# VILLAGE OF POPLAR GROVE

"A Great Place to Call Home"

## PLANNING & ZONING COMMISSION

**Tuesday, August 12, 2025 - 6:00 AM**

200 N. Hill Street, Poplar Grove, IL 61065

## AGENDA

**CALL TO ORDER**

**ROLL CALL**

**APPROVAL OF AGENDA**

**APPROVAL OF MINUTES**

1. Motion to approve minutes from the Planning and zoning Commission Meeting July 08, 2025

**PUBLIC COMMENTS:** *(General Comments)*

**OLD BUSINESS**

2. Case 2025-02 The applicant, Inkberry Solar, LLC, PO Box 310, Highland Park, IL 60035 on behalf of the property owner Tahoe Trading Company, LLC 1610 Candlewick Drive SW, Poplar Grove, IL 61065 is requesting a Special Use Permit to install non-building ground mounted solar collectors on the real property with PIN 03-23-200-014 and PIN 03-23-200-017. The property is zoned LI (Light Industrial) and requires a Special Use Permit per section 8-6-11 and 8-5-7 of the Poplar Grove Zoning Code.

**NEW BUSINESS**

**ADJOURNMENT**

# VILLAGE OF POPLAR GROVE

"A Great Place to Call Home"

## PLANNING & ZONING COMMISSION

**Tuesday, July 08, 2025 - 6:00 PM**

200 N. Hill Street, Poplar Grove, IL 61065

## MINUTES

**CALL TO ORDER**

**ROLL CALL**
PRESENT
Chairwomen Jessica Roberts
Commissioner Amy Ekberg
Commissioner Kim Krawczk
Commissioner Nate Sroka
Clerk Karri Miller
Attorney Aaron Szeto
Building Offical Vince Galo
ABSENT
Commissioner Darrell McFarlin
Commissioner Melissa Robinson

**APPROVAL OF AGENDA**
Motion made by Commissioner Krawczk, Seconded by Commissioner Sroka. Motion passed by voice vote.

**APPROVAL OF MINUTES**
1. Motion to approve Planning and Zoning Meeting minutes from November 21, 2024

   Motion made by Commissioner Krawczk, Seconded by Commissioner Sroka. Motion passed by via voice vote.

**PUBLIC COMMENTS:** *(General Comments)*
no public comments

**NEW BUSINESS**

2. case 2025-01 Special Use/Planned Development Amendment – To develop a fifty-lot subdivision of hangar homes at the Poplar Grove Airport located at 11619 Illinois Route 76, Poplar Grove.
2025-01A - The proposed annexation of approximately 3.438 acres of territory, being a portion of PIN 05-01-200-017 into the Village of Poplar Grove, Illinois. Filed by Bel Air Estates, LTD.
2025-01B - An amendment to the existing Special Use/Planned Community Development with Special Use Permit Number 2108-03, regarding the property at 11619 Illinois Route 76, Poplar Grove, Illinois 61065 (commonly known as the Poplar Grove Airport), with PINS: 05-02-200-004, 05-01-100-011, 05-01-300-014, 05-02-200-006 and 05-01-101-010 to allow for the development of fifty (50) residential/Hangar (known as hangar homes) lots per section 8-5-8 of the Village of Poplar Grove Zoning Code. Filed by Bel Air Estates, LTD.

2025-01C - A Map Amendment per section 8-5-5 of the Poplar Grove Zoning Code to change the existing zoning of GB (General Business District) and AG (Agricultural District) to R-2 Single Family Residential two (2) District for a portion of the property at 11619 Illinois Route 76, Poplar Grove, IL 61065, (commonly known as the Poplar Grove Airport) and with PINS: 05-02-200-004, 05-01-100-011, 05-01-300-014, 05-02-200-006 and 05-01-101-010. Filed by Bel Air Estates, LTD.

2025-01D Consider a preliminary and final plat of subdivision per the Village of Poplar Grove Subdivision Ordinance 9-3-3-1 and 9-3-4-1 regarding the property at 11619 Illinois Route 76, Poplar Grove, IL 61065, (commonly known as the Poplar Grove Airport). Filed by Bel Air Estates, LTD.

Public hearing opened at 6:06 pm
Building Official Vince Galo was sworn in at 6:06 pm and gave the staff report
Attorney Gino Galluzzo and Steve Thomas were sworn in at 6:19 pm, gave a brief presentation on what they are asking in the case.
Commissioners asked questions
Public hearing closed at 6:26 pm
Motion made by Commissioner Sroka, Seconded by Commissioner Ekberg to approve 2025-01A.
Voting Yea: Chairwomen Roberts, Commissioner Ekberg, Commissioner Krawczk, Commissioner Sroka
Motion made by Commissioner Ekberg, Seconded by Commissioner Sroka to approve 2025-01B.
Voting Yea: Chairwomen Roberts, Commissioner Ekberg, Commissioner Krawczk, Commissioner Sroka
Motion made by Commissioner Sroka, Seconded by Commissioner Krawczk to approve 2025-01C.
Voting Yea: Chairwomen Roberts, Commissioner Ekberg, Commissioner Krawczk, Commissioner Sroka

Motion made by Commissioner Sroka, Seconded by Commissioner Krawczk to approve 2025-01D

Voting Yea: Chairwomen Roberts, Commissioner Ekberg, Commissioner Krawczk, Commissioner Sroka

3. Case 2025-02 The applicant, Inkberry Solar, LLC, PO Box 310, Highland Park, IL 60035 on behalf of the property owner Tahoe Trading Company, LLC 1610 Candlewick Drive SW, Poplar Grove, IL 61065 is requesting a Special Use Permit to install non-building ground mounted solar collectors on the real property with PIN 03-23-200-014 and PIN 03-23-200-017. The property is zoned LI (Light Industrial) and requires a Special Use Permit per section 8-6-11 and 8-5-7 of the Poplar Grove Zoning Code.

Public hearing opened at 6:35 pm

Building Hearing Vince Galo was sworn in at 6:35 pm and gave the staff report

Representatives for the applicant were sworn in at 6:54pm

Daniel Kelly, owner of Tahoe Trading Company, the landowner.

The applicants presented their case, and their presentations are available for review with the clerk's office and answered questions of the applicant

Public Comment:

Tommy Carpenter: expressed concerns about proposed development plans, specifically the use of farmland for Solar

Dan Smyth: Shared experience as a union carpenter, noting that their first solar farm project was located near the restaurant on Route 173. Stated the project was completed with all-union labor and included significant drainage work. Commented that it was a good example of repurposing farmland. Mentioned speaking with the landowner, who felt the farmland was not highly productive. Expressed the view that the landowner should be able to decide how to use their property, provided it is not being used for harmful purposes. Compared the solar farm favorably to alternative uses such as storing junk or semi-trailers. Noted that some community members do not like the appearance of solar farms, referencing one near Rockford, but personally did not find it objectionable aside from large utility poles.

Zach and Michelle Anderson:

Referenced discussions with attorneys regarding Special Use Permit 857, Section D(2), noting that it requires proof that the project will not negatively impact property values. Stated that research they reviewed indicates property values could decrease by 5–20% when located near solar farms.

Expressed concerns previously raised with the applicant, including visual impact, flooding issues, and drainage problems. Questioned who would want to purchase a home adjacent to a solar farm and submitted an Agriculture Committee report stating solar panels can reduce home values. The document was provided to the Village Clerk for the record.

Suggested that land should be used for a business to promote growth rather than solar development. Stated that taxpayer funds, including local and federal incentives, subsidize the projects. Raised concerns regarding potential electromagnetic field (EMF) exposure from inverters and transformers, citing a lack of long-term studies. Mentioned

possible “heat island” effects and glare issues, as well as the loss of flowers and presence of weeds under existing solar installations.
Reported speaking with a Boone County firefighter about limited availability in certain solar programs. Concluded that nearby residents overwhelmingly oppose the project and believe it will decrease property values, and reiterated the need for proof that values will not decline.
Glen Bird:
stated they live on Tall Grass, one of the closest streets to the proposed solar panels. Expressed concern about decreased property values and opposition to the installation, believing potential buyers would not want to purchase their home if solar panels are nearby
Eduardo Calderon:
Stated he shares the same concerns as his neighbors and is not in favor of the project. Noted that the information he referenced came from several websites.
Mary-ann Whitte:
Stated she does not generally oppose solar energy and noted personal benefits from the solar program, including significant savings. However, expressed opposition to having a solar installation located in close proximity to her neighborhood.
Caitlin and Tyler Wingo:
Expressed concerns about drainage issues and stated they prefer the current open farmland view. Opposed the proposed solar project.
Leanne and Adam Wilcox:
Asked about the expected construction timeline for the project. Expressed concerns about potential fog effects, drainage issues, and who would be responsible for covering related costs. Noted that while they are not entirely opposed to solar energy, they have concerns about property impacts, including visibility of the panels and the effectiveness of proposed tree screening.
Questioned the adequacy of the proposed decommissioning fund, including whether it accounts for inflation over 20–30 years. Raised the possibility that future studies could reveal health or environmental risks from solar farms that are not currently known.
Expressed the view that solar farms are not a selling point for attracting residents, noting there are already two within a 10-mile radius. Stated that neighbors have considered selling their homes due to nearby solar installations, and emphasized that land use should not negatively affect surrounding property owners.
Michelle Burke:
Stated her property backs up to the proposed solar project and expressed opposition to having it in her backyard.
Public hearing closed at 8:30 pm
Commissioners asked questions to the staff
Commissioners want to see the NRI report
Motion made by Commissioner Ekberg, Seconded by Commissioner Krawczk to postpone until August 12, 2025 at 6:00pm.
Voting Yea: Chairwomen Roberts, Commissioner Ekberg, Commissioner Krawczk, Commissioner Sroka

**ADJOURNMENT**

Motion made by Commissioner Krawczk, Seconded by Commissioner Ekberg. Motion passed by voice vote.

The meeting adjourned at 8:47pm

OFFICE & SHIPPING:
2420 Vantage Drive
CORRESPONDENCE:
P.O. BOX 5178
ELGIN, IL 60121-5178

**CONSTRUCTION CODE SERVICES, INC.**
**BUILDING & FIRE PROTECTION PLAN REVIEW**
**TRAINING • INSPECTIONS • CODE CONSULTING**

PHONE (847) 428-7010
FAX (847) 428-3151
TOLL FREE 1-800-232-5523
E-MAIL bfccs@bfccs.org

To: Planning and Zoning Commission Members

From: Kenneth Garrett, Zoning Administrator

Date: June 30, 2025

RE: Special Use – Ground Mounted Solar Collectors

Hearing Date: July 8, 2025 at 6:00 p.m.

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The petitioner is requesting a Special Use Permit to install non-building ground mounted solar collectors on the real property referenced in the below PIN Numbers. The property is Currently Zoned LI (Light Industrial). Non-Building ground mounted solar collectors are permitted in the LI zoning district via through the Special Use Permit Process.
**********

**Adjacent Zoning Districts**

North Light Industrial (LI) - Currently the property is being farmed.
South Single Family Residential 2 R-2 (West Grove Subdivision)
West General Business (GB) Currently vacant land
East Single Family Residential (R-1) Currently vacant land

The proposed project is located at PIN Number 03-23-200-014 and is currently being farmed by the owner. The lot is approximately 46 acres where the applicant will be leasing 20+ acres of the land for the proposed use of solar collectors. Lot 03-23-200-017 (Lot is 1.23 acres and the proposal is to use 0.16 acres) is the access road, which will be widened to 24 feet and then 40 feet once on private property. The proposed enhanced driveway access is to continue with gravel. It is recommended by the Village Engineer the area in the Right-of-Way be asphalt per the ordinance, but there is no objection to a gravel drive on the private property side.

The proposed applicant will lease the property from the owner for 35 years with the ability to extend the lease for 2-five year terms.

Residents and business owners within the Village can subscribe to the solar collectors and receive an approximate 10% reduction in their electrical bill. The subscription is offered to residents and business operators before it will be offered to areas outside the Village.

As stated above the use of the property is Zoned Light Industrial. The light industrial zoning code uses allows for the following permitted uses: Personal or Professional Services, Indoor Repair Sales/Service, Vehicle Related Sales and Service, Daycare Facility, Light Manufacturing/industrial, Self Service Storage Facilities (mini warehouses), Public Parks and Open Space, Utilities and Wireless Communication Facility. Section 8-6-11 allows through the Special Use Process, Non-Building mounted solar collectors for export of energy use by an

electrical utility. In this case, Solar Collectors.

Solar Collectors must still follow the setbacks as outlined in the Light Industrial District as follows:

Front Setback 30 feet
Side Yard 20 feet but not less than a combined 50 feet
Rear Yard 30 feet

The proposed project is in compliance with the above setbacks.

Buffer Yards are required whenever a side or rear yard in the R-5, MH, NB, GB, CB, LI or HI District abuts any RE, R-1, R-2 or R-3 District or any residential use within the Village limits or in any neighboring jurisdiction, a buffer yard shall be required. Buffer Yards shall not be required in front yards.

This proposed project is buffered with existing landscaping and will continued to be farmed which, will aid in the screening during the growing season. The buffer yard shall be at a minimum of 10 feet in width but not greater than 50 feet. There are a number of trees behind the West Grove Subdivision. It is recommended to provide additional screening for the neighbors to screen the areas that are not properly screened. The plan calls for evergreen planting 4-6 feet in height.

Note: The applicant is only leasing a portion of the property with the remaining area still being farmed. The solar portion does not abut the residential neighborhood. There is approximately 271 feet to the nearest solar collector. Consideration has been taken to effectively screen the area.

The Solar collectors are approximately, eight feet in length and four feet in height. They are mounted on a pole device that rotates with the sun. There is an electrical invertor for each collector. The collector receives energy from the sun in a DC format and the invertor converts it from DC power to AC power so it can be run into the electrical grid. The total height from grade to the top of the collector is approximately 9 feet.

There is a farm style fence surrounding the entire area of solar collectors. The fence runs on all 4 sides of the proposed development. The rows of collectors are spaced approximately 26 feet apart. There are 156 collectors in total. The proposal is requesting an eight fence. See attached sample of fencing.

It is the intent of the landowner to continue farming the property around the solar collectors. It is my understanding the farming of the property consists of corn and soybeans. The corn and soybean plantings have an alternate switching pattern between plants during different growing seasons. The owner shall determine how often the crops change location. This will continue during the project. The applicant is requesting a two-year approval of the SUP to begin construction. This is in order to be able to apply for State of Illinois Adjustable Block Program in August for renewable energy credits contract. They are required to have in place proper zoning before applying.

The distance from the lot line off of route 76 to the collector/investors is 231 feet and to the Electrical Equipment is 252 feet.

The solar collector equipment does produce a low level of noise. It is similar to a refrigerator level. It is silent at night. All noise levels must comply with the noise standards of the Illinois Pollution Board.

Application for the Boone County Soil and water Conservation District has not been approved as of the writing of this report.

The Fire District is in the process of the reviewing this project as of the writing of this report they have not made a recommendation.

Security Measures are in place to monitor the site. There is a gate that either will have an electronic pad or is operated with a key for access. This is for maintenance staff only. There will be a knox box for emergency for the Fire District to gain access.

**Recommendation:** Should the Planning Zoning Committee recommend approval of the project, staffs recommends the following conditions be adhered to:

1. Approval from the Illinois Department of Transportation be received prior to issuing any Building Permits.
2. Approval from the Boone County Soil and Water Conservation District be received prior to issuing any Building Permits.
3. Approval from the Fire District be received prior to issuing any Building Permits.
4. Additional screening shall be provided as needed adjacent to the West Grove Subdivision.
5. The drive access located in the right of way be improved with asphalt.
6. The Village Enginners Report and recommendations shall be followed.
7. A decommissioning and reclamation plan shall be submitted to and approved by the Village of Poplar Grove prior to commencement of the development.
8. A surety bond covering the complete execution of the decommissioning and reclamation plan for when the project ends shall be posted prior to the commencement of the development.

Should you have any questions regarding this report feel free to contact me at your convenience.

Respectfully Submitted,

Kenneth Garrett
Zoning Administrator – Village of Poplar Grove

McMAHON
ENGINEERS ARCHITECTS

June 27, 2025

Mr. Ken Garrett
Building and Zoning Official
B&F Construction Code Services Inc.
2400 Vantage Drive
Elgin, IL 60124

Via Email Only

*Re: Proposed Inkberry Solar Farm*
*Special Use Permit (SUP) Application Review*

Dear Ken:

Please allow this to acknowledge receipt of the following:

- Application for Special Use Permit for a 2 MWac solar farm on PIN Numbers 03-23-200-014 and 03-23-200-17, consisting of 65 pages.

We have reviewed the same and provide the following comments for Village consideration:

- We strongly recommend that historical records for drain tile be provided for review. Much of Boone County's farmlands contain drain tile, and cutting through an existing tile can impact tributary field(s) that are far away from the point where the tile is severed.
- We recommend that the Village require pollinator friendly landscape features, along with a maintenance bond to help ensure that the applicant establish and maintain the landscaping (or the bond could be used to construct improvements to manage runoff if the vegetation is not established or maintained).
    - The American Society of Civil Engineers conducted hydrologic studies of solar farms to determine if there is increased runoff volume, or a notable increase in peak runoff rate. The study was published in the *Journal of Hydrologic Engineering* in May of 2013, and found that there is little increase in runoff volume or rate *if* the panels are placed on vegetated fields, and the vegetation is maintained. It is therefore very important to properly establish and maintain the vegetation, otherwise storm water detention will be necessary.
    - We recommend that the periodic vegetation inspection reports be provided to the Village.
- Permits from IDOT will be required for the site access driveway(s).
- We recommend that the portion of the access driveway(s) within the public right of ways are paved. Access driveways on private property may be aggregate.
- We would like to understand what the applicant has in mind for the vegetative screening along the south side of the panel field. Please provide additional information and/or a detailed drawing.
- We recommend that the applicant provide at least a preliminary decommissioning plan, as well as an opinion of probable cost. A decommissioning bond should be included as a condition of the SUP.

- There is a drainage ditch located along the northerly property line of West Grove Subdivision with known drainage issues. The Village anticipated that the issues would be resolved concurrently with the development of the parcel to the north, and while at the time the Village probably didn't envision the property to the north developing as a solar farm the drainage issues should nonetheless be addressed concurrently with this project. The "fix" that was envisioned years ago anticipated the property to the north developing as an industrial use and included widening the drainage easement, installing storm sewers to manage high frequency rainfall events (i.e., 10-year storm and more frequent storms) and create a swale over the storm sewer to manage the low frequency storm events (i.e., any storm greater than the 10-year event). Given the fact that the proposed development is a solar farm with the panels located 250'+ from the property line, we think there is an easier, less costly fix. We'd suggest that a new ditch be created on the solar farm property along its southern property line. Spoils from the new ditch could then be utilized to fill the existing ditch. The new ditch could be made wider w/ 4:1 side slopes so that it can be maintained, and the new ditch should be protected by a drainage easement.

Please do not hesitate to contact me at (815) 636-9590 with any questions, or if I may be of further assistance.

Yours very truly,

McMAHON

Christopher D. Dopkins, P.E.
Associate/Village Engineer

Cc: Ms. Kristi Richardson, Village President
Mr. David Howe, Director of Public Works
Mr. Aaron Szeto, Village Attorney
File

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To: Planning and Zoning Commission Members

From: Kenneth Garrett, Zoning Administrator

Date: June 30, 2025

RE: Inkberry Solar Special Use - Finding of Facts

Hearing Date: July 8, 2025 at 6:00 p.m.

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**Findings of Fact**
Per section 8-5-7(D) of the Village of Poplar Grove Zoning Ordinance, the criteria for granting a Special Use Permit are as follows:

1. The establishment, maintenance or operation of the special use would not be detrimental to or endanger the public health, safety, morals, comfort or general welfare.

   *The Proposed ground mounted solar collectors is a non-manned facility and the only traffic is from maintenance personal. Based on the fact, that other potential uses of this site would be more impactful then a solar farm, the Special Use would not be detrimental or endanger the public health, safety, morals, comfort or general welfare.*

2. The special use would not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted or substantially diminish or impair property values within the neighborhood.

   *The current zoning code allows commercial and industrial uses as permitted uses with no public hearing required. The Proposed Use of the property does not affect adjacent and or other properties within the vicinity of this site. The lack of personnel and truck traffic further verifies the minimal impact to the area and does not effect property values.*

3. The establishment of the special use will not impede the normal or orderly development and improvements of the surrounding property for uses permitted in the district.

   *The proposed improvement of the solar collectors will not impede the normal or orderly development of other properties in the area. The area between the*

*nearest homes and solar collectors will continue to be farmed. Collectors are more than 200 feet away from the rear lot line of the adjoining neighbors.*

4. Adequate utilities, access roads, drainage and/or necessary facilities will be provided.

   *The improvement does include additional utility poles along route 76. An expansion of the roadway into the site will be constructed. Any electrical equipment installed as part of the project for the solar collectors will be in excess of 200 feet except for the utility poles and lot lines. Any drainage concerns will be addressed by the Village Engineer in his review.*

5. Adequate measures have been taken to provide ingress or egress so designed as to minimize traffic congestion in the public streets.

   *As stated above in number 4, an enlarged access road will be installed along route 76. There will no traffic impact after the project is constructed. Of course, during construction there may be minimum impact on route 76.*

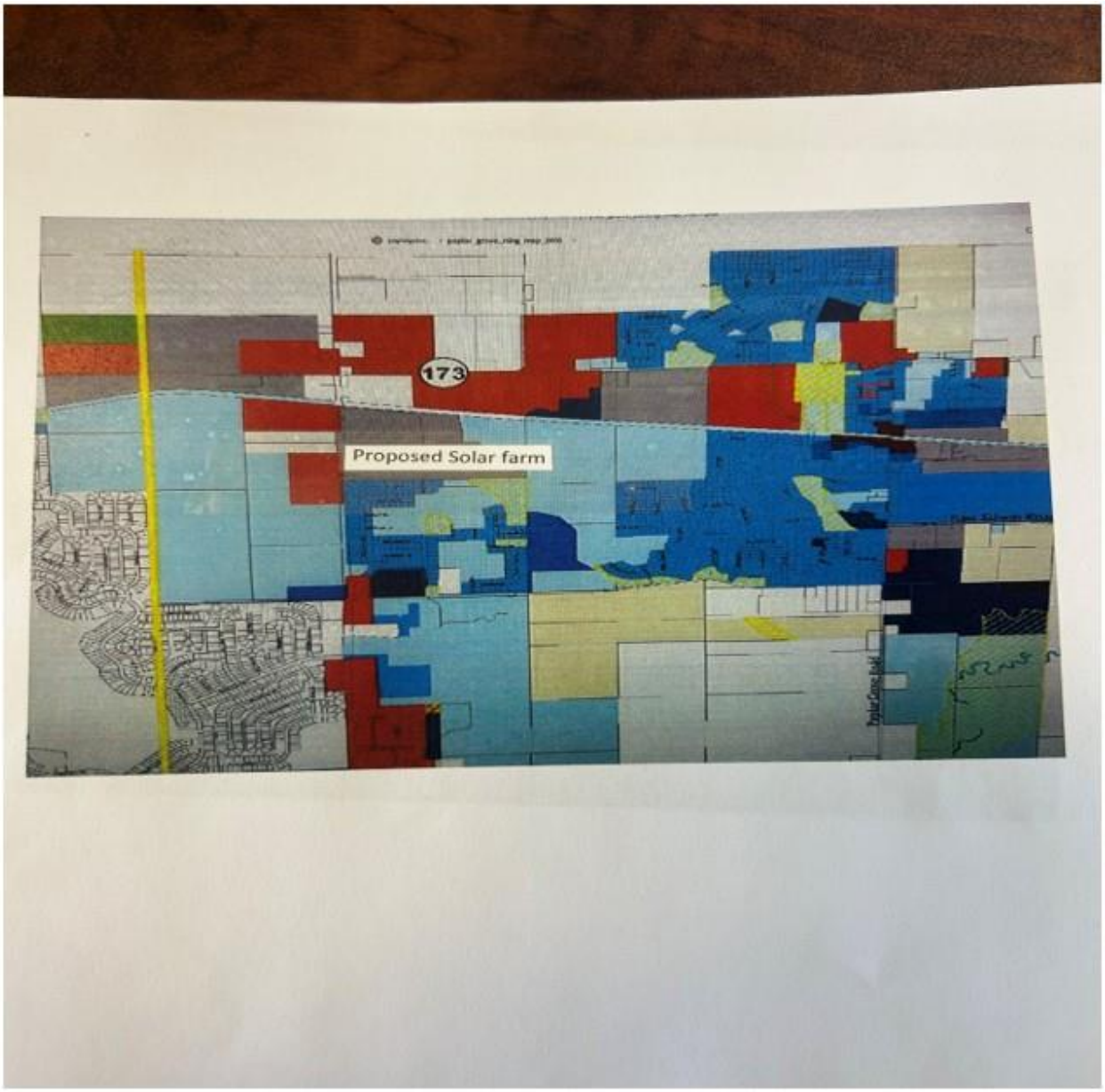
6. The special use shall, in all other respects, conform to the applicable regulations of the districts in which it is located.

   *The landscape buffer will be enhanced with evergreens as necessary. Although, the majority of the site is screened with existing trees to the residential neighborhood. The area between the solar collectors and rear yard of the residences shall continue to be farmed thereby further reducing the impact to the residents. All other regulations will be in compliance.*

Should you have any questions regarding this report feel free to contact me at your convenience.

Respectfully Submitted,

Kenneth Garrett
Zoning Administrator – Village of Poplar Grove


173
Proposed Solar farm

Proposed Fence

# Vegetation Installation and Management Plan for Inkberry Solar, LLC

Prepared June 2025 by:

## Contents

# 1. Inkberry Solar, LLC Vegetation Management Plan (VMP) Overview

## 1.1. Site Owner

Inkberry Solar, LLC
PO Box 310
Highland Park, IL 60035
312.882.3713

## 1.2. Vegetation Restoration Consultant

Natural Resource Services, Inc
2885 Quail Road NE
Sauk Rapids, MN 56379
320.290.5363

and

16425 W. State Route 90 Princeville, IL
61559

### 1.3. Project Description

The proposed Inkberry Solar project is planned for approximately 20 acres of land in Boone County, Illinois. Tracker-style panels with approximately 30-36" ground clearance at max tilt are planned. The site will be planted with a fully-native pollinator mix appropriate for a solar site. Vegetative screening is planned on the west side using 4-6 ft native prairie grasses and on portions of the south side using evergreen trees.

### 1.4. VMP Use and Objectives

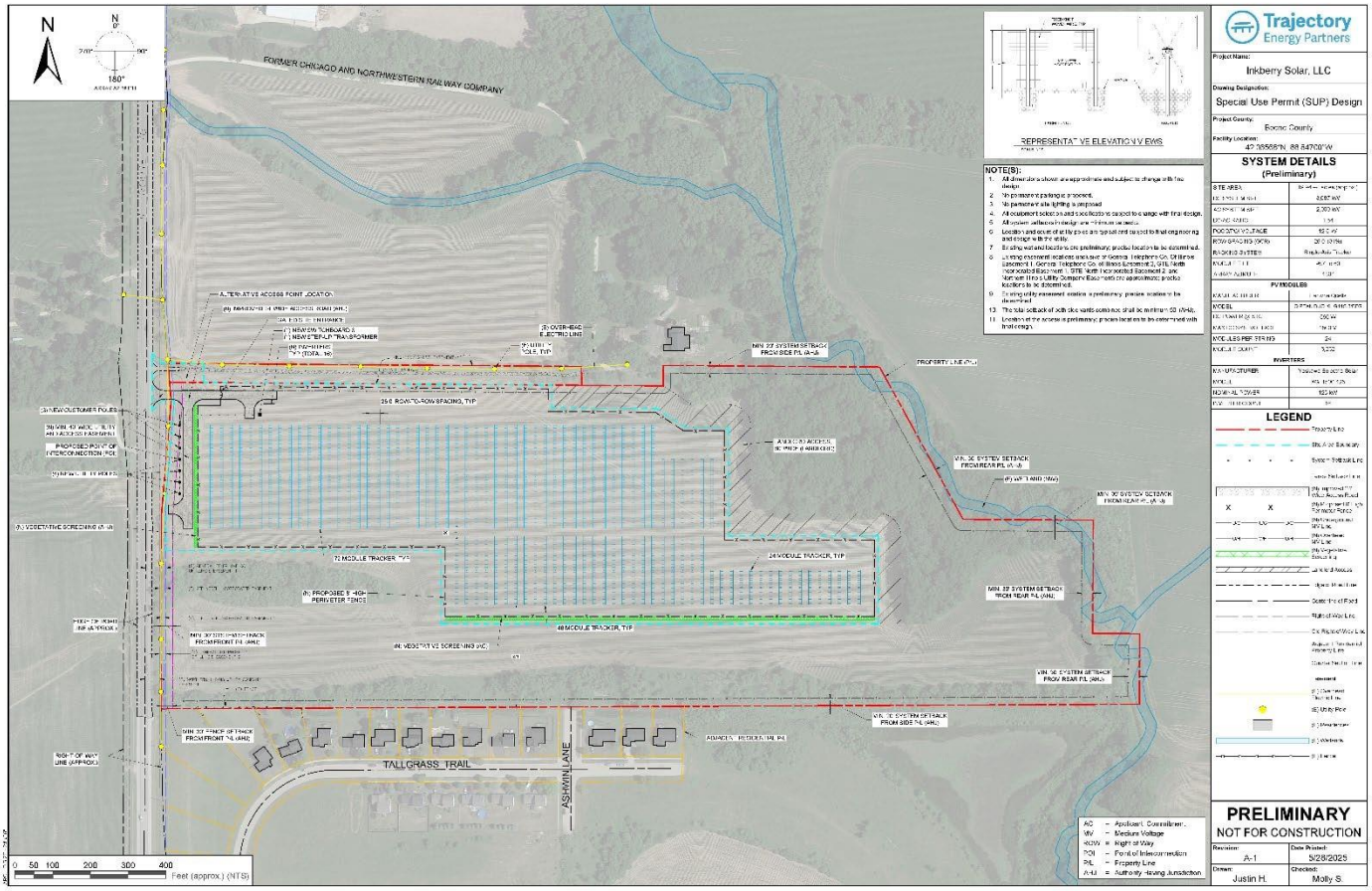
The VMP was written to provide a brief overview and description of the project and to act as a guide for vegetation installation and management. It has been custom-written based on information known at the time of writing. The VMP should be treated as a living document and adjusted as additional information about the site is gathered both pre and post construction. A qualified native vegetation contractor with a history of success working on native vegetation restorations should be contracted to implement the procedures outlined in this document and to provide feedback and suggestions for the VMP during the lifespan of the project.

## 2. Site Information

### 2.1. Site Location

The Inkberry Solar project site is located east side of Il-76, approximately 1/3 of a mile south of the intersection of IL-76 and IL173.


2.2. Map of Array Layout




## 2.3. Site Conditions

A review of historical aerial photos shows that the entire site has been in traditional row crops for the majority of the last 30 years, likely rotating between corn and soybeans. Little to no ponding or flooding can be seen in the aerial photos. A review of the soils on the USDA/NRCS Web Soil Survey shows show loam and silty loam soils on the site, ranging from well drained to poorly drained, with well drained areas primarily a result of topography.

# 3. Overview of Vegetation Establishment and Management

## 3.1. Vegetative Goals

The primary vegetative goal is to establish permanent vegetation that does not interfere with solar production. This solar site will be planted with 100% native species. The species were

chosen with an emphasis on native pollinator habitat to achieve and maintain Pollinator Friendly status as defined in the Illinois Pollinator Friendly Solar Site Act (525 ILCS 55/) [1] .

## 3.2. Contribution of Native Habitat on Solar Sites

Economical production of power is the foremost goal of solar sites. There is a parallel opportunity to provide critically important native pollinator-friendly habitat throughout the array while capitalizing on the long-term low maintenance needs of native vegetation.

Establishing prairies and other native plant communities within the confines of solar sites provides a tremendous opportunity to restore ecosystems that have been severely degraded or eliminated across all areas of the country.

Native plants have profound root systems, many reaching 12 or more feet deep into the soil. Rainwater follows those roots into the ground, helping to reduce water runoff and promote the drainage of standing water into an aquifer. Those deep roots also stabilize the soil, preventing erosion from rain and wind. The plants provide seeds for songbirds, cover for game birds and, of course, provide blossoms and host plants for our beloved butterflies and other nectar-loving insects.

Native grasses and forbs will be selected based on their ecological appropriateness to the specific conditions of this site, with consideration to their mature height to not interfere with panel productivity. These species will not require irrigation, fertilizer, or other soil amendments.

The contribution to habitat restoration cannot be overstated given the acreage impacted and lifespan of the project.

## 3.3. Vegetation Installation Overview

The native mix planned for this array is selected for ecological appropriateness to the moister soil types and site conditions as well as the mature plant height of 24” to 36” so as to not

[1] https://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=3900&ChapterID=44

interfere with panel productivity. The habitat provides low-maintenance vegetation that won't require fertilizer, amended soils or irrigation on this site.

It is important to note that the species selected for this site are based on their ability to successfully establish from seed and thrive within the unique conditions found on solar sites. From a practical standpoint, the species contained in these mixes are generally available in the marketplace and, as a whole, have reasonable price points. Ultimately, the list consists of well-performing, workhorse species coupled with smaller amounts of more unique species for a robust mixture.

### 3.4. Vegetation Management Overview

Maintenance plays a vital role in the eventual success of any native landscape installation, especially during the establishment period of years one through three. Active management is similar in all areas of the project site. All areas of the site are inspected annually followed by maintenance necessary to encourage healthy native species while discouraging nonnative/invasive species. During the growing season of the first year of establishment, the site shall be inspected a minimum of three times.


## 4. Vegetation Installation Procedures

### 4.1. Site Inspections and Monitoring

Site inspections and monitoring throughout the installation process are vital to continually assess site conditions and determine what procedures are needed and the timing of those

procedures. The pre-construction site inspection is particularly important to determine the need for any herbicide application or mowing prior to soil preparation and seeding.

### 4.2. Site Preparation Herbicide Application

A site preparation herbicide application, if deemed necessary, should be performed by a licensed, qualified contractor using appropriate herbicides to kill all actively growing weeds on the project site. Typically, only glyphosate herbicide is necessary, but if certain perennial weed species are present such as Canada thistle, a broadleaf additive may be necessary. The contractor should carefully select an herbicide with a short soil residual, such as Garlon 3A, to minimize the impact on germination of the permanent seeding. The vegetation should not be disturbed for a minimum of 14 days after an herbicide application to allow time for effective weed elimination.

### 4.3. Site Preparation Mowing

Site preparation mowing may be required to reset vegetative growth to prepare for an herbicide application. Additionally, site preparation mowing may be needed to cut and mulch vegetation to simplify the soil preparation and seeding process.

### 4.4. Soil and Seedbed Preparation

Soil and seedbed preparation is vital to the success of any planting. Disking and harrowing (or raking) the site is common and extremely effective. If extreme compaction is present on site, a ripper may be needed to mitigate the compaction. The seedbed should be relatively smooth and firm prior to seeding. Soil that is too clumpy or too fluffy may result in seeds being planted too deep in the soil to germinate and survive.

### 4.5. Seed and Seeding

A custom native pollinator seed mix has been designed for use on this project and is found on page 13. Seeding will be completed through broadcasting by using a mechanical spreader appropriate for the specified seed mixes. Large and fluffy seeds (such as most grasses and cover crop) should be broadcast first and then lightly harrowed/raked into the soil. Following the harrowing, small seeds (such as most forbs, sedges, and rushes) should be broadcast on top of the soil.

### 4.6. Tree Installation

Tree installation can occur either before or after permanent seeding depending on the preferences of the contractor, timing of seeding, and the site conditions. If installation occurs after permanent seeding, touchup seeding in the disturbed areas may need to be completed. All trees should be watered at the time of installation and properly mulched. A watering plan should be in place in the event of inadequate rainfall.

### 4.7. Erosion control

Erosion control measures should be implemented as required after permanent seeding is completed.

## 5. Vegetation Management Procedures

### 5.1. Adaptive Management

An adaptive management strategy is vital to the success of any project, but especially so for native pollinator restorations. Adaptive management consists of continual monitoring and adjusting maintenance strategies based on the site conditions in order to achieve the best outcomes. No two sites are exactly the same and responding to changing site conditions, weed pressures, weather, and a multitude of other variables is essential to the success of the planting.

### 5.2. Complete Site Maintenance Mowing

Complete site maintenance mowing consists of mowing the entire project area during the growing season, including trimming as appropriate around equipment or in inaccessible areas. Complete site maintenance mowing is implemented primarily during the establishment phase

of the restoration (years 1-3) for several reasons. First, if a closed canopy of vegetation develops, mowing is implemented to knock back the taller vegetation and allow sunlight to reach the native seedlings below. Second, if weed species are present and actively nearing their seed set, mowing is implemented to prevent those weeds from producing viable seed. Third, vegetation has become tall enough to shade the panels or impact other solar equipment on site and must be cut down.

### 5.3. Integrated Vegetation Maintenance

Integrated vegetation maintenance or IVM is a method using a combination of targeted mowing/trimming and herbicide application aimed at reducing or eliminating weed species and promoting the desired vegetation. IVM can also include grazing, haying, and other maintenance options as appropriate. IVM is implemented starting towards the end of the 2nd full growing season typically and is used throughout the life of the project. 3 IVM visits are typical on most sites until year 5 when a reduction to 1-2 visits per year can be made if site conditions allow.

### 5.4. Dormant Mowing

Dormant mowing is a type of complete site mow implemented when vegetation is not actively growing on site. This method is typically performed in early spring or fall. Oftentimes, dormant mows are completed in the fall to mulch up dead vegetation and encourage decomposition. This practice also has a dual purpose of cleaning up the site to make electrical maintenance easier and to reduce the chance of accidental fire.

## 6. Vegetation Installation and Management Timeline

### 6.1. Site Prep and Installation Phase *Site*

*Preparation:*

1. Prior to the start of construction, a cover crop may be seeded to aid in erosion control, soil moisture management, and weed suppression.
2. Inspection of the project area to assess site conditions and determine the need for any site prep mowing or spraying activities.
3. If necessary, an herbicide application will be completed using glyphosate (Roundup® or equivalent) as per manufacturer's directions in areas with actively growing vegetation. Allow a minimum of 14 days before disturbing the soil or completing seeding activities.
4. When perennial broadleaf vegetation is present a triclopyr herbicide will be added (Garlon 3A® or equivalent) as per manufacturer's directions. When a broadleaf herbicide is used allow a minimum of 30 days before disturbing the site or completing seeding.
5. Depending on the density and type of undesirable vegetation present (i.e., annual vs perennial) a complete site mowing might be advisable in lieu of an herbicide application.

For instance, if the site is dominated by Foxtail (an annual), mowing would be preferrable to an herbicide application.

*Soil Prep and Seeding:*

1. Construction debris, garbage, and building materials will be removed and/or staged outside the intended seeding areas.
2. Disk soil within the project area in preparation for seeding. Harrow or rake the soil to achieve the proper seedbed.
3. Broadcast the large and fluffy seed (mostly grasses) along with a cover crop of winter wheat or oats.
4. Harrow or rake the soil to work the seed to a proper depth.
5. Broadcast the small seeds (forbs, sedges, rushes, small grass seeds) on top of the soil.

*Vegetative Screening Installation*

1. Prior to evergreen tree installation, planting locations should be marked to ensure proper placement and spacing of the trees.
2. Install evergreen trees using appropriate equipment and procedures, including watering at the time of installation, mulch rings, and staking or guying if necessary.
3. Implement a watering plan post-installation to ensure survival.
4. On the west side, the tallgrass screening area should be seeded at the same time as the rest of the permanent seeding, using a native grass and forb mix appropriate for Boone County and the site conditions.

5. Example Screening Option:

   Two types of evergreen species used for screening are the Red Pine, growing 20 – 40' wide, up to 60 feet tall, and the Eastern Red Cedar, 10' – 20' wide and 40 feet tall. Trees would be four to six feet tall at time of installation and planted 16' on center in a double, staggered row to increase visual screening. Final selections are to be determined at this time, pending approval by the AHJ.

Red Pine, *Pinus resinosa*

Eastern Red Cedar, *Juniper virginiana*

*Installation Phase Maintenance*

If the site is seeded in the summer or early fall, 1-2 complete site mowings may be needed during this first partial growing season.

### 6.2. Establishment Phase

Year 1 is defined as the 1st full growing season for the vegetation. A recommendation of 3 complete site mowings is most common for this phase. Depending on site conditions and vegetation growth, more or less may be needed.

Year 2 is the second full growing season. 3 total visits are typical with 2 complete site mowings and 1 Integrated Vegetation Maintenance visit the most likely combination.

Year 3 typically requires 3 IVM site visits depending on vegetation status.

### 6.3. Maintenance Phase

Year 4 – 34. During the maintenance phase, 2 IVM visits are typical.

## 7. Monitoring

Consistent project monitoring is essential to evaluate vegetative establishment, weed presence, and possible erosion concerns. This information helps determine which management procedures to utilize, the proper timing for those procedures, and whether any other remedial action is required such as reseeding or replanting. As the site's vegetation matures, adaptive management should be utilized as previously described.

## 8. Seed Mix

**Inkberry Solar Native Pollinator Seed Mix**

**Seeding Rate - 12.5 lb/acre - 75 seed/ft²**

| Common Name | Scientific Name | Bloom Month | % of Mix by Weight | Lbs/Acre | Seeds per ft² | % of Mix by Seeds/ft² |
|---|---|---|---|---|---|---|
| Sideoats Grama | Bouteloua curtipendula | | 34.25% | 4.28 | 9.43 | 12.58% |
| Prairie Brome | Bromus kalmii | | 0.80% | 0.10 | 0.29 | 0.39% |
| Plains Oval Sedge | Carex brevior | | 2.80% | 0.35 | 3.72 | 4.97% |
| Bicknell's Sedge | Carex bicknellii | | 0.96% | 0.12 | 0.75 | 1.00% |
| Troublesome Sedge | Carex molesta | | 1.84% | 0.23 | 2.11 | 2.82% |
| Brown Fox Sedge | Carex vulpinoidea | | 2.00% | 0.25 | 9.18 | 12.24% |
| Silky Wild Rye | Elymus villosus | | 6.00% | 0.75 | 1.52 | 2.02% |
| Little Bluestem | Schizachyrium scoparium | | 26.96% | 3.37 | 18.57 | 24.75% |

| | | | | | | |
|---|---|---|---|---|---|---|
| Prairie Dropseed | Sporobolus heterolepis | | 0.40% | 0.05 | 0.29 | 0.39% |
| **Graminoid Total** | | | **76.00%** | **9.50** | **45.87** | **61.15%** |
| Common Yarrow | Achillea millefolium | Jun-Aug | 0.44% | 0.06 | 3.63 | 4.84% |
| Nodding Onion | Allium cernuum | Jul-Aug | 0.24% | 0.03 | 0.08 | 0.11% |
| Lead Plant | Amorpha canescens | Jun-Aug | 1.33% | 0.17 | 0.98 | 1.30% |
| Canada Anemone | Anemone canadensis | May-Jun | 0.04% | 0.01 | 0.02 | 0.02% |
| Wild Columbine | Aquilegia canadensis | Apr-Jun | 0.04% | 0.01 | 0.07 | 0.10% |
| Common Milkweed | Asclepias syriaca | Jun-Aug | 0.34% | 0.04 | 0.06 | 0.08% |
| Butterfly Milkweed | Asclepias tuberosa | Jun-Aug | 0.32% | 0.04 | 0.06 | 0.08% |
| Canada Milkvetch | Astragalus canadensis | Jun-Aug | 1.08% | 0.14 | 0.84 | 1.13% |
| Partridge Pea | Chamaecrista fasciculata | Jul-Sep | 3.11% | 0.39 | 0.39 | 0.51% |
| White Prairie Clover | Dalea candida | Jun-Sep | 4.08% | 0.51 | 3.56 | 4.74% |
| Purple Prairie Clover | Dalea purpurea | Jul-Sep | 6.02% | 0.75 | 4.98 | 6.63% |
| Cream Gentian | Gentiana flavida | Aug-Sep | 0.04% | 0.01 | 0.27 | 0.36% |
| Prairie Blazing Star | Liatris pycnostachya | Jul-Sep | 0.24% | 0.03 | 0.12 | 0.16% |
| Virginia Mountain Mint | Pycnanthemum virginianum | Jun-Sep | 0.09% | 0.01 | 0.95 | 1.26% |
| Prairie Wild Rose | Rosa arkansana | Jun-Aug | 0.29% | 0.04 | 0.03 | 0.04% |
| Black-eyed Susan | Rudbeckia hirta | Jun-Oct | 1.92% | 0.24 | 8.13 | 10.83% |
| Gray Goldenrod | Solidago nemoralis | Aug-Oct | 0.04% | 0.01 | 0.57 | 0.76% |
| Ohio Goldenrod | Solidago ohioensis | Aug-Sep | 0.04% | 0.01 | 0.21 | 0.28% |
| Calico Aster | Symphyotrichum lateriflorum | Aug-Oct | 0.04% | 0.01 | 0.48 | 0.64% |
| Sky Blue Aster | Symphyotrichum oolentangiense | Aug-Oct | 0.16% | 0.02 | 0.57 | 0.76% |
| Ohio Spiderwort | Tradescantia ohiensis | May-Jul | 0.24% | 0.03 | 0.09 | 0.12% |
| Hoary Vervain | Verbena stricta | Jun-Sep | 1.44% | 0.18 | 1.85 | 2.46% |
| Golden Alexanders | Zizia aurea | Apr-Jun | 2.40% | 0.30 | 1.21 | 1.62% |
| **Forb Total** | | | **24.00%** | **3.00** | **29.14** | **38.85%** |
| **Mix Total** | | | **100.00%** | **12.50** | **75.01** | **100.00%** |

# 9. Pollinator Scorecard

# Illinois Solar Site Pollinator Habitat Planning Form

**Use this form as a draft before completing the *Illinois Planned Pollinator Habitat on Solar Sites Scorecard* online**

## In Between and Under Solar Panels

1. PLANNED PLANT DIVERSITY IN ROWS & UNDER SOLAR ARRAY (choose up to 2)
   - ☐ 4-6 species +5 pts
   - ☒ 7 or More species +8 pts
   - ☒ All Native Species (minimum 4 species) +10 pts

## Perimeter and Buffer Area

2. VEGETATIVE BUFFER PLANNED ADJACENT TO THE SOLAR SITE (choose all that apply)
   - ☒ Buffer planned outside of array fencing +5 pts
   - ☐ Buffer is 30-49ft wide measured from array fencing +5 pts
   - ☐ Buffer is at least 50ft wide measured from array fencing +10 pts
   - ☐ Buffer has Native shrubs/trees that provide food for wildlife +5 pts

3. SEEDS USED FOR NATIVE PERIMETER & BUFFER AREAS (choose all that apply)
   - ☒ Mixes are seeded using at least 20 seeds per square foot of Pure Live Seed or 40 Seeds per square foot on slopes > 5% +10 pts
   - ☐ All seeds are from a source within 150 miles of site +5 pts
   - ☐ At least 2% milkweed cover is planned to be established from seeds/plants +5 pts

4. PLANNED # OF NATIVE SPECIES IN SITE PERIMETER & BUFFER AREA (species with more than 1% cover)(choose 1)
   - ☐ 5-10 species +2 pts
   - ☐ 10-15 species +5 pts
   - ☒ 16-20 species +10 pts
   - ☐ >20 species +15 pts

*Exclude invasive and non-native plant species from total*

5. PLANNED PERCENT OF PERIMETER & BUFFER AREA DOMINATED BY NATIVE PLANT SPECIES (choose 1)
   - ☐ 26- 50 % +2 pts
   - ☐ 51-75 % +10 pts
   - ☒ More than 75% +15 pts

## Whole Site

6. PLANNED PERCENT OF SITE VEGETATION COVER TO BE DOMINATED BY DESIRABLE WILDFLOWERS (choose 1)
   - ☒ 26- 50 % +2 pts
   - ☐ 51-75 % +10 pts
   - ☐ More than 75% +15 pts

7. PLANNED SEASONS WITH AT LEAST THREE BLOOMING NATIVE SPECIES PRESENT (choose all that apply)
   - ☒ Spring (April-May) +5 pts
   - ☒ Summer (June-August) +5 pts
   - ☒ Fall (September-October) +5 pts

8. HABITAT SITE PREPARATION PRIOR TO IMPLEMENTATION (choose all that apply)
   - ☒ Soil preparation done to promote germination and reduce erosion as appropriate for the site. +10 pts
   - ☒ Measures taken to control weeds prior to seeding +10 pts
   - ☐ None -10 pts

9. AVAILABLE HABITAT COMPONENTS WITHIN 0.25 MILES (choose all that apply)
   - ☐ Native bunch grass for bee nesting +2 pts
   - ☐ Native trees/shrubs for bee nesting +2 pts
   - ☐ Clean, perennial water sources +2 pts
   - ☐ Created habitat nesting features +2 pts

10. SITE PLANNING AND MANAGEMENT(choose all that apply)
    - ☒ Detailed establishment and management plan developed +10 pts
    - ☐ Signage legible at forty or more feet stating "pollinator friendly solar habitat" +3 pts

11. INSECTICIDE RISK (choose all that apply)
    - ☐ Planned on-site use of insecticide or pre-planting seed/plant treatment (excluding buildings/electrical boxes, etc.) -40 pts
    - ☐ Communication/registration with local chemical applicators or on www.fieldwatch.com to prevent drift +5 pts

Total Points: 105

**Meets Preliminary Pollinator Standards - 85**
**Provides Exceptional Habitat - 110 and higher**

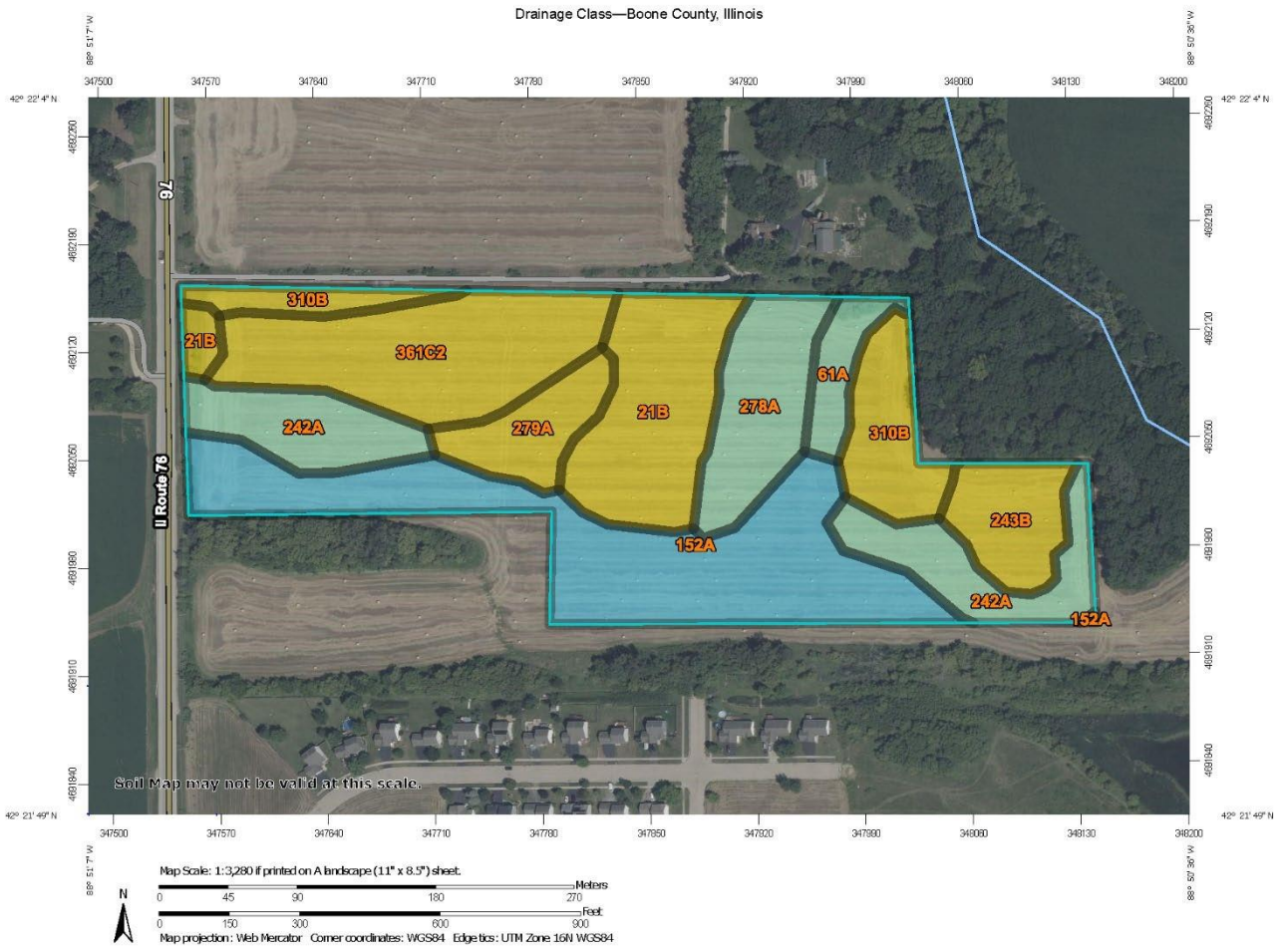
**Owner:** Inkberry Solar LLC
**Vegetation Consultant:** Natural Resource Services, Inc
**Project Location:** Boone County
**Project Size:** +/- 20 acres **acres**
**Final Seeding Date:** TBD - Anticipated fall 2026

*This form is designed (with the help of the Solar Site Pollinator Guidelines found on IDNR's website) to guide owners or managers of solar sites to meet the requirements to be able to claim a site is pollinator friendly according to the "Pollinator Friendly Solar Site Act (525 ILCS 55)". This form is for company records only and does not grant the title of a Pollinator Friendly Solar Site until the "Illinois Planned Pollinator Habitat on Solar Sites Scorecard" is completed with a score of 85 or higher on IDNR's website. This preliminary recognition is good for 3yrs, after which the "Established Pollinator Habitat on Solar Sites Scorecard" will need to be completed every 5 years to maintain recognition as a Pollinator Friendly Solar Site.*

12/3/2019

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

# 10. Soils Maps




USDA Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

6/13/2025
Page 1 of 3

# 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 | 13.6% |
| 61A | Atterberry silt loam, 0 to 2 percent slopes | Somewhat poorly drained | 0.8 | 3.2% |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes | Poorly drained | 6.1 | 25.1% |
| 242A | Kendall silt loam, 0 to 2 percent slopes | Somewhat poorly drained | 3.2 | 13.4% |
| 243B | St. Charles silt loam, 2 to 5 percent slopes | Well drained | 1.4 | 5.7% |
| 278A | Stronghurst silt loam, 0 to 2 percent slopes | Somewhat poorly drained | 2.1 | 8.7% |
| 279A | Rozetta silt loam, 0 to 2 percent slopes | Well drained | 1.3 | 5.3% |
| 310B | McHenry silt loam, 2 to 4 percent slopes | Well drained | 2.1 | 8.9% |
| 361C2 | Kidder loam, 4 to 6 percent slopes, eroded | Well drained | 3.9 | 16.1% |
| **Totals for Area of Interest** | | | **24.1** | **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

# INKBERRY SOLAR, LLC

## 2 MWac Community Solar Project

## Village of Poplar Grove Petition for Special Use

## Submitted May 30th, 2025

**EXECUTIVE SUMMARY**

Inkberry Solar, LLC (the "Applicant") proposes to develop a 2MWac community solar project on approximately 20 +/- acres currently used for agriculture located along Illinois Route 76 in Poplar Grove, Boone County, Illinois. The Inkberry Solar, LLC community solar project (the "Solar Project") will be located on parcels 03-23-200-014 and 03-23-200-017 (the "Project Parcels") owned by Tahoe Trading Company, LLC (the "Landowner"). Applicant is submitting this Petition for Special Use pursuant to and in compliance with the requirements set forth under Sections 8-5-7 and 8-7-9 of the Village of Poplar Grove Zoning Ordinance (the "Zoning Ordinance").

The figures and information contained in this application are based on the best available information from desktop and field analyses performed to date, and may be subject to change (within the bounds of applicable laws and permit conditions) based on the final siting of the solar arrays and associated facilities and the ultimate procurement of the Solar Project's equipment.

**ABOUT TRAJECTORY ENERGY PARTNERS**

Inkberry Solar, LLC is a limited liability company indirectly owned by Trajectory Energy Partners, LLC ("Trajectory"). Trajectory brings together communities, organizations, and landowners to develop clean energy projects with strong local support. Trajectory team members have built their careers in clean energy and community engagement. They are focused on building quality clean energy projects that are integrated into the local landscape and welcomed in the community.

**CONTENTS**



**APPENDIX A:**



**APPENDIX B:**

# I. SUMMARY OF APPLICATION

Applicant is submitting this application for a Special Use Permit for a ground-mounted community solar farm on an approximately 20 +/- acre area on the Project Parcels pursuant to and in compliance with the requirements set forth under Sections 8-5-7 and 8-7-9 of the Village of Poplar Grove Zoning Ordinance (the "Zoning Ordinance"). See Attachment 2: Zoning Ordinance.

Applicant is requesting a Special Use Permit for a Commercial Solar Energy Facility on land leased on the Project Parcels, which is located in the Village of Poplar Grove Light Industrial Zoning District. A legal description of the Project Parcels are attached as Attachment 3 and a redacted lease agreement is attached as Attachment 4.

Duration: Applicant is requesting that the Village of Poplar Grove issue the Special Use Permit for a period of two years to allow Applicant sufficient time to continue development of the Solar Project and submit a building permit application.

# II. APPLICANT INFORMATION

The Applicant is a limited liability company, a wholly owned indirect subsidiary of Trajectory Energy Partners, LLC. Jonathan Carson is an Authorized Representative of the Applicant.

Applicant:

Inkberry Solar, LLC
% Trajectory Energy Partners, LLC
P.O. Box 310
Highland Park, IL 60035
(312) 882-3713
legal@trajectoryenergy.com

Landowner:

Tahoe Trading Company, LLC
% Daniel Kelly
1610 Candlewick Dr. SW
Poplar Grove, IL 61065
(815) 985-0879
landlorddan@hotmail.com

# III. SOLAR PROJECT DESCRIPTION

The Solar Project will consist of equipment to generate electricity from solar energy, including rows of photovoltaic cell panels mounted on posts driven into the ground. The components of the Solar Project will comply with the current edition of the National Electric Code and be UL listed or meet a comparable safety standard. The panels will be designed with an anti-reflective coating to minimize glare from the Solar Project. A fence will enclose all panels and electrical equipment on site. Access is via a locked gate.

The Solar Project is intended to be a community solar project under the Clean Energy Jobs Act,

which allows residential and commercial customers to subscribe to the Solar Project. The Solar Project will support CEJA's goals of increasing the adoption and availability of renewable energy to Illinois residents and businesses.

The Solar Project will provide economic and environmental benefits to the community. Village of Poplar Grove and Boone County residents and businesses will have an opportunity to subscribe to the Solar Project. These subscribers will support clean energy in their community while benefiting from electricity bill savings. In addition, the Solar Project will create new tax revenues in the Village, provide steady income to the Landowner, and generate economic activity through local construction, materials, and services.

The Solar Project will be designed to integrate into the local landscape. Where possible, Applicant will prioritize pollinator-friendly landscaping, vegetation maintenance that limits runoff, and other management practices that are in keeping with the community, adjacent uses, and the local ecosystem.

The Solar Project is intended to operate for a period of at least 35 years, and will be constructed with solar panels with long-term warranties and very low expected rates of replacement. In the event the Solar Project is required to be removed in the future, the Solar Project will be decommissioned in compliance with an Agricultural Impact Mitigation Agreement ("AIMA").

# IV. SOLAR PROJECT CONSTRUCTION AND OPERATION

The active construction period for the Solar Project is expected to be between nine and twelve months. Construction will require trucks no larger than a typical 18-wheeler to deliver materials to the site, and onsite equipment will be used to drive pilings into the ground and install the panels, supports, and tracking equipment. Concrete pads may be used to support certain electrical equipment.

Once installed and commissioned, the Solar Project will require periodic maintenance. The Solar Project's performance will be continuously monitored, and engineers and maintenance technicians will visit the Solar Project a few times a year for routine maintenance and any required repairs.

# V. SPECIAL USE PERMIT APPLICATION REQUIREMENTS

## Special Use Permit Application Requirements (Section 8-5-7 & Village Application Form)

1. **Plat of Survey**

   A plat of survey is included as Exhibit C.

2. **Site Plan**

   A Site Plan is included as Exhibit B. As depicted on the attached Site Plan, the Solar Project shall be in compliance with the applicable Zoning District requirements related to setbacks, landscaping/buffer yards, screening, fencing and lighting.

   *Setbacks:* The Solar Project shall comply with the setbacks applicable to the light industrial zoning district. See the attached Exhibit B.

Primary Structure Minimum Setbacks (Light Industrial):

| | |
|---|---|
| Front Lot Line | 30 feet |
| Side Lot Line | 20 feet |
| Total of Both Side Lot Lines | 50 feet |
| Rear Lot Line | 30 feet |

*Fencing*: Applicant is proposing an 8' farm-style fence to surround the entirety of the Solar Project. See Exhibit B. Applicant requests confirmation that this fence style and height is excluded from fencing height regulations for fencing in an industrial district in Chapter 10 of the Zoning Ordinance. This exclusion would be in alignment with the provision that allows certain uses, including public utilities and "similar uses", to provide an up to 10' high fence. See Section 8-10-3(B)(3)(c)) of the Zoning Ordinance. The Solar Project is a similar use to a public utility and requires the additional height to maintain compliance with the National Electric Code.

*Project Access:* The Solar Project will be accessed from IL Route 76 along a dedicated gravel access road. See the Site Plan attached as Exhibit B. No permanent parking is proposed. The Solar Project will be secured with a locked gate. Knox boxes will be provided for emergency personnel access.

*Landscaping/Buffer Yards*: Vegetation under and around the Solar Project will be maintained by periodic mowing, inspections, and weed management as appropriate. The Solar Project will plant pollinator-friendly vegetation within the fenced area. A Weed/Grass Control Plan is attached as Exhibit , as well as the Illinois Department of Natural Resources ("IDNR") Guidelines for establishment and maintenance of pollinator-friendly ground cover. A final landscape plan will be provided prior to building permit. No buffer yard is proposed as the Solar Project's Site Area does not directly abut a residential lot line.

*Screening*: Landscape screening is currently proposed along the Project fence in the front yard where the Solar Project abuts IL Route 76, and partially along the southern side of the Solar Project. See the attached Exhibit B depicting the locations of the screening.

3. **Floor Plan – (N/A)**
4. **Legal Description**

   See Attachment 3**.**

5. **Adjacent Property Owners**

   See Exhibit E.

6. **Application Fee**

   The application fee will be transmitted along with the final application.

7. **NRI Application**

   Proof of submission of the NRI application is attached as Exhibit F.

8. **IDNR EcoCAT**

   Consultation with the Illinois Department of Natural Resources is attached as Exhibit D**.**

9. **Equipment Specifications**

   While final equipment selections are to be determined with final engineering and design, the product sheets for equipment as the project is currently designed are attached as Exhibit H.

10. **Topography Map**

    A topographical map is attached as Exhibit I.

## Special Use Permit Findings of Fact – Section 8-5-7(D)

1. *The establishment, maintenance or operation of the special use will not be detrimental to or endanger the public health, safety, morals, comfort or general welfare;*

   The proposed use of the Project Parcels as a solar farm will not be detrimental to or endanger public health, safety, morals, comfort, or general welfare. The Solar Project will operate to convert sunlight to electrical power with occasional ongoing maintenance. The clean energy generated by the Solar Project will avoid pollution associated with other forms of power generation. The Solar Project will comply with state and local laws, and be designed and installed using current best practices, including the current National Electric Code and the use of UL (or equivalent) equipment. The Solar Project will be surrounded by a UL compliant fence and a locked gate with emergency personnel access provided via a knox box.

2. *The special use will not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, not substantially diminish and impair property values within the neighborhood;*

   The Solar Project will not affect the existing use and enjoyment of property in the vicinity for those uses permitted by the Zoning Ordinance. The Solar Project will be designed to enclose the solar panels and associated electrical equipment with fencing, to comply with applicable state and local laws and ordinances designed to maintain the use and enjoyment of adjacent property, and to maintain property values.

3. *The establishment of the special use will not impede the normal or orderly development and improvement of the surrounding property for uses permitted in the district;*

   The Solar Project will not impede the normal and orderly development and improvement of surrounding properties for the uses contemplated in the current Zoning Ordinance.

4. *Adequate utilities, access roads, drainage and/or necessary facilities have been, are being, or will be provided;*

   The Solar Project will include adequate provisions for buffers, landscaping, fencing, lighting, building materials, and open space, as required, and other improvements such as utilities, equipment, access roads, drainage and other necessary facilities as described on the Site Plan attached as Exhibit B. The Solar Project will have no permanent buildings or employees on site, and therefore does not require water, waste, or sewage facilities.

5. *Adequate measures have been, or will be taken, to provide ingress or egress so designed as to minimize traffic congestion in the public streets; and*

   The Solar Project will have minimal impact on public street congestion. During the construction phase, standard construction vehicles will come on and off site to deliver material and construction equipment. Once installed and commissioned, the Solar Project only requires periodic maintenance. The Solar Project's performance will be continuously monitored, and traffic will consist of engineers and maintenance technicians visiting the Solar Project typically only a few times a year for any inspections, routine maintenance, and any required repairs.

6. *The special use shall, in all other respects, conform to the applicable regulations of the districts in which it is located.*

   The Solar Project will conform to the Zoning Ordinance, all applicable laws and regulations, and the Special Use Permit. Applicant will continue to work with regulatory authorities to ensure compliance with relevant regulatory and permitting requirements.

# INKBERRY SOLAR, LLC

## 2 MWac Community Solar Project

## Village of Poplar Grove Petition for Special Use

## APPENDIX A

## Submitted May 30th, 2025

**Attachment 1**

Application Form

[Attached]

# VILLAGE OF POPLAR GROVE

*"A Great Place to Call Home"*

**200 Hill Street, Poplar Grove, IL 61065**

**Phone: (815) 765-3201 – Fax: (815)765-3571**

www.poplargrove-il.gov

## Special Use Application

### PART 1: INTRODUCTION

Please complete this Zoning Special Use Permit Application and return it to the Village of Poplar Grove along with the following documentation:

- Written Narrative of the Proposed Request
- Plat of Survey of the Property
- Site Plan of property if changes to the property are proposed
- Floor Plan
- Legal description of the Property
- Any other information required by staff such as hours of operation, number of employees, traffic report, landscape plan, lighting plan, elevation plan.
- List of Adjacent Property Owners within 250 feet, excluding public right-of-way. This may be obtained from the Supervisor of Assessments Office, 1208 Logan Ave. The accuracy of the information is the applicant's responsibility.
- Application Fee
- Natural Resource Information (NRI) – State law requires applicants to request a natural Resource Information Report (NRI) from Boone county Soil and Water Conservation District at 211 North Appleton Road, Belvidere, IL 61008-1983, 815-544-2677, ext 3. This report must be received by the Village of Poplar Grove prior to the Plan Commission public hearing.
- Proof of submittal to IDNR regarding the Endangered Species Act. The applicant shall contact the Illinois Department of Natural Resources (IDNR) via the EcoCat website at https://dnr@Illinois.gov/EcoPublic/
- Proof of submittal to the Illinois Historic Preservation Agency at 217-782-4836 if the proposal involves State or Federal Funding.

### PART 2: APPLICANT INFORMATION

Applicant Name: Inkberry Solar, LLC

Email: jcarson@trajectoryenergy.com; legal@trajectoryenergy.com

| | | |
|---|---|---|
| | Address/City: | P.O. Box 310<br>Highland Park, IL 60035 |
| | Phone Number(s): | (312) 882-3713 |
| Owner of Record | Name: | Tahoe Trading Company, LLC |
| | Email: | landlorddan@hotmail.com |
| | Address/City: | 1610 Candlewick Dr. SW, Poplar Grove, IL 61065 |
| | Phone Number(s): | (815) 985-0879 |
| Attorney | Name: | Molly Snittjer |
| | Email: | msnittjer@trajectoryenergy.com |
| | Address/City: | P.O. Box 310, Highland Park, IL 60035 |
| | Phone Number(s): | (847) 732-0968 |

## PART 3: PROPERTY INFORMATION

Street Address: Agricultural land along IL Route 76

Tax Parcel Number (PIN): 03-23-200-014 and 03-23-200-017

Legal Description: See attached application
(May be on separate sheet)

Current Use of the Property: Agriculture

Current Zoning of the property: LI Light Industrial District

Surrounding Zoning and Land Use

North: LI Light Industrial
South: R2 Single Family Residential
East: R1 Single Family Residential
West: GB General Business

## PART 5: PROPOSED SPECIAL USE

Describe the proposed special use (Attach additional sheets as needed to thoroughly describe the proposed use and/or business)
Commercial Solar Energy Facility (See attached application)

_____
_____
_____

## PART 6: STANDARDS FOR SPECIAL USE PERMITS

The Plan Commission will make its recommendation to approve or deny the proposed special use based on compliance with the facts listed below. Describe how the proposed use will comply with the minimum standards set forth in the Village of Poplar Grove Zoning Ordinance:

1. The establishment, maintenance or operation of the special use will not be detrimental to or endanger the public health, safety, morals, comfort or general welfare;

   See attached application
   _____
   _____

2. The special use will not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, not substantially diminish and impair property values within the neighborhood;

   See attached application
   _____
   _____

3. The establishment of the special use will not impede the normal or orderly development and improvement of the surrounding property for uses permitted in the district;

   See attached application
   _____
   _____

4. Adequate utilities, access roads, drainage and/or necessary facilities have been, are being, or will be provided;

   See attached application
   _____
   _____

5. Adequate measures have been, or will be taken, to provide ingress or egress so designed as to minimize traffic congestion in the public streets; and

   See attached application
   _____
   _____

6. The special use shall, in all other respects, conform to the applicable regulations of the districts in which it is located.

   See attached application
   _____
   _____

## PART 7: PROCESS

Once a special use application is submitted with all required documentation it will be reviewed by Village Staff. It is recommended that the proposed use be described in as much detail as possible to avoid delays in processing. Staff may request additional information to complete its review.

When the review is complete, a public hearing before the Plan Commission will be scheduled. The public hearing will be conducted no less than 15 days or more than 30 days after public notice is sent to adjacent property owners within 250 feet by certified mail. The notice form will be provided to the applicant by Village staff, but the applicant shall send the notices and provide proof of service to the Village prior to the hearing. The Village will place a legal notice in a newspaper of general circulation. The cost of the newspaper notification shall be paid by the applicant.

The Plan Commission may make a recommendation after the public hearing, or continue the case to a future date for additional information.

The Plan Commission will forward its recommendation, along with its Findings of Fact to the Village Board, which will make the final determination on the proposed special use.

## PART 8: ACKNOWLEDGEMENT

Payment of Fees. Fees shall be payable at the time applications are filed with the Village Clerk and are not refundable.

Reimbursable Costs. The Village may expend time in the investigation and processing of zoning procedures and site plan review. In addition to Village involvement, the Village may retain the services of professional consultants including, but not limited to engineers, landscape architects, architects, attorneys, environmental specialists, and recreation specialists in the administration, investigation and processing of such matters. Any person, firm or corporation requesting action by the Village on zoning procedures shall reimburse the Village for staff time expended in the administration, investigation and processing of applications for such permits or amendments and the cost to the Village charged by any professional consultant retained by the Village on any such matter. Notice shall be sent to the property owner or representative of the property owner informing them of the Village policy on reimbursement costs prior to the costs being incurred.

Fees for Public Hearing Notification. Applicants for all zoning matters (special uses, variations, map amendments, etc.) shall pay all expenses incurred for notification of all public hearings and other notices; including, but not limited to, publication, first class mail, certified mail, etc.

Any person who shall knowingly make or cause to be made, conspire, combine, aid, assist in, agree to, arrange for, or in any way procure the making of a false or fraudulent application affidavit, certificate or statement, shall be guilty of a misdemeanor as provided by statute by the State of Illinois. I hereby acknowledge that the information provided in this application is true and correct and that I understand that I am responsible for costs incurred.

Name of applicant: Jonathan K. Carson Signature: Jonathan Carson Date: 5.29.2025

Name of property owner: _____ Signature: _____ Date: _____

Once a special use application is submitted with all required documentation it will be reviewed by Village Staff. It is recommended that the proposed use be described in as much detail as possible to avoid delays in processing. Staff may request additional information to complete its review.

When the review is complete, a public hearing before the Plan Commission will be scheduled. The public hearing will be conducted no less than 15 days or more than 30 days after public notice is sent to adjacent property owners within 250 feet by certified mail. The notice form will be provided to the applicant by Village staff, but the applicant shall send the notices and provide proof of service to the Village prior to the hearing. The Village will place a legal notice in a newspaper of general circulation. The cost of the newspaper notification shall be paid by the applicant.

The Plan Commission may make a recommendation after the public hearing, or continue the case to a future date for additional information.

The Plan Commission will forward its recommendation, along with its Findings of Fact to the Village Board, which will make the final determination on the proposed special use.

## PART 8: ACKNOWLEDGEMENT

Payment of Fees. Fees shall be payable at the time applications are filed with the Village Clerk and are not refundable.

Reimbursable Costs. The Village may expend time in the investigation and processing of zoning procedures and site plan review. In addition to Village involvement, the Village may retain the services of professional consultants including, but not limited to engineers, landscape architects, architects, attorneys, environmental specialists, and recreation specialists in the administration, investigation and processing of such matters. Any person, firm or corporation requesting action by the Village on zoning procedures shall reimburse the Village for staff time expended in the administration, investigation and processing of applications for such permits or amendments and the cost to the Village charged by any professional consultant retained by the Village on any such matter. Notice shall be sent to the property owner or representative of the property owner informing them of the Village policy on reimbursement costs prior to the costs being incurred.

Fees for Public Hearing Notification. Applicants for all zoning matters (special uses, variations, map amendments, etc.) shall pay all expenses incurred for notification of all public hearings and other notices; including, but not limited to, publication, first class mail, certified mail, etc.

Any person who shall knowingly make or cause to be made, conspire, combine, aid, assist in, agree to, arrange for, or in any way procure the making of a false or fraudulent application affidavit, certificate or statement, shall be guilty of a misdemeanor as provided by statute by the State of Illinois. I hereby acknowledge that the information provided in this application is true and correct and that I understand that I am responsible for costs incurred.

Name of applicant: _____ Signature: _____ Date: _____

Name of property owner: TAHOE TRADING COMPANY Signature: _____ Date: 5.29.2025

DANIEL J KELLY JR, IT'S MANAGER

**Attachment 2**

Zoning Ordinance

[Attached]

## 8-5-7. SPECIAL USE.

A. Purpose. The purpose of this chapter is to establish regulations, which govern the procedures for review and approval or denial of special use permits. In some instances as indicated in the specific use table, certain land uses in certain districts are not permitted by right, but rather as special uses. In these cases, special requirements or characteristics require review by the Commission and the possible imposition of such conditions as necessary to ensure that the use is compatible with adjacent properties. Modification, alteration or expansion of any special use in violation as approved (if approved), without approval of the Village Board shall be grounds for revocation of said special use approval.

B. Required Information. A completed application for a special use, the required fee and any supporting documentation shall be submitted to the Village Clerk for referral to the Commission. If the application is deemed incomplete then the Commission shall postpone any public hearing until all adequate information is submitted.

C. Public Hearing Notice. Refer to Section 8-5-3.

D. Planning and Zoning Commission Hearing and Recommendation. The Commission shall hold a public hearing on the proposed special use, after which a recommendation will be made to grant or deny the special use application to the Village Board based on the findings of facts made by the Commission. The Commission may make the recommendation at the same meeting, or choose to continue the proceedings at a later date. The Commission may request additional information as needed. Once a recommendation is made, the Commission shall record its conclusion as part of the meeting minutes, written findings of fact and recommended conditions of approval (if recommended for approval). The Commission's failure to act or submit a report within 65 days of the public hearing shall constitute a recommendation of approval for the request. In order to make a recommendation and adoption of findings of fact, the Commission shall consider the following facts:

    1. The establishment, maintenance or operation of the special use will not be detrimental to or endanger the public health, safety, morals, comfort or general welfare;

    2. The special use will not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, not substantially diminish and impair property values within the neighborhood;

    3. The establishment of the special use will not impede the normal or orderly development and improvement of the surrounding property for uses permitted in the district;

    4. Adequate utilities, access roads, drainage and/or necessary facilities have been, are being, or will be provided;

    5. Adequate measures have been, or will be taken, to provide ingress or egress so designed as to minimize traffic congestion in the public streets; and

    6. The special use shall, in all other respects, conform to the applicable regulations of the districts in which it is located.

E. Village Board Decision. Within 65 days of receipt of the Commission's recommendation, the Village Board shall act by ordinance to approve or deny the special use as originally proposed or approve the special use with modifications. The Village Board may also remand the request back to the Commission for further hearings and/or discussion. The Village Board's approval or denial of the requested special use shall be considered the approval or denial of a unique request, and shall not be construed as precedent for any other proposed special use.

F. Conditions of Approval. In permitting a new special use or in modifying an existing special use, the Village Board may impose additional conditions and requirements, either solely or based on the recommendation of the Commission beyond those expressly stated in this chapter, which are deemed necessary to ensure that the above review criteria are met.

G. Effect of Denial. If an application for a special use is denied by the Village Board (either wholly or in part), no application may be filed with the Village for the same special use within one year of denial unless new evidence or proof of change of factors is found to be valid by the Village Board.

H. Termination of an Approved Special Use. The applicant must demonstrate that the proposed special use meets all general and specific special use requirements in the site plan required for the initiation of development activity on the subject property. Once a special use is granted, no erosion control permit, site plan approval, occupancy permit, or building permit shall be issued for any development which does not comply with all requirements of this chapter. Any special use found not to be in compliance with the terms of this chapter shall be considered in violation of this chapter and shall be subject to all applicable procedures and penalties. In such circumstances, the Commission, following a properly noticed public hearing as described in subsection 8-5-3F.1, may recommend revocation of the special use permit. Such recommendation shall be forwarded to the Village Board for final action. The Village Board may affirm, reverse or modify the decision of the Commission to revoke the special use permit.

I. Time Limits on the Development of Special Use. The start of construction of any and all special uses shall be initiated within 365 days of their approval by the Village Board and the use shall be operational within 730 days of said approval, unless stated otherwise in the conditions of approval. Failure to initiate development within this period shall automatically constitute a revocation of the special use. For the purposes of this section, "operational" shall be defined as the granting of an occupancy permit for the special use. Prior to such a revocation, the applicant may request an extension of this period. Said request shall require formal approval by the Village Board and shall be based upon showing of acceptable justification, as determined by the Village Board.

J. Discontinued Special Use. Any and all special uses that have been discontinued for a period of one year shall have their special use permit invalidated automatically. The burden of proof shall be on the property owner to demonstrate that the special use was in operation during this period.

K. Changes to Special Use. All requirements of the approved special use shall be continued regardless of ownership of the subject property. Modification, alteration, or expansion of any special use without approval by the Village Board, shall be considered in violation of the Zoning Ordinance and shall be, in addition to any other remedies or penalties, grounds for revocation of said special use approval per subsection H. above.

L. Fee. A fee is required for this procedure. Refer to Section 8-5-12.

(Ord. 2012-012, 3-13-2012)

## 8-7-9. SOLAR ENERGY.

A. Purpose. As energy demands increase the need for alternate sources rises. It is the purpose of this section to provide opportunity for residents to utilize alternate energy sources in a safe and effective manner.

B. Minimum Requirements:

1. Any solar collectors shall be installed either on the roof of the principal structure or accessory structure or shall be otherwise incorporated into and made an integral part of the main building. The maximum height and setback regulations of the zoning district in which it is proposed shall be observed.

2. No solar collector, solar engine or accessories, pipes or ducts for any solar collector or shall be installed on any roof having a slope of less than one percent (one-eighth (1/8) of an inch per foot or one centimeter per meter).

3. Installations on low sloped roofs shall comply with the following requirements:

a. Clearances. All collectors, reflectors, engines, pipes, ducts and other components shall have sufficient clearance between the roof and the installation to permit roof repairs to be made and to permit circulation of air to avoid constant dampness. A space of two feet or 61 centimeters shall be adequate clearance in all instances, provided that a smaller space shall be permitted if it can be demonstrated that all normal repairs and resurfacings of the roof may be made under the proposed clearances. The clearances required herein shall not apply to vertical pipes installed through the roof surface or installed outside of the outside walls to provide access to solar components.

b. Load capacity. No solar component shall be installed on any roof unless the roof has sufficient capacity to hold the weight of the roof, the weight of the solar components and the anticipated snow load. Load requirements must meet the Village of Poplar Grove's adopted building code. The weight of fluid to be used in any panels, pipes or other components will be included in the calculations of load. In determining the anticipated snow load, the effect of the solar components on causing drifting shall be considered. All solar collectors shall meeting building code requirements.

c. Protection from drifting or sliding snow. On any installation where solar collectors, solar engines and reflectors may cause snow to drift on a roof, provisions shall be made by snow fences, chutes or other barriers to prevent snowdrifts from accumulating on the roof. Wherever a solar collector or other solar component may cause snow to slide, the part of the roof where the snow may accumulate as a result of sliding shall have sufficient capacity to hold the weight of the snow anticipated to accumulate because of sliding. Wherever the location and slope of a solar collector or other solar component may cause snow to slide onto any doorway, sidewalk or other place used by pedestrian traffic, protection in the form of chutes, awnings or other devices shall be provided to prevent any snow from sliding onto any such doorway, sidewalk or other place.

d. Roof penetration. Wherever any pipe, duct or other solar component penetrates the surface of a roof, the roof shall be protected from leaks in the manner provided for any stack, pipe, or conduit penetrating the roof surface.

e. Roof preparation. Before any solar component is installed, the roof shall be inspected and any repairs and maintenance work needed shall be done to put the roof in leak proof condition.

4. All of the requirements for installations on low sloped roofs shall apply to installations on roofs other than low sloped roofs, except that in lieu of clearance from the roof, a solar panel may be attached flush to the roof. Such solar panel may be an integral part of the roof, providing a waterproof cover, with a waterproof seal between the panel and the rest of the roof. If such panel is not made an integral

part of the roof but is attached flush with the roof, the top and sides of the panel shall be sealed where they meet the roof surface or shingles, to prevent water from getting under the panel.

5. Any roof over three stories above the ground shall be provided with a means of access other than an outside ladder against an outside wall. No solar components shall be installed in a location so as to interfere with walkways on any roof.

6. Each solar component which may contain any liquid or gas shall be designed and constructed to prevent the leakage of any liquid or gas under any combination of temperature and pressure possible either during use or when the system is not in use.

7. Each solar collector, solar panel and solar engine shall be securely anchored to withstand the maximum wind pressure anticipated, considering the effects, if any, of the solar components in channeling wind, and without considering the weight of any liquid in the components.

8. Each solar collector, reflector, solar engine and all solar components shall be inspected at least once every two years. Such inspections shall be at the owner's expense and may be made by any qualified person selected by the owner. The inspection shall include looking for any evidence of dampness on the roof due to shading, lack of air circulation or leaks, and shall include examining the structural parts securing all components. The Zoning Officer may request a certified report of such inspection to be provided by the owner/applicant. If such request is required by the Zoning Officer it shall be in writing and provided by the owner/applicant within 30 days.

9. Nothing in this section shall be interpreted as prohibiting any innovative design. Any design not specifically permitted by this chapter may be installed, upon a showing that the proposed system of solar components will achieve the safety objectives and structural objectives of the provisions of this title.

10. Nothing herein contained nor any permit issued hereunder, shall be constructed to restrict or limit the use and development of any adjoining or other premises.

(Ord. 2012-012, 3-13-2012)

Trajectory Energy Partners

**Attachment 3**

Legal Description

[Attached]

## Legal Description

PARCEL 1:
PART OF THE NORTHEAST QUARTER OF SECTION 23, TOWNSHIP 45 NORTH, RANGE 3 EAST OF THE THIRD PRINCIPAL MERIDIAN
DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF SAID NORTHEAST QUARTER OF SAID SECTION 23; THENCE NORTH 00 DEGREES 19 MINUTES 24 SECONDS EAST ALONG SAID EAST LINE, 165.28 FEET TO A POINT ON THE EASTERLY EXTENSION OF THE NORTH LINE OF WEST GROVE SUBDIVISION NO. 2 PER DOCUMENT NO. 2005R09773, SAID POINT BEING THE POINT OF BEGINNING; THENCE SOUTH 89 DEGREES 44 MINUTES 05 SECONDS WEST ALONG SAID EASTERLY EXTENSION AND NORTH LINE THEREOF, 2,592.15 FEET TO THE EAST RIGHT OF WAY LINE OF ILLINOIS ROUTE 76 PER DOCUMENT NUMBER 93-11289; THENCE NORTH 00 DEGREES 03 MINUTES 55 SECONDS EAST ALONG SAID EAST RIGHT OF WAY LINE, 515.66 FEET; THENCE NORTH 04 DEGREES 49 MINUTES 44 SECONDS EAST ALONG SAID EAST RIGHT OF WAY LINE, 301.04 FEET; THENCE NORTH 04 DEGREES 41 MINUTES 54 SECONDS WEST ALONG SAID EAST RIGHT OF WAY LINE, 48.92 FEET TO THE SOUTH LINE OF AN INGRESS/EGRESS EASEMENT PER DOCUMENT NO. 86-4746, SAID SOUTH LINE BEING THE WESTERLY EXTENSION OF THE SOUTH LINE OF A TRACT OF LAND PER DOCUMENT 2017R04091; THENCE SOUTH 89 DEGREES 34 MINUTES 54 SECONDS EAST ALONG SAID WESTERLY EXTENSION AND SOUTH LINE THEREOF, 1,308.30 FEET; THENCE NORTH 00 DEGREES 14 MINUTES 30 SECONDS EAST ALONG SAID SOUTH LINE, 54.02 FEET; THENCE SOUTH 89 DEGREES 34 MINUTES 54 SECONDS EAST ALONG SAID SOUTH LINE AND THE SOUTHERLY LINE OF A TRACT OF LAND PER DOCUMENT NO. 200701917, 573.31 FEET TO THE SOUTHWEST LINE OF SAID TRACT; THENCE SOUTH 28 DEGREES 44 MINUTES 12 SECONDS EAST ALONG SAID SOUTHWEST LINE, 460.00 FEET TO THE SOUTHERLY LINE OF SAID TRACT; THENCE SOUTH 89 DEGREES 40 MINUTES 36 SECONDS EAST ALONG SAID SOUTHERLY LINE, 345.00 FEET TO THE WESTERLY LINE OF SAID TRACT, SAID WESTERLY LINE BEING PARALLEL WITH THE AFOREMENTIONED EAST LINE OF SAID NORTHEAST QUARTER; THENCE SOUTH 00 DEGREES 19 MINUTES 24 SECONDS WEST ALONG SAID PARALLEL LINE, 300.00 FEET TO THE SOUTHERLY MOST LINE OF SAID TRACT; THENCE SOUTH 89 DEGREES 40 MINUTES 36 SECONDS EAST ALONG SAID SOUTHERLY MOST LINE, 125.00 FEET TO SAID EAST LINE; THENCE SOUTH 00 DEGREES 19 MINUTES 24 SECONDS WEST ALONG SAID EAST LINE, 186.68 FEET TO THE POINT OF BEGINNING, IN BOONE COUNTY, ILLINOIS.

PARCEL 2:
PART OF THE NORTHEAST QUARTER OF SECTION 23, TOWNSHIP 45 NORTH, RANGE 3 EAST OF THE THIRD PRINCIPAL MERIDIAN

DESCRIBED AS FOLLOWS:
COMMENCING AT THE SOUTHEAST CORNER OF THE NORTHEAST QUARTER OF SAID SECTION 23; THENCE NORTH 00 DEGREES 19 MINUTES 24 SECONDS EAST ALONG SAID EAST LINE, 165.28 FEET TO THE EASTERLY EXTENSION OF THE NORTH LINE OF WEST GROVE SUBDIVISION NO. 2 PER DOCUMENT NO. 2005R09773; THENCE SOUTH 89 DEGREES 44 MINUTES 05 SECONDS WEST ALONG SAID EASTERLY EXTENSION AND NORTH LINE THEREOF, 2,592.15 FEET TO THE EAST RIGHT OF WAY LINE OF ILLINOIS ROUTE 76 PER DOCUMENT NUMBER 93-11289; THENCE NORTH 00 DEGREES 03 MINUTES 55 SECONDS EAST ALONG SAID EAST RIGHT OF WAY LINE, 515.66 FEET; THENCE NORTH 04 DEGREES 49 MINUTES 44 SECONDS EAST ALONG SAID EAST RIGHT OF WAY LINE, 301.04 FEET; THENCE NORTH 04 DEGREES 41 MINUTES 54 SECONDS WEST ALONG SAID EAST RIGHT OF WAY LINE, 48.92 FEET TO THE POINT OF BEGINNING; THENCE CONTINUING NORTH 04 DEGREES 41 MINUTES 54 SECONDS WEST ALONG SAID EAST RIGHT OF WAY LINE, 50.20 FEET TO THE NORTH LINE OF A INGRESS/EGRESS EASEMENT PER DOCUMENT NO. 86- 4746; THENCE SOUTH 89 DEGREES 34 MINUTES 54 SECONDS EAST ALONG SAID NORTH LINE, 1,095.18 FEET TO THE EAST

LINE OF SAID INGRESS/EGRESS EASEMENT, SAID EAST LINE BEING COINCIDENT WITH THE WEST LINE OF A TRACT OF LAND PER DOCUMENT NO. 2017R04091; THENCE SOUTH 02 DEGREES 09 MINUTES 44 SECONDS EAST ALONG SAID EAST LINE, 50.05 FEET TO THE SOUTH LINE OF SAID INGRESS/EGRESS EASEMENT; THENCE NORTH 89 DEGREES 34 MINUTES 54 SECONDS WEST ALONG SAID SOUTH LINE, 1,092.93 FEET TO THE POINT OF BEGINNING, IN BOONE COUNTY, ILLINOIS.

Trajectory Energy Partners

**Attachment 4**

Lease Agreement (Redacted)

[Attached]

# GROUND LEASE AGREEMENT

## BASIC LEASE TERMS SUMMARY

| | |
|---|---|
| **Effective Date** | May 9, 2024 |
| **Landlord** | Tahoe Trading Company, LLC, an Illinois limited liability company ("**Landlord**"). |
| **Tenant** | Inkberry Solar, LLC, a Delaware limited liability company. |
| **Land** | That certain real property located in Boone County, Illinois (the "**County**") as further described on Exhibit A attached hereto. The portion of the Land to be leased hereunder will be determined in accordance with Section 2 of this Lease. |
| **Initial Due Diligence Period** (Section 3) | Twelve (12) calendar months from the Effective Date. |
| **Initial Due Diligence Fee** (Section 3) | [redacted] |
| **Extended Due Diligence Periods** (Section 3) | Up to five (5) additional 12-month periods commencing upon expiration of the Initial Due Diligence Period (collectively, the "**Extended Due Diligence Periods**"). |
| **Extended Diligence Period Fees** (Section 3) | [redacted] |
| **Term** (Section 4) | The "**Construction Term**" shall commence upon the earlier to occur of (i) the expiration of the Due Diligence Period (as may be extended pursuant to Section 3(b)), and (ii) the Construction Commencement Date (as defined below) and run through the earlier of (a) the Construction Term Outside Date (as defined below) and (b) the date on which Tenant begins to produce and sell electric power from the System on a regular basis (not including test power produced in connection with preliminary testing and final completion of the System) and the System has been interconnected to the local utility and achieved "commercial operations" (or similar term) under the applicable power purchase agreement(s) (the "**Commercial Operation Date**").<br><br>The "**Initial Term**" of this Lease will run for a period of four hundred and twenty (420) consecutive calendar months. |

| | |
|---|---|
| | The "**Term**" of this Lease will include the Construction Term, the Initial Term and, if applicable, any Renewal Terms. |
| **Renewal Terms** (Section 4) | Two (2) successive renewal terms of sixty (60) consecutive calendar months each. |
| **Rent** (Section 7) | [redacted] |
| **Rent Escalation Date** (Section 7) | The first (1st) anniversary of the Rent Commencement Date (as defined in Section 6(a)), and every year thereafter. |
| **Rent Escalation Percentage** (Section 7) | [redacted] |
| **Intended Use** (Section 11) | The development, construction, installation, operation, maintenance, repair, replacement, removal, and financing of one or more solar energy and/or energy storage systems for the generation, conversion, storage and distribution of electric power (the "**System**") and related monitoring, interconnection, transmission, distribution and communication facilities. |
| **Landlord's Notice Address** (Section 19) | [redacted] |
| **Tenant's Notice Address** (Section 19) | Inkberry Solar, LLC<br>P.O. Box 310<br>Highland Park, IL 60035<br>(312) 882-3713<br>legal@trajectoryenergy.com |

*[remaining portions of Ground Lease Agreement omitted for confidentiality]*

IN WITNESS WHEREOF, the parties hereto have duly executed this Lease as of the Effective Date.

**TENANT:** **Inkberry Solar, LLC**

By: _____

Name: Jonathan K. Carson

Title: Authorized Representative

**LANDLORD:** **Tahoe Trading Company, LLC**

By: _____

Name: Daniel Kelly

Title: Manager

IN WITNESS WHEREOF, the parties hereto have duly executed this Lease as of the Effective Date.

**TENANT:** **Inkberry Solar, LLC**

By: _____

Name: Jonathan K. Carson

Title: Authorized Representative

**LANDLORD:** **Tahoe Trading Company, LLC**

By: _____

Name: Daniel Kelly

Title: Manager

*[Signature page to Ground Lease Agreement – Inkberry Solar]*

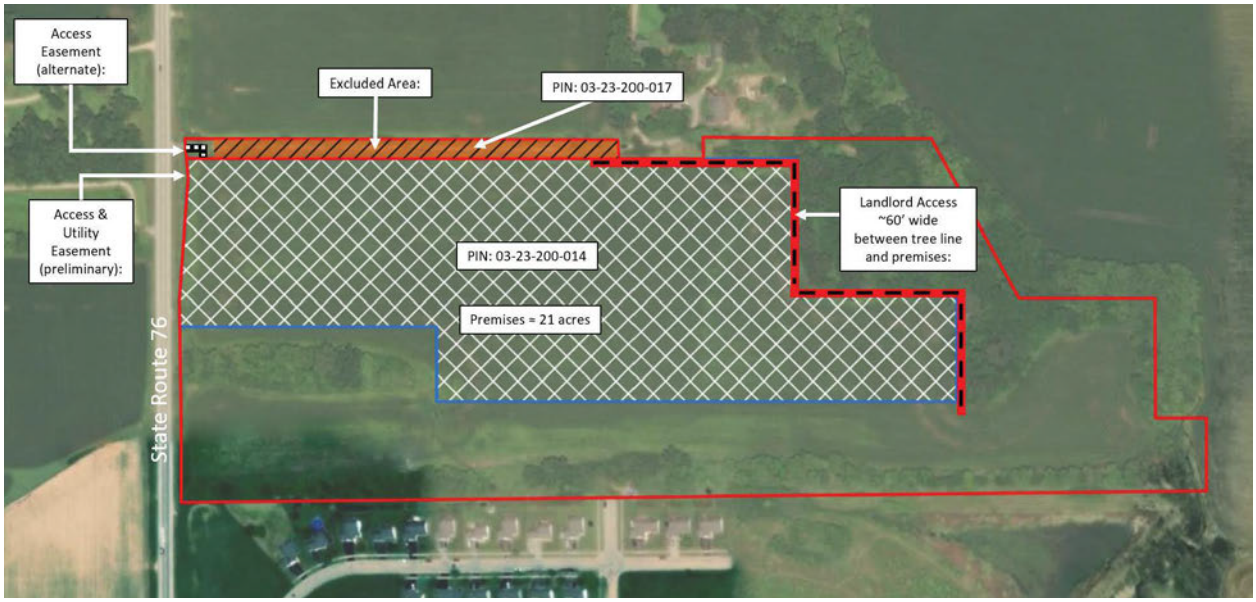
# Exhibit A

## Lease Boundary Line

Land: parcel nos. 03-23-200-014 and 03-23-200-017 in Boone County, Illinois.

Acreage: Tenant proposes to lease up to the entire portion of the Land as outlined below, or approximately 21 acres in total, including the following easements.

Easements: Tenant expects to run across any setback between the System and (a) IL Route 76 (which runs north to south immediately west of the Land) access road(s) for ingress/egress to/from the System and (b) the utility distribution lines that run along IL Route 76 wire(s) that would connect the System to such utility distribution lines, in order to interconnect the System to the distribution grid.



## Exhibit B

### Permitted Liens

That certain written farm lease agreement (Illinois Cash Farm Lease) dated as of February 1, 2022 between Landlord and Matthew Bullard, as farm tenant, as amended by the first amendment to Illinois Cash Farm Lease dated as of May 1, 2024.

Trajectory Energy Partners

# INKBERRY SOLAR, LLC

## 2 MWac Community Solar Project

## Village of Poplar Grove Petition for Special Use

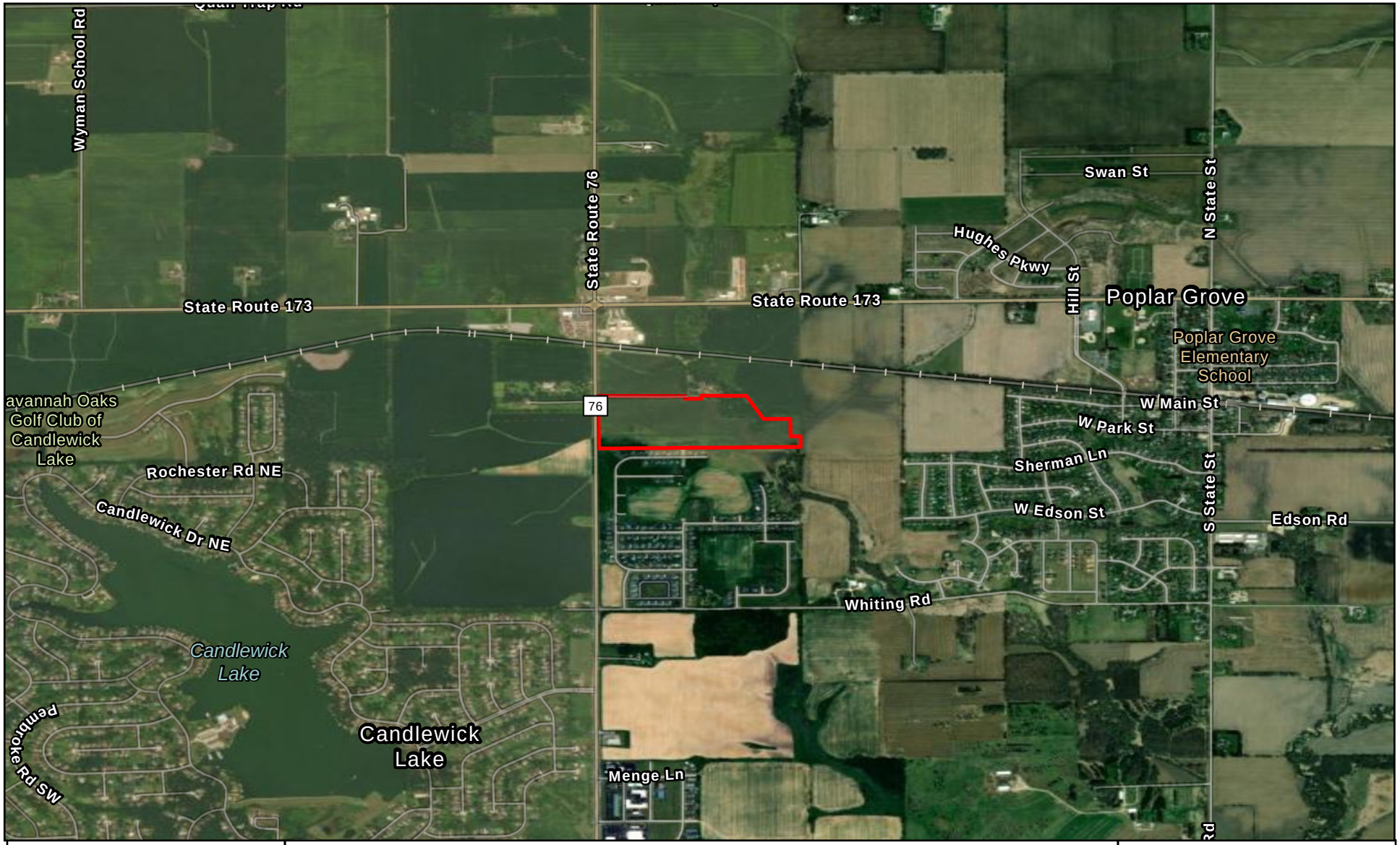
## APPENDIX B

## Submitted May 30th, 2025

**Exhibit A**

Project Location

[Attached]




# Inkberry Solar, LLC

Trajectory Energy Partners

## General Location

Date: 5/13/2025

N

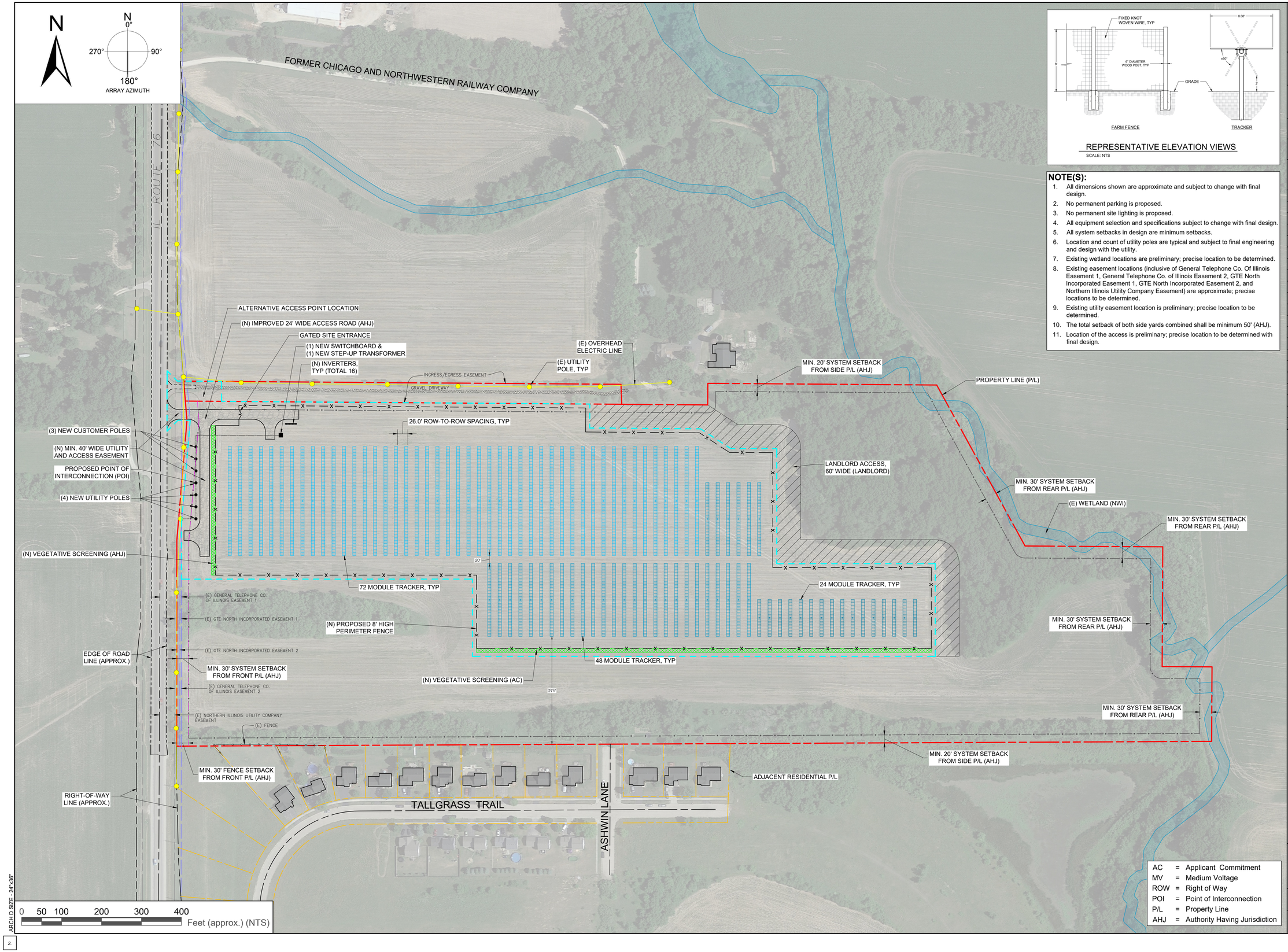
0 0.3 0.6 Mi

0 1,500 3,000 Feet

**Exhibit B**

Preliminary Site Plan

[Attached]







REPRESENTATIVE ELEVATION VIEWS

SCALE: NTS

## NOTE(S):

1. All dimensions shown are approximate and subject to change with final design.
2. No permanent parking is proposed.
3. No permanent site lighting is proposed.
4. All equipment selection and specifications subject to change with final design.
5. All system setbacks in design are minimum setbacks.
6. Location and count of utility poles are typical and subject to final engineering and design with the utility.
7. Existing wetland locations are preliminary; precise location to be determined.
8. Existing easement locations (inclusive of General Telephone Co. Of Illinois Easement 1, General Telephone Co. of Illinois Easement 2, GTE North Incorporated Easement 1, GTE North Incorporated Easement 2, and Northern Illinois Utility Company Easement) are approximate; precise locations to be determined.
9. Existing utility easement location is preliminary; precise location to be determined.
10. The total setback of both side yards combined shall be minimum 50' (AHJ).
11. Location of the access is preliminary; precise location to be determined with final design.

| | |
|---|---|
| AC | = Applicant Commitment |
| MV | = Medium Voltage |
| ROW | = Right of Way |
| POI | = Point of Interconnection |
| P/L | = Property Line |
| AHJ | = Authority Having Jurisdiction |

Trajectory Energy Partners

**Project Name:**
Inkberry Solar, LLC

**Drawing Designation:**
Special Use Permit (SUP) Design

**Project County:**
Boone County

**Facility Location:**
42.36568°N, 88.84700°W

## SYSTEM DETAILS
### (Preliminary)

| | |
|---|---|
| SITE AREA | 19.94 +/- acres (approx.) |
| DC SYSTEM SIZE | 3,087 kW |
| AC SYSTEM SIZE | 2,000 kW |
| DC/AC RATIO | 1.54 |
| POCC/POI VOLTAGE | 12.5 kV |
| ROW SPACING (GCR) | 26.0' (31%) |
| RACKING SYSTEM | Single-Axis Tracker |
| MODULE TILT | -60° to 60 |
| ARRAY AZIMUTH | 180° |
| **PV MODULES** | |
| MANUFACTURER | Hanwha Qcells |
| MODEL | Q.PEAK DUO XL-G11S.3/BFG |
| DC POWER @ STC | 590 W |
| MAX DC SYS. VOLTAGE | 1500 V |
| MODULES PER STRING | 24 |
| MODULE COUNT | 5,232 |
| **INVERTERS** | |
| MANUFACTURER | Yaskawa Solectria Solar |
| MODEL | XGI 1500-125 |
| NOMINAL POWER | 125 kW |
| INVERTER COUNT | 16 |

## LEGEND

- Property Line
- Site Area Boundary
- System Setback Line
- Fence Setback Line
- (N) Improved 24' Wide Access Road
- (N) Proposed 8' High Perimeter Fence
- (N) Underground MV Line
- (N) Overhead MV Line
- (N) Vegetative Screening
- Landlord Access
- Edge of Road Line
- Centerline of Road
- Right-of-Way Line
- Old Right-of-Way Line
- Adjacent Residential Property Line
- Quarter Section Line
- Easement
- (E) Overhead Electric Line
- (E) Utility Pole
- (E) Residences
- (E) Wetlands
- (E) Fence

**PRELIMINARY**
NOT FOR CONSTRUCTION

| | |
|---|---|
| **Revision:** A-1 | **Date Printed:** 5/28/2025 |
| **Drawn:** Justin H. | **Checked:** Molly S. |

ARCH D SIZE - 24"x36"

**Exhibit C**

Plat of Survey

[Attached]

# ALTA/NSPS LAND TITLE SURVEY

## NOTES CORRESPONDING TO TABLE A:

TABLE A ITEMS 1, 2, 3, 4, 6(a), 6(b), 7(a), 7(b)(1), 7(b)(2), 8, 9, 11(a), 13, 14, 16, 17, 18 AND 19 ARE SHOWN HEREON THIS SURVEY

TABLE A ITEM 1: ALL MONUMENTS WERE EITHER FOUND OR SET AND ARE SHOWN HEREON THIS SURVEY.

TABLE A ITEM 2: ADDRESS OF THE SURVEYED PROPERTY WAS NOT OBTAINED BY THE SURVEYOR OR OBSERVED WHILE CONDUCTING THE FIELD WORK.

TABLE A ITEM 3: UPON INSPECTION OF THE FLOOD INSURANCE RATE MAP FOR THE SUBJECT AREA, PANEL NUMBER 17007C0105C WITH EFFECTIVE DATE OF FEBRUARY 18, 2011 IT APPEARS THAT THE PROPERTY SHOWN HEREON WOULD LINE IN "ZONE X" AREA OF MINIMAL FLOOD HAZARD.

TABLE A ITEM 4: GROSS LAND AREA = 2,049,721 SQUARE FEET OR 47.055 ACRES MORE OR LESS. (TO HEAVY LINES)

TABLE A ITEM 6(a): NO ZONING REPORT PROVIDED.

TABLE A ITEM 6(b): NO ZONING REPORT PROVIDED.

TABLE A ITEM 7(a): EXTERIOR DIMENSIONS OF ALL BUILDINGS AT GROUND LEVEL. NOT APPLICABLE.

TABLE A ITEM 7(b)(1): SQUARE FOOTAGE OF EXTERIOR FOOTPRINT OF ALL BUILDINGS AT GROUND LEVEL. NOT APPLICABLE.

TABLE A ITEM 8: ALL SUBSTANTIAL FEATURES OF THE SUBJECT PROPERTY ARE SHOWN ON THE SURVEY.

TABLE A ITEM 9: NO PARKING SPACES WERE OBSERVED AT THE TIME OF SURVEY.

TABLE A ITEM 11(a): MANHOLES, INLETS, CATCH BASINS, VAULTS, VALVES AND ANY OTHER SUCH STRUCTURES SHOWN HEREON ARE FROM FIELD LOCATIONS OF SUCH, AND ONLY REPRESENT SUCH UTILITY IMPROVEMENTS WHICH ARE VISIBLE FROM ABOVE GROUND OR ACCESSIBLE THROUGH STRUCTURES AT THE TIME OF SURVEY. OTHER UTILITIES NOT SHOWN HEREON THIS SURVEY MAY EXIST. PLANS AND/OR REPORTS WERE NOT PROVIDED BY THE CLIENT.

TABLE A ITEM 13: NAMES OF ADJOINING OWNERS ACCORDING TO CURRENT TAX RECORDS SHOWN ON SURVEY.

TABLE A ITEM 14: DISTANCE TO THE NEAREST INTERSECTING STREET SHOWN ON SAID SURVEY.

TABLE A ITEM 16: NO EVIDENCE OF EARTH MOVING WORK, BUILDING CONSTRUCTION, OR BUILDING ADDITIONS WERE OBSERVED IN THE PROCESS OF CONDUCTING THE FIELD WORK.

TABLE A ITEM 17: NO PROPOSED CHANGES IN STREET RIGHT OF WAY LINES HAVE BEEN DISCOVERED. NO EVIDENCE OF RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS WERE OBSERVED IN THE PROCESS OF CONDUCTING THE FIELD WORK.

TABLE A ITEM 18: PLOTTABLE OFFSITE EASEMENTS WERE DISCLOSED IN DOCUMENTS PROVIDED TO OR OBTAINED BY THE SURVEYOR AS SHOWN ON SAID SURVEY.

TABLE A ITEM 19: REGIONAL LAND SERVICES, LLC CARRIES PROFESSIONAL LIABILITY INSURANCE IN THE MINIMUM AMOUNT OF $1,000,000.

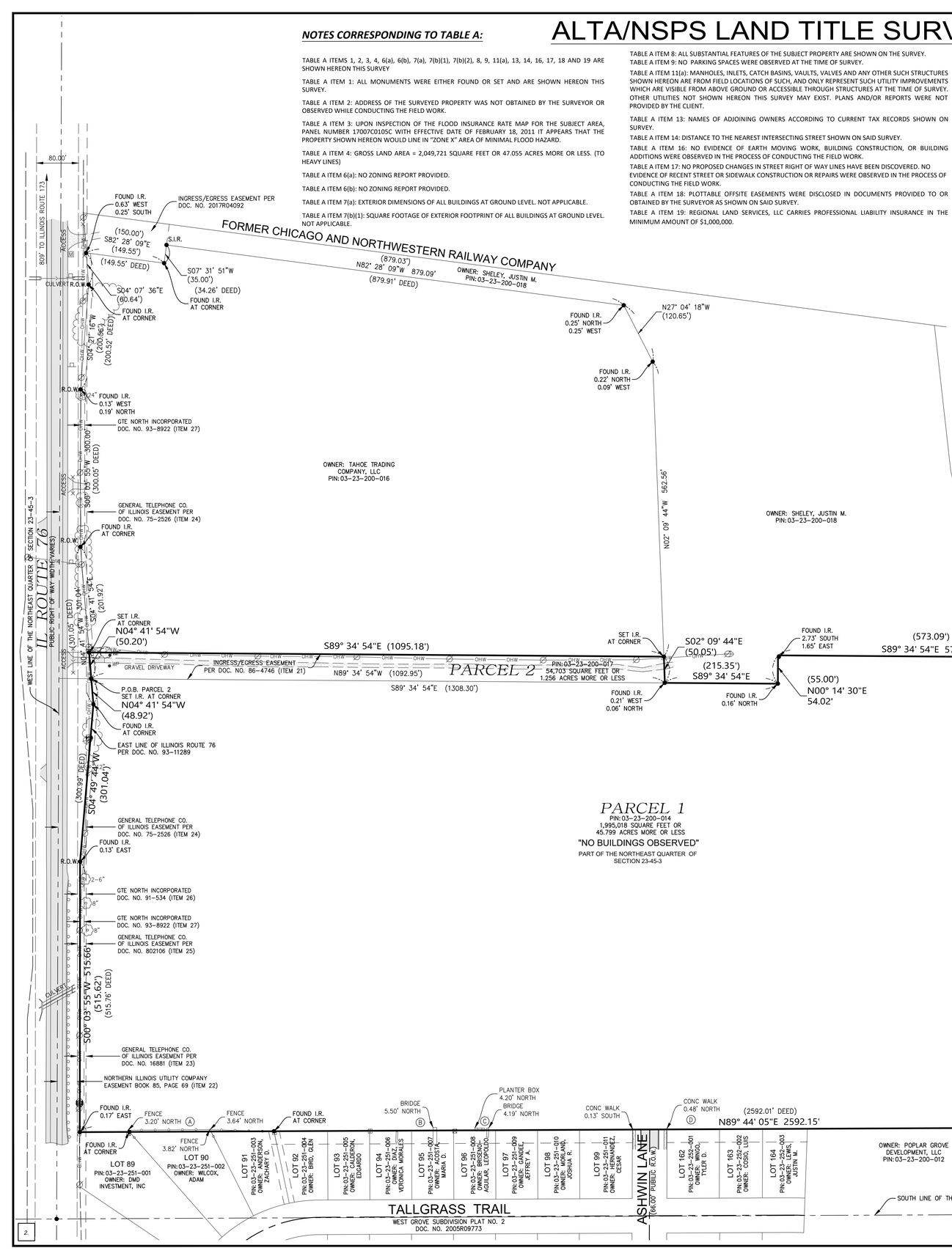
## LEGAL DESCRIPTION

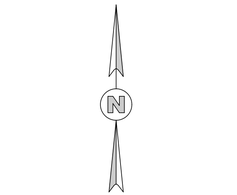
PARCEL 1:
PART OF THE NORTHEAST QUARTER OF SECTION 23, TOWNSHIP 45 NORTH, RANGE 3 EAST OF THE THIRD PRINCIPAL MERIDIAN DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF SAID NORTHEAST QUARTER OF SAID SECTION 23; THENCE NORTH 00 DEGREES 19 MINUTES 24 SECONDS EAST ALONG SAID EAST LINE, 165.28 FEET TO A POINT ON THE EASTERLY EXTENSION OF THE NORTH LINE OF WEST GROVE SUBDIVISION NO. 2 PER DOCUMENT NO. 2005R09773, SAID POINT BEING THE POINT OF BEGINNING; THENCE SOUTH 89 DEGREES 44 MINUTES 05 SECONDS WEST ALONG SAID EASTERLY EXTENSION AND NORTH LINE THEREOF, 2,592.15 FEET TO THE EAST RIGHT OF WAY LINE OF ILLINOIS ROUTE 76 PER DOCUMENT NUMBER 93-11289; THENCE NORTH 00 DEGREES 03 MINUTES 55 SECONDS EAST ALONG SAID EAST RIGHT OF WAY LINE, 515.66 FEET; THENCE NORTH 04 DEGREES 49 MINUTES 44 SECONDS EAST ALONG SAID EAST RIGHT OF WAY LINE, 301.04 FEET; THENCE NORTH 04 DEGREES 41 MINUTES 54 SECONDS WEST ALONG SAID EAST RIGHT OF WAY LINE, 48.92 FEET TO THE SOUTH LINE OF AN INGRESS/EGRESS EASEMENT PER DOCUMENT NO. 86-4746, SAID SOUTH LINE BEING THE WESTERLY EXTENSION OF THE SOUTH LINE OF A TRACT OF LAND PER DOCUMENT 2017R04091; THENCE SOUTH 89 DEGREES 34 MINUTES 54 SECONDS EAST ALONG SAID WESTERLY EXTENSION AND SOUTH LINE THEREOF, 1,308.30 FEET; THENCE NORTH 00 DEGREES 14 MINUTES 30 SECONDS EAST ALONG SAID SOUTH LINE, 54.02 FEET; THENCE SOUTH 89 DEGREES 34 MINUTES 54 SECONDS EAST ALONG SAID SOUTH LINE AND THE SOUTHERLY LINE OF A TRACT OF LAND PER DOCUMENT NO. 200701917, 573.31 FEET TO THE SOUTHWEST LINE OF SAID TRACT; THENCE SOUTH 28 DEGREES 44 MINUTES 12 SECONDS EAST ALONG SAID SOUTHWEST LINE, 460.00 FEET TO THE SOUTHERLY LINE OF SAID TRACT; THENCE SOUTH 89 DEGREES 40 MINUTES 36 SECONDS EAST ALONG SAID SOUTHERLY LINE, 345.00 FEET TO THE WESTERLY LINE OF SAID TRACT, SAID WESTERLY LINE BEING PARALLEL WITH THE AFOREMENTIONED EAST LINE OF SAID NORTHEAST QUARTER; THENCE SOUTH 00 DEGREES 19 MINUTES 24 SECONDS WEST ALONG SAID PARALLEL LINE, 300.00 FEET TO THE SOUTHERLY MOST LINE OF SAID TRACT; THENCE SOUTH 89 DEGREES 40 MINUTES 36 SECONDS EAST ALONG SAID SOUTHERLY MOST LINE, 125.00 FEET TO SAID EAST LINE; THENCE SOUTH 00 DEGREES 19 MINUTES 24 SECONDS WEST ALONG SAID EAST LINE, 186.68 FEET TO THE POINT OF BEGINNING, IN BOONE COUNTY, ILLINOIS.

PARCEL 2:
PART OF THE NORTHEAST QUARTER OF SECTION 23, TOWNSHIP 45 NORTH, RANGE 3 EAST OF THE THIRD PRINCIPAL MERIDIAN DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF THE NORTHEAST QUARTER OF SAID SECTION 23; THENCE NORTH 00 DEGREES 19 MINUTES 24 SECONDS EAST ALONG SAID EAST LINE, 165.28 FEET TO THE EASTERLY EXTENSION OF THE NORTH LINE OF WEST GROVE SUBDIVISION NO. 2 PER DOCUMENT NO. 2005R09773; THENCE SOUTH 89 DEGREES 44 MINUTES 05 SECONDS WEST ALONG SAID EASTERLY EXTENSION AND NORTH LINE THEREOF, 2,592.15 FEET TO THE EAST RIGHT OF WAY LINE OF ILLINOIS ROUTE 76 PER DOCUMENT NUMBER 93-11289; THENCE NORTH 00 DEGREES 03 MINUTES 55 SECONDS EAST ALONG SAID EAST RIGHT OF WAY LINE, 515.66 FEET; THENCE NORTH 04 DEGREES 49 MINUTES 44 SECONDS EAST ALONG SAID EAST RIGHT OF WAY LINE, 301.04 FEET; THENCE NORTH 04 DEGREES 41 MINUTES 54 SECONDS WEST ALONG SAID EAST RIGHT OF WAY LINE, 48.92 FEET TO THE POINT OF BEGINNING; THENCE CONTINUING NORTH 04 DEGREES 41 MINUTES 54 SECONDS WEST ALONG SAID EAST RIGHT OF WAY LINE, 50.20 FEET TO THE NORTH LINE OF A INGRESS/EGRESS EASEMENT PER DOCUMENT NO. 86- 4746; THENCE SOUTH 89 DEGREES 34 MINUTES 54 SECONDS EAST ALONG SAID NORTH LINE, 1,095.18 FEET TO THE EAST LINE OF SAID INGRESS/EGRESS EASEMENT, SAID EAST LINE BEING COINCIDENT WITH THE WEST LINE OF A TRACT OF LAND PER DOCUMENT NO. 2017R04091; THENCE SOUTH 02 DEGREES 09 MINUTES 44 SECONDS EAST ALONG SAID EAST LINE, 50.05 FEET TO THE SOUTH LINE OF SAID INGRESS/EGRESS EASEMENT; THENCE NORTH 89 DEGREES 34 MINUTES 54 SECONDS WEST ALONG SAID SOUTH LINE, 1,092.93 FEET TO THE POINT OF BEGINNING, IN BOONE COUNTY, ILLINOIS.




BASIS OF BEARINGS:
*BEARINGS SHOWN HEREON BASED ON ILLINOIS STATE PLANE COORDINATES, ZONE EAST, N.A.D. 1983*

### LEGEND

- EXISTING SIGN
- EXISTING POWER POLE
- EXISTING GUY WIRE
- EXISTING MAILBOX
- EXISTING ELECTRIC PEDESTAL
- EXISTING TELEPHONE PEDESTAL
- EXISTING WOOD POST
- EXISTING FIBER OPTICS MARKER POST
- EXISTING DECIDUOUS TREE (LEAF TREE)
- PARCEL LIMITS
- SECTION LINE
- QUARTER SECTION LINE
- RIGHT OF WAY LINE
- EASEMENT
- CENTER LINE OF RIGHT OF WAY
- EXISTING STORM LINE
- EXISTING OVERHEAD WIRES
- EXISTING STEEL GUARDRAIL
- EXISITING WOOD FENCE
- EXISTING EDGE OF TREES
- EXISTING BUILDING
- EXISTING CONCRETE PAVEMENT
- EXISTING ASPHALT PAVEMENT
- EXISTING GRAVEL PAVEMENT

### UTILITY STATEMENT

*THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES DECLARE THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.*

811 Know what's below. Call before you dig. JULIE (OUTSIDE CHICAGO AREA) CALL 48 HOURS (2 WORKING DAYS) BEFORE YOU DIG 811 or 1-800-892-0123


*LOCATION MAP*
NOT TO SCALE

## NOTES CORRESPONDING TO SCHEDULE B, PART II:

1. THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY THE SURVEYOR. ALL INFORMATION REGARDING DEEDS, EASEMENTS, RIGHTS, COVENANTS, CONDITIONS, RESTRICTIONS, ADJOINERS AND/OR OTHER DOCUMENTS THAT MIGHT EFFECT TITLE TO THE PROPERTY DEPICTED HEREON WAS APPLIED FROM CHICAGO TITLE INSURANCE COMPANY, COMMITMENT NO. 5245-2301549, REVISION 7, DATED DECEMBER 16, 2024 PROVIDED TO THE SURVEYOR BY THE CLIENT, TITLE COMPANY AND/OR THEIR REPRESENTATIVES.

2. SCHEDULE B ITEMS 1 THROUGH 7 ARE NOT SURVEY RELATED.

3. SCHEDULE B ITEM 8: PERMANENT TAX NUMBER 03-23-200-014 AS LISTED IN TITLE COMMITMENT. (AFFECTS PARCEL 1:)

4. SCHEDULE B ITEM 9: IS NOT SURVEY RELATED.

5. SCHEDULE B ITEM 10: PERMANENT TAX NUMBER 03-23-200-017 AS LISTED IN TITLE COMMITMENT. (AFFECTS PARCEL 2)

6. SCHEDULE B ITEMS 11 THROUGH 20 ARE NOT SURVEY RELATED.

7. SCHEDULE B ITEM 21: INGRESS AND EGRESS EASEMENT FOR THE PURPOSE OF MOVEMENT OF FARM MACHINERY PER DOCUMENT NO. 86-4746 RECORDED NOVEMBER 7, 1986. AFFECTS SUBJECT PARCEL. SHOWN ON SAID SURVEY.

8. SCHEDULE B ITEM 22: EASEMENT GRANTED TO ILLINOIS NORTHERN UTILITIES COMPANY FOR THE PURPOSE OF ELECTRIC TRANSMISSION LINES RECORDED IN BOOK 85, PAGE 69 AND DATED OCTOBER 17, 1928. FALLS WITHIN ROAD RIGHT OF WAY. SHOWN ON SAID SURVEY.

9. SCHEDULE B ITEM 23: EASEMENT GRANTED TO GENERAL TELEPHONE COMPANY OF ILLINOIS FOR THE PURPOSE OF COMMUNICATION LINES PER DOCUMENT NO. 16881 RECORDED JULY 1, 1970. AFFECTS SUBJECT PARCEL. SHOWN ON SAID SURVEY.

10. SCHEDULE B ITEM 24: EASEMENT GRANTED TO GENERAL TELEPHONE COMPANY OF ILLINOIS FOR THE PURPOSE OF COMMUNICATION LINES PER DOCUMENT NO. 75-2526 RECORDED OCTOBER 14, 1975. AFFECTS SUBJECT PARCEL. SHOWN ON SAID SURVEY.

11. SCHEDULE B ITEM 25: EASEMENT GRANTED TO GENERAL TELEPHONE COMPANY OF ILLINOIS FOR THE PURPOSE OF COMMUNICATION LINES PER DOCUMENT NO. 80-2106 RECORDED AUGUST 5, 1980. AFFECTS SUBJECT PARCEL. SHOWN ON SAID SURVEY.

12. SCHEDULE B ITEM 26: EASEMENT GRANTED TO GTE NORTH INCORPORATED FOR THE PURPOSE OF COMMUNICATION LINES PER DOCUMENT NO. 91-534 RECORDED SEPTEMBER 11, 1991. AFFECTS SUBJECT PARCEL. SHOWN ON SAID SURVEY.

13. SCHEDULE B ITEM 27: EASEMENT GRANTED TO GTE NORTH INCORPORATED FOR THE PURPOSE OF COMMUNICATION LINES PER DOCUMENT NO. 93-8922 RECORDED OCTOBER 12, 1993. AFFECTS SUBJECT PARCEL. SHOWN ON SAID SURVEY.

14. SCHEDULE B ITEM 28 THROUGH 31 ARE NOT SURVEY RELATED.

15. SCHEDULE B ITEM 32: A LEASE WITH CERTAIN TERMS, COVENANTS, CONDITIONS AND PROVISIONS SET FORTH THEREIN DATED MAY 9, 2024 AS DOCUMENT NO. 2025R01199.
NOTE: PARTIAL RELEASE OF MEMORANDUM OF LEASE RECORDED APRIL 2, AS DOCUMENT NO. 2025R01199.
AMENDED AND RESTATED MEMORANDUM OF LEASE MADE BY AND BETWEEN TAHOE TRADING COMPANY, LLC AN ILLINOIS LIMITED LIABILITY COMPANY AND INKBERRY SOLAR, LLC RECORDED APRIL 2, 2025 AS DOCUMENT NO. 202501201. AFFECTS SUBJECT PARCEL. NOT POLTTABLE.

## NOTES:

1. THE LEASE PREMISES HAS DIRECT ACCESS TO IL ROUTE 76, A PUBLIC ROAD, FOR PUBLIC USE, WITHOUT GAPS OR GORES.

2. THE PROPERTY DESCRIBED HEREON IS THE SAME PROPERTY DESCRIBED IN THAT CERTAIN TITLE COMMITMENT ISSUED BY CHICAGO TITLE INSURANCE COMPANY, COMMITMENT NUMBER 5245-2301549, REVISION 7, DATED AS OF DECEMBER 16, 2024.

3. ALL SUBSTANTIAL FEATURES OBSERVED DURING THE FIELDWORK ARE PLOTTED HEREON, INCLUDING ANY ABOVE-GROUND UTILITIES.

4. LOCATION OF ALL UTILITIES AND SUBSTRUCTURES ARE APPROXIMATELY BASED ON SURFACE EVIDENCE AND EXISTING PLANS, AS PROVIDED BY THE CLIENT.

5. ENCROACHMENTS WERE OBSERVED AT THE TIME OF THE SURVEY.
   A. WOOD FENCE LOCATED NEAR LOT 90 IN WEST GROVE SUBDIVISION.
   B. WOOD BRIDGE LOCATED NEAR LOT 95 IN WEST GROVE SUBDIVISION.
   C. WOOD BRIDGE AND PLANTER BOX NEAR LOT 96 IN WEST GROVE SUBDIVISION.
   D. CONCRETE SIDEWALK AT ASHWIN LANE IN WEST GROVE SUBDIVISION.

STATE OF ILLINOIS )
) SS
COUNTY OF OGLE )

TO: INKBERRY SOLAR, LLC.
CHICAGO TITLE INSURANCE COMPANY

PROFESSIONAL LAND SURVEYOR — RUDY P. DIXON — 035-003832 — ROCHELLE ILLINOIS — STATE OF ILLINOIS

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2021 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1, 2, 3, 4, 6(a), 6(b), 7(a), 7(b)(1), 7(b)(2), 8, 9, 11(a), 13, 14, 16, 17, 18 AND 19 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON SEPTEMBER 20, 2024. DATE OF PLAT OR MAP: 05/07/2025

REGIONAL LAND SERVICES, LLC
PROFESSIONAL DESIGN FIRM NUMBER 007858-0010

Rudy P. Dixon — 05/07/2025
RUDY P. DIXON — DATE
ILLINOIS PROFESSIONAL LAND SURVEYOR NO. 035-003832
LICENSE EXPIRES NOVEMBER 30, 2026
EMAIL:rdixon@regional-ls.com
WWW.REGIONAL-LS.COM

*THIS PROFESSIONAL SERVICE CONFORMS TO THE CURRENT ILLINOIS MINIMUM STANDARDS FOR A BOUNDARY SURVEY.*

DRAWN BY: RVAH — DATE: 05/07/2025
CHECKED BY: RPD — DATE: 05/07/2025
PROJECT LEADER: 240231
SCALE: 1" = 100'
FIELD WORK COMPLETED DATE: 09/20/2024
ORDERED BY: AVIA HASSE
PROPERTY ADDRESS: 7S 765 IL ROUTE 76 POPLAR GROVE, IL

| REV | DESCRIPTION | DATE |
|---|---|---|
| 0 | CLIENT COMMENT | 05/07/2025 |
| 1 | CLIENT COMMENT | 05/09/2025 |

*SURVEYORS NOTES:*
1) ALL DIMENSIONS ARE GIVEN IN FEET AND DECIMAL PARTS THEREOF.
2) BEFORE STARTING ANY CONSTRUCTION OF IMPROVEMENTS OR FENCES FIELD MONUMENTATION SHALL BE ESTABLISHED.
3) REFER TO YOUR DEED, TITLE POLICY AND LOCAL ORDINANCES FOR RESTRICTIONS, BUILDING LINES & EASEMENTS.
4) PARCEL DIMENSIONS AND/OR BEARINGS WITHIN PARENTHESIS ABBREVIATED REC ARE RECORDED DOCUMENT DIMENSIONS AND/OR BEARINGS

CLIENT: INKBERRY SOLAR, LLC
POPLAR GROVE, IL 61065

REGIONAL LAND SERVICES
9512 FOWLER ROAD
ROCHELLE, ILLINOIS 61068
PHONE: (618) 559-2260

PROJECT NUMBER: 240231
DATE: 05/07/2025
SHEET: 1 OF 1
DRAWING NUMBER: ALTA 70

**Exhibit D**

EcoCAT Consultation

[Attached]

EcoCAT
Ecological Compliance Assessment Tool

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

*Applicant:* Trajectory Energy Partners, LLC
*Contact:* Tyler Morris
*Address:* PO Box 310
Highland Park, IL 60035

*IDNR Project Number:* 2415190
*Date:* 05/20/2024

*Project:* Inkberry Solar, LLC
*Address:* Land along Illinois Route 76 Street in Boone County, IL, Poplar Grove

*Description:* Inkberry Solar is a 2MWac community solar system on approximately 21 acres.

## Natural Resource Review Results

**Consultation for Endangered Species Protection and Natural Areas Preservation (Part 1075)**

The Illinois Natural Heritage Database contains no record of State-listed threatened or endangered species, Illinois Natural Area Inventory sites, dedicated Illinois Nature Preserves, or registered Land and Water Reserves in the vicinity of the project location.

**Consultation is terminated.** This consultation is valid for two years unless new information becomes available that was not previously considered; the proposed action is modified; or additional species, essential habitat, or Natural Areas are identified in the vicinity. If the project has not been implemented within two years of the date of this letter, or any of the above listed conditions develop, a new consultation is necessary. Termination does not imply IDNR's authorization or endorsement.

### Location

The applicant is responsible for the accuracy of the location submitted for the project.

*County:* Boone

*Township, Range, Section:*
45N, 3E, 23

**IL Department of Natural Resources Contact**
Bradley Hayes
217-785-5500
Division of Ecosystems & Environment

**Government Jurisdiction**
Zoning Office
Jessica Roberts
1212 Logan Ave.
Suite 102
Belvidere, Illinois 61008

**Disclaimer**

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.

**Terms of Use**

By using this website, you acknowledge that you have read and agree to these terms. These terms may be revised by IDNR as necessary. If you continue to use the EcoCAT application after we post changes to these terms, it will mean that you accept such changes. If at any time you do not accept the Terms of Use, you may not continue to use the website.

1. The IDNR EcoCAT website was developed so that units of local government, state agencies and the public could request information or begin natural resource consultations on-line for the Illinois Endangered Species Protection Act, Illinois Natural Areas Preservation Act, and Illinois Interagency Wetland Policy Act. EcoCAT uses databases, Geographic Information System mapping, and a set of programmed decision rules to determine if proposed actions are in the vicinity of protected natural resources. By indicating your agreement to the Terms of Use for this application, you warrant that you will not use this web site for any other purpose.

2. Unauthorized attempts to upload, download, or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act.

3. IDNR reserves the right to enhance, modify, alter, or suspend the website at any time without notice, or to terminate or restrict access.

**Security**

EcoCAT operates on a state of Illinois computer system. We may use software to monitor traffic and to identify unauthorized attempts to upload, download, or change information, to cause harm or otherwise to damage this site. Unauthorized attempts to upload, download, or change information on this server is strictly prohibited by law.

Unauthorized use, tampering with or modification of this system, including supporting hardware or software, may subject the violator to criminal and civil penalties. In the event of unauthorized intrusion, all relevant information regarding possible violation of law may be provided to law enforcement officials.

**Privacy**

EcoCAT generates a public record subject to disclosure under the Freedom of Information Act. Otherwise, IDNR uses the information submitted to EcoCAT solely for internal tracking purposes.

EcoCAT
Ecological Compliance Assessment Tool

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

# EcoCAT Receipt

**Project Code** 2415190

| APPLICANT | DATE |
|---|---|
| Trajectory Energy Partners, LLC<br>Tyler Morris<br>PO Box 310<br>Highland Park, IL 60035 | 5/20/2024 |

| DESCRIPTION | FEE | CONVENIENCE FEE | TOTAL PAID |
|---|---|---|---|
| EcoCAT Consultation | $ 125.00 | $ 2.81 | $ 127.81 |

TOTAL PAID $ 127.81

Illinois Department of Natural Resources
One Natural Resources Way
Springfield, IL 62702
217-785-5500
dnr.ecocat@illinois.gov

**Exhibit E**

Adjacent Landowner Map

[Attached]


| # | PIN | Landowner Name | Owner Address | Tax Code # |
|---|---|---|---|---|
| 1 | 03-23-100-006 | CATHOLIC DIOCESE OF ROCKFORD | OFFICE OF FINANCE PO BOX 7044 ROCKFORD, IL, 61125 | 09004 - TCA CODE 09004 |
| 2 | 03-23-200-018 | SHELEY, JUSTIN M & HALLIE M | 14837 IL ROUTE 76 CALEDONIA, IL 61011 | 09004 - TCA CODE 09004 |
| 3 | 03-23-200-015 | PRAIRIE TRAIL DEVELOPMENT LLC | 3271 NEWBURG ROAD BELVIDERE, IL, 61008 | 09004 - TCA CODE 09004 |
| 4 | 03-24-100-006 | GALLANO FARMS LTD | 3271 NEWBURG RD BELVIDERE, IL, 61008 | 09004 - TCA CODE 09004 |
| 5 | 03-23-429-007 | POPLAR GROVE VILLAGE OF | 200 N HILL ST POPLAR GROVE, IL, 61065 | 09004 - TCA CODE 09004 |
| 6 | 03-23-200-012 | POPLAR GROVE DEVELOPMENT LLC | 6801 SPRING CREEK RD ROCKFORD, IL, 61114 | 09004 - TCA CODE 09004 |

| | | | | |
|---|---|---|---|---|
| 7 | 03-23-252-003 | LEWIS, JUSTIN M & MIRANDA L | 14081 TALLGRASS TRL POPLAR GROVE, IL 61065 | 09004 - TCA CODE 09004 |
| 8 | 03-23-252-002 | COSIO, LUIS | 14083 TALLGRASS TRL POPLAR GROVE, IL 61065 | 09004 - TCA CODE 09004 |
| 9 | 03-23-252-001 | WINGO, TYLER D | 14085 TALLGRASS TRL POPLAR GROVE, IL 61065 | 09004 - TCA CODE 09004 |
| 10 | 03-23-251-011 | HERNANDEZ, CESAR | 14108 TALLGRASS TRL POPLAR GROVE, IL 61065 | 09004 - TCA CODE 09004 |
| 11 | 03-23-251-010 | MORLAND, JOSHUA R | 14106 TALLGRASS TRL POPLAR GROVE, IL 61065 | 09004 - TCA CODE 09004 |
| 12 | 03-23-251-009 | GANDEE, JEFFREY A & CARMEN L | 14104 TALLGRASS TRL POPLAR GROVE, IL 61065 | 09004 - TCA CODE 09004 |
| 13 | 03-23-251-008 | BRISENO-AGUILAR, LEOPOLDO & BRISENO ANGELINA YVETTE | 14102 TALLGRASS TRL POPLAR GROVE, IL 61065 | 09004 - TCA CODE 09004 |
| 14 | 03-23-251-007 | ACOSTA, MARIA D | 14100 TALLGRASS TRL POPLAR GROVE, IL 61065 | 09004 - TCA CODE 09004 |
| 15 | 03-23-251-006 | DIAZ, VERONICA MORALES | 14098 TALLGRASS TRL POPLAR GROVE, IL 61065 | 09004 - TCA CODE 09004 |
| 16 | 03-23-251-005 | CALDERON, EDGARDO & BAUTISTA BERTHA V | 14096 TALLGRASS TRL POPLAR GROVE, IL 61065 | 09004 - TCA CODE 09004 |
| 17 | 03-23-251-004 | BIRD, GLENN & MARY | 14094 TALLGRASS TRL POPLAR GROVE, IL 61065 | 09004 - TCA CODE 09004 |
| 18 | 03-23-251-003 | ANDERSON, ZACHARY D | 14092 TALLGRASS TRL POPLAR GROVE, IL 61065 | 09004 - TCA CODE 09004 |
| 19 | 03-23-251-002 | WILCOX, ADAM & ALEXANDRIA, LEANN | 14090 TALLGRASS TRL POPLAR GROVE, IL 61065 | 09004 - TCA CODE 09004 |
| 20 | 03-23-251-001 | DMD INVESTMENT INC | 923 LOGAN AVE BELVIDERE, IL, 61008 | 09004 - TCA CODE 09004 |

| | | | | |
|---|---|---|---|---|
| 21 | 03-23-100-009 | HARRIS, DANN A & HARRIS RICHARD E | 13537 ROUTE 76 POPLAR GROVE, IL, 61065 | 09004 - TCA CODE 09004 |
| 22 | 03-23-100-008 | SUNFLOWER DECLARATION OF LIVING TRUST 14718 | 14718 IL ROUTE 76 CALEDONIA, IL, 61011 | 09003 - TCA CODE 09003 |
| 23 | 03-23-100-007 | MILLER, TODD D | 14730 IL ROUTE 76 CALEDONIA, IL 61011 | 09003 - TCA CODE 09003 |
| 24 | 03-23-200-016 | TAHOE TRADING COMPANY LLC | 1610 CANDLEWICK DR SW POPLAR GROVE, IL, 61065 | 09004 - TCA CODE 09004 |

**Exhibit F**

NRI Application - Confirmation of Submission

[Attached]

# Inkberry Solar NRI Application

**Patrick Holzman** <patrick@trajectoryenergy.com> Tue, May 13, 2025 at 2:41 PM
To: boonecountyswcd@gmail.com
Cc: Molly Snittjer <msnittjer@trajectoryenergy.com>, Leah Jorn <ljorn@trajectoryenergy.com>

Hello,

Please see attached the NRI application for Inkberry Solar, LLC. The check for this application is in the mail.

Please let us know if any other information is needed.

Thank you and have a great afternoon.

--
**Patrick Holzman**
**Permitting Analyst,** Trajectory Energy Partners
(773) 562-5323 | patrick@trajectoryenergy.com
Trajectory Energy Partners

**NRI application - Inkberry Solar, LLC.pdf**
8209K

Date Received (Office Only): NRI No._____

# Natural Resource Information Report Application

Boone County Soil and Water Conservation District
211 North Appleton Road, Belvidere, Illinois 61008
815-544-2677 Ext. 3

**Owner's Name:** Tahoe Trading Company, LLC

**Address:** 1610 Candlewick Dr. SW, Poplar Grove, IL 61065

**Petitioner's Name:** Inkberry Solar, LLC

**Address:** P.O Box 310, Highland Park, IL 60035

**Contact Information:**

**Phone Number:** 773-562-5323

**E-Mail Address:** patrick@trajectoryenergy.com; msnittjer@trajectoryenergy.com

**Please indicate how you would like to receive your copy:** ☐ **Mail** ☑ **Email**

**Type of Request:**

☐ Change in Zoning from _____ to _____

☐ Subdivision – Attach proposed plat, if available

☐ Variance (Explain Type) _____

☑ Other (Describe) Special Use Permit in the Village of Poplar Grove for a Commercial Solar Energy Facility.

**Location of the Property:**

Agricultural land along Illinois Route 76 (42.36568, -88.84700)

*(Street Address)*

Parcel Identification Number(s): 03-23-200-014 and 03-23-200-017

Total Acres: 21 +/- acres

**Please Include the Following if Available:**

☑ Plat of survey w/ Legal Description
☐ Zoning or Land Use Petition
☑ Site Plan/ Concept Plan
☑ Fee and Completed Application
☑ Location Map (if not on above map)

Date Received (Office Only): NRI No._____

# Natural Resource Information Fee Schedule

| | |
|---|---|
| Full Report: 0-5 Acres | $400.00 |
| Full Report: 5+ Acres | $400.00 plus $20.00/acre for each acre over five |
| Resource Concern Letter | $100.00 |
| No Impact Letter | $50.00 |
| EcoCat Information Only Report | $35.00 |
| Soil Information with Map Only Report | $35.00 |

Note: We accept cash, check, or card. Card payments through our website. (*Illinois E-Pay through the SWCD website at www.boonecountyswcd.org)* Before the report or letter can be started a payment must be made in full. Please allow 30 days for your application to be processed.

Checks payable to:

Boone County SWCD
211 N. Appleton Road
Belvidere, IL 61008

I (We) understand the filling of this application allows an authorized representative of the Boone County Soil & Water Conservation District to visit and conduct any necessary on-site investigations on the site described above. Completion of this report may require 30 days as allowed by State Law.

| Jonathan K. Carson | | May 13, 2025 |
|---|---|---|
| **Petitioner's Name Printed** | **Petitioner's Name Signed** | **Date of Request** |

_____

**Approved by the Soil & Water Conservation District Board** **Date of Approval**

This report is issued as a guide in making land use decisions and does not preclude further refinement of soil type boundary lines during more detailed on-site investigations. Interpretations are based on criteria established by the National Soils Handbook (USDA-Natural Resources Conservation Service) and are subject to change by this office and appropriate agencies.

**Exhibit G**

Weed/Grass Control Plan & IDNR Pollinator Guidelines

[Attached]

# INKBERRY SOLAR: PRELIMINARY PROJECT SITE WEED AND GRASS MANAGEMENT PLAN

## 1.0 INTRODUCTION

In accordance with the Village of Poplar Grove Zoning Ordinance, Inkberry Solar, LLC ("Inkberry Solar") shall manage all vegetation within the project area and outside the immediate fenced area during the operations of the facility.

Inkberry Solar will maintain native and/or typical pasture grasses on the site during its lifespan unless otherwise approved by the Village of Poplar Grove. Such species are purposefully used so that vegetation will not encroach upon structures which could limit access or effective generation of power. Such plants and grasses shall be mowed/cut and otherwise maintained as needed throughout the year to ensure the site is operated in a clean and neat condition at all times. All vegetation, including beneath solar panels, within and beyond the fenced area shall be maintained by trimming, cutting, and other forms of vegetation maintenance.

Noxious and exotic weeds shall be minimized in order to control these species in general.

## 2.0 NOXIOUS AND EXOTIC WEEDS

The State of Illinois identifies nine species of plants in its Designated Noxious Weeds list. These include:

- common ragweed (Ambrosia artemisiifolia)
- giant ragweed (Ambrosia trifida)
- marijuana (Cannabis sativa)
- musk thistle (Carduus nutans)
- Canada thistle (Cirsium arvense)
- kudzu-vine (Pueraria lobate)
- perennial sowthistle (Sonchus arvensis)
- Johnson grass (Sorghum halepense)
- sorghum-almum (Sorghum x almum)

Additionally, Illinois maintains a Designated Exotic Weeds list. This includes:

- Japanese honeysuckle (Lonicera japonica)
- multiflora rose (Rosa multiflora)
- purple loosestrife (Lythrum salicaria)
- common buckthorn (Rhamnus cathartica)
- glossy buckthorn (Rhamnus frangula)
- saw-toothed buckthorn (Rhamnus arguta)
- dahurian buckthorn (Rhamnus davurica)
- Japanese buckthorn (Rhamnus japonica)
- Chinese buckthorn (Rhamnus utilis)
- kudzu-vine (Pueraria lobata)

- exotic bush honeysuckles (Lonicera maackii, Lonicera tatarica, Lonicera morrowii, and Lonicera fragrantissima)
- exotic olives (Elaeagnus umbellata, Elaeagnus pungens, Elaeagnus angustifolia)
- salt cedar (all members of the Tamarix genus)
- poison hemlock (Conium maculatum)
- giant hogweed (Heracleum mantegazzianum)
- Oriental bittersweet (Celastrus orbiculatus)
- lesser celandine (Ficaria vema)
- teasel (all members of the Dipsacus genus)
- Japanese, giant, and Bohemian knotweed (Fallopia japonica, syn. Polygonum cuspidatum; Fallopia sachalinensis; and Fallopia x bohemica, resp.)

Inkberry Solar will manage the project site to control or minimize the spread of the above listed noxious and exotic species. Control and minimization of weeds will not require eradication. The intent is for the facility to establish effective site vegetation for erosion and sediment control and minimize weed and exotic species issues.

**3.0 WEED PREVENTION**

It is important to reduce or eliminate any new weed species from being introduced into or spreading from the project disturbance areas.

General measures to prevent the spread of weeds include the following:

- Clean equipment (e.g., air compressors [high pressure] or washing station or offsite cleaning with certification) prior to personnel, vehicles, and equipment entering site (each time a vehicle enters the site).
- Ensure that all equipment and materials brought onto the site are weed-seed free.
- Limit disturbance areas during construction to the minimum required to perform work.
- Limit ingress and egress to defined routes.
- Vegetate temporarily disturbed areas with appropriate native species as soon as possible after construction is complete to prevent weed establishment
- Use certified weed-free products for erosion control.
- Employ manual, mechanical, and chemical control methods as appropriate to target species.

**4.0 WEED CONTROL**

Weed control activities could include mechanical, manual, and chemical control methods. Mechanical control activities, such as chaining, disking, grubbing, and mowing using tractors or other heavy equipment will be a part of the vegetation management program where applicable. Manual means of vegetation management would be limited to the use of hand-operated powertools and hand tools to cut, clear, or prune herbaceous and woody species.

Hand-operated tools such as hoes, shovels, and hand saws could be used under the program, as well as hand-pulling of plants. Manual means will only be used where necessary.

Chemical control will involve the use of approved herbicides to control weed populations when other methods are not successful in managing the spread of these listed species. All weed control using herbicides and adjuvants would be conducted by a state certified herbicide applicator and will conform to the manufacturer's label recommendations.

# Solar Site Pollinator Establishment and Management Guidelines

Many species of pollinating insects, including bees and butterflies, have experienced population declines in recent years. This document is designed to provide guidelines for establishment of pollinator habitat that meets the criteria of the Pollinator Friendly Solar Site Scorecard for Illinois (525 ILCS 55). Although these guidelines include best practices, they are not all inclusive, nor do they guarantee the successful establishment of pollinator habitat. Soil types, weather and rain patterns, and other factors may impact the success of a new planting.

All methods used or planned for should be outlined in a Vegetation Management Plan (VMP). More details on what is required in a VMP can be found in the "Vegetation Management Plan Guidelines for Pollinator Friendly Solar Sites" on the IDNR's Solar Site Pollinator Scorecard website.

## Site Preparation

Good site preparation is critical and perhaps the most important step to successful establishment of pollinator habitat.

### Weed control

- In many cases weeds may be present and must be terminated before planting
- A broad-spectrum systemic herbicide such as glyphosate works in most cases
- In some cases, such as with the presence of Sericea Lespedeza, other herbicides may need to be used as well.
- Multiple applications may be required. This is especially true if tall fescue is present.
- Weed seeds can be stimulated by tillage. If tillage is used, wait until weeds reach appropriate height after tillage to spray.
- ALWAYS READ AND FOLLOW ALL HERBICIDE LABELS

### Seedbed

- Bare ground is the ideal seedbed
- If using a no-till drill, minimal seedbed preparation is needed. Any eroded gullied or washes should be worked and smoothed.
- If broadcast seeding, work the ground fine then firm the seedbed with a cultipacker or similar. Ground should be firm not hard.

## Seeding

Native prairie species are preferred and should be the only thing planted to the perimeter and buffer areas. However, some prairie plants can grow tall. Setting solar panels at taller heights and choosing shorter plants for between and under rows can prevent shading. If this is not an option, mixing some clover (not sweet clover) in with some shorter native species is a less desirable but an acceptable practice.

- Species should be native to the area and adapted to the site (For example: little bluestem grass on a dry site or monkey flower on a wetter site).
- It is very important that seed not be planted too deep. 1/8”-1/4” is the target depth. Some seed sitting on top is ok.
- If broadcast seeding the area should be rolled with cultipacker, harrow or similar after seeding.
- Seeding should generally be done between November 15 and June 15.
- Seeding rates should be calculated by seeds/ $ft^2$ (not by weight) of Pure Live Seed (PLS).
    - PLS = % Purity X % Total Germination/100
- For pollinators, the more flowers the better. A ratio of 25% Native Grass to 75% Native Forbs (wildflowers) is preferred.
- The goal is to provide food for pollinators throughout the year. Having a minimum of three species blooming in the Spring (April-May), Summer (June-August), and Fall (September-October) can accomplish this.
- Slope 5% or less - Minimum seeding rate of 20 seeds/ $ft^2$ PLS. (5 Grass Seeds and 15 Forb seeds)
- Slope > 5% - Minimum seeding rate of 40 seeds/ $ft^2$ PLS. (10 Grass Seeds and 30 Forb seeds)
- An oat companion crop should be used if slopes are >5% and in areas with erosion potential.
- If the site was previously an agricultural field, the farm may have used an herbicide with residual control. Contact the farmer to get this information and application dates. Then wait until after herbicide effects have expired. A temporary cover of oats, wheat or rye can be used to prevent erosion during this time.
- Planting plugs can be a way to increase diversity without waiting for seeds to germinate. Be sure to keep plugs moist before planting.

## Maintenance

Lack of maintenance can cause newly established plantings to fail. Without proper maintenance, pollinator habitat can quickly be over taken by undesirable species such as woody plants or invasive species. Sites should be checked for these undesirable species at least annually. The easiest and most cost-effective management technique is to catch and treat an invasion early. Any equipment (tractors, mowers, hay rakes, etc.) used to manage the site should be cleaned free of weed seed before entering the site.

### Short-Term Management

Guidance for short-term or the establishment phase of pollinator friendly vegetation.

- During the first year, mow at a height of 10” or greater 1-3 times during the growing season if undesirable weeds are overtopping the newly established seedlings.
- Use spot mowing and/or spot herbicide treatment to control noxious and undesirable weeds.

- After the first year, avoid mowing (other than spot mowing) between April 15th and October 1st
- Interseeding or plug planting may need to be done during the establishment phase to ensure the requirement of the "Established Pollinator Habitat on Solar Sites Scorecard."

## Long-Term Management

- Broadcast mowing or herbicide application should not be used in long-term management.
- Use spot mowing and/or spot herbicide treatment to control noxious and undesirable weeds.
- Mowing can temporarily control invasion by trees, invasive species, and other undesirable species. However, it is not effective in the long run. Instead, spot treat with herbicide being careful not to damage the grasses and forbs.
- Prescribed fire every 1-3 years is the ideal maintenance method and can be used on perimeter and buffer areas to the solar panels.
- Fire is not an option between and immediately adjacent to solar panels. In place of fire, haying can be used every 1-3 years to remove thatch buildup.
    - Haying should only be done once a season at a height of 6" or greater.
    - No more than half the site should be hayed each year.
- Livestock grazing can be used to help manage solar site vegetation.
    - A separate grazing plan should be created if this method is used.
    - A grazing plan should include goals of grazing, type and number of animals, plans for fencing, time and duration of grazing, and details to ensure vegetation is not overgrazed.
    - No more than half the site should be grazed each year.
- Interseeding or plug planting may need to be done during the life of the solar site to meet the "Established Pollinator Habitat on Solar Sites Scorecard" requirements.

For question, please email DNR.PollinatorSolar@illinois.gov

**Exhibit H**

Equipment Specifications

[Attached]

# Q.PEAK DUO XL-G11S SERIES

**590 - 605 Wp | 156 Cells**
**21.7 % Maximum Module Efficiency**

**MODEL** Q.PEAK DUO XL-G11S.3 / BFG

## Bifacial energy yield gain of up to 21%

Bifacial Q.ANTUM solar cells make efficient use of light shining on the module rear-side for radically improved LCOE.

## Low electricity generation costs

Q.ANTUM DUO technology with optimized module layout to boost module power and improve LCOE.

## A reliable investment

Double glass module design enables extended lifetime with 12-year product warranty and improved 30-year performance warranty[1].

## Enduring high performance

Long-term yield security with Anti LID and Anti PID Technology[2], Hot-Spot Protect.

## Frame for versatile mounting options

High-tech aluminum alloy frame protects from damage, enables use of a wide range of mounting structures and is certified regarding IEC for high snow (5400 Pa) and wind loads (3750 Pa)[3].

## Innovative all-weather technology

Optimal yields, whatever the weather with excellent low-light and temperature behavior.

[1] See data sheet on rear for further information.
[2] APT test conditions according to IEC / TS 62804-1:2015 method B (–1500 V, 168 h) including post treatment according to IEC 61215-1-1 Ed. 2.0 (CD)
[3] See Installation Manual for instructions

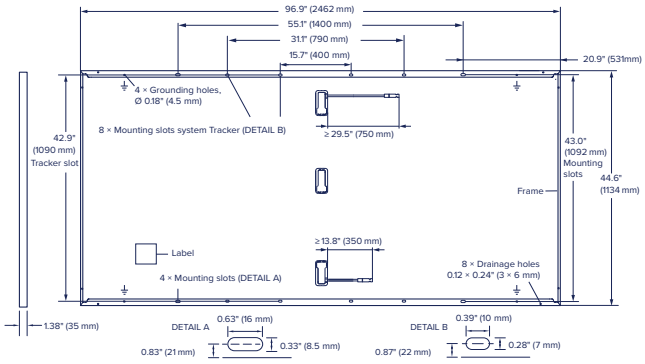
**The ideal solution for:**

Ground-mounted solar power plants

# Q.PEAK DUO XL-G11S SERIES

## Mechanical Specification

| | |
|---|---|
| Format | 96.9 in × 44.6 in × 1.38 in (including frame)<br>(2462 mm × 1134 mm × 35 mm) |
| Weight | 76.9 lbs (34.9kg) |
| Front Cover | 0.08 in (2.0 mm) thermally pre-stressed glass<br>with anti-reflection technology |
| Back Cover | 0.08 in (2.0 mm) semi-tempered glass |
| Frame | Anodised aluminium |
| Cell | 6 × 26 monocrystalline Q.ANTUM solar half cells |
| Junction box | 2.09-3.98 × 1.26-2.36 × 0.59-0.71 in (53-101 mm × 32-60 mm × 15-18 mm),<br>Protection class IP67, with bypass diodes |
| Cable | 4 mm² Solar cable; (+) ≥29.5 in (750 mm), (−) ≥13.8 in (350 mm) |
| Connector | Stäubli MC4; Stäubli MC4-Evo2; - IP68 |




## Electrical Characteristics

**POWER CLASS** | **590** | **595** | **600** | **605**

MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / −0 W)

| | | | | | BSTC* | | BSTC* | | BSTC* | | BSTC* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum | Power at MPP[1] | $P_{MPP}$ | [W] | 590 | 645.4 | 595 | 650.8 | 600 | 656.3 | 605 | 661.8 |
| | Short Circuit Current[1] | $I_{SC}$ | [A] | 13.74 | 15.04 | 13.77 | 15.07 | 13.80 | 15.10 | 13.82 | 15.13 |
| | Open Circuit Voltage[1] | $V_{OC}$ | [V] | 53.60 | 53.79 | 53.63 | 53.82 | 53.66 | 53.85 | 53.68 | 53.87 |
| | Current at MPP | $I_{MPP}$ | [A] | 13.12 | 14.36 | 13.17 | 14.41 | 13.22 | 14.46 | 13.27 | 14.52 |
| | Voltage at MPP | $V_{MPP}$ | [V] | 44.96 | 44.95 | 45.18 | 45.17 | 45.39 | 45.38 | 45.60 | 45.59 |
| | Efficiency[1] | η | [%] | ≥21.1 | | ≥21.3 | | ≥21.5 | | ≥21.7 | |

Bifaciality of $P_{MPP}$ and $I_{SC}$ 70 % ±5 % • Bifaciality given for rear side irradiation on top of STC (front side) • According to IEC 60904-1-2

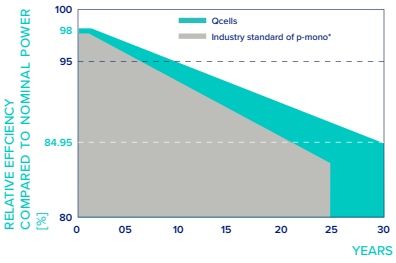
[1]Measurement tolerances $P_{MPP}$ ±3 %; $I_{SC}$, $V_{OC}$ ±5 % at STC: 1000 W/m²; *at BSTC: 1000 W/m² + φ × 135 W/m², φ = 70 %, 25±2 °C, AM 1.5 according to IEC 60904-3

MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]W

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Minimum | Power at MPP | $P_{MPP}$ | [W] | 444.2 | 448.0 | 451.8 | 455.5 |
| | Short Circuit Current | $I_{SC}$ | [A] | 11.07 | 11.09 | 11.11 | 11.13 |
| | Open Circuit Voltage | $V_{OC}$ | [V] | 50.69 | 50.72 | 50.75 | 50.77 |
| | Current at MPP | $I_{MPP}$ | [A] | 10.34 | 10.38 | 10.42 | 10.47 |
| | Voltage at MPP | $V_{MPP}$ | [V] | 42.97 | 43.15 | 43.34 | 43.52 |

[1]Measurement tolerances $P_{MPP}$ ±3 %; $I_{SC}$; $V_{OC}$ ±5 % at STC: 1000 W/m², 25±2 °C, AM 1.5 according to IEC 60904-3 • [2]800 W/m², NMOT, spectrum AM 1.5

### Qcells PERFORMANCE WARRANTY

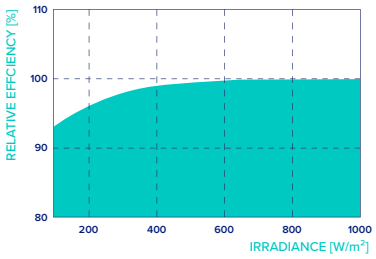



At least 98 % of nominal power during first year. Thereafter max. 0.45 % degradation per year. At least 93.95 % of nominal power up to 10 years. At least 84.95 % of nominal power up to 30 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Qcells sales organisation of your respective country.

*Standard terms of guarantee for the 5 PV companies with the highest production capacity in 2021 (February 2021)

### PERFORMANCE AT LOW IRRADIANCE




Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²).

### TEMPERATURE COEFFICIENTS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Temperature Coefficient of $I_{SC}$ | α | [%/K] | +0.04 | Temperature Coefficient of $V_{OC}$ | β | [%/K] | −0.27 |
| Temperature Coefficient of $P_{MPP}$ | γ | [%/K] | −0.34 | Nominal Module Operating Temperature | NMOT | [°F] | 108±5.4<br>(42±3 °C) |

## Properties for System Design

| | | | | | |
|---|---|---|---|---|---|
| Maximum System Voltage | $V_{SYS}$ | [V] | 1500 | PV module classification | Class II |
| Maximum Series Fuse Rating | | [A DC] | 30 | Fire Rating based on ANSI / UL 61730 | TYPE 29[4] |
| Max. Push Load[3], Test / Design | | [lbs / ft²] | 113 (5400 Pa) / 75 (3600 Pa) | Permitted Module Temperature<br>on Continuous Duty | −40 °F up to +185 °F<br>(−40 °C up to +85 °C) |
| Max. Pull Load[3], Test/Design | | [lbs / ft²] | 78 (3750 Pa) / 52 (2500 Pa) | | |

[3] See Installation Manual for instructions

[4] New Type is similar to Type 3 but with metallic frame

## Qualifications and Certificates

UL61730-1 & UL61730-2, CE-compliant,
IEC 61215:2016,
IEC 61730:2016,
U.S. Patent No. 9,893,215
(solar cells)

www.tuv.com
ID 1111220277

Find product recycling details at QR code

* Contact your Qcells Sales Representative for details regarding the module's eligibility to be Buy American Act (BAA) compliant.

Qcells pursues minimizing paper output in consideration of the global environment.

Note: Installation instructions must be followed. Contact our technical service for further information on approved installation of this product.
Hanwha Q CELLS America Inc. 400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | TEL +1 949 748 59 96 | EMAIL hqc-inquiry@qcells.com | WEB www.qcells.com

# SOLECTRIA® XGI 1500-166 SERIES

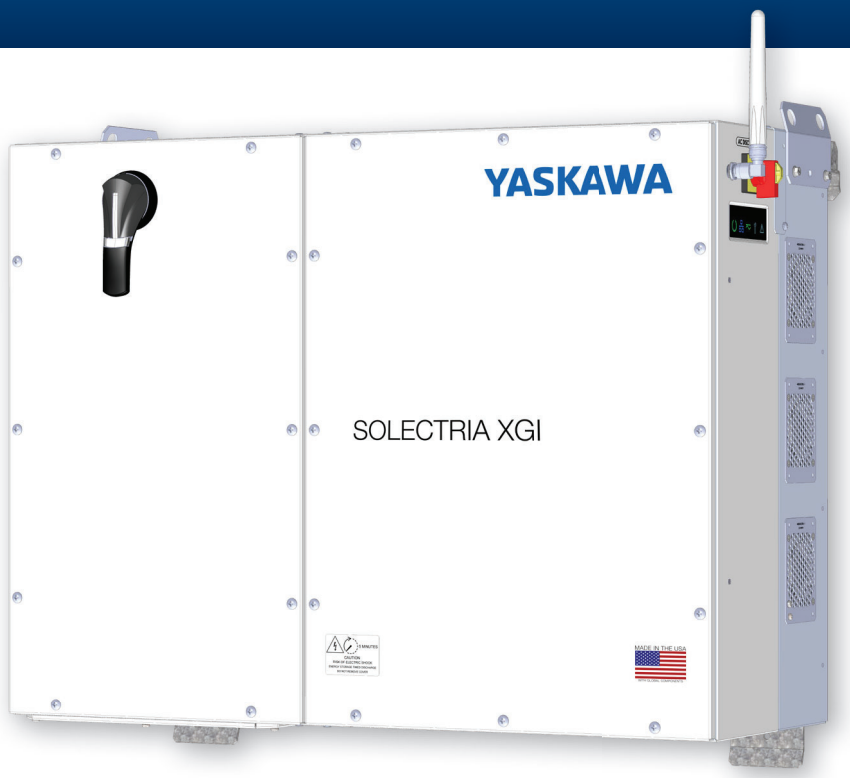
## PREMIUM 3-PHASE TRANSFORMERLESS UTILITY-SCALE INVERTERS

### FEATURES

- Made in the USA with global components
- Buy American Act (BAA) compliant
- Four models:
  - 125kW/125kVA,
  - 125kW/150kVA,
  - 150kW/166kVA,
  - 166kW/166kVA
- Additional models available certified to UL1699b, Photovoltaic DC Arc-Fault Circuit Protection
- 99.0% peak efficiency
- Flexible solution for distributed and centralized system architecture
- Advanced grid-support functionality Rule 21/UL1741SB
- Robust, dependable, & built to last
- Lowest O&M and installation costs
- Access all inverters on site via WiFi from one location
- Remote diagnostics and firmware upgrades
- SunSpec Modbus Certified
- Tested compatible with the TESLA PowerPack Microgrid System app for system visibility

### OPTIONS

- String combiners for distributed and centralized systems
- Web-based monitoring
- Extended warranty




## Yaskawa Solectria Solar's XGI 1500 utility-scale string inverters are designed for high reliability and built of the highest quality components that were selected, tested and proven to last beyond their warranty.

XGI 1500 inverters provide advanced grid-support functionality and meet the latest IEEE 1547 and UL1741SB standards for safety. They are the most powerful 1500 VDC string inverters in the PV market and have been engineered for both distributed and centralized system architecture.

Designed and engineered in Lawrence, MA, XGI inverters are assembled and tested at Yaskawa America's facilities in Buffalo Grove, IL. They are Made in the USA with global components and are compliant with the Buy American Act.



YASKAWA SOLECTRIA SOLAR

Yaskawa Solectria Solar 1-978-683-9700 | Email: sales@solectria.com | solectria.c
Document No. FL.XGI1500.01 | 04/26/2023 | 

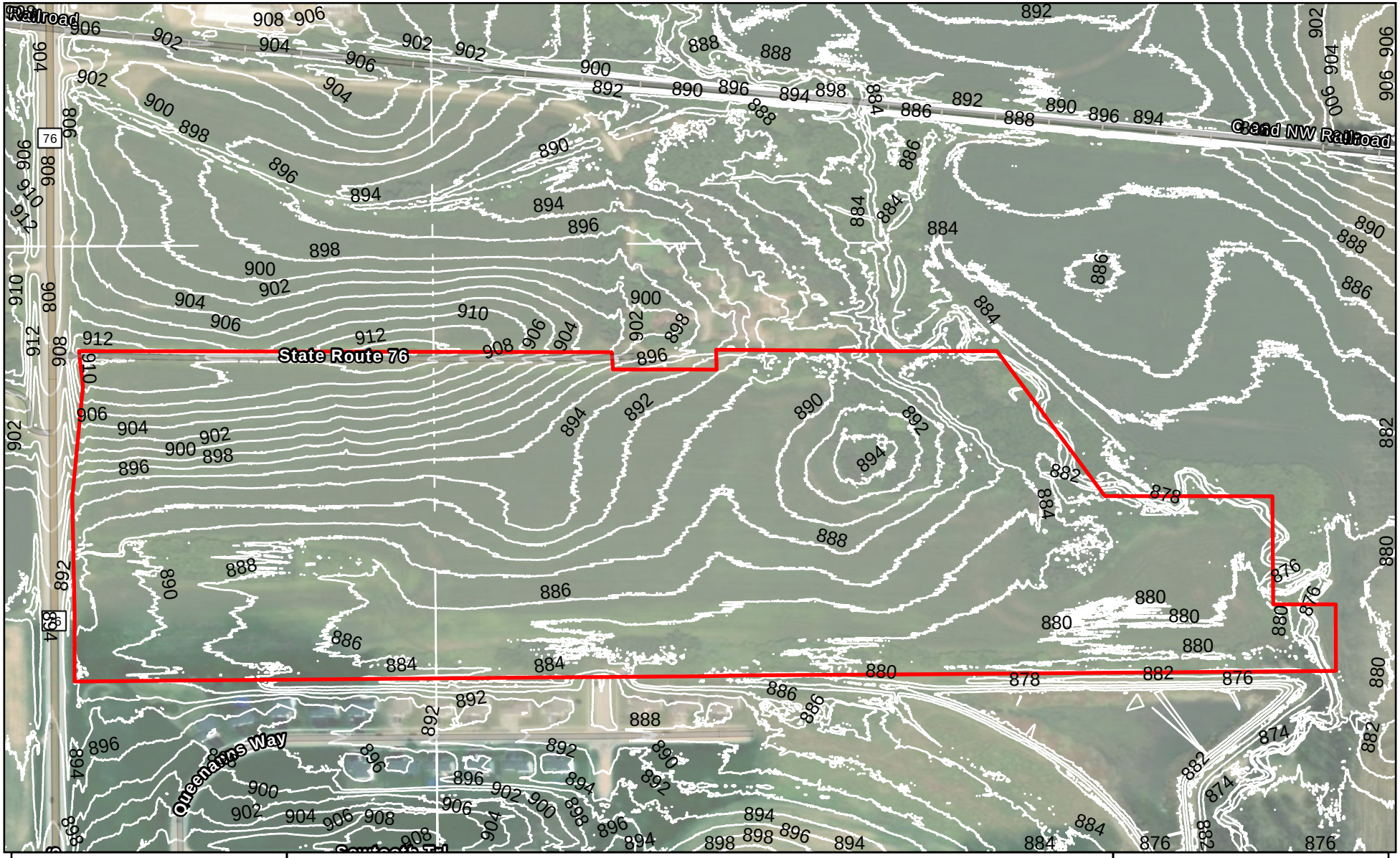
## SPECIFICATIONS

| SOLECTRIA XGI 1500 Model | | XGI 1500-125/125-UL<br>XGI 1500-125/125-UL-A | XGI 1500-125/150-UL<br>XGI 1500-125/150-UL-A | XGI 1500-150/166-UL<br>XGI 1500-150/166-UL-A | XGI 1500-166/166-UL<br>XGI 1500-166/166-UL-A |
|---|---|---|---|---|---|
| DC Input | Absolute Max Input Voltage | 1500 VDC | 1500 VDC | 1500 VDC | 1500 VDC |
| | Max Power Input Voltage Range (MPPT) | 860-1250 VDC | 860-1250 VDC | 860-1250 VDC | 860-1250 VDC |
| | Operating Voltage Range (MPPT) | 860-1450 VDC | 860-1450 VDC | 860-1450 VDC | 860-1450 VDC |
| | Number of MPP Trackers | 1 MPPT | 1 MPPT | 1 MPPT | 1 MPPT |
| | Max Operating Input Current | 148.3 A | 148.3 A | 178.0 A | 197.7 A |
| | Max Operating PV Power | 128 kW | 128 kW | 153 kW | 170 kW |
| | Max DC/AC Ratio \| Max Rated PV Power | 2.6 \| 332 kW | 2.6 \| 332 kW | 2.2 \| 332 kW | 2.0 \| 332 kW |
| | Max Rated PV Short-Circuit Current (∑Isc x 1.25) | 500 A | 500 A | 500 A | 500 A |
| AC Output | Nominal Output Voltage | 600 VAC, 3-Ph | 600 VAC, 3-Ph | 600 VAC, 3-Ph | 600 VAC, 3-Ph |
| | AC Voltage Range | -12% to +10% | -12% to +10% | -12% to +10% | -12% to +10% |
| | Continuous Real Output Power | 125 kW | 125 kW | 150 kW | 166 kW |
| | Continuous Apparent Output Power | 125 kVA | 150 kVA | 166 kVA | 166 kVA |
| | Max Output Current | 120 A | 144 A | 160 A | 160 A |
| | Nominal Output Frequency | 60 Hz | 60 Hz | 60 Hz | 60 Hz |
| | Power Factor (Unity default) | +/- 0.80 Adjustable | +/- 0.80 Adjustable | +/- 0.80 Adjustable | +/- 0.80 Adjustable |
| | Total Harmonic Distortion (THD) @ Rated Load | <3% | <3% | <3% | <3% |
| | Grid Connection Type | 3-Ph + N/GND | 3-Ph + N/GND | 3-Ph + N/GND | 3-Ph + N/GND |
| | Fault Current Contribution (1 cycle RMS) | 144 A | 173 A | 192 A | 192 A |
| Efficiency | Peak Efficiency | 98.9% | 98.9% | 99.0% | 99.0% |
| | CEC Average Efficiency | 98.5% | 98.5% | 98.5% | 98.5% |
| | Tare Loss | 2.75 W | 2.75 W | 2.75 W | 2.75 W |
| Temperature | Ambient Temp Range | -40°F to 140°F (-40C to 60C) | | -40°F to 140°F (-40C to 60C) | |
| | De-Rating Temperature | 122°F (50C) | | 113°F (45C) | |
| | Storage Temperature Range | -40°F to 167°F (-40C to 75C) | | -40°F to 167°F (-40C to 75C) | |
| | Relative Humidity (non-condensing) | 0 - 95% | | 0 - 95% | |
| | Operating Altitude | Full Power up to 9,840 ft (3.0 km); De-Rate to 70% of Full Power at 13,123 ft (4.0 km) | | | |
| Communications | Advanced Graphical User Interface | WiFi | | | |
| | Communication Interface | Ethernet | | | |
| | Third-Party Monitoring Protocol | SunSpec Modbus TCP/IP | | | |
| | Web-Based Monitoring | Optional | | | |
| | Firmware Updates | Remote and Local | | | |
| Testing & Certifications | Safety Listings & Certifications | UL1741SB, IEEE 1547, UL 1998 (All models)<br>UL 1699b Photovoltaic Arc-Fault Circuit Protection Certified (-A models) | | | |
| | Advanced Grid Support Functionality | Rule 21, UL 1741SB | | | |
| | Testing Agency | ETL | | | |
| | FCC Compliance | FCC Part 15 (Subpart B, Class A) | | | |
| Warranty | Standard and Options | 5 Years Standard; Option for 10 Years | | | |
| Enclosure | Acoustic Noise Rating | 73 dBA @ 1 m ; 67dBA @ 3 m | | | |
| | DC Disconnect | Integrated 2-Pole 250 A DC Disconnect | | | |
| | Mounting Angle | Vertical only | | | |
| | Dimensions | Height: 29.5 in. (750 mm) \| Width: 39.4 in. (1000 mm) \| Depth: 15.1 in. (380 mm) | | | |
| | Weight | 270 lbs (122 kg) | | | |
| | Enclosure Rating and Finish | Type 4X, Polyester Powder-Coated Aluminum | | | |

**Exhibit I**

Topography Map

[Attached]




# Inkberry Solar

Trajectory Energy Partners

## Topography (2' Contour Intervals)

Date: 5/21/2025

N

0 0.05 0.1 Mi

0 300 600 Feet

Hi Ken,

Thanks again for your time this morning -- agree it was easier to clarify over the phone! Following up on a few items here:

- **Re the proposed native grasses on the western side of the parcel, alongside Rt 176**: From our landscape plan (on pg. 3): "Vegetative screening is planned on the west side using 4-6 ft native prairie grasses." To elaborate a bit here, assuming a typical tallgrass prairie native mix of grass and forbs, the heights would be 4-6’ of the overall vegetation during the growing season when it matures. Example species of these native tallgrasses would include Big Bluestem, Switchgrass, Indian Grass, Wild Bergamont, Ox-eye Sunflower, Stiff Goldenrod, and Canada Wild Rye.

- **Re measurement of the area we're using on parcel 03-23-200-017:** We're proposing to use approximately .016 acres of this parcel.

- **Re subscriptions:** all Poplar Grove residents and businesses should be eligible for a subscription, even those with aggregator agreements (something that's been raised to us previously). There may be an unusual situation here or there that we're not aware of, but by and large everyone who gets their energy (whether a residential customer, small business, municipal office, non-profit organization, etc.) from ComEd in the Village should be able to partake in a community solar subscription. Having said this, I don't know that any visual here will be useful as it would just be a map of the Village itself, but if it's helpful to have something please just let me know and we'll work to pull a visual exhibit together.

Additionally, I can confirm our landowner will be in attendance on the 8th; thanks again for helping to clear that up! Could you confirm when notice for the July 8th meeting was sent out? And is it possible for me to have a copy for our records?

Thanks very much!
Abby

**NOTICE OF PUBLIC HEARING**
**POPLAR GROVE PLANNING AND ZONING COMMSSION**

Notice is hereby given that the Village of Poplar Grove Planning and Zoning Commission will hold a public hearing on Tuesday, July 8th, 2025 at 6:00 pm in the Village Board Room, 200 North Hill Street, Poplar Grove, Illinois, 61065 for the purpose of considering the following:

The applicant, Inkberry Solar, LLC, PO Box 310, Highland Park, IL 60035 on behalf of the property owner Tahoe Trading Company, LLC 1610 Candlewick Drive SW, Poplar Grove, IL 61065 is requesting a Special Use Permit to install non-building ground mounted solar collectors on the real property with PIN 03-23-200-014 and PIN 03-23-200-017. The property is zoned LI (Light Industrial) and requires a Special Use Permit per section 8-6-11 and 8-5-7 of the Poplar Grove Zoning Code.

# 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<br>NE ¼ Section |
| **Property Index Number** | PIN: 03-23-200-014, 03-23-200-017 |
| **Acreage** | Parcel: Approximately 48 acres<br>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****

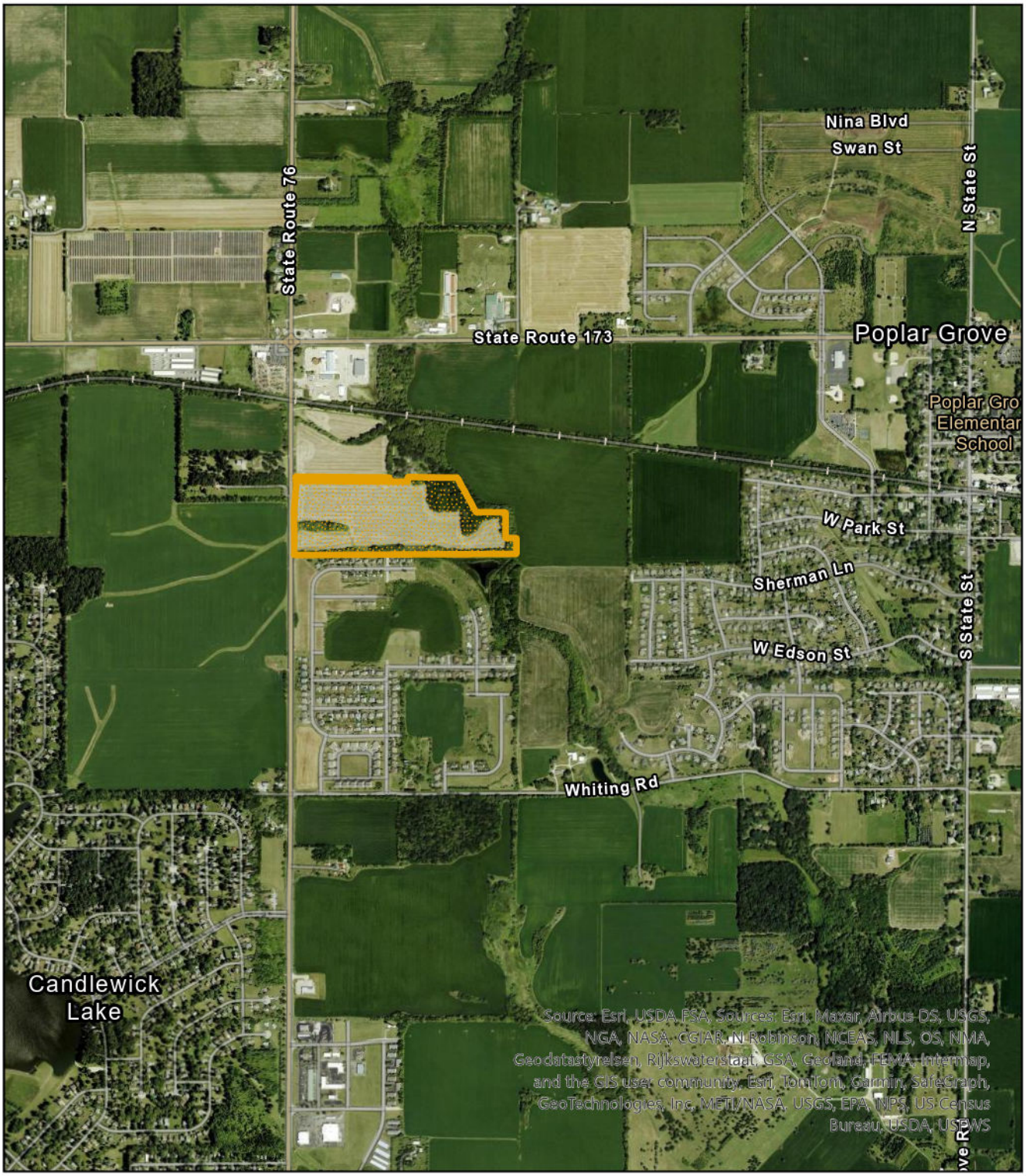
Thank you for taking the SWCD’s comments into consideration. If you have any questions about this report or its findings, please contact the Boone County Soil and Water Conservation District at (815) 544-3465 ext. 3

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**:<br><br>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**:<br><br>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**:<br><br>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**:<br><br>Facing southeast—about halfway down the proposed drive. Beginning to see varying slopes to the northeast. | |
| **Photo #**: 04 | |

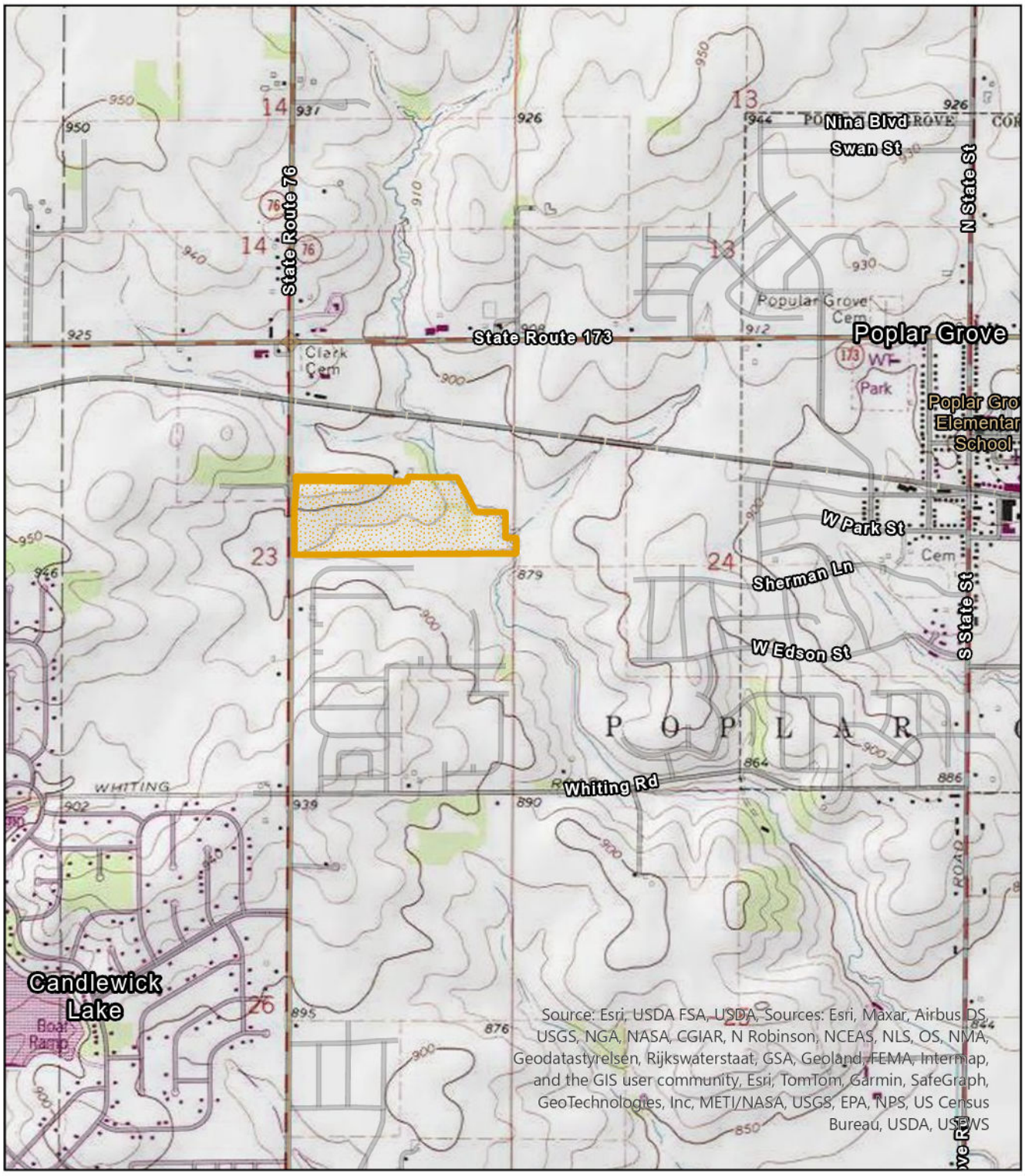
| **Date**: 06/09/2025 | **Site Location:** **03-23-200-014, 03-23-200-017** |
|---|---|
| **Photo By**: VanTilburg |  |
| **County**: Boone | |
| **Comments**:<br><br>Facing West | |
| **Photo #**: 05 | |
| | |

| **Date**: 06/09/2025 | **Site Location:** **03-23-200-014, 03-23-200-017** |
|---|---|
| **Photo By**: VanTilburg |  |
| **County**: Boone | |
| **Comments**:<br><br>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**:<br><br>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**:<br><br>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.

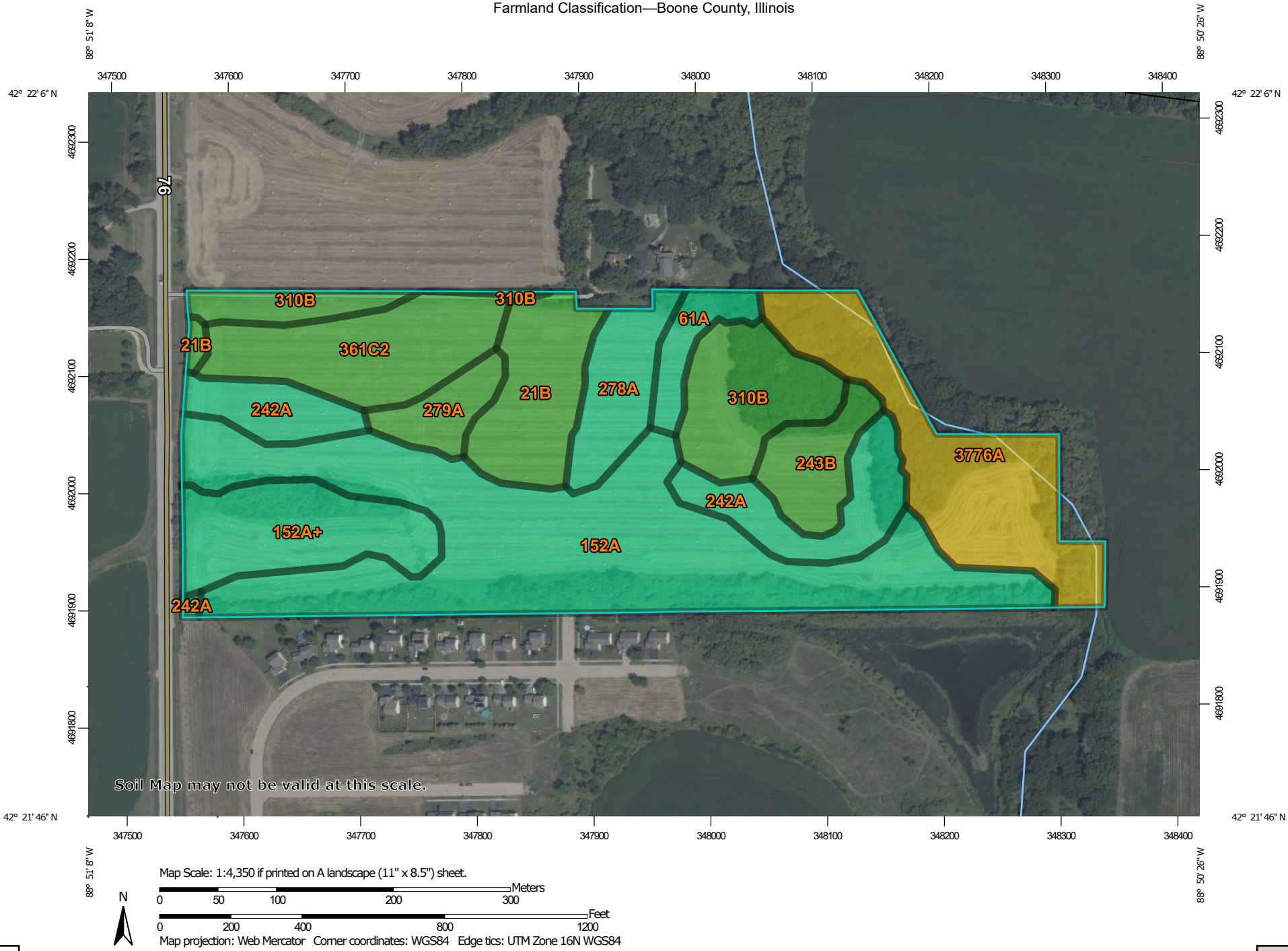
Land Evaluation encompasses information regarding soils found on the site and their suitability for agricultural purposes. Boone County soils consist of 78 different soil series ranging from excessively drained gravely sands to poorly drained muck soils and from highly productive agricultural soils to 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




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**

- 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
- 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 Points**

- 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

**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.

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.

# 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.

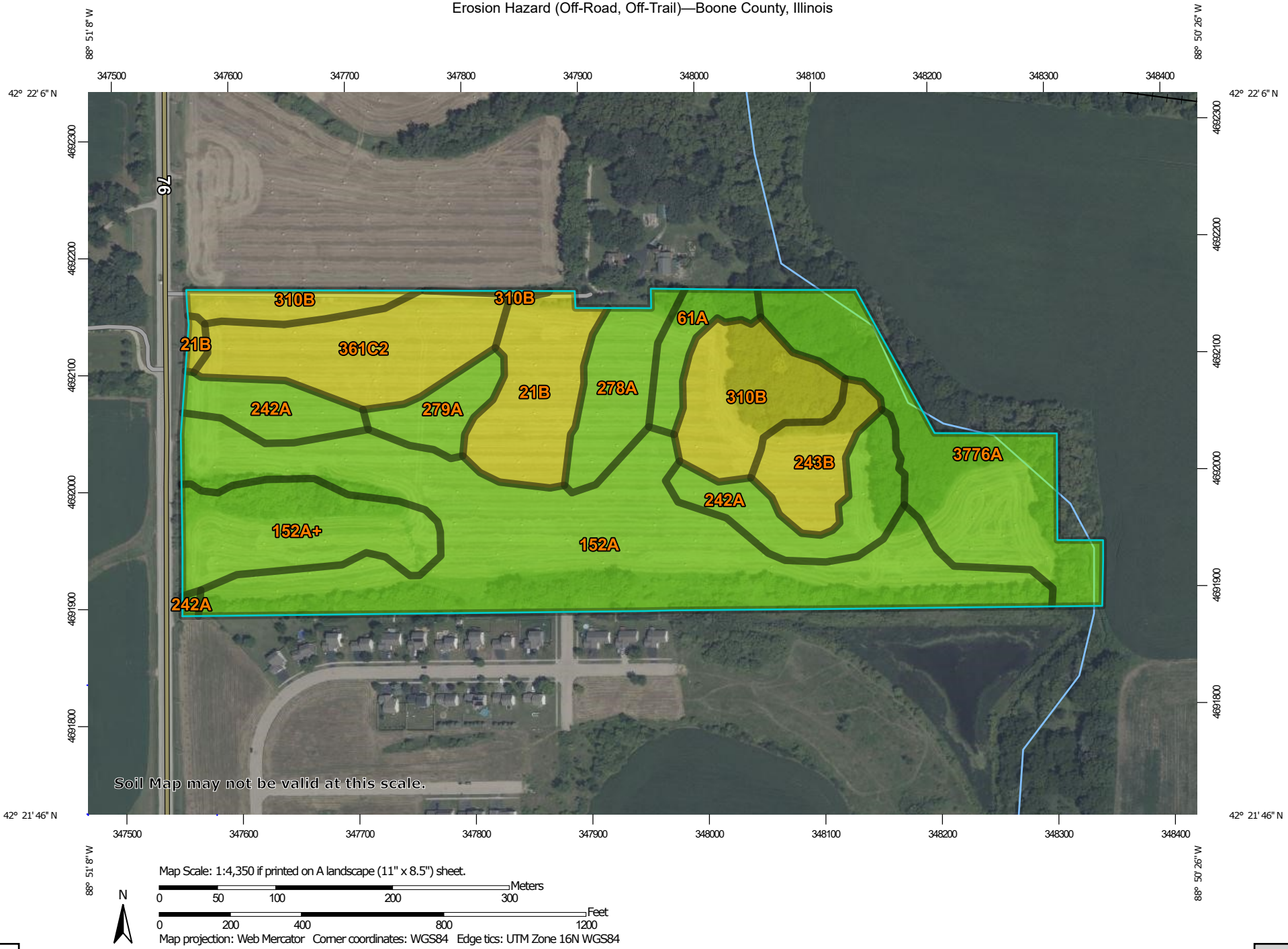
The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth and hardness of bedrock, bulk density of the soil and the number of large stones influence the ease of digging, filling, and compacting. Depth to the seasonal water table and flooding 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.

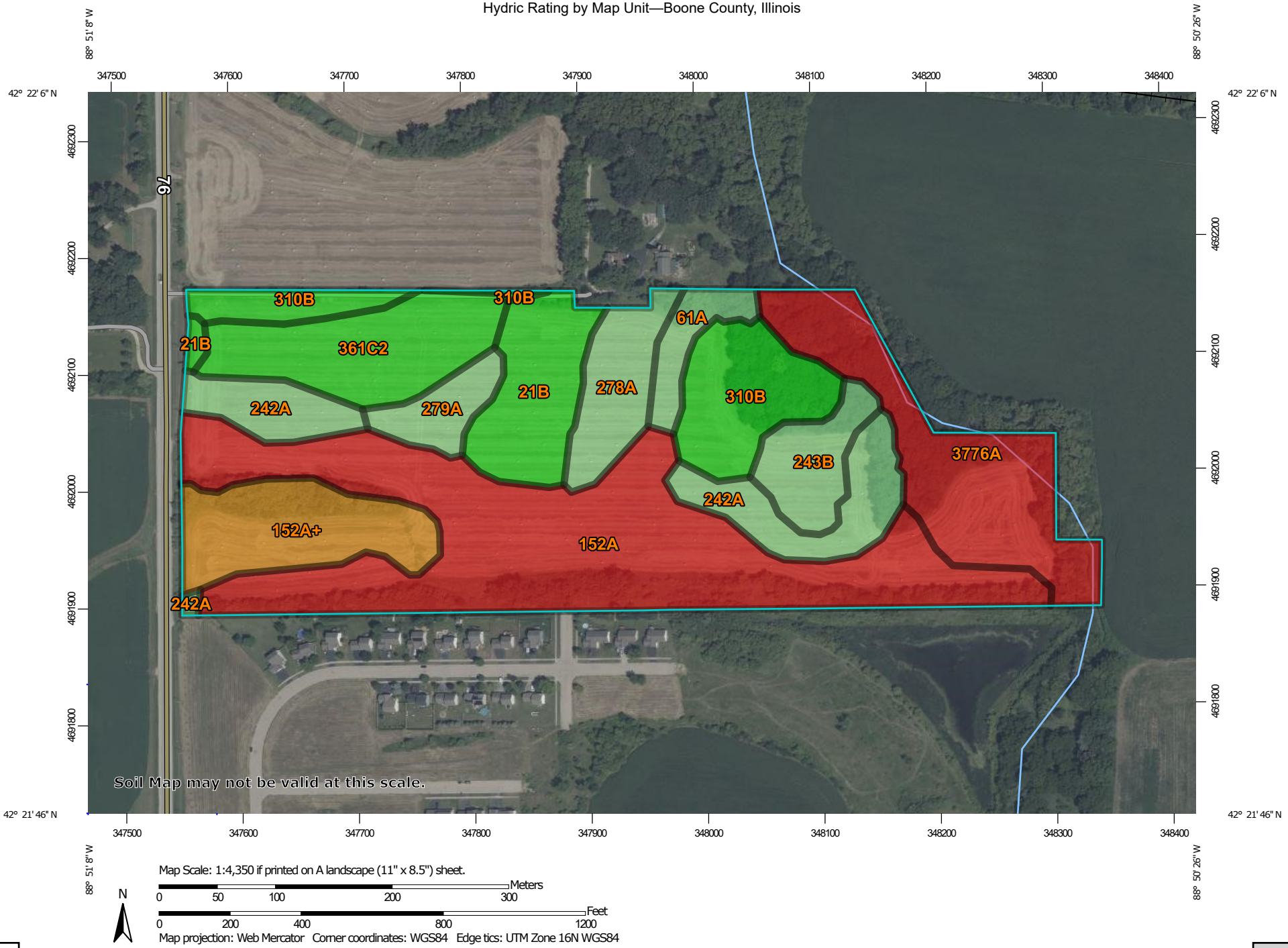
## Rating Options

*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.

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.

# 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.

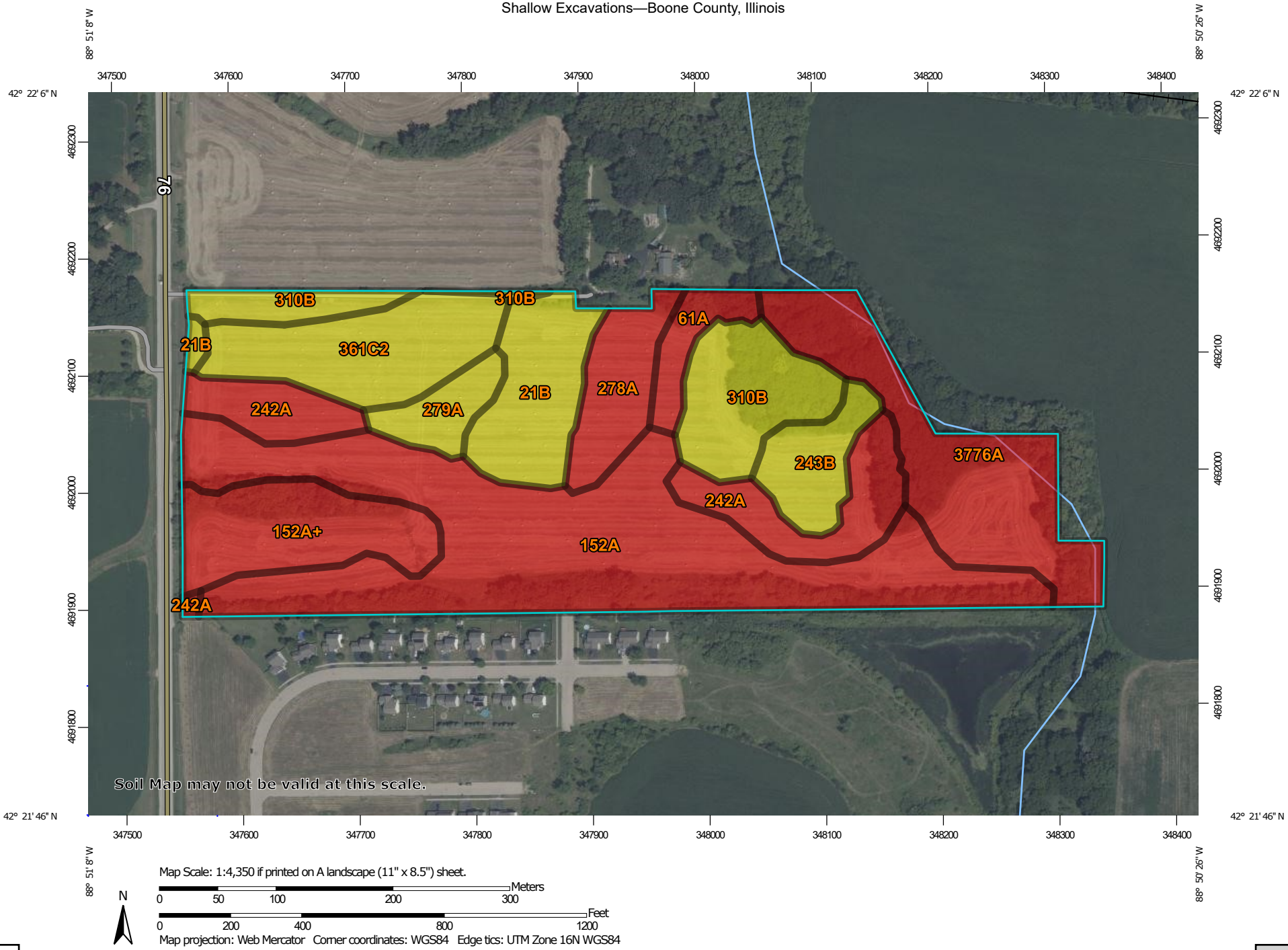
## Rating Options

*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

0 50 100 200 300 Meters

0 200 400 800 1200 Feet

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.

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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.

# 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.

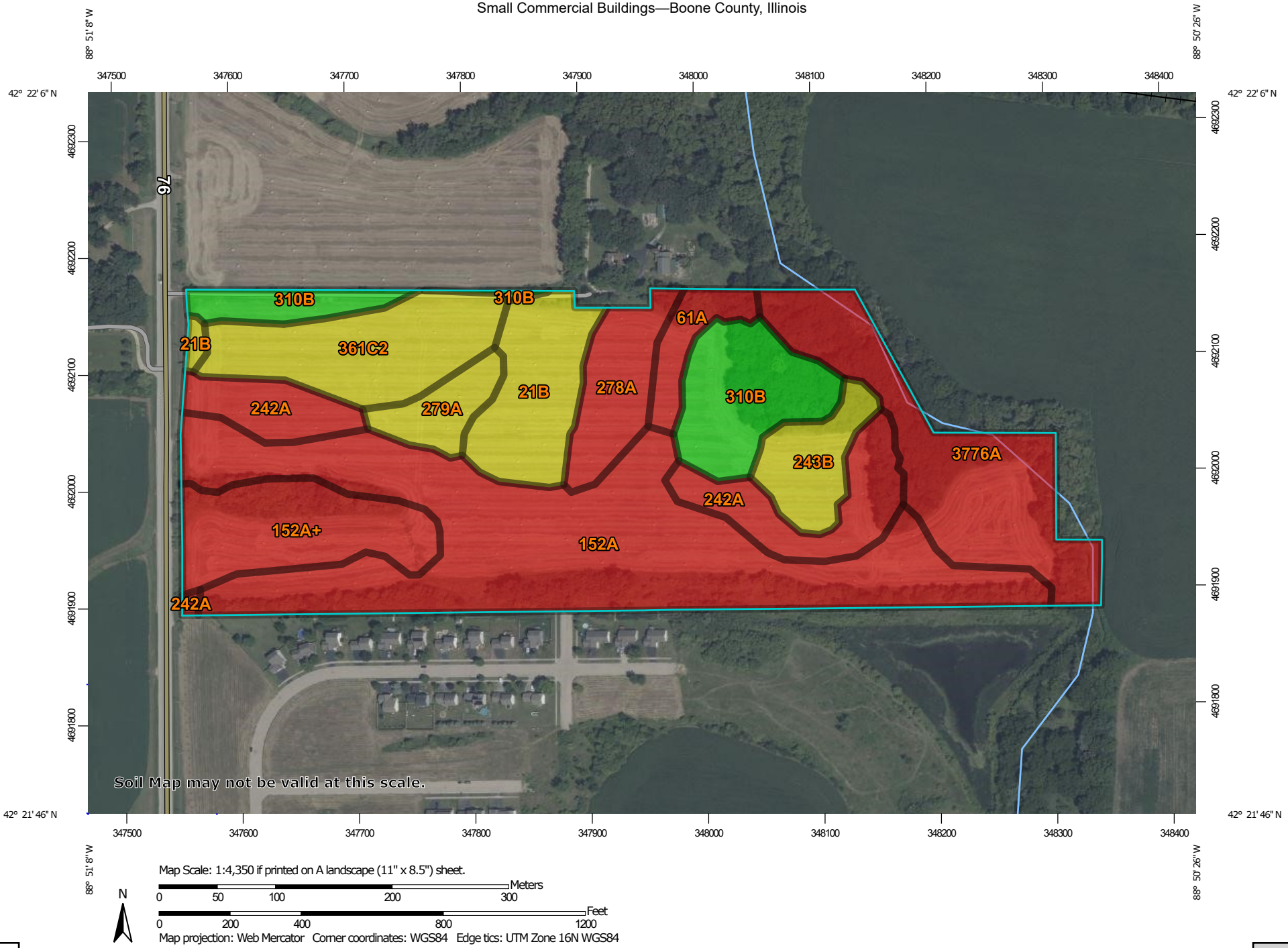
Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may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


88° 51' 8" W
88° 50' 26" W
347500
347600
347700
347800
347900
348000
348100
348200
348300
348400
42° 22' 6" N
42° 21' 46" N
4692300
4692200
4692100
4692000
4691900
4691800
92
310B
310B
61A
21B
361C2
21B
278A
310B
242A
279A
243B
3776A
242A
152A+
152A
242A
Soil Map may not be valid at this scale.
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

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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.

# 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.

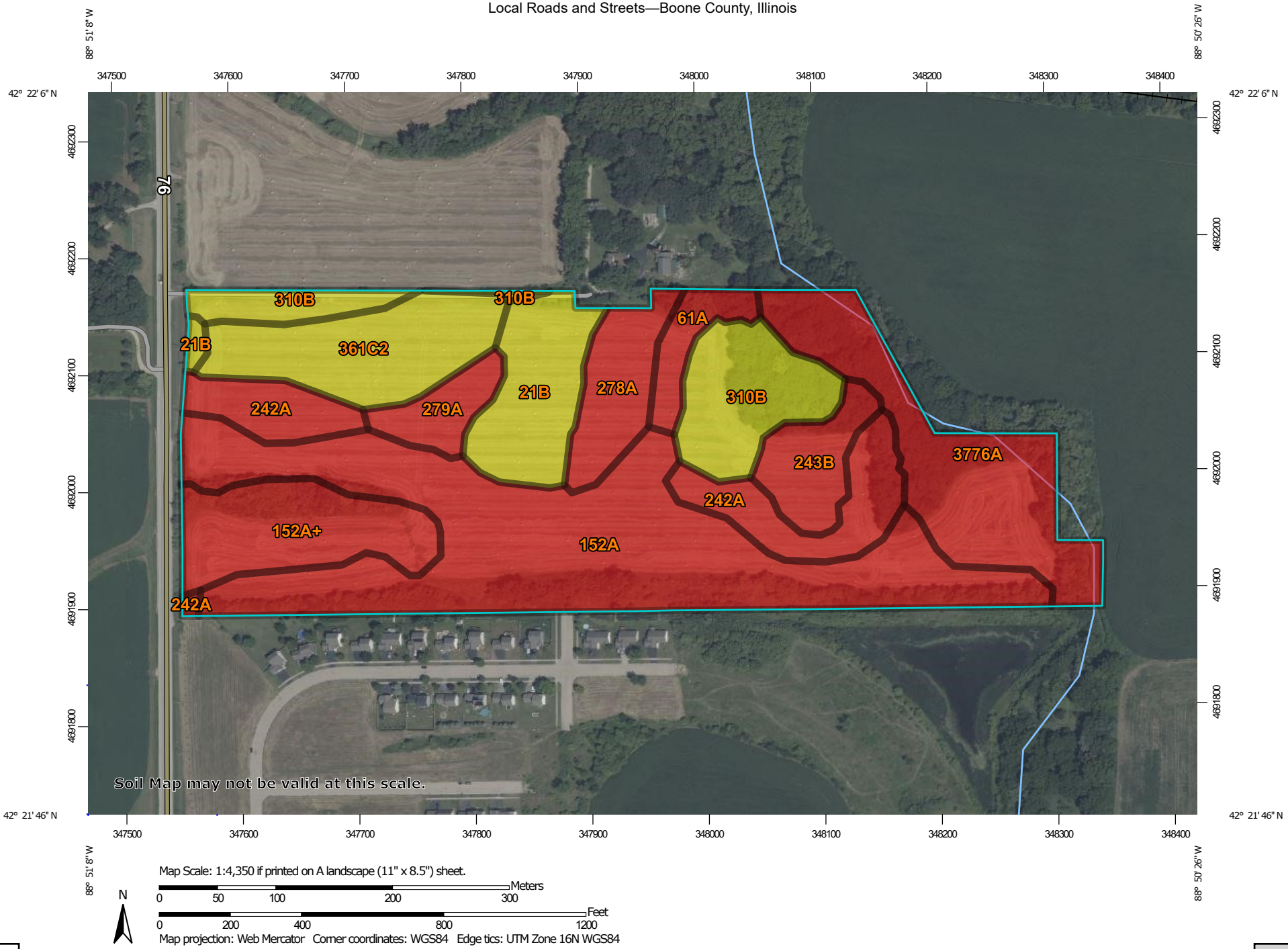
## Rating Options

*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.

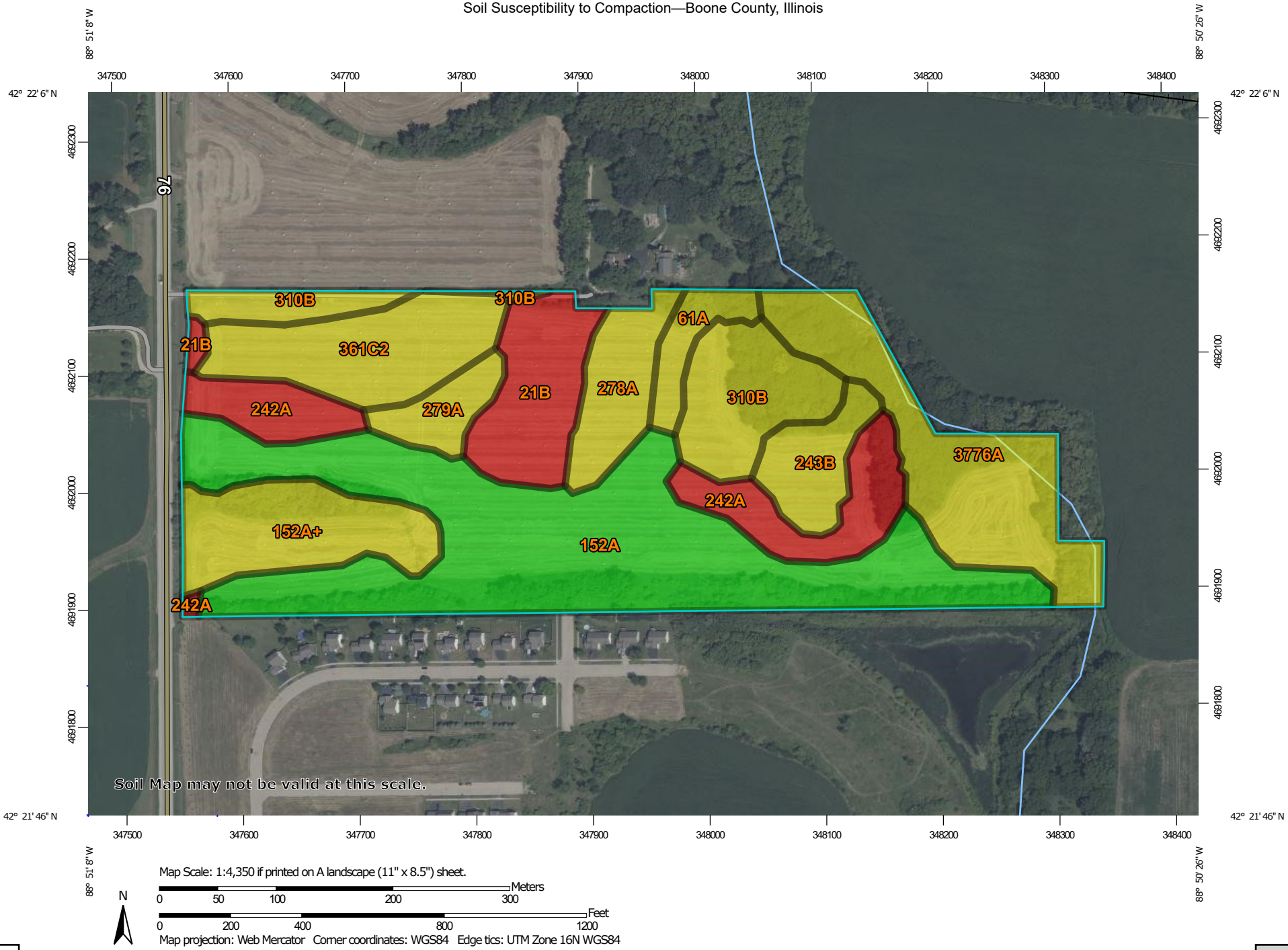
# Report—Soil Features

| 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




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.

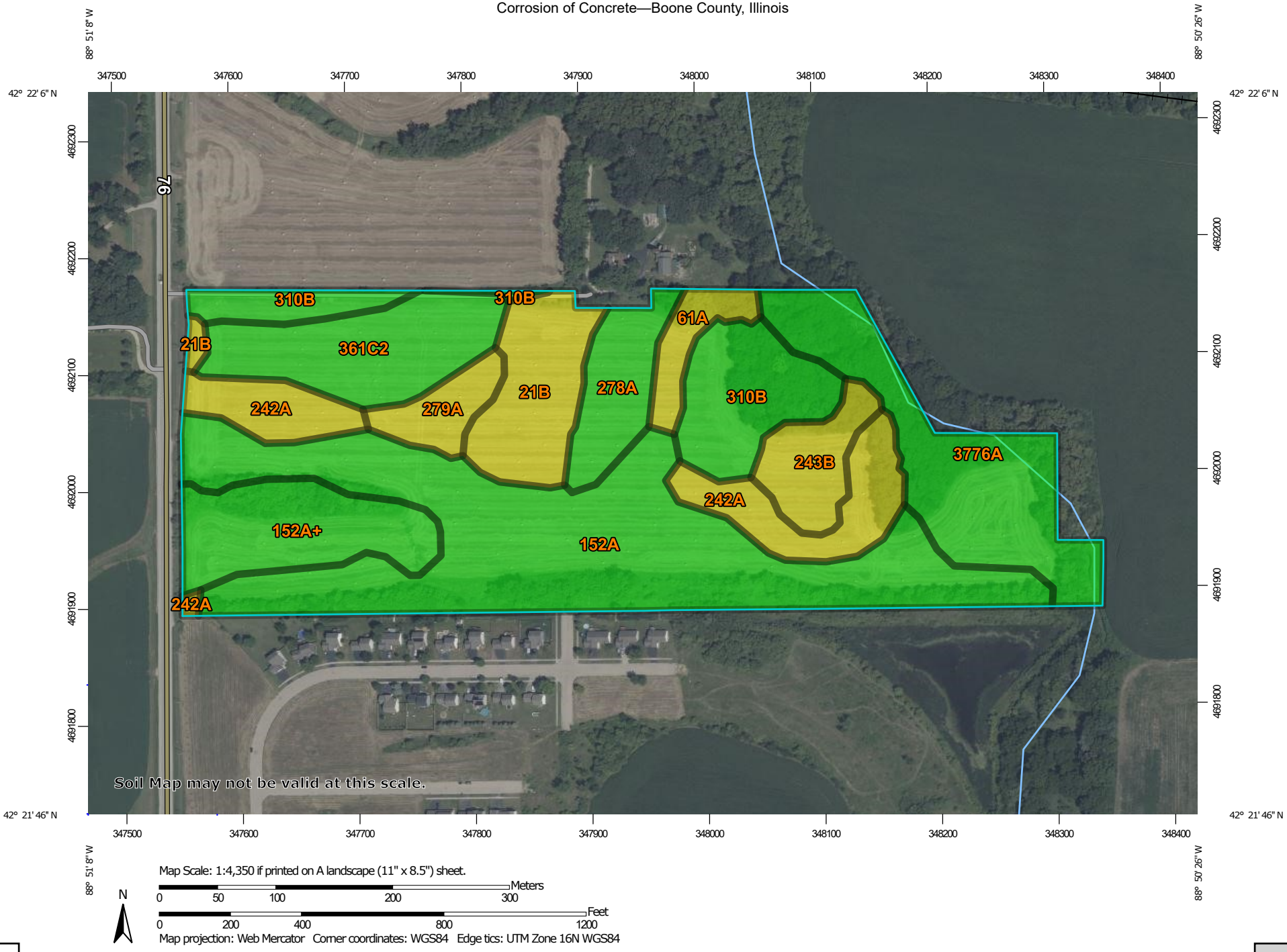
Page-Dumrose, Deborah S. 1993. Susceptibility of Volcanic Ash Influenced Soils in Northern Idaho to Mechanical Compaction. U.S. Forest Service Intermountain Research Station. Research Note INT-409.

## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher


88° 51' 8" W
88° 50' 26" W
347500
347600
347700
347800
347900
348000
348100
348200
348300
348400
42° 22' 6" N
42° 21' 46" N
4692300
4692200
4692100
4692000
4691900
4691800
92
310B
310B
61A
21B
361C2
21B
278A
310B
242A
279A
3776A
243B
242A
152A+
152A
242A
Soil Map may not be valid at this scale.
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)

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

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# 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."

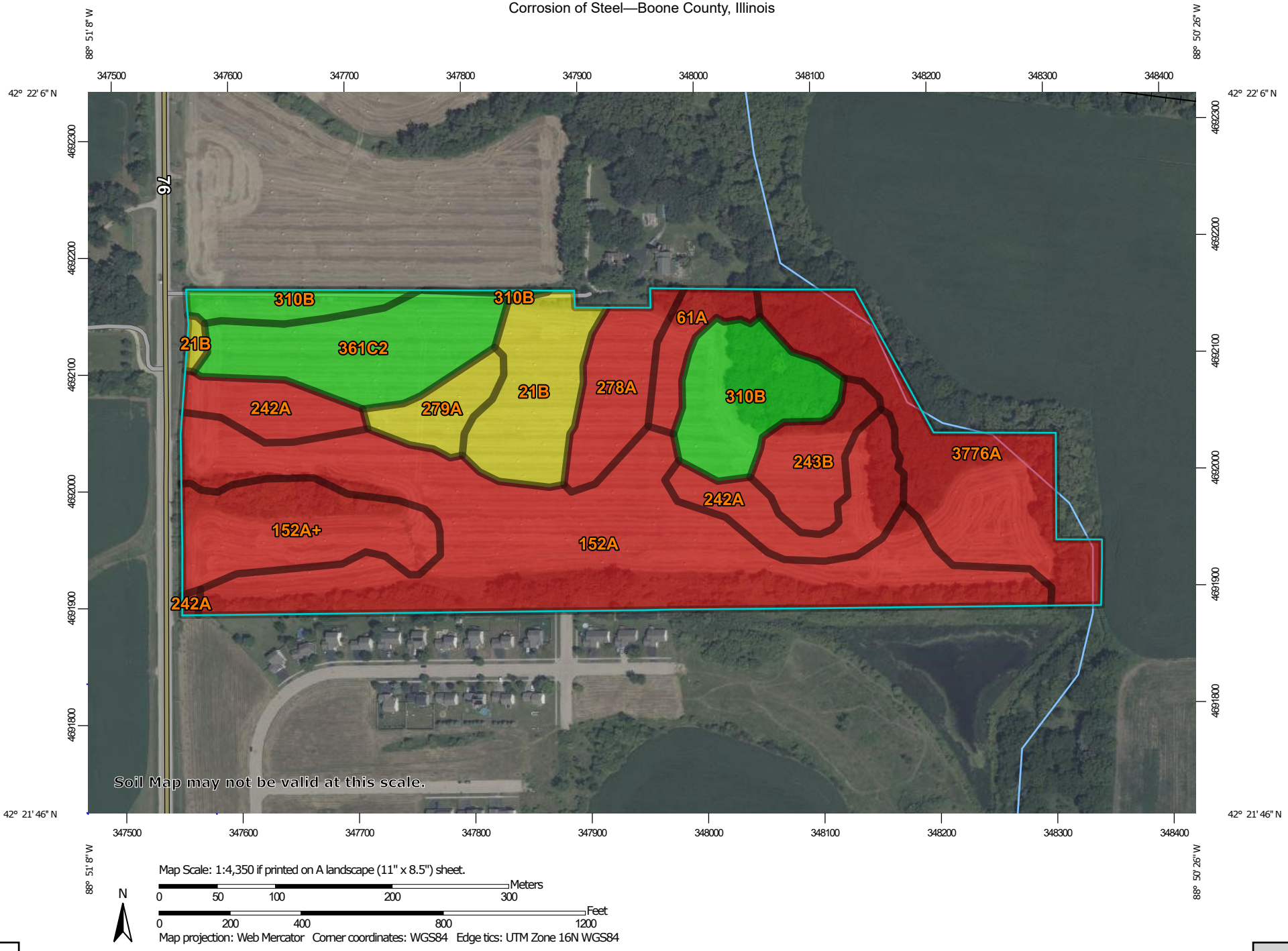
## Rating Options

*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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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."

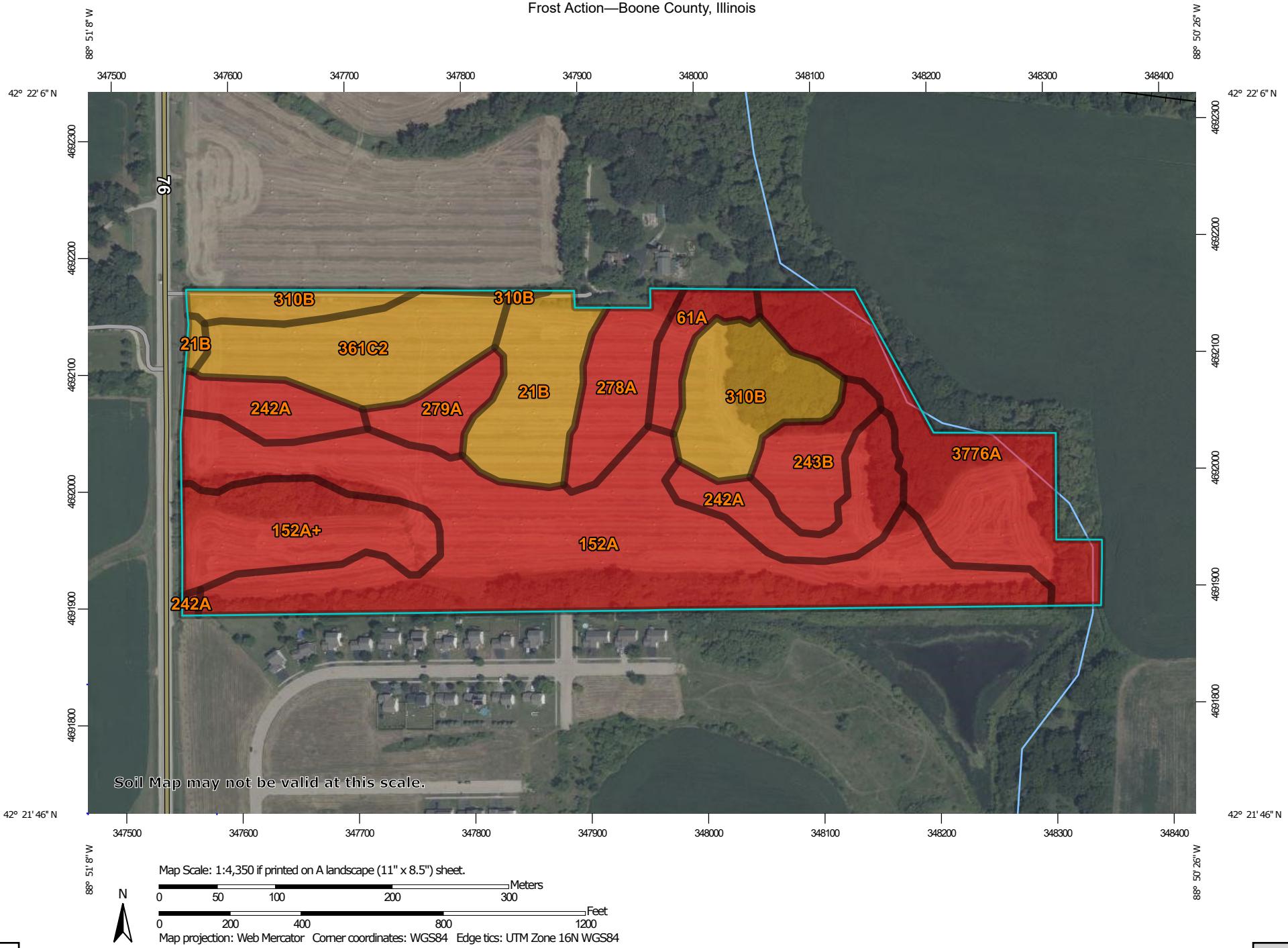
## Rating Options

*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.

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

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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.

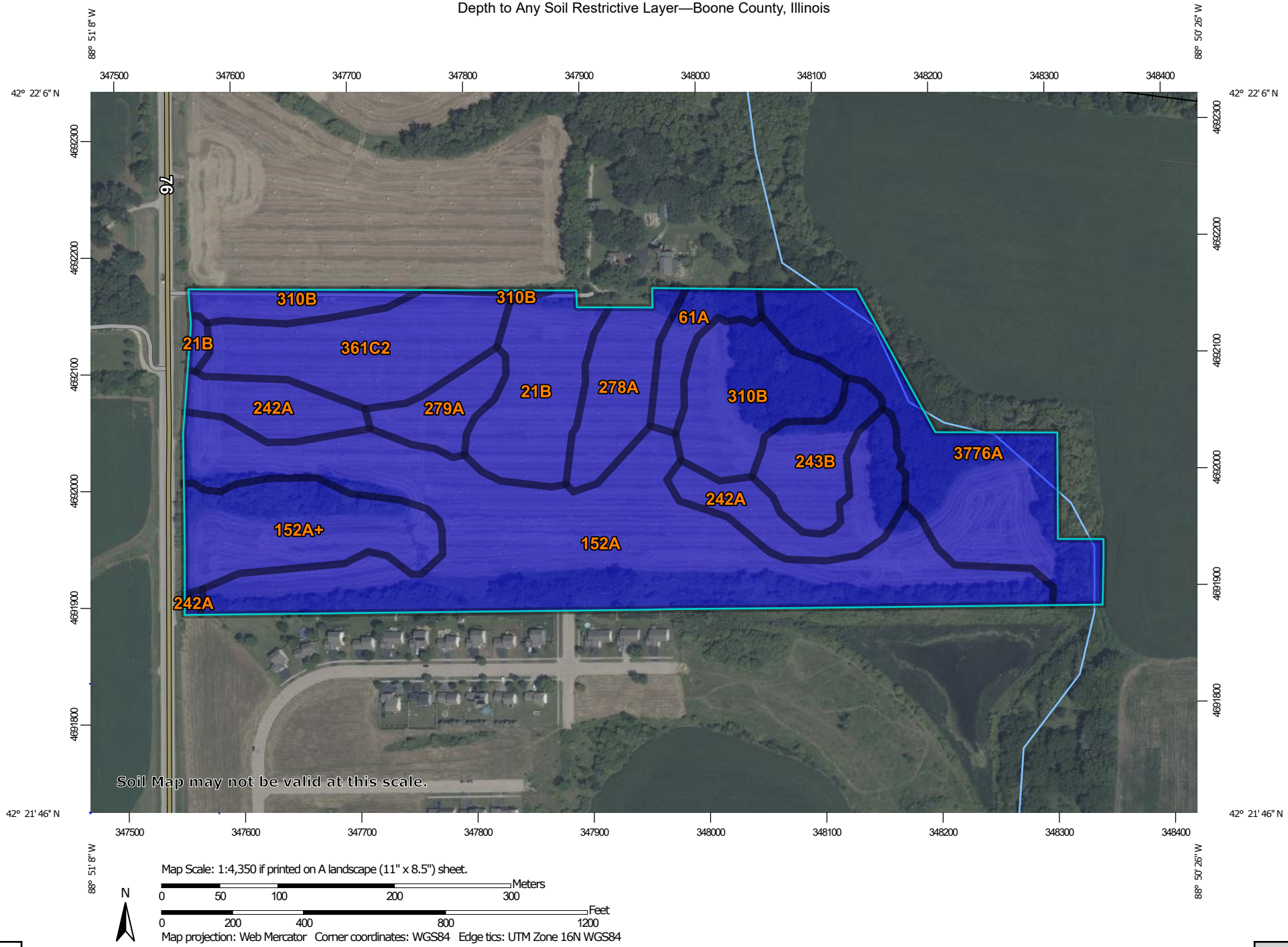
## Rating Options

*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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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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# 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

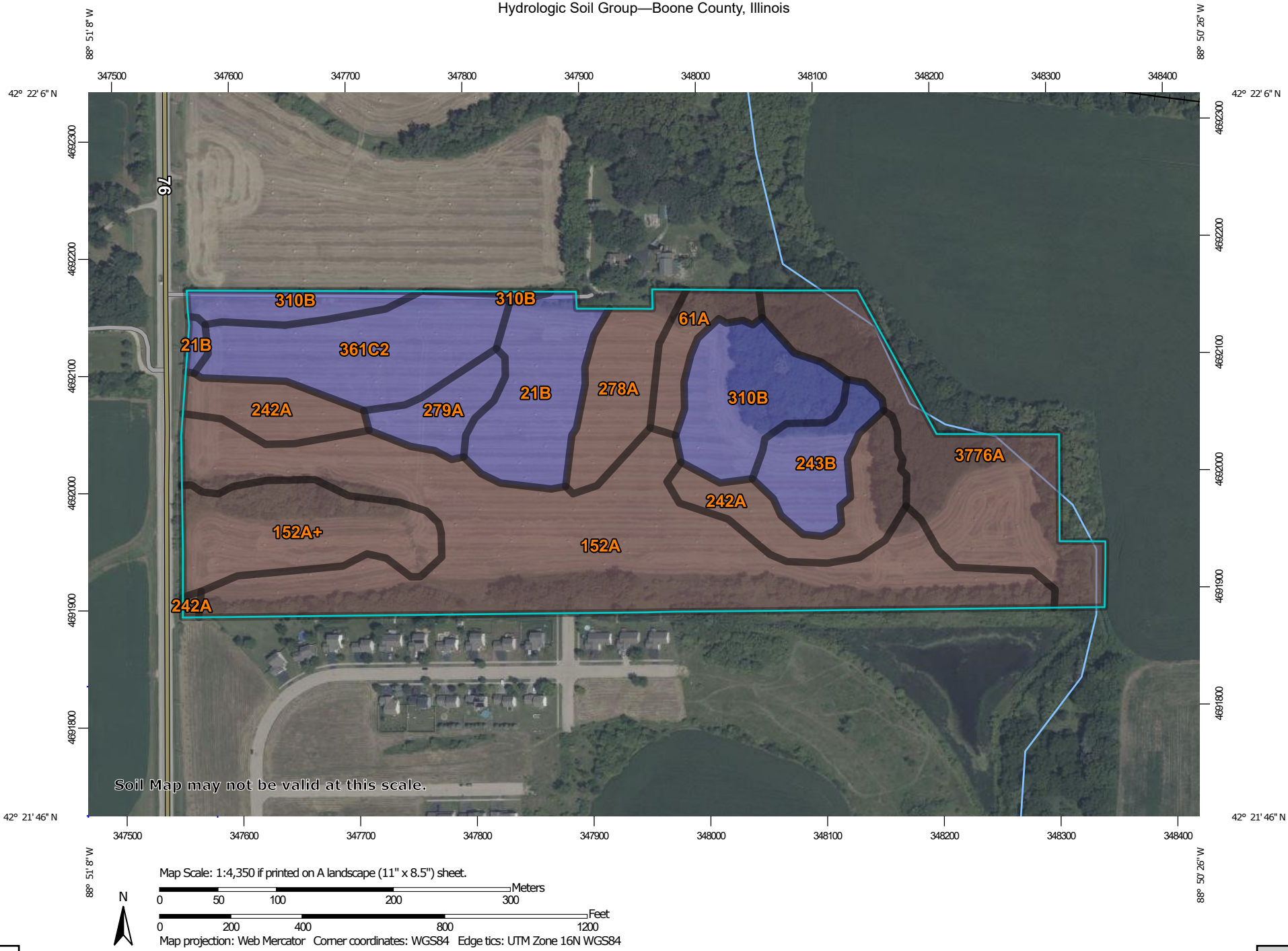
| Map unit symbol and soil name | Hydrologic group | Surface runoff | Most likely months | Water table | | | Ponding | | | Flooding | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Upper limit | Lower limit | Kind | Surface depth | Duration | Frequency | Duration | Frequency |
| | | | | *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 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**

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)

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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

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# 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.

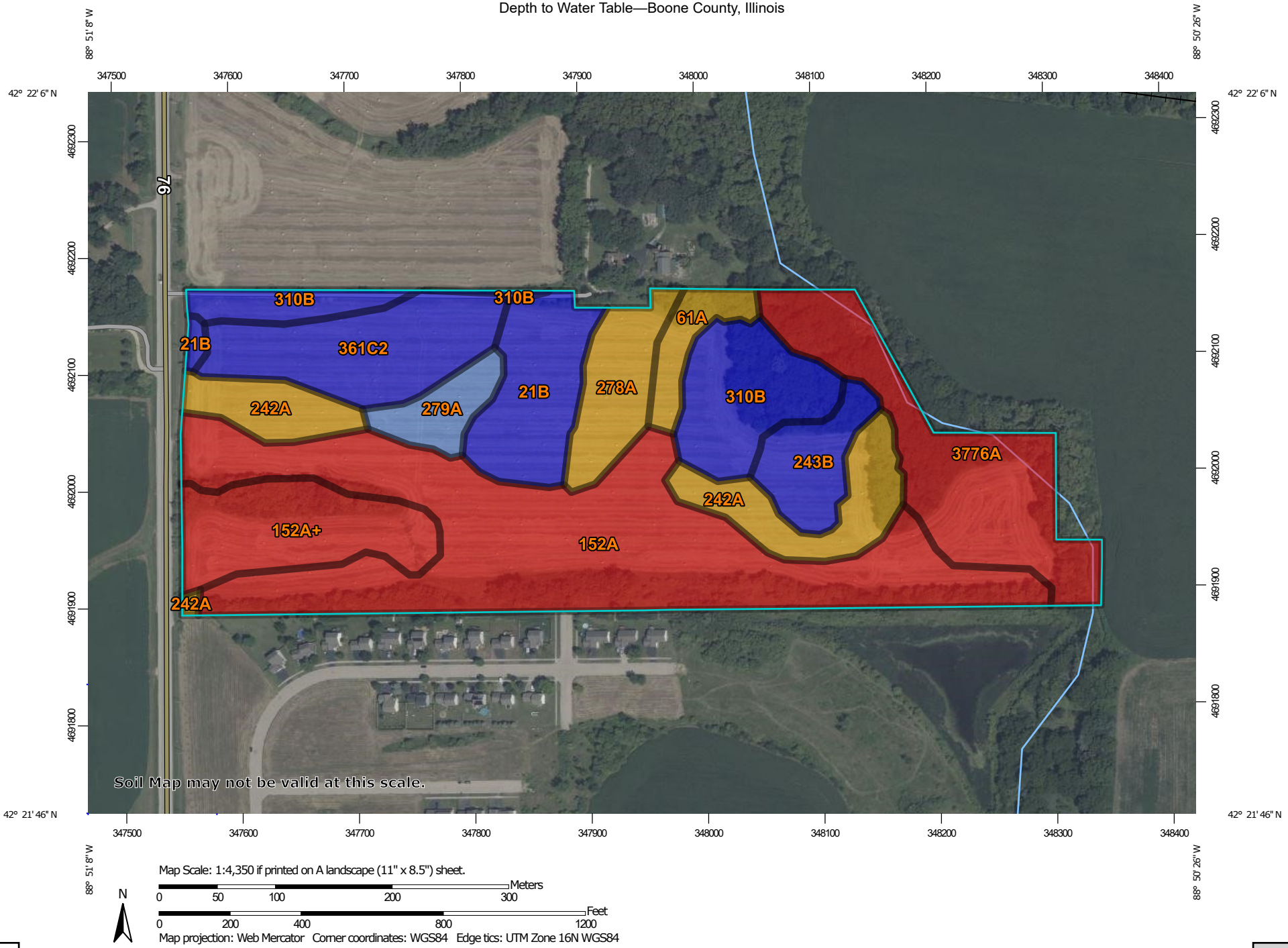
## Rating Options

*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.

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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

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

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# 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*

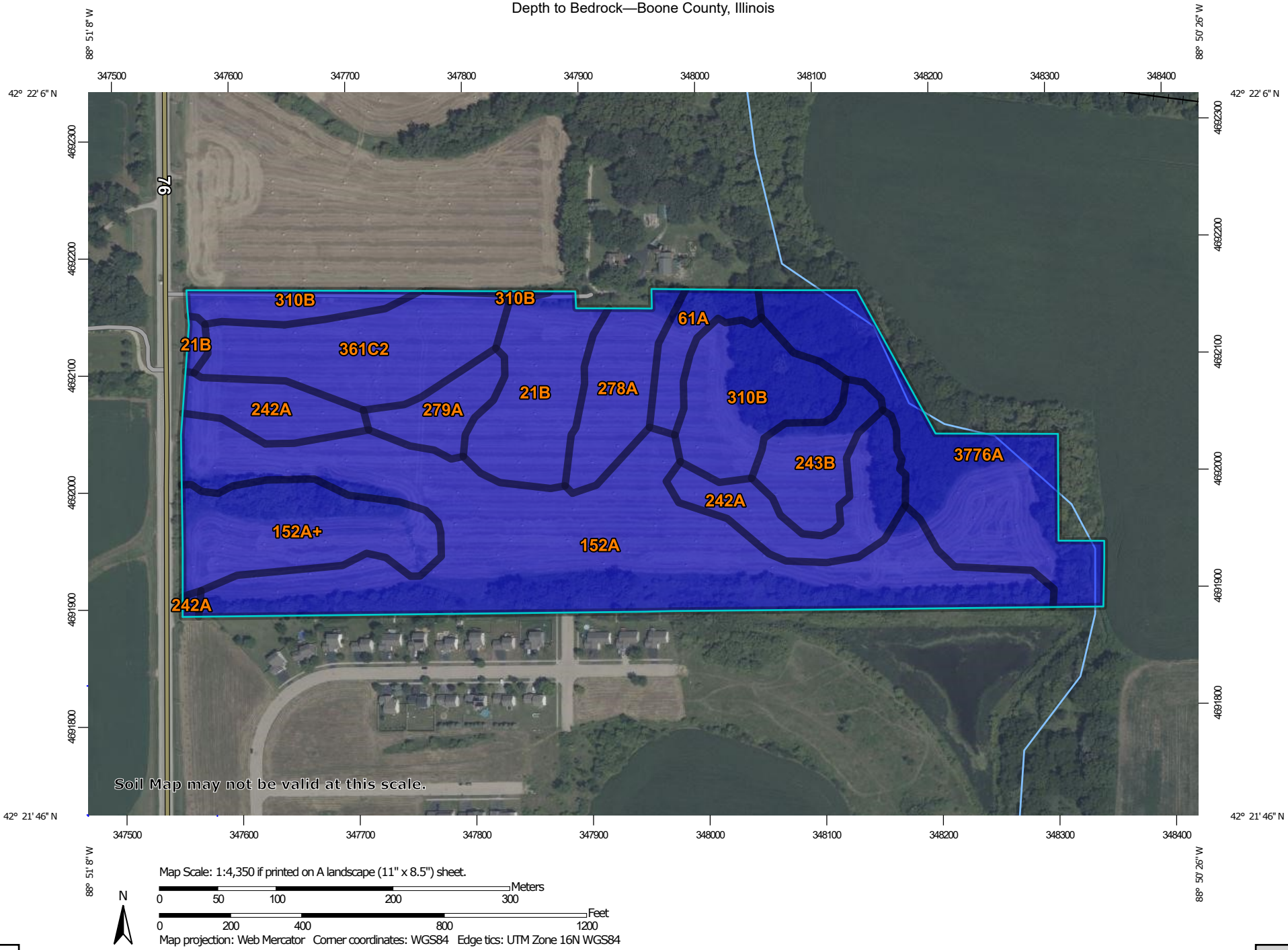
*Tie-break Rule:* Lower

*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.

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

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# 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

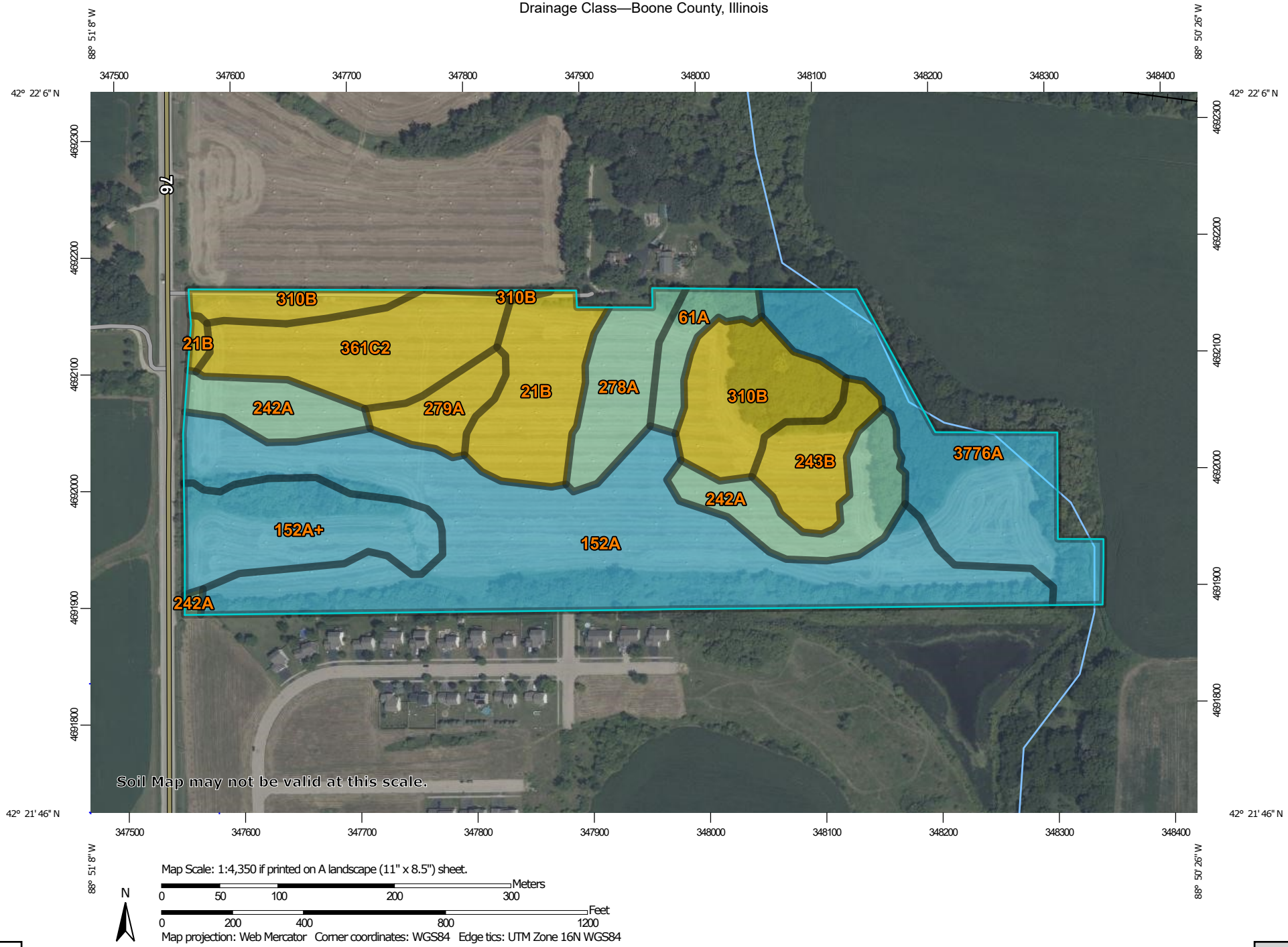
*Aggregation Method:* Dominant Component

*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

0 50 100 200 300 Meters

0 200 400 800 1200 Feet

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

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# 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."

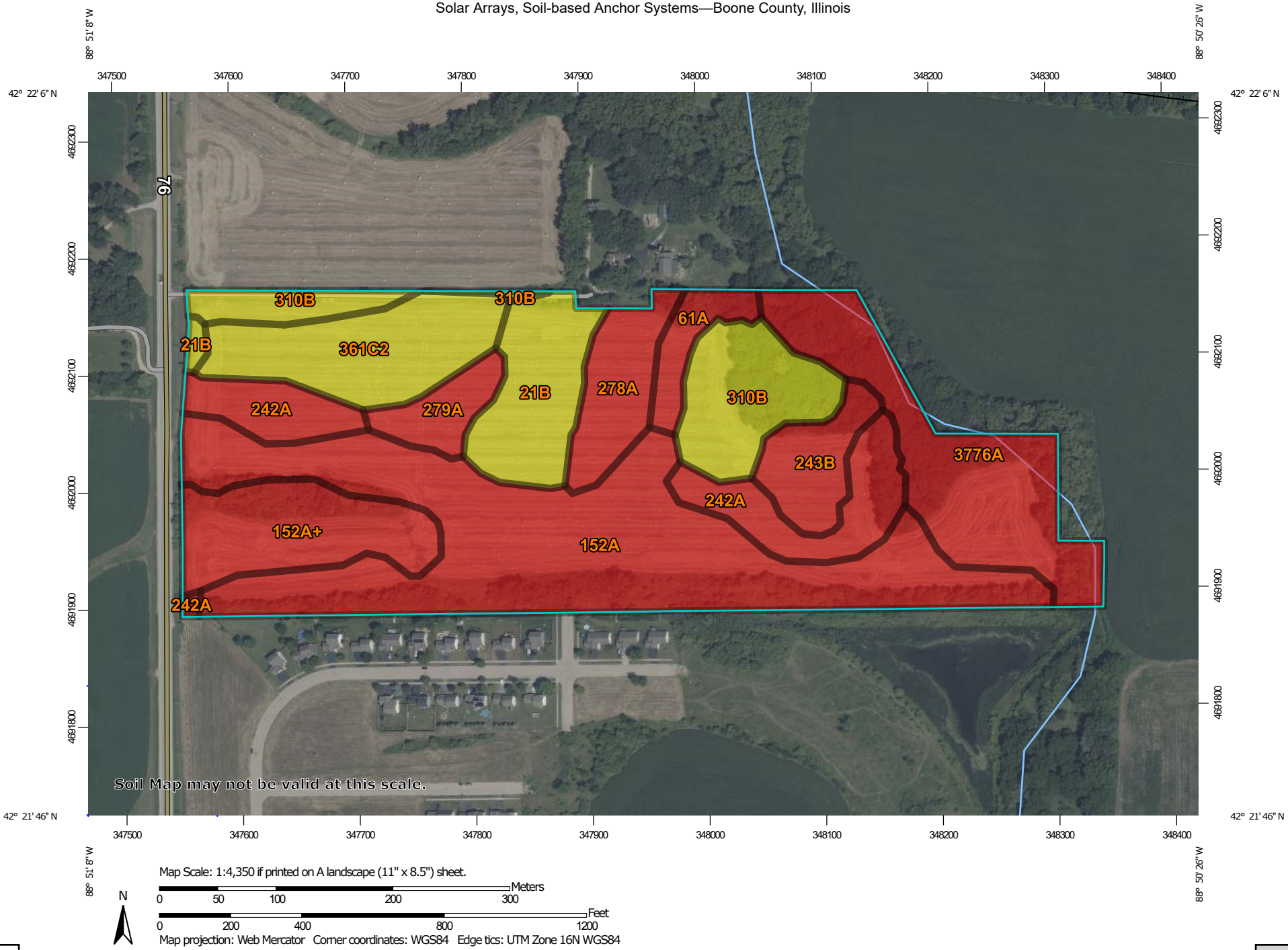
## Rating Options

*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.

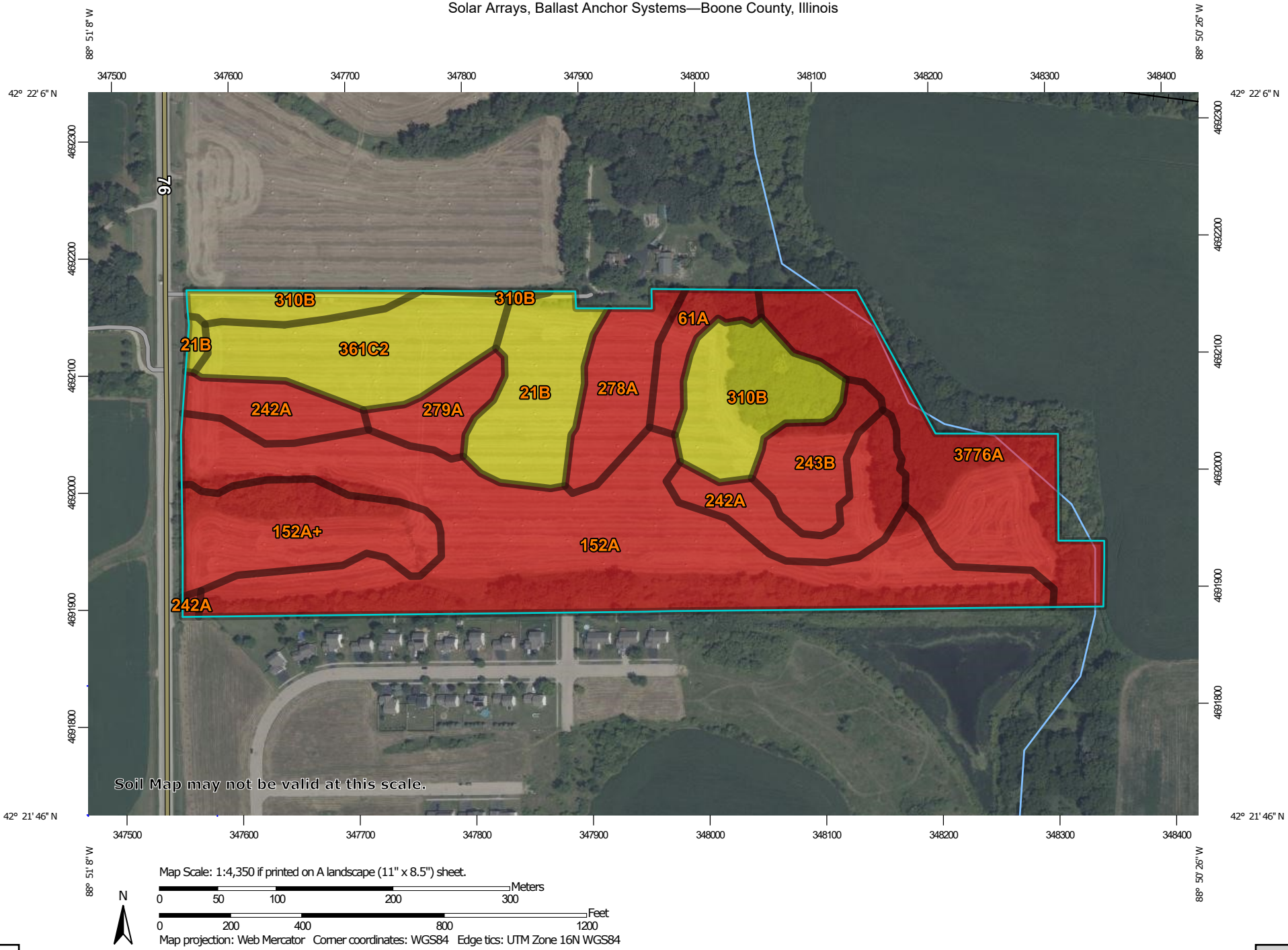
Romanoff, Melvin. 1962. Corrosion of Steel Pilings in Soils. Journal of Research of the National Bureau of Standards. (Volume 66C, No. 3). July/September, 1962.

## 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

## 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, 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

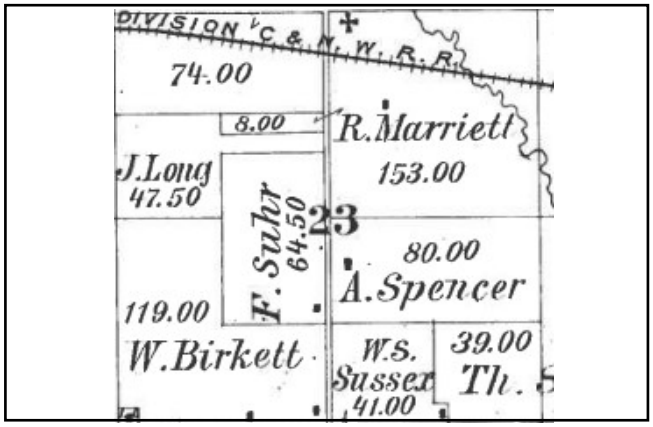
# CULTURAL RESOURCES INFORMATION

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.

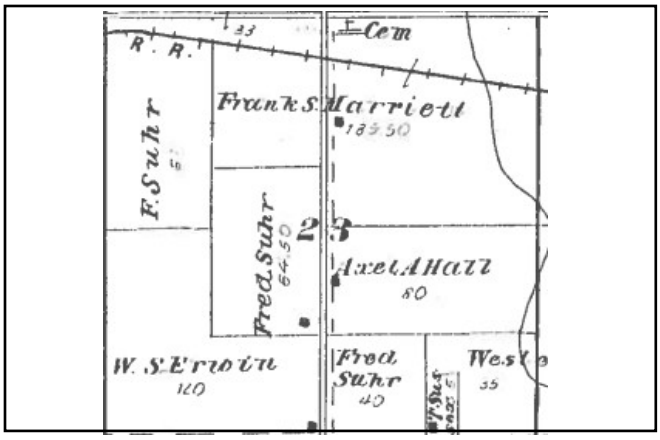
Landowners with historical properties on their land have ownership of that historical property and may choose to collect or disturb a historical property on their own land. However, human remains, grave markers, burial mounds, and artifacts associated with graves and human remains over 100 years old, 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/](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<br>Wherever found<br>There is **final** critical habitat for this species. Your location does not overlap the critical habitat.<br>https://ecos.fws.gov/ecp/species/5949 | Endangered |

# Birds

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

# Insects

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

# Flowering Plants

| NAME | STATUS |
|---|---|
| Eastern Prairie Fringed Orchid Platanthera leucophaea<br>Wherever found<br>No critical habitat has been designated for this species.<br>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<br>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.<br>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.

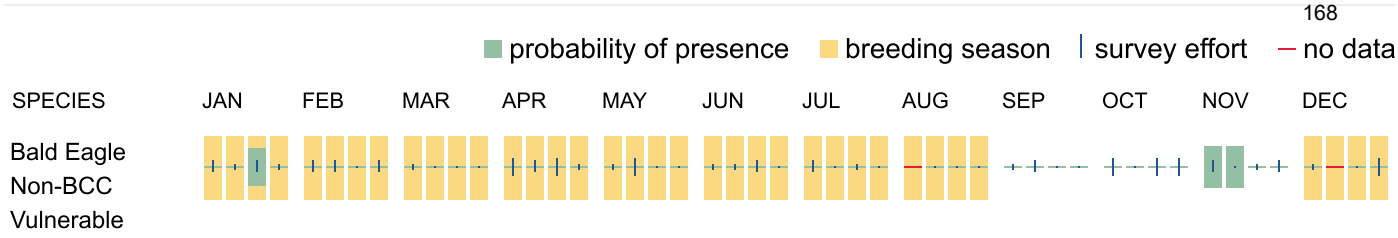
**Breeding Season** (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

**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<br>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.<br>https://ecos.fws.gov/ecp/species/1626 | Breeds Dec 1 to Aug 31 |
| Black-billed Cuckoo Coccyzus erythropthalmus<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9399 | Breeds May 15 to Oct 10 |
| Bobolink Dolichonyx oryzivorus<br>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<br>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<br>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<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/8745 | Breeds May 1 to Jul 20 |
| Grasshopper Sparrow Ammodramus savannarum perpallidus<br>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA<br>https://ecos.fws.gov/ecp/species/8329 | Breeds Jun 1 to Aug 20 |
| Lesser Yellowlegs Tringa flavipes<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9679 | Breeds elsewhere |
| Pectoral Sandpiper Calidris melanotos<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. | Breeds elsewhere |
| Red-headed Woodpecker Melanerpes erythrocephalus<br>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<br>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<br>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.

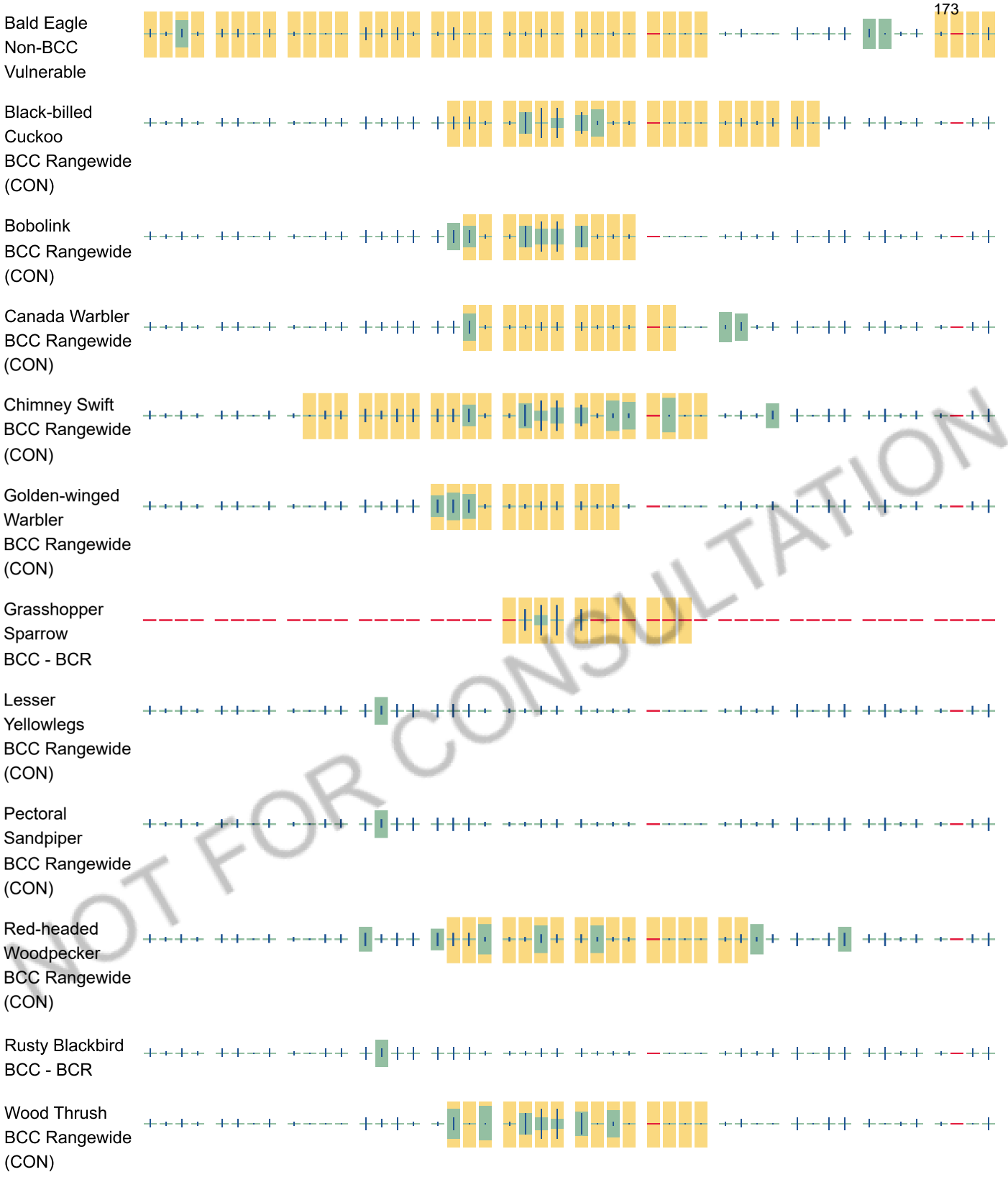
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

**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






## 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).

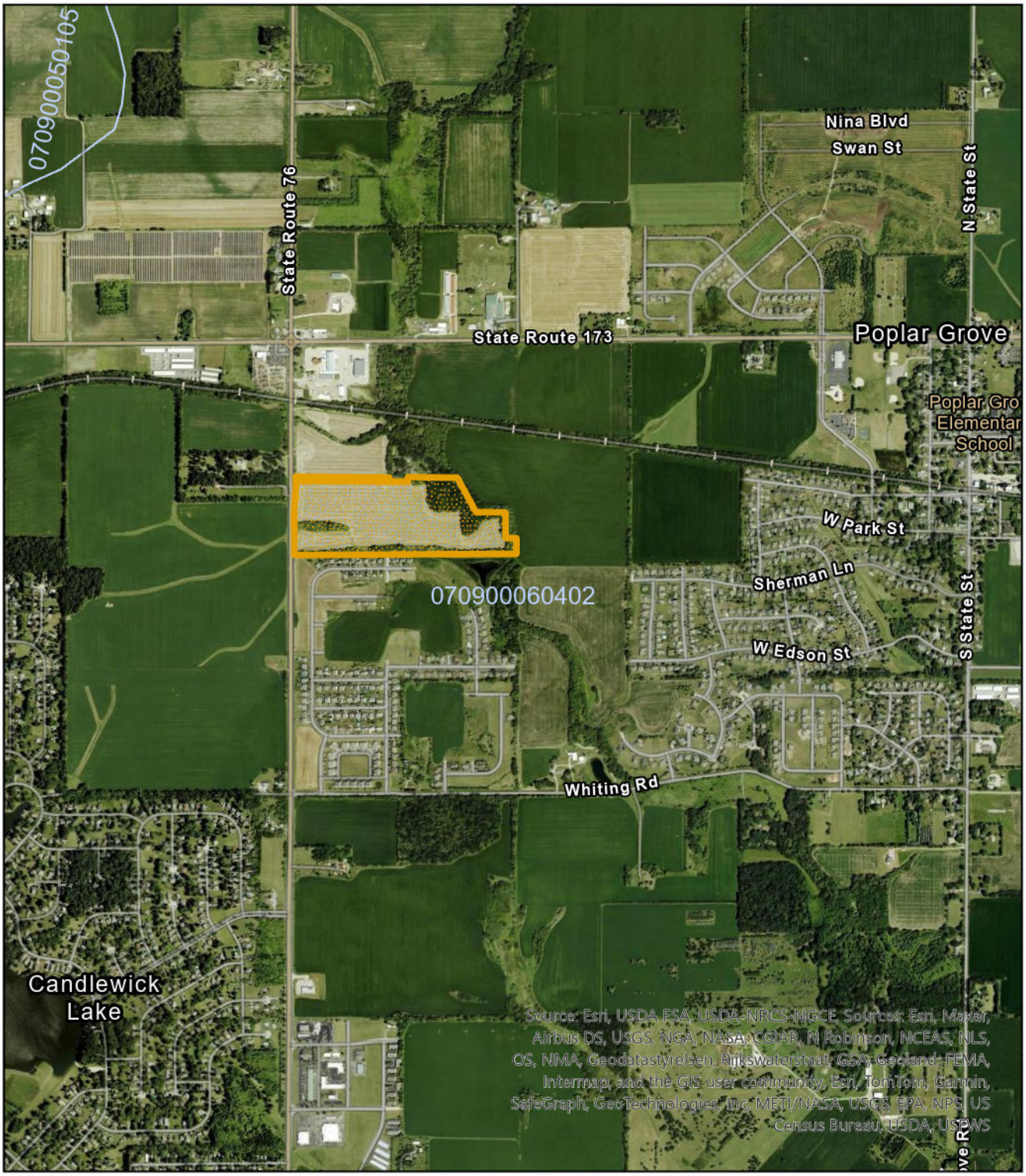
Natural drainage systems develop a complex and interactive system that allows for the conveyance, storage, and overflow of surface water runoff. The various components of this system are continuously adapting to accommodate the current flow conditions. When land is developed, people tend to disrupt one 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



# 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:<br>Boone County Highway Department<br>9759 IL-76 Belvidere, IL 61008<br>Phone: 815-319-4000 | ***Wetlands or U.S. Waters:<br>U.S. Army Corps of Engineers, Chicago District<br>111 North Canal Street, Chicago, IL 60606-7206<br>Phone: 312-353-4117 |
| Flood Plains:<br>Illinois Department of Natural Resources \ Office of Water Resources<br>201 W. Center Court, Schaumburg, IL 60196-1096<br>Phone: 847-705-4341 | Water Quality \ Erosion Control:<br>Illinois Environmental Protection Agency, Division of Water Pollution Control, Permit Section, Watershed Unit<br>2200 Churchill Road, Springfield, IL 62706<br>Phone: 217-782-0610 |

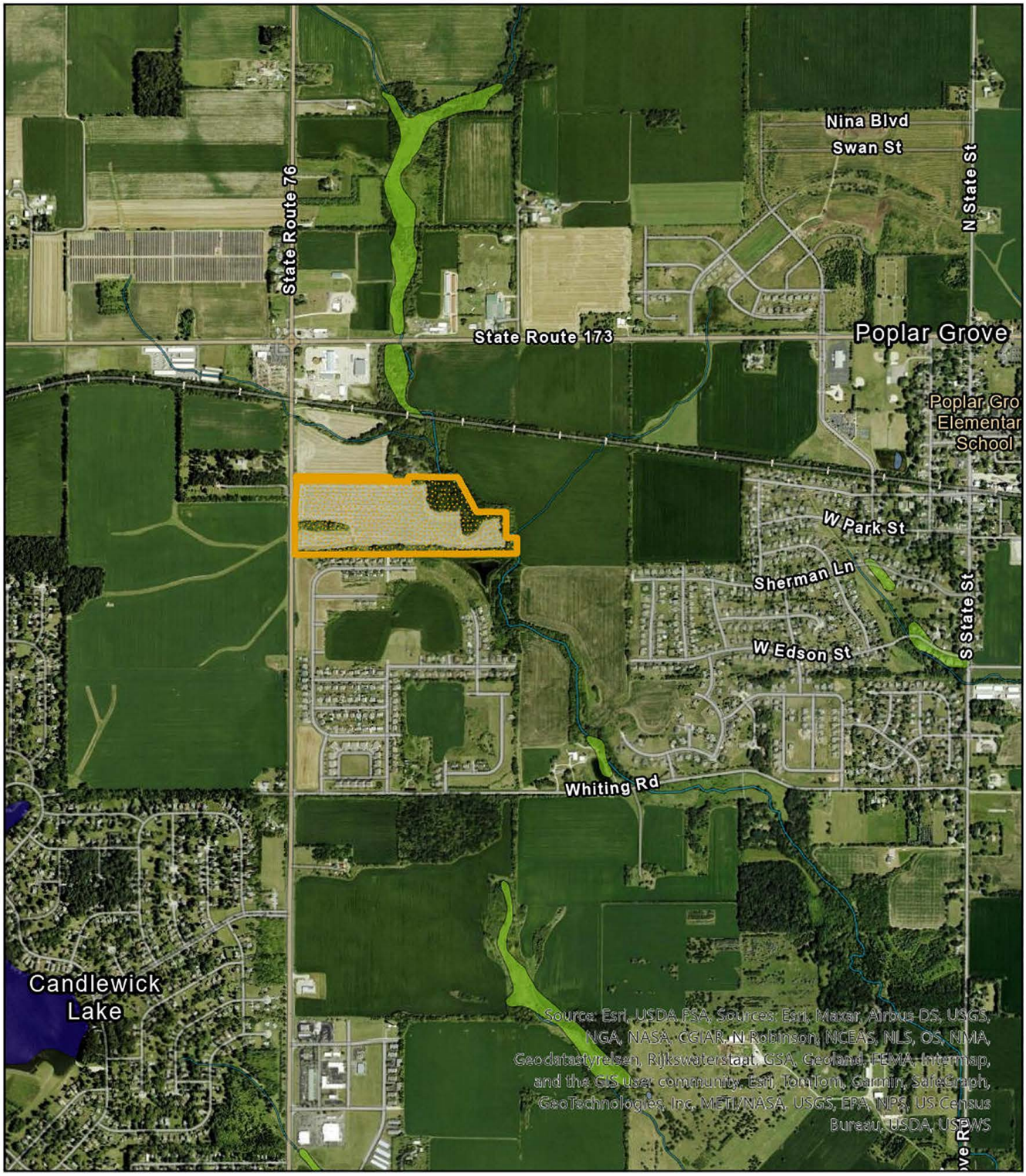
***__CAUTION__: Contact with the United States Army Corps of Engineers is strongly advised before commencement of any work in or near a water of the United States. This could save considerable time and expense. Persons responsible for willful and direct violation of Section 10 of the River and Harbor 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

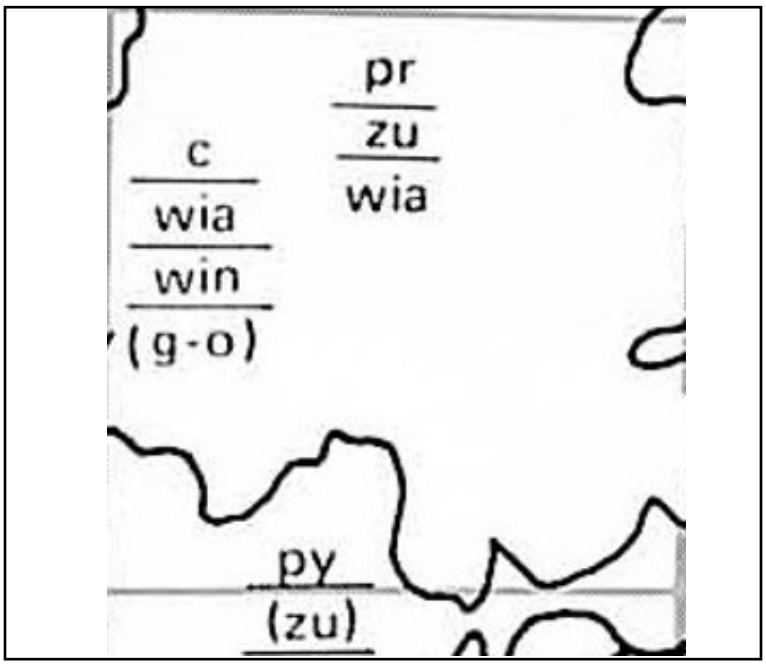
FIRM is the acronym for the Flood Insurance Rate Map, produced by the Federal Emergency Management Agency. These maps define flood elevation adjacent to tributaries and major bodies of water, and superimpose that onto a simplified USGS topographic map. The FIRM map has three zones.

- 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 position

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. ints, bedding planes, fractures, and solution openings normally provide adequate water for farmstead 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 velopment

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.

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Belvidere, IL

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Phone #: 815-547-8591

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175 W. Jackson Street, 4th Floor
Chicago, IL 60604
Phone #: 312-408-5541

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1 Natural Resource Way
Springfield, IL 62702
Phone #: 217-782-3862

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313 N Main Street
Rockford, IL 61101
Phone #: 815-319-4180

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USDA Service Center
4833 Owen Center Road
Rockford, IL 61101
Phone #: 815-965-2392, ext. 3

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Clock Tower Building, Box 2004
Rock Island, IL 61204
Phone #: (309) 794-5369

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