

# Aquatic Resource Delineation Report

## Green Road Solar Project

Harvard, McHenry County, Illinois

**Project No. 25-0392**

Prepared For:  
3 A Energy LLC  
1816 Main Street  
Lombard, Illinois 60148

*Hey and Associates, Inc.*

Engineering, Ecology and Landscape Architecture

**Main Office:**

26575 W. Commerce Dr., Ste 601  
Volo, Illinois 60073  
847-740-0888 (phone)  
847-740-2888 (fax)

**Additional Offices:**

Chicago, IL

8755 W. Higgins Rd., Ste 835  
Chicago, Illinois 60631  
773-693-9200 (phone)  
847-740-2888 (fax)

Richland Center, WI

20442 County Highway G  
Richland Center, Wisconsin 53581  
847-740-0888 (phone)  
847-740-2888 (fax)

Illinois Professional Design Firm 184.002429 / Wisconsin Architectural and Engineering License # 2340-11  
Staff licensed to practice in Illinois, Indiana, Iowa, Michigan, and Wisconsin  
IDOT and WisDOT Prequalified

**April 3, 2026**

# Green Road Solar Aquatic Resource Delineation Report

---

Introduction.....	2
Maps and Review Area Information.....	2
Aquatic Resource Delineation Methods .....	3
Farmed Wetland Determination Methods .....	5
Weather Data .....	5
Aquatic Resource Delineation Results.....	6
Farmed Wetland Determination Results .....	8
Potential Regulatory Requirements & Conclusions .....	9
References .....	10

## Tables

Table 1: Historical Aerial Review Summary .....	3
Table 2: Wetlands Summary.....	7
Table 3: Potential Farmed Wetland Aerial Review Summary.....	8

## Exhibits

- Exhibit 1 – Project Location
- Exhibit 2 – USGS Topographic Map
- Exhibit 3 – National Wetland Inventory
- Exhibit 4 – McHenry County ADID Study
- Exhibit 5 – FEMA Flood Hazard Zones
- Exhibit 6 – USGS Hydrologic Atlas
- Exhibit 7 – NRCS McHenry County Soil Survey
- Exhibit 8 – Aquatic Resources Delineation Map
- Exhibit 9 – Floristic Quality Assessments
- Exhibit 10 – Wetland Determination Data Sheets
- Exhibit 11 – Representative Photographs
- Exhibit 12 – Antecedent Precipitation Tool
- Exhibit 13 – WETS Table – McHenry/Stratton Dam
- Exhibits 14A to 14F – Farmed Wetland Aerials

# Green Road Solar Aquatic Resource Delineation Report

## **Introduction**

A wetland delineation of the project site, as outlined in Exhibit 1, was conducted at the request of 3 A Energy and Kachi Energy. The review area encompasses approximately 9.63 acres and is located along the south side of Green Road, just east of Shields Road in unincorporated McHenry County near Harvard, Illinois. The site is geographically located within Section 33, Township 46 North, Range 6 East of the Third Principal Meridian (Latitude 42.420370, Longitude -88.543691).

The site currently consists of agricultural fields, wooded fence rows, and wetland. The surrounding area is characterized by agricultural land, private open space, and rural residential.

## **Maps and Review Area Information**

Prior to the field investigation, the project area was remotely evaluated to identify potential areas of interest and assess environmental conditions. A review of publicly available online resources was conducted to examine site topography, mapped soils, vegetation patterns, proximity to surface water features (e.g., streams, ditches, or ponds), and the classification of nearby waterways based on stream order. Historical aerial imagery was also reviewed to determine whether the site had experienced any recent or long-term disturbances, or changes in land use. Review of historic aerial photographs from 2010, 2014, 2016, 2018, 2020, 2022, and 2024 which consistently depict the property as being in agricultural land use and fallow/wetland with no significant shifts in vegetation cover or hydrologic features. See Table 1 below for additional information regarding historical aerials.

# Green Road Solar Aquatic Resource Delineation Report

**Table 1: Historical Aerial Review Summary**

Year	Notes
2010	Normal precipitation year, north and southeast portions farmed, remainder wetland/fallow and farmed wetland.
2014	Normal precipitation year, north and southeast portions farmed, remainder wetland/fallow and farmed wetland.
2016	Normal precipitation year, north and southeast portions farmed, remainder wetland/fallow and farmed wetland.
2018	Wet precipitation year though site appears drier than previous normal years; north and southeast portions farmed, remainder wetland/fallow and farmed wetland.
2020	Wet precipitation year, north and southeast portions farmed, remainder wetland/fallow and farmed wetland.
2022	Normal precipitation year, north and southeast portions farmed, remainder wetland/fallow and farmed wetland.
2024	Normal precipitation year, north and southeast portions farmed, remainder wetland/fallow and farmed wetland.

Aerial Sources: Google Earth, ArcOnline – McHenry Co.

The United States Geological Survey (USGS) topographic map did not identify any wetlands, open water bodies, or stream channels within the project boundaries (Exhibit 2). The U.S. Fish & Wildlife Service’s National Wetland Inventory (NWI) map shows one Palustrine Emergent Persistent Seasonally Flooded Partially Drained/Ditched (PEM1Cd) at the southwest corner of the project area (Exhibit 3). The McHenry County ADID Study shows a High Habitat Value wetland extending onto the project site from the west and south (Exhibit 4). The FEMA Flood Hazard Zones map indicates that the project limits are not located within a mapped floodplain or floodway (Exhibit 5). The USGS Hydrologic Atlas does not show a flood of record on the project site but indicates it is in the North Branch Kishwaukee River watershed (Exhibit 6). The Natural Resources Conservation Service (NRCS) Soil Survey McHenry County (Exhibit 7) identified the presence of two hydric soil mapping units within the project limits: Pella silty clay loam, 0 to 2 percent slopes (153A) and Houghton muck, 0-2 percent slopes.

## **Aquatic Resource Delineation Methods**

Wetlands within the project area were delineated on March 30, 2026 by Jeffrey Mengler, PWS, of Hey and Associates, Inc. using a combination of remote sensing techniques and field procedures consistent with the *U.S. Army Corps of Engineers (USACE) 1987 Wetland Delineation Manual* and the *2012 Northcentral and Northeast Regional Supplement*. Level 3

# Green Road Solar Aquatic Resource Delineation Report

---

routine wetland determination methodology, as outlined in the 1987 Manual, was applied to this site.

Upon arrival, the entire project area was visually surveyed, with priority given to areas exhibiting vegetation indicative of potential wetland conditions. Areas where wetland plant species appeared to comprise more than 50% of the dominant vegetative cover were noted for further analysis, including verification of hydric soils and wetland hydrology indicators.

Representative data points were collected in both potential wetland and upland areas. Dominant plant species were documented during the field investigation, and additional species lists were compiled to complete USACE wetland determination data forms. Field indicators of hydric soil were assessed based on USACE-accepted criteria, the NRCS *Field Indicators of Hydric Soils in the United States* manual, and other signs of prolonged soil saturation. Wetland hydrology indicators, as described in the regional supplement, were also evaluated at each data point. Hydrologic criteria were confirmed using visual or physical evidence of saturation or inundation consistent with growing season wetness.

To further assess the ecological integrity of the wetland areas, a Floristic Quality Assessment (FQA) was performed following the methodology outlined in *Swink and Wilhelm's Plants of the Chicago Region* (1994) and updated by *Wilhelm and Rericha's Flora of the Chicago Region* (2017). Each plant species observed was assigned a coefficient of conservatism, which reflects its fidelity to natural habitat conditions. These coefficients were used to calculate the Floristic Quality Index (FQI) for each delineated wetland. FQI values provide a quantitative assessment of vegetative quality: scores between 1–19 indicate low-quality vegetation, 20–35 indicate high-quality vegetation, and scores above 35 are generally representative of “Natural Area” quality.

Wetland flags and data points were surveyed using a Trimble R1 external GNSS receiver with <50cm horizontal accuracy. Data was uploaded using ArcGIS Field Maps and wetland boundaries and areas are calculated using ArcGIS Pro software.

# Green Road Solar Aquatic Resource Delineation Report

---

## **Farmed Wetland Determination Methods**

Due to modifications to the Memorandum of Agreement between the USACE and the U.S. Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS), farmed wetland delineations are no longer conducted by NRCS for purposes unrelated to the implementation of the Farm Bill. As a result, the farmed wetland determination was conducted by Hey and Associates, Inc. using USDA-NRCS methodology in conjunction with applicable USACE permitting guidance. A minimum of five years of growing season aerial imagery from years classified as having normal precipitation—based on WETS (Wetland Climate Analysis) tables were reviewed. The nearest WETS station with adequate data for this site was McHenry Stratton Lock/Dam (Exhibit 13). Aerial imagery from normal precipitation years 2010, 2014, 2016, 2022, 2024 was analyzed using GIS software to identify photographic signatures such as persistent ponding, delayed or failed planting, and crop stress. Supplemental imagery from wet precipitation years, including 2018 was also reviewed (Exhibits 14A-14F). Areas were identified as potential farmed wetlands (PFW) if they exhibited wet signatures or crop failure. A PFW was determined to be a farmed wetland only if these indicators appeared in a majority of the normal years reviewed.

Soil conditions were evaluated using NRCS Web Soil Survey, and mapped soil types such as Pella silty clay loam and Houghton muck were cross-referenced for hydric soil classification based on USDA hydric soil criteria. Field investigation included spot soil sampling at representative locations to verify the presence of hydric soil indicators where necessary.

Site drainage features were reviewed using GIS layers and field observations, including surface ditches, swales, or visible tile drainage networks. No onsite drainage features were observed. A large wetland complex was observed on the parcel to the west, and a pond with a wetland fringe to the south.

## **Weather Data**

March 30, 2026, the date of the field visit, was partly sunny and unseasonably warm (77°F). The 72 hours prior to the field visit had spring thunderstorms and seasonable temperatures.

# **Green Road Solar Aquatic Resource Delineation Report**

Last rainfall prior to the field observations was 0.12 inches on March 27, 2026, according to the nearest weather station, Woodstock, Illinois.

Antecedent moisture conditions within the 90 days prior to field work were evaluated using the USACE Antecedent Precipitation Tool (APT), which determined that the three-month period prior to the field visit fell within a normal precipitation range during a moderate drought period (Exhibit 12).

## **Aquatic Resource Delineation Results**

The wetland and waters boundaries are shown on an aerial photograph in Exhibit 8, as surveyed in March 2026. The Floristic Quality Assessments (FQAs) for the wetland areas are provided in Exhibit 9. Additionally, the USACE data forms for wetland and upland areas are presented in Exhibit 10. Representative color photographs of the upland and wetland/waters areas are provided in Exhibit 11. The delineated wetlands are summarized in Table 2.

# Green Road Solar Aquatic Resource Delineation Report

**Table 2: Wetlands Summary.**

Wetland	Latitude	Longitude	Area (acres)	Native FQI <sup>1</sup>	Native Mean C <sup>2</sup>	McHenry County ADID	USACE Chicago District HQAR <sup>3</sup>	Vegetative Community Type	Cowardin Code <sup>4</sup>	Dominant Vegetation
1	42.420352	-88.543801	2.47	6.68	1.79	High Habitat Value	Yes	Emergent Marsh	PEM	Reed Canary Grass ( <i>Phalaris arundinacea</i> ) Sandbar willow ( <i>Salix interior</i> )
FARMED WETLAND 1	42.421385	-88.543815	0.11	n/a	n/a	No	No	Farmed Wetland	POW	n/a farmed
<p>1 The Floristic Quality Index (FQI) is an indication of native vegetative quality for an area: generally 1-19 indicates low vegetative quality, 20-35 indicates high vegetative quality and above 35 indicates "Natural Area" quality.                  2 The Native Mean C is an indication of native vegetative quality for an area. Areas with value of 3.5 or greater are considered high quality.                  3 High Quality Aquatic Resources, January 8, 2026, received from USACE Chicago District                  4 PEM = palustrine emergent, POW = palustrine open water</p>										

# Green Road Solar Aquatic Resource Delineation Report

Wetland 1 is an emergent wetland with some areas of shrub/scrub. A wooded fencerow along its eastern edge had been recently cut down and removed at the time of the field delineation. In addition, some of the woody vegetation within the wetland had also been cut down. Much of the herbaceous vegetation was matted down from snow cover over the winter. The wetland extends off site to the west. It is of low floristic quality and low functional value based on the field conditions observed. Drainage flows offsite to the west.

An assessment of the aquatic resources within the project limits was conducted to determine whether they meet the criteria for high quality under current federal and county definitions. Wetland 1 meets the definition for high quality because they are located within an ADID high habitat wetland (Exhibit 4).

## Farmed Wetland Determination Results

The Farmed Wetland Determination was conducted using a WETS Table from the McHenry Stratton Dam reporting station and growing season aerial photographs. One area was investigated as a Potential Farmed Wetlands (PFW) using the growing season aerial photographs. Table 3 summarizes the evaluation of all PFWs identified.

**Table 3: Potential Farmed Wetland Aerial Review Summary**

Potential Farmed Wetland	2010 Normal	2014 Normal	2016 Normal	2018 Wet	2022 Normal	2024 Normal	Hydric	Farmed Wetland
PFW1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

PFW1 was present in five of five normal precipitation years and in the wet reference year, indicating it is a farmed wetland. It is located in the northern part of the project site in an area mapped as hydric soil (Pella). examined. The Antecedent Precipitation Tool resulted in a finding that the previous three months to the March 2026 field visit were normal precipitation conditions (Exhibit 12). The area was ponded with a fringed of emergent vegetation and crop residue during the field inspection.

# Green Road Solar Aquatic Resource Delineation Report

---

## Potential Regulatory Requirements & Conclusions

Permits for impacts to federal jurisdiction wetlands and surface waters in McHenry County are issued by the USACE under Section 404 of the Clean Water Act. Depending on the jurisdictional status of the wetlands and waters identified within the project area, as well as the nature and extent of proposed impacts, additional coordination or authorization may be required from other regulatory agencies. These agencies may include the U.S. Fish and Wildlife Service, the Illinois Environmental Protection Agency, the Illinois Department of Natural Resources, the Illinois State Historic Preservation Office, and McHenry County.

Based on our understanding of the site and knowledge of current wetland regulations, it is our professional opinion that Wetland 1 and Farmed Wetland 1 are not under federal jurisdiction but are isolated waters of McHenry County. While they are in the Kishwaukee River watershed and there is a small tributary south of the project site, there is no apparent continuous surface water connection from the site to the Kishwaukee River. The final determination regarding jurisdictional status can only be made by the USACE in an Approved Jurisdictional Determination (AJD). Currently, a stand-alone jurisdictional determination request is the lowest priority for the USACE, in the absence of a permit application.

It is important to note that this report and the aquatic resource delineation are time sensitive. Field delineations approved by the USACE are generally valid for five years. Wetland and waters boundaries may change as a result of time of year the delineation is conducted, climatic conditions, changes in hydrology, and changes in land use on adjacent parcels, among other factors. The wetland delineation exhibits and results presented in this report are based on the conditions at the time of the field visit and current methodology to delineate wetlands.

Wetlands and waters identified within the project area may not be filled or otherwise impacted without appropriate permit authorization. No work which would result in impacts to wetlands/waters should be undertaken unless approval from the relevant regulatory authorities is first obtained.

# Green Road Solar Aquatic Resource Delineation Report

---

## References

- Federal Geographic Data Committee. 2013. *Classification of Wetlands and Deepwater Habitats of the United States Wetlands* (FGDC-STD-004-2013. Second Edition.). Wetlands Subcommittee.
- Natural Resources Conservation Service, United States Department of Agriculture. 2010. *National food security act manual. (5th ed., as amended)*.
- Natural Resources Conservation Service, United States Department of Agriculture. 2021. Title 210 National Engineering Handbook. Part 650 Engineering Field Handbook. Chapter 19 Hydrology Tools for Wetland Identification and Analysis. (210-650-H, 2nd Edition, Feb 2021).
- Natural Resources Conservation Service, United States Department of Agriculture, & National Technical Committee for Hydric Soils. 2024. *Field Indicators of Hydric Soils in the United States: Vol. Version 9.0* (A Guide for Identifying and Delineating Hydric Soils).
- Swink, F., and Wilhelm, G. 1994. *Plants of the Chicago Region*. Indiana Academy of Science.
- U.S. Army Corps of Engineers. 1987. *Corps of Engineers Wetlands Delineation Manual* (Technical Report Y-87-1). U.S. Army Engineer Waterways Experiment Station.
- U.S. Army Corps of Engineers. 2005. *Regulatory Guidance Letter No. 05-05 on Ordinary High Water Mark Identification*. U.S. Army Corps of Engineers Headquarters Website.  
<https://usace.contentdm.oclc.org/utis/getfile/collection/p16021coll9/id/1253>
- U.S. Army Corps of Engineers. 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)* (ERDC/EL TR-12-1). U.S. Army Engineer Research and Development Center.
- U.S. Army Corps of Engineers. 2022. *National Wetland Plant List*, version 3.6. <https://wetland-plants.sec.usace.army.mil/>

# Green Road Solar Aquatic Resource Delineation Report

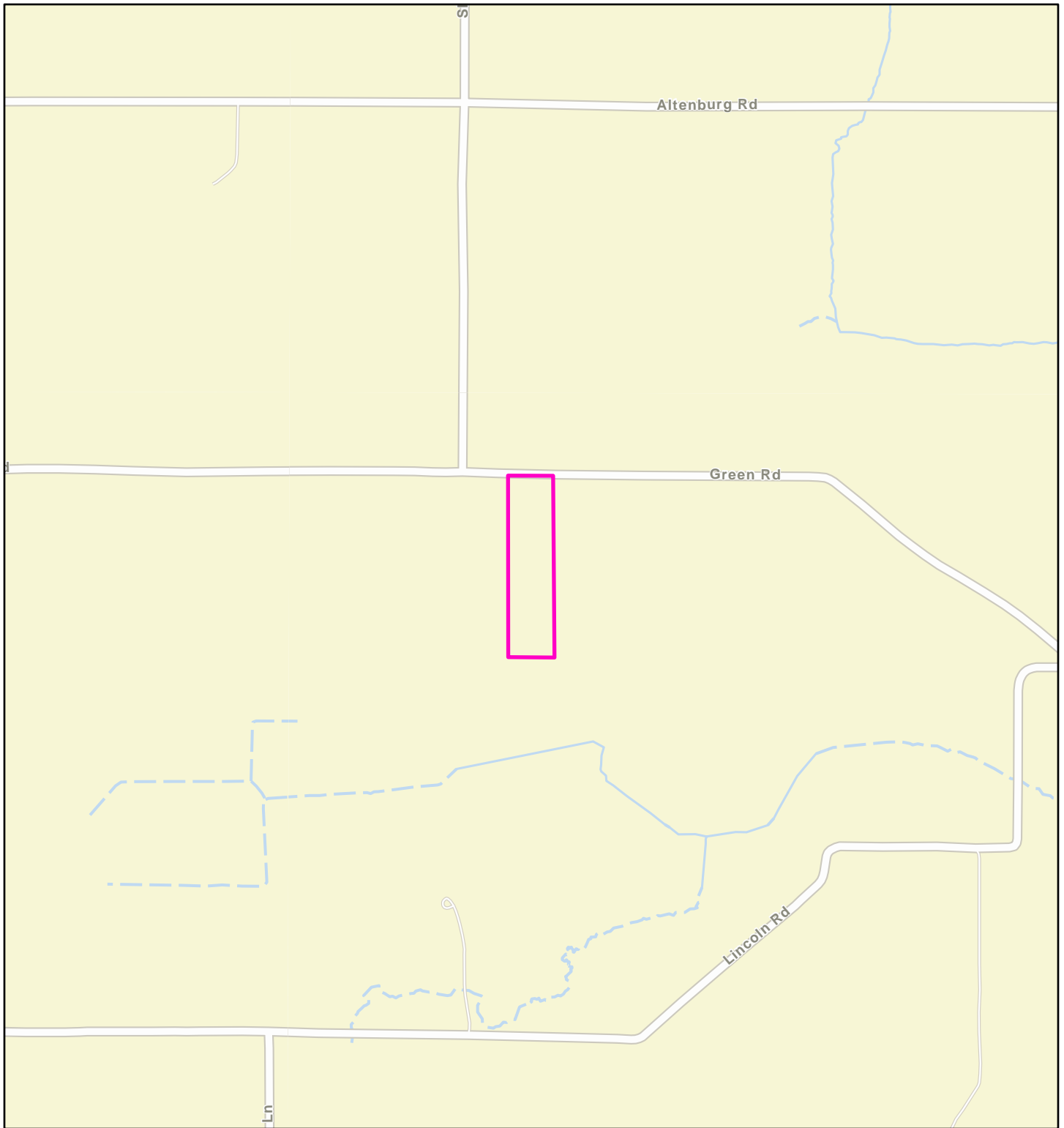
---

U.S. Army Corps of Engineers. 2025. *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams (Final Version)* (ERDC/CRREL TR-25-1). U.S. Army Engineer Research and Development Center. <https://doi.org/10.21079/11681/49526>

U.S. Army Corps of Engineers. 2025. *Antecedent Precipitation Tool (APT) Version 3.0: Technical and User Guide*. ERCD/TN WRAP-25-1. <http://dx.doi.org/10.21079/11681/49835>

U.S. Department of Agriculture. (n.d.). *Title 180, National Food Security Act Manual (NFSAM) Part 527.4*.

Wilhelm, G. and L. Rericha. 2017. *Flora of the Chicago Region: a floristic and ecological synthesis*. Conservation Research Institute (Cedarburg, WI), Forest Preserve District of Cook County, and Chicago Botanic Garden, Indiana Academy of Science.



Scale:



Project Number: 25-0392

Project Area Acreage: 9.63

Prepared by:

Orientat on:



Date: 3/9/2026

Legend:

 Project Boundary

Project Name:

Green Rd - Harvard

Prepared for:

3A Energy

Locat on Informat on:

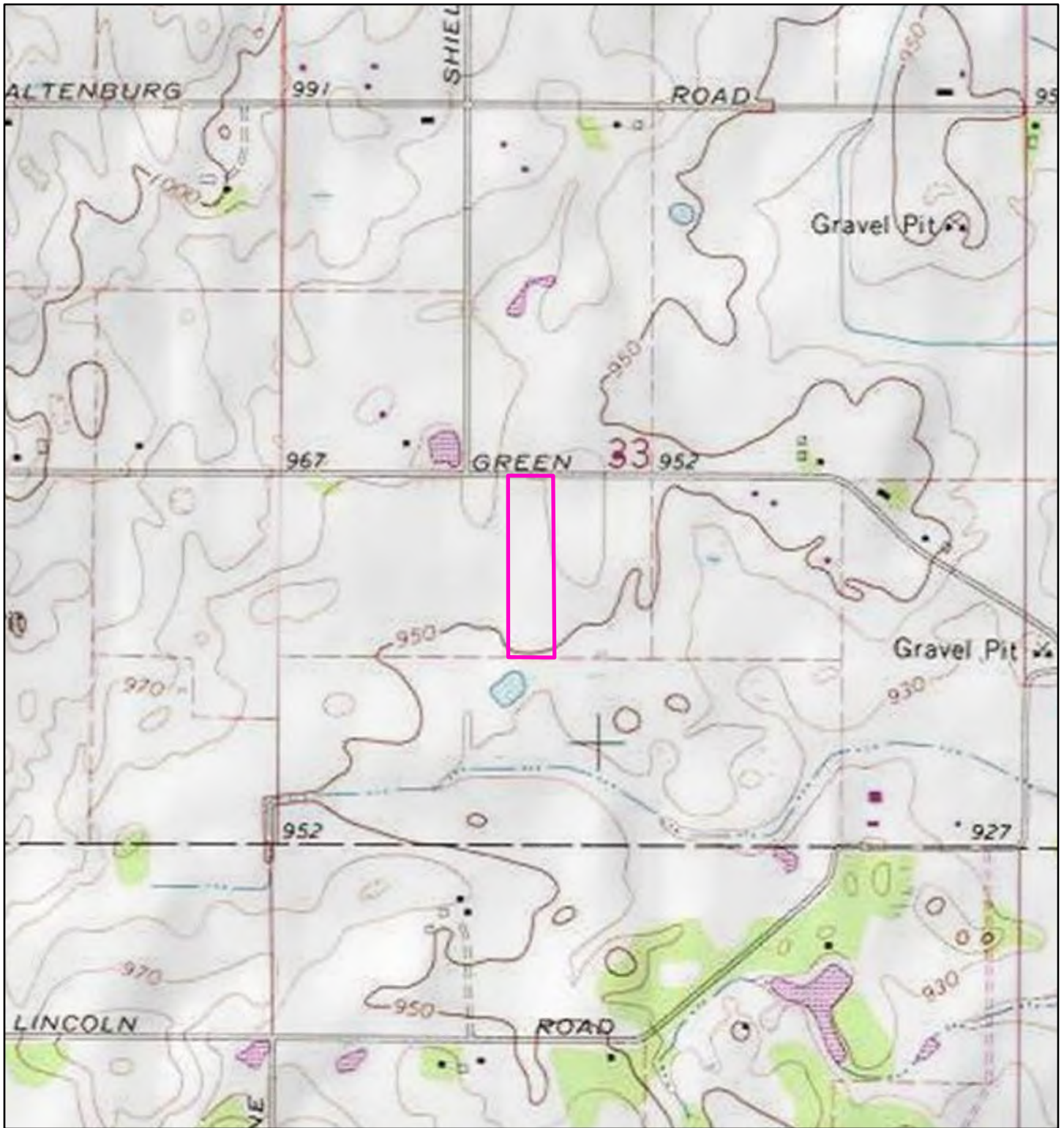
T.46N, R.6E, Sect on 33

Exhibit Title:

Project Locat on

Exhibit

1



Scale:



Project Number: 25-0392

Orientat on:



Date: 3/9/2026

Legend:

 Project Boundary

Project Name:

Green Rd - Harvard

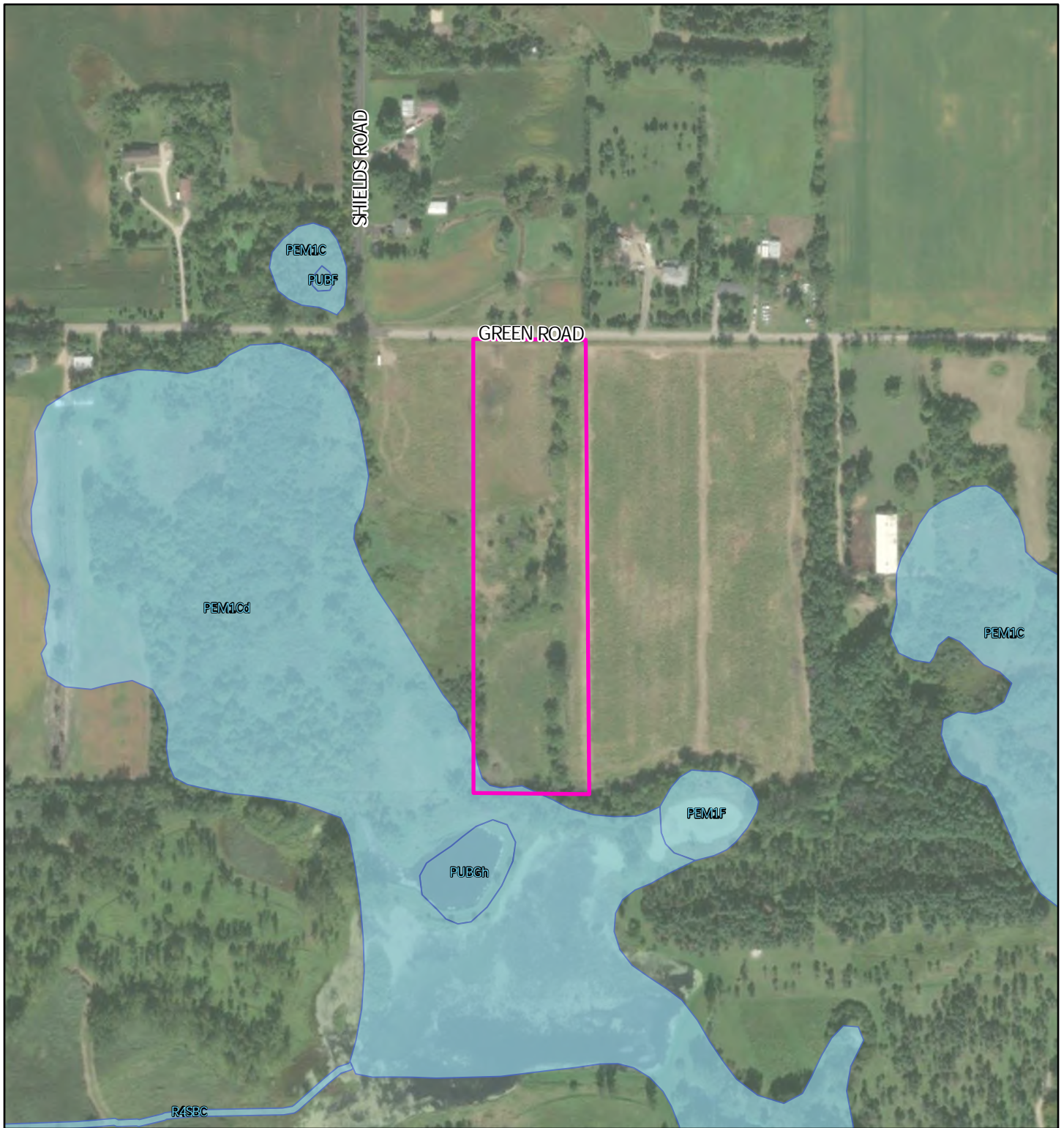
Prepared for:

3A Energy

Locat on Informat on:

Harvard III Quadrangle

Prepared by:



Scale:



Project Number: 25-0392

Orientation:



Date: 3/10/2026

Legend:

- Project Boundary
- National Wetland Inventory

Project Name:

Green Rd - Harvard

Prepared for:

3A Energy

Location Information:

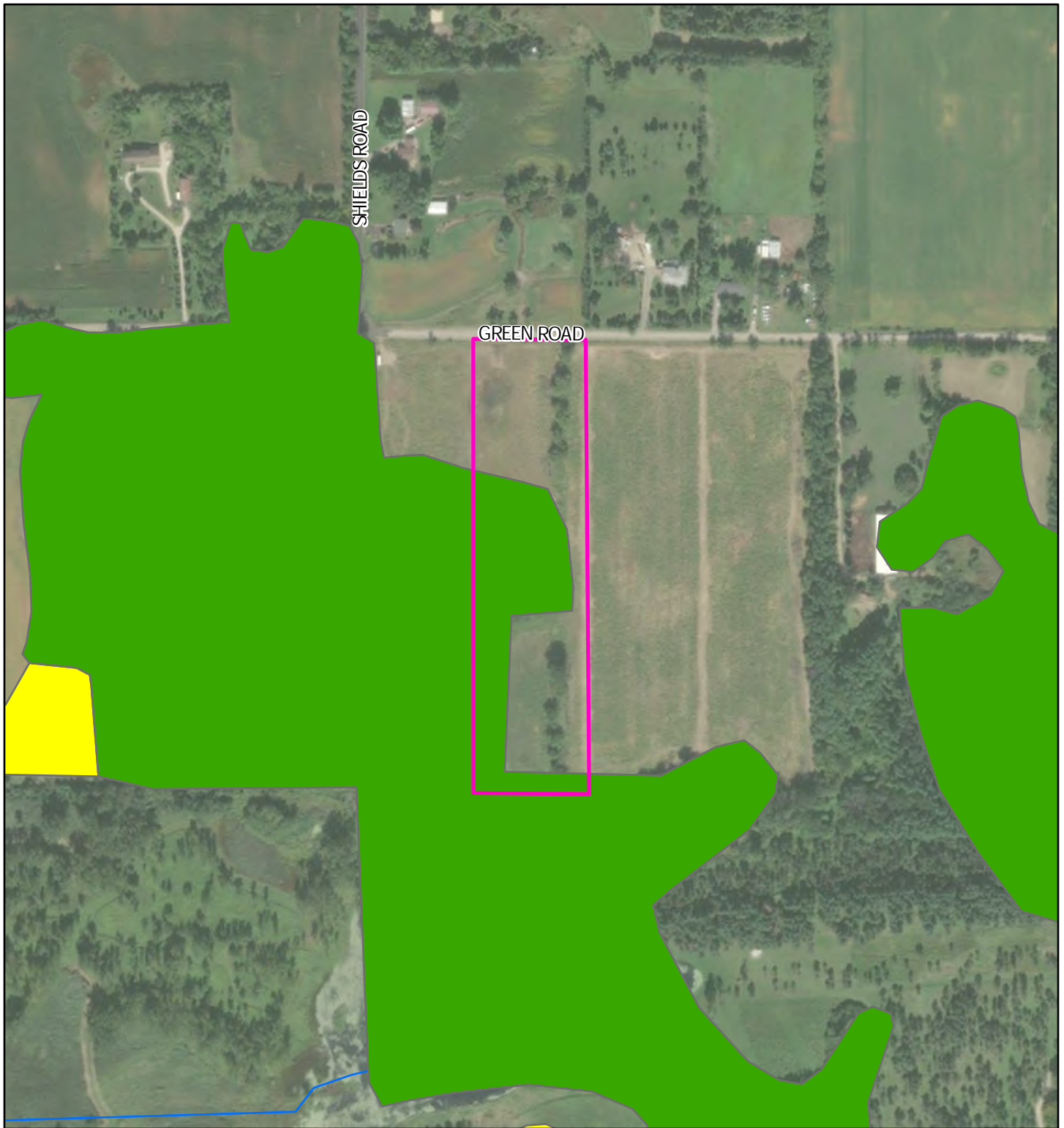
Harvard III Quadrangle

Exhibit Title:

National Wetland Inventory

Exhibit:

3



Scale:



Project Number: 25-0392

Prepared by:

Orientat on:



Date: 3/10/2026

Legend:

- Project Boundary
- ADID High Habitat Value
- ADID High Functional Value
- Wetland
- Farmed Wetland
- Lake High Quality
- Lake
- ADID High Quality River/Stream
- River/Stream

Project Name:

Green Rd - Harvard

Prepared for:

3A Energy

Study Date:

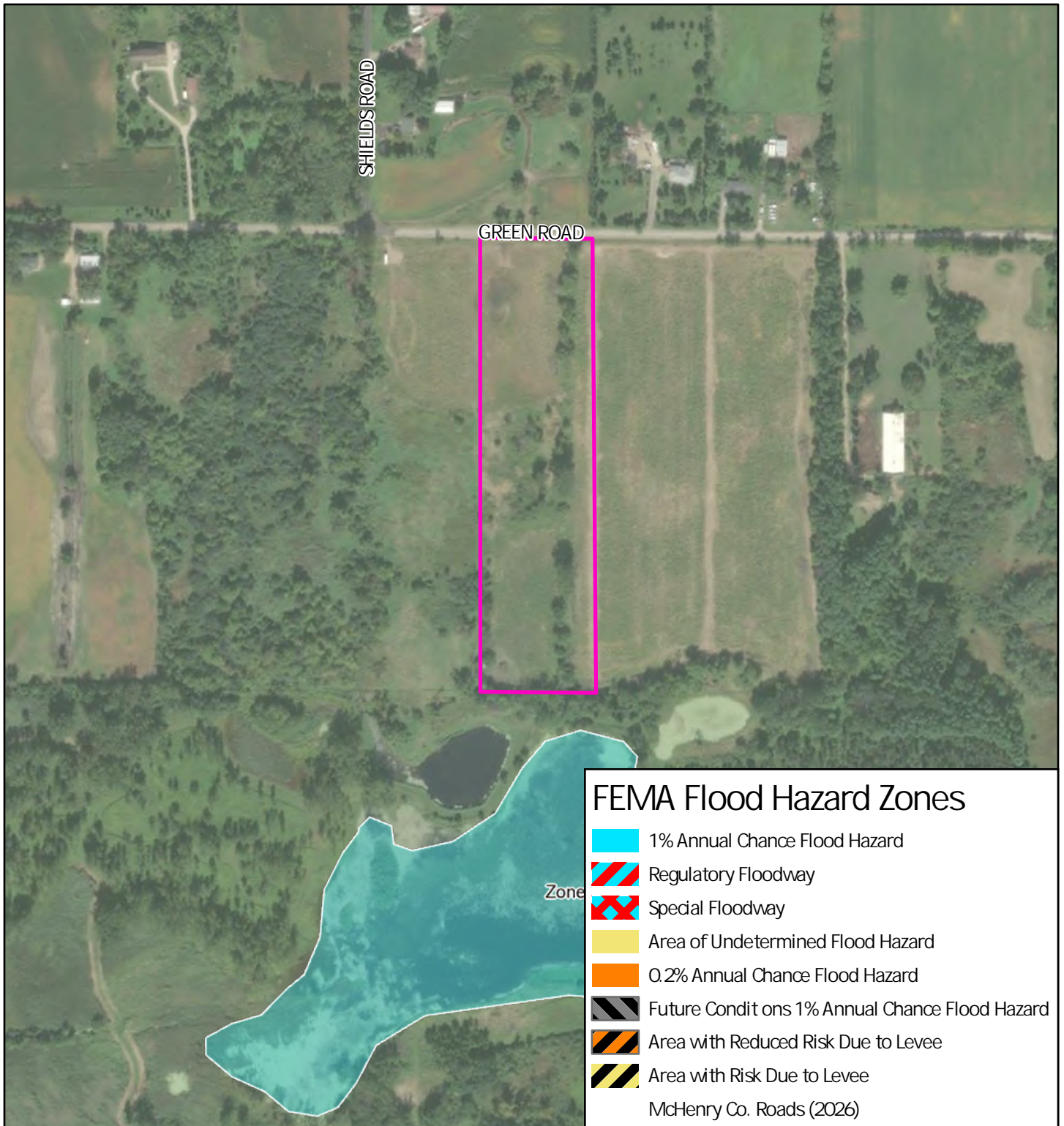
1998

Exhibit Title:

McHenry County ADID Study

Exhibit:

4



Scale:



Project Number: 25-0392

Orientation:



Date: 3/10/2026

Legend:

 Project Boundary

Project Name:

Green Rd - Harvard

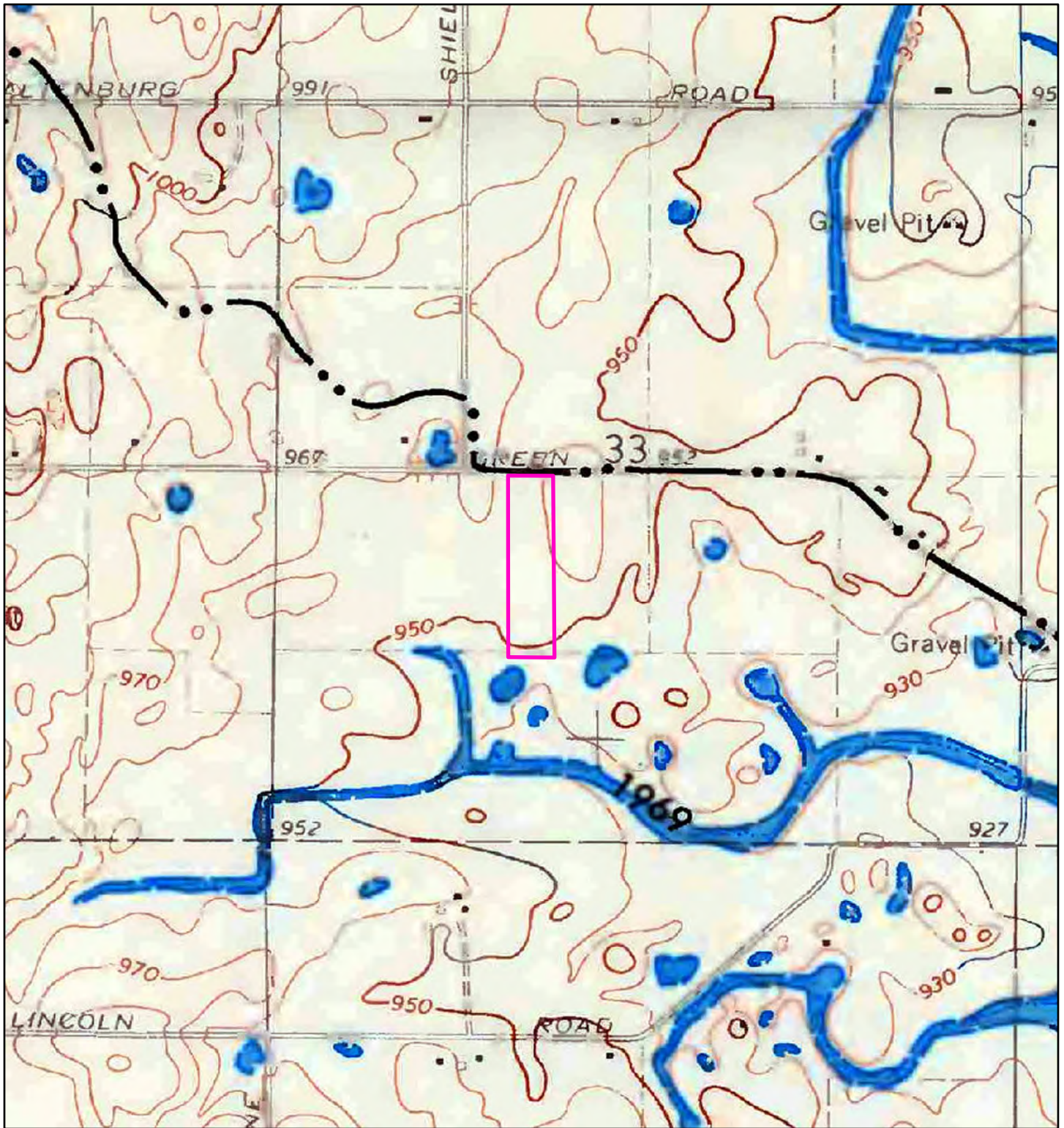
Prepared for:

3A Energy

Effective Date:

10/2/2009

Prepared by:



Scale:



Project Number: 25-0392

Prepared by:

Orientation:



Date: 3/10/2026

Legend:

 Project Boundary

Project Name:

Green Rd - Harvard

Prepared for:

3A Energy

Hydrologic Atlas Date:

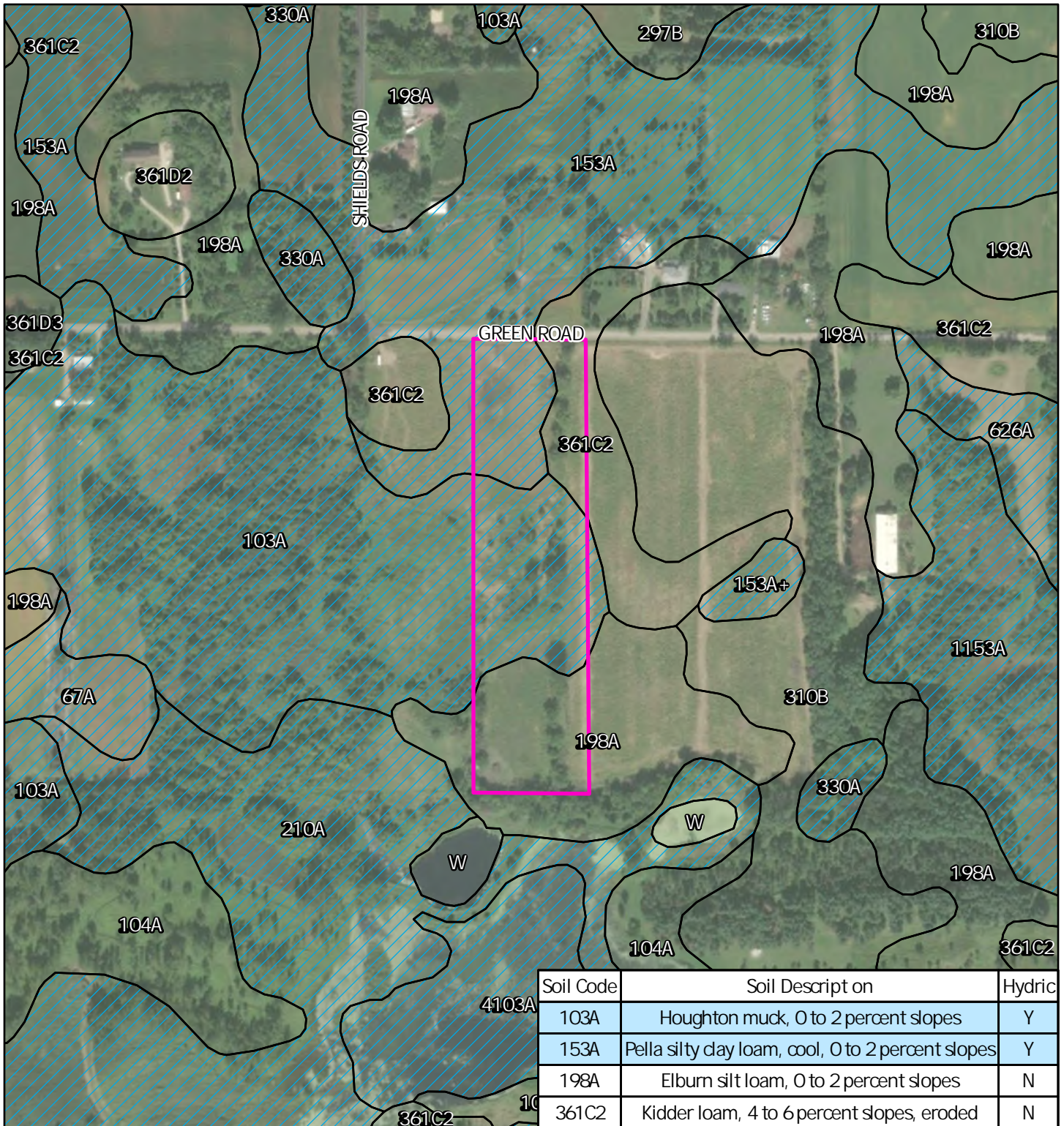
1973

Exhibit Title:

USGS Hydrologic Atlas

Exhibit

6



Soil Code	Soil Description	Hydric
103A	Houghton muck, 0 to 2 percent slopes	Y
153A	Pella silty clay loam, cool, 0 to 2 percent slopes	Y
198A	Elburn silt loam, 0 to 2 percent slopes	N
361C2	Kidder loam, 4 to 6 percent slopes, eroded	N

Scale:



Project Number: 25-0392




Prepared by:

Orientation:



Date: 3/10/2026

Legend:

-  Project Boundary
-  Soils Units
-  Hydric Soils

Project Name:

Green Rd - Harvard

Prepared for:

3A Energy

Soil Survey Date:

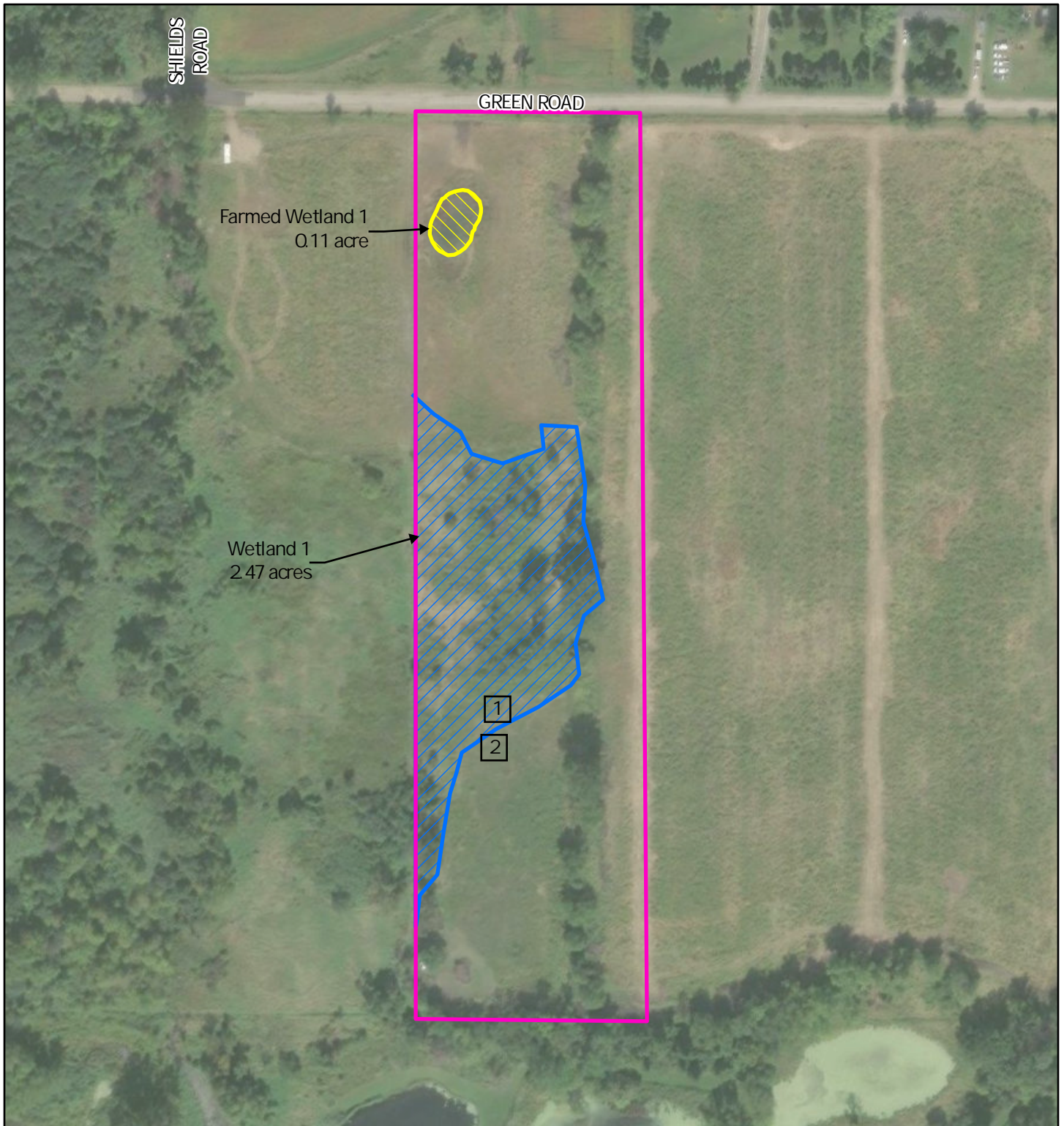
2026

Exhibit Title:

NRCS McHenry Co. Soil Survey

Exhibit:

7



Scale:



Project Number: 25-0392

Prepared by:

Orientation:



Date: 3/31/2026

Legend:

- Project Boundary
- Surveyed Wetland Boundary
- Of-site Surveyed Wetland Boundary
- Farmed Wetland Boundary
- Data Point Locations

Project Name:

Green Rd - Harvard

Prepared for:

3A Energy

Aerial Date:

2024

Exhibit Title:

Aquatic Resources Delineation Map 8

Exhibit:

The following plant species inventory and floristic quality analysis, prepared by Hey and Associates, Inc., was prepared using the U.S. Army Corps of Engineers Chicago FQA Calculator Version 11, November 2017. It is cited as Herman, B., Sliwinski, R. and S. Whitaker. 2017. Chicago Region FQA (Floristic Quality Assessment) Calculator. U.S. Army Corps of Engineers, Chicago, IL.

Floristic Quality Assessment (FQA) provides a standardized way to rapidly assess the condition of a vegetated area based on the plant species that are present. FQA works by assigning each plant species a value from 0 to 10. This value is called a Coefficient of Conservatism, or C Value. Values of 0 indicate species that are highly tolerant of human activities and have general environmental needs, while higher values represent higher fidelity to a specific habitat and low tolerance to anthropogenic disturbances. Generally, C values are assigned to either an entire inventory or selected plant species in a region, which may be an entire state (e.g., IN), biome (e.g., Interior Plateau), or specific location (e.g., Middle Rio Grande floodplain) by a group of expert regional botanists. As a result, there are numerous regional FQA databases of flora and their associated C Values covering various geographic areas.

In 2022, published, accessible (e.g., Universal FQA Calculator or via Google search with key terms) regional FQA databases were reviewed by the U.S. Army Engineer Research and Development Center's Environmental Laboratory for use during the planning phase of water resource projects. FQA databases that had clear documentation of their methodology of assigning and testing/validating their C Values were recommended for planning model certification. Then the U.S. Army Corps of Engineers' Center of Ecosystem Restoration Expertise certified recommended regional FQA databases for USACE planning purposes. Certified regional FQA databases have been compiled and made available for rapid and consistent calculation of FQA metrics within this web application. Note that *some* of the certified regional FQA databases have been altered slightly from their initial lists to reduce redundancies, indicate which species names are synonyms, or otherwise clarify the data. For a full description of data alterations, see Herman et al., 2023.

Common floristic quality metrics include Mean C (the mean of C Values for all species present in an inventory or along a transect) and the Floristic Quality Index (FQI, the Mean C multiplied by the square root of the total number of species).

This analysis used the Chicago Region 2017 database as cited above and the online USACE FQA calculator. The output has been put into a tabular easy to read form for this report.

The information above the species list provides analysis of the vegetative quality of the site. It shows the total number of species present (species richness), the mean coefficient of conservatism (Mean C), the index (FQI), and mean wetness; calculated separately for native species only and including the adventive species. If the FQAI of an area registers in the middle 30s or higher, one can be relatively certain that there is sufficient native character to be of rather profound environmental importance in terms of a regional natural area prospective. The wetness datum indicates the mean wetness coefficient for all species present, natives only and then with adventives.

**Wetland 1, Green Road Solar Site, Harvard, McHenry County, Illinois**  
**Jeffrey Mengler, PWS**  
**3/30/2026**

metrics	values
Total Species Richness	20
Native Species Richness	14
Introduced Species Richness	6
% of Species with no C Value	0
% of Species with 0 C Value	55
% of Species with 1-3 C Value	25
% of Species with 4-6 C Value	20
% of Species with 7-10 C Value	0
Mean C	1.25
Native Mean C	1.79
Total FQI	5.59
Native FQI	6.68
Adjusted FQI	14.94
Mean Wetness	-0.25
Native Mean Wetness	-0.36
% Hydrophytes	45

Physiognomy Metrics		
physiognomy	number	percent
forb	9	45
grass	2	10
sedge	1	5
shrub	6	30
tree	1	5
vine	1	5
rush	0	0
fern	0	0
bryophyte	0	0

Duration Metrics		
duration	number	percent
annual	3	15
biennial	1	5
perennial	16	80

**Species Entered**

acronym	name	name_origin	accepted_scientific_name	family	nativity	c	w	wetland_indicator	physiognomy	duration	common_name
SETFAB	SETARIA FABERI	accepted_scientific_name	Setaria faberi	POACEAE	introduced	0	1	FACU	grass	annual	Japanese Bristle Grass
SCIFLU	BOLBOSCHOENUS FLUVIATILIS	synonym	Schoenoplectus fluviatilis	CYPERACEAE	native	4	-2	OBL	sedge	perennial	River Club-Rush
JUNDUD	JUNCUS DUDLEYI	accepted_scientific_name	Juncus dudleyi	JUNCACEAE	native	2	-1	FACW	forb	perennial	Dudley's Rush
SALINT	SALIX INTERIOR	accepted_scientific_name	Salix interior	SALICACEAE	native	2	-1	FACW	shrub	perennial	Sandbar Willow
RHACAT	RHAMNUS CATHARTICA	accepted_scientific_name	Rhamnus cathartica	RHAMNACEAE	introduced	0	0	FAC	shrub	perennial	European Buckthorn
PRUSER	PRUNUS SEROTINA	accepted_scientific_name	Prunus serotina	ROSACEAE	native	0	1	FACU	shrub	perennial	Black Cherry
AMBTRI	AMBROSIA TRIFIDA	accepted_scientific_name	Ambrosia trifida	ASTERACEAE	native	0	0	FAC	forb	annual	Great Ragweed
TAROFF	TARAXACUM OFFICINALE	accepted_scientific_name	Taraxacum officinale	ASTERACEAE	introduced	0	1	FACU	forb	perennial	Common Dandelion
SAMCAN	SAMBUCUS NIGRA SSP. CANADENSIS	accepted_scientific_name	Sambucus nigra ssp. canadensis	CAPRIFOLIACEAE	native	4	0	FAC	shrub	perennial	Black Elder
ROSMUL	ROSA MULTIFLORA	accepted_scientific_name	Rosa multiflora	ROSACEAE	introduced	0	1	FACU	shrub	perennial	Rambler Rose

acronym	name	name_origin	accepted_scientific_name	family	nativity	c	w	wetland_indicator	physiognomy	duration	common_name
PHAARU	PHALARIS ARUNDINACEA	accepted_scientific_name	Phalaris arundinacea	POACEAE	introduced	0	-1	FACW	grass	perennial	Reed Canary Grass
VITRIP	VITIS RIPARIA	accepted_scientific_name	Vitis riparia	VITACEAE	native	1	-1	FACW	vine	perennial	River-Bank Grape
ACENEG	ACER NEGUNDO	accepted_scientific_name	Acer negundo	ACERACEAE	native	0	0	FAC	tree	perennial	Ash-Leaf Maple
CIRDIS	CIRSIIUM DISCOLOR	accepted_scientific_name	Cirsium discolor	ASTERACEAE	native	3	1	FACU	forb	biennial	Field Thistle
CORRAC	CORNUS RACEMOSA	accepted_scientific_name	Cornus racemosa	CORNACEAE	native	1	0	FAC	shrub	perennial	Gray Dogwood
SOLGIG	SOLIDAGO GIGANTEA	accepted_scientific_name	Solidago gigantea	ASTERACEAE	native	4	-1	FACW	forb	perennial	Late Goldenrod
ASCSYR	ASCLEPIAS SYRIACA	accepted_scientific_name	Asclepias syriaca	ASCLEPIADACEAE	native	0	1	FACU	forb	perennial	Common Milkweed
POLPEN	POLYGONUM PENNSYLVANICUM	synonym	Persicaria pensylvanica	POLYGONACEAE	native	0	-1	FACW	forb	annual	Pinkweed
TYPGLA	TYPHA X GLAUCA	accepted_scientific_name	Typha X glauca	TYPHACEAE	introduced	0	-2	OBL	forb	perennial	Hybrid Cat-Tail
HELGRO	HELIANTHUS GROSSESERRATUS	accepted_scientific_name	Helianthus grosseserratus	ASTERACEAE	native	4	-1	FACW	forb	perennial	Saw-Tooth Sunflower

---

Project Number: 25-0392

Project Name:  
**Green Rd - Harvard**

***Hey and Associates, Inc.***  
Engineering, Ecology and Landscape Architecture

Exhibit Title: **Wetland Determination Data Sheets** Exhibit: **10**

Project/Site: Green Road Solar Site City/County: Harvard / McHenry County Sampling Date: 3/30/2026  
 Applicant/Owner: 3 A Energy ? Kachi Energy State: IL Sampling Point: 1  
 Investigator(s): J. Mengler Section, Township, Range: section 33, T46N, R6E  
 Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): flat Slope %: <1%  
 Subregion (LRR or MLRA): LRR K, MLRA 94A Lat: 42.419505 Long: -88.543593 Datum: WGS84  
 Soil Map Unit Name: Houghton muck (103A) NWI classification: none  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No      (If no, explain in Remarks.)  
 Are Vegetation     , Soil     , or Hydrology      significantly disturbed? Are "Normal Circumstances" present? Yes X No       
 Are Vegetation     , Soil     , or Hydrology      naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <u>X</u> No <u>    </u> Hydric Soil Present? Yes <u>X</u> No <u>    </u> Wetland Hydrology Present? Yes <u>X</u> No <u>    </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No <u>    </u> If yes, optional Wetland Site ID: <u>    </u>
Remarks: (Explain alternative procedures here or in a separate report.)   	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators</u> (minimum of one is required; check all that apply) <u>    </u> Surface Water (A1) <u>    </u> Water-Stained Leaves (B9) <u>    </u> High Water Table (A2) <u>    </u> Aquatic Fauna (B13) <u>X</u> Saturation (A3) <u>    </u> Marl Deposits (B15) <u>    </u> Water Marks (B1) <u>    </u> Hydrogen Sulfide Odor (C1) <u>    </u> Sediment Deposits (B2) <u>    </u> Oxidized Rhizospheres on Living Roots (C3) <u>    </u> Drift Deposits (B3) <u>X</u> Presence of Reduced Iron (C4) <u>    </u> Algal Mat or Crust (B4) <u>    </u> Recent Iron Reduction in Tilled Soils (C6) <u>    </u> Iron Deposits (B5) <u>    </u> Thin Muck Surface (C7) <u>    </u> Inundation Visible on Aerial Imagery (B7) <u>    </u> Other (Explain in Remarks) <u>    </u> Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators</u> (minimum of two required) <u>    </u> Surface Soil Cracks (B6) <u>X</u> Drainage Patterns (B10) <u>    </u> Moss Trim Lines (B16) <u>    </u> Dry-Season Water Table (C2) <u>    </u> Crayfish Burrows (C8) <u>    </u> Saturation Visible on Aerial Imagery (C9) <u>    </u> Stunted or Stressed Plants (D1) <u>    </u> Geomorphic Position (D2) <u>    </u> Shallow Aquitard (D3) <u>    </u> Microtopographic Relief (D4) <u>X</u> FAC-Neutral Test (D5)
---	---

<b>Field Observations:</b> Surface Water Present? Yes <u>    </u> No <u>X</u> Depth (inches): <u>    </u> Water Table Present? Yes <u>    </u> No <u>X</u> Depth (inches): <u>    </u> Saturation Present? Yes <u>X</u> No <u>    </u> Depth (inches): <u>12</u> (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <u>X</u> No <u>    </u>
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: 1

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: _____ )				
1.	_____	_____	_____	
2.	_____	_____	_____	
3.	_____	_____	_____	
4.	_____	_____	_____	
5.	_____	_____	_____	
6.	_____	_____	_____	
7.	_____	_____	_____	
	=Total Cover			
<b>Sapling/Shrub Stratum</b> (Plot size: _____ )				
1.	_____	_____	_____	
2.	_____	_____	_____	
3.	_____	_____	_____	
4.	_____	_____	_____	
5.	_____	_____	_____	
6.	_____	_____	_____	
7.	_____	_____	_____	
	=Total Cover			
<b>Herb Stratum</b> (Plot size: <u>1 m sq</u> )				
1.	<u><i>Typha X glauca</i></u>	20	Yes	OBL
2.	<u><i>Phalaris arundinacea</i></u>	30	Yes	FACW
3.	<u><i>Solidago gigantea</i></u>	15	Yes	FACW
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
8.	_____	_____	_____	_____
9.	_____	_____	_____	_____
10.	_____	_____	_____	_____
11.	_____	_____	_____	_____
12.	_____	_____	_____	_____
	65 =Total Cover			
<b>Woody Vine Stratum</b> (Plot size: _____ )				
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
	=Total Cover			

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

	Total % Cover of:		Multiply by:
OBL species	<u>20</u>	x 1 =	<u>20</u>
FACW species	<u>45</u>	x 2 =	<u>90</u>
FAC species	<u>0</u>	x 3 =	<u>0</u>
FACU species	<u>0</u>	x 4 =	<u>0</u>
UPL species	<u>0</u>	x 5 =	<u>0</u>
Column Totals:	<u>65</u> (A)		<u>110</u> (B)
Prevalence Index = B/A =			<u>1.69</u>

**Hydrophytic Vegetation Indicators:**

   1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0<sup>1</sup>

   4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

   Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?**      Yes       No

Remarks: (Include photo numbers here or on a separate sheet.)





**VEGETATION** – Use scientific names of plants.

Sampling Point: 2

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: _____)				
1.	_____	_____	_____	
2.	_____	_____	_____	
3.	_____	_____	_____	
4.	_____	_____	_____	
5.	_____	_____	_____	
6.	_____	_____	_____	
7.	_____	_____	_____	
	=Total Cover			
<b>Sapling/Shrub Stratum</b> (Plot size: _____)				
1.	_____	_____	_____	
2.	_____	_____	_____	
3.	_____	_____	_____	
4.	_____	_____	_____	
5.	_____	_____	_____	
6.	_____	_____	_____	
7.	_____	_____	_____	
	=Total Cover			
<b>Herb Stratum</b> (Plot size: <u>1 m sq</u> )				
1.	<u>Setaria faberi</u>	80	Yes	FACU
2.	<u>Solidago altissima</u>	10	No	FACU
3.	<u>Poa pratensis</u>	10	No	FACU
4.	<u>Cirsium vulgare</u>	5	No	FACU
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
8.	_____	_____	_____	_____
9.	_____	_____	_____	_____
10.	_____	_____	_____	_____
11.	_____	_____	_____	_____
12.	_____	_____	_____	_____
	105 =Total Cover			
<b>Woody Vine Stratum</b> (Plot size: _____)				
1.	_____	_____	_____	
2.	_____	_____	_____	
3.	_____	_____	_____	
4.	_____	_____	_____	
	=Total Cover			

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

---

**Prevalence Index worksheet:**

	Total % Cover of:		Multiply by:	
OBL species	<u>0</u>	x 1 =	<u>0</u>	
FACW species	<u>0</u>	x 2 =	<u>0</u>	
FAC species	<u>0</u>	x 3 =	<u>0</u>	
FACU species	<u>105</u>	x 4 =	<u>420</u>	
UPL species	<u>0</u>	x 5 =	<u>0</u>	
Column Totals:	<u>105</u>	(A)	<u>420</u>	(B)
Prevalence Index = B/A =				<u>4.00</u>

---

**Hydrophytic Vegetation Indicators:**

     1 - Rapid Test for Hydrophytic Vegetation

     2 - Dominance Test is >50%

     3 - Prevalence Index is ≤3.0<sup>1</sup>

     4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

     Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

---

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

---

**Hydrophytic Vegetation Present?**      Yes           No   X

Remarks: (Include photo numbers here or on a separate sheet.)





Photograph 1:

View northeast of Wetland 1.



Photograph 2:

View of vegetation at Datapoint 1,  
Wetland 1.



Photograph 3:

View of vegetation at Datapoint 2,  
upland by Wetland 1.



Photograph 4:

View west of Farmed Wetland 1.

---

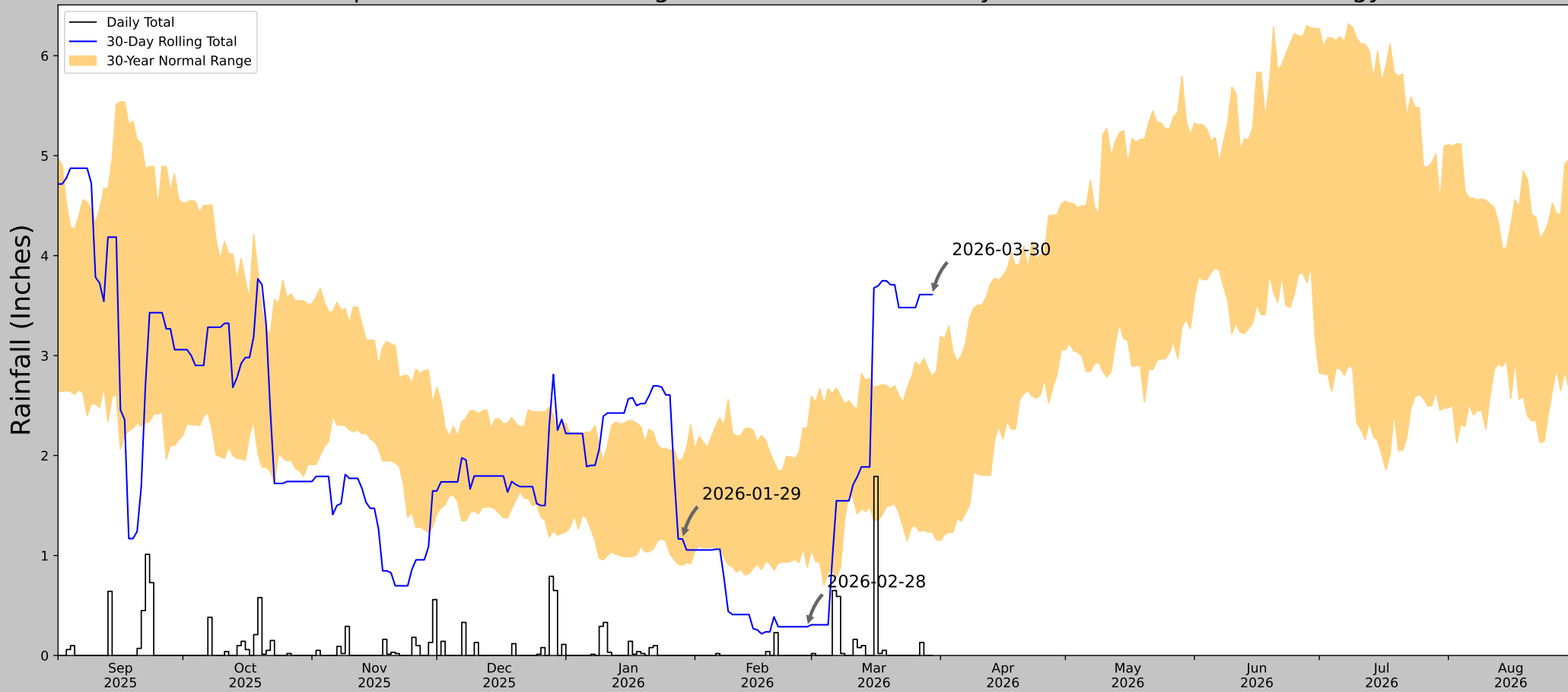
Project Number: 25-0392

***Hey and Associates, Inc.***  
Engineering, Ecology and Landscape Architecture

Project Name:  
**Green Rd - Harvard**

Exhibit Title: Exhibit:  
**USACE Antecedent Precipitation Tool 12**

# Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	42.42037, -88.54369
Observation Date	2026-03-30
Elevation (ft)	954.651
Drought Index (PDSI)	Moderate drought (2026-02)
WebWIMP H <sub>2</sub> O Balance	Wet Season

30 Days Ending	30 <sup>th</sup> %ile (in)	70 <sup>th</sup> %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2026-03-30	1.235433	2.792913	3.610236	Wet	3	3	9
2026-02-28	0.883858	2.275197	0.287402	Dry	1	2	2
2026-01-29	0.901969	1.957087	1.165354	Normal	2	1	2
Result							Normal Conditions - 13

Figures and tables made by the  
Antecedent Precipitation Tool  
Version 3.0



US Army Corps  
of Engineers



Developed by:  
U.S. Army Corps of Engineers and  
U.S. Army Engineer Research and  
Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WOODSTOCK 5NW	42.3628, -88.5314	946.85	4.027	7.801	1.843	8091	90
WOODSTOCK 1.5 WSW	42.3037, -88.4639	956.037	5.344	9.187	2.454	2	0
HARVARD 0.3 E	42.4204, -88.6089	970.144	5.611	23.294	2.656	1	0
HARVARD WWTP	42.4156, -88.6253	916.011	6.022	30.839	2.896	3258	0
MARENGO	42.2636, -88.6078	814.961	7.888	131.889	4.59	1	0

---

Project Number: 25-0392

***Hey and Associates, Inc.***  
Engineering, Ecology and Landscape Architecture

Project Name:  
**Green Rd – Harvard**

Exhibit Title: Exhibit:  
**WETS Table – McHenry/Stratton Dam 13**

WETS Station: MCHENRY STRATTON LOCK/DAM, IL

Requested years: 1995 - 2025

Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	29.3	13.4	21.3	1.63	0.99	1.97	4	10.2
Feb	33.3	15.9	24.6	1.6	0.9	1.94	4	7.8
Mar	45.2	26.3	35.8	2.17	1.44	2.6	5	3.8
Apr	57.5	36.8	47.1	3.54	2.61	4.16	7	0.9
May	68.8	47.4	58.1	4.55	3.14	5.42	8	0
Jun	79.1	57.4	68.2	4.66	3.21	5.55	8	0
Jul	82.9	61.6	72.3	3.89	2.5	4.68	6	0
Aug	81.2	60	70.6	3.81	2.57	4.55	6	0
Sep	75.1	51.9	63.5	3.59	1.95	4.38	5	0
Oct	62.1	40.1	51.1	3.19	1.93	3.86	6	0.1
Nov	47.2	29.6	38.4	2	1.17	2.44	4	1.9
Dec	34.6	19.5	27.1	1.83	1.15	2.21	4	7.1
Annual:					<b>32.65</b>	<b>39.67</b>		
Average	58	38.3	48.2	-	-	-	-	-
Total	-	-	-	<b>36.46</b>			68	31.8

GROWING SEASON DATES

Years with missing data: 24 deg = 0 28 deg = 0 32 deg = 0  
 Years with no occurrence: 24 deg = 0 28 deg = 0 32 deg = 0  
 Data years used: 24 deg = 31 28 deg = 31 32 deg = 31  
 Probability 24 F or higher 28 F or higher 32 F or higher  
 4/4 to 11/5: 215 4/20 to 10/19: 5/1 to 10/10: 162  
 50 percent \* days 182 days days  
 3/31 to 11/9: 4/16 to 10/24: 4/28 to 10/13:  
 70 percent \* 223 days 191 days 168 days  
 \* Percent chance of the growing season occurring between the Beginning and Ending dates.

STATS TABLE - total precipitation (inches)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl	
1995	2.75	0.16	1.68	5.06	3.9	1.85	3.24	4.29	1.89	4.96	3.33	0.55	33.66	normal
1996	1.15	0.79	0.75	2.96	9.5	4.64	5.51	2.67	1.61	2.45	0.95	1.64	34.62	normal
1997	1.46	3.67	1.45	1.46	4.64	2.5	2.96	4.08	2.56	1.56	1.67	0.88	28.89	dry
1998	2.33	1.59	2.79	5.57	3.26	6.47	1.77	4.16	2.86	6.12	1.73	1.36	40.01	wet
1999	3.09	1.16	0.64	6.31	2.17	7.94	2.71	1.94	5.22	1.05	0.4	2.03	34.66	normal
2000	1.15	1.11	1.45	3.86	6.46	7.91	M3.70	1.85	5.49	1.17	3.39	1.58	39.12	normal
2001	0.95	2.37	0	3.05	4.3	3.39	2.1	3.77	5.98	7.35	1.15	0.98	35.39	normal
2002	0.72	1.3	1.54	3.26	2.9	3.36	0.56	7.19	2.25	2.32	M0.60	M0.77	26.77	dry
2003	0.31	0.12	1.44	1.64	M5.78	1.95	6.66	M0.91	2.04	1.74	5.22	M2.51	30.32	dry
2004	0.6	M0.56	4.39	1.99	10.25	4.95	1.96	3.47	0.92	2.65	3.11	1.44	36.29	normal
2005	3.42	1.79	0.74	1.71	3.2	1.6	1.88	3.11	2.96	0.44	2.91	0.56	24.32	dry
2006	M2.43	M0.78	3.35	2.74	5.02	4	3.19	4.38	3.7	4.55	2.41	2.57	39.12	normal
2007	0.67	1.73	2.92	4.1	1.8	5.97	5	12.71	1.35	3.31	0.47	3.17	43.2	wet
2008	1.29	3.46	2.47	4.55	2.84	6.07	4.95	1.93	8.55	2.35	0.96	4.59	44.01	wet
2009	0.81	2.18	3.62	4.17	4.94	6.52	1.67	5.75	1.1	6.76	1.38	3.11	42.01	wet
2010	0.83	0.87	1.48	2.7	5.53	7.1	7.15	2.27	3.02	1.49	1.05	M0.70	34.19	normal
2011	0.71	2.28	3.48	4.88	6.6	3.46	8.41	3.72	2.83	2.23	3.11	2.26	43.97	wet
2012	1.2	1.3	2.12	M3.24	3.11	1.23	2.66	1.68	1.95	2.7	0.46	M1.82	23.47	dry
2013	3.8	2.48	1.88	7.25	2.53	9.69	2.03	2.17	2.67	1.9	2.78	1.45	40.63	wet
2014	1.66	1.87	0.91	3.38	3.23	6.82	3.57	7.16	4.68	3.15	M1.23	M0.54	38.2	normal
2015	1.34	0.79	1.03	3.83	4.46	4.79	4.7	2.63	4.83	1.03	5.5	5.36	40.29	wet
2016	M0.56	M0.89	3.53	2.51	4.22	2.45	5.1	3.53	2.55	3.42	2.64	1.55	32.95	normal
2017	2.32	M1.56	4.42	M4.19	M2.79	M6.49	8.31	2.93	0.06	7.26	1.63	M0.48	42.44	wet
2018	M1.66	M3.01	M0.69	M2.22	5.4	8.11	1.16	6.03	7.26	6.05	M3.04	1.82	46.45	wet
2019	M2.38	3.31	M1.47	M3.88	7.48	3.64	5.77	3.17	12.16	5.94	1.41	2.13	52.74	wet
2020	2.76	0.48	4.55	4.71	8.91	3.8	1.95	2	5.28	2.96	1.87	2.27	41.54	wet
2021	2.28	0.91	0.96	1.05	1.46	3.04	1.32	6.21	1.55	4.08	0.54	M1.10	24.5	dry
2022	0.62	M1.37	2.78	6.14	5.35	2.87	5.16	3.5	4.55	1.78	0.93	2.07	37.12	normal
2023	2.03	3.65	2.55	2.33	1.21	2.05	4.79	1.66	3.93	3.26	1.26	2.33	31.05	dry
2024	2.91	0.5	3.54	M3.27	5.93	6.99	6.2	2.89	1.66	0.9	3.55	0.98	39.32	normal
2025	0.31	0.99	2.62	1.81	1.91	2.91	4.42	4.21	3.93	1.82	1.47	2.06	28.46	dry
2026	0.68	0.13	M4.11										4.92	

Notes: Data missing in any month have an "M" flag. A "T" indicates a trace of precipitation.

Data missing for all days in a month or year is blank.

Creation date: 2026-03-30