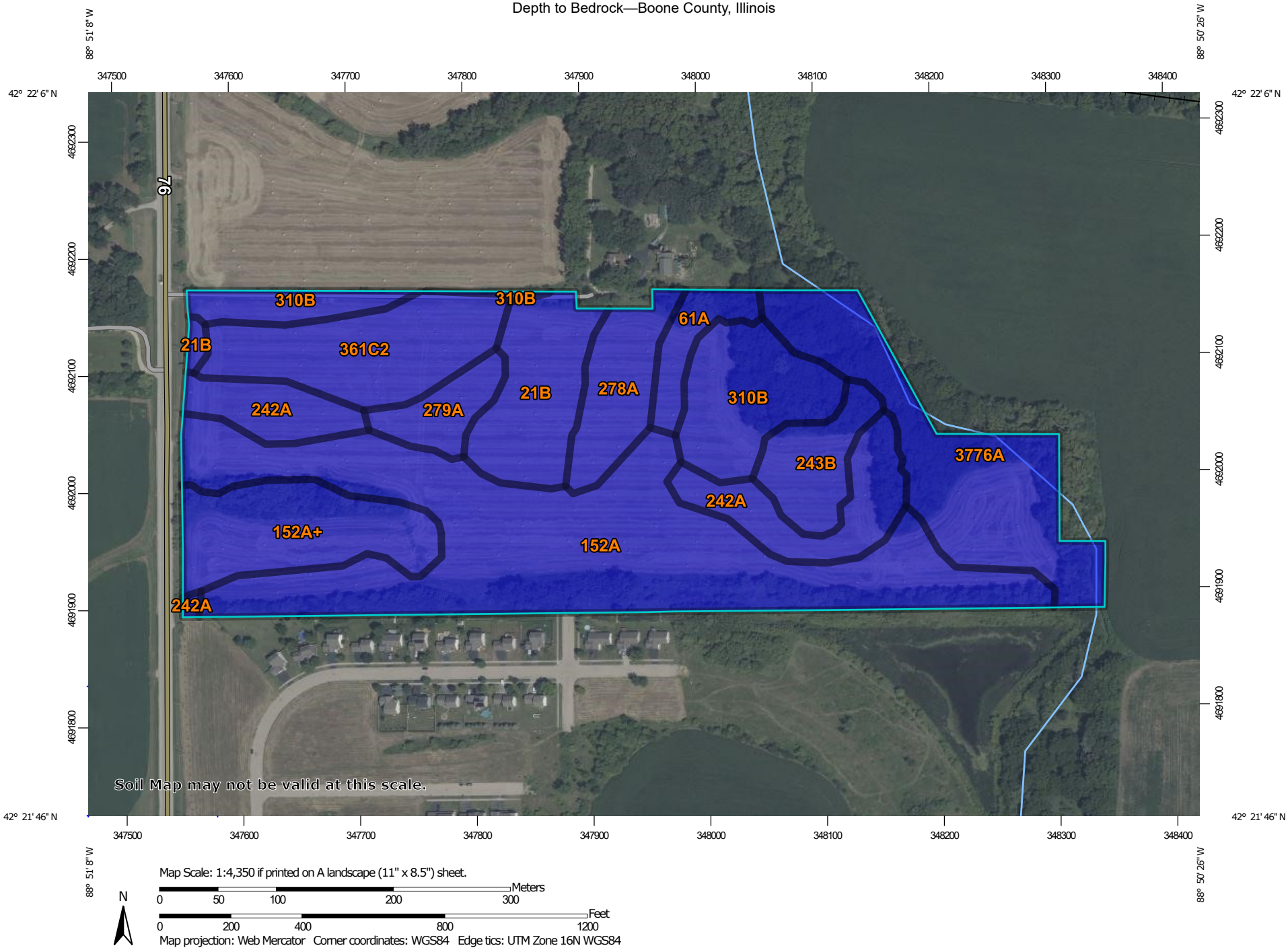
Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

Depth to Bedrock—Boone County, Illinois



Map Scale: 1:4,350 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Lines

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Points

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Boone County, Illinois
Survey Area Data: Version 18, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2023—Aug 16, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Depth to Bedrock

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
21B	Pecatonica silt loam, 2 to 5 percent slopes	>200	3.3	7.0%
61A	Atterberry silt loam, 0 to 2 percent slopes	>200	1.1	2.4%
152A	Drummer silty clay loam, 0 to 2 percent slopes	>200	15.0	31.9%
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	>200	3.7	7.9%
242A	Kendall silt loam, 0 to 2 percent slopes	>200	4.1	8.6%
243B	St. Charles silt loam, 2 to 5 percent slopes	>200	1.9	3.9%
278A	Stronghurst silt loam, 0 to 2 percent slopes	>200	2.2	4.7%
279A	Rozetta silt loam, 0 to 2 percent slopes	>200	1.3	2.7%
310B	McHenry silt loam, 2 to 4 percent slopes	>200	4.4	9.3%
361C2	Kidder loam, 4 to 6 percent slopes, eroded	>200	4.1	8.8%
3776A	Comfrey loam, 0 to 2 percent slopes, frequently flooded	>200	6.0	12.8%
Totals for Area of Interest			**47.2**	**100.0%**

Description

The term bedrock in soil survey refers to a continuous root and water restrictive layer of rock that occurs within the soil profile.

There are many types of restrictions that can occur within the soil profile but this theme only includes the three restrictions that use the term bedrock. These are:

1) Lithic Bedrock

2) Paralithic Bedrock

3) Densic Bedrock

Lithic bedrock and paralithic bedrock are comprised of igneous, metamorphic, and sedimentary rocks, which are coherent and consolidated into rock through pressure, heat, cementation, or fusion. Lithic bedrock represents the hardest type of bedrock, with a hardness of strongly coherent to indurated. Paralithic bedrock has a hardness of extremely weakly coherent to moderately coherent. It can occur as a thin layer of weathered bedrock above harder lithic bedrock. Paralithic bedrock can also be much thicker, extending well below the soil profile.

Densic bedrock represents a unique kind of bedrock recognized within the soil survey. It is non-coherent and consolidated, dense root restrictive material, formed by pressure, heat, and dewatering of earth materials or sediments. Densic bedrock differs from densic materials, which formed under the compaction of glaciers, mudflows, and or human-caused compaction.

If more than one type of bedrock is described for an individual soil type, the depth to the shallowest one is given. If no bedrock is described in a map unit, it is represented by the "greater than 200" depth class.

Depth to bedrock is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: centimeters

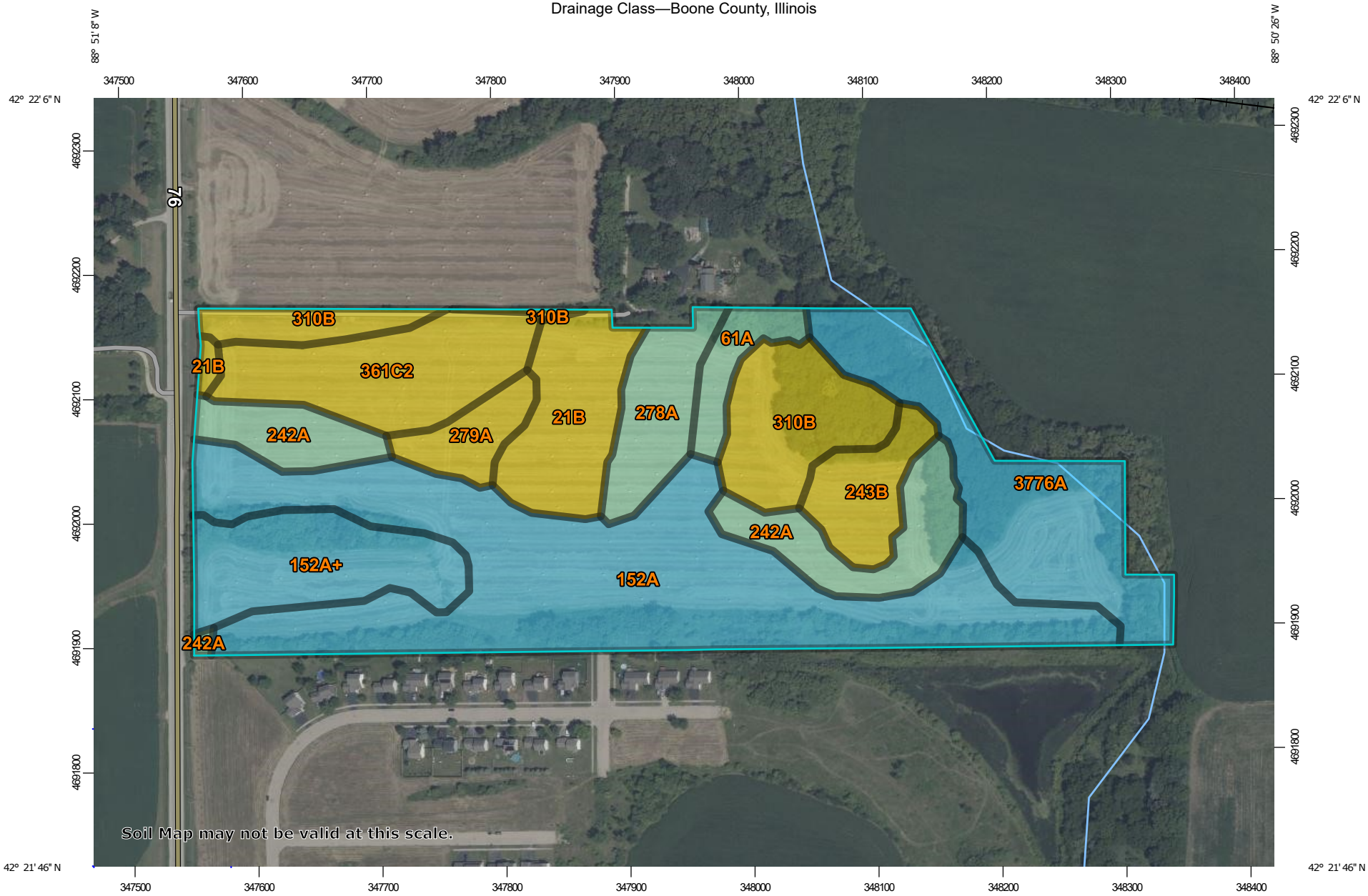
Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Drainage Class—Boone County, Illinois



Map Scale: 1:4,350 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Soil Rating Lines

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Soil Rating Points

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Boone County, Illinois
Survey Area Data: Version 18, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2023—Aug 16, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Drainage Class

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
21B	Pecatonica silt loam, 2 to 5 percent slopes	Well drained	3.3	7.0%
61A	Atterberry silt loam, 0 to 2 percent slopes	Somewhat poorly drained	1.1	2.4%
152A	Drummer silty clay loam, 0 to 2 percent slopes	Poorly drained	15.0	31.9%
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	Poorly drained	3.7	7.9%
242A	Kendall silt loam, 0 to 2 percent slopes	Somewhat poorly drained	4.1	8.6%
243B	St. Charles silt loam, 2 to 5 percent slopes	Well drained	1.9	3.9%
278A	Stronghurst silt loam, 0 to 2 percent slopes	Somewhat poorly drained	2.2	4.7%
279A	Rozetta silt loam, 0 to 2 percent slopes	Well drained	1.3	2.7%
310B	McHenry silt loam, 2 to 4 percent slopes	Well drained	4.4	9.3%
361C2	Kidder loam, 4 to 6 percent slopes, eroded	Well drained	4.1	8.8%
3776A	Comfrey loam, 0 to 2 percent slopes, frequently flooded	Poorly drained	6.0	12.8%
Totals for Area of Interest			**47.2**	**100.0%**

Description

"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

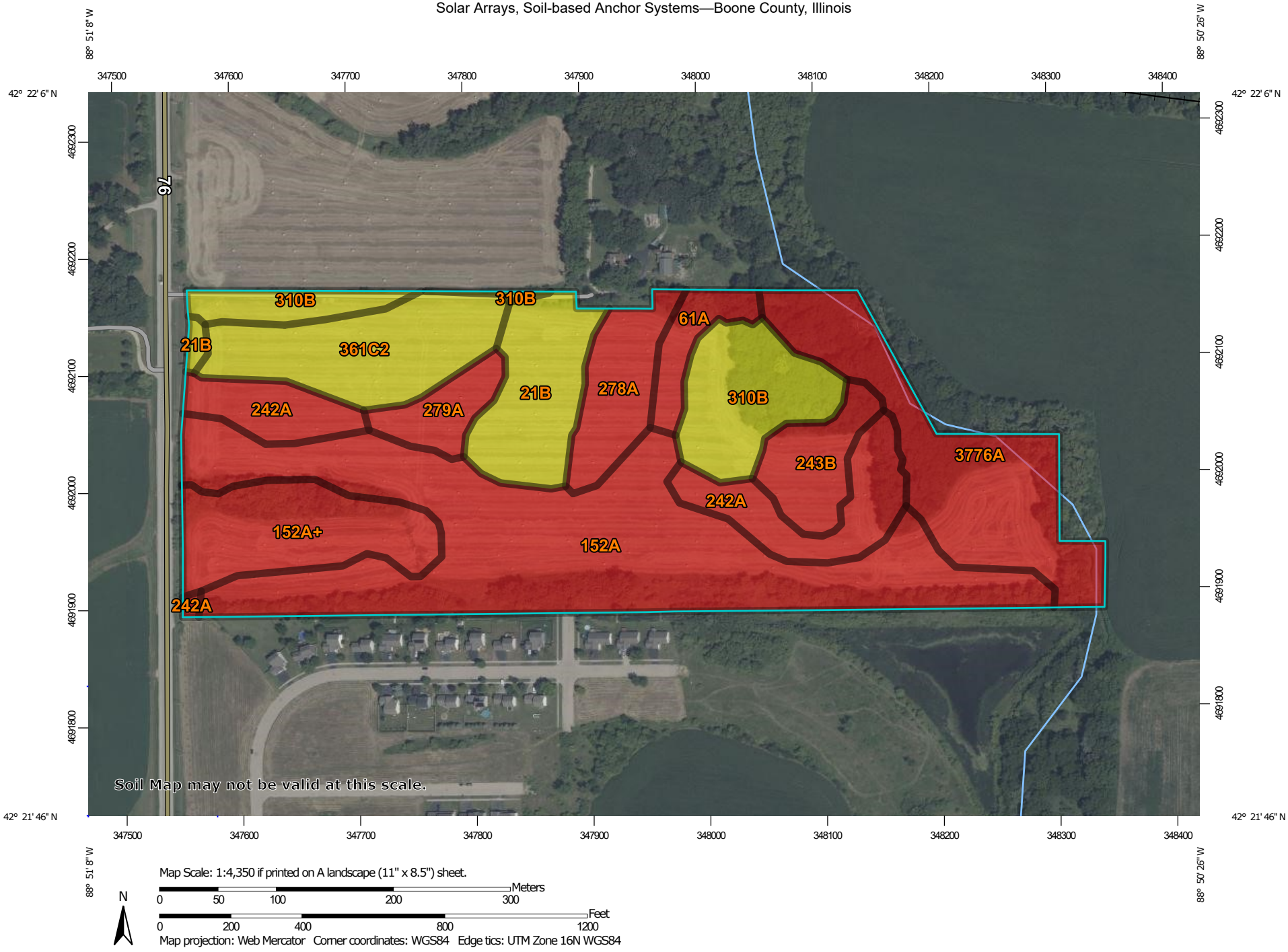
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Solar Arrays, Soil-based Anchor Systems—Boone County, Illinois



Map Scale: 1:4,350 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Lines

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Points

Very limited

Somewhat limited

Not limited

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Boone County, Illinois
Survey Area Data: Version 18, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2023—Aug 16, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

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
21B	Pecatonica silt loam, 2 to 5 percent slopes	Somewhat limited	Pecatonica (90%)	Frost action (0.50)	3.3	7.0%
				Steel corrosion (0.25)		
				Hillslope position (0.25)		
				Slope shape across (0.20)		
				Shrink-swell (0.10)		
61A	Atterberry silt loam, 0 to 2 percent slopes	Very limited	Atterberry (98%)	Frost action (1.00)	1.1	2.4%
				Depth to saturated zone (0.94)		
				Steel corrosion (0.75)		
				Low strength (0.67)		
				Shrink-swell (0.17)		
			Denny (1%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Shrink-swell (0.78)		
				Steel corrosion (0.75)		
			Sable (1%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (0.89)		
				Steel corrosion (0.75)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
152A	Drummer silty clay loam, 0 to 2 percent slopes	Very limited	Drummer, drained (94%)	Ponding (1.00)	15.0	31.9%
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (0.76)		
				Steel corrosion (0.75)		
			Peotone, drained (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Shrink-swell (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
			Harpster, drained (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Steel corrosion (0.75)		
				Low strength (0.72)		
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	Very limited	Drummer, overwash (92%)	Ponding (1.00)	3.7	7.9%
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Steel corrosion (0.75)		
				Low strength (0.64)		
242A	Kendall silt loam, 0 to 2 percent slopes	Very limited	Kendall (92%)	Frost action (1.00)	4.1	8.6%
				Depth to saturated zone (0.94)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Steel corrosion (0.75)		
				Low strength (0.72)		
				Shrink-swell (0.42)		
			Brooklyn (2%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Shrink-swell (1.00)		
				Frost action (1.00)		
				Low strength (0.99)		
			Sable (2%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (0.99)		
				Steel corrosion (0.75)		
			Vesser (2%)	Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Flooding (1.00)		
				Steel corrosion (0.75)		
				Low strength (0.55)		
			Drummer (2%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Steel corrosion (0.75)		
				Low strength (0.53)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
243B	St. Charles silt loam, 2 to 5 percent slopes	Very limited	St. Charles (95%)	Frost action (1.00)	1.9	3.9%
				Low strength (0.75)		
				Steel corrosion (0.75)		
				Hillslope position (0.50)		
				Shrink-swell (0.36)		
278A	Stronghurst silt loam, 0 to 2 percent slopes	Very limited	Stronghurst (97%)	Frost action (1.00)	2.2	4.7%
				Depth to saturated zone (0.94)		
				Low strength (0.83)		
				Steel corrosion (0.75)		
				Shrink-swell (0.42)		
			Sable (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (0.93)		
				Steel corrosion (0.75)		
279A	Rozetta silt loam, 0 to 2 percent slopes	Very limited	Rozetta (95%)	Frost action (1.00)	1.3	2.7%
				Low strength (0.66)		
				Steel corrosion (0.25)		
				Hillslope position (0.25)		
				Shrink-swell (0.14)		
			Denny (1%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Frost action (1.00)		
				Shrink-swell (0.98)		
				Low strength (0.94)		
310B	McHenry silt loam, 2 to 4 percent slopes	Somewhat limited	McHenry (90%)	Frost action (0.50)	4.4	9.3%
				Slope shape across (0.20)		
				Hillslope position (0.13)		
				Low strength (0.05)		
			Kidder (5%)	Frost action (0.50)		
				Slope shape across (0.20)		
				Hillslope position (0.13)		
361C2	Kidder loam, 4 to 6 percent slopes, eroded	Somewhat limited	Kidder, eroded (95%)	Frost action (0.50)	4.1	8.8%
				Slope shape across (0.20)		
				Hillslope position (0.13)		
			Fox (3%)	Steel corrosion (0.75)		
				Frost action (0.50)		
				Slope shape across (0.20)		
				Hillslope position (0.13)		
3776A	Comfrey loam, 0 to 2 percent slopes, frequently flooded	Very limited	Comfrey (90%)	Ponding (1.00)	6.0	12.8%
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Flooding (1.00)		
				Steel corrosion (0.75)		
			Millington (6%)	Ponding (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Flooding (1.00)		
				Steel corrosion (0.75)		
			Houghton (4%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Flooding (1.00)		
				Low strength (1.00)		
Totals for Area of Interest					**47.2**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very limited	35.4	74.9%
Somewhat limited	11.8	25.1%
Totals for Area of Interest	**47.2**	**100.0%**

Description

ENG - Engineering

Ground-based Solar Arrays, Soil-penetrating Anchor Systems

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.

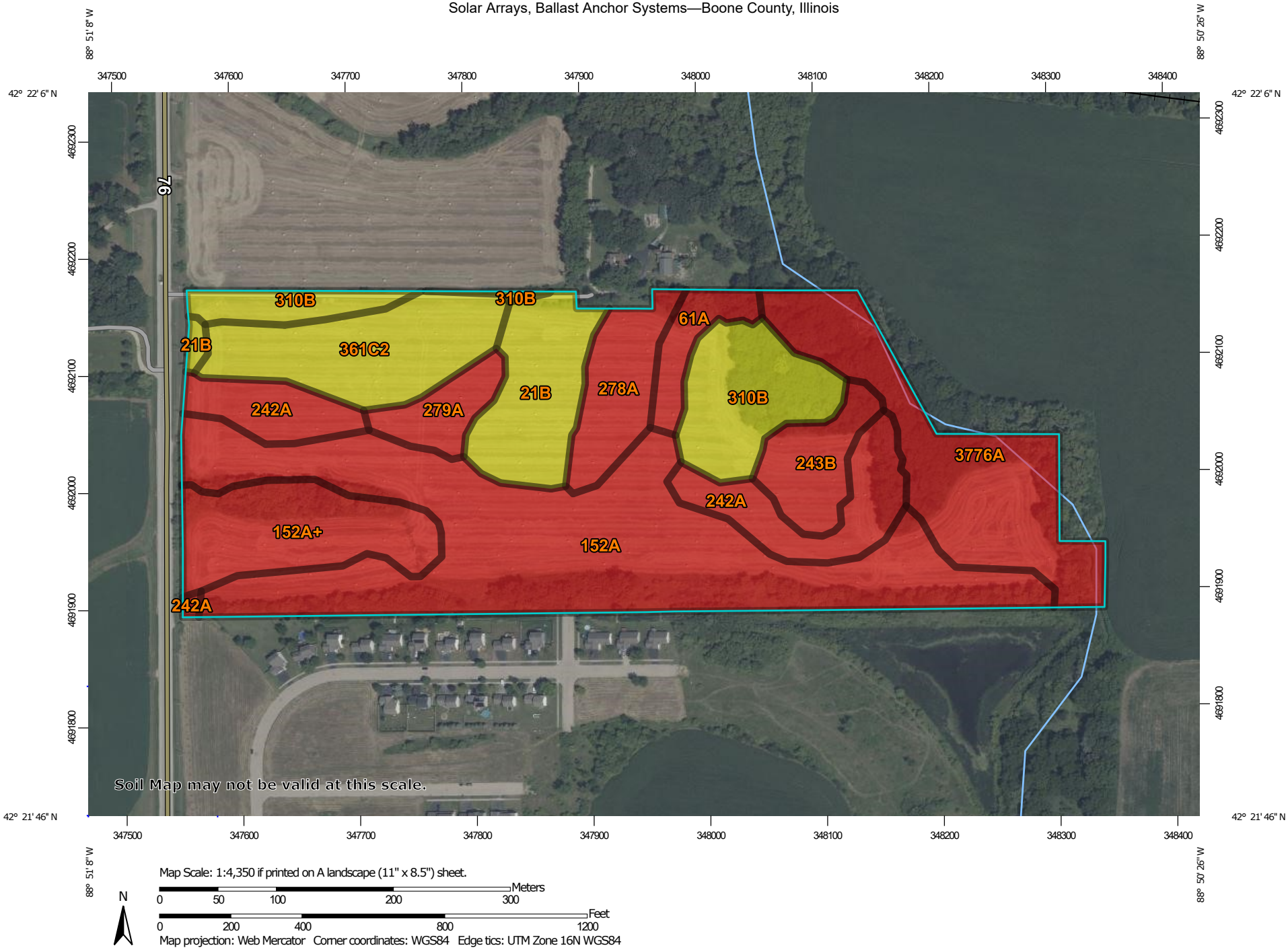
Romanoff, Melvin. 1962. Corrosion of Steel Pilings in Soils. Journal of Research of the National Bureau of Standards. (Volume 66C, No. 3). July/September, 1962.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



Map Scale: 1:4,350 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Lines

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Points

Very limited

Somewhat limited

Not limited

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

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Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Solar Arrays, Ballast Anchor Systems

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
21B	Pecatonica silt loam, 2 to 5 percent slopes	Somewhat limited	Pecatonica (90%)	Frost action (0.50)	3.3	7.0%
				Hillslope position (0.25)		
				Slope shape across (0.20)		
				Low strength (0.01)		
61A	Atterberry silt loam, 0 to 2 percent slopes	Very limited	Atterberry (98%)	Frost action (1.00)	1.1	2.4%
				Depth to saturated zone (0.94)		
				Low strength (0.67)		
			Denny (1%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (0.68)		
				Slope shape across (0.30)		
			Sable (1%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (0.89)		
				Slope shape across (0.30)		
152A	Drummer silty clay loam, 0 to 2 percent slopes	Very limited	Drummer, drained (94%)	Ponding (1.00)	15.0	31.9%
				Depth to saturated zone (1.00)		
				Frost action (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Low strength (0.76)		
			Peotone, drained (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Slope shape across (0.30)		
			Harpster, drained (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (0.72)		
				Slope shape across (0.30)		
152A+	Drummer silt loam, 0 to 2 percent slopes, overwash	Very limited	Drummer, overwash (92%)	Ponding (1.00)	3.7	7.9%
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (0.64)		
242A	Kendall silt loam, 0 to 2 percent slopes	Very limited	Kendall (92%)	Frost action (1.00)	4.1	8.6%
				Depth to saturated zone (0.94)		
				Low strength (0.72)		
				Hillslope position (0.25)		
			Brooklyn (2%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Low strength (0.99)		
				Slope shape across (0.30)		
			Sable (2%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (0.99)		
			Vesser (2%)	Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Flooding (1.00)		
				Low strength (0.55)		
			Drummer (2%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (0.53)		
243B	St. Charles silt loam, 2 to 5 percent slopes	Very limited	St. Charles (95%)	Frost action (1.00)	1.9	3.9%
				Low strength (0.75)		
				Hillslope position (0.50)		
				Slope shape across (0.20)		
			Drummer (5%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Low strength (1.00)		
278A	Stronghurst silt loam, 0 to 2 percent slopes	Very limited	Stronghurst (97%)	Frost action (1.00)	2.2	4.7%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to saturated zone (0.94)		
				Low strength (0.83)		
				Hillslope position (0.25)		
			Sable (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (0.93)		
279A	Rozetta silt loam, 0 to 2 percent slopes	Very limited	Rozetta (95%)	Frost action (1.00)	1.3	2.7%
				Low strength (0.66)		
				Hillslope position (0.25)		
			Atterberry (2%)	Low strength (1.00)		
				Depth to saturated zone (0.94)		
				Hillslope position (0.25)		
			Denny (1%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (0.94)		
				Slope shape across (0.30)		
			Keomah (1%)	Low strength (1.00)		
				Depth to saturated zone (0.94)		
				Hillslope position (0.25)		
			Stronghurst (1%)	Low strength (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to saturated zone (0.94)		
				Hillslope position (0.25)		
310B	McHenry silt loam, 2 to 4 percent slopes	Somewhat limited	McHenry (90%)	Frost action (0.50)	4.4	9.3%
				Slope shape across (0.20)		
				Hillslope position (0.13)		
				Low strength (0.05)		
			Kidder (5%)	Frost action (0.50)		
				Slope shape across (0.20)		
				Hillslope position (0.13)		
361C2	Kidder loam, 4 to 6 percent slopes, eroded	Somewhat limited	Kidder, eroded (95%)	Frost action (0.50)	4.1	8.8%
				Slope shape across (0.20)		
				Hillslope position (0.13)		
			Fox (3%)	Frost action (0.50)		
				Slope shape across (0.20)		
				Hillslope position (0.13)		
3776A	Comfrey loam, 0 to 2 percent slopes, frequently flooded	Very limited	Comfrey (90%)	Ponding (1.00)	6.0	12.8%
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Flooding (1.00)		
				Low strength (0.22)		
			Millington (6%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Flooding (1.00)		
				Low strength (0.07)		
			Houghton (4%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Flooding (1.00)		
				Low strength (1.00)		
Totals for Area of Interest					**47.2**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very limited	35.4	74.9%
Somewhat limited	11.8	25.1%
Totals for Area of Interest	**47.2**	**100.0%**

Description

ENG - Engineering

Ground-based Solar Arrays, Ballast Anchor Systems

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.

Ballast anchor systems can be used in some places where soil-penetrating systems cannot, such as in shallow or stony soil. Also, since they do not penetrate the soil, ballast systems can be used where the soil is contaminated and disturbance is to be avoided. The soil in the area must have sufficient strength to be able to support the vehicles that haul the ballast and the machinery to install it.

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 Arrays" 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 (1.0) 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 Pilings in Soils. Journal of Research of the National Bureau of Standards. (Volume 66C, No. 3). July/September, 1962.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

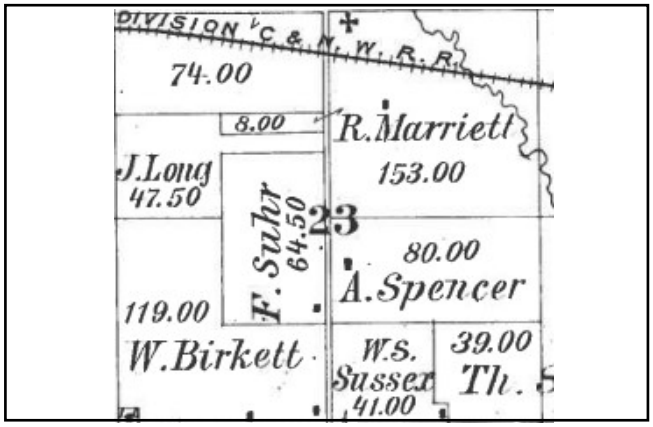
CULTURAL RESOURCES INFORMATION

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 and may choose to collect or disturb a historical property on their own land. However, human remains, grave markers, burial mounds, and artifacts associated with graves and human remains over 100 years old, are protected by state law, regardless of private or public property. If an earth moving activity disturbs human remains, the landowner must contact the county coroner within 48 hours.

The "National Historic Preservation Act" entitles the National Historic Preservation Agency to review zoning, special use permits, and variation petitions for their impact on cultural and historical resources. The applicant is responsible for contacting the Illinois Historic Preservation Agency at 1 (217) 782-4836 or http://www.illinoishistory.gov/.

There appears to be a possible historical structure north of the subject property. Due to the size of the planned project area and to the nature of this project being subject to compliance with State Historic Preservation Agency regulations, a cultural resource review was not conducted by our partnering agencies NRCS Archaeologist. The applicant should contact the Archeology Section, Preservation Services Division, Illinois Historic Preservation Agency, for information about compliance with Federal and State regulation. http://www.state.il/us/hpa/



1886 Historical Plat

1905 Historical Plat

WHAT IS BIOLOGICAL DIVERSITY AND WHY SHOULD IT BE CONSERVED?

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 is 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 several billion years of life’s history on Earth, altered the nature of the atmosphere, the soils and the water of our Planet; and by making possible the sustainability of our planet though their life activities now.” (Raven 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. 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 increases. 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, exacerbating 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 areas, 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 fifteen 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 that 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 planes 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. As part of the Natural Resources Information Report, staff checks office maps to determine if any nature preserves are in the general vicinity 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, storm water management, and groundwater monitoring.

The Illinois Natural Areas Inventory (INAI) sites include high quality natural areas, habitats that support state-listed species, and other important natural features, and are characterized as the best examples of all significant types of natural features remaining in Illinois. While not all INAI sites have the same level of legal protection, it is important to note that many of these sites are part of the Illinois Nature Preserves System and/or support State-listed species and as such, are afforded a high level of protection under State law.

The Illinois Nature Preserves Commission (INPC) assists private and public landowners in protecting high quality natural areas and habitats of state-listed species in perpetuity through dedication or registration of such lands into the Illinois Nature Preserves System. INPC sites include dedicated nature preserves, registered land and water reserves, and designated natural heritage landmarks. Dedicated and registered INPC sites are afforded a high level of ecological protection under state law pursuant to the Illinois Natural Areas Preservation Act (525 ILCS 30) and associated State Administrative Rules (17 IAC Chapter V, Sections 4000, 4010, and 4015).

The Illinois Department of Natural Resources (IDNR) Natural Resource Awareness Tool for Applicators help to determine if there are sensitive areas within a mile and a half of the proposed project area. The IDNR designed the Natural Resources Awareness Tool for Applicators interactive map as an informative tool to bring awareness of the state's many natural resource sensitive areas to assist landowners, producers, and applicators with pre-application planning of herbicides and pesticides, to help prevent and manage off-target drift. No further action is needed. Simply be aware of your surroundings when applying herbicides and pesticides. This combined layer represents approximately 995,000 acres of:

- Illinois Threatened and Endangered Species
- Illinois Nature Preserves Commission Sites
- Illinois Natural Areas Inventory Sites
- IDNR Owned and Managed Properties

IPaC resource list - This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as trust resources) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activity) information. *The following attached report is for informational purposed only and does not constitute an analysis of project level impacts.*

EcoCAT - The SWCD does not provide an IDNR Ecological Compliance Assessment Tool (EcoCAT) Local Government Consultation Request or Information Only Requests as part of the Natural Resource Inventory Report. This tool uses databases, Geographical Information System mapping, and programmed decision rules to determine if a proposed project is in the vicinity of a protected natural resource. These natural resources include protected species, INAI Sites, Land and Water Reserves, and Natural Heritage Landmarks. The information provided in this Natural Resources Inventory report does not supersede the information or findings in an EcoCAT report. To file for an EcoCAT report for the proposed project area, please submit an EcoCat request through the Illinois Department of Natural Resources website.

This property has twenty mapped sensitive resources within a mile and a half of the proposed project area. Sensitive resources, including threatened and endanger species, could be in the area but have not been observed and recorded by the IDNR. If any sensitive resource is suspected on the site, please suspend activities and contact the IDNR immediately for further consolation.

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Boone County, Illinois

Local office

Illinois-Iowa Ecological Services Field Office

(309) 757-5800
(309) 757-5807

Illinois & Iowa Ecological Services Field Office

1511 47th Ave
Moline, IL 61265-7022

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., *placing a dam upstream of a fish population even if that fish does not occur at the dam site*, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Indiana Bat Myotis sodalis Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/5949	Endangered

Birds

NAME	STATUS
Whooping Crane Grus americana No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/758	EXPN

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/9743	Proposed Threatened
Rusty Patched Bumble Bee Bombus affinis Wherever found There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/9383	Endangered

Flowering Plants

NAME	STATUS
Eastern Prairie Fringed Orchid Platanthera leucophaea Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/601	Threatened

Prairie Bush-clover Lespedeza leptostachya Threatened

Wherever found

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/4458

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are Bald Eagles and/or Golden Eagles in your project area.

Measures for Proactively Minimizing Eagle Impacts

For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the National Bald Eagle Management Guidelines. You may employ the timing and activity-specific distance recommendations in this document when designing your project/activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to Bald Eagle Nesting and Sensitivity to Human Activity.

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

If disturbance or take of eagles cannot be avoided, an incidental take permit may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the Do I Need A Permit Tool. For assistance making this determination for golden eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

Ensure Your Eagle List is Accurate and Complete
If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

Review the FAQs
The FAQs below provide important additional information and resources.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental

Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

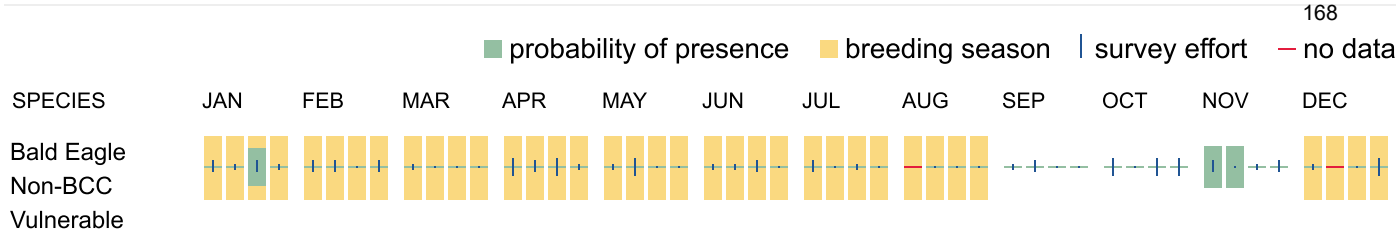
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Bald & Golden Eagles FAQs

What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are an eagle (Bald and Golden Eagle Protection Act requirements may apply).

Proper interpretation and use of your eagle report

On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort line or no data line (red horizontal) means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide you in knowing when to implement avoidance and minimization measures to eliminate or reduce potential impacts from your project activities or get the appropriate permits should presence be confirmed.

How do I know if eagles are breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If an eagle on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your “IPaC PROBABILITY OF PRESENCE SUMMARY” at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

Interpreting the Probability of Presence Graphs

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:

The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Migratory birds

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

Measures for Proactively Minimizing Migratory Bird Impacts

Your IPaC Migratory Bird list showcases birds of concern, including Birds of Conservation Concern (BCC), in your project location. This is not a comprehensive list of all birds found in your project area. However, you can help proactively minimize significant impacts to all birds at your project location by implementing the measures in the Nationwide avoidance and minimization measures for birds document, and any other project-specific avoidance and minimization measures suggested at the link Measures for avoiding and minimizing impacts to birds for the birds of concern on your list below.

Ensure Your Migratory Bird List is Accurate and Complete

If your project area is in a poorly surveyed area, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles document, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

Review the FAQs

The FAQs below provide important additional information and resources.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Black-billed Cuckoo Coccyzus erythropthalmus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Canada Warbler Cardellina canadensis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10

Chimney Swift Chaetura pelagica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Golden-winged Warbler Vermivora chrysoptera This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20
Grasshopper Sparrow Ammodramus savannarum perpallidus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8329	Breeds Jun 1 to Aug 20
Lesser Yellowlegs Tringa flavipes This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Pectoral Sandpiper Calidris melanotos This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Red-headed Woodpecker Melanerpes erythrocephalus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird Euphagus carolinus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

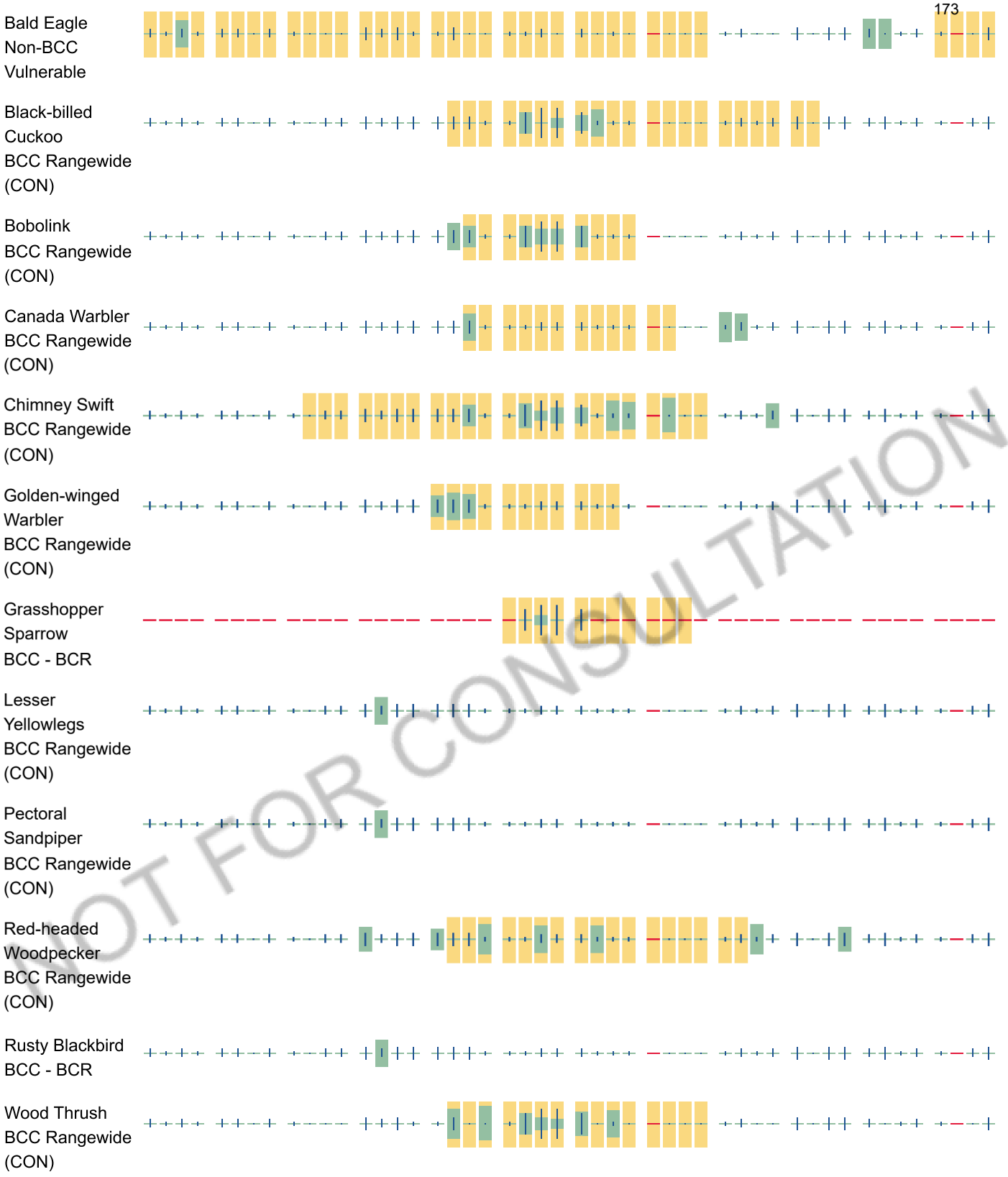
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort – no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC



Migratory Bird FAQs

Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Avoidance & Minimization Measures for Birds describes measures that can help avoid and minimize impacts to all birds at any location year-round. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is one of the most effective ways to minimize impacts. To see when birds are most likely to occur and breed in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location, such as those listed under the Endangered Species Act or the Bald and Golden Eagle Protection Act and those species marked as "Vulnerable". See the FAQ "What are the levels of concern for migratory birds?" for more information on the levels of concern covered in the IPaC migratory bird species list.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) with which your project intersects. These species have been identified as warranting special attention because they are BCC species in that area, an eagle (Bald and Golden Eagle Protection Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, and to verify survey effort when no results present, please visit the Rapid Avian Information Locator (RAIL) Tool.

Why are subspecies showing up on my list?

Subspecies profiles are included on the list of species present in your project area because observations in the AKN for **the species** are being detected. If the species are present, that means that the subspecies may also be present. If a subspecies shows up on your list, you may need to rely on other resources to determine if that subspecies may be present (e.g. your local FWS field office, state surveys, your own surveys).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your IPaC migratory bird

species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your “IPaC PROBABILITY OF PRESENCE SUMMARY” at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Bald and Golden Eagle Protection Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially BCC species. For more information on avoidance and minimization measures you can implement to help avoid and minimize migratory bird impacts, please see the FAQ “Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds”.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Proper interpretation and use of your migratory bird report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list does not represent all birds present in your project area. It is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide implementation of avoidance and minimization measures to eliminate or reduce potential impacts from your project activities, should presence be confirmed. To learn more about avoidance and minimization measures, visit the FAQ "Tell me about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds".

Interpreting the Probability of Presence Graphs
Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:
The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

RIVERINE
R5UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

WATERSHED IMPACTS-DRAINAGE AND RUNOFF

Dramatic changes occur as a watershed is converted from an undeveloped landscape to a more urbanized and developed landscape. This is largely due to changes in ground cover. Areas planted to crops, grass, or other vegetation can absorb a certain percentage of rain and water from melting snow and ice into the ground. A portion of this water becomes groundwater. The water that does not become absorbed into the soil runs across the surface as either sheet flow (or overland flow) or concentrated flow (water that is concentrated into some type of swale, channel, ditch or stream).

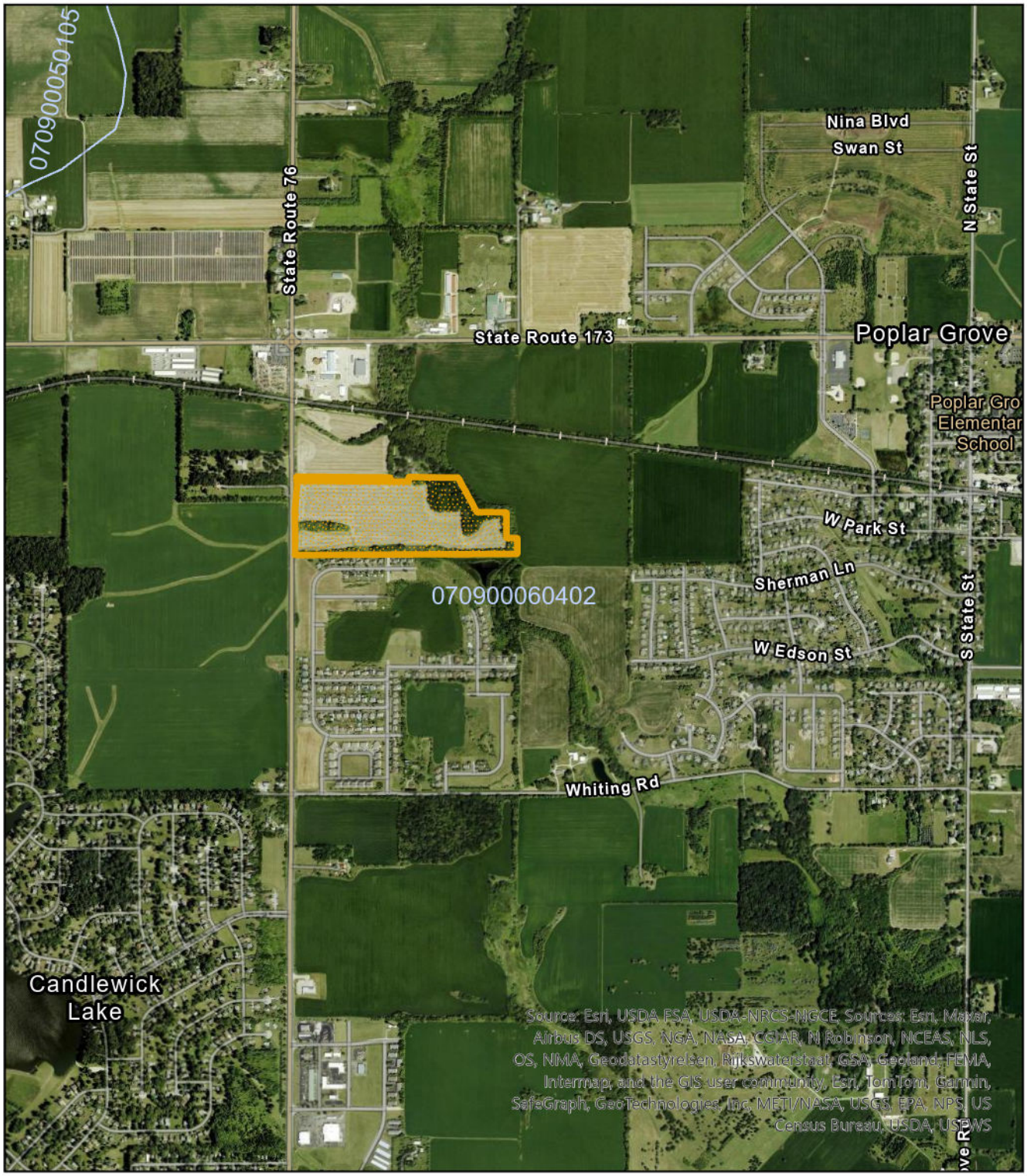
Natural drainage systems develop a complex and interactive system that allows for the conveyance, storage, and overflow of surface water runoff. The various components of this system are continuously adapting to accommodate the current flow conditions. When land is developed, people tend to disrupt one or more components of the natural drainage system. These changes to the drainage system are easily overlooked when development pressures are either just beginning or are few and far between. But, as development pressure expands to encompass more areas of the watershed, the changes become more obvious.

The usual cause and effect resulting from urbanizing land development within a given watershed results in the following conditions:

- There is usually an increase in the volume of surface water runoff being contributed to the watershed. This is typically the result of an increase of impervious surfaces. Impervious surfaces are things like roads, driveways, buildings with rooftops, etc. These impervious surfaces now occupy land area in the watershed that would have absorbed a percentage of the precipitation that falls there.
- The time of concentration is shortened. This means that water gets to the actual stream channel sooner than the water did when it was allowed to flow under natural conditions. Precipitation that falls onto an urbanized portion of a watershed is manipulated to maximize efficient drainage. Beginning with the rain gutter on your roof, rainwater or snowmelt is generally routed offsite and downstream as quickly and efficiently as possible.
- The combined effect of the increased volume of flow and shortened time of concentration causes several reactions including, but not limited to:
    - An increase in magnitude and frequency of severe floods
    - An increased frequency of erosive bank full floods
    - More annual runoff volume as storm flow
    - Less annual runoff volume as base flow
    - More rapid stream water velocities
    - Groundwater recharge may be significantly reduced
    - The watershed system becomes impaired and degraded
- In many areas, land uses are not restricted to the upland portion of the watershed. Urbanized development may also occur in and along the floodplains of streams and rivers in the watershed. Natural floodplains act as buffers by providing storage area for floodwaters. Urbanized development in a floodplain occupies storage area for floodwater, which may cause flood impacts upstream. In addition, those urbanized areas are much more likely to experience flood related damage as well.

This property is located in the Beaver Creek-Kishwaukee River Watershed. Increased stormwater runoff from the site, and soil that erodes from the site, can degrade the water quality of the watershed and the downstream environment.

Report 1791 Watershed: Beaver Creek



0 50 100 200 Miles

NRI 1791 Parcels

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WETLAND AND FLOODPLAIN REGULATIONS

According to the National Wetlands Inventory produced by the U.S. Fish and Wildlife Service, there may be mapped wetlands on the property. If a wetland is discovered, or suspected to be on the property, please contact the appropriate authorities.

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 State of Federal regulatory jurisdiction should apply for agency approvals.

REGULATORY AGENCIES:

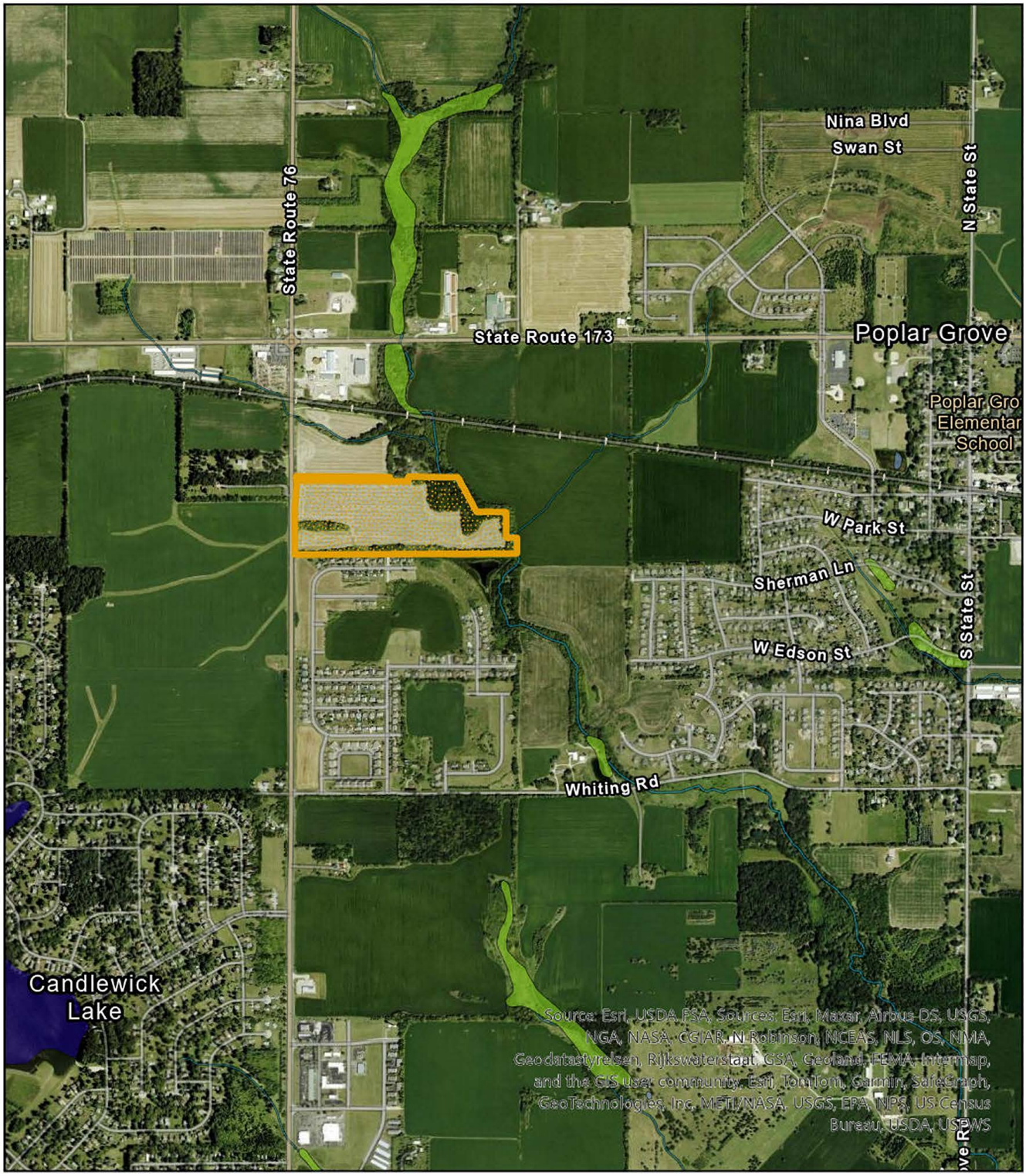
Construction in Flood Plain: Boone County Highway Department 9759 IL-76 Belvidere, IL 61008 Phone: 815-319-4000	***Wetlands or U.S. Waters: U.S. Army Corps of Engineers, Chicago District 111 North Canal Street, Chicago, IL 60606-7206 Phone: 312-353-4117
Flood Plains: Illinois Department of Natural Resources \ Office of Water Resources 201 W. Center Court, Schaumburg, IL 60196-1096 Phone: 847-705-4341	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

***__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.

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 the time required to process necessary approvals.

Report 1791 Wetland Map



0 50 100 200 Miles

NRI 1791 Parcels

Legend

Wetlands

- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/ Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine
- Estuarine and Marine Deepwater

N

FLOOD INSURANCE RATE MAP
(100 Year Floodplain)

Source: Federal Emergency Management Agency/effective September 6, 2006

Floodplains are lands adjacent to streams, rivers and lakes that are immersed when flooding occurs. Rivers and Streams are a part of nature's system for carrying water from high ground down to lakes and oceans. Floodplains are a part of that system and carry large amount of water. Flooding is a natural process, and floodplains are a vital part of that process. Floodplain areas are documented as areas of hazard in Illinois and unwise development in these areas increases property damage and potential loss of life from flooding.

The National Flood Insurance Program (NFIP) was created to slow disaster costs and loss of life and property caused by flooding. The NFIP has four goals: 1) make flood insurance available to the general public, 2) require new buildings be constructed to resist flooding, 3) guide future development away from flood hazard area, and 4) transfer cost of flood losses from taxpayers to floodplain property owners through flood insurance premiums.

Flood insurance is only available to communities participating in the NFIP. Purchasing flood insurance is voluntary except where a person receives federal aid, a mortgage, or other loan for a flood-prone area. Federal law requires flood insurance for all federal assistance and commercial loans to construct, improve or purchase structures located in floodplain area.

Request for assistance could be directed through your local Public Works Department or by contacting:

Illinois Department of Transportation
Division of Natural Resources
Office of Water Resources
1 Natural Resource Way
Springfield, IL 62702-1271
Phone #: 217-782-3862

Federal Emergency Management Agency
Region V
175 W. Jackson, 4th Floor
Chicago, IL 60604
Phone #: 312-408-5541

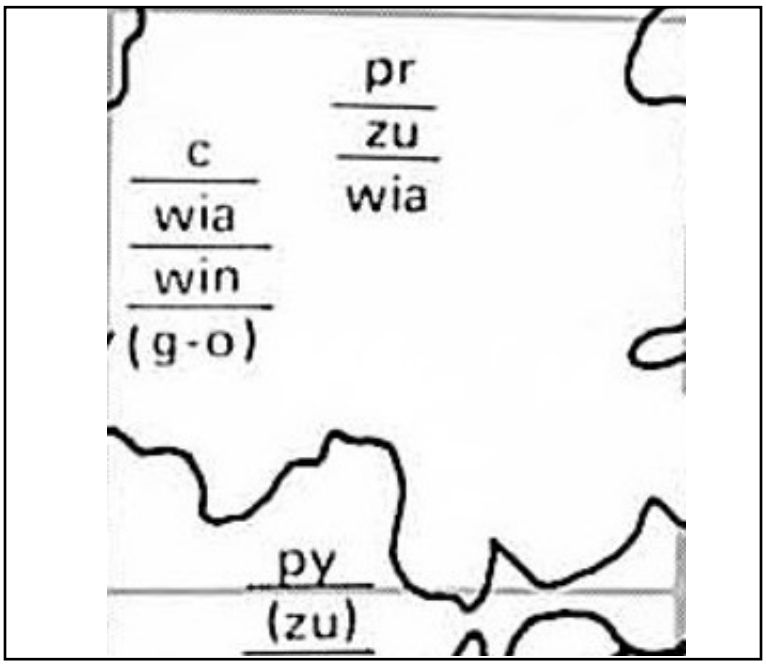
FIRM is the acronym for the Flood Insurance Rate Map, produced by the Federal Emergency Management Agency. These maps define flood elevation adjacent to tributaries and major bodies of water, and superimpose that onto a simplified USGS topographic map. The FIRM map has three zones.

- A is the zone of 100 year flood. Areas subject to inundation by the 1-percent-annual-chance flood event. Because detailed hydraulic analyses have not been performed, no BFEs or flood depths are shown. Mandatory flood insurance purchase requirements apply.
- AE is the A zone with Base Flood Elevations Determined. Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. BFEs are shown within these zones. Mandatory flood insurance purchase requirements apply.
- Zone X is the 100 to 500 year flood or areas outside the 500 year floodplain. Areas identified in the community FIS as areas of moderate or minimal hazard from the principal source of flood in the area. However, buildings in these zones could be flooded by severe, concentrated rainfall coupled with inadequate local drainage systems. Local stormwater drainage systems are not normally considered in the community's FIS. The failure of a local drainage system creates areas of high flood risk within these rate zones. Flood insurance is available in participating communities but is not required by regulation in these zones.

According to the FEMA map, this PIQ is not inside flood plain.

SIGNIFICANCE OF GEOLOGICAL INFORMATION

Geological information is an important component of each NRI report. Maps and reports of statewide scale can provide important information about a specific area's suitability for a given land use. Generalizations about the potential for groundwater contamination, development potential, groundwater recharge, etc. can be made. The local geology is an important element of the natural resource base. Geological information used in this report is taken directly from Geology for Planning in Boone & Winnebago Counties (circular 531. 1984).



Geological Information to a depth of 20 feet

c: Cahokia Alluvium

Mostly poorly sorted sand, silt, and clay (organics locally); deposited by modern rivers and streams on floodplains, in channels, and in places on terraces along the Rock, Pecatonica, and Kishwaukee Rivers and Piscasaw Creek during peak floods; Cahokia Alluvium is always a surficial material.

wia: Argyle Till Member, Winnebago Formation

Pinkish or buff-tan, somewhat compact sandy till up to 30 feet thick; average sand-silt-clay percentage of 53-29-18; illite averages 58 percent; occurs as a surficial unit on much of the upland between the Rock and the Kishwaukee Piscasaw River systems, and generally thin to less than 10 feet on lower slopes; also occurs west of the Rock River in south-central Winnebago County; stratigraphically underlies the Clinton Till and overlies Nimtz Till; ridge tops of Argyle commonly have a strong paleosol overlain by 2 to 5 feet of Peoria Loess and Roxana Silt while side slopes and toe slopes are often eroded and do not have a paleosol; Argyle Till covers more of the surface area than any other till in the Winnebago and Boone County area.

win: Nimtz Till Member, Winnebago Formation

Gray-brown or buff, often compact and hard sandy till usually greater than 25 feet thick; may have platy structure; two textural phases are recognized-one has an average sand-silt-clay percentage of 55-31-14, the other a percentage of 49-31-20; where both phases are present the former overlies the latter; illite averages 70 percent; the till occurs (1) as a surficial unit cropping out beneath Argyle Till along the east valley wall of the Rock River, (2) along the north valley wall of the Kishwaukee River, (3) along Beaver Creek, and (4) north and east of the confluence of the Rock River with the Kishwaukee River; because it occurs downslope in eroded positions, it

commonly lacks a significant loess cover; a paleosol has formed in it; stratigraphically it underlies the Argyle Till and overlies, in numerous places, a sand and gravel unit that in turn overlies tills of the Glasford Formation.

g-o: Glasford Formation Outwash

Generally poorly sorted mixture of sand and gravel between 5 and 15 feet thick; material may have been deposited by the advancing ice that deposited the Esmond or Belvidere Tills immediately to the south; occurs as a surficial unit; most extensive deposits are adjacent to Beaver Creek; stratigraphically it is overlain by the Nimtz Till and underlain by the Belvidere Till of the Glasford Formation; however, the material may be underlain by either bedrock or the Oregon Till.

pr: Peoria Loess and Roxana Silt

Windblown silt 2 to 5 feet thick, generally yellowish brown; occurs on uplands throughout the counties; locally overlain by a thin Parkland Sand deposit east of the Rock River; overlies glacial materials of lllinoian and early Altonian age.

zu: Undifferentiated paleosol, oxidized

Weathered, reddish-brown paleosol formed primarily in till having characteristics of the Sangamon Soil; occurs on surfaces mapped as Winnebago Formation in central and eastern Winnebago County, and in northern Boone County; usually overlain by 2 to 5 feet of loess; its similarity to the Sangamon Soil suggests that it may also be Sangamon Soil, but because correlation is uncertain, the soil is mapped as undifferentiated.

THE GEOLOGIC FRAMEWORK

As glaciers advanced and retreated, the landscape was eroded, reshaped, and modified many times. In northern Boone County and northeastern Winnebago County, glacial drift (interpreted as depth to bedrock), is often more than 100 feet thick, and the topography is primarily controlled by erosion.

The succession of geologic materials that constitutes the framework of Boone and Winnebago Counties can be generally categorized as (1) the Precambrian granite that forms the basement rocks; (2) the sedimentary rock succession (shale, sandstone, and dolomite) of the Cambrian, Ordovician, and Silurian Systems; and (3) the Quaternary material (pebbly clays and sand and gravel). The granite and sedimentary rocks are commonly called bedrock; the Quaternary glacial deposits are often referred to as overburden, unconsolidated materials, or drift.

The glacial deposits consist primarily of: (1) till- pebbly clay, silt, and sand, deposited directly from melting glaciers; (2) outwash- mostly sand and gravel, deposited by the rapidly flowing melt water rivers; (3) lacustrine deposits-silt and clay that settled out in quiet water-lakes and ponds; and (4) loess- windblown sand and silt. Glacial till and outwash are the most prevalent of these materials. In areas of thicker drift, several tills-as well as outwash and lacustrine deposits-may be present.

BEDROCK GEOLOGY

The bedrock formations are important sources of groundwater; those at or near land surface are current or potential sources of rock and mineral products. The Ordovician System is subdivided into four groups in Boone and Winnebago Counties: the Ancell (consisting of the St. Peter and Glenwood Formations), and the Platteville, the Galena, and the Maquoketa.

The uppermost bedrock units over most of Boone and Winnebago Counties are dolomites of the Galena and Platteville Groups. The Platteville Group, which stratigraphically overlies the Glenwood Formation, is a finely crystalline, dense, and partly argillaceous dolomite. Its upper part is often cherty, its lower part is often sandy. The Galena Group is a medium to coarse-grained, partly cherty dolomite. In general, Platteville formations are finer grained and thinner bedded than are the overlying Galena formations and are gray rather than brown; however, some Platteville formations resemble the Galena.

The dolomites of the Galena and Platteville Groups are generally a dependable source of groundwater. Joints, bedding planes, fractures, and solution openings normally provide adequate water for farmsteads or other residents.

Because of their widespread distribution, consistent water-yielding zones, and shallow position, these rocks provide water to more wells than does any other aquifer system in the counties. In some areas, the top of the zone of saturation within the joints and fractures of the dolomite is close to land surface; groundwater can frequently be found under the uplands where there is less than 20 feet of drift. In places where the dolomite is considerably below the top of the zone of saturation, artesian (confined) conditions are likely to exist.

This property has bedrock predicted to be 100 feet below the land surface. The Galena Group Formation is predicted to be the first bedrock unit beneath the surface. This rock unit is a medium to coarse-grained, partly cherty dolomite. It is considered to be a dependable source of groundwater. Joints, bedding planes, fractures, and solution openings normally provide adequate water for farmsteads or other residences. This area is rated as having excessive sensitivity to aquifer contamination.

GLOSSARY

AGRICULTURE PRODUCTION- The growing, harvesting and storing of crops including legumes, hay, grain, fruit and truck or vegetable including dairy, 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.

AEOLIAN – Material accumulated through wind action. Loess and sand dunes are examples.

ALLUVIUM – Loose (unconsolidated) sediments deposited by flowing water.

AQUIFER – Means saturated (with groundwater) soils and geological materials which are sufficiently permeable to readily yield economically useful quantities of water to wells, springs, or streams under ordinary hydrologic gradients.

BEDROCK – Consolidated geologic materials such as limestone, sandstone, shale, granite, basalt, etc. Indicates depth at which bedrock occurs. Also lists hardness as rippable or hard.

COLLUVIUM – Unconsolidated, unsorted earth material that has moved downhill under the force of gravity and has accumulated at the base or lower slopes of hills.

CONSERVATION – The protection and wise use of the forests, rivers, animals, minerals and other natural resources.

DRAIN, TILE – A subsurface tunnel drain consisting of loosely fitting ceramic or plastic pipe sections into which water can flow from saturated soil.

EFFLUENT – Liquid waste from either a septic tank or a sewage treatment plant.

ELUVIAL HORIZON – A soil layer (horizon) formed by the removal of constituents such as clay or iron.

ENDANGERED – Threatened with danger or extinction.

EOLIAN - Affected by wind: carried or produced by the wind.

EROSION – The wearing away of the land surface by water, wind, ice, or other geological agents and by such processes as gravitational creep. It may be natural or a result of activities of man or other animals.

FLOOD PLAIN – Areas adjacent to streams and rivers where floods are likely to occur, unless protected artificially.

FLOODING - The temporary covering of soil surface by flowing water from any source, such as streams overflowing slopes, runoff from adjacent or surrounding slopes, inflow from high tides, or any combination of sources.

FROST ACTION POTENTIAL - 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.

GEOLOGICAL OUTWASH – Geological material moved by glaciers and subsequently sorted and deposited by streams flowing from melting ice. Also called glaciofluvial deposits.

GLACIAL TILL – Unsorted and unstratified geological material deposited directly by glacial ice.

GLACIATION – The process of geological erosion by means of glacial ice.

GROUNDWATER RECHARGE AREA – Where water enters through various earth materials to become part of a groundwater system.

HABITAT FRAGMENTATION – Separation of areas of natural habitat by agricultural or urban development

HILLSLOPE – A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill.

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 Resource Conservation Service 1987)

HYDRIC INCLUSIONS – An inclusion is a soil polygon that is too small to be separated out on maps, and usually encompasses swales or low lying areas within a larger soil polygon.

ILLUVIATION – The process of deposition in lower soil horizons of material eluviated (transported) from upper horizons.

IMPERVIOUS SURFACE – Soil or other surface which water, air, or roots cannot penetrate.

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

LAND EVALUATION AND SITE ASSESSMENT (LESA) - LESA is a systematic approach for evaluating a parcel of land and to determine a numerical value for the parcel for farmland preservation purposes.

LOESS – Wind-transported and deposited material of silt and clay size.

LOW STRENTH – The soils is not strong enough to support loads.

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.

MOTTLING, SOIL - Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance - few, common, and many; size - fine, medium, and coarse, and contrast - faint, distinct, and prominent. The size measurements are of the diameter along the greatest dimension. Fine indicates less than 5 millimeters; medium, from 5 to 15 millimeters; and coarse more than 15 millimeters.

PERMEABILITY - Values listed are estimates of 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.

PONDING–Standing water in a closed depression, which is removed only by percolation, transpiration, or evaporation

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 Soil 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 is found in Bulletin 811 from the University of Illinois at Urbana-Champaign.

RUNOFF – Water that runs off the soil surface instead of infiltrating; the process of running off.

SEASONAL 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. It is at least 6 inches thick, persists in the soil for more than a few weeks, and is within 6 feet of the soil surface. It may be apparent, perched or artesian kinds of water tables.

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.

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.

PERCHED - A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated form a lower one by a dry zone.

SHRINK-SWELL POTENTIAL - Indicates volume changes to be expected for the specific soil material with changes in moisture content, and is related to the type and percentage of clay pre-sent. The expansion and con-traction exerts stress on foundations, footings, and pave surfaces due to the changes in soil moisture conditions.

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 delineation 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 de-scribed in terms of ranges of soil properties within the limits defined for taxa and in terms of ranges of tax adjuncts 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.

SOLUM – The upper and most weathered part of the soil profile; the A, E, and B horizons.

STRATIGRAPHIC SEQUENCE–The order or sequence in which earth materials and geologic events (faults, intrusion) occur through time and space; includes the physical relationship these materials and/or events have with each other.

SUBSURFACE DRAINAGE–A tile conduit below the ground that is designed to remove surplus ground or surface water

SWALES – A linear, but flat depression in the ground surface which conveys drainage water, but offers no impediment to traffic, as do ditches or gutters.

TOPOGRAPHICAL RELIEF – The difference in elevation from one measured point to another.

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 and past land uses.

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.

REFERENCES

Boone County GIS Department
GIS Datasets
1204 Logan Ave.
Belvidere, IL

Boone County Health Department
Private Sewage disposal codes for Boone County
1204 Logan Ave.
Belvidere, IL 61008
Phone #: 815-547-8591

Federal Emergency Management Agency
Floodway Boundary and Floodway Maps
Effective September 6, 2006
175 W. Jackson Street, 4th Floor
Chicago, IL 60604
Phone #: 312-408-5541

Geology for Planning in Boone and Winnebago Counties
Geology information, depth to bedrock and bedrock geology
Illinois State Geological Survey, Circular 531, 1984
R.C. Berg, J.P. Kempton, and A.N. Stecyk

Illinois Department of Natural Resources
Illinois Nature Preserves, Endangered and Threatened Species
1 Natural Resource Way
Springfield, IL 62702
Phone #: 217-782-3862

Land Evaluation Site Assessment System for Boone County, Revised 2012

Region 1 Planning Council/Regional Metropolitan Agency for Planning Boone/Winnebago Greenways Map
313 N Main Street
Rockford, IL 61101
Phone #: 815-319-4180

USDA - Natural Resource Conservation Service
Hydric Soils of the United States
Wetland Inventory Maps
Boone County Soil Survey – Web Soil Survey
USDA Service Center
4833 Owen Center Road
Rockford, IL 61101
Phone #: 815-965-2392, ext. 3

U.S. Army Corps of Engineers – Floodplain Information
Clock Tower Building, Box 2004
Rock Island, IL 61204
Phone #: (309) 794-5369

United State Department of the Interior
Fish and Wildlife Services
National wetlands inventory map, 1987