**KENDALL COUNTY**
**ZONING BOARD OF APPEALS**
**PUBLIC HEARING/MEETING**
110 West Madison Street • Court Room • Yorkville, IL • 60560
(630) 553-4141 Fax (630) 553-4179

# AGENDA

January 27, 2025 – 7:00 p.m.

## CALL TO ORDER – ZONING BOARD OF APPEALS

ROLL CALL for the Zoning Board of Appeals: Randy Mohr (Chair); Scott Cherry, Cliff Fox, Tom LeCuyer, Jillian Prodehl, Dick Thompson, and Dick Whitfield

MINUTES: Approval of Minutes from the December 16, 2024, Zoning Board of Appeals Hearing/Meeting (Page 3-13)

PETITIONS:

1. **Petition 24 – 13 – James C. Marshall on Behalf of TurningPointEnergy, LLC Through TPE IL KE240 (Tenant) and Frank J. Santoro (Owner) (Page 14)**

Request: Special Use Permit for a Commercial Solar Energy Facility and Variance to Section 7:01.D.17.a of the Kendall County Zoning Ordinance to Allow a Commercial Solar Energy Facility on Land within One Point Five (1.5) Miles of Municipality without an Annexation Agreement
PIN: 03-26-300-006
Location: East of 2025 Simons Road, Oswego in Oswego Township
Purpose: Petitioner Would Like to Install a Commercial Solar Energy Facility; Property is Zoned A-1

2. **Petition 24 – 30 – Nicholas S. Bellone on Behalf of Ament Solar 1, LLC (Tenant) and Janet M. Dhuse on Behalf of the Janet Dhuse Declaration of Family Trust Dated March 1, 2013 (Owner) (Pages 15-864)**

Request: Special Use Permit for a Commercial Solar Energy Facility and Variance to Section 36-282(17)(a) of the Kendall County Code to Allow a Commercial Solar Energy Facility on Land within One Point Five (1.5) Miles of Municipality without an Annexation Agreement
PINs: 05-16-300-006 and 05-17-400-005
Location: South of 9949 and 10021 Ament Road, Yorkville in Kendall Township
Purpose: Petitioner Would Like to Install a Commercial Solar Energy Facility; Property is Zoned A-1

3. **Petition 24 – 35 – Kendall County Regional Planning Commission (Pages 865-878)**

Request: Text Amendment to the Kendall County Code Amending the Parking Regulations in Front Yard Setbacks
Purpose: Petitioner Would Like to Allow Parking in the Interior ½ of the Front Yard Setback on Properties Zoned A-1

NEW BUSINESS/ OLD BUSINESS

1. Presentation of By-Laws Amendment-Amendment to Article II, Section 5 by Amending the Address of the Office of the Board. (Page 879)

2. Kendall County Regional Planning Commission Annual Meeting on February 1, 2025, at 9:00 a.m. (Page 880)

REVIEW OF PETITIONS THAT WENT TO COUNTY BOARD

1. Petition 24-31 Text Amendment Related to Road Weight Classifications
2. Petition 24-32 Text Amendment Related to Enforcement of Window Sign Zoning Regulations
3. Petition 24-33 Text Amendment Adding Parks to the List of Permitted Uses in Certain Residential

Districts

4. Petition 24-34 Text Amendment Related to Setbacks of Pipelines from Occupied Principal Structures

PUBLIC COMMENT:

**ADJOURN ZONING BOARD OF APPEALS**- Next hearing/meeting on March 3, 2025

If special accommodations or arrangements are needed to attend this County meeting, please contact the Administration Office at 630-553-4171, a minimum of 24-hours prior to the meeting time.

**MINUTES – UNOFFICIAL UNTIL APPROVED**
**KENDALL COUNTY**
**ZONING BOARD OF APPEALS MEETING**
111 WEST FOX STREET, COUNTY BOARD ROOM (ROOMS 209 and 210)
YORKVILLE, IL 60560
December 16, 2024 – 7:00 p.m.

**CALL TO ORDER**
Chairman Randy Mohr called the Zoning Board of Appeals meeting to order at 7:00 p.m.

**ROLL CALL:**
Members Present: Scott Cherry, Cliff Fox, Tom LeCuyer, Randy Mohr, Jillian Prodehl, Dick Thompson, and Dick Whitfield
Members Absent: None
Staff Present: Matthew Asselmeier, AICP, CFM, Director and Wanda Rolf, Office Assistant
Others Present: Michael Faulkner and Miranda Marshall-Faulkner

**MINUTES:**
Member Prodeh**l** made a motion, seconded by Member LeCuyer, to approve the minutes of the October 28, 2024, hearing/meeting.

With a voice vote of seven (7) ayes, the motion carried.

**PETITIONS:**
The Zoning Board of Appeals started their reviews of Petitions 24-30 and 24-35 and opened the public hearings for both at 7:01 p.m.

**Petition 24 – 30 – Nicholas S. Bellone on Behalf of Ament Solar 1, LLC (Tenant) and Janet M. Dhuse on Behalf of the Janet Dhuse Declaration of Family Trust Dated March 1, 2013 (Owner)**

| | |
|---|---|
| Request: | Special Use Permit for a Commercial Solar Energy Facility and Variance to Section 36-282(17)(a) of the Kendall County Code to Allow a Commercial Solar Energy Facility on Land within One Point Five (1.5) Miles of Municipality without an Annexation Agreement |
| PINs: | 05-16-300-006 and 05-17-400-005 |
| Location: | South of 9949 and 10021 Ament Road, Yorkville in Kendall Township |
| Purpose: | Petitioner Would Like to Install a Commercial Solar Energy Facility; Property is Zoned A-1 |

**Petition 24 – 35 – Kendall County Regional Planning Commission**

| | |
|---|---|
| Request: | Text Amendment to the Kendall County Code Amending the Parking Regulations in Front Yard Setbacks |
| Purpose: | Petitioner Would Like to Allow Parking in the Interior ½ of the Front Yard Setback on Properties Zoned A-1 |

At the request of the Petitioners, Chairman Mohr stated that Petition 24 – 30 and Petition 24 – 35 will be continued until the January 27, 2025, meeting, at 7:00 p.m., at the Historic Courthouse.

With a voice vote of seven (7) ayes, the motion carried.

The Zoning Board of Appeals completed their reviews and recessed the public hearings for Petition 24-30 and 24-35 at 7:02 p.m.

The Zoning Board of Appeals started their review of Petition 24-31 and opened the public hearing at 7:02 p.m.

**Petition 24 – 31 – Kendall County Zoning Administrator**

Request: Text Amendments to Sections 36-282(20)(j), 36-282(32)(b), and 36-282(54) of the Kendall County Code by Increasing the Road Weight Limit Requirements from 73,280 Pounds to 80,000 Pounds in the Zoning Regulation Requirements for Composting Facilities, Landscaping Businesses, and Storage Facilities for Motor Vehicles, Boats, Trailers, and Recreational Vehicles

Purpose: Petitioner Would Like to Increase the Weight Requirement to Match State Law

Mr. Asselmeier summarized the request.

Effective January 1, 2010, the State of Illinois raised the weight limits on local roads from seventy-three thousand two hundred eighty (73,280) pounds to eighty thousand (80,000) pounds. Local road authorities could still post roads for lesser amounts, but unposted roads were raised to the higher weight limit.

The zoning regulations for composting facilities, landscaping businesses, and storage facilities for motor vehicles, boats, trailers, and recreational vehicles retained the old number.

Staff is proposing to raise the number to match State regulations. The redlined version of the amendments are as follows:

Section 36-282 (20) (j) (Regulation of Composting Facilities)

Truck weights shall be limited to ~~**seventy-three thousand two hundred eighty (73,280)**~~ **eighty thousand (80,000)** pounds.

Section 36-282 (32) (b) (Regulation of Landscaping Businesses)

The business shall be located on, and have direct access to, a State, County or collector highway as identified in the County's Land Resource Management Plan, having an all-weather surface, designed to

accommodate loads of at least ~~seventy-three thousand two hundred eighty (73,280)~~ **eighty thousand (80,000)** pounds unless otherwise approved in writing by the agency having jurisdiction over said highway. Such approvals shall establish limitations as to the number of employees and types of vehicles coming to and from the site that are engaged in the operation of the use (including delivery vehicles). These restrictions shall be included as controlling conditions of the special use.

Section 36-282 (54) (Regulation of Storage Facilities for Motor Vehicles, Boats, Trailers, and Recreational Vehicles)

Storage facilities for motor vehicles, boats, trailers, and other recreational vehicles, provided that the business shall be located on, and have direct access to, a State, County or collector highway as identified in the County's Land Resource Management Plan, having an all-weather surface, designed to accommodate loads of at least ~~seventy-three thousand two hundred eighty (73,280)~~ **eighty thousand (80,000)** pounds. Unless specifically permitted under a special use permit, all storage shall be in enclosed buildings. Self-storage or mini-warehouse facilities are specifically prohibited in the A-1 Agricultural District.

Petition information was sent to the Townships on October 25, 2024. No comments received.

ZPAC reviewed the proposal at their meeting on November 5, 2024, and voted to forward the proposal to the Kendall County Regional Planning Commission by a vote of seven (7) in favor and zero (0) in opposition with three (3) members absent. The minutes of the meeting were provided.

The Kendall County Regional Planning Commission reviewed this proposal at their meeting on December 11, 2024. Discussion occurred regarding why the text had not been changed previously. Discussion also occurred regarding input from the Highway Engineer; the Highway Engineer had brought up this issue previously when evaluating special use permits for landscaping business. The Kendall County Regional Planning Commission recommended approval of the proposal by a vote of nine (9) in favor and zero (0) in opposition with one (1) member absent. The minutes of the meeting were provided.

Member Thompson made a motion, seconded by Member Fox, to recommend approval of the proposed text amendments.

The votes were as follows:

| | |
|---|---|
| Ayes (7): | Cherry, Fox, LeCuyer, Mohr, Prodehl, Thompson, and Whitfield |
| Nays (0): | None |
| Abstain (0): | None |
| Absent (0): | None |

The motion carried.

The townships will be notified of the results of the public hearing.

The proposal goes to the Kendall County Planning, Building and Zoning Committee on January 13, 2025, at 6:30 p.m. at the Historic Courthouse.

The Zoning Board of Appeals completed their review of Petition 24-31 and adjourned the public hearing at 7:03 p.m.

The Zoning Board of Appeals started their review of Petition 24-32 and opened the public hearing at 7:04 p.m.

**Petition 24 – 32 – Kendall County Zoning Administrator**

Request: Text Amendment to Section 36-1051(12) of the Kendall County Code by Transferring the Enforcement Authority of Window Sign Zoning Regulations from the County Sheriff or Designee to the Zoning Administrator or Designee

Purpose: Petitioner Would Like Consistent Regulatory Authority Throughout the Entire Zoning Portion of the Kendall County Code

Mr. Asselmeier summarized the request.

As part of the codification review process, the Sheriff Department requested that the enforcement regulations for window signs contained in Section 36-1051 (12) be amended.

The redlined version of the text is as follows:

Window signs. Window signs shall be affixed only to the interior surface of the glass and shall not be located on any windows above the first floor of the building. Such signs shall not exceed thirty-five (35) percent of the window surface area for each building face. Signs shall not be affixed in such a manner that a safety hazard to customers or staff of the establishment is created by the obstruction of vision. The ~~**County Sheriff**~~ **Zoning Administrator** or designee shall be empowered to require the removal or relocation of any such sign deemed to be a safety hazard.

To Staff's knowledge, the above section of the Zoning Ordinance portion of the Kendall County Code is the only section of the Zoning Ordinance portion of the Kendall County Code where enforcement was assigned to someone other than the Zoning Administrator or their designee.

Information was sent to the Townships on October 25, 2024. No comments received.

ZPAC reviewed the proposal at their meeting on November 5, 2024, and voted to recommend approval of the proposal by a vote of seven (7) in favor and zero in opposition with three (3) members absent. The minutes of the meeting were provided.

The Kendall County Regional Planning Commission reviewed this proposal at their meeting on December 11, 2024, and recommended approval of the proposal by a vote of nine (9) in favor and zero (0) in opposition with one (1) member absent. The minutes of the meeting were provided.

Member Whitfield made a motion, seconded by Member Cherry, to recommend approval of the proposed text amendments.

The votes were as follows:

| | |
|---|---|
| Ayes (7): | Cherry, Fox, LeCuyer, Mohr, Prodehl, Thompson, and Whitfield |
| Nays (0): | None |
| Abstain (0): | None |
| Absent (0): | None |

The motion carried.

The townships will be notified of the results of the public hearing.

The proposal goes to the Kendall County Planning, Building and Zoning Committee on January 13, 2025, at 6:30 p.m. at the Historic Courthouse.

The Zoning Board of Appeals completed their review of Petition 24-32 and adjourned the public hearing at 7:06 p.m.

The Zoning Board of Appeals started their review of Petition 24-33 and opened the public hearing at 7:07 p.m.

**Petition 24 – 33 – Kendall County Zoning Administrator**

| | |
|---|---|
| Request: | Text Amendments to the Kendall County Code by Adding Parks to the Appropriate Place Alphabetically in the List of Permitted Uses in the R-4, R-5, R-6, and R-7 Zoning Districts and Related Text Changes |
| Purpose: | Petitioner Would Like to Add Parks to the List of Permitted Uses in the R-4, R-5, R-6, and R-7 Zoning Districts |

Mr. Asselmeier summarized the request.

Parks are presently special uses in the A-1, M-1 and M-2 Districts and they are permitted uses in the R-1, R-2, R-3, and RPD Districts.

The Oswegoland Park District operates Winrock Park at 21 Winrock Road, SuzanJohn Park at 29 Hampton Road, and Augusta Lake Park at 116 Augusta Road. Winrock Park is zoned R-7 and the other two (2) parks are zoned R-6.

The above parks are presently legally non-conforming which could create regulatory issues if the Oswegoland Park District decided to make changes to the parks; Staff is not aware of any proposed changes at this time.

Staff proposes to add parks to the list of permitted uses in the R-4, R-5, R-6, and R-7 Districts by amending Section 36-535 adding parks in the appropriate place alphabetically to the list of permitted uses in these districts and related text changes.

No property can be rezoned to the R-4, R-5, R-6, or R-7 zoning districts.

Information was sent to the Townships and Park Districts on October 25, 2024. No comments received.

ZPAC reviewed the proposal at their meeting on November 5, 2024, and voted to recommend approval of the proposal by a vote of seven (7) in favor and zero (0) in opposition with three (3) members absent. The minutes of the meeting were provided.

The Kendall County Regional Planning Commission reviewed this proposal at their meeting on December 11, 2024, and recommended approval of the proposal by a vote of nine (9) in favor and zero (0) in opposition with one (1) member absent. The minutes of the meeting were provided.

Member Fox asked, if any of the parks would like to make major improvements or changes, would they have to be up to code. Mr. Asselmeier responded that one (1) of the parks previously proposed to do a building addition. Without this amendment, the addition might not conform to the zoning regulations. This proposal will ensure that all work would be done in compliance with the zoning regulations.

Member Fox made a motion, seconded by Member Cherry, to recommend approval of the proposed text amendments.

The votes were as follows:

| | |
|---|---|
| Ayes (7): | Cherry, Fox, LeCuyer, Mohr, Prodehl, Thompson, and Whitfield |
| Nays (0): | None |
| Abstain (0): | None |
| Absent (0): | None |

The motion carried.

The townships will be notified of the results of the public hearing.

The proposal goes to the Kendall County Planning, Building and Zoning Committee on January 13, 2025, at 6:30 p.m. at the Historic Courthouse.

The Zoning Board of Appeals completed their review of Petition 24-33 and adjourned the public hearing at 7:10 p.m.

The Zoning Board of Appeals started their review of Petition 24-34 and opened the public hearing at 7:11 p.m.

**Petition 24 – 34 – Kendall County Regional Planning Commission**

Request: Text Amendment to Section 36-247(7)(a) of the Kendall County Code by Reducing the Setback from Pipelines to Occupied Principal Structures

Purpose: Petitioner Would Like to Reduce the Setback for Pipeline Greater Than 10 Inches in Diameter which Carry/Conduct Flammable or Hazardous Material from 500 Feet from Occupied Principal Structures to 25 Feet from Occupied Principal Structures

Mr. Asselmeier summarized the request.

Section 36-247 (7) (a) of the Kendall County Code contains the following regulations regarding the setback of certain pipelines from Occupied Principal Structures:

"All pipelines greater than ten (10) inches in diameter which carry/conduct flammable or hazardous material shall be located a minimum of five hundred (500) feet from any occupied principal structure."

In July 2024, the Kendall County Regional Planning Commission requested Staff to contact the municipalities and neighboring counties to ask what their regulations were pertaining to setback and the reason for their respective setback. A table with that information was provided.

Staff also contacted a representative from a pipeline company to see what the industry standard was for temporary construction easements. That email was provided.

At their meeting on September 25, 2024, the Kendall County Regional Planning Commission, by a vote of eight (8) in favor and zero (0) in opposition with two (2) members absent voted to initiate a text amendment to the Kendall County Zoning Ordinance reducing the setback from five hundred (500) feet to twenty-five feet (25).

The redlined version of the proposal is as follows:

"All pipelines greater than ten (10) inches in diameter which carry/conduct flammable or hazardous material shall be located a minimum of ~~**five hundred (500)**~~ **twenty-five (25)** feet from any occupied principal structure."

The Commission's reasons for the proposal were as follows:

1. The present five hundred (500) foot regulation negatively impacted a property owner's ability to use their land by consuming too much land for setback purposes.

2. The present five hundred (500) foot regulation did not address public health and safety. The regulation of pipeline depth more adequate addresses public health and safety. Pipelines become a problem for public health and safety when they are disturbed and, if a pipeline is disturbed, five hundred (500) feet would not be an adequate setback to prevent property damage.

Information was sent to the Townships on October 25, 2024. No comments received.

ZPAC reviewed the proposal at their meeting on November 5, 2024, and voted to forward the proposal to the Kendall County Regional Planning Commission by a vote of seven (7) in favor and zero (0) in opposition with three (3) members absent with the suggestion that the setback be five feet (5') as measured from the permanent easement line instead of being measured from the pipeline. The minutes of the meeting were provided.

The Kendall County Regional Planning Commission reviewed this proposal at their meeting on December 11, 2024. Discussion occurred regarding the measurement and the suggestion from ZPAC. It was noted that the width of easements and the placement of pipelines within easements also differed. The Kendall County Regional Planning Commission recommended approval of the original proposal by a vote of seven (7) in favor and two (2) in opposition with one (1) member absent. Chairman Ashton and Tom Casey voted no because they believed that five hundred feet (500') was excessive and twenty-five feet (25') was insufficient. The minutes of the meeting were provided.

Member LeCuyer asked, if the pipeline company went to twenty-five feet (25'), could the area be fenced. Mr. Asselmeier stated the setback was twenty-five feet (25') from the principal structure.

Chairman Mohr asked Member Prodehl what a home would be worth if it was twenty-five feet (25') from a pipeline. Member Prodehl stated that it would be detrimental to the value of the property and the distance is extensive from five hundred feet (500') to twenty-five feet (25').

Chairman Mohr stated that many times the pipelines have hazardous chemicals which are detrimental if someone is exposed to them.

Member LeCuyer asked who made this recommendation. Mr. Asselmeier stated that members of the Planning Commission made the recommendation.

Member LeCuyer asked if the proposal came from a pipeline company. Mr. Asselmeier stated that the pipeline companies provided temporary easements which are traditionally fifty feet (50'). Attendees reviewed the email from the pipeline company representative included in the packet. Member LeCuyer stated he would be in favor of fifty feet (50').

Member Prodehl stated that they don't have enough information to be able to make an informed decision.

Chairman Mohr asked if he could build a house next to an easement. Mr. Asselmeier stated that under normal circumstances he could.

Attendees reviewed the table of information with the setbacks of other municipalities and neighboring counties. It was noted that Yorkville was using the pipeline's recommendation of a fifty foot (50') setback for any building because the IEPA issued a recommendation in some of their handouts that fifty feet (50') off the easement was recommended and no blasting or explosive excavation within three hundred twenty-five feet (325') of the easement.

Member LeCuyer made a motion, seconded by Member Prodehl, to recommend approval of the proposed text amendments.

The votes were as follows:

| | |
|---|---|
| Ayes (0): | None |
| Nays (7): | Cherry, Fox, LeCuyer, Mohr, Prodehl, Thompson, and Whitfield |
| Abstain (0): | None |
| Absent (0): | None |

The motion carried.

The Board felt twenty-five feet (25') is too close and they were open to seeing a revised proposal.

The townships will be notified of the results of the public hearing.

The proposal goes to the Kendall County Planning, Building and Zoning Committee on January 13, 2025, at 6:30 p.m. at the Historic Courthouse.

The Zoning Board of Appeals completed their review of Petition 24-34 and adjourned the public hearing at 7:23 p.m.

**NEW BUSINESS/OLD BUSINESS**

None

**REVIEW OF PETITIONS THAT WENT TO COUNTY BOARD**

Mr. Asselmeier reported that Petitions 24-26 and 24-28 were approved by the County Board. The Petitioner in Petition 24-28 was required to submit a photometric plan and an ADA plan prior to the issuance of a building permit.

**PUBLIC COMMENTS**

Mr. Asselmeier reported that the next application deadline was December 24, 2024. The only petitions, to date, for the January hearing are the solar project on Simons Road and the solar project on Ament

Road and the two (2) petitions continued at tonight's meeting.

Michael Faulkner, a property owner in the A-1 district, wanted to speak about Petition 24-35, the parking regulations in the front yard setbacks.

Mr. Asselmeier spoke regarding the issue with the setbacks. It was noted that at their meeting on October 23, 2024, the Kendall County Regional Planning Commission decided to initiate a text amendment to the Kendall County Code allowing parking in the A-1 Zoning District in the interior seventy-five feet (75') from the centerline for properties where the right-of-way was not dedicated and the interior fifty feet (50') from the right-of-way line where a right-of-way existed.

Mr. Faulkner asked why he could not park within the first twenty-five feet (25') of the road if he is a owns property zoned A-1. Mr. Asselmeier stated that Mr. Faulkner is not allowed to count that parking spot as his principal, required parking spot.

Miranda Marshall-Faulkner discussed the situation at 1539 Collins Road regarding the demolition of the house and their concerns about setbacks at the property.

The reasoning behind this proposal was because there was a landscaping business that wanted to have their required parking spaces in the front yard setback and that is against regulation.

Chairman Mohr asked Mr. and Mrs. Faulkner to attend the January 27, 2025, meeting, at 7:00 p.m., at the Historic Courthouse.

Starting in January, the meetings will be in the Historic Courthouse.

**ADJOURNMENT OF THE ZONING BOARD OF APPEALS**

Member LeCuyer made a motion, seconded by Member Prodehl, to adjourn.

With a voice vote of seven ayes, the motion carried.

The Zoning Board of Appeals meeting adjourned at 7:33 p.m.

The next regularly scheduled meeting/hearing will be on Monday, January 27, 2025, in the Historic Courthouse.

Respectfully submitted by,
Wanda A Rolf
Planning, Building and Zoning Part-Time Administrative Assistant

Exhibits

1. Memo on Petition 24-30 Dated December 12, 2024

2. Certificate of Publication and Green Cards from Mailing for Petition 24-30 (Not Included with Report but on file in Planning, Building and Zoning Office)
3. Memo on Petition 24-31 Dated December 12, 2024
4. Certificate of Publication for Petition 24-31 (Not Included with Report but on file in Planning, Building and Zoning Office)
5. Memo on Petition 24-32 Dated December 12, 2024
6. Certificate of Publication for Petition 24-32 (Not Included with Report but on file in Planning, Building and Zoning Office)
7. Memo on Petition 24-33 Dated December 12, 2024
8. Certificate of Publication for Petition 24-33 (Not Included with Report but on file in Planning, Building and Zoning Office)
9. Memo on Petition 24-34 Dated December 12, 2024
10. Certificate of Publication for Petition 24-34 (Not Included with Report but on file in Planning, Building and Zoning Office)
11. Memo on Petition 24-35 Dated December 12, 2024
12. Certificate of Publication for Petition 24-35 (Not Included with Report but on file in Planning, Building and Zoning Office)

January 13th, 2025

Matthew H. Asselmeier, AICP, CFM
Director
Kendall County Planning, Building & Zoning
111 West Fox Street
Yorkville, IL 60560-1498

**Subject: Petition 24-13 regarding the proposed solar farm on Simons Road**

With this letter, I formally request to withdraw Petition 24-13 from TPE IL KE240, LLC regarding the proposed solar farm on Simons Road, previously submitted on April 23, 2024. I appreciate your time, the efforts of the planning staff, and the consideration of the commissioners and board members who were involved in reviewing this application.

Respectfully submitted,

[redacted]

Gloria Foxman
Development Manager
TurningPoint Energy
646-229-5041
gfoxman@tpoint-e.com

**DEPARTMENT OF PLANNING, BUILDING & ZONING**
807 West John Street • Yorkville, IL • 60560
(630) 553-4141 Fax (630) 553-4179

# Petition 24-30
# Nicholas S. Bellone on Behalf of Ament Solar 1, LLC (Tenant) and Janet M. Dhuse on Behalf of the Janet Dhuse Declaration of Family Trust Dated March 1, 2013 (Owner)
# A-1 Special Use Permit for Commercial Solar Energy Facility and Variance to Allow the Facility on Land Within 1.5 Miles of a Municipality Without an Annexation Agreement

**INTRODUCTION**

The Petitioner is seeking a special use permit for a commercial solar energy facility and a variance to Section 36-282(17)a of the Kendall County Code to allow a commercial solar energy facility on land within one point five (1.5) miles of municipality without an annexation agreement.

The application materials are included as Attachment 1. The wetland delineation reports, including EcoCat information is included as Attachment 2. The NRI Report is included as Attachment 3. The property survey is included as Attachment 4. An amended site plan reflecting WBK's comments contained in their letter dated December 30, 2024 (Attachment 26), and two (2) stormwater basins requested by Kendall Townships is included as Attachment 5. The vegetative management plan is included as Attachment 6. Decommissioning information is included as Attachment 7. Amended stormwater information reflecting comments from WBK's letter of December 30, 2024 (Attachment 26) is included as Attachment 8. Drain tile information is included as Attachment 9. A glare study is included as Attachment 10. A property value study is included as Attachment 11.

On November 7, 2024, the property owner submitted a letter supporting the project. This letter is included as Attachment 16.

**SITE INFORMATION**

PETITIONER: Nicholas S. Bellone on Behalf of Ament Solar 1, LLC (Tenant) and Janet M. Dhuse on Behalf of the Janet Dhuse Declaration of Family Trust Dated March 1, 2013 (Owner)

ADDRESS: South of 9949 and 10021 Ament Road, Yorkville

LOCATION: Approximately 0.33 Miles West of Route 47 on the South Side of Ament Road

Aerial of Entire Property



TOWNSHIP: Kendall

PARCEL #s: 05-16-300-006 and 05-17-400-005

LOT SIZE: 93.4 +/- Acres (Total Parcel), 42.4 +/- (Disturbed Area), 35.7 +/- (Fenced Area)

EXISTING LAND USE: Agricultural

ZONING: A-1

LRMP:

| | |
|---|---|
| Future Land Use | Rural Residential (Max 0.65 DU/Acre) (County)<br>Agricultural (Yorkville) |
| Roads | Ament Road is a Local Road maintained by Kendall Township. |
| Trails | The United City of Yorkville has a trail planned along Ament Road. |
| Floodplain/ Wetlands | There are no floodplains on the property. There are two (2) farmed wetlands in the vicinity of the proposed use. |

REQUESTED ACTIONS: Special Use Permit for a Commercial Solar Energy System

Variance to Allow a Commercial Solar Energy System on Land with One Point Five (1.5) Miles of a Municipality without an Annexation Agreement

APPLICABLE REGULATIONS: §36-282(17) – A-1 Special Uses

§36-39 – Variance Procedures

Chapter 36, Article II, Division 3, Subdivision I – Special Use Procedures

**SURROUNDING LAND USE**

| Location | Adjacent Land Use | Adjacent Zoning | Land Resource Management Plan | Zoning within ½ Mile |
|---|---|---|---|---|
| North | Agricultural/Farmstead/ Public Institutional (Cemetery) | A-1 and A-1 SU | Rural Residential (Max 0.65 DU/Acre) and Commercial (County)<br>Agricultural (Yorkville) | A-1, A-1 SU, R-1, R-3, and M-1 (County) |
| South | Agricultural/Farmstead | A-1 | Rural Residential (County)<br>Agricultural (Yorkville) | A-1 |
| East | Agricultural/Single-Family Residential | A-1 and R-3 | Rural Residential and Transportation Corridor (County)<br>Agricultural (Yorkville) | A-1, A-1 SU, and R-3 (County) |

| | | | | |
|---|---|---|---|---|
| West | Agricultural | A-1 | Rural Residential (County) Agricultural (Yorkville) | A-1, R-1 PUD, and RPD-2 |

The A-1 special use permit to the north is for a cemetery. The A-1 special use permits to the east are for a church and school and for agricultural implement sales and service.

The Deere Crossing subdivision is located near the subject property. Approximately fourteen (14) homes are located within a half mile (0.5) miles of the subject property.

**PHYSICAL DATA**

**ENDANGERED SPECIES REPORT**

EcoCAT Report was submitted on July 10, 2023, for the eastern parcel and November 16, 2023, for the western parcel and consultation was terminated for both parcels, see Attachment 2, Pages 42 and 133.

**NATURAL RESOURCES INVENTORY**

A LESA Score was not generated for the property. The land evaluation was 96 out of 100 indicating the soils were well suited for agricultural. The NRI Report is included as Attachment 3.

**ACTION SUMMARY**

**KENDALL TOWNSHIP**

Petition information was sent to Kendall Township on October 25, 2024. The Kendall Township Planning Commission met on November 18, 2024. The Kendall Township Planning Commission recommended approval of the proposal with the following conditions:

"The entity will maintain and repair the subsurface drainage throughout the entirety of the lease to be repaired within the timeframe indicated in the special use permit (sup). The entity will commit to, as part of their maintenance schedule, perform a physical inspection of the property to include drain tile observation for damage and necessary repair. The surrounding property owners shall be provided a copy of the existing drain tile survey of subject property as well as any changes made as part of this project.

We would request that there be a subsurface drainage repair bond to ensure there are sufficient funds available for any required repair of materials and labor at the time of agreement. All replacement tile shall equal to or greater than its current flow.

The planning and zoning committee also recommends as part of the comprehensive MONITORING AND MANAGEMENT PLAN AMENT ROAD SOLAR FARM – KENDALL COUNTY (section 1-6) specific attention to the noxious weeds including but not limited to water hemp, and Giant Ragweed."

The Kendall Township Board met on November 19, 2024, and requested that the County layover this proposal until the following items have been addressed to Kendall Township's satisfaction:

1. "That it appears specifically and in writing that any fiduciary instrument (i.e. Bond) be attached to the Title and or abstract of the Subject Property presently identified as *AMENT ROAD SOLAR FARM.* In so much as that responsibility will pass to any and all owners until the end of the deconstruction phase of the project.

2. That the concerns expressed above regarding the subsoil drainage issues be specifically addressed in any SUP, and failure to do so will result in a violation of the terms of the agreement and a monetary penalty will be applied.

3. That the concerns regarding the noxious weeds shall be specifically spelled out in the SUP and future agreements."

An email outlining Kendall Township's position is included as Attachment 17.

On December 3, 2024, the Petitioner submitted a letter responding to Kendall Township's requests and requesting that the proposal be continued to the January Kendall County Regional Planning Commission meeting and the January Zoning Board of Appeals hearing. This letter is included as Attachment 18.

On December 6, 2024, the Petitioner submitted an email to Kendall Township with the addresses of the abutting property owners for other solar projects in Kendall County. This email is included as Attachment 20.

On December 16, 2024, the Kendall Township Planning Commission met and reaffirmed their previous approval recommendation. The Kendall Township Board will take up the proposal on January 21, 2025. An email to that effect is included as Attachment 21.

On January 21, 2025, the Kendall Township Board met and voted not to approve the proposal. They clarified that the Kendall Township Planning Commission's recommendation was contingent upon addressing stormwater issues. An email to that effect is included as Attachment 27.

**UNITED CITY OF YORKVILLE**
Petition information was sent to the United City of Yorkville on October 25, 2024. Prior to formal application submittal, the United City of Yorkville submitted a letter stating they would not pursue annexation at this time, see Attachment 1, Page 16. Yorkville also submitted an email requesting a forty foot (40') right-of-way dedication; Kendall Township was agreeable to this request. The emails related to the right-of-way dedication are included as Attachment 12.

The Yorkville Economic Development Committee reviewed the original proposal on January 7, 2025, and the Yorkville Planning and Zoning Committee reviewed the original on January 8, 2025. Both boards recommended approval. An email from Yorkville is included as Attachment 22. The proposal goes to the Yorkville City Council on January 28, 2025.

**BRISTOL-KENDALL FIRE PROTECTION DISTRICT**
Petition information was sent to the Bristol-Kendall Fire Protection District on October 25, 2024.

**ZPAC**
ZPAC reviewed the original proposal at their meeting on November 5, 2024. ZPAC voted to forward the proposal to the Kendall County Regional Planning Commission by a vote of seven (7) in favor and zero (0) in opposition with three (3) members absent. The minutes of the meeting are included as Attachment 13.

**RPC**
The Kendall County Regional Planning Commission started their review of the proposal at their meeting on December 11, 2024. Discussion occurred regarding actionable items related to Kendall Township's concerns. Kendall Township's drainage concerns were centered on the impact of the proposal on neighboring property owners. Discussion occurred regarding Illinois Drainage Law and the need to have bonds of sufficient size to cover the complete cost of decommissioning and site cleanup. Discussion occurred regarding the ability of the County to place additional conditions on the special use permit. It was noted that Ament 1, LLC was created by New Leaf Energy. The Kendall County Regional Planning Commission voted to continue the Petition to the January 22, 2025, meeting at the Petitioner's request by a vote of nine (9) in favor and zero (0) in opposition with one (1) member absent. The minutes are included as Attachment 23.

The Kendall County Regional Planning Commission continued their review of the proposal at their meeting on January 22, 2025. Discussion occurred regarding the County's requirement for such projects to seek annexation or pre-annexation, if they were located near municipality. Discussion occurred regarding outstanding stormwater issues. Discussion occurred regarding requiring the decommissioning bond be recorded and requiring the Petitioner to pay for an independent consultant to conduct a separate decommissioning study. Discussion occurred regarding the rationale for the numbers contained in the decommissioning plan. Discussion occurred regarding whether or not the

proposed land use was the best use of the land, both now and in the future. Discussion occurred regarding updating the County's Land Resource Management Plan. Discussion occurred why this site was chosen; it has to do with the location of substations and feeder lines. Discussion occurred regarding potential tax revenue at the property. Discussion occurred regarding placing solar panels on commercial buildings. Discussion occurred regarding landowners generating revenue from their property and the impact of denying the proposal. The motion at the Kendall County Regional Planning Commission was to recommend approval of the special use permit and variance with the conditions proposed by Staff, adding a condition that the decommissioning bond be attached to the decommissioning plan which would be recorded against the real estate, and adding a condition that an independent evaluation of the decommissioning cost occur at the Petitioner's expense which failed by a vote of two (2) in favor and eight (8) in opposition.

Member Landovitz voted no because of the potential land uses at the property. He gave deference to the voice of the elected officials, both the County and Kendall Township. He hoped that the updating of the Land Resource Management Plan will remove some of the differences. He felt bad for the landowners and the people that worked on the project.

Member Bernacki voted no because of the current classification of the land in the Land Resource Management Plan. He noted that Plainfield redid their plan recently and reclassified land to agricultural that had annexation agreements. He noted that Yorkville could redo their plan, which was completed in 2016. He felt working with Kendall Township was important. He also said that the Regional Planning Commission recommended denial of the solar project on Simons Road partially due to a lack of an annexation agreement with a municipality.

Member Wilson discussed balancing interests and unknowns. She noted that for farmers, their retirement is in their land. She understood the need to use farmland as a revenue source. She did not like the fact that farmer land is disappearing. In this case, she did not see an aesthetic issue and comparatively little farmland was being lost. She noted that solar panels have to be in certain locations related to substations and related infrastructure. She noted the project would comply with State law and she was unsure if the County's law related to annexation would hold in court. She favored the landowner and noted that the land could revert back to farm ground.

Member Hamman voted in favor of the proposal because the Petitioner presented a good case with the site setback from the roads. He favored being landowner's rights because selling the land may not be an option for tax reasons. He also had concerns regarding the legal aspects of denying this proposal.

Chairman Ashton voted no because of the high land evaluation score. He favored solar panels on ground that was not as productive for farming purposes.

Member Rodriguez discussed new developments and future land use in Kendall County. He voted no because of developments going on in Kendall County and future land uses in the County.

Member Casey favored commercial solar developments on commercial buildings.

Member McCarthy-Lange voted no because the proposal would look in the land use for twenty to forty (20-40) years. The County has changed drastically in the last forty (40) years. She did not want to lock in the land use that close to a municipality for such a long period of time. She would have liked the landowner to be present at the meeting; if the situation was dire, the landowner would appear at the meeting.

The minutes of the meeting, including the Petitioner's presentation, are included as Attachment 28.

**ZBA**

The Kendall County Zoning Board of Appeals initiated a public hearing on this proposal on December 16, 2024, and voted to continue the Petition to the January 27, 2025, hearing by a vote of seven (7) in favor and zero (0) in opposition. The minutes are included as Attachment 24.

**GENERAL INFORMATION**

Per § 36-282(17) of the Kendall County Code, commercial solar energy facilities businesses can be special uses on A-1 zoned property subject to the following conditions (Staff Comments in Bold):

a. All commercial solar energy facilities and test solar energy systems located within one point five (1.5) miles of a municipality shall either annex to the municipality or obtain an annexation agreement with the municipality requiring the municipality's regulations to flow through the property. **Petitioner is requesting a variance.**

b. The setbacks for commercial solar energy facilities shall be measured from the nearest edge of any component of the facility as follows:

   Occupied Community Buildings or Dwellings on Nonparticipating Properties-One hundred fifty feet (150') from the nearest point on the outside wall of the structure

   Boundary Lines of Participating Properties-None

   Boundary Lines of Nonparticipating Properties- Fifty feet (50') to the nearest point on the property line of the nonparticipating property

   Public Road Rights-Of-Way-Fifty feet (50') from the nearest edge

   The above setbacks do not exempt or excuse compliance with electric facility clearances approved or required by the National Electrical Code, the National Electrical Safety Code, Commerce Commission, Federal Energy Regulatory Commission, and their designees or successors. **Per the site plan, see Attachment 5, Page 4, the closet nonparticipating structure is approximately one thousand, thirty feet (1,030') to the southeast of the commercial solar energy facility. A church is located approximately one thousand, four hundred thirty-three feet (1,433') to the northeast of the commercial solar energy facility. The perimeter fence is setback fifty feet (50') from the adjoining property line. The commercial solar energy facility is approximately one thousand, four hundred forty-two feet (1,442') from the Ament Road. At their closest points, the panels are approximately forty-nine feet (49') south of the northern fence line, twenty-nine point five feet (29.5) west of the eastern fence line, just under nineteen feet (19') north of the southern fence line, and twenty-one point five feet (21.5') east of the western fence line.**

c. A commercial solar energy facility's perimeter shall be enclosed by fencing having a height of at least six feet (6') and no more than twenty-five feet (25'). **This is true. Per the site plan, see Attachment 5, Page 5, the fence is proposed to be seven feet (7') in height and will be chain link.**

d. No component of a solar panel as part of a commercial solar energy facility shall have a height of more than twenty feet (20') above ground when the solar energy facility's arrays are at full tilt. **This is true. Per the site plan, see Attachment 5, Page 4, the maximum height will be nine feet (9'). The Petitioner does not want a restriction setting the maximum height at this level.**

e. The above setback, fencing, and component height requirements may be waived subject to written consent of the owner of each affected nonparticipating property. This written consent shall be submitted at the time of application submittal. **No such consent requested or needed.**

f. Sound limitations for components in commercial solar energy facilities shall follow the sound limitations established by the Illinois Pollution Control Board. **A noise study was provided; see Attachment 15.**

g. The County shall not require standards for construction, decommissioning, or deconstruction of a commercial solar energy system or related financial assurances to be more restrictive than agricultural impact mitigation agreement set in State law. The amount of any decommissioning payment shall be limited to the cost identified in the decommissioning or deconstruction plan, as required by the agricultural impact mitigation agreement, minus the salvage value of the project. A copy of the agricultural impact mitigation agreement shall be submitted with the application materials. **The decommissioning plan is included as Attachment 7 and is outlined in the AIMA provided in Attachment 1, starting on page 18. As noted on Page 6 of Attachment 7, the estimated cost of**

**decommissioning is Four Hundred Twenty-Five Thousand, Eight Hundred Ninety-Seven Dollars and Thirty-Seven Cents ($425,897.37). This money will be provided to the County in the form of a bond as outlined in the AIMA on Pages 28 and 29 of Attachment 1.**

h. A vegetative screening shall be placed around the commercial solar energy facility. **The landscaping plan was included on Pages 7 and 8 of the site plan (Attachment 5) with more detailed landscaping information included in the vegetative management plan (Attachment 6). The plan includes a cover crop seed mix, a native pollinator seed mix, and a native grazing seed mix. The performance standards and ground cover maintenance requirements were included in the vegetative management plan.**

i. Commercial solar energy facility applicants shall provide the results and recommendations from consultations with the Illinois Department of Natural Resources obtained through the Ecological Compliance Assessment Tool (EcoCat) or a comparable successor tool. The commercial solar energy facility applicant shall adhere to the recommendations provided through this consultation. **The EcoCat was submitted and consultation was terminated without any specific recommendations.**

j. Commercial solar energy facility applicants shall provide the results of the United States Fish and Wildlife Service's Information for Planning and Consulting environmental review or a comparable successor toll that is consistent with the U.S. Fish and Wildlife Service's Land-Based Wind Energy Guidelines and any applicable United States Fish and Wildlife Service solar wildlife guidelines that have been subject to public review. **This was provided on Pages 21 and 117 of both wetland delineation reports (Attachment 2). Six (6) threatened or endangered species were in the area, but no impacts were anticipated.**

k. A facility owner shall demonstrate avoidance of protected lands as identified by the Illinois Department of Natural Resources and the Illinois Nature Preserve Commission or consider the recommendations of the Illinois Department of Natural Resources for setbacks from protected lands, including areas identified by the Illinois Nature Preserve Commission. **This is true. The site is designed around the farmed wetlands.**

l. A facility owner shall provide evidence at the time of application submittal of consultation with the Illinois State Historic Preservation Office to assess potential impacts on State-registered historic sites under applicable State law. **No potential impacts to State-registered historic sites exists, see Attachment 1, Page 74.**

m. A commercial solar energy facility owner shall plant, establish, and maintain for the life of the facility vegetative ground cover consistent with State law and the guidelines of the Illinois Department of Natural Resources' vegetative management plans. The vegetation management plan shall be required at the time of application submittal. **The vegetation management plan, including timelines for planting and maintenance of the vegetation was provided, see Attachment 6.**

n. The facility owner shall enter into a road use agreement with the jurisdiction having control over the applicable roads. The road use agreement shall follow applicable law. The facility owner shall supply the Kendall County Planning, Building and Zoning Department with a copy of the road use agreement. This provision shall be waived if the jurisdiction having control over the applicable roads does not wish to enter into an agreement. **As of the date of this memo, the road use agreement negotiations are ongoing. No transportation or access plan was provided. The site plan (Attachment 5) shows one (1) twenty foot (20') wide gravel driveway approximately thirty feet (30') west of the eastern property line.**

o. The facility owner shall repair or pay for the repair of all damage to the drainage system caused by the construction of the commercial solar energy system within a reasonable time after construction of the commercial solar energy facility is complete. The specific time shall be set in the special use permit. **A tentative drain tile study was provided (See Attachment 9). The foundations for the racking will be placed in a manner that minimizes impacts on the drain tile.**

**BUILDINGS AND BUILDING CODES**
No buildings are planned for the site. Any structures proposed for the site, including the solar arrays, shall obtain applicable permits.

**ENVIRONMENTAL HEALTH**
The property is presently farmland. No wells, septic systems, or refuse collection points were identified.

**STORMWATER**
The proposed area of disturbance is slightly less than one (1) acre. The County requested that the Petitioner submit an escrow payment so that WBK can evaluate the proposal; the Petitioner agreed to this request.

On November 15, 2024, WBK submitted a letter (Attachment 19) with several comments and questions. On December 23, 2024, the Petitioner submitted a response including a revised site plan and revised stormwater information. The cover letter outlining the changes is included as Attachment 25. On December 30, 2024, WBK submitted a response letter (Attachment 26). On January 15, 2025, the Petitioner submitted an amendment site plan which incorporated the changes recommended by WBK and included two (2) basins requested by Kendall Township. They also submitted revised stormwater information (Attachment 8). The basins are shown on Attachment 5, Pages 4 and 5. The western basin has a depth of two point four feet (2.4') from the berm to the bottom of the basin. At the highest elevation, it has a surface area of forty-two thousand, five hundred thirty-five (42,535) square feet and will have a volume of forty-five thousand, three hundred nine (45,309) cubic feet. The eastern basin has a depth of one point eight (1.8') from the berm to the bottom of the basin. At the highest elevation, it has a surface area of thirty-nine thousand, seven hundred seventy-three (39,773) square feet and will have a volume of twenty-nine thousand, five hundred forty-six (29,546) cubic feet.

**ACCESS**
Per the site plan (See Attachment 5), the Petitioner proposes one (1) twenty foot (20') wide access road.

There is one (1) forty foot (40') wide vehicular access gate and approximately ten (10) four foot (4') access gates proposed around the perimeter of the property. The locations of the smaller gates have not been determined. Knox box information will be provided to the County.

**PARKING AND INTERNAL TRAFFIC CIRCULATION**
No permeant parking was proposed. There will be a staging area during construction; the specific location of the staging area was undetermined, but will likely be northwest of the vehicular access gate.

**LIGHTING**
No lighting was proposed.

**SIGNAGE**
No specific signage was planned. The Petitioner was agreeable to installing one (1) sign at the vehicular access gate stating emergency contact information.

**GLARE**
The Petitioner provided a glare study, see Attachment 10.

**IMPACT ON PROPERTY VALUES**
The Petitioner provided a general property values study, see Attachment 11. The same firm that prepared the property value study for this proposal also provided the property value study for the solar project on Simons Road. The differences between the two studies are included as Attachment 14.

**ODORS**
No odors were foreseen.

**NOISE**
The Petitioner provided noise information, see Attachment 15.

**RELATION TO OTHER SPECIAL USES**
If approved, this would be the second special use permit for a commercial solar energy facility in unincorporated Kendall County.

**FINDINGS OF FACT-SPECIAL USE PERMIT**
§ 36-119 of the Kendall County Code outlines findings that the Zoning Board of Appeals must make in order to recommend in favor of the applicant on special use permit applications. They are listed below in *italics.* Staff has provided findings in **bold** below based on the recommendation:

*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 Project will generate clean, renewable electricity while producing no air, noise, or water pollution, or ground contamination. The front portion of the parcel closest to Ament Road will be retained for agricultural use as well as the surrounding land of the other parcel, which will create a natural screening during the growing season. The Petitioner submitted a vegetative management plan outlining the types of vegetation that will be planted, the timing of planting, and a maintenance plan for the vegetation.**

*The special use will not be substantially injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, nor substantially diminish and impair property values within the neighborhood. The Zoning classification of property within the general area of the property in question shall be considered in determining consistency with this standard. The proposed use makes adequate provisions for appropriate buffers, landscaping, fencing, lighting, building materials, open space and other improvements necessary to insure that the proposed use does not adversely impact adjacent uses and is compatible with the surrounding area and/or the County as a whole.* **The proposal will not interfere with the use and enjoyment of nearby properties. The surrounding properties are zoned primarily A-1 and will not be prevented from continuing any existing use or from pursuing future uses. The proposal's operations would be quiet and minimal traffic will occur after installation is completed. The solar panels are setback from Ament Road and neighboring houses to avoid negative visual impacts.**

*Adequate utilities, access roads and points of ingress and egress, drainage, and/or other necessary facilities have been or are being provided.* **The proposal will have adequate utility interconnections designed in collaboration with ComEd. The proposal does not require water, sewer, or any other public utility facilities to operate. The Petitioner will also build all roads and entrances at the facility and will enter into an agreement with Kendall Township regarding road use. After initial construction traffic, landscape maintenance and maintenance to the project components are anticipated to occur on an as-needed basis, consistent with the vegetative management plan. Existing traffic patterns will not be impacted in the post-construction operations phase. A drain tile survey will be completed prior to construction and foundation design will work around or reroute any identified drain tiles to ensure proper drainage.**

*The special use shall in all other respects conform to the applicable regulations of the district in which it is located, except as such regulations may in each instance be modified by the County Board pursuant to the recommendation of the Zoning Board of Appeals.* **If the requested variance is granted, the proposal meets all applicable regulations.**

*The special use is consistent with the purpose and objectives of the Land Resource Management Plan and other adopted County or municipal plans and policies.* **The proposal is also consistent with a goal and objective found on page 3-34 of the Land Resource Management Plan**, **"Support the public and private use of sustainable energy systems (examples include wind, solar, and geo-thermal)." However, the proposal is located on property classified as Rural Residential on the Future Land Use Map and the Kendall County Regional Planning Commission recommended denial of the proposal.**

**FINDINGS OF FACT-VARIANCE**
§36-39 of the Kendall County Code outlines findings that the Zoning Board of Appeals must make in order to grant variations. They are listed below in *italics.* Staff has provided findings in **bold** below based on the recommendation:

*The particular physical surroundings, shape, or topographical condition of the specific property involved would*

*result in a particular hardship or practical difficulty upon the owner if the strict letter of the regulations were carried out.* **The subject property is located within one point five (1.5) miles of the United City of Yorkville. The Petitioner provided a letter from the United City of Yorkville stating that Yorkville did not wish to annex the property or enter into a pre-annexation agreement.**

*The conditions upon which the requested variation is based would not be applicable, generally, to other property within the same zoning classification.* **Other A-1 zoned properties within one point five (1.5) miles of a municipality could request a similar variance, if the municipality refuses to annex or enter into a pre-annexation agreement.**

*The alleged difficulty or hardship has not been created by any person presently having an interest in the property.* **The difficulty was created because the United City of Yorkville did not wish to enter into a pre-annexation agreement or annex the property.**

*The granting of the variation will not materially be detrimental to the public welfare or substantially injurious to other property or improvements in the neighborhood in which the property is located.* **Granting the variance would not be detrimental to the public or substantially injurious to other properties.**

*That the proposed variation will not impair an adequate supply of light and air to adjacent property, or substantially increase the congestion in the public streets or increase the danger of fire, or endanger the public safety or substantially diminish or impair property values within the neighborhood.* **The proposed variance would not impair light or air on adjacent property, cause congestion, increase the danger of fire, or negatively impact property values.**

**RECOMMENDATION**
Given that the Kendall County Regional Planning Commission recommended denial of the proposal, Staff's recommendation is neutral because of lack of clarity in State law regarding using the LaSalle and Sinclar Factors in evaluating applications of special use permits for commercial solar facilities. Assuming that conditions can be imposed on the special use permit, the proposed conditions and restrictions are as follows:

1. The site shall be developed substantially in accordance with the submitted site plan (Attachment 5), vegetative management plan, (Attachment 6), decommissioning plan, (Attachment 7), road access plan (yet to be submitted), and Agricultural Impact Mitigation Agreement (Attachment 1, Pages 18-31).
2. A variance to section 36-282(17)(a) of the Kendall County Code is hereby granted allowing a commercial solar energy facility within one point five (1.5) miles of a municipality without an annexation or pre-annexation agreement. (**Added after ZPAC**).
3. Within ninety (90) days of the approval of the special use permit, the owners of the subject property shall dedicate a strip of land forty feet (40') in depth along the northern property line to Kendall Township. The Kendall County Planning, Building and Zoning Committee may grant an extension to this deadline.
4. None of the vehicles or equipment parked or stored on the subject property allowed by the special use permit shall be considered agricultural vehicles or agricultural equipment.
5. All of the vehicles and equipment stored on the subject property allowed by the special use permit shall be maintained in good condition with no deflated tires and shall be licensed if required by law.
6. Any structures, included solar arrays, constructed, installed, or used allowed by this special use permit shall not be considered for agricultural purposes and must secure applicable building permits.
7. One (1) warning sign shall be placed near or on the vehicular entrance gate. This sign shall include, at minimum, the address of the subject property and a twenty-four (24) hour emergency contact phone number. Additional signage may be installed, if required by applicable law.
8. KenCom and other applicable public safety agencies shall be supplied the access code to the Knox Box/security gate.
9. The operators of the use allowed by this special use permit acknowledge and agree to follow Kendall

County's Right to Farm Clause.

10. The property owner and operator of the use allowed by this special use permit shall follow all applicable Federal, State, and Local laws related to the operation of this type of use.

11. Failure to comply with one or more of the above conditions or restrictions could result in the amendment or revocation of the special use permit.

12. If one or more of the above conditions is declared invalid by a court of competent jurisdiction, the remaining conditions shall remain valid.

13. This special use permit and variance shall be treated as a covenant running with the land and is binding on the successors, heirs, and assigns as to the same special use conducted on the property.

**ATTACHMENTS**

1. Application Materials
2. Wetland Delineation Reports
3. NRI Report
4. Property Survey
5. Site Plan Dated January 15, 2025
6. Vegetative Management Plan
7. Decommissioning Information
8. Stormwater Management Memo Dated January 14, 2025
9. Drain Tile Information
10. Glare Study
11. Property Value Study
12. Right-of-Way Dedication Emails
13. November 5, 2024, ZPAC Meeting Minutes (This Petition Only)
14. Property Value Study Email
15. Noise Study
16. November 7, 2024, Letter from Janet Dhuse
17. November 22, 2024, Email from Kendall Township
18. December 3, 2024, Email and Letter from Nicholas Bellone and Tom Ryan
19. November 15, 2024, Letter from WBK Engineering
20. December 6, 2024, Email from Nicholas Bellone
21. December 17, 2024, Email from Kendall Township
22. January 9, 2025, Email from the United City of Yorkville
23. December 11, 2024, Kendall County Regional Planning Commission Meeting Minutes (This Petition Only)
24. December 16, 2024, Kendall County Zoning Board of Appeals Hearing Minutes (This Petition Only)
25. December 23, 2024, Stormwater Letter from New Leaf
26. December 30, 2024, Letter from WBK Engineering
27. January 21, 2025, Email from Kendall Township
28. January 22, 2025, Kendall County Regional Planning Commission Meeting Minutes (This Petition Only)

**DEPARTMENT OF PLANNING, BUILDING & ZONING**
111 West Fox Street • Yorkville, IL • 60560
(630) 553-4141 Fax (630) 553-4179

# APPLICATION

**PROJECT NAME** AMENT ROAD SOLAR **FILE #:**_____

**NAME OF APPLICANT (Including First, Middle Initial, and Last Name)**
Ament Road Solar 1, LLC

**CURRENT LANDOWNER/NAME(s)**
Janet M. Dhuse as Trustee of the Janet Dhuse Declaration of Family Trust dated March 1, 2013

| SITE INFORMATION ACRES | SITE ADDRESS OR LOCATION | ASSESSOR'S ID NUMBER (PIN) |
|---|---|---|
| 95.3 | Ament Road | 05-16-300-006<br>05-17-400-005 |

| EXISTING LAND USE | CURRENT ZONING | LAND CLASSIFICATION ON LRMP |
|---|---|---|
| Agriculture | A-1 Agricultural District | |

**REQUESTED ACTION** (Check All That Apply):

- X SPECIAL USE
- ___ MAP AMENDMENT (Rezone to ____)
- ___ VARIANCE
- ____ ADMINISTRATIVE VARIANCE
- ___ A-1 CONDITIONAL USE for:_____
- ___ SITE PLAN REVIEW
- ___ TEXT AMENDMENT
- ___ PRELIMINARY PLAT
- ___ RPD (___Concept; ___ Preliminary; ___ Final)
- ___ FINAL PLAT
- ___ ADMINISTRATIVE APPEAL
- ___ OTHER PLAT (Vacation, Dedication, etc.)
- ___ AMENDMENT TO A SPECIAL USE (____Major; _____ Minor)

| [1]PRIMARY CONTACT | PRIMARY CONTACT MAILING ADDRESS | PRIMARY CONTACT EMAIL |
|---|---|---|
| Nicholas S. Bellone | [redacted] | [redacted] |
| **PRIMARY CONTACT PHONE #** | **PRIMARY CONTACT FAX #** | **PRIMARY CONTACT OTHER #**(Cell, etc.) |
| [redacted] | | |

| [2]ENGINEER CONTACT | ENGINEER MAILING ADDRESS | ENGINEER EMAIL |
|---|---|---|
| Michael Keith | [redacted] | [redacted] |
| **ENGINEER PHONE #** | **ENGINEER FAX #** | **ENGINEER OTHER #** (Cell, etc.) |
| [redacted] | | |

I UNDERSTAND THAT BY SIGNING THIS FORM, THAT THE PROPERTY IN QUESTION MAY BE VISITED BY COUNTY STAFF & BOARD/ COMMISSION MEMBERS THROUGHOUT THE PETITION PROCESS AND THAT THE PRIMARY CONTACT LISTED ABOVE WILL BE SUBJECT TO ALL CORRESPONDANCE ISSUED BY THE COUNTY.

I CERTIFY THAT THE INFORMATION AND EXHIBITS SUBMITTED ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND THAT I AM TO FILE THIS APPLICATION AND ACT ON BEHALF OF THE ABOVE SIGNATURES. **THE APPLICANT ATTESTS THAT THEY ARE FREE OF DEBT OR CURRENT ON ALL DEBTS OWED TO KENDALL COUNTY AS OF THE DATE OF THE APPLICATION.**

**SIGNATURE OF APPLICANT** [redacted] **DATE** 9/11/2024

FEE PAID:$_____
CHECK #:_____

[1]*Primary Contact will receive all correspondence from County*
[2]*Engineering Contact will receive all correspondence from the County's Engineering Consultants*

Date Stamp Here If Checklist Is Complete

Please fill out the following findings of fact to the best of your capabilities. §13:08.J of the Zoning Ordinance outlines findings that the Zoning Board of Appeals shall consider in rendering a decision, but is not required to make an affirmative finding on all items in order to grant a **special use**. They are as follows:

*That the establishment, maintenance, and operation of the special use will not be detrimental to, or endanger, the public health, safety, morals, comfort, or general welfare.* This Solar facility will not be detrimental to the public. It will provide power to the grid and will be completely enclosed by a fence. The panels will not give off any energy, static, glare or harmful chemicals. The electrical equipment will be enclosed and securded to avoid any public access.

*That the special use will not be substantially injurious to the use and enjoyment of other properties in the immediate vicinity for the purposes already permitted, nor substantially diminish and impair property values within the neighborhood. The Zoning classification of property within the general area of the property in question shall be considered in determining consistency with this standard. The proposed use shall make adequate provisions for appropriate buffers, landscaping, fencing, lighting, building materials, open space and other improvements necessary to insure that the proposed use does not adversely impact adjacent uses and is compatible with the surrounding area and/or the County as a whole.*

The proposed site meets all county required setbacks and state required buffers. Fencing meets the county's required fencing height along with the national electric code for fencing around a solar facility. There is no proposed lighting. Building materials will meet all local, state and federal requirements. This site meets all Kendall County Zoning Oordinance requiremetns.

*That adequate utilities, access roads and points of ingress and egress, drainage, and/or other necessary facilities have been or are being provided.*

This site does not require the use of any public utilities (i.e. water or sewer). Access to the site will made via Ament Road. Majority of site related traffic generation will be made during construction. After the site is constructed, site access will be made for general monthly maintenance. This site does not propose increasing stormwater run-off. A culvert will be provided at the access for the road side ditch

*That the special use shall in all other respects conform to the applicable regulations of the district in which it is located, except as such regulations may in each instance be modified by the County Board pursuant to the recommendation of the Zoning Board of Appeals* This site meets all requirements in the Kendall County Zoning Oridance.

*That the special use is consistent with the purpose and objectives of the Land Resource Management Plan and other adopted County or municipal plans and policies.*

This site is consistent with the purpose and objections fo the Land Resourse Manament Plan and other adopted County and municipal plans and policies.

**DEPARTMENT OF PLANNING, BUILDING & ZONING**
111 West Fox Street • Yorkville, IL • 60560
(630) 553-4141 Fax (630) 553-4179

# APPLICATION

**PROJECT NAME** AMENT ROAD SOLAR **FILE #:**_____

**NAME OF APPLICANT (Including First, Middle Initial, and Last Name)**
Ament Road Solar 1, LLC

**CURRENT LANDOWNER/NAME(s)**
Janet M. Dhuse as Trustee of the Janet Dhuse Declaration of Family Trust dated March 1, 2013

| SITE INFORMATION ACRES | SITE ADDRESS OR LOCATION | ASSESSOR'S ID NUMBER (PIN) |
|---|---|---|
| 95.3 | Ament Road | 05-16-300-006<br>05-17-400-005 |

| EXISTING LAND USE | CURRENT ZONING | LAND CLASSIFICATION ON LRMP |
|---|---|---|
| Agriculture | A-1 Agricultural District | |

**REQUESTED ACTION** (Check All That Apply):

| | | |
|---|---|---|
| _____SPECIAL USE | ___ MAP AMENDMENT (Rezone to ____) | X VARIANCE |
| _____ADMINISTRATIVE VARIANCE | ___ A-1 CONDITIONAL USE for:_____ | ___ SITE PLAN REVIEW |
| ___ TEXT AMENDMENT<br>___ PRELIMINARY PLAT | ___ RPD (___Concept; ___ Preliminary; ___ Final)<br>___ FINAL PLAT | ___ ADMINISTRATIVE APPEAL<br>___ OTHER PLAT (Vacation, Dedication, etc.) |

___ AMENDMENT TO A SPECIAL USE (_____Major; _____ Minor)

| [1]PRIMARY CONTACT | PRIMARY CONTACT MAILING ADDRESS | PRIMARY CONTACT EMAIL |
|---|---|---|
| Nicholas S. Bellone | [redacted] | [redacted] |

| PRIMARY CONTACT PHONE # | PRIMARY CONTACT FAX # | PRIMARY CONTACT OTHER #(Cell, etc.) |
|---|---|---|
| [redacted] | | |

| [2]ENGINEER CONTACT | ENGINEER MAILING ADDRESS | ENGINEER EMAIL |
|---|---|---|
| Michael Keith | [redacted] | [redacted] |

| ENGINEER PHONE # | ENGINEER FAX # | ENGINEER OTHER # (Cell, etc.) |
|---|---|---|
| [redacted] | | |

I UNDERSTAND THAT BY SIGNING THIS FORM, THAT THE PROPERTY IN QUESTION MAY BE VISITED BY COUNTY STAFF & BOARD/ COMMISSION MEMBERS THROUGHOUT THE PETITION PROCESS AND THAT THE PRIMARY CONTACT LISTED ABOVE WILL BE SUBJECT TO ALL CORRESPONDANCE ISSUED BY THE COUNTY.

I CERTIFY THAT THE INFORMATION AND EXHIBITS SUBMITTED ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND THAT I AM TO FILE THIS APPLICATION AND ACT ON BEHALF OF THE ABOVE SIGNATURES. **THE APPLICANT ATTESTS THAT THEY ARE FREE OF DEBT OR CURRENT ON ALL DEBTS OWED TO KENDALL COUNTY AS OF THE APPLICATION DATE.**

**SIGNATURE OF APPLICANT** [redacted] **DATE** 10/17/2024

FEE PAID:$_____
CHECK #:_____

[1]*Primary Contact will receive all correspondence from County*
[2]*Engineering Contact will receive all correspondence from the County's Engineering Consultants*

Last Revised:
**10.17.22**

Date Stamp Here If Checklist Is Complete

Please fill out the following findings of fact to the best of your capabilities. § 13:04 of the Zoning Ordinance outlines findings that the Zoning Board of Appeals shall take into consideration the extent to which the following conditions have been established by the evidence:

See below for the findings of fact.

*That the particular physical surroundings, shape, or topographical condition of the specific property involved would result in a particular hardship or practical difficulty upon the owner if the strict letter of the regulations were carried out.*

The City of Yorkville expressed to us via a letter that they would not like to annex or pre-annex this parcel. Therefore, if the current regulations were to be carried out we would not be able to have our petition heard.

*That the conditions upon which the requested variation is based would not be applicable, generally, to other property within the same zoning classification.*

The variation may not be applicable to properties within the same zoning classification if the City of Yorkville wanted to annex one of those specific parcels.

*That the alleged difficulty or hardship has not been created by any person presently having an interest in the property.*

Ament Road Solar 1, LLC is the first entity to apply for a Special Use Permit for a Solar Farm on this property.

*That the granting of the variation will not materially be detrimental to the public welfare or substantially injurious to other property or improvements in the neighborhood in which the property is located.*

The variation will not be detrimental to the public welfare or injurious to other properties. The variation will allow our petition to be heard by the board.

*That the proposed variation will not impair an adequate supply of light and air to adjacent property, or substantially increase the congestion in the public streets or increase the danger of fire, or endanger the public safety or substantially diminish or impair property values within the neighborhood.*

The variation will not impair light or air to adjacent properties, create congestion, risk of fire or endanger public welfare. The variation will allow our petition to be heard by the board.

DocuSign Envelope ID: 654446D0-ABAC-4EE7-BF10-2D264C5115B7



**EXHIBIT F**

Date: 9-12-22

To Whom It May Concern

New Leaf Energy and its employees and affiliates are hereby authorized to act as our agent for submission of applications and related plans and documents, and to appear before boards and other officials, with respect to obtaining approvals for solar installations and/or energy storage systems to be constructed on my property located at Ament Rd in Yorkville, Kendall County, IL 60560 {Parcel: 05-16-300-006}.

Sincerely,

[redacted]

Janet Dhuse

ATWELL

# AMENT ROAD

PROJECT NARRATIVE

Ament Road, Kendall County, IL

**Job No. 23002398**

**Prepared for:**

**New Leaf Energy**

[redacted]

**Prepared by:**

**Atwell, LLC**

[redacted]

September 12, 2024

ATWELL

# AMENT ROAD

## PROJECT NARRATIVE

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B. AGRICULTURAL IMPACT MITIGATION AGREEMENT (AIMA)

# 1.0 INTRODUCTION

New Leaf Energy, Inc. (New Leaf) is requesting a Special Use Permit (SUP) to allow for development of a 5 MW AC community solar farm on two parcels of land in Kendall County, Illinois with the parcel numbers (PIN) of 05-16-300-006 and 05-17-400-005. The project encompasses an approximate 39.34-acre portion of the total 95.3 acres. The parcels are zoned Agricultural District (A-1). Per Kendall County Code, *Section 7:01.D.17*, construction and operation of Commercial Solar Energy Facilities are permitted in the Agricultural District by Special Use Permit. Once constructed, the solar farm will fit well within the surrounding low-density agricultural uses, and the property will not be occupied more than 3 or 4 times per year for maintenance. The residual acreage will continue to be maintained by the property owners and may continue to be farmed if the property owners choose to do so. New Leaf is requesting a Special Use Permit to allow for the Commercial Solar Energy Facility use.

To assist in the review of this Special Use Permit request, a SUP Set of plans is included with the SUP Application packet, which illustrates the proposed solar farm use and site improvements. This report will outline how this project meets all standards, requirements, and factors for consideration that Kendall County has set forth.

# 2.0 APPROVAL STANDARDS FOR SPECIAL USE PERMITS

Per the Kendall County Zoning Ordinance, *Section 13:08.J*, "no special use shall be recommended by the ZBA unless said ZBA shall make a written finding. The ZBA shall consider the following in rendering a decision but is not required to make an affirmative finding on all items."

## 2.1 STANDARD 1

*That 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 solar facility will be located near the southwest corner of the two parcels to reduce the visual impacts to nearby residents. The front portion of the parcel closest to Ament Road will be retained for agricultural use as well as the surrounding land of the other parcel, which will create a natural screening during the growing season.

## 2.2 STANDARD 2

*That the special use will not be substantially injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, nor substantially diminish and impair property values within the neighborhood. The*

*Zoning classification of property within the general area of the property in question shall be considered in determining consistency with this standard. The proposed use shall make adequate provisions for appropriate buffers, landscaping, fencing, lighting, building materials, open space and other improvements necessary to insure that the proposed use does not adversely impact adjacent uses and is compatible with the surrounding area and/or the County as a whole.*

- The proposed solar facility is a quiet neighbor and a low-impact use. The project will have no on-site employees once built. Thus, the project will not add to any neighborhood traffic. The system is located near the rear of the property, away from public rights-of-way. The nearest component of the proposed solar facility is 1,434' from adjacent residences and 1,442' from public rights-of-way.

## 2.3 STANDARD 3

*That adequate utilities, access roads and points of ingress and egress, drainage, and/or other necessary facilities have been or are being provided.*

- The proposed solar facility does not require access to traditional utilities such as natural gas, water, or sanitary sewer. The routing of electrical infrastructure is required to connect to the ComEd electric system as shown on the SUP plan set. The solar farm will not require additional public expense for fire protection, rescue, or relief.
- During the initial construction timeframe of approximately 4 to 6 months, there will be a mix of trucks ranging from semi-trucks for panel and racking delivery, flatbed trucks for fencing, dump trucks for driveway gravel, and various delivery trucks – averaging 2-3 per day. Many of the major materials/suppliers travel from across the area and their arrival times are fluid. Temporary, on-site locations for truck staging will be proposed on site. Access to the site will be available each day during the work hours of 7:30am and 5:00pm. Any truck that will not be off-loaded will not be allowed to idle for more than five minutes. "No Idling" signs will be placed at appropriate locations. In addition to material and equipment deliveries, workers will be arriving at the site each weekday using personal vehicles. For similar projects of this scale, approximately 40 personal vehicles may be on site at one time. These vehicles will arrive each day in the morning and leave in the afternoon. The total number of vehicles on site will fluctuate depending on the phase of the project.
- Once construction is complete, there will be little to no traffic to or from the site other than occasional maintenance visits 3 to 4 times per year.

## 2.4 STANDARD 4

*That the special use shall in all other respects conform to the applicable regulations*

*of the district in which it is located, except as such regulations may in each instance be modified by the County Board pursuant to the recommendation of the Zoning Board of Appeals.*

- The proposed solar facility is located on parcels in the Agricultural District. The solar farm is designed to comply with the applicable regulations set forth in the Kendall County Zoning Code, Section 7:01 *Agricultural District*.

### 2.5 STANDARD 5

*That the special use is consistent with the purpose and objectives of the Land Resource Management Plan and other adopted County or municipal plans and policies.*

- The proposed solar facility will follow all applicable requirements of the Land Resource Management Plan and any other adopted County or municipal plans/policies.

## 3.0 DEVELOPMENT REQUIREMENTS

### 3.1 PROXIMITY TO MUNICIPALITY

*All commercial solar energy facilities and test solar energy systems located within one point five (1.5) miles of a municipality shall either annex to the municipality or obtain an annexation agreement with the municipality requiring the municipality's regulations to flow through the property.*

- The project site is located outside of the 1.5-mile radius from the City of Yorkville. Per the letter provided in **Appendix A** dated August 27, 2024, the City of Yorkville notified Kendall County that the City does not currently seek to annex the project parcels or enter into a pre-annexation agreement with the landowner and developer of these properties.

### 3.2 SETBACKS

*The setbacks for commercial solar energy facilities shall be measured from the nearest edge of any component of the facility as follows:*

| | REQUIRED | PROVIDED |
|---|---|---|
| Occupied Community Buildings or Dwellings on Nonparticipating Properties | 150' from the nearest point on the outside wall of the structure | 1,434' |
| Boundary Lines of Participating Properties | None | N/A |
| Boundary Lines of Nonparticipating Properties | 50' to the nearest point on the property line of the nonparticipating property | 50' |
| Public Road Rights-of-Way | 50' from the nearest edge | 1,442' |

## 3.3 HEIGHT

*No component of a solar panel as part of a commercial solar energy facility shall have a height of more than twenty feet (20') above ground when the solar energy facility's arrays are at full tilt.*

- Photovoltaic solar panel arrays are currently planned at approximately 9 feet in height with trackers/racking/string inverters. If other module configurations are considered in the future, the maximum height would be less than 20 feet. The racking system is to be installed via posts or augured screws. On-site power lines will be placed underground to the maximum extent possible until the point of interconnection.

## 3.4 FENCING

*A commercial solar energy facility's perimeter shall be enclosed by fencing having a height of at least six feet (6') and no more than twenty-five feet (25').*

- The solar facility will be enclosed by a National Electric Code-compliant perimeter security fence that is 7 feet high and includes a KnoxBox and keys provided to the County. The proposed fencing will secure all four sides of the array field. Refer to the SUP plan set, Sheet C-5.0, for additional information on the proposed perimeter fence.

## 3.5 VEGETATIVE GROUND COVER

*A commercial solar energy facility owner shall plant, establish, and maintain for the life of the facility vegetative ground cover consistent with State law and the guidelines of the Illinois Department of Natural Resources' vegetative management plans. The vegetation management plan shall be required at the time of application submittal.*

- The project area will be planted with native pollinator friendly prairie seed mixes. Refer to the SUP plan set, Sheet C-6.0, for additional information on seeding of the project area. A vegetation management plan will be provided with final engineering documents for construction permits.

## 3.6 LANDSCAPE SCREENING

*A vegetative screening shall be placed around the commercial solar energy facility.*

- The solar facility is located 1,434 feet away from the closest nonparticipating residence. Any existing vegetation on the property boundaries will be protected during construction and operation of the facility. Refer to the SUP plan set for additional information on the location of existing vegetation in relation to the solar facility components.

## 3.7 AGRICULTURAL IMPACT MITIGATION AGREEMENT

*The County shall not require standards for construction, decommissioning, or*

*deconstruction of a commercial solar energy system or related financial assurances to be more restrictive than agricultural impact mitigation agreement set in State law… A copy of the agricultural impact mitigation agreement shall be submitted with application materials.*

- An Agricultural Impact Mitigation Agreement (AIMA) with the Illinois Department of Agriculture is provided in **Appendix B**.

### 3.8 ROAD USE AGREEMENT

*The facility owner shall enter into a road use agreement with the jurisdiction having control over the applicable roads. The road use agreement shall follow applicable law. The facility owner shall supply the Kendall County PBZ Department with a copy of the road use agreement. This provision shall be waived if the jurisdiction having control over the applicable roads does not wish to enter into an agreement.*

- The proposed access road is off Ament Road. It is understood that an executed road use agreement between the applicable road jurisdictions and the applicant will be provided with final engineering plans.

## 4.0 SPECIAL USE APPLICATION CHECKLIST

### 4.1 APPLICATION FORM

A completed and signed application form is included in the SUP application packet.

### 4.2 APPLICATION FEE

The Special Use Permit application fee of $1,155 will be provided with the SUP application packet.

### 4.3 DETAILED DESCRIPTION OF PROPOSED USE

This narrative contains all information required in this checklist item and is part of the SUP application packet.

### 4.4 LEGAL DESCRIPTION OF PROPERTY INVOLVED

This document is included in the SUP application packet.

### 4.5 PROOF OF OWNERSHIP

This document is included in the SUP application packet.

### 4.6 BENEFICIARY DISCLOSURE STATEMENT, IF HELD IN TRUST

This document is included in the SUP application packet.

### 4.7 PROOF OF APPLICATION TO SWCD FOR NRI

The letter confirming receipt of the Natural Resources Inventory (NRI) report from the Soil & Water Conservation District (SWCD) is included in the SUP application packet.

4.8 **ENDANGERED SPECIAL CONSULTATION REPORT**
This document is included in the SUP application packet.

4.9 **SPECIAL USE FINDINGS OF FACT**
This document is included in the SUP application packet.

4.10 **ENGINEERING CONSULTANTS FEE DEPOSIT FORM**
This document is included in the SUP application packet.

4.11 **PLAT OF SURVEY**
There will be **15 copies** of the plat of survey signed with the Surveyor's seal provided in the SUP application packet.

4.12 **SITE PLAN**
There will be **15 copies** of the SUP plan set provided in the SUP application packet.

4.13 **SITE DATA**
All required site data is provided on the SUP plan set in the SUP application packet.

4.14 **PHOTOMETRIC PLAN**
There are no lights proposed with this project.

4.15 **LANDSCAPE PLAN**
There will be **2 copies** of the landscape plan, Sheet C-6.0, included in the SUP application packet. There are no trees proposed with the project, only pollinator friendly seed mixes.

4.16 **PHASING PLAN**
A phasing plan is not applicable to this project.

4.17 **BUILDING ELEVATIONS**
Building elevation sheets are not applicable to this project.

4.18 **SUPPLEMENTAL INFORMATION**
A wetland delineation report and stormwater memorandum are included in the SUP application packet.

# APPENDIX A

## LETTER FROM CITY OF YORKVILLE RE: ANNEXATION

**United City of Yorkville**
651 Prairie Pointe Drive
Yorkville, Illinois 60560
Telephone: 630-553-4350
www.yorkville.il.us

August 27, 2024

Matthew H. Asselmeier, AICP, CFM (VIA E-MAIL: masselmeier@kendallcountyil.gov)
Kendall County
Planning, Building & Zoning
111 West Fox Street
Yorkville, Illinois 60560

**RE: Ament Road Solar // PINS: 05-16-300-006 & 05-17-400-005**

Dear Mr. Asselmeier,

Section 7:01(D)(17)(a) of the Kendall County Zoning Ordinance states as follows:

> 17. Commercial Solar Energy Facility and Test Solar Energy Systems subject to the following conditions (Amended 5/16/23): a. All commercial solar energy facilities and test solar energy systems located within one point five (1.5) miles of a municipality shall either annex to the municipality or obtain an annexation agreement with the municipality requiring the municipality's regulations to flow through the property.

Please let this letter serve as the City of Yorkville's ("City") notice to Kendall County that the City does not currently seek to annex the above-referenced property or to enter into a pre-annexation agreement with the landowner and developer of this property.

[redacted]
Krysti J. Barksdale-Noble, AICP
Community Development Director

Cc: Kathleen F. Orr, City Attorney kfo@ottosenlaw.com
Bart Olson, City Administrator BOlson@yorkville.il.us
Tom Ryan tryan@newleafenergy.com
Nicholas Sandiford nstandiford@schainbanks.com

# APPENDIX B

## AGRICULTURAL IMPACT MITIGATION AGREEMENT (AIMA)

**STANDARD AGRICULTURAL IMPACT MITIGATION AGREEMENT**
between
**Ament Solar 1, LLC**

**and the**
**ILLINOIS DEPARTMENT OF AGRICULTURE**
**Pertaining to the Construction of a Commercial Solar Energy Facility**
**in**
**Kendall County, Illinois**

Pursuant to the Renewable Energy Facilities Agricultural Impact Mitigation Act (505 ILCS 147), the following standards and policies are required by the Illinois Department of Agriculture (IDOA) to help preserve the integrity of any Agricultural Land that is impacted by the Construction and Deconstruction of a Commercial Solar Energy Facility. They were developed with the cooperation of agricultural agencies, organizations, Landowners, Tenants, drainage contractors, and solar energy companies to comprise this Agricultural Impact Mitigation Agreement (AIMA).

Ament Solar 1, LLC, hereafter referred to as Commercial Solar Energy Facility Owner, or simply as Facility Owner, plans to develop and/or operate a 4.99MW Commercial Solar Energy Facility in Kendall County [GPS Coordinates: 41.591540, -88.443737 ], which will consist of up to 36 acres that will be covered by solar facility related components, such as solar panel arrays, racking systems, access roads, an onsite underground collection system, inverters and transformers and any affiliated electric transmission lines. This AIMA is made and entered between the Facility Owner and the IDOA.

If Construction does not commence within four years after this AIMA has been fully executed, this AIMA shall be revised, with the Facility Owner's input, to reflect the IDOA's most current Solar Farm Construction and Deconstruction Standards and Policies. This AIMA, and any updated AIMA, shall be filed with the County Board by the Facility Owner prior to the commencement of Construction.

The below prescribed standards and policies are applicable to Construction and Deconstruction activities occurring partially or wholly on privately owned agricultural land.

## Conditions of the AIMA

The mitigative actions specified in this AIMA shall be subject to the following conditions:

A. All Construction or Deconstruction activities may be subject to County or other local requirements. However, the specifications outlined in this AIMA shall be the minimum standards applied to all Construction or Deconstruction activities. IDOA may utilize any legal means to enforce this AIMA.

B. Except for Section 17. B. through F., all actions set forth in this AIMA are subject to modification through negotiation by Landowners and the Facility Owner, provided such changes are negotiated in advance of the respective Construction or Deconstruction activities.

C. The Facility Owner may negotiate with Landowners to carry out the actions that Landowners wish to perform themselves. In such instances, the Facility Owner shall offer Landowners the area commercial rate for their machinery and labor costs.

D. All provisions of this AIMA shall apply to associated future Construction, maintenance, repairs, and Deconstruction of the Facility referenced by this AIMA.

E. The Facility Owner shall keep the Landowners and Tenants informed of the Facility's Construction and Deconstruction status, and other factors that may have an impact upon their farming operations.

F. The Facility Owner shall include a statement of its adherence to this AIMA in any environmental assessment and/or environmental impact statement.

G. Execution of this AIMA shall be made a condition of any Conditional/Special Use Permit. Not less than 30 days prior to the commencement of Construction, a copy of this AIMA shall be provided by the Facility Owner to each Landowner that is party to an Underlying Agreement. In addition, this AIMA shall be incorporated into each Underlying Agreement.

H. The Facility Owner shall implement all actions to the extent that they do not conflict with the requirements of any applicable federal, state and local rules and regulations and other permits and approvals that are obtained by the Facility Owner for the Facility.

I. No later than 45 days prior to the Construction and/or Deconstruction of a Facility, the Facility Owner shall provide the Landowner(s) with a telephone number the Landowner can call to alert the Facility Owner should the Landowner(s) have questions or concerns with the work which is being done or has been carried out on his/her property.

J. If there is a change in ownership of the Facility, the Facility Owner assuming ownership of the Facility shall provide written notice within 90 days of ownership transfer, to the Department, the County, and to Landowners of such change. The Financial Assurance requirements and the other terms of this AIMA shall apply to the new Facility Owner.

K. The Facility Owner shall comply with all local, state and federal laws and regulations, specifically including the worker protection standards to protect workers from pesticide exposure.

L. Within 30 days of execution of this AIMA, the Facility Owner shall use Best Efforts to provide the IDOA with a list of all Landowners that are party to an Underlying Agreement and known Tenants of said Landowner who may be affected by the Facility. As the list of Landowners and Tenants is updated, the Facility Owner shall notify the IDOA of any additions or deletions.

M. If any provision of this AIMA is held to be unenforceable, no other provision shall be affected by that holding, and the remainder of the AIMA shall be interpreted as if it did not contain the unenforceable provision.

## Definitions

| | |
|---|---|
| Abandonment | When Deconstruction has not been completed within 12 months after the Commercial Solar Energy Facility reaches the end of its useful life. For purposes of this definition, a Commercial Solar Energy Facility shall be presumed to have reached the end of its useful life if the Commercial Solar Energy Facility Owner fails, for a period of 6 consecutive months, to pay the Landowner amounts owed in accordance with an Underlying Agreement. |

| | |
|---|---|
| Aboveground Cable | Electrical power lines installed above ground surface to be utilized for conveyance of power from the solar panels to the solar facility inverter and/or point of interconnection to utility grid or customer electric meter. |
| Agricultural Impact Mitigation Agreement (AIMA) | The Agreement between the Facility Owner and the Illinois Department of Agriculture (IDOA) described herein. |
| Agricultural Land | Land used for Cropland, hayland, pastureland, managed woodlands, truck gardens, farmsteads, commercial ag-related facilities, feedlots, livestock confinement systems, land on which farm buildings are located, and land in government conservation programs used for purposes as set forth above. |
| Best Efforts | Diligent, good faith, and commercially reasonable efforts to achieve a given objective or obligation. |
| Commercial Operation Date | The calendar date of which the Facility Owner notifies the Landowner, County, and IDOA in writing that commercial operation of the facility has commenced. If the Facility Owner fails to provide such notifications, the Commercial Operation Date shall be the execution date of this AIMA plus 6 months. |
| Commercial Solar Energy Facility (Facility) | A solar energy conversion facility equal to or greater than 500 kilowatts in total nameplate capacity, including a solar energy conversion facility seeking an extension of a permit to construct granted by a county or municipality before June 29, 2018. "Commercial solar energy facility" does not include a solar energy conversion facility: (1) for which a permit to construct has been issued before June 29, 2018; (2) that is located on land owned by the commercial solar energy facility owner; (3) that was constructed before June 29, 2018; or (4) that is located on the customer side of the customer's electric meter and is primarily used to offset that customer's electricity load and is limited in nameplate capacity to less than or equal to 2,000 kilowatts. |
| Commercial Solar Energy Facility Owner deemed (Facility Owner) | A person or entity that owns a commercial solar energy facility. A Commercial Solar Energy Facility Owner is not nor shall it be to be a public utility as defined in the Public Utilities Act. |
| County | The County or Counties where the Commercial Solar Energy Facility is located. |
| Construction | The installation, preparation for installation and/or repair of a Facility. |
| Cropland | Land used for growing row crops, small grains or hay; includes land which was formerly used as cropland, but is currently enrolled in a government conservation program; also includes pastureland that is classified as Prime Farmland. |

| | |
|---|---|
| Deconstruction | The removal of a Facility from the property of a Landowner and the restoration of that property as provided in the AIMA. |
| Deconstruction Plan | A plan prepared by a Professional Engineer, at the Facility's expense, that includes:<br>(1) the estimated Deconstruction cost, in current dollars at the time of filing, for the Facility, considering among other things:<br>i. the number of solar panels, racking, and related facilities involved;<br>ii. the original Construction costs of the Facility;<br>iii. the size and capacity, in megawatts of the Facility;<br>iv. the salvage value of the facilities (if all interests in salvage value are subordinate to that of the Financial Assurance holder if abandonment occurs);<br>v. the Construction method and techniques for the Facility and for other similar facilities; and<br>(2) a comprehensive detailed description of how the Facility Owner plans to pay for the Deconstruction of the Facility. |
| Department | The Illinois Department of Agriculture (IDOA). |
| Financial Assurance | A reclamation or surety bond or other commercially available financial assurance that is acceptable to the County, with the County or Landowner as beneficiary. |
| Landowner | Any person with an ownership interest in property that is used for agricultural purposes and that is party to an Underlying Agreement. |
| Prime Farmland | Agricultural Land comprised of soils that are defined by the USDA Natural Resources Conservation Service (NRCS) as "Prime Farmland" (generally considered to be the most productive soils with the least input of nutrients and management). |
| Professional Engineer | An engineer licensed to practice engineering in the State of Illinois. |
| Soil and Water Conservation District (SWCD) | A unit of local government that provides technical and financial assistance to eligible Landowners for the conservation of soil and water resources. |
| Tenant | Any person, apart from the Facility Owner, lawfully residing or leasing/renting land that is subject to an Underlying Agreement. |
| Topsoil | The uppermost layer of the soil that has the darkest color or the highest content of organic matter; more specifically, it is defined as the "A" horizon. |
| Underlying Agreement | The written agreement between the Facility Owner and the Landowner(s) including, but not limited to, an easement, option, lease, or license under the terms of which another person has constructed, constructs, or intends to construct a Facility on the property of the Landowner. |

| | |
|---|---|
| Underground Cable | Electrical power lines installed below the ground surface to be utilized for conveyance of power within a Facility or from a Commercial Solar Energy Facility to the electric grid. |
| USDA Natural Resources Conservation Service (NRCS) | An agency of the United States Department of Agriculture that provides America's farmers with financial and technical assistance to aid with natural resources conservation. |

## Construction and Deconstruction Standards and Policies

### 1. Support Structures

A. Only single pole support structures shall be used for the Construction and operation of the Facility on Agricultural Land. Other types of support structures, such as lattice towers or H-frames, may be used on nonagricultural land.

B. Where a Facility's Aboveground Cable will be adjacent and parallel to highway and/or railroad right-of-way, but on privately owned property, the support structures shall be placed as close as reasonably practicable and allowable by the applicable County Engineer or other applicable authorities to the highway or railroad right-of-way. The only exceptions may be at jogs or weaves on the highway alignment or along highways or railroads where transmission and distribution lines are already present.

C. When it is not possible to locate Aboveground Cable next to highway or railroad right-of-way, Best Efforts shall be expended to place all support poles in such a manner to minimize their placement on Cropland (i.e., longer than normal above ground spans shall be utilized when traversing Cropland).

### 2. Aboveground Facilities

Locations for facilities shall be selected in a manner that is as unobtrusive as reasonably possible to ongoing agricultural activities occurring on the land that contains or is adjacent to the Facility.

### 3. Guy Wires and Anchors

Best Efforts shall be made to place guy wires and their anchors, if used, out of Cropland, pastureland and hayland, placing them instead along existing utilization lines and on land other than Cropland. Where this is not feasible, Best Efforts shall be made to minimize guy wire impact on Cropland. All guy wires shall be shielded with highly visible guards.

### 4. Underground Cabling Depth

A. Underground electrical cables located outside the perimeter of the (fence) of the solar panels shall be buried with:

1. a minimum of 5 feet of top cover where they cross Cropland.
2. a minimum of 5 feet of top cover where they cross pastureland or other non-Cropland classified as Prime Farmland.
3. a minimum of 3 feet of top cover where they cross pastureland and other Agricultural Land not classified as Prime Farmland.

4. a minimum of 3 feet of top cover where they cross wooded/brushy land.

B. Provided that the Facility Owner removes the cables during Deconstruction, underground electric cables may be installed to a minimum depth of 18 inches:

1. Within the fenced perimeter of the Facility; or

2. When buried under an access road associated with the Facility provided that the location and depth of cabling is clearly marked at the surface.

C. If Underground Cables within the fenced perimeter of the solar panels are installed to a minimum depth of 5 feet, they may remain in place after Deconstruction.

**5. Topsoil Removal and Replacement**

A. Any excavation shall be performed in a manner to preserve topsoil. Best Efforts shall be made to store the topsoil near the excavation site in such a manner that it will not become intermixed with subsoil materials.

B. Best Efforts shall be made to store all disturbed subsoil material near the excavation site and separate from the topsoil.

C. When backfilling an excavation site, Best Efforts shall be used to ensure the stockpiled subsoil material will be placed back into the excavation site before replacing the topsoil.

D. Refer to Section 7 for procedures pertaining to rock removal from the subsoil and topsoil.

E. Refer to Section 8 for procedures pertaining to the repair of compaction and rutting of the topsoil.

F. Best Efforts shall be performed to place the topsoil in a manner so that after settling occurs, the topsoil's original depth and contour will be restored as close as reasonably practicable. The same shall apply where excavations are made for road, stream, drainage ditch, or other crossings. In no instance shall the topsoil materials be used for any other purpose unless agreed to explicitly and in writing by the Landowner.

G. Based on the mutual agreement of the landowner and Facility Owner, excess soil material resulting from solar facility excavation shall either be removed or stored on the Landowner's property and reseeded per the applicable National Pollution Discharge Elimination System (NPDES) permit/Stormwater Pollution Prevention Plan (SWPPP). After the Facility reaches the end of its Useful Life, the excess subsoil material shall be returned to an excavation site or removed from the Landowner's property, unless otherwise agreed to by Landowner.

**6. Rerouting and Permanent Repair of Agricultural Drainage Tiles**

The following standards and policies shall apply to underground drainage tile line(s) directly or indirectly affected by Construction and/or Deconstruction:

A. Prior to Construction, the Facility Owner shall work with the Landowner to identify drainage tile lines traversing the property subject to the Underlying Agreement to the extent reasonably practicable. All drainage tile lines identified in this manner shall be shown on the Construction and Deconstruction Plans.

B. The location of all drainage tile lines located adjacent to or within the footprint of the Facility shall be recorded using Global Positioning Systems (GPS) technology. Within 60 days after Construction is complete, the Facility Owner shall provide the Landowner, the IDOA, and the respective County Soil and Water Conservation District (SWCD) with "as built" drawings (strip maps) showing the location of all drainage tile lines by survey station encountered in the Construction of the Facility, including any tile line repair location(s), and any underground cable installed as part of the Facility.

C. **Maintaining Surrounding Area Subsurface Drainage**

If drainage tile lines are damaged by the Facility, the Facility Owner shall repair the lines or install new drainage tile line(s) of comparable quality and cost to the original(s), and of sufficient size and appropriate slope in locations that limit direct impact from the Facility. If the damaged tile lines cause an unreasonable disruption to the drainage system, as determined by the Landowner, then such repairs shall be made promptly to ensure appropriate drainage. Any new line(s) may be located outside of, but adjacent to the perimeter of the Facility. Disrupted adjacent drainage tile lines shall be attached thereto to provide an adequate outlet for the disrupted adjacent tile lines.

D. **Re-establishing Subsurface Drainage Within Facility Footprint**

Following Deconstruction and using Best Efforts, if underground drainage tile lines were present within the footprint of the facility and were severed or otherwise damaged during original Construction, facility operation, and/or facility Deconstruction, the Facility Owner shall repair existing drainage tiles or install new drainage tile lines of comparable quality and cost to the original, within the footprint of the Facility with sufficient capacity to restore the underground drainage capacity that existed within the footprint of the Facility prior to Construction. Such installation shall be completed within 12 months after the end of the useful life of the Facility and shall be compliant with Figures 1 and 2 to this Agreement or based on prudent industry standards if agreed to by Landowner.

E. If there is any dispute between the Landowner and the Facility Owner on the method of permanent drainage tile line repair, the appropriate County SWCD's opinion shall be considered by the Facility Owner and the Landowner.

F. During Deconstruction, all additional permanent drainage tile line repairs beyond those included above in Section 6.D. must be made within 30 days of identification or notification of the damage, weather and soil conditions permitting. At other times, such repairs must be made at a time mutually agreed upon by the Facility Owner and the Landowner. If the Facility Owner and Landowner cannot agree upon a reasonable method to complete this restoration, the Facility Owner may implement the recommendations of the appropriate County SWCD and such implementation constitutes compliance with this provision.

G. Following completion of the work required pursuant to this Section, the Facility Owner shall be responsible for correcting all drainage tile line repairs that fail due to Construction and/or Deconstruction for one year following the completion of Construction or Deconstruction, provided those repairs were made by the Facility Owner. The Facility Owner shall not be responsible for drainage tile repairs that the Facility Owner pays the Landowner to perform.

## 7. Rock Removal

With any excavations, the following rock removal procedures pertain only to rocks found in the uppermost 42 inches of soil, the common freeze zone in Illinois, which emerged or were brought to the site as a result of Construction and/or Deconstruction.

A. Before replacing any topsoil, Best Efforts shall be taken to remove all rocks greater than 3 inches in any dimension from the surface of exposed subsoil which emerged or were brought to the site as a result of Construction and/or Deconstruction.

B. If trenching, blasting, or boring operations are required through rocky terrain, precautions shall be taken to minimize the potential for oversized rocks to become interspersed in adjacent soil material.

C. Rocks and soil containing rocks removed from the subsoil areas, topsoil, or from any excavations, shall be removed from the Landowner's premises or disposed of on the Landowner's premises at a location that is mutually acceptable to the Landowner and the Facility Owner.

## 8. Repair of Compaction and Rutting

A. Unless the Landowner opts to do the restoration work on compaction and rutting, after the topsoil has been replaced post-Deconstruction, all areas within the boundaries of the Facility that were traversed by vehicles and Construction and/or Deconstruction equipment that exhibit compaction and rutting shall be restored by the Facility Owner. All prior Cropland shall be ripped at least 18 inches deep or to the extent practicable, and all pasture and woodland shall be ripped at least 12 inches deep or to the extent practicable. The existence of drainage tile lines or underground utilities may necessitate less ripping depth. The disturbed area shall then be disked.

B. All ripping and disking shall be done at a time when the soil is dry enough for normal tillage operations to occur on Cropland adjacent to the Facility.

C. The Facility Owner shall restore all rutted land to a condition as close as possible to its original condition upon Deconstruction, unless necessary earlier as determined by the Landowner.

D. If there is any dispute between the Landowner and the Facility Owner as to what areas need to be ripped/disked or the depth at which compacted areas should be ripped/disked, the appropriate County SWCD's opinion shall be considered by the Facility Owner and the Landowner.

## 9. Construction During Wet Weather

Except as provided below, construction activities are not allowed on agricultural land during times when normal farming operations, such as plowing, disking, planting or harvesting, cannot take place due to excessively wet soils. With input from the landowner, wet weather conditions may be determined on a field by field basis.

A. Construction activities on prepared surfaces, surfaces where topsoil and subsoil have been removed, heavily compacted in preparation, or otherwise stabilized (e.g. through cement mixing) may occur at the discretion of the Facility Owner in wet weather conditions.

B. Construction activities on unprepared surfaces will be done only when work will not result in rutting which may mix subsoil and topsoil. Determination as to the potential of subsoil and topsoil mixing will be made in consultation with the underlying Landowner, or, if approved by the Landowner, his/her designated tenant or designee.

**10. Prevention of Soil Erosion**

A. The Facility Owner shall work with Landowners and create and follow a SWPPP to prevent excessive erosion on land that has been disturbed by Construction or Deconstruction of a Facility.

B. If the Landowner and Facility Owner cannot agree upon a reasonable method to control erosion on the Landowner's property, the Facility Owner shall consider the recommendations of the appropriate County SWCD to resolve the disagreement.

C. The Facility Owner may, per the requirements of the project SWPPP and in consultation with the Landowner, seed appropriate vegetation around all panels and other facility components to prevent erosion. The Facility Owner must utilize Best Efforts to ensure that all seed mixes will be as free of any noxious weed seeds as possible. The Facility Owner shall consult with the Landowner regarding appropriate varieties to seed.

**11. Repair of Damaged Soil Conservation Practices**

Consultation with the appropriate County SWCD by the Facility Owner shall be carried out to determine if there are soil conservation practices (such as terraces, grassed waterways, etc.) that will be damaged by the Construction and/or Deconstruction of the Facility. Those conservation practices shall be restored to their preconstruction condition as close as reasonably practicable following Deconstruction in accordance with USDA NRCS technical standards. All repair costs shall be the responsibility of the Facility Owner.

**12. Compensation for Damages to Private Property**

The Facility Owner shall reasonably compensate Landowners for damages caused by the Facility Owner. Damage to Agricultural Land shall be reimbursed to the Landowner as prescribed in the applicable Underlying Agreement.

**13. Clearing of Trees and Brush**

A. If trees are to be removed for the Construction or Deconstruction of a Facility, the Facility Owner shall consult with the Landowner to determine if there are trees of commercial or other value to the Landowner.

B. If there are trees of commercial or other value to the Landowner, the Facility Owner shall allow the Landowner the right to retain ownership of the trees to be removed and the disposition of the removed trees shall be negotiated prior to the commencement of land clearing.

**14. Access Roads**

A. To the extent practicable, access roads shall be designed to not impede surface drainage and shall be built to minimize soil erosion on or near the access roads.

B. Access roads may be left intact during Construction, operation or Deconstruction through mutual agreement of the Landowner and the Facility Owner unless otherwise restricted by federal, state, or local regulations.

C. If the access roads are removed, Best Efforts shall be expended to assure that the land shall be restored to equivalent condition(s) as existed prior to their construction, or as otherwise agreed to by the Facility Owner and the Landowner. All access roads that are removed shall be ripped to a depth of 18 inches. All ripping shall be performed consistent with Section 8.

**15. Weed/Vegetation Control**

A. The Facility Owner shall provide for weed control in a manner that prevents the spread of weeds. Chemical control, if used, shall be done by an appropriately licensed pesticide applicator.

B. The Facility Owner shall be responsible for the reimbursement of all reasonable costs incurred by owners of agricultural land where it has been determined by the appropriate state or county entity that weeds have spread from the Facility to their property. Reimbursement is contingent upon written notice to the Facility Owner. Facility Owner shall reimburse the property owner within 45 days after notice is received.

C. The Facility Owner shall ensure that all vegetation growing within the perimeter of the Facility is properly and appropriately maintained. Maintenance may include, but not be limited to, mowing, trimming, chemical control, or the use of livestock as agreed to by the Landowner.

D. The Deconstruction plans must include provisions for the removal of all weed control equipment used in the Facility, including weed-control fabrics or other ground covers.

**16. Indemnification of Landowners**

The Facility Owner shall indemnify all Landowners, their heirs, successors, legal representatives, and assigns from and against all claims, injuries, suits, damages, costs, losses, and reasonable expenses resulting from or arising out of the Commercial Solar Energy Facility, including Construction and Deconstruction thereof, and also including damage to such Facility or any of its appurtenances, except where claims, injuries, suits, damages, costs, losses, and expenses are caused by the negligence or intentional acts, or willful omissions of such Landowners, and/or the Landowners heirs, successors, legal representatives, and assigns.

**17. Deconstruction Plans and Financial Assurance of Commercial Solar Energy Facilities**

A. Deconstruction of a Facility shall include the removal/disposition of all solar related equipment/facilities, including the following utilized for operation of the Facility and located on Landowner property:

1. Solar panels, cells and modules;
2. Solar panel mounts and racking, including any helical piles, ground screws, ballasts, or other anchoring systems;
3. Solar panel foundations, if used (to depth of 5 feet);

4. Transformers, inverters, energy storage facilities, or substations, including all components and foundations; however, Underground Cables at a depth of 5 feet or greater may be left in place;
5. Overhead collection system components;
6. Operations/maintenance buildings, spare parts buildings and substation/switching gear buildings unless otherwise agreed to by the Landowner;
7. Access Road(s) unless Landowner requests in writing that the access road is to remain;
8. Operation/maintenance yard/staging area unless otherwise agreed to by the Landowner; and
9. Debris and litter generated by Deconstruction and Deconstruction crews.

B. The Facility Owner shall, at its expense, complete Deconstruction of a Facility within twelve (12) months after the end of the useful life of the Facility.

C. During the County permit process, or if none, then prior to the commencement of construction, the Facility Owner shall file with the County a Deconstruction Plan. The Facility Owner shall file an updated Deconstruction Plan with the County on or before the end of the tenth year of commercial operation.

D. The Facility Owner shall provide the County with Financial Assurance to cover the estimated costs of Deconstruction of the Facility. Provision of this Financial Assurance shall be phased in over the first 11 years of the Project's operation as follows:

1. On or before the first anniversary of the Commercial Operation Date, the Facility Owner shall provide the County with Financial Assurance to cover ten (10) percent of the estimated costs of Deconstruction of the Facility as determined in the Deconstruction Plan.
2. On or before the sixth anniversary of the Commercial Operation Date, the Facility Owner shall provide the County with Financial Assurance to cover fifty (50) percent of the estimated costs of Deconstruction of the Facility as determined in the Deconstruction Plan.
3. On or before the eleventh anniversary of the Commercial Operation Date, the Facility Owner shall provide the County with Financial Assurance to cover one hundred (100) percent of the estimated costs of Deconstruction of the Facility as determined in the updated Deconstruction Plan provided during the tenth year of commercial operation.

The Financial Assurance shall not release the surety from liability until the Financial Assurance is replaced. The salvage value of the Facility may only be used to reduce the estimated costs of Deconstruction if the County agrees that all interests in the salvage value are subordinate or have been subordinated to that of the County if Abandonment occurs.

E. The County may, but is not required to, reevaluate the estimated costs of Deconstruction of any Facility after the tenth anniversary, and every five years thereafter, of the Commercial Operation Date. Based on any reevaluation, the County may require changes in the level of Financial Assurance used to calculate the phased Financial Assurance levels described in Section 17.D. required from the Facility Owner. If the County is unable to its satisfaction to perform the investigations necessary to approve the Deconstruction Plan filed by the Facility Owner, then the County and Facility may mutually agree on the selection of a Professional Engineer independent of the Facility Owner to conduct any necessary investigations. The Facility Owner shall be responsible for the cost of any such investigations.

F. Upon Abandonment, the County may take all appropriate actions for Deconstruction including drawing upon the Financial Assurance.

## Concurrence of the Parties to this AIMA

The Illinois Department of Agriculture and Ament Solar 1, LLC concur that this AIMA is the complete AIMA governing the mitigation of agricultural impacts that may result from the Construction and Deconstruction of the solar farm project in Kendall County within the State of Illinois.

The effective date of this AIMA commences on the date of execution.

**STATE OF ILLINOIS**
**DEPARTMENT OF AGRICULTURE**

[redacted]

By: Jerry Costello II, Director

[redacted]

By Clay Nordsiek, Deputy General Counsel

801 E. Sangamon Avenue,
State Fairgrounds, POB 19281
Springfield, IL 62794-9281

7/19, 2024

**Ament Solar 1, LLC**

[redacted]

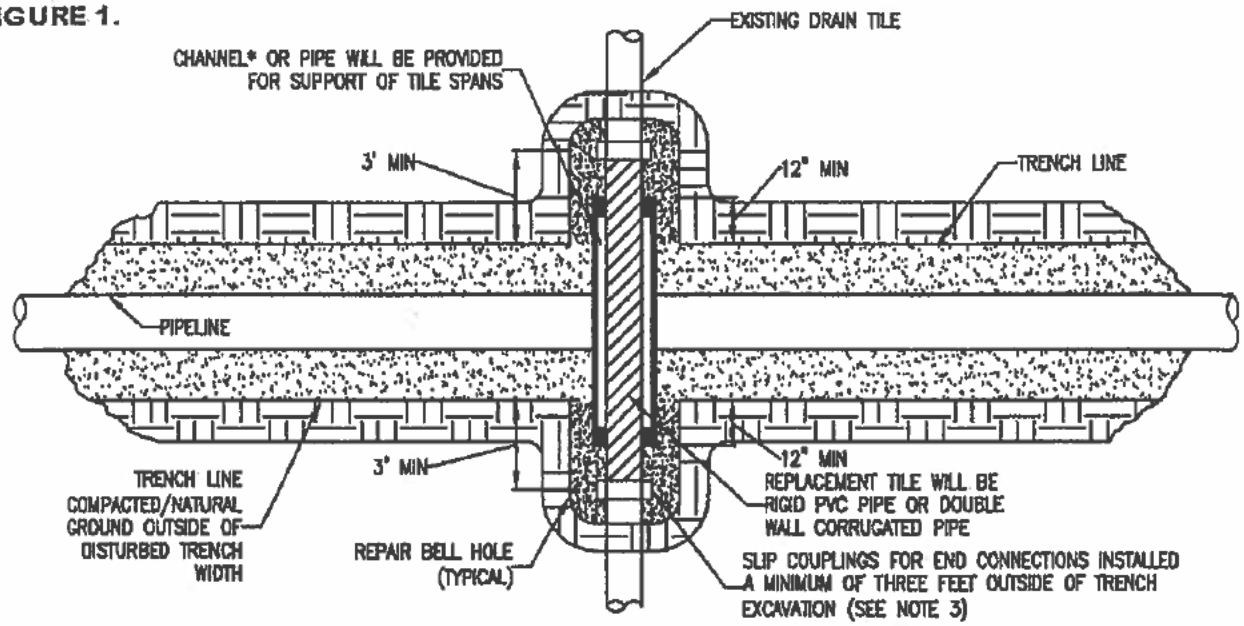
By Nicholas Bellone

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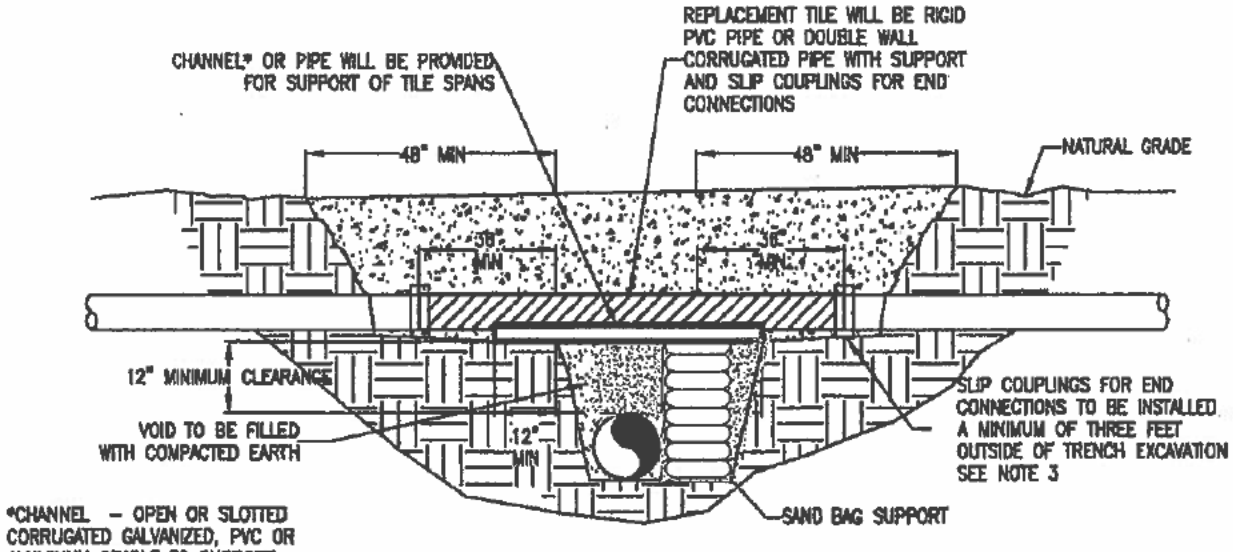
Address

July 16, 2024

**FIGURE 1.**




**PLAN**
N.T.S.




*CHANNEL – OPEN OR SLOTTED CORRUGATED GALVANIZED, PVC OR ALUMINUM CRADLE TO SUPPORT DRAIN TILE.

**CROSS SECTION**
N.T.S.

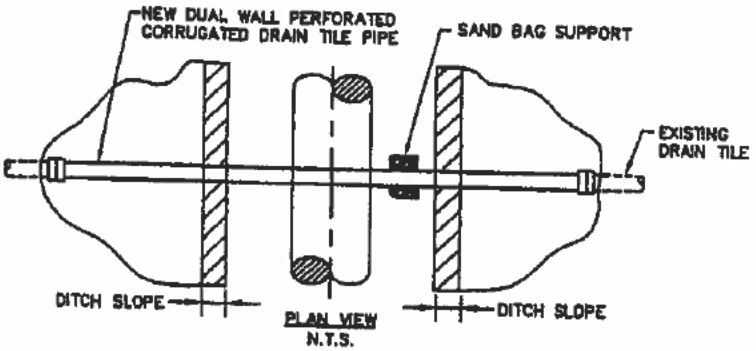
NOTE:

1. IMMEDIATELY REPAIR TILE IF WATER IS FLOWING THROUGH TILE AT TIME OF TRENCHING. IF NO WATER IS FLOWING AND TEMPORARY REPAIR IS DELAYED, OR NOT MADE BY THE END OF THE WORK DAY, A SCREEN OR APPROPRIATE 'NIGHT CAP' SHALL BE PLACED ON OPEN ENDS OF TILE TO PREVENT ENTRAPMENT OF ANIMALS ETC.
2. CHANNEL OR PIPE (OPEN OR SLOTTED) MADE OF CORRUGATED GALVANIZED PIPE, PVC OR ALUMINUM WILL BE USED FOR SUPPORT OF DRAIN TILE SPANS.
3. INDUSTRY STANDARDS SHALL BE FOLLOWED TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES.

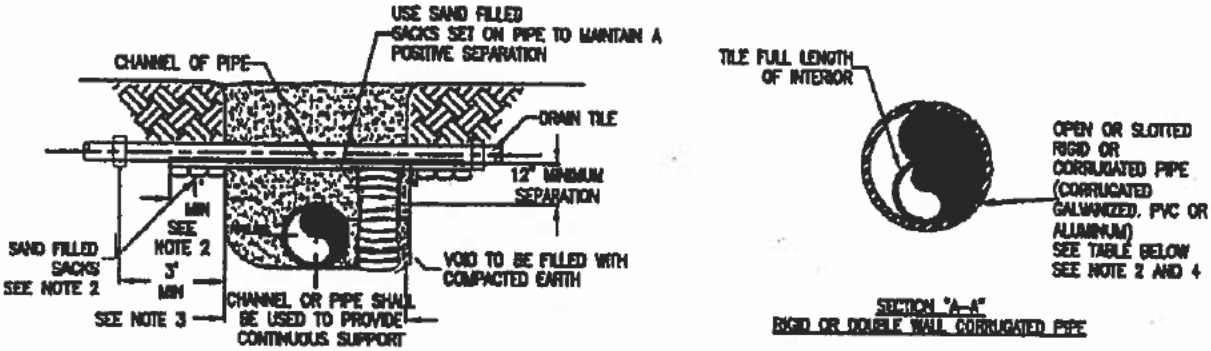
# TEMPORARY DRAIN TILE REPAIR

PAGE 1 of 2

**FIGURE 2.**




## PLAN VIEW




## END VIEWS

| MINIMUM SUPPORT TABLE | | | |
|---|---|---|---|
| TILE SIZE | CHANNEL SIZE | PIPE SIZE | |
| 3" | 4" @ 5.4 #/ft | 4" | STD. WT. |
| 4"-5" | 5" @ 6.7 #/ft | 6" | STD. WT. |
| 6"-9" | 7" @ 9.8 #/ft | 9"-10" | STD. WT. |
| 10" | 10" @ 15.3 #/ft | 12" | STD. WT. |

NOTE:

1. TILE REPAIR AND REPLACEMENT SHALL MAINTAIN ORIGINAL ALIGNMENT GRADIENT AND WATER FLOW TO THE GREATEST EXTENT POSSIBLE. IF THE TILE NEEDS TO BE RELOCATED, THE INSTALLATION ANGLE MAY VARY DUE TO SITE SPECIFIC CONDITIONS AND LANDOWNER RECOMMENDATIONS.
2. 1'-0" MINIMUM LENGTH OF CHANNEL OR RIGID PIPE (OPEN OR SLOTTED CORRUGATED GALVANIZED, PVC OR ALUMINUM CRADLE) SHALL BE SUPPORTED BY UNDISTURBED SOIL, OR IF CROSSING IS NOT AT RIGHT ANGLES TO PIPELINE, EQUIVALENT LENGTH PERPENDICULAR TO TRENCH. SHIM WITH SAND BAGS TO UNDISTURBED SOIL FOR SUPPORT AND DRAINAGE GRADIENT MAINTENANCE (TYPICAL BOTH SIDES).
3. DRAIN TILES WILL BE PERMANENTLY CONNECTED TO EXISTING DRAIN TILES A MINIMUM OF THREE FEET OUTSIDE OF EXCAVATED TRENCH LINE USING INDUSTRY STANDARDS TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES INCLUDING SLIP COUPLINGS.
4. DIAMETER OF RIGID PIPE SHALL BE OF ADEQUATE SIZE TO ALLOW FOR THE INSTALLATION OF THE TILE FOR THE FULL LENGTH OF THE RIGID PIPE.
5. OTHER METHODS OF SUPPORTING DRAIN TILE MAY BE USED IF ALTERNATE PROPOSED IS EQUIVALENT IN STRENGTH TO THE CHANNEL/PIPE SECTIONS SHOWN AND IF APPROVED BY COMPANY REPRESENTATIVES AND LANDOWNER IN ADVANCE. SITE SPECIFIC ALTERNATE SUPPORT SYSTEM TO BE DEVELOPED BY COMPANY REPRESENTATIVES AND FURNISHED TO CONTRACTOR FOR SPANS IN EXCESS OF 20', TILE GREATER THEN 10" DIAMETER, AND FOR "HEADER" SYSTEMS.
6. ALL MATERIAL TO BE FURNISHED BY CONTRACTOR.
7. PRIOR TO REPAIRING TILE, CONTRACTOR SHALL PROBE LATERALLY INTO THE EXISTING TILE TO FULL WIDTH OF THE RIGHTS OF WAY TO DETERMINE IF ADDITIONAL DAMAGE HAS OCCURRED. ALL DAMAGED/DISTURBED TILE SHALL BE REPAIRED AS NEAR AS PRACTICABLE TO ITS ORIGINAL OR BETTER CONDITION.

# PERMANENT DRAIN TILE REPAIR

PAGE 2 of 2

## SCHEDULE A - EXHIBIT A

**Parcel 1:**
**Parcel ID No.: 05-16-300-006**

58.0 acres, more or less, being out of Section 16, Township 36 North, Range 7 East of the Third Principal Meridian, Kendall County, Illinois, and being a part of that certain 93.4 acres, more or less, of land, and said 58.0 acres being all of the 93.4 acres, more or less, that lies within the lateral boundaries of said Section 16, Township 36 North, Range 7 East of the Third Principal Meridian, Kendall County, Illinois, more particularly described as follows:

The Southerly 93.4 acres, more or less, of the following described parcels 1 and 2, said acreage lying South of a line being the center of Ament Road:

**Parcel One**
That part of the Southwest Quarter of the Southwest Quarter of Section 16 and part of the Southeast Quarter of the Southeast Quarter of Section 17, Township 36 North, Range 7 East of the Third Principal Meridian described as follows: Commencing at the Northwest Corner of the Southwest Quarter of said Section 16; thence due East along the North line of said Southwest Quarter, 665.69 feet to the West line of the East 10.04 chains of the West half of the West half of said Section 16; thence South 0° 30' 2" West along said West line 1485.28 feet to a line drawn parallel with and 1155 feet North of, as measured along the East line of the Southwest Quarter of said Southwest Quarter the South line of said Southwest Quarter for the point of beginning; thence South 89° 50' 27" East along said parallel line 662.63 feet to the East line of said Quarter Quarter; thence South 0° 30' 2" West along said East line 1155 feet to the Southeast Corner of said Quarter Quarter; thence North 89° 50' 27" West along the South line of .said Quarter Quarter 1330.09 feet to the Southwest Corner thereof; thence North 89° 46' 8" West along the South line of the Southeast Quarter of said Section 17, 188.76 feet; thence North 0° 32' 21" East parallel with the East line of said Southeast Quarter, 1155 feet; thence Easterly to the point of beginning in the Township of Kendall, Kendall County, Illinois.

**Parcel Two**
That part of the West half of Section 16 and part of the East half of Section 17, Township 36 North, Range 7 East of the Third Principal Meridian, described as follows: Commencing at the Southeast corner of said Section 17; thence North 89° 46' 8" West along the South line of said Section 17, 188.76 feet; thence North 0° 32' 21" East parallel with the East line of said Section 17, 1155 feet for the point of beginning; thence North 89° 46' 8" West parallel with the South line of said Section 17, 758.94 feet; thence North 0° 30' 2" East parallel with the West line of the East 10.04 chains of the West half of the West half of said Section 16, 2285.72 feet; thence South 89° 29' 58" East 128.7 feet; thence North 0º 30' 2" East parallel with the West line of the East 10.04 chains of the West half of the West half of Section 16, 1188 feet; thence South 89° 29' 58" East 1485.66 feet to the West line of the East 10.04 chains of the West half of the West half of said Section 16; thence South 0º 30' 2" West along said West line 3465.28 feet to a line drawn parallel with and 1155 feet North of the South line of the Southwest Quarter of the Southwest Quarter of said Section 16, as measured along the East line of said Quarter Quarter; thence Westerly to the point of beginning; Excepting therefrom the following: That part of the Northeast Quarter of Section 17, Township 36 North, Range 7 East of the Third Principal Meridian, described as follows: Commencing at the Southeast corner of said Northeast Quarter; thence Northerly along the East line of said Northeast Quarter, 4.13 feet to the center line of Ament Road; thence Westerly along said center line, 65.0 feet for the point of beginning; thence Westerly along said center line, 220.0 feet; thence Northerly at right angles to said center line, 348.0 feet; thence Easterly parallel with said center line, 220.0 feet; thence Southerly at right angles to the last described course, 348.0 feet to the point of beginning, in Kendall Township, Kendall County, Illinois; AND that part of the Southwest Quarter of Section 16, Township 36 North, Range 7 East of the Third Principal Meridian described as follows: Commencing at the Northwest corner of said Southwest Quarter; thence Easterly along the North line of said Southwest Quarter, 658.60 feet for the point of beginning; thence Southerly along the line of a fence which forms an angle of 89° 13' 17" with the last described course (measured counter-clockwise therefrom) 255.63 feet; thence Easterly parallel with said North line to the West line of the Easterly 10.04 chains of the West Half of said Southwest Quarter; thence Northerly along said West line to said North line; thence Westerly along said North line to the point of beginning, all in the Township of Kendall, Kendall County, Illinois.

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**Parcel 2:**
**Parcel ID No.: 05-17-400-005**

35.4 acres, more or less, being out of Section 17, Township 36 North, Range 7 East of the Third Principal Meridian, Kendall County, Illinois, and being a part of that certain 93.4 acres, more or less, of land, and said 35.4 acres being all of the 93.4 acres, more or less, that lies within the lateral boundaries of said Section 17, Township 36 North, Range 7 East of the Third Principal Meridian, Kendall County, Illinois, more particularly described as follows:

The Southerly 93.4 acres, more or less, of the following described Parcels1 and 2, said acreage lying South of a line being the center of Ament Road:

**Parcel One**
That part of the Southwest Quarter of the Southwest Quarter of Section 16 and part of the Southeast Quarter of the Southeast Quarter of Section 17, Township 36 North, Range 7 East of the Third Principal Meridian described as follows: Commencing at the Northwest corner of the Southwest Quarter of said Section 16; thence due East along the North line of said Southwest Quarter, 665.69 feet to the West line of the East 10.04 chains of the West half of the West half of said Section 16; thence South 0° 30' 2" West along said West line 1485.28 feet to a line drawn parallel with and 1155 feet North of, as measured along the East line of the Southwest Quarter of said Southwest Quarter the South line of said Southwest Quarter for the point of beginning; thence South 89° 50' 27" East along said parallel line 662.63 feet to the East line of said Quarter Quarter; thence South 0° 30' 2" West along said East line 1155 feet to the Southeast corner of said Quarter Quarter; thence North 89° 50' 27" West along the South line of said Quarter Quarter 1330.09 feet to the Southwest corner thereof; thence North 89° 46' 8" West along the South line of the Southeast Quarter of said Section 17, 188.76 feet; thence North 0° 32' 21" East parallel with the East line of said Southeast Quarter, 1155 feet; thence Easterly to the point of beginning in the Township of Kendall, Kendall County, Illinois.

**Parcel Two**
That part of the West half of Section 16 and part of the East half of Section 17, Township 36 North, Range 7 East of the Third Principal Meridian, described as follows: Commencing at the Southeast corner of said Section 17; thence North 89° 46' 8" West along the South line of said Section 17, 188.76 feet; thence North 0° 32' 21" East parallel with the East line of said Section 17, 1155 feet for the point of beginning; thence North 89° 46' 8" West parallel with the South line of said Section 17, 758.94 feet; thence North 0° 30 '2" East parallel with the West line of the East 10.04 chains of the West half of the West half of said Section 16, 2285.72 feet; thence South 89° 29' 8" East 128.7 feet; thence North 0° 30' 2" East parallel with the West line of the East 10.04 chains of the West half of the West half of Section 16, 1188 feet; thence South 89° 29' 58" East 1485.66 feet to the West line of the East 10.04 chains of the West half of the West half of said Section 16; thence South 0° 30' 2" West along said West line 3465.28 feet to a line drawn parallel with and1155 feet North of the South line of the Southwest Quarter of the Southwest Quarter of said Section 16, as measured along the East line of said Quarter Quarter; thence Westerly to the point of beginning; excepting therefrom the following: That part of the Northeast Quarter of Section 17, Township 36 North, Range 7 East of the Third Principal Meridian, described as follows: Commencing at the Southeast corner of said Northeast Quarter; thence Northerly along the East line of said Northeast Quarter, 4.13 feet to the center line of Ament Road; thence Westerly along said center line, 65.0 feet for the point of beginning; thence Westerly along said center line, 220.0 feet; thence Northerly at right angles to said center line, 348.0 feet; thence Easterly parallel with said centerline, 220.0 feet; thence Southerly at right angles to the last described course, 348.0 feet to the point of beginning, in Kendall Township, Kendall County, Illinois; AND that part of the Southwest Quarter of Section 16,Township 36 North, Range 7 East of the Third Principal Meridian described as follows: Commencing at the Northwest corner of said Southwest Quarter; thence Easterly along the North line of said Southwest Quarter, 658.60 feet for the point of beginning; thence Southerly along the line of a fence which forms an angle of 89° 13' 17" with the last described course (measured counter-clockwise therefrom) 255.63 feet; thence Easterly parallel with said North line to the West line of the Easterly 10.04 chains of the West Half of said Southwest quarter; thence Northerly along said West line to said North line; thence Westerly along said North line to the point of beginning ,all in the Township of Kendall, Kendall County, Illinois.

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QUIT CLAIM DEED
Statutory (ILLINOIS)

201300005788

DEBBIE
GILLETTE
KENDALL COUNTY, IL

RECORDED: 3/15/2013 11:52 AM
QCD: 50.00 RHSPS FEE: 10.00
PAGES: 5

THE GRANTOR Janet Dhuse
of the [redacted]n
the [redacted]d State
[redacted]or and in consideration
of Ten and No/100 Dollars in hand paid
CONVEYS and QUIT CLAIMS to

Janet Dhuse as trustee of The Janet Dhuse Family Trust,
Declaration of Trust dated March 1, 2013
[redacted]

Any and all interest she may have in the following described real estate, situated in the County of Kendall in the State of Illinois, to-wit

SEE ATTACHED

Hereby releasing and waiving all rights under and by virtue of the Homestead Exemption Laws of the State of Illinois

This transaction exempt under the provisions of Paragraph 35 ILCS 200/31-45(e) of the Real Estate Transfer Tax Law

DATE 3-1-2013

[redacted]
LEGAL REPRESENTATIVE

Permanent Real Estate Index Number(s) 05-16-300-006 and 05-17-400-005

Address(es) of Real Estate Rural Route, Ament Road, Yorkville, Illinois 60560

DATED this 1st day of March, 2013

[redacted] (SEAL)
JANET DHUSE

5

QUIT CLAIM DEED
Statutory (ILLINOIS)

State of Illinois, County of Kendall SS I the undersigned, a Notary Public in and for said County, in the State aforesaid, DO HEREBY CERTIFY that JANET DHUSE

Personally known to me to be the same person whose name subscribed to the foregoing instrument, appeared before me this day in person, and acknowledged that she signed, sealed and delivered the instrument as her free and voluntary act, for the uses and purposes therein set forth, including the release and waiver of the right of homestead

Given under my hand and official seal this 1st day of March, 2013

Commission expires 7-28, 2014 [redacted]

NOTARY PUBLIC

"OFFICIAL SEAL"
PAM MONKEMEYER
[redacted] OF ILLINOIS
MY COMMISSION EXPIRES 7/28/2014

This instrument was prepared by Joseph R Voiland, [redacted]

Mail to

Joseph R Voiland
[redacted]

Send Subsequent Tax Bills to

Janet Dhuse
[redacted]

Recorder's Office Box No _____

## RIDER

### Legal Description

The Southerly 93 4 acres of the following described parcels 1 and 2, said acreage lying South of a line being the center of Ament Road

### PARCEL 1

That part of the Southwest quarter of the Southwest quarter of Section 16 and part of the Southeast quarter of the Southeast quarter of Section 17, Township 36 North, Range 7, East of the Third Principal Meridian, described as follows: Commencing at the Northwest corner of the Southwest quarter of said Section 16; thence due East along the North line of said Southwest quarter, 665.69 feet to the West line of the East 10.04 chains of the West half of the West half of said Section 16, thence South 0°30'2" West along said West line 1485 28 feet to a line drawn parallel with and 1155 feet North of, as measured along the East line of the Southwest quarter of said Southwest quarter the South line of said Southwest quarter for the point of beginning; thence South 89°50'27" East along said parallel line 662 63 feet to the East line of said quarter quarter, thence South 0°30'2" West along said East line 1155 feet to the Southeast corner of said quarter quarter; thence North 89°50'27" West along the South line of said quarter quarter 1330.09 feet to the Southwest corner thereof, thence North 89°46'8" West along the South line of the Southeast quarter of said Section 17, 188 76 feet, thence North 0°32'21" East parallel with the East line of said Southeast quarter, 1155 feet, thence Easterly to the point of beginning, in the Township of Kendall, Kendall County, Illinois,

### PARCEL 2

That part of the West 1/2 of Section 16 and part of the East 1/2 of Section 17, Township 36 North, Range 7 East of the Third Principal Meridian, described as follows Commencing at the Southeast corner of said Section 17, thence North 89°46'8" West along the South line of said Section 17, 188 76 feet, thence North 0°32'21" East parallel with the East line of said Section 17, 1155 feet for the point of beginning; thence North 89°46'8" West parallel with the South line of said Section 17, 758.94 feet; thence North 0°30'2" East parallel with the West line of the East 10.04 chains of the West 1/2 of the West 1/2 of said Section 16, 2285 72 feet, thence South 89°29'58" East 128.7 feet, thence North 0°30'2" East parallel with the West line of the East 10.04 chains of the West 1/2 of the West 1/2 of Section 16, 1188 feet, thence South 89°29'58" East 1485 66 feet to the West line of the East 10 04 chains of the West 1/2 of the West 1/2 of said Section 16; thence South 0°30'2" West along said West line 3465.28 feet to a line drawn parallel with and 1155 feet North of the South line of the Southwest quarter of the Southwest quarter of said Section 16, as measured along the East line of said quarter quarter; thence Westerly to the point of beginning, excepting therefrom the following· That part of the North East 1/4 of Section 17, Township 36 North, Range 7 East of the Third Principal Meridian, described as follows: Commencing at the South East corner of said North East 1/4; thence Northerly along the East line of said North East 1/4, 4 13 feet to the center line of Ament Road, thence Westerly along said center line, 65.0 feet for the point of

beginning, thence Westerly along said center line, 220 0 feet; thence Northerly at right angles to said center line, 348 0 feet, thence Easterly parallel with said center line, 220.0 feet; thence Southerly at right angles to the last described course, 348 0 feet to the point of beginning, in Kendall Township, Kendall County, Illinois, AND that part of the Southwest Quarter of Section 16, Township 36 North, Range 7 East of the Third Principal Meridian described as follows: Commencing at the Northwest corner of said Southwest Quarter, thence Easterly along the North line of said Southwest Quarter, 658.60 feet for the point of beginning; thence Southerly along the line of a fence which forms an angle of 89°13'17" with the last described course (measured counter-clockwise therefrom) 255 63 feet; thence Easterly parallel with said North line to the West line of the Easterly 10.04 chains of the West Half of said Southwest Quarter; thence Northerly along said West line to said North line; thence Westerly along said North line to the point of beginning, all in Kendall Township, Kendall County, Illinois.

## PLAT ACT AFFIDAVIT – METES AND BOUNDS DESCRIPTION

STATE OF ILLINOIS )
) ss
COUNTY OF KENDALL )

Joseph R. Voiland, being duly sworn on oath, states that he resides at [redacted]

And further states that (please check the appropriate box)

A [X] That the attached deed is not in violation of 765 ILCS 205/1(a), in that the sale or exchange is of an entire tract of land not being a part of a larger tract of land, or

B [ ] That the attached deed is not in violation of 765 ILCS 205/1(b) for one of the following reasons (please circle the appropriate number)

1. The division or subdivision of land into parcels or tracts of 5 acres or more in size which does not involve any new streets or easements of access,
2. The division of lots or blocks of less than 1 acre in any recorded subdivision which does not involve any new streets or easements of access,
3. The sale or exchange of parcels of land between owners of adjoining and contiguous land,
4. The conveyance of parcels of land or interests therein for use as right of way for railroads or other public utility facilities and other pipe lines which does not involve any new streets or easements of access,
5. The conveyance of land owned by a railroad or other public utility which does not involve any new streets or easements of access,
6. The conveyance of land for highway or other public purposes or grants or conveyances relating to the dedication of land for public use or instruments relating to the vacation of land impressed with a public use,
7. Conveyances made to correct descriptions in prior conveyances,
8. The sale or exchange of parcels or tracts of land following the division into no more than 2 parts of a particular parcel or tract of land existing on July 17, 1959 and not involving any new streets or easements of access,
9. The sale is of a single lot of less than 5 acres from a larger tract when a survey is made by an Illinois Registered Land Surveyor, provided, that this exemption shall not apply to the sale of any subsequent lots from the same larger tract of land, as determined by the dimensions and configuration of the larger tract on October 1, 1973, and provided also that this exemption does not invalidate any local requirements applicable to the subdivision of land,
10. This conveyance is of land described in the same manner as title was taken by grantor(s)

AFFIANT further states the he makes this affidavit for the purpose of inducing the Recorder of Kendall County, Illinois, to accept the attached deed for recording.

[redacted]
Signature of Affiant

SUBSCRIBED AND SWORN TO BEFORE ME
THIS 8th DAY OF March, 2013

[redacted]
Notary Public

"OFFICIAL SEAL"
PAM MONKEMEYER
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 7/28/2014

# KENDALL COUNTY
# DISCLOSURE OF BENEFICIARIES FORM

1. Applicant Ament Solar 1, LLC

Address [redacted]

City [redacted] State [redacted] Zip [redacted]

2. Nature of Benefit Sought _____

3. Nature of Applicant: (Please check one)
   - ___ Natural Person (a)
   - ___ Corporation (b)
   - ___ Land Trust/Trustee (c)
   - ___ Trust/Trustee (d)
   - ___ Partnership (e)
   - ___ Joint Venture (f)

4. If applicant is an entity other than described in Section 3, briefly state the nature and characteristics of the applicant:

   Limited Liability Corporation

5. If your answer to Section 3 you have checked letter b, c, d, e, or f, identify by name and address each person or entity who is a 5% shareholder in case of a corporation, a beneficiary in the case of a trust or land trust, a joint venture in the case of a joint venture, or who otherwise has proprietary interest, interest in profits and losses or right to control such entity:

| NAME | ADDRESS | INTEREST |
|---|---|---|
| 1115 Solar Development | [redacted] | 100% |
| | | |
| | | |
| | | |
| | | |

6. Name, address, and capacity of person making this disclosure on behalf of the applicant:

   Sarah Wochos, Vice President, [redacted]

VERIFICATION

I, Sarah Wochos, being first duly sworn under oath that I am the person making this disclosure on behalf of the applicant, that I am duly authorized to make the disclosure, that I have read the above and foregoing Disclosure of Beneficiaries, and that the statements contained therein are true in both substance and fact> [redacted] Sept. 12, 2024

Subscribed and sworn to before me this 12 day of September, A.D. 2024

(seal) [redacted]

Notary Public

THOMAS RYAN
OFFICIAL SEAL
Notary Public, State of Illinois
My Commission Expires
December 30, 2026



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**COVER SHEET**

**OPTION AND LEASE AGREEMENT**

| | |
|---|---|
| Effective Date | 9/12/2022 |
| Lease Commencement Date | [*To be completed on the date the option is exercised*] |
| Lessor | Janet Dhuse |
| Lessee | 312 Solar Development, LLC |
| Property Address | Ament Rd in Yorkville, Kendall County, IL 60560 [redacted] |
| Option Payment | [redacted] |
| First Additional Option Payment | [redacted] |
| Second Additional Option Payment | [redacted] |
| Rent | [redacted] |
| Lease Term | The term commencing on the date of delivery of the Exercise Notice and ending on the Expiration Date, subject to Lessee's option to extend the Lease Term for up to four (4) additional and successive periods of five (5) years each. |
| Expiration Date | The date that is twenty (20) years from the Commercial Operation Date, as may be extended pursuant to this Agreement. |
| Addresses for Notices | Lessee:<br>312 Solar Development, LLC<br>[redacted]<br>Attn: EVP Project Finance<br><br>With a copy to:<br>[redacted]<br><br>Lessor:<br><br>Janet Dhuse<br>[redacted] |

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# OPTION AND LEASE AGREEMENT

This Option and Lease Agreement (this "***Agreement***") is dated as of the Effective Date and is entered into by and between Lessor and Lessee (each a "***Party***" and together, the "***Parties***").

## RECITALS

A. Lessor owns the real property, together with any rights, benefits and easements appurtenant to such real property more particularly described in the attached **Exhibit A** (the "***Property***").

B. Lessee desires to obtain, the exclusive right to occupy all or a portion of the Property (the "***Land***") and, if applicable, the Easements (the Easements together with the Land are collectively referred to as the "***Premises***") more particularly described in the attached **Exhibit B**, and to enjoy all the rights necessary for Lessee to occupy, develop, design, engineer, access, construct, monitor, install, own, maintain, and operate one or more solar photovoltaic electric power generating and/or energy storage Systems (as defined in Exhibit C attached hereto) as well as ancillary buildings, structures, fixtures, or enclosures necessary or desirable in connection therewith to be located upon, under, on and within the Premises, or any portion thereof and all rights necessary or desirable for Lessee to sell the energy generated by, stored within and/or injected by such System and any and all other credits, solar renewable energy credits, and any other environmental financial attributes created as a result of such energy generation and/or storage.

NOW, THEREFORE, in consideration of the foregoing and the mutual covenants and agreements herein contained, the receipt and sufficiency of which are acknowledged, Lessee and Lessor hereby agree to and intend to be bound by the foregoing recitals and as follows:

1. **Definitions**. Capitalized terms used but not otherwise defined in this Agreement have the meanings assigned to them on the Cover Sheet or in the attached **Exhibit C**.

2. **Access to Property**. Commencing on the Effective Date and throughout the Option Term, Lessee and its employees, agents, contractors and current or potential lenders or investors, shall have the right to enter upon the Property to perform all effort and labor necessary to carry out tests, inspections, surveys and investigations that Lessee deems necessary or advisable to assess the feasibility of the Property for the construction and operation of the System ("***Tests***"). During the Lease Term, Lessee shall have exclusive access to the Land and non-exclusive access to the Easements to design, engineer, construct, install, inspect, test, operate, upgrade, repair and maintain the System. Lessor shall not interfere with the Tests during the Option Term and during the Lease Term, Lessor shall not enter on the Land or interfere with the installation of the System, move, adjust, alter, tamper with, or otherwise handle any Lessee equipment or any component of the System. Tests shall include identification of all underground drain tiles on the Property. If Lessee damages any drain tile during the construction, operation or removal of the System, Lessee shall either repair such drain tile or construct a new drain tile, at Lessee's option.

3. **Option to Lease the Premises.**

(a) Grant of Option. Lessor hereby grants to Lessee the exclusive option to lease all or a portion of the Land and acquire the Easements on the terms and conditions set forth in this Agreement (the "***Option***").

(b) Time and Manner of Exercise of the Option. The Option shall be for an initial term of five hundred forty (540) days after the Effective Date (as it may be extended, the "***Option Term***"). The Option Term may be extended by Lessee for up to two (2) additional three hundred sixty-five (365) day periods upon notice to Lessor prior to the end of the then-current Option Term.

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(c) Option Payment. Lessee shall pay to Lessor the Option Payment within forty-five (45) Business Days after the Effective Date of this Agreement, and any Option extension payments are to be paid within thirty (30) days after the end of the then-current Option Term; provided that Lessor, its successors, assigns and/or designee, if any, has submitted to Lessee any documents reasonably required by Lessee in connection with the payment of the Option Payment, including, without limitation, an IRS Form W-9.

(d) Lessor Cooperation. During the Option Term and throughout the Lease Term, Lessor shall fully cooperate with (i) the performance of Tests, at Lessee's expense, (ii) the obtaining by Lessee, at Lessee's expense, of all licenses, and Permits or authorizations required for Lessee's use of the Premises from all applicable government and/or regulatory entities, including any approvals required to obtain a tax abatement for the Premises, as may be applicable, and any subdivision of the Property to be sought by Lessee in connection with the construction, operation and maintenance of the Systems, (collectively, "***Governmental Approvals***"), (iii) the securing by Lessee at Lessee's expense of all other leases, agreements, licenses, and Permits or authorizations that relate to either the Property or Premises, and (iv) the securing by Lessee of any amendments to this Agreement that are reasonably necessary to accommodate the System, or to facilitate an assignment pursuant to Section 21. Lessor agrees and acknowledges that any amendment to the Agreement pursuant to this Section 3(d) that does not materially increase any obligation or materially decrease any right of Lessor hereunder, shall not result in adjustment of the Rent unless otherwise required under this Agreement. Lessor authorizes Lessee and its Affiliates to act as Lessor's agent for submission of applications and related plans, documents and recordings, and to appear before boards and other officials, with respect to obtaining approvals for the Systems to be constructed on the Premises, and shall execute an authorization letter to that effect ("***Authorization Letter***"), in substantially the form in the attached **Exhibit F**. Lessor agrees to use reasonable efforts in assisting Lessee to acquire necessary utility service at the Premises. In the event that a utility company requires an easement in connection with Lessee's use of the Premises during the Option Term or Lease Term, Lessor shall grant such necessary easement to the utility company, provided that such easement is in a commercially reasonable and recordable form.

(e) Use of the Property. During the Option Term, Lessor may continue to use the Property in the ordinary course, *provided*, *however*, Lessor shall not commit waste on the Property or otherwise materially change the Property, nor will Lessor agree to grant or permit any easement, lease, license, right of access or other encumbrance or possessory right in the Premises to any third party without the prior written consent of Lessee. Notwithstanding the foregoing, if Lessor leases the Property to a third party during the Option Term, such lease shall be terminable upon thirty (30) days' notice such that upon notice from Lessee that it will exercise the Option ("***Pre-Exercise Notice***") and/or start construction, Lessor shall terminate any lease on the Property and such termination shall be effective in no more than thirty (30) days. If crops have been planted on the Property by Lessor or Lessor's tenant, and such crops will not be harvested within thirty (30) days of receiving the Pre-Exercise Notice, Lessee shall reimburse Lessor or Lessor's tenant for the value of the crops located within the Premises ("***Crop Compensation***"). Crop Compensation will be calculated by multiplying the acreage of crop land within the Premises by the Fair Market Price per acre of such crop. The *"**Fair Market Price***" shall be equal to the average value of the applicable crop as provided by the Illinois crop budget Farmer Return figures. Crop Compensation shall be pro-rated for partial acres affected. Lessee will make any Crop Compensation payment to Lessor or Lessor's tenant within thirty (30) days of delivery of the Pre-Exercise Notice.

4. **Exercise of Option; Lease; Easements; and Related Rights.**

(a) Exercise of Option. In order to exercise the Option, Lessee must deliver to Lessor a notice of exercise (the "***Exercise Notice***") prior to the expiration of the Option Term. The date of the Exercise Notice shall be the commencement of the Lease Term (the "***Lease Commencement Date***").

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(b) Lease. Subject to receipt of the Exercise Notice, Lessor hereby leases and grants to Lessee, for the Lease Term, the exclusive rights to the Land together with all right, title and interest of Lessor in and to all easements, rights, privileges and appurtenances to the same belonging or in any way appertaining thereto, to occupy, develop, design, engineer, construct, access, monitor, install, own, operate, maintain, repair, replace, improve and remove the System for the generation, storage and distribution of electrical power.

(c) Easement. Subject to receipt of the Exercise Notice, and if noted on Exhibit B, Lessor hereby grants to Lessee a non-exclusive, appurtenant easement on, under, over, across and through the Property in the locations more particularly described on the attached **Exhibit B**, for the Lease Term, to occupy, develop, design, engineer, construct, access, monitor, install, own, operate, maintain, repair, replace, improve and remove at all times on a 24-hours-a-day, 7-days-a-week basis (i) a road ("***Access Easement***") and (ii) utility and communication infrastructure, including without limitation poles, supporting towers, guys and anchors, fibers, cables and other conductors and conduits, and pads, transformers, switches, vaults and cabinets, and related equipment to connect the System to the local electric distribution system, together with the right of access to the utility infrastructure over the Property, for any purpose reasonably connected with the System (the "***Utility Easement***"). Lessor hereby also grants to Lessee and the applicable utility company, at all times on a 24-hours-a-day, 7-days-a-week basis, for the Lease Term, an easement for ingress, egress and related rights over the Property and/or any surrounding or nearby property owned or leased by Lessor, passage through which is necessary or convenient to install, operate or gain access to the System or the Premises (the "***easement***" and together with the Access Easement and the Utility Easement, the "***Easements***"). If Lessee determines in its reasonable discretion that any additional easements across the Property are necessary, useful or appropriate for the construction and/or operation of the System, Lessor shall fully cooperate in granting or agreeing to such easements by amendment to this Agreement or by separate agreement and recordation of same.

(d) Construction Laydown Area. Subject to receipt of the Exercise Notice, Lessor hereby further grants to Lessee, and Lessee hereby accepts from Lessor, a non-exclusive license to use an area of the Property in a location mutually agreed upon by the Parties (the "***Construction License***"), which area shall be referred to herein as the "***Construction License Area***", for use as a laydown and construction staging area, and for temporary storage. Such Construction License shall commence at such time as Lessee commences construction of the System and shall terminate on the Commercial Operation Date. Lessee shall have access to the Construction License Area 24 hours per day, 7 days per week. Lessee agrees to work in good faith with Lessor to minimize any interference with the operations of Lessor or any other lessees on the Property. Upon or prior to the Commercial Operation Date, Lessee, at Lessee's sole cost and expense, shall surrender the Construction License Area to Lessor in the same condition as the date Lessee first occupied the Construction License Area, ordinary wear and tear excepted.

(e) Landscape License. Lessor grants to Lessee a license to use and access Lessor's Property for purposes of tree trimming, clearing, planting, maintenance, and landscaping as may be required by this Agreement or the applicable municipality in which the Premises is located. This license shall run for the Term of this Agreement and shall permit Lessee to plant, maintain and trim trees and vegetation on an as-needed basis and to do other such things as required for the successful operation of the Systems on the Premises.

(f) Utilities. At Lessee's request and expense, Lessor shall provide or cooperate with the provision of electric current and water to the perimeter of the Premises; *provided, however*, separate meters for such utilities shall be installed at Lessee's expense and Lessee shall be responsible for all utility expenses. Lessor grants Lessee the right to install, use, modify, and remove water lines, sewer lines, storm water lines, overhead, and/or underground power lines, fuel lines, telephone and communication lines, pipelines, conveyors, and drainage ditches and/or canal systems within the Premises as are reasonably required for operation of the System, and use or modify the existing lines, ditches, and canal systems as

may be reasonably required subject to Lessor's prior consent, which shall not be unreasonably delayed, conditioned, or withheld and given within ten (10) days of notification or otherwise deemed approved.

(g) The Parties recognize that the descriptions of the Premises are based on preliminary site discovery information, and that these descriptions shall be modified via amendment prior to construction. As such, Lessor hereby agrees to execute any amendment to this Agreement proposed by Lessee which modifies the Premises, including reducing the size of the Premises and/or splitting the Premises into two or more to accommodate two or more systems and entering into multiple leases but in no event shall the acreage of the Premises be less than 30 acres, provided that such amendment is reasonably necessary to accommodate (i) the System as designed, or (ii) the System as modified by Lessee to comply with the requirements of any Governmental Authority or the Local Electric Utility, including, but not limited to, entering into an amendment in the form attached hereto as **Exhibit G**. For the avoidance of doubt, under no circumstances shall Lessor be entitled to any increase in Rent or other additional compensation under this Agreement as a result of an amendment to the description of the Premises.

5. **Rents & Payments**.

[redacted]

6. **Term and Termination; Removal.**

(a) The Lease Term shall commence on the Lease Commencement Date and terminate on the Expiration Date, as it may be extended, unless otherwise terminated pursuant to this Agreement.

(b) Lessee shall have the right, in its sole discretion, to terminate this Agreement at any time prior to the Commercial Operation Date.

(c) Except in the event of a termination by Lessee for an uncured Event of Default by the Lessor, if this Agreement expires or is terminated, Lessee shall decommission and remove the System and any ancillary structures and repair any damage caused to the Premises by the installation or removal of the System or any ancillary structures ("***System Removal***"). Lessor agrees that Lessee's obligation of System Removal constitutes removal of all above-ground improvements and repair of any damage caused to the Premises by Lessee, but does not include removal of access roads below-ground improvements or an obligation to re-sod or re-vegetate the Premises, grade the Premises or alter the contour of the land. Lessee shall perform System Removal on or before the one hundred eighty (180) days after either the Expiration Date or the date of earlier termination of this Agreement (the "***Removal Date Term***") at Lessee's sole expense. In connection with the System Removal, Lessor shall continue to provide Lessee and its Affiliates and subcontractors with access to the Premises during the Removal Date Term until the System Removal

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has been completed. In the event Lessee fails to complete the System Removal by the expiration of the Removal Date Term (the Removal Date Term is not considered a hold over period and is not subject to Section 44 hereof), Lessor may provide notice to Lessee stating that Lessee has failed to complete System Removal (the "***Abandonment Notice***"). If Lessee fails to complete the System Removal within sixty (60) days after receipt of the Abandonment Notice, Lessor shall have the right, at its option, in its sole discretion, to complete System Removal by a qualified licensed contractor, in which case Lessee shall reimburse Lessor for all actual and reasonable costs of such System Removal.

7. **Extension Option.** Lessee shall have the option to extend the Lease Term ("***Extension Option***") for up to four (4) additional and successive periods of five (5) years each beginning on the day following the Expiration Date of the then-current Lease Term (each an "***Extension Term***"), by giving notice (the "***Extension Exercise Notice***") to Lessor not less than ninety (90) days prior to the then-current Expiration Date, and without the requirement of any further action on the part of either Lessor or Lessee.

8. **System Construction and Maintenance.** Throughout the Lease Term and through the Removal Date Term, Lessee shall have the right to perform (or cause to be performed) all tasks necessary or appropriate, as reasonably determined by Lessee, to carry out the activities set forth in this Agreement, including, without limiting the generality of the foregoing, the right (i) to design, construct, install, and operate the System, (ii) to maintain, clean, repair, replace, add to, remove or modify the System or any part thereof as determined to be necessary by Lessee in its sole discretion and in accordance with the Permits and Applicable Laws, (iii) to use any and all appropriate means of restricting access to the System and Premises, including without limitation, the construction of a fence, and (iv) to permanently grub and grade the Premises and to permanently remove and/or clear any trees, vegetation, structures, rocks, watercourses (to the extent permissible) or other encumbrances existing on the Premises determined to be necessary by Lessee in its sole discretion and in accordance with the Permits and Applicable Laws. Except as may otherwise be specifically agreed upon by the Parties or as expressly set forth herein, Lessee shall be responsible for all costs of design, permitting, construction, installation, operation, and maintenance of the System and System Removal.

9. **Permits; Lessor Cooperation.** Prior to commencement of construction of the System by Lessee, Lessee shall obtain the necessary Permits. In the event Lessee, in its sole discretion, shall determine that the Premises should be subdivided to accommodate the construction, operation and/or maintenance of the Systems or to comply with Permits and Applicable Laws, Lessor shall fully cooperate with Lessee to facilitate and cause any application for subdivision of the Premises to be approved, provided that Lessee shall pay all costs and expenses related thereto.

10. **Statutory and Regulatory Compliance**. Lessee, the Lessee Parties, Lessor and the Lessor Parties shall each comply with all applicable provisions of all Applicable Laws of the locality in which the Property is located.

11. **Lessee's Ownership of Systems and Output.** The Systems are personal property, whether or not the same is deemed real or personal property under Applicable Law, and shall not attach to or be deemed a part of, or a fixture to, the Premises or Property. Lessee or its designees shall be the legal and beneficial owners of the applicable Systems at all times and Lessor shall have no right, title or interest in any of the Systems or any component thereof, notwithstanding that any such Systems may be physically mounted or adhered to the Premises or Property. Lessor covenants that it will use commercially reasonable efforts to place all parties having an interest in or lien upon the Property or the Premises on notice of the ownership of the System and the legal status or classification of the System as personal property. If there is any mortgage or fixture filing against the Property or Premises which could reasonably be construed as attaching to the Systems as a fixture of the Property or Premises, Lessor shall provide a disclaimer or release from such lien holder in form and substance reasonably satisfactory to Lessee and any Financing Party. Lessor, as the fee owner of the Property, consents to the filing by Lessee, on behalf of Lessor or its designees, as applicable, of a disclaimer of the Systems as a fixture of the Property or Premises in the office

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where real estate records are customarily filed in the jurisdiction of the Property. Further, Lessor acknowledges and agrees that Lessee or its designees, as applicable, are the exclusive owners of all electricity and all utility credits, including renewable energy credits, environmental credits, and tax credits, generated by and/or stored within the System and owners of all Environmental Attributes and Incentives attributable to the System. In the absence of an additional agreement to the contrary, all electricity generated by and/or stored within the Systems will be connected to the distribution grid and sold by Lessee to third parties and will not be available to Lessor or any other occupant at the Property. Without the express consent of Lessee, Lessor shall not make or publish any public statement or notice regarding any Environmental Attributes and Incentives relating to the System or the electricity generated by and/or stored within the System.

12. **Representation and Warranties of the Parties as to Authorization and Enforceability**. Each Party represents and warrants that the execution and delivery by such Party of, and the performance of its obligations under, this Agreement have been duly authorized by all necessary action, do not and will not require any further consent or approval of any other Person, and do not contravene any provision of, or constitute a default under any indenture, mortgage, lease, easement, encumbrance, right, restriction, or other material agreement binding on such Party or any valid order of any court, or regulatory agency or other body having authority to which such Party is subject. Each Party represents and warrants the Agreement constitutes a legal and valid obligation of such Party, enforceable against it in accordance with its terms, except as may be limited by a Bankruptcy Event, reorganization, insolvency, bank moratorium or laws relating to or affecting creditors' rights generally and general principles of equity where such enforceability is considered in a proceeding in equity or at law.

13. **Representations, Warranties and Covenants of the Lessor**

(a) No Conflict. Lessor represents and warrants that the execution, delivery and performance by it of this Agreement does not (i) violate its organizational documents or any Applicable Law, or (ii) require any approval or consent of any other Person, except for such approvals or consents that have been obtained on or before the date hereof or the absence of which could not, individually or in the aggregate, reasonably be expected to have a material adverse effect on its ability to execute, deliver or perform this Agreement. Each Person signing this Agreement on behalf of Lessor is authorized to do so.

(b) Lessor's Title to Premises. Lessor represents, warrants and covenants that Lessor has (i) a lawful fee simple interest in title to the Property, including the Premises, subject to any mortgages, leases, easements, covenants, restrictions, and rights of record that may exist, and (ii) that Lessee shall have quiet and peaceful possession of the Premises free from any claim of any entity or Person of superior title thereto without hindrance to or interference with or molestation of Lessee's quiet enjoyment thereof, throughout the Lease Term. Lessor, at its sole cost and expense, shall comply with all restrictive covenants or other title exceptions affecting the Premises to the extent that the same are applicable to the Premises or to the extent that the same would, if not complied with or performed, impair or prevent the continued use, occupancy and operation of the Premises for the purposes set forth in this Agreement and Lessor agrees to take all action necessary to eliminate such interference. In the event Lessor fails to comply with this provision, Lessee may (x) terminate this Agreement, (y) take all necessary steps to bring Lessor into compliance with any restrictive covenants or title exceptions which, if not complied with, would impair or prevent Lessee from exercising its rights under this Agreement, and Lessor shall be responsible for all costs incurred by Lessee for such actions, and/or (z) pursue any other remedies available under this Agreement, at law, and/or at equity.

(c) Defects. Lessee has the right to obtain a title report or commitment for a leasehold title policy from a title insurance company of its choice. Lessor shall fully cooperate with Lessee at no cost to Lessor to enable Lessee to obtain a standard policy of title insurance insuring the property interests granted hereunder (including such endorsements as Lessee shall reasonably request). Lessor agrees that Lessor will execute and deliver to Lessee any documents reasonably required by the title insurance company

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within five (5) Business Days after presentation of said documents by Lessee; *provided, however*, in no event will such documents materially increase any obligation or materially decrease any right of Lessor hereunder.

(d) Transfers. Lessor shall not assign its interest in the Premises separate from its ownership interest and shall not lease the Premises to any other Person. Upon the sale of the Property, Lessor shall assign all of its rights and obligations hereunder to any purchaser of the Property, and so long as such purchaser assumes the obligation to perform all obligations under this Agreement in writing, Lessor shall be released from liability hereunder accruing from and after the effective date of such purchase and assignment. Lessor shall not mortgage, alienate or otherwise encumber the Premises without first obtaining a NDA pursuant to Section 13(f) below. Lessor shall provide notice to Lessee at lease thirty (30) days prior to any sale, mortgage or encumbrance of the Property. Lessor agrees that this Agreement and the lease and the Easements granted hereunder shall run with the Property and/or the Premises and survive any transfer of all or any portion of the Property and/or the Premises. In furtherance of the foregoing, Lessor shall cause any purchaser, lessee, assignee, mortgagee, pledge, secured party or party to whom a lien on the Premises or Property has been granted to execute and deliver to Lessee a commercially reasonable document pursuant to which such party acknowledges and consents to the Lessee's rights in the Premises as set forth herein including, without limitation, an acknowledgement by the transferee that it has no interest in the Systems, or any work related to such Systems, and shall not gain any interest in the Systems by virtue of the Lessor's transfer.

(e) No Interference With and Protection of System. Lessor will not conduct activities on, in or about the Property or Premises that have a reasonable likelihood of causing damage, impairment or otherwise adversely affecting the System or operation thereof. The System shall be operated, maintained and repaired by Lessee at its sole cost and expense; provided, that any repair or maintenance costs incurred by Lessee as a result of Lessor's negligence, misconduct or breach of its obligations hereunder shall be promptly reimbursed to Lessee by Lessor.

(f) Non-Disturbance Agreements. Lessor shall, at its sole effort and expense, obtain a non-disturbance agreement ("***NDA***") in favor of Lessee from any third party who now has or may in the future obtain an interest in the Property or Premises, including, without limitation, any lenders to Lessor, in a form acceptable to Lessee, which NDA shall: (i) acknowledge and consent to Lessee's rights to the Premises and the Systems under this Agreement; (ii) acknowledge that the third party has no interest in the Systems and shall not gain any interest in the Systems by virtue of the Parties' performance or breach of this Agreement; (iii) acknowledge that the third party's interest in the Premises (if any) is subject to Lessee's interest under this Agreement; (iv) waives any lien the third party may have in and to the Systems; and (v) agrees not to disturb Lessee's possession of the Premises.

(g) Insolation. Lessor acknowledges and agrees that access to sunlight ("***Insolation***") is essential to the value to Lessee of the leasehold interest granted hereunder and is a material inducement to Lessee in entering into this Agreement. Accordingly, Lessor shall not permit any interference on the Property (exclusive of the Premises) or any neighboring property under Lessor's or its Affiliate's control which interferes with Insolation on and at the Premises. Without limiting the foregoing, Lessor shall not construct or permit to be constructed on the Property or any adjoining property under Lessor's control any structure on or adjacent to the Premises or on any adjacent property owned by any Affiliate of Lessor that could adversely affect Insolation levels on the Premises, shall not permit the growth of foliage on the Property (exclusive of the Premises) or any neighboring property under Lessor's or its Affiliate's control that could adversely affect Insolation levels on the Premises, or directly emit or permit the emission of suspended particulate matter, smoke, fog or steam or other air-borne impediments to Insolation on the Premises. If Lessor becomes aware of any potential development or other activity on adjacent or nearby properties that could diminish the Insolation to the Premises, Lessor shall promptly advise Lessee of such information and reasonably cooperate with Lessee in taking measures to preserve average levels of Insolation at the Premises as they existed as of the Lease Commencement Date. Such measures may

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include, but not be limited to, obtaining a solar insolation easement. In the event any such obstruction occurs and is not promptly removed following notice of such obstruction, Lessee shall have the right to remove such obstruction on the Property or any neighboring property under Lessor's or its Affiliate's control, at Lessor's cost, or terminate this Agreement without penalty or further liability, upon notice to Lessor. Additionally, Lessee shall have the right upon no less than twenty-four (24) hours' notice to Lessor to remove, cut or trim any trees and/or any other vegetation on the Property or on any other property or land owned by Lessor or its Affiliate which is adjacent to the Property which materially impacts the Insolation on the Premises. Notwithstanding any other provision of this Agreement, the Parties agree that (i) Lessee would be irreparably harmed by a breach of the provisions of this Section 13(g), (ii) an award of damages might be inadequate to remedy such a breach, and (iii) Lessee shall be entitled to equitable relief, including specific performance, to compel compliance with the provisions of this Section 13(g). Lessor further represents and warrants that, to the best of its knowledge, there are no developments pending or in progress on adjacent or nearby properties that could diminish the Insolation to the Premises.

(h) Hazardous Substances. Lessor represents and warrants that there are no Hazardous Substances present on, in or under the Property or Premises in violation of any Applicable Law.

(i) Condition of Premises. Except as otherwise expressly set forth herein Lessee accepts the Premises "as is" without benefit of any improvements or modifications to be made by Lessor. Lessor represents and warrants to Lessee that, to the best of its knowledge, there are no site conditions at the Property or Premises which would: (i) materially increase the cost of installing the System at the planned locations on the Premises or would materially increase the cost of maintaining the System at the Premises over the cost that would be typical or customary for a substantially similar System; or (ii) adversely affect the ability of the System, as designed, to produce, store and/or inject electricity once installed, absent conditions beyond Lessor's reasonable control.

(j) Notice of Damage or Emergency. Lessor shall immediately notify Lessee if Lessor becomes aware, through discovery or receipt of notice: (i) of any damage to or loss of the use of the System; (ii) of any event or circumstance that poses an imminent risk to human health, the environment, the System or the Premises; or (iii) of any interruption or material alteration of the energy supply to or from the Premises or the System.

(k) Liens and Tenants. Except as may be disclosed in the real property records of the County, Lessor represents there are no encumbrances, leases, mortgages, deeds of trust, deeds to secure debt, or similar liens or security interests encumbering all or any portion of the Property and/or the Premises that could interfere with Lessee's operations on the Premises, including mechanic's liens. Lessor shall not directly or indirectly cause, create, incur, assume or suffer to exist any mortgage, pledge, lien (including mechanics', labor or materialman's lien), charge, security interest, encumbrance or claim on or with respect to the Systems, the Premises, or any interest therein. Lessor shall provide Lessee with notice if it receives notice of any such claims. Lessor further agrees to discharge or bond, at its sole expense, any such encumbrance or interest that attaches to the Systems and to indemnify, defend and hold harmless Lessee from any costs, losses, expenses or liabilities arising from the same, including, without limitation, Lessee's attorneys' fees and court costs. Lessor waives any and all lien rights it may have, statutory or otherwise, concerning the System or any portion thereof.

(l) Mineral Rights. Lessor represents and warrants there are no existing mineral, oil and gas, water, or natural resource rights that could interfere with Lessee's rights hereunder. During the Lease Term, Lessor may not use, or grant the use of the Premises for the purpose of exploring for, extracting, producing or mining such oil, gas, minerals, or other natural resources, including selling or leasing such interests to a third party, from the surface to a depth of 500 feet below the surface. Lessor may explore for, extract or produce oil, gas, minerals, and other natural resources from the Property in a manner which does not interfere with Lessee's use of the Premises or affect the System and utilizes a method, such

as "directional drilling" which does not require the use of the Premises to a depth of five hundred (500) feet below the surface.

(m) Litigation. No litigation is pending, and, to the best of Lessor's knowledge, no actions, claims or other legal or administrative proceedings are pending, threatened or anticipated with respect to, or which could affect, the Premises or Lessor's right or authority to enter into this Agreement. If Lessor learns that any such litigation, action, claim or proceeding is threatened or has been instituted, Lessor will promptly deliver notice thereof to Lessee.

(n) Representations Regarding Security Interest in System. Lessor has been advised that part of the collateral securing the financial arrangements for the System may be the granting of a first priority perfected personal property security interest under the Uniform Commercial Code (the "***Security Interest***") in this leasehold and the Easements or any portion thereof or in the Systems to one or more Financing Parties and Lessor hereby consents to the granting of such Security Interest. In connection therewith, Lessor represents and warrants as follows: (i) the granting of the Security Interest will not violate any term or condition of any covenant, restriction, lien, financing agreement, or security agreement affecting the Property or Premises; (ii) there is no existing lease, mortgage, security interest, easement, claim, use, or restriction or other interest in or lien upon the Property or Premises that could attach to the Systems as an interest adverse to or senior to Lessee's Financing Parties' Security Interest therein; (iii) there exists no event or condition which constitutes a default, or would, with the giving of notice or lapse of time, constitute a default under the Agreement, and (iv) there is no existing mineral, oil and gas, water, or natural resource right that could attach to the Systems as an interest adverse to or senior to Lessee's Financing Parties' Security Interest therein.

14. **Hazardous Substances.** Neither Party shall introduce or use any Hazardous Substances on, in or under the Premises or Property in violation of any Applicable Law. If a Party becomes aware of any Hazardous Substances on, in, or under the Premises or Property, it shall promptly notify the other Party of the type and location of such Hazardous Substances in writing. Each Party agrees to indemnify, defend and hold harmless the other Party and its Affiliates and their employees and agents from and against any and all administrative and judicial actions and rulings, claims, causes of action, demands and liability, including, but not limited to, damages, costs, expenses, assessments, penalties, fines, losses, judgments, and reasonable attorney fees that any Party may suffer or incur due to the existence of any Hazardous Substances on the Property or the migration of any Hazardous Substance to other properties or the release of any Hazardous Substance into the environment ("***Environmental Claims***"), that relate to or arise from such Party's activities on the Property or Premises, except to the extent directly attributable to the negligent acts or omissions or willful misconduct of the other Party. Lessor shall further indemnify, defend and hold harmless Lessee and its Affiliates and their employees and agents from and against any and all Environmental Claims due to the presence of any Hazardous Substances in, on or under the Premises as of the Effective Date. The indemnifications in this Section 14 specifically include, without limitation, costs incurred in connection with any investigation of site conditions or any cleanup, remedial, removal or restoration work required by any Governmental Authority. Lessor shall be responsible for, and shall promptly conduct any investigation and remediation as required by any Applicable Law, all spills or other releases of any Hazardous Substances to the extent not caused by Lessee, that have occurred or which may occur on the Property. This Section 14 shall survive the termination or expiration of this Agreement.

15. **Insurance.**

[redacted]

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[redacted]

16. **Taxes**.

[redacted]

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17. **Liability and Indemnity**.

(a) Each Party as indemnitor shall indemnify, defend, and hold harmless the other Party and its Affiliates and their employees and agents against and from any and all loss, liability, damage, claim, cost, charge, demand, or expense (including reasonable attorneys' fees) asserted by third parties for injury or death to Persons (including employees of either Party) and/or physical damage to property arising out of or in connection with the negligent acts or omissions or willful misconduct of the indemnitor or a material breach of any obligation, representation or warranty of the indemnitor under this Agreement, except to the extent caused by the negligent acts or omissions or willful misconduct of the indemnified party.

(b) Lessee shall not be responsible to Lessor or any third party, for any claims, costs or damages, including fines or penalties, attributable to any violations of Applicable Laws existing prior to the Effective Date, or by any party other than the Lessee Parties.

(c) This Section 17 shall survive the termination or expiration of this Agreement.

18. **Casualty/System Loss**.

(a) In the event the Premises or access thereto shall be so damaged or destroyed by fire or other casualty so as to make the use of the Premises impractical, as determined by Lessee in its sole and absolute discretion, then Lessee may elect to terminate this Agreement by providing notice to Lessor of such termination within ninety (90) days of Lessee's knowledge of the damage or destruction, which termination will be effective as of a date of such damage or destruction. If Lessee does not elect to terminate this Agreement within ninety (90) days of such a casualty, then the Rent shall be abated until such time as Lessee's use of the Premises is restored. If Lessee does not elect to terminate this Agreement pursuant to the previous sentences, Lessor shall exercise commercially reasonable efforts to repair the damage to the Premises and return the Premises to its condition prior to such damage or destruction; *provided*, *however*, that, except as otherwise provided in this Agreement, Lessor shall in no event be required to repair, replace or restore any property of Lessee comprising part of the Systems, which replacement or restoration shall be Lessee's responsibility.

(b) In the event of any harm to the System that, in the reasonable judgment of Lessee, results in total damage, destruction or loss of the System ("***System Loss***"), Lessee shall, within twenty (20) Business Days following the occurrence of such System Loss, notify Lessor whether Lessee is willing, notwithstanding such System Loss, to repair or replace the System and to continue this Agreement. In the event that Lessee notifies Lessor that Lessee is not willing to repair or replace the System, Lessee may terminate this Agreement effective upon the date of such System Loss, and Lessee shall be entitled to all proceeds of its insurance policies with respect to the System Loss and Lessor shall promptly return to Lessee the portion of the pre-paid Rent covering the days remaining between the date of such System Loss and the next anniversary of the Commercial Operation Date.

(c) In the event of termination under this Section 18, Lessee shall remove the Systems in accordance with Section 6(c).

19. **No Consequential Damages.** Notwithstanding any other provision in this Agreement, neither Lessee nor Lessor shall be liable to the other for any consequential, punitive, or indirect damages, including without limitation, loss of use of their property, loss of profits, cost of capital or increased operating costs, arising out of this Agreement whether by reason of contract, indemnity, strict liability, negligence or breach of warranty.

20. **Condemnation.** Promptly upon receipt of notice that the Premises or Property may be or will be transferred to a condemning authority pursuant to a taking of all or a portion of the Property, Lessor

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shall notify Lessee of same. In the event the Premises or Property are transferred to a condemning authority pursuant to a taking of all or a portion of the Property sufficient in Lessee's determination to render the Premises unsuitable for Lessee's use or to negatively impact the access to the Premises, Lessee shall have the right to terminate this Agreement immediately upon notice to Lessor. Sale to a purchaser with the power of eminent domain in the face of the exercise of the power shall be treated as a taking by condemnation under this Agreement. In the event of an award related to eminent domain or condemnation of all or part of the Premises, each Party shall be entitled to take from such award that portion as allowed by law for its respective property interest appropriated as well as any damages suffered thereby.

21. **Assignment by Lessee and Financing Party Protections**.

(a) Lessee shall not assign or sublease any of its rights, duties or obligations under this Agreement without the prior consent of Lessor, which consent shall not be unreasonably withheld, conditioned or delayed. Notwithstanding the foregoing, Lessee may, without consent from Lessor, assign any of its rights, duties or obligations under this Agreement: (i) to a Financing Party pursuant to Section 21(c), (ii) to one or more of its Affiliates, (iii) to one or more third parties in connection with a collateral assignment of rights, mortgage, pledge or otherwise, (iv) to any Person or entity succeeding to all or substantially all of the stock or assets of Lessee, or (v) to a successor entity in a merger or acquisition transaction. Lessor agrees to execute any consent, novation or other documentation that Lessee may request in connection with any assignment permitted by this Section 21, including without limitation entering into a consent and assignment agreement with Lessee's Financing Party.

(b) Notwithstanding anything herein to the contrary, Lessee may collaterally assign this Agreement and the System to a Financing Party without the need for consent from Lessor. Upon receipt of notice of the name and address of a Financing Party, Lessor agrees to deliver any notices of default to the Financing Party simultaneously with the delivery of such notices of default to Lessee. The Financing Party will have the right in its sole discretion, but not the obligation, (i) to enforce its lien and acquire title to all or any portion of the System and all right, title and interest of Lessee in and to this Agreement by any lawful means, (ii) to take possession of and operate all or any portion of the System and to perform all obligations to be performed by Lessee under this Agreement, or to cause a receiver to be appointed to do so, (iii) to cure any defaults or breaches by Lessee within the time periods provided hereunder for Lessee plus an additional sixty (60) days in the case of an Event of Default under Section 22, and in order to succeed to the rights and obligations of Lessee under this Agreement shall not be required to cure any defaults by Lessee under Section 22 that by their nature are not capable of being cured by the Financing Party. Any such notices shall be sent to the Financing Party at the address specified in writing to Lessor by Lessee or any Financing Party. Failure by Lessor to give the Financing Party such notice shall not diminish the Financing Party's rights against Lessee, but shall preserve all rights of the Financing Party to cure any default and to remove any property of Lessee located on the Premises.

(c) If Lessor has been notified of the existence of a Financing Party, Lessor will not agree to any amendment, modification or voluntary termination of this Agreement without the prior written consent of the Financing Party. Lessor agrees that, upon foreclosure (or assignment in lieu of foreclosure) of its mortgage or security interest in the System, the Financing Party may succeed to the rights and obligations of Lessee under this Agreement and thereafter, without Lessor's consent, to assign or transfer all or any portion of the System to a third party. The Financing Party will be responsible for performance of Lessee's obligations after it succeeds to Lessee's interests under this Agreement, but shall have no further liability hereunder after it assigns such interests to a third party.

(d) If this Agreement is rejected or disaffirmed by Lessee pursuant to bankruptcy law or other law affecting creditor's rights and within ninety (90) days after such event any Financing Party shall have arranged to the reasonable satisfaction of Lessor for performance of Lessee's obligations under this Agreement, then Lessor shall execute and deliver to such Financing Party or to a designee of such Financing Party a new agreement which (i) shall be for a term equal to the remainder of the Lease Term

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before giving effect to such rejection or termination; and (ii) shall contain the same covenants, agreements, terms, provisions and limitations as this Agreement.

(e) An assignment by either Party in accordance with this Section 21 shall, provided that assignee assumes the assignor's obligations under this Agreement, relieve the assignor of its obligations hereunder, except with respect to undisputed payments due by the assignor as of the effective date of the assignment, which obligations shall be performed by assignor or assignee as a condition precedent to such assignment.

(f) The provisions of this Section 21 shall survive the termination, rejection or disaffirmation of this Agreement and shall continue in full force and effect thereafter to the same extent as if this Section 21 were a separate and independent contract made by Lessor, Lessee and each Financing Party. Lessee's Financing Parties shall be express third party beneficiaries of this Section 21.

22. **Defaults and Remedies.**

(a) Events of Default. The occurrence of any of the following (each an "***Event of Default***") shall place the Party responsible for the Event of Default (the "***Defaulting Party***") in default of this Agreement, and the other Party (the "***Non-Defaulting Party***") shall be entitled to the remedies provided in Section 22(b): (i) a Party's failure to pay any amount required to be paid hereunder and such failure shall continue for thirty (30) days after written notice of such failure has been received by the Defaulting Party, (ii) a Party's failure to perform any covenant or obligations hereunder, other than payment of monetary sums, or commitment of a material breach of this Agreement and the failure to cure such default within sixty (60) days after written notice specifying such failure has been received by the Defaulting Party, or (iii) if the nature or extent of the obligation or obligations is such that more than sixty (60) days are required to complete the cure, a Party's failure to use diligence and good faith to commence and continue exercising commercially reasonable diligence to cure the Event of Default after such sixty (60) day period, and (iv) a Party becomes subject to a Bankruptcy Event. Further, if the Parties have a good faith dispute as to whether a payment is due hereunder, the alleged defaulting Party may deposit the amount in controversy in escrow with any reputable third party escrow, or may interplead the same, which amount shall remain undistributed and shall not accrue interest or penalties, and no Event of Default shall be deemed to have occurred, until final decision by a court of competent jurisdiction or upon agreement by the Parties. No such deposit shall constitute a waiver of the Defaulting Party's right to institute legal action for recovery of such amounts.

(b) Remedies**.** Except as qualified by Section 21(b), upon the occurrence of, and during the continuance of an Event of Default, the Non-Defaulting Party shall: (i) have the right to terminate this Agreement by giving written notice of termination to the Defaulting Party; and (ii) have all rights and remedies that may be available to the Non-Defaulting Party at law or in equity.

23. **Notices**. All notices under this Agreement shall be made in writing to the Addresses for Notices specified on the Cover Sheet. Notices shall be delivered by hand delivery, regular overnight delivery service, registered or certified mail return receipt requested, or email. Email notices shall require confirmation of receipt. Notices shall be deemed to have been received when delivered as shown on the records or manifest of such courier, delivery service or the U.S. Postal Service. Rejection or refusal to accept delivery of any notice shall be deemed to be the equivalent of receipt of any notice given hereunder. A Party may change its address by providing written notice of the same in accordance with the provisions of this Section 23. Failure to comply strictly with the terms of this provision shall not be held against the Party claiming to have given notice so long as such Party substantially complied with this provision and can demonstrate that the notice in question was received.

24. **Waiver**. The waiver by either Party of any breach of any term, condition, or provision herein contained shall not be deemed to be a waiver of any subsequent breach of such term, condition, or provision, or any other term, condition, or provision contained herein.

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25. **Remedies Cumulative**. No remedy herein conferred upon or reserved to Lessee or Lessor shall exclude any other remedy herein or by law or in equity or by statute provided, but each shall be cumulative and in addition to every other remedy given hereunder or now or hereafter existing at law or in equity or by statute.

26. **Headings**. The headings in this Agreement are solely for convenience and ease of reference and shall have no effect in interpreting the meaning of any provision of this Agreement.

27. **Invalid Term**. If any provision of this Agreement is declared or determined by any court of competent jurisdiction to be illegal, invalid or unenforceable, the legality, validity or enforceability of the remaining parts, terms and provisions shall not be affected thereby, and said illegal, unenforceable or invalid part, term or provision will be deemed not to be a part of this Agreement; *provided*, *however*, that the Parties shall work together in good faith to modify this Agreement as necessary to retain the intent of any such severed clause.

28. **Choice of Law**. This Agreement shall be construed in accordance with the laws of the State of Illinois, without regard to its conflict of law principles.

29. **Dispute Resolution**. In the event that there is any controversy, claim or dispute between the Parties hereto arising out of or related to this Agreement, or the breach hereof, the Parties agree to engage in good faith negotiations to resolve such dispute. If the Parties are unable to resolve such dispute through such negotiations, either Party may, within a reasonable time after the dispute has arisen, pursue all available legal and/or equitable remedies.

[redacted]

31. **Waiver of Jury Trial**. TO THE EXTENT PERMITTED BY LAW, EACH PARTY HEREBY IRREVOCABLY WAIVES ITS RESPECTIVE RIGHTS TO A JURY TRIAL OF ANY CLAIM OR CAUSE OF ACTION IN ANY COURT IN ANY JURISDICTION BASED UPON OR ARISING OUT OF OR RELATING TO THIS AGREEMENT.

32. **Binding Effect**. This Agreement and its rights, privileges, duties and obligations shall bind and inure to the benefit of and be binding upon each of the Parties hereto, together with their respective heirs, personal representatives, successors and permitted assigns.

33. **Counterparts**. This Agreement may be executed in any number of counterparts, which shall together constitute one and the same agreement. Each Party agrees that signatures transmitted by facsimile or electronically shall be legal and binding and have the same full force and effect as if an original of this Agreement and had been delivered and hereby waive any defenses to the enforcement of the terms of this Agreement based on the foregoing forms of signature.

34. **Entire Agreement**. This Agreement, including the Cover Sheet and all exhibits, represents the full and complete agreement between the Parties hereto with respect to the subject matter contained herein and therein and supersedes all prior written or oral negotiations, representations, communications and agreements between said parties with respect to said subject matter. This Agreement may be amended only in writing signed by both Lessee and Lessor or their respective successors in interest. Lessor and Lessee each acknowledge that in executing this Agreement that Party has not relied on any verbal or written understanding, promise, or representation which does not appear in this document.

35. **Agricultural Impact Mitigation Agreement.** This Agreement does not incorporate any provision from any agricultural impact mitigation agreement that may be entered into with the Illinois

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Department of Agriculture with respect to the Premises (an "***AIMA***"). The Parties specifically agree that with respect to any provision contained in an AIMA, this Agreement shall control, whether such provision is addressed generally, specifically or not at all in this Agreement.

36. **Further Assurances**. Upon the receipt of a request from the other Party or a Financing Party, each Party shall execute such commercially reasonable additional documents, instruments and assurances and take such additional actions as are reasonably necessary to carry out the terms and intent hereof, including at the requesting Party's expense, entering into any consents, assignments, affidavits, estoppels and other documents as may be reasonably required by such Party's lender to create, perfect or preserve its collateral interest in such Party's property or such party's rights and obligations under this Agreement. Any estoppel shall be executed within ten (10) days of a request therefor. Neither Party shall unreasonably withhold, condition or delay its compliance with any reasonable request made pursuant to this Section 35.

37. **Force Majeure**. Except as otherwise specifically provided in this Agreement, neither Party shall be considered in breach of this Agreement or liable for any delay or failure to comply with this Agreement, if and to the extent that such delay or failure is attributable to the occurrence of a Force Majeure Event; provided that the Party claiming relief under this Section 36 shall immediately (i) notify the other Party in writing of the existence of the Force Majeure Event, (ii) exercise all reasonable efforts necessary to minimize delay caused by such Force Majeure Event, (iii) notify the other Party in writing of the cessation or termination of said Force Majeure Event and (iv) resume performance of its obligations hereunder as soon as practicable thereafter. If a Force Majeure Event shall have occurred that has prevented either Party from performing any of its material obligations hereunder and that has continued for a continuous period of one hundred twenty (120) days, then either Party shall have the right, but not the obligation, to terminate the Agreement upon ninety (90) days' prior notice to the other Party without penalty or further liability. If at the end of such ninety (90) day period such Force Majeure Event shall still continue and the material obligation has not been able to be resumed to the reasonable satisfaction of the affected Party, the Agreement shall terminate. Upon such termination due to a Force Majeure Event, neither Party shall have any liability to the other (other than any such liabilities that have accrued prior to such termination or those which expressly survive the termination or expiration of the Agreement pursuant to the terms hereof). If, at the end of such ninety (90) day period such Force Majeure Event is no longer continuing, the Agreement shall remain in full force and effect, and the Party's termination notice shall be deemed to have been withdrawn. Rent shall abate for any period during which Lessee is not able to operate the System in the manner contemplated herein.

38. **Confidentiality.** Lessor will maintain in strict confidence, for the sole benefit of Lessee, the existence and the terms of this Agreement and the transactions contemplated herein, including but not limited to any business plans, financial information, technical information regarding the design, operation, maintenance of the System; *provided*, *however*, Lessor may disclose this Agreement and the transactions contemplated herein to Lessor's affiliates, subsidiaries, attorneys, consultants or other agents or professional advisors, or as required by law.

39. **Memorandum of Lease**. Lessor agrees to cooperate with Lessee in executing any documents necessary to protect Lessee's rights in or use of the Premises. A Memorandum of Lease in substantially the form attached hereto as **Exhibit E** shall be recorded in the office where real estate records are customarily filed in the jurisdiction of the Premises**.**

40. **Brokers**. In the event any broker or other party claims a commission, the Party responsible for the contact with that claimant shall indemnify, defend and hold the other Party harmless from that claim, and including, without limitation, the payment of any attorneys' fees and costs incurred.

41. **Interpretation**. This Agreement shall not be construed against the Person or entity preparing it, but shall be construed as if all of the Parties jointly prepared this Agreement without any uncertainty or ambiguity being interpreted against any one of them.

42. **No Partnership**. This Agreement is not intended and shall not be construed to create any partnership or joint venture or any other relationship other than one of 'lessor' and 'lessee' and 'grantor' and 'grantee', and neither Party shall be deemed the agent of the other Party nor have the authority to act as agent for the other Party, other than as provided in Section 3(d).

43. **Public Officials**. Lessor acknowledges that its receipt of monetary and other good and valuable consideration hereunder may represent a conflict of interest if Lessor or its Affiliate is a government employee or otherwise serves on a governmental entity with decision-making authority (a "***Public Official***") as to any rights Lessee may seek, or as to any obligations that may be imposed upon Lessee in order to develop and/or operate the Systems ("***Development Rights***"), and Lessor hereby agrees for itself and its Affiliates to (1) recuse him/herself from all such decisions related to Lessee's Development Rights unless such recusal is prohibited by law or is not reasonably practicable considering the obligations of such Public Official's position and (2) recuse him/herself from all such decisions related to Lessee's Development Rights if such recusal is required by law. If Lessor is not required pursuant to (1) or (2) above to recuse him/herself from a decision related to Lessee's Development Rights, Lessor will, in advance of any vote or other official action on the Development Rights, disclose the existence of this Agreement (but not the financial terms therein) at an open meeting of the relevant governmental entity Lessor serves on as a Public Official. Additionally, if Lessor is a Public Official and any of Lessor's spouse, child or other dependent has a financial interest in the Systems, Lessor shall disclose such relationship (but not the financial terms thereof) at an open meeting of the relevant governmental entity Lessor serves on as a Public Official, prior to participation in any decision related to Lessee's Development Rights.

44. **Time is of the Essence**. Time is of the essence with respect to all provisions within this Agreement.

[redacted]

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**IN WITNESS WHEREOF**, the Parties have executed this Agreement on the Effective Date.

**LESSOR:**

[redacted]
Janet Dhuse

**LESSEE:**

**312 Solar Development, LLC**
**a Delaware limited liability company**

DocuSigned by:
By: [redacted]
9247E8A795A0445...

Name: Ryan Bailey

Title: Director of Development, Midwest

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## DEFINITIONS

"***Abandonment Notice***" has the meaning set forth in Section 6(c) of this Agreement.

"***Access Easement***" has the meaning set forth in Section 4(c).

"***Affiliate***" means, as to any Person, any other Person that, directly or indirectly, is in control of, is controlled by or is under common control with such Person or is a director, officer or member of such Person or of an Affiliate of such Person.

"***Agreement***" has the meaning set forth on page 1 herein.

"***Applicable Law***" means, with respect to any Person, any constitutional provision, law, statute, rule, regulation, ordinance, treaty, order, decree, judgment, decision, certificate, holding, injunction, registration, license, franchise, permit, authorization, guideline, Governmental Approval, Environmental Law, consent or requirement of any Governmental Authority having jurisdiction over such Person or its property, enforceable at law or in equity, including the interpretation and administration thereof by such Governmental Authority.

"***Authorization Letter***" has the meaning set forth in Section 3(d) of this Agreement.

"***Bankruptcy Event***" means with respect to a Party, that either: such Party has (A) applied for or consented to the appointment of, or the taking of possession by, a receiver, custodian, trustee or liquidator of itself or of all or substantially all of its property; (B) made a general assignment for the benefit of its creditors; (C) commenced a voluntary case under any bankruptcy law; (D) filed a petition seeking to take advantage of any other law relating to bankruptcy, insolvency, reorganization, winding up, or composition or readjustment of debts; or (E) taken any corporate or other action for the purpose of effecting any of the foregoing; or a proceeding or case has been commenced without the application or consent of such Party in any court of competent jurisdiction seeking (i) its liquidation, reorganization, dissolution or winding-up or the composition or readjustment of debts or, (ii) the appointment of a trustee, receiver, custodian, liquidator or the like of such Party under any bankruptcy law, and such proceeding or case has continued undefended, or any order, judgment or decree approving or ordering any of the foregoing shall be entered and continue unstayed and in effect for a period of more than one hundred eighty (180) days.

"***Business Day***" means any day other than Saturday, Sunday or any other day on which banking institutions in the state where the Property is located are required or authorized by Applicable Law to be closed for business.

"***Commercial Operation Date***" means the date on which the System(s) commences selling electricity to a third party purchaser on a commercial basis (excluding the sale of test energy).

"***Construction License***" has the meaning set forth in Section 4(d) of this Agreement.

"***Construction License Area***" has the meaning set forth in Section 4(d) of this Agreement.

"***Defaulting Party"*** has the meaning set forth in Section 22(a) of this Agreement.

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"***Development Rights***" has the meaning set forth in Section 42 of this Agreement.

"***Easements***" has the meaning set forth in Section 4(c) of this Agreement.

"***Environmental Attributes and Incentives***" means any emissions, air quality or other environmental attribute, aspect, characteristic, claim, credit, benefit, reduction, offset or allowance, howsoever entitled or designated, directly or indirectly resulting from, attributable to or associated with the consumption, storage, injection, sale and/or generation of energy by a solar renewable energy facility and/or through the storage and/or injection of electricity, whether existing as of the Effective Date or thereafter, and whether as a result of any present or future local, state or federal laws or regulations or local, state, national or international voluntary program.

"***Environmental Claims***" has the meaning set forth in Section 14 of this Agreement.

"***Environmental Law***" means and includes, without limitation, any present or future federal, state or local law, whether under common law, statute, rule, regulation or otherwise, requirements under Permits or other authorizations issued with respect thereto, and other orders, decrees, judgments, directive or other requirements of any Governmental Authority relating to or imposing liability or standards of conduct, disclosure or notification with regard to the protection of human health, the environment, ecological conditions, Hazardous Substances or any activity involving Hazardous Substances.

"***Event of Default"*** has the meaning set forth in Section 22(a) of this Agreement.

"***Exercise Notice"*** has the meaning set forth in Section 4(a) of this Agreement.

"***Expiration Date***" has the meaning set forth on the Cover Sheet, as such date may be extended in accordance with the Agreement.

"***Extension Exercise Notice"*** has the meaning set forth in Section 7 of this Agreement.

"***Extension Option"*** has the meaning set forth in Section 7 of this Agreement.

"***Extension Term"*** has the meaning set forth in Section 7 of this Agreement.

"***Financing Party***" means, as applicable (i) any Person (or its agent) from whom Lessee (or an Affiliate of Lessee) leases the System or (ii) any Person (or its agent) who has made or will make a loan to or otherwise provide capital to Lessee (or an Affiliate of Lessee) with respect to the System. Lessee shall provide written notice to Lessor of, and the contact information for, any Financing Party prior to a party being deemed a Financing Party hereunder.

"***Force Majeure Event***" means, when used in connection with the performance of a Party's obligations under this Agreement, any events or circumstances beyond the affected Party's reasonable control that arise after the Effective Date, to the extent not caused by the acts or omissions of (and are otherwise unavoidable, or beyond the reasonable control of, and could not have been prevented or overcome by the reasonable efforts and diligence of) such Party and which materially and adversely affects such Party's performance of its obligations under this Agreement. Force Majeure Event includes but is not limited to the following: (i) war, riot, acts of a public enemy or other civil disturbance; (ii) acts of God, including but not limited to, pandemics, epidemics, disease, earthquakes, tornados, typhoons, lightning, blizzards, hurricanes and landslides of the type which would, under normal circumstances and typical insurance policies, constitute an event of insurable loss; (iii) acts of, or unreasonably excessive failures to act by, any Governmental Authority including changes in Applicable Law after the Effective Date (other than acts of Governmental Authorities in response to a Party's failure to comply with existing Applicable Laws as required in connection with performance under this Agreement); and (iv) strikes, walkouts, lockouts or similar industrial or labor actions or disputes not caused by, specific to employees of, or the result of an unfair labor practice or other unlawful activity by the asserting Party.

"***Governmental Approvals***" has the meaning set forth in Section 3(d) of this Agreement.

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"***Governmental Authority***" means any federal, state, regional, county, town, city or municipal government, whether domestic or foreign, or any department, agency, bureau or other administrative, regulatory or judicial body of any such government.

"***Hazardous Substances***" means and includes, without limitation any substance, chemical, material or waste: (i) the presence of which causes a nuisance or trespass of any kind under any applicable Environmental Law; (ii) which is regulated by any Governmental Authority; (iii) is likely to create liability under any Environmental Law because of its toxic, flammable, corrosive, reactive, carcinogenic, mutagenic, infectious, radioactive, or other hazardous property or because of its effect on the environment, natural resources or human health and safety, including but not limited to, flammables and explosives, gasoline, petroleum and petroleum products, asbestos containing materials, polychlorinated biphenyls, lead and lead-based paint, radon, radioactive materials, microbial matter, biological toxins, mycotoxins, mold or mold spores or any hazardous or toxic material, substance or waste which is defined by those or similar terms or is regulated as such by any Governmental Authority; or (iv) which is designated, classified, or regulated as being a hazardous or toxic substance, material, pollutant, waste (or a similar such designation) under any federal, state or local law, regulation or ordinance, including under any Environmental Law.

"***Insolation***" has the meaning set forth in Section 13(g) of this Agreement.

"***Land***" has the meaning set forth in Recital B.

"***Lease Commencement Date***" has the meaning set forth in Section 4(a) of this Agreement.

"***Lease Term***" has the meaning set forth on the Cover Sheet of this Agreement.

"***Lessee Real Property Taxes***" has the meaning set forth in Section 16 of this Agreement.

"***Lessee Parties***" means, individually or collectively, Lessee, its Affiliates and any of their authorized representatives, agents, employees, managers, contractors, architects, and engineers, and each of their respective officers, directors, partners, members, managers, agents, employees, representatives, and invitees.

"***Lessee Taxes***" has the meaning set forth in Section 16 of this Agreement.

"***Lessor Parties***" means, individually or collectively, Lessor, its Affiliates, and any of their authorized representatives, agents, employees, managers, and each of their respective officers, directors, partners, members, managers, agents, employees, and representatives.

"***Local Electric Utility***" means the local electric distribution owner and operator providing electric distribution services to Lessee and also providing electric distribution and interconnection services to Lessee for Lessee's System.

"***Non-Defaulting Party"*** has the meaning set forth in Section 22(a) of this Agreement.

"***NDA***" has the meaning set forth in Section 13(f) of this Agreement.

"***Operation Term***" has the meaning set forth in Section 5(b) of this Agreement.

"***Option***" has the meaning set forth in Section 3(a) of this Agreement.

"***Option Term***" has the meaning set forth in Section 3(b) of this Agreement.

"***Party" or "Parties"*** has the meaning set forth on page 1 of this Agreement.

"***Permits***" means all applications, approvals, authorizations, consents, filings, licenses, orders, permits or similar requirements imposed by any Governmental Authority which are required in order to develop, construct, operate, maintain, improve, refurbish and retire the System or to schedule and deliver the electric energy produced by the System to the Local Electric Utility, including an authorization to construct or a conditional use permit.

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"***Person***" means any individual, corporation, partnership, limited liability company, joint venture, estate, trust, unincorporated association, any other person or entity, and any federal, state, county or municipal government or any bureau, department or agency thereof and any fiduciary acting in such capacity on behalf of any of the foregoing.

"***Personal Property Taxes***" has the meaning set forth in Section 16 of the Agreement.

"***Premises***" has the meaning set forth in Recital B of this Agreement.

"***Property***" has the meaning set forth in Recital A of this Agreement.

"***Public Official***" has the meaning set forth in Section 42 of this Agreement.

"***Removal Date Term***" has the meaning set forth in Section 6(c) of this Agreement.

"***Rent***" has the meaning set forth on the Cover Sheet of this Agreement.

"***Roll Back Taxes***" has the meaning set forth in Section 16(b) of this Agreement.

"***Sales Tax***" has the meaning set forth in Section 16(b) of this Agreement.

"***Security Interest***" has the meaning set forth in Section 13(n) of this Agreement.

"***System(s)***" means the solar photovoltaic and/or energy storage system or systems installed and operating at the Premises, together with all electrical production, transmission, storage, and distribution facilities and related equipment, hardware and materials, including without limitation, panels, overhead and underground transmission, distribution or collector lines, circuit breakers, meters, conduit, footings, cabling, wires, overhead and underground control, communications and radio relay systems, energy storage facilities (including batteries), interconnection facilities and/or switching facilities, transformers and current inverters, control boxes and computer monitoring equipment systems, structures, batteries, features and improvements necessary to produce, transmit and store electric energy at such facility (excluding power to the Property).

"***System Loss***" has the meaning set forth in Section 18(b) of this Agreement.

"***System Removal***" has the meaning set forth in Section 6(c) of this Agreement.

"***Taxes and Assessments***" has the meaning set forth in Section 16 of this Agreement.

"***Tests***" has the meaning set forth in Section 2 of this Agreement.

"***Utility Easement***" has the meaning set forth in Section 4(c) of this Agreement.

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**EXHIBIT E**

**MEMORANDUM OF OPTION AND LEASE**

**[See attached]**

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**Recording Requested by and**
**after recording return to:**

_____, LLC
55 Technology Drive, Suite 102
Lowell, MA 01853
Attn: Legal Department

**MEMORANDUM OF OPTION AND LEASE**

THIS MEMORANDUM OF OPTION AND LEASE (the "***Memorandum***"), is made as of _____, 20_, by and between [_____], [a _____having its principal place of business located at] [an individual with an address of] _____ _____, Illinois ("***Lessor***") and _____**, LLC**, a Delaware limited liability company with its principal place of business located at 55 Technology Drive, Suite 102 Lowell, MA 01853 ("***Lessee***").

1. Lessor and Lessee are parties to that certain Option and Lease Agreement (the "***Lease***"), dated as of_____(the "***Effective Date***") covering a portion of that certain parcel of land and the improvements thereon commonly known as _____, Illinois and identified in the deed dated _____and recorded in the _____County Recorder's Office at Book _____, Page _____(the ***Property***").

2. Under the Lease, Lessee has an option to lease a portion] of the Property and acquire easements over a portion of the Property as described in **Exhibit A** annexed hereto (the "***Premises***"), which option commences on the Effective Date and lasts for five hundred forty (540) days thereafter. The option term may be extended for two (2) addition terms of three hundred sixty five (365) days each.

3. The commencement date of Lessor's lease of the Premises shall be the date of Lessor's exercise of the option.

4. If the option is exercised, the initial term of the lease and the easements will be for twenty (20) years, and Lessee shall have the option to extend the lease for up to four (4) additional five (5) year terms, subject to earlier termination or extension pursuant to the terms of the Lease or applicable law.

5. The System, as defined in the Lease, installed and operated by Lessee at the Premises shall not be deemed a fixture. The System is Lessee's personal property and Lessor has no right, title or interest in the System. Further, Lessor has waived all right of levy for rent, all claims and demands against the System and all rights it may have to place a lien on the System.

6. All of the terms, covenants and conditions of the Lease are incorporated herein and made a part hereof. The purpose of this Memorandum is to give notice of the existence of the tenancy and easements created by the Lease; and shall not be construed to vary or otherwise affect the rights or obligations of the parties under the Lease as it may be amended. All capitalized terms not defined herein have the meaning attributed to them in the Lease.

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IN WITNESS WHEREOF, the parties have duly executed this Memorandum as of the date first above written.

**LESSOR:**

_____
Janet Dhuse

**LESSEE:**

**312 Solar Development, LLC**
**a Delaware limited liability company**

By: _____

Name: _____

Title: _____

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**LESSOR ACKNOWLEDGMENT**

STATE OF )
: ss.
COUNTY OF )

This instrument was acknowledged before me on _____(date) by _____(name of person(s)).

_____
Notary Public

**LESSEE ACKNOWLEDGEMENT**

STATE OF )
: ss.
COUNTY OF )

This instrument was acknowledged before me on _____(date) by _____(name of person) as _____(type of authority, e.g., officer, trustee, etc.) of _____(name of company).

_____
Notary Public

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**EXHIBIT A**
**to**
**Memorandum of Option and Lease**

**PREMISES LEGAL DESCRIPTION**

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**EXHIBIT F**

Date: 9-12-22

To Whom It May Concern

New Leaf Energy and its employees and affiliates are hereby authorized to act as our agent for submission of applications and related plans and documents, and to appear before boards and other officials, with respect to obtaining approvals for solar installations and/or energy storage systems to be constructed on my property located at Ament Rd in Yorkville, Kendall County, IL 60560 {Parcel: 05-16-300-006}.

Sincerely,

[redacted]

Janet Dhuse

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# EXHIBIT G

## FORM OF AMENDMENT TO DESCRIBE THE PREMISES

### FIRST AMENDMENT TO OPTION AND LEASE AGREEMENT

THIS FIRST AMENDMENT TO OPTION AND LEASE AGREEMENT ("***Amendment***") is made and entered into as of _____, 202_ (the "***Effective Date***"), between **_____, LLC**, a Delaware limited liability company (the "***Lessee***").

**WHEREAS**, Lessor and Lessee entered into that certain Option and Lease Agreement, dated _____, 201_ with respect to the property commonly known as _____, (collectively, the "***Lease***").

**WHEREAS**, the legal descriptions for the Premises shown on Exhibit B were based on preliminary site discovery information and were contemplated to be replaced with actual metes and bounds upon completion of System design and site survey.

**WHEREAS**, Lessee has completed its System design and site survey and the parties now seek to replace the legal descriptions attached to Exhibit B with the legal descriptions for the current design.

**WHEREAS**, the parties desire to amend the Lease on the terms and conditions contained herein.

**NOW, THEREFORE**, for good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, the parties hereby agree, as follows:

1. **Recitals.** The foregoing recitals are incorporated herein as if set forth at length. Capitalized terms not otherwise defined herein shall have the meanings given to such terms in the Lease. All references herein to the Lease shall include the Lease as modified by this Amendment.

2. **Premises Exhibit**. Exhibit B of the Lease is hereby deleted in its entirety and replaced with **Schedule 1** attached hereto.

3. **Ratification; Full Force and Effect**. Except as amended by this Amendment, the Lease is hereby ratified, confirmed and approved in all respects.

4. **Provisions Binding**. All rights and liabilities given to or imposed upon either of the parties to this Amendment shall extend to and are binding upon the parties hereto and their respective successors and assigns.

5. **Entire Agreement**. This Amendment (a) together with the Lease contains the entire agreement between the parties with respect to the subject matter hereof and supersedes all prior agreements and understandings, whether oral or written, between the parties, (b) may not be modified or amended except by written agreement signed by the parties, (c) will be governed by the laws of the State of Illinois, without regard to principles of conflicts of laws and (d) may be executed by facsimile signature and in one or more counterparts, each of which will be deemed an original, and all of which when taken together will constitute one and the same instrument.

**[*Signatures on the Following Page*]**

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**IN WITNESS WHEREOF**, the parties hereto have executed this Amendment as of the date first above written.

**LESSOR:**

By: _____
Name: _____
Title: _____

**LESSEE:**

**_____, LLC,**
a Delaware limited liability company

By: _____
Name: _____
Title: _____

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**SCHEDULE 1**

**EXHIBIT B**

**DESCRIPTION OF PREMISES**

# ASSIGNMENT AGREEMENT

THIS ASSIGNMENT AGREEMENT ("**Agreement**") is made effective as of Jul 10, 2024, ("**Effective Date**"), by and between 312 Solar Development, LLC, a Delaware limited liability company having a principal place of business at [redacted], [redacted] ("**Assignor**"), and Ament Solar 1, LLC, a Delaware limited liability company with a business address of [redacted] ("**Assignee**").

Recitals

A. Assignor entered into the following agreements identified in this Recital A (the "**Assigned Documents**"):

Janet Dhuse (**"Lessor**") and Assignor entered into that certain Option and Lease Agreement, dated effective September 12, 2022 for the property address commonly known as Ament Road, Yorkville, Kendall County, IL (Parcel Number 05-16-300-006).

B. Assignor desires to assign to Assignee all of its rights, title and interest in and to the Assigned Documents.

NOW, THEREFORE, in consideration of the covenants set forth herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows.

**1. TRANSFER AND ASSIGNMENT.** Assignor does hereby irrevocably convey, grant, bargain, sell, transfer, assign and deliver to Assignee, its successors and assigns, and Assignee does hereby accept from Assignor, effective as of the Effective Date, all of Assignor's right, title and interest in and to the Assigned Documents. Effective as of the Effective Date, Assignor hereby delegates to Assignee, and Assignee hereby assumes from Assignor, all of Assignor's duties and obligations under the Assigned Documents.

**2. REPRESENTATIONS AND WARRANTIES.** Assignor represents and warrants to Assignee that Assignor has delivered to Assignee true, correct and complete copies of the Assigned Documents as amended to date.

**3. FURTHER ASSURANCES.** Each party hereto agrees from time to time, subsequent to the date hereof, to execute and deliver or cause to be executed and delivered such instruments or further assurances as may, in the reasonable opinion of the other party, be necessary or desirable to give effect to the provisions of this Agreement.

**4. GOVERNING LAW.** This Agreement is governed by the laws of the State of Illinois, without giving effect to any conflict of law principle that would result in the laws of any other jurisdiction governing this Agreement.

**5. COUNTERPARTS.** This Agreement may be executed in any number of counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the

same instrument. This Agreement may be executed by facsimile or other electronic signatures and such signatures shall be deemed to bind each signatory as if they were original signatures.

**6. SUCCESSORS AND ASSIGNS.** This Agreement shall be binding upon and inure to the benefit of the successors and permitted assigns of Assignor and Assignee.

**7. WAIVERS AND MODIFICATIONS.** Neither this Agreement nor any term hereof may be amended, changed, waived, discharged or terminated other than by an instrument in writing, signed by an authorized signatory of each of Assignor and Assignee.

IN WITNESS WHEREOF, Assignor and Assignee have executed this Agreement as of the date first set forth above.

**ASSIGNOR:**

[redacted]**ENT, LLC**

Name: Ryan Bailey
Title: VP of Development - Midwest

**ASSIGNEE:**
**AMENT SOLAR 1, LLC**
BY: **1115 SOLAR DEVELOPMENT, LLC,**
i[redacted] sole member and manager

By: _____
Name: Ryan Bailey
Title: VP of Development - Midwest

Illinois Department of Natural Resources
JB Pritzker, Governor • Natalie Phelps Finnie, Director
One Natural Resources Way • Springfield, Illinois 62702-1271
www.dnr.illinois.gov

Kendall County
Kendall Township
Ament Road between IL 47 & Immanuel Road
IEPA, Langan-541021422
*New construction, solar development

PLEASE REFER TO: SHPO LOG #008122322

February 1, 2023

McKenzie Cornell
Langan Engineering, Environmental, Surveying
200 West Madison St., Suite 1920
Chicago, IL 60606

Dear M. Cornell:

The Illinois State Historic Preservation Office is required by the Illinois State Agency Historic Resources Preservation Act (20 ILCS 3420, as amended, 17 IAC 4180) to review all state undertakings for their effect on cultural resources. Pursuant to this requirement, we have received information regarding the above referenced project for our comment.

According to the information provided concerning the proposed project, apparently there is no federal involvement in your project. However, please note that the state law is less restrictive than the federal cultural resource laws concerning archaeology. If your project will use federal loans or grants, need federal agency permits, use federal property, or involve assistance from a federal agency, then your project must be reviewed under the National Historic Preservation Act of 1966, as amended. Please notify us immediately if such is the case.

Our files do not identify any known historic properties within this proposed project area, nor is the project area within the high probability area for archaeological resources as defined in the state Act. Accordingly, this project is EXEMPT pursuant to the Illinois State Agency Historic Resources Preservation Act (20 ILCS 3420/6). An archaeological survey for your above referenced project is not required under STATE law.

If further assistance is needed please contact Jeff Kruchten, Chief Archaeologist at 217/785-1279 or Jeffery.kruchten@illinois.gov.

Sincerely,

[redacted]

Carey L. Mayer , AIA
Deputy State Historic
Preservation Officer

ENCAP INCORPORATED

2585 Wagner Ct.
DeKalb, IL 60115
Phone: 815.748.4500
Fax: 815.748.4255
www.encapinc.net

## TRANSMITTAL LETTER

| | | | |
|---|---|---|---|
| **TO:** | **New Leaf Energy** | **DATE:** | July 13, 2023 |
| | [redacted] | **PROJECT:** | Ament Road |
| | [redacted] | | |
| **ATTN:** | **Mr. Bobby Lee, Project Engineer** [redacted] | **ENCAP Project #** | 23-0519B |

| **We are sending you:** | **Date of Enclosed Materials** | **# of Copies** |
|---|---|---|
| 2023 Water Resources Delineation Report | July 13, 2023 | PDF |
| | | |
| | | |
| | | |

| **CC:** | **Date of Enclosed Materials** | **# of Copies** |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**Via:** ☐ **UPS Ground** ☐ **UPS Overnight** ☐ **U.S. Mail** ☒ **Electronic**

**THESE ARE TRANSMITTED AS CHECKED BELOW:**

☐ **For Approval** ☐ **As Requested** ☒ **For your review** ☒ **For your use**

REMARKS: _____

_____

_____

_____

**Signed: Robert Van Herik, CWS**
rvanherik@encapinc.net

# WATER RESOURCES DELINEATION REPORT

# AMENT ROAD

# KENDALL TOWNSHIP, KENDALL COUNTY, ILLINOIS

**Prepared for:** New Leaf Energy
[redacted]
Attn: Mr. Bobby Lee, Project Engineer

**Prepared by:** ENCAP, Inc.
Mr. Robert Van Herik, CWS
Ms. Susan Rowley, PWS, CWS, LEED AP

**Date Prepared:** July 13, 2023

**ENCAP, Inc. Project #:** 23-0519B

ENCAP INCORPORATED
2585 Wagner Ct.
DeKalb, IL 60115
Phone: 815.748.4500
Fax: 815.748.4255
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# WATER RESOURCES DELINEATION REPORT

## Ament Road / New Leaf Energy

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**Attachments**


USFWS Section 7 Consult. Review Summary + Official Threatened & Endangered Species List
IDNR EcoCAT Natural Resource Review Results / Termination
Floristic Quality Data Sheets
USACE Wetland Determination Data Forms – Midwest Region
Site Photographs
USACE Antecedent Precipitation Tool Figure & Tables (2007, 2009, 2010-WET, 2011, 2015, 2018, 06/16/2023)
Historical Aerial Photographs: 2007, 2009, 2010-WET, 2011, 2015, 2018
Exhibits

- A – Location Map
- B – National Wetlands Inventory
- C – Soil Map
- D – 2021 USGS Topographic Map
- E – FEMA Flood Insurance Rate Map
- F – ISHPO HARGIS Map
- G – Aerial Photograph

# WATER RESOURCES DELINEATION REPORT

**Project Name and Client:** Ament Road / New Leaf Energy

**Project Number:** 23-0519B

**Location:** Illinois, Kendall County, Kendall Township, Unincorporated,
T36N R7E, SW 1/4 of Section 16
Latitude 41.593804; Longitude -88.444237

**Date of Site Visit:** June 16, 2023

**Field Investigators:** R. Van Herik & S. DeDina

## EXECUTIVE SUMMARY

The project area (approximately 58 acres in size) is located in unincorporated Kendall Township, Kendall County, Illinois (Exhibit A: Location Map). The project area, as presented in this report, represents the property limits investigated by ENCAP, Inc. for the presence of regulated surface water resources. These limits do not necessarily reflect the boundaries of any proposed development activities. The project area is generally bounded by Ament Road to the north, and agricultural land to the south, east, and west. A residential/agricultural parcel is located adjacent to the northeast portion of the project area. The project area is located within the Fox River watershed, Middle Aux Sable Creek sub-watershed.

The project area consists of agricultural land that has been tiled, tilled, and is currently in production of corn (*Zea mays*). Two upland grassed swales are found within the southern portion of the site. No buildings or structures were located on-site. Topographically, the elevation decreases from north to south, with a few slightly depressional areas found throughout the site.

One wetland, a farmed wetland, totaling 0.08 acres was identified on the project area. The limits of farmed wetlands were identified using protocol established by the U.S. Department of Agriculture and were not staked in the field.

Basic information regarding wetland regulations may be found in the Regulatory Statement portion of this report. Briefly, the U.S. Army Corps of Engineers (USACE) regulates all Waters of the United States that are currently or historically navigable and all wetlands that are connected to or associated with these waterways. The Kendall County Stormwater Management Ordinance provides for the protection of wetlands and other depressional storage areas from damaging modifications and adverse changes in runoff quality and quantity associated with land developments. It appears that the wetland identified on site is isolated and therefore regulated by Kendall County and not regulated by the USACE, however, the USACE must make a final determination regarding jurisdictional status. Kendall County's ordinance does not specifically enforce wetland buffers.

Based on a July 10, 2023 review of the U.S. Fish and Wildlife Service (USFWS) technical assistance website, sensitive (federally threatened or endangered) plant or animal species habitat are not located on or adjacent to the project area and the proposed project will have "no

effect" on those species (see attached USFWS Review Summary). Further consultation with this agency is not required for a Section 404 Permit from the USACE.

According to the Illinois Department of Natural Resources (IDNR), sensitive (threatened or endangered) plant or animal species are not known to exist within the vicinity of the project area and consultation with the IDNR has been terminated. The formal consultation from the IDNR is valid for 2 years from the submittal date of July 10, 2023 (see attached IDNR EcoCAT Results Report).

At the time of this wetland delineation report, current regulations state that this delineation is valid for 5 years from the date of site visit June 16, 2023.

**PROJECT PURPOSE**

The purpose of the site visit was to identify regulated surface water resources on, or within 100 feet of the project area. A floodplain determination was not included as part of our investigation. On-site wetland areas encountered were delineated using standard methods sanctioned by the United States Army Corps of Engineers in the Corps of Engineers Wetlands Delineation Manual (1987) and 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region and the United States Department of Agriculture National Food Security Act Manual (1994 and 1996). Plant observations were made in order to calculate the Coefficient of Conservatism (ĉ) and Floristic Quality Index (FQI) for each wetland plant community using the Chicago Region FQA Calculator (Herman, B., Sliwinski, R. and S. Whitaker. 2017). Observed wildlife and evaluation of resource quality are also reported as required by the USACE.

## METHODS

**1987 USACE Wetland Delineation Manual and 2010 Midwest Regional Supplement.**

Prior to the site visit, a preliminary site evaluation is performed using aerial photography and natural resource mapping. Potential wetland areas identified by these resources are evaluated in the field to determine if they meet the requirements for a wetland based on the USACE parameters of vegetation, hydrology, and soils. In general, positive indication of each of the three parameters must be demonstrated to classify an area as wetland. Each of these parameters is discussed below.

- **Vegetation** – Three vegetative indicators are applied to plant communities in order to determine if the hydrophytic vegetation criterion is met.
  1. More than 50% of the dominant plant species across all strata must be hydrophytic (water tolerant). The U.S. Army Corps of Engineers has prepared a regional list of plants occurring in wetlands which assigns the plant species different indicators. Wetland plants fall into three indicator classes based on differing tolerances to water level and soil saturation. These indicators are rated obligate wetland (OBL), facultative wetland (FACW), or facultative (FAC). Dominant plant species are recorded at sample points within investigated areas.
  2. The prevalence index is 3.0 or less. The prevalence index is a weighted-average wetland indicator status of all plant species in a sampling plot. Each indicator status category is given a numeric value (OBL = 1, FACW = 2, FAC = 3, FACU = 4, and UPL = 5) and weighting is by abundance. A prevalence index of 3.0 or less indicates that hydrophytic vegetation is present. The prevalence index is used to determine whether hydrophytic vegetation is present on sites where indicators of hydric soil and wetland hydrology are present but the vegetation initially fails the dominance test.
  3. The plant community passes either the dominance test (Indictor 1) or the prevalence index (Indicator 2) after reconsideration of the indicator status of certain plant species that exhibit morphological adaptations for life in wetlands. Common morphological adaptations include but are not limited to adventitious roots, multi-stemmed trunks, shallow root systems developed on or near the soil surface, and buttressing in tree species. To apply this indicator, these morphological features must be observed on more than 50% of the individuals of a FACU species living in an area where indicators of hydric soil and wetland hydrology are present.

- **Hydrology** – To be considered a wetland, an area must have 14 or more consecutive days of flooding or ponding, or a water table 12 inches or less below the soil surface, during the growing season at a minimum frequency of 5 years in 10. Wetland hydrology indicators are divided into four groups as described below:
  - **Group A** – indicators are based on the direct observation of surface water or groundwater during a site visit.
  - **Group B** – consists of evidence that the site is subject to flooding or ponding, although it may not be inundated currently. These indicators include water marks, drift deposits, sediment deposits, and similar features.
  - **Group C** – consists of other evidence that the soil is saturated currently or was saturated recently. Some of these indicators, such as oxidized rhizopheres surrounding living roots and the presence of reduced iron or sulfur in the soil profile, indicate that the soil has been saturated for an extended period.

- **Group D** – consists of landscape and vegetation characteristics that indicate contemporary rather than historical wet conditions. These indicators include stunted or stressed plants, geomorphic position, and the FAC-neutral test.

Wetland hydrology indicators are intended as one-time observations of site conditions that are sufficient evidence of wetland hydrology. Within each group, indicators are divided into two categories – *primary* and *secondary*. One primary indicator from any group is sufficient to conclude that wetland hydrology is present. In the absence of a primary indicator, two or more secondary indicators from any group are required to conclude that wetland hydrology is present.

- **Soils** - To be considered a wetland, an area must contain hydric soil. Hydric soils are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic (lacking oxygen) conditions in the upper part. Soils generally, but not always, will develop indicators that are formed predominantly by the accumulation or loss of iron, manganese, sulfur, or carbon compounds in a saturated and anaerobic environment. The most current edition of the United States Department of Agriculture, Natural Resource Conservation Service *Field Indicators of Hydric Soils in the United States* is used for identification of hydric soils. Field indicators of hydric soils include but are not limited to the presence of any of the following: histic epipedon, sulfidic odor, at least 2 centimeters of muck, depleted matrix, and/or redoximorphic features. Field indicators are usually examined in the top 24 inches of the soil. Soil colors are determined using *Munsell Soil Color Charts*.

Areas meeting these three criteria are staked in the field for surveying purposes. Boundaries are demarcated in the field with pink flagged pin stakes labeled “WETLAND DELINEATION.” Staked boundaries are mapped on an aerial photograph included in this report. Approximate off-site wetland boundaries are identified on the aerial photograph and were determined using available aerial photographs, wetland maps, and field observation.

**Farmed Wetland Determinations.**

ENCAP, Inc. conducted a wetland determination on the farmed portion of the project area and off-site farmed portion immediately adjacent to the property using National Food Security Act Manual (NFSAM) methodology. Aerial photographs are reviewed in order to identify potential farmed wetland signatures. The identified suspect areas are then field investigated to confirm that the areas are in fact wetlands. Copies of the aerial photographs used in identifying farmed wetlands are included in this report.

**MAP REVIEW**

- The **National Wetlands Inventory** does not identify any water resources or wetlands within the project area (Exhibit B).

- The **Soil Map** identifies the following soils within the project area: Lisbon silt loam, 0 to 2 percent slopes (59A), Graymont silt loam, 2 to 5 percent slopes (541B), Graymont silt loam 5 to 10 percent slopes, eroded (541C2), Drummer silty clay loam, 0 to 2 percent slopes (152A), and Elpaso silty clay loam, 0 to 2 percent slopes (356A). Drummer silty clay loam, 0 to 2 percent slopes (152A), and Elpaso silty clay loam, 0 to 2 percent slopes (356A) are considered predominantly hydric in Kendall County (Exhibit C).

- The **2021 United States Geological Survey (USGS) Topographic Map** does not identify any surface drainage within or adjacent to the project area (Exhibit D).

- The **FEMA Flood Insurance Rate Map** identifies the project area outside the 500-year floodplain (Exhibit E).

- The **Illinois State Historic Preservation Office (ISHPO) Historic Architectural Resources Geographic Information System (HARGIS) Map** does not identify any properties or objects that have been listed in the National Register of Historic Places, determined eligible, or surveyed without determination within the project area (Exhibit F).

## SPECIFIC DESCRIPTION OF IDENTIFIED WATER RESOURCES

**Farmed Wetland 1.** This wetland (0.08 acres in total size) is located within the southeast portion of the project area. The wetland is depressional, receiving its hydrology from overland flow, likely connecting to drain tiles located within the agricultural field. Farmed Wetland 1 exhibited wetland signatures in 3 out of 5 historic aerial photographs from years with normal precipitation. The location and acreage of Farmed Wetland 1 were determined through aerial photograph interpretation, and its boundaries were not field staked by ENCAP, Inc. Based on the definition of a high-quality aquatic resource, Farmed Wetland 1 would not be considered a high-quality aquatic resource. No waterfowl or amphibian species observed while at the project area.

The buffer surrounding Farmed Wetland 1 consists of an agricultural field currently in production and an upland grassed swale dominated by non-native grasses. The upland grassed swale provides little functional value to the wetland, while the planted field provides almost no functional value. The farmed wetland and surrounding buffer provide no wildlife habitat to the surrounding area.

Farmed Wetland 1 appears to be isolated and therefore, not under the jurisdiction of the U.S. Army Corps of Engineers; however, the wetland is regulated by Kendall County through implementation of the County Stormwater Ordinance.

One sample point was established within Farmed Wetland 1 to characterize the vegetation, soils, and hydrology (Exhibit G: Aerial Photograph). Farmed Wetland 1 was primarily vegetated by corn and redroot amaranth (*Amaranthus retroflexus*). The mapped soil series is Graymont silt loam, 5 to 10 percent slopes, eroded (541C2), a non-hydric soil. USDA field indicators A11: Depleted Below Dark Surface and F3: Depleted Matrix provided evidence of hydric soil. Saturation visible on aerial imagery, geomorphic position, and a review of historic aerial photographs provided evidence of persistent hydrology (See Wetland Determination Data Forms).

The native mean Coefficient of Conservatism (ĉ) for Farmed Wetland 1 was 0.00, and the native Floristic Quality Index (FQI) of Farmed Wetland 1 was 0.00 (see attached Floristic Quality Data). These values indicate a low-quality plant community.

## INVESTIGATION OF FARMED AREAS

During the field investigation, the entire site consisted of agricultural land. ENCAP, Inc. evaluated aerial photographs (slides) obtained from Google Earth year-by-year using NRCS wetland signature criteria. Wetland signatures consist of wetland vegetation, surface water, drowned-out crops, patches of greener vegetation, and avoided areas. Areas exhibiting wetland signatures in >50% or more of reviewed aerial photographs and containing hydric soils are considered farmed wetlands. Additionally, if areas do not exhibit wetland signatures in >50% or more of reviewed aerial photographs but do exhibit positive primary or secondary wetland hydrology indicators in the field and contain hydric soils, they are also considered farmed wetlands.

See the attached aerial photographs for years reviewed and wetland signatures observed. Figures and tables from the U.S. Army Corps of Engineers Antecedent Precipitation Tool, which indicate the hydrologic conditions for each historic aerial image, are also attached.

**Table 1. Slide Analysis Summary**
**New Leaf Energy/Ament Road**

| Year | Google Earth Source | Precipitation | Sample Points Type of Signature / Corresponding Number | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** |
| 2007 | Google, Maxar Technologies | Normal | N | CT 4 | CT 3 | CT 2 | N | CT 1 | N | N |
| 2009 | USDA/FPAC/ GEO | Normal | N | CT 1 | N | N | N | N | N | N |
| *2010* | *USDA/FPAC/ GEO* | *WET* | *CT 5* | *CT 6* | *CT 4* | *CT 3* | *N* | *CT 2* | *N* | *CT 7* |
| 2011 | USDA/FPAC/ GEO | Normal | CT 2 | N | N | N | N | CT 1 | N | N |
| 2015 | Google, Maxar Technologies | Normal | CT 3 | CT 5 | CT 4 | CT 2 | N | CT 1 | N | N |
| 2018 | Google, Maxar Technologies | Normal | CT 2 | N | N | N | N | CT 1 | N | N |
| Percent wetland signatures present in years with normal precipitation | | | 0%* | 60% | 40% | 40% | 0% | 0%* | 0% | 0% |
| Hydric soil present based on field inspection | | | Yes | Yes | Yes | Yes | No | No | Yes | Yes |
| Identified as wetland on the NWI | | | No | No | No | No | No | No | No | No |
| Qualifies as Farmed Wetland | | | No | Yes | No | No | No | No | No | No |

INU= Inundation
CT= Color Tone Difference
SAT= Saturation
N=No Wetland Signatures Observed
Y= Yes / Identified
*Although these areas displayed color tone differences in the historical aerials, they were determined to be upland grassed swales and therefore the color tone differences are not considered wetland signatures.

## ADDITIONAL AREAS INVESTIGATED FOR WETLAND STATUS

Seven additional vegetated sites located within the project area were examined to determine if they satisfied wetland criteria. None of these sites qualified; therefore, they are referred to as Upland Grassed Swales / Investigated Areas in this report. Each area is briefly described herein and USACE data forms are provided to support our negative findings (See USACE data forms).

**Upland Grassed Swale 1.** This investigated area is located in the southeast portion of the project area (Exhibit G: Aerial Photograph – Sample Point A). This area was investigated because it consisted of an upland grassed swale that displayed color tone differences in the historical aerial imagery examined during the farmed wetland desk review.

Upland Grassed Swale 1 was primarily vegetated by smooth brome (*Bromus inermis*) and meadow fescue (*Schedonorus pratense*). The mapped soil series is Drummer silty clay loam, 0 to 2 percent slopes (152A), a hydric soil. USDA field indicators A11: Depleted Below Dark Surface and F3: Depleted Matrix provided evidence of hydric soil. Evidence of persistent hydrology was not observed (See Wetland Determination Data Forms).

Based on the dominance of upland plant species and non-persistent hydrology, Upland Grassed Swale 1 does not qualify as wetland.

**Upland Grassed Swale 2.** This investigated area is located in the southwest portion of the project area (Exhibit G: Aerial Photograph – Sample Point F). This area was investigated because it consisted of an upland grassed swale that displayed color tone differences in the historical aerial imagery examined during the farmed wetland desk review.

Upland Grassed Swale 2 was primarily vegetated by smooth brome and meadow fescue. The mapped soil series is Drummer silty clay loam, 0 to 2 percent slopes (152A), a hydric soil. The field investigated soil did not exhibit hydric characteristics. Evidence of persistent hydrology was not observed (See Wetland Determination Data Forms).

Based on the dominance of upland plant species, the presence of non-hydric soil, and non-persistent hydrology, Upland Grassed Swale 2 does not qualify as wetland.

**Investigated Area 1.** This investigated area is located in the southeast portion of the project area (Exhibit G: Aerial Photograph – Sample Point C). This area was investigated because it displayed wetland signatures during 2 of 5 years with normal precipitation.

Investigated Area 1 was primarily vegetated by corn. The mapped soil series is Drummer silty clay loam, 0 to 2 percent slopes (152A), a hydric soil. USDA field indicator A12: Thick Dark Surface provided evidence of hydric soil. Evidence of persistent hydrology was not observed (See Wetland Determination Data Forms).

Based on the non-persistent hydrology, Investigated Area 1 does not qualify as farmed wetland.

**Investigated Area 2.** This investigated area is located in the southeast portion of the project area (Exhibit G: Aerial Photograph – Sample Point D). This area was investigated because it displayed wetland signatures during 2 of 5 years with normal precipitation.

Investigated Area 2 was primarily vegetated by corn. The mapped soil series is Drummer silty clay loam, 0 to 2 percent slopes (152A), a hydric soil. USDA field indicator A12: Thick Dark

Surface provided evidence of hydric soil. Evidence of persistent hydrology was not observed (See Wetland Determination Data Forms).

Based on the non-persistent hydrology, Investigated Area 2 does not qualify as farmed wetland.

**Investigated Area 3.** This investigated area is located in the south portion of the project area (Exhibit G: Aerial Photograph – Sample Point E). This area was investigated because it contained a mixture of cultivated crops and hydrophytic vegetation.

Investigated Area 3 was primarily vegetated by corn and barnyard grass (*Echinochloa crus-galli*). The mapped soil series is Graymont silt loam, 2 to 5 percent slopes (541B), a non-hydric soil. The field investigated soil did not exhibit hydric characteristics. Evidence of persistent hydrology was not observed (See Wetland Determination Data Forms).

Based on the presence of non-hydric soil and non-persistent hydrology, Investigated Area 3 does not qualify as farmed wetland.

**Investigated Area 4.** This investigated area is located in the northwest portion of the project area (Exhibit G: Aerial Photograph – Sample Point G). This area was investigated because it consisted of a slight topographic depression.

Investigated Area 4 was primarily vegetated by corn. The mapped soil series Elpaso silty clay loam, 0 to 2 percent slopes (356A), a hydric soil. USDA field indicator A12: Thick Dark Surface provided evidence of hydric soil. Evidence of persistent hydrology was not observed (See Wetland Determination Data Forms).

Based on the non-persistent hydrology, Investigated Area 4 does not qualify as farmed wetland.

**Investigated Area 5.** This investigated area is located in the northeast portion of the project area (Exhibit G: Aerial Photograph – Sample Point H). This area was investigated because it consisted of a slight topographic depression that appeared as a wetland signature during the wet year of the examined historical aerials; however, it did not display wetland signatures in years examined with normal precipitation.

Investigated Area 5 was primarily vegetated by corn. The mapped soil series Elpaso silty clay loam, 0 to 2 percent slopes (356A), a hydric soil. USDA field indicator A12: Thick Dark Surface provided evidence of hydric soil. Evidence of persistent hydrology was not observed (See Wetland Determination Data Forms).

Based on the non-persistent hydrology, Investigated Area 5 does not qualify as farmed wetland.

## REGULATORY STATEMENT

**Federal Regulations:** The deposition of dredged or fill materials into federally jurisdictional wetlands or Waters of the United States is regulated by the USACE under Section 404 of the Clean Water Act.

The Nationwide Permit Program authorizes 0.10 acre or less of low quality wetlands to be filled without mitigation. If over 0.1 acre is proposed for filling or is subject to secondary impacts, in-kind mitigation may be required at a ratio of 1.5:1, or greater. The aggregate total loss of waters of the U.S. authorized by NWP 39 cannot exceed 0.5 acre or 300 linear feet of streambed.

Under the existing regulations, secondary impacts (both on-site and off-site) from filling also must be evaluated. Mitigation may be required at a higher rate if a project will significantly alter wetland functions such as stormwater detention, water filtration, sediment trapping, and/or wildlife habitat.

Before mitigation will be approved, reasonable proof that avoidance or minimization of wetland impacts has been attempted must be provided to the Corps.

A USACE permit is not required if the wetlands are avoided and construction erosion near wetlands is controlled.

**Kendall County Stormwater Management Ordinance:** On December 15, 2011, Kendall County adopted a Stormwater Management Ordinance, with a most recent update of May 18, 2021. The ordinance provides for the protection of wetlands and other depressional storage areas from damaging modifications and adverse changes in runoff quality and quantity associated with land developments.

Natural vegetation shall be retained and protected. Areas immediately adjacent to natural watercourses, lakes, ponds, and wetlands shall be left undisturbed during development to the greatest extent possible. Temporary crossings of watercourses, when permitted, must include appropriate watercourse and bank stabilization measures.

Special precautions shall be taken to prevent damages resulting from any necessary development activity within or adjacent to any stream, lake, pond, or wetland. Preventative measures shall reflect the sensitivity of these areas to erosion and sedimentation.

**Illinois Department of Natural Resources Agency Action Plans for Interagency Wetlands Policy Act of 1989:** The Illinois Interagency Wetlands Policy Act of 1989 is intended to ensure that there is no overall net loss of the State's existing wetland acres or their functional values resulting from State-supported activities. The Act charges State agencies with a further duty to "preserve, enhance and create wetlands where necessary to increase the quality and quantity of the State's wetland resource base."

The Interagency Wetlands Policy Act of 1989 states that any construction, land management or other activity performed by, or for which financial assistance is administered or provided by, a State agency that will result in an adverse impact to a wetland shall be subject to compliance. This includes, but is not limited to the following:

- The alteration, removal, excavation, or dredging of soil, sand, gravel, minerals, organic matter, vegetation, or naturally occurring minerals of any kind from a wetland;

- The discharge or deposit of fill material or dredged material in a wetland;
- The alteration of existing drainage characteristics, sedimentation patterns, or flood retention characteristics of a wetland;
- The disturbance of water level or water table of a wetland;
- The destruction or removal of plant life that would alter the character of a wetland, except for activities undertaken in accordance with the Illinois Noxious Weed Act;
- The transfer of State owned wetlands to any entity other than another state agency; and
- Other actions that cause or may cause adverse wetland impacts.

The Act is to be implemented through a State Wetland Mitigation Policy. The State Wetland Mitigation Policy requires preservation of wetlands as the primary objective. Where adverse wetland impacts are unavoidable, progressive levels of compensation based upon the level of impact to the existing wetland and the location of compensation wetlands are required.

**Archaeological Survey Requirements:** An archaeological survey may be required before a Section 404 permit will be issued for wetland impacts. The U.S. Army Corps of Engineers will make this determination as part of the permit application review. The archaeological survey must cover all areas of the project area, not wetlands only. If you already have a letter from the Illinois State Historic Preservation Office (ISHPO) stating an archaeological survey is required, you should act on it because the USACE will support this notification.

**RECOMMENDATIONS**

One farmed wetland totaling 0.08 acres was identified on the project area. The boundary of Farmed Wetland 1 was not field staked by ENCAP, Inc. Farmed wetland boundaries must be scaled from the attached aerial photograph (Exhibit G) onto the property boundary survey.

The U.S. Army Corps of Engineers has the final authority in determining the jurisdictional status of the wetland identified on site. ENCAP, Inc. recommends that a request for jurisdictional determination be sent to the U.S. Army Corps of Engineers as soon as possible. An Approved Jurisdictional Determination may take between 3-6 months to receive from the USACE offices.

If wetlands can be completely avoided by project development, a Letter of No Objection (LONO) / No Permit Required may be obtained from the USACE in lieu of an Approved Jurisdictional Determination. A LONO/No Permit Required letter may take between 2-3 months to receive from the USACE offices.

Any impacts to Farmed Wetland 1 will require U.S. Army Corps of Engineers or County notification and approval. ENCAP, Inc. can assist you with the request for jurisdictional determination/LONO/No Permit Required, permit applications, agency negotiations, wetland design plans, and mitigation plans which may be applicable to your project. The wetland consultant should be involved during the planning and design stages of the project to avoid complications with the agencies after the plan has been drafted. Proper planning regarding wetlands can reduce delays caused by the permitting process and costly changes in site plans.

## REFERENCES

Cowardin, L.M., Carter, V., Golet, F.D., and LaRoe, E.T., 1979, "Classification of Wetlands and Deepwater Habitats of the United States," FWA/OBS-79/31, U.S. Fish & Wildlife Service, Office of Biological Services, Washington, D.C.

Environmental Laboratory. 1987. "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Gutenson, J. L., and J. C. Deters. 2022. Antecedent Precipitation Tool (APT) Version 1.0: Technical and User Guide. ERDC/TN WRAP-22-1. Vicksburg, MS: US Army Engineer Research and Development Center. http://dx.doi.org/10.21079/11681/43160.

Herman, B., Sliwinski, R. and S. Whitaker. 2017. Chicago Region FQA (Floristic Quality Assessment) Calculator. U.S. Army Corps of Engineers, Chicago, IL.

Illinois Department of Natural Resources. "Agency Action Plans for Interagency Wetlands Policy Act of 1989." **http://dnr.state.il.us/wetlands/ch6d.htm**.

Kendall County Stormwater Management Ordinance. Adopted December 15, 2011. Revised October 15, 2019.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X.

Munsell Soil Color Charts. 2023. GretagMacbeth, New Windsor, New York.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at the following link: https://websoilsurvey.sc.egov.usda.gov/. Accessed [05/19/2023].

Swink F. and G. Wilhelm, 1994, "Plants of the Chicago Region", 4th Edition, Indianapolis: Indiana Academy of Science.

United States Army Corps of Engineers 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0), U.S. Army Engineer Research and Development Center.

United States Army Corps of Engineers 2016. National Wetland Plant List, version 3.3. http://wetland_plants.usace.army.mil/ U.S. Army Corps of Engineers. Engineer Research and Development Center. Cold Regions Research and Engineering Laboratory, Hanover, NH.

United States Department of Agriculture. 1994. National Food Security Act manual, 180-V-NFSAM, Third Edition, 2nd Amendment, December 20, 1996.

United States Department of Agriculture, Natural Resources Conservation Service. 2018. Field Indicators of Hydric Soils in the United States, Version 8.2. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

United States Department of the Army, Corps of Engineers, “Nationwide Permit Program,” February 25, 2022.

United States Government, Joint Guidance From The Natural Resources Conservation Service And The Army Corps Of Engineers Concerning Wetland Determinations For The Clean Water Act And The Food Security Act Of 1985, March 25, 2005.

Wilhelm, G. and L. Rericha. 2017, “Flora of the Chicago Region: A Floristic and Ecological Synthesis”, Indianapolis: Indiana Academy of Science.

**USFWS Section 7 Consultation Review Summary**
**+ Official Threatened & Endangered Species List**

ENCAP INCORPORATED

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July 10, 2023

U.S. Fish and Wildlife Service
Illinois & Iowa Ecological Services Field Office
1511 47th Ave
Moline, IL 61265-7022

**Re: USFWS Review Summary - Section 7 Endangered Species Act Consultation**
**Project: Ament Road, located in Illinois, Kendall County, Kendall Township, Unincorporated, T36N R7E Section 16;**
**Latitude 51.593804 N; Longitude -88.444237 W**
**ENCAP, Inc. project # 23-0519B**
**Client: New Leaf Energy**

The project area consists of agricultural land that has been tiled, tilled, and is currently in production of corn (*Zea mays*). Two upland grassed swales are found within the southern portion of the site to aid in drainage of stormwater from the field off-site. No buildings or structures were located on-site. Topographically, the elevation decreases from north to south, with a few slightly depressional areas found throughout the site. The proposed project includes conversion of the agricultural field to a solar array and attendant features.

ENCAP, Inc. carefully reviewed the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPAC) technical assistance website on July 10, 2023 for federally listed threatened and endangered species. According to the website, 3 threatened or endangered species are listed and may be present in Kendall County: Indiana Bat (*Myotis sodalis*), Northern Long-eared Bat (*Myotis septentrionalis*), and Eastern Prairie Fringed Orchid (*Platanthera leucophaea*). Additionally, the Tricolored Bat (*Perimyotis subflavus*) is proposed to be listed as an endangered species, the Monarch Butterfly (*Danaus plexippus*) is included as a candidate species, and the Whooping Crane (*Grus americana*) is included as an experimental population, non-essential species.

Two major types of habitat exist on the project area. The majority of the project area is an active agricultural field currently in production of corn. The remainder of the project area consists of non-native grasses planted in upland grassed swales and at the border of the field. Scattered non-planted forbs were found throughout the property border and the west upland grassed swale. These areas provide virtually no wildlife habitat on-site. Along the southern border of the parcel, a few mature trees and several saplings were found consisting of hackberry (*Celtis occidentalis*) and white mulberry (*Morus alba*). This area provides minimal wildlife habitat but is unlikely to support listed species. Very few flowering forbs were identified on-site.

One wetland, a farmed wetland, totaling 0.08 acres was identified on the project area. The native mean Coefficient of Conservatism (ĉ) for Farmed Wetland 1 was 0.00, and the native Floristic Quality Index (FQI) of Farmed Wetland 1 was 0.00.

The project area does not contain medium to high quality wetland with species associated with Eastern prairie fringed orchid. The limited number of mature trees provides very little foraging habitat for listed bat species. If tree clearing is avoided, or is conducted during the winter months, it is likely this project will have “no effect” on the Northern long-eared or Indiana bat species.

The minimal flowering forbs found on-site may support limited habitat for the Monarch Butterfly. Further guidance for this species is not required since it is a candidate species and not yet fully listed as threatened or endangered. The Monarch Butterfly was found to warrant listing and protection under the Endangered Species Act (ESA), but resources must go to higher priority species at this time. Candidate species have no legal protection under the ESA, but agencies can still provide recommendations for them. The USFWS broadly urges the public to provide habitat for this imperiled species by planting native milkweed and nectar plants. The Monarch Butterfly should be considered in any landscaping plans.

The endangered Whooping Crane population plummeted to only about 20 birds in the 1940’s due to habitat loss and hunting, but through intense conservation efforts, the overall wild and captive population is now around 800 birds. The Whooping Crane Eastern Migratory population, which travels through Illinois, is a reintroduced flock started in 2001 with captive raised chicks. The flock breeds in central Wisconsin and winters between the central Gulf Coast of Florida and southeastern United States. This reintroduction effort is ongoing; 72 adults were present as of May 2023. Whooping Cranes require wetlands, particularly wetland mosaic landscapes, in Illinois while migrating, so the greatest threat to them in Illinois is wetland loss. The Eastern Migratory population is designated “non-essential” by the Endangered Species Act to reduce regulatory restrictions on reintroductions. Non-essential, experimental populations are treated as threatened under the U.S. Fish & Wildlife Service’s 10(j) policy. The Eastern Migratory population is important to the recovering Whooping Crane population overall, but formal consultation with the USFWS is likely not required for this population.

None of the two areas on-site contain suitable habitats for the Indiana Bat, Northern Long Eared Bat, Tricolored Bat, Eastern Prairie Fringed Orchid, Monarch Butterfly or Whooping Crane. Therefore, ENCAP, Inc. concludes that the Ament Road solar project does not contain the aforementioned listed species, their habitats, or designated critical habitat and will have “no effect” on the aforementioned species.



Robert Van Herik, CWS
Senior Ecological Consultant
ENCAP, Inc.

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Illinois-Iowa Ecological Services Field Office
Illinois & Iowa Ecological Services Field Office
1511 47th Ave
Moline, IL 61265-7022
Phone: (309) 757-5800 Fax: (309) 757-5807

In Reply Refer To:
Project Code: 2023-0102286
Project Name: Ament Road

July 10, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The attached species list identifies federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat, if present, within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Under 50 CFR 402.12(e) (the regulations that implement Section 7 of the Endangered Species Act) **the accuracy of this species list should be verified after 90 days**. This verification can be completed formally or informally. You may verify the list by visiting the ECOSPHERE Information for Planning and Consultation (IPaC) website https://ipac.ecosphere.fws.gov at regular intervals during project planning and implementation and completing the same process you used to receive the attached list.

## Section 7 Consultation

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the U.S. Fish and Wildlife Service (Service) if they determine their project “may affect” listed species or designated critical habitat. Under the ESA, it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action may affect endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service to make "no effect" determinations. If you determine that your proposed action will have

no effect on threatened or endangered species or their respective designated critical habitat, you do not need to seek concurrence with the Service.

**Note:** For some species or projects, IPaC will present you with *Determination Keys*. You may be able to use one or more Determination Keys to conclude consultation on your action.

***Technical Assistance for Listed Species***

1. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain information on the species life history, species status, current range, and other documents by selecting the species from the thumbnails or list view and visiting the species profile page.

***No Effect Determinations for Listed Species***

1. If there are *no* species or designated critical habitats on the Endangered Species portion of the species list: conclude "no species and no critical habitat present" and document your finding in your project records. No consultation under ESA section 7(a)(2) is required if the action would result in no effects to listed species or critical habitat. Maintain a copy of this letter and IPaC official species list for your records.

2. If any species or designated critical habitat are listed as potentially present in the **action area** of the proposed project the project proponents are responsible for determining if the proposed action will have “no effect” on any federally listed species or critical habitat. No effect, with respect to species, means that no individuals of a species will be exposed to any consequence of a federal action or that they will not respond to such exposure.

3. If the species habitat is not present within the action area or current data (surveys) for the species in the action area are negative: conclude “no species habitat or species present” and document your finding in your project records. For example, if the project area is located entirely within a “developed area” (an area that is already graveled/paved or supports structures and the only vegetation is limited to frequently mowed grass or conventional landscaping, is located within an existing maintained facility yard, or is in cultivated cropland conclude no species habitat present. Be careful when assessing actions that affect: 1) rights-of-ways that contains natural or semi-natural vegetation despite periodic mowing or other management; structures that have been known to support listed species (example: bridges), and 2) surface water or groundwater. Several species inhabit rights-of-ways, and you should carefully consider effects to surface water or groundwater, which often extend outside of a project’s immediate footprint.

4. Adequacy of Information & Surveys - Agencies may base their determinations on the best evidence that is available or can be developed during consultation. Agencies must give the benefit of any doubt to the species when there are any inadequacies in the information. Inadequacies may include uncertainty in any step of the analysis. To provide adequate information on which to base a determination, it may be appropriate to conduct surveys to determine whether listed species or their habitats are present in the action area. Please contact our office for more information or see the survey guidelines that the Service has made available in IPaC.

***May Effect Determinations for Listed Species***

1. If the species habitat is present within the action area and survey data is unavailable or inconclusive: assume the species is present or plan and implement surveys and interpret results in coordination with our office. If assuming species present or surveys for the species are positive continue with the may affect determination process. May affect, with respect to a species, is the appropriate conclusion when a species might be exposed to a consequence of a federal action and could respond to that exposure. For critical habitat,

‘may affect’ is the appropriate conclusion if the action area overlaps with mapped areas of critical habitat and an essential physical or biological feature may be exposed to a consequence of a federal action and could change in response to that exposure.

2. Identify stressors or effects to the species and to the essential physical and biological features of critical habitat that overlaps with the action area. Consider all consequences of the action and assess the potential for each life stage of the species that occurs in the action area to be exposed to the stressors. Deconstruct the action into its component parts to be sure that you do not miss any part of the action that could cause effects to the species or physical and biological features of critical habitat. Stressors that affect species’ resources may have consequences even if the species is not present when the project is implemented.

3. If no listed or proposed species will be exposed to stressors caused by the action, a ‘no effect’ determination may be appropriate – be sure to separately assess effects to critical habitat, if any overlaps with the action area. If you determined that the proposed action or other activities that are caused by the proposed action may affect a species or critical habitat, the next step is to describe the manner in which they will respond or be altered. Specifically, to assess whether the species/critical habitat is "not likely to be adversely affected" or "likely to be adversely affected."

4. Determine how the habitat or the resource will respond to the proposed action (for example, changes in habitat quality, quantity, availability, or distribution), and assess how the species is expected to respond to the effects to its habitat or other resources. Critical habitat analyses focus on how the proposed action will affect the physical and biological features of the critical habitat in the action area. If there will be only beneficial effects or the effects of the action are expected to be insignificant or discountable, conclude "may affect, not likely to adversely affect" and submit your finding and supporting rationale to our office and request concurrence.

5. If you cannot conclude that the effects of the action will be wholly beneficial, insignificant, or discountable, check IPaC for species-specific Section 7 guidance and conservation measures to determine whether there are any measures that may be implemented to avoid or minimize the negative effects. If you modify your proposed action to include conservation measures, assess how inclusion of those measures will likely change the effects of the action. If you cannot conclude that the effects of the action will be wholly beneficial, insignificant, or discountable, contact our office for assistance.

6. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

For additional information on completing Section 7 Consultation including a Glossary of Terms

used in the Section 7 Process, information requirements for completing Section 7, and example letters visit the Midwest Region Section 7 Consultations website at: https://www.fws.gov/office/midwest-region-headquarters/midwest-section-7-technical-assistance.
You may find more specific information on completing Section 7 on communication towers and transmission lines on the following websites:

- Incidental Take Beneficial Practices: Power Lines - https://www.fws.gov/story/incidental-take-beneficial-practices-power-lines
- Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning. - https://www.fws.gov/media/recommended-best-practices-communication-tower-design-siting-construction-operation

***Northern Long-eared Bat Update***

Please note that on March 23, 2022, the Service published a proposal to reclassify the northern long-eared bat (NLEB) as endangered under the Endangered Species Act. The U.S. District Court for the District of Columbia has ordered the Service to complete a new final listing determination for the NLEB by November 2022 (Case 1:15-cv-00477, March 1, 2021). The bat, currently listed as threatened, faces extinction due to the range-wide impacts of white-nose syndrome (WNS), a deadly fungal disease affecting cave-dwelling bats across the continent. The proposed reclassification, if finalized, would remove the current 4(d) rule for the NLEB, as these rules may be applied only to threatened species. Depending on the type of effects a project has on NLEB, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective (anticipated to occur by December 30, 2022). If your project may result in incidental take of NLEB after the new listing goes into effect this will first need to addressed in an updated consultation that includes an Incidental Take Statement. If your project may require re-initiation of consultation, please contact our office for additional guidance.
Other Trust Resources and Activities

***Bald and Golden Eagles***

Although no longer protected under the Endangered Species Act, be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act, as are golden eagles. Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near an eagle nest or winter roost area, please contact our office for further coordination. For more information on permits and other eagle information visit our website https://www.fws.gov/library/collections/bald-and-golden-eagle-management.
We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries

- Migratory Birds
- Wetlands

# OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Illinois-Iowa Ecological Services Field Office**
Illinois & Iowa Ecological Services Field Office
1511 47th Ave
Moline, IL 61265-7022
(309) 757-5800

# PROJECT SUMMARY

Project Code: 2023-0102286
Project Name: Ament Road
Project Type: Power Gen - Solar
Project Description: Conversion of a agricultural field to a solar development and attendant features
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@41.59330225,-88.44436848325043,14z



Counties: Kendall County, Illinois

# ENDANGERED SPECIES ACT SPECIES

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. 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.

## MAMMALS

| NAME | STATUS |
|---|---|
| Indiana Bat *Myotis sodalis*<br>There is **final** critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/5949 | Endangered |
| Northern Long-eared Bat *Myotis septentrionalis*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/9045 | Endangered |
| Tricolored Bat *Perimyotis subflavus*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/10515 | Proposed Endangered |

## BIRDS

| NAME | STATUS |
|---|---|
| Whooping Crane *Grus americana*<br>Population: U.S.A. (AL, AR, CO, FL, GA, ID, IL, IN, IA, KY, LA, MI, MN, MS, MO, NC, NM, OH, SC, TN, UT, VA, WI, WV, western half of WY)<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/758 | Experimental Population, Non-Essential |

## INSECTS

| NAME | STATUS |
|---|---|
| Monarch Butterfly *Danaus plexippus* | Candidate |

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9743

## FLOWERING PLANTS

| NAME | STATUS |
|---|---|
| Eastern Prairie Fringed Orchid *Platanthera leucophaea* | Threatened |

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/601

## CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

# USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

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 OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

# MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

**The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location.** To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

| NAME | BREEDING SEASON |
|---|---|
| American Golden-plover *Pluvialis dominica*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. | Breeds elsewhere |
| 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. | Breeds Oct 15 to Aug 31 |

| NAME | BREEDING SEASON |
|---|---|
| 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 |
| Cerulean Warbler *Dendroica cerulea*<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/2974 | Breeds Apr 21 to Jul 20 |
| 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 |
| Henslow's Sparrow *Ammodramus henslowii*<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/3941 | Breeds May 1 to Aug 31 |
| Kentucky Warbler *Oporornis formosus*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. | Breeds Apr 20 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 |
| Prothonotary Warbler *Protonotaria citrea*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. | Breeds Apr 1 to Jul 31 |
| 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 |
| Upland Sandpiper *Bartramia longicauda*<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/9294 | Breeds May 1 to Aug 31 |
| 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 and understand the FAQ "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.

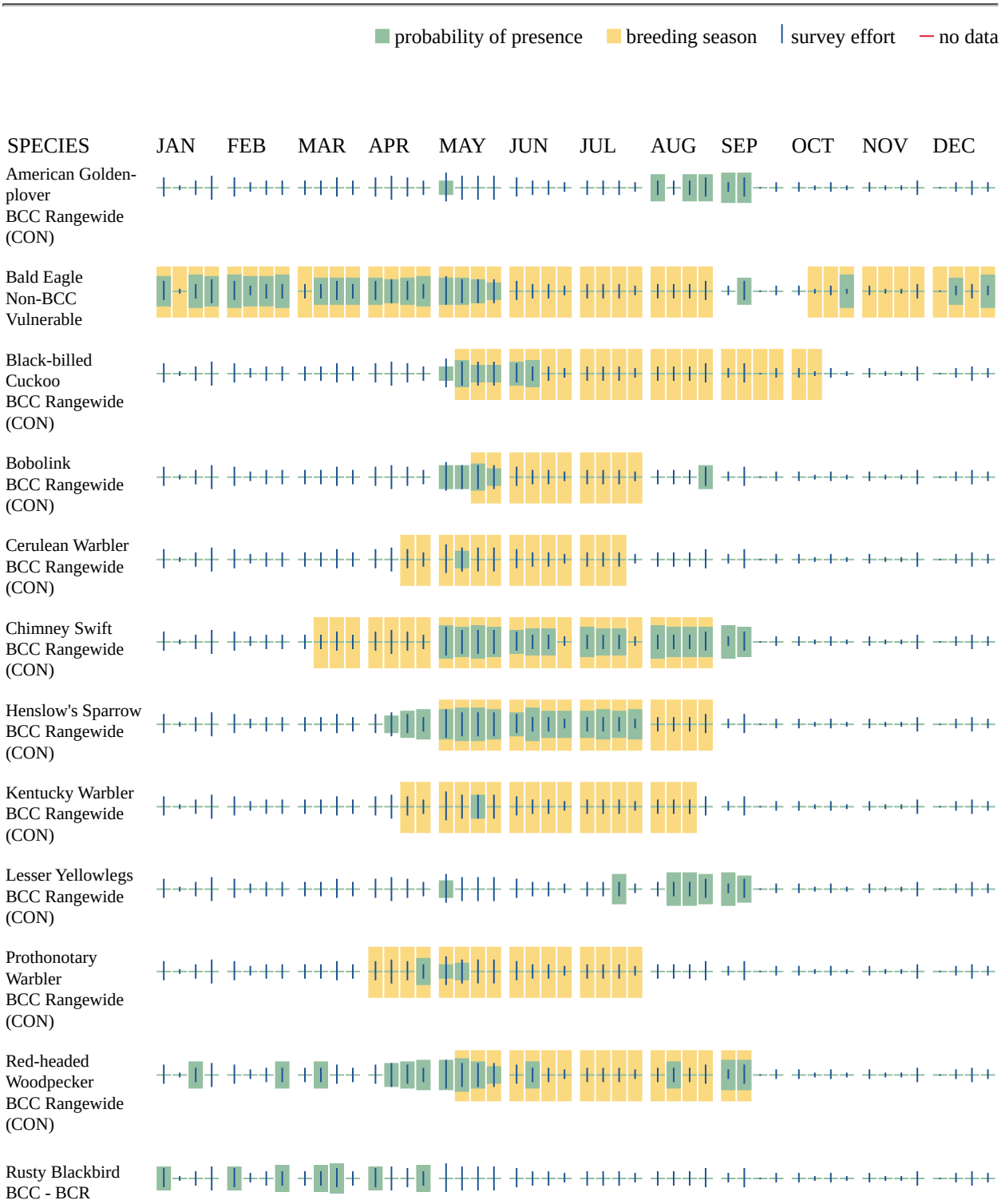
**Breeding Season (■)**
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

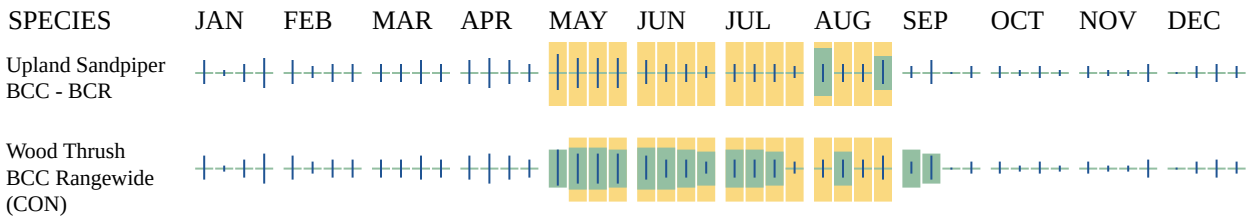
**Survey Effort (|)**
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

**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.






Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

## MIGRATORY BIRDS FAQ

**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding 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 USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

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) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle 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, please visit the Rapid Avian Information Locator (RAIL) Tool.

**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 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 year-round), you may query your location using the RAIL Tool and look at 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 migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, 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 Eagle 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 try 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 eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

**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.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

**What if I have eagles on my list?**
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

**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 also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). 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 is not perfect; 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 helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

# WETLANDS

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.

THERE ARE NO WETLANDS WITHIN YOUR PROJECT AREA.

# IPAC USER CONTACT INFORMATION

Agency: ENCAP, Inc.
Name: Robert Van Herik
Address: [redacted]
City: [redacted]
State: [redacted]
Zip: [redacted]
Email [redacted]
Phone: [redacted]

## IDNR EcoCAT Natural Resources Review Results / Termination

EcoCAT
Ecological Compliance Assessment Tool

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

*Applicant:* ENCAP, Inc.
*Contact:* Robert Van Herik, Jr.
*Address:* [redacted]

*IDNR Project Number:* 2400448
*Date:* 07/10/2023
*Alternate Number:* 23-0519B

*Project:* Ament Road
*Address:* Ament Road, Yorkville

*Description:* conversion of agricultural field into a solar development and attendant features.

## 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:* Kendall

*Township, Range, Section:*
36N, 7E, 16
36N, 7E, 17



**IL Department of Natural Resources Contact**
Kyle Burkwald
217-785-5500
Division of Ecosystems & Environment

**Government Jurisdiction**
Kendall County Planning, Building, & Zoning
Matt Asselmeier,
masselmeier@kendallcountyil.gov
111 West Fox Street
Yorkville, Illinois 60560

**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.

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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.

*IDNR Project Number: 2400448*

EcoCAT
Ecological Compliance Assessment Tool

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

# EcoCAT Receipt

**Project Code** 2400448

| APPLICANT | DATE |
|---|---|
| ENCAP, Inc.<br>Robert Van Herik, Jr.<br>[redacted] | 7/10/2023 |

| 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

# Floristic Quality Data Sheets

SITE: Ament Road
LOCALE: Farmed Wetland 1
BY: R. Van Herik & S. DeDina
NOTES: 6/16/2023

| CONSERVATISM-BASED METRICS | | ADDITIONAL METRICS | |
|---|---|---|---|
| MEAN C (NATIVE SPECIES) | 0.00 | SPECIES RICHNESS (ALL) | 3 |
| MEAN C (ALL SPECIES) | 0.00 | SPECIES RICHNESS (NATIVE) | 1 |
| MEAN C (NATIVE TREES) | n/a | % NON-NATIVE | 0.67 |
| MEAN C (NATIVE SHRUBS) | n/a | WET INDICATOR (ALL) | 0.67 |
| MEAN C (NATIVE HERBACEOUS) | 0.00 | WET INDICATOR (NATIVE) | -1.00 |
| FQAI (NATIVE SPECIES) | 0.00 | % HYDROPHYTE (MIDWEST) | 0.33 |
| FQAI (ALL SPECIES) | 0.00 | % NATIVE PERENNIAL | 0.33 |
| ADJUSTED FQAI | 0.00 | % NATIVE ANNUAL | 0.00 |
| % C VALUE 0 | 1.00 | % ANNUAL | 0.67 |
| % C VALUE 1-3 | 0.00 | % PERENNIAL | 0.33 |
| % C VALUE 4-6 | 0.00 | | |
| % C VALUE 7-10 | 0.00 | | |

| SPECIES ACRONYM | SPECIES NAME (NWPL/ MOHLENBROCK) | SPECIES (SYNONYM) | COMMON NAME | C VALUE | MIDWEST WET INDICATOR | NC-NE WET INDICATOR | WET INDICATOR (NUMERIC) | HABIT | DURATION | NATIVITY |
|---|---|---|---|---|---|---|---|---|---|---|
| AMARET | Amaranthus retroflexus | AMARANTHUS RETROFLEXUS | Red-Root | 0 | FACU | FACU | 1 | Forb | Annual | Adventive |
| CYPESC | Cyperus esculentus | Cyperus esculentus | Chufa | 0 | FACW | FACW | -1 | Sedge | Perennial | Native |
| ZEAMAY | Zea mays | ZEA MAYS | Corn | 0 | UPL | UPL | 2 | Grass | Annual | Adventive |

**USACE Wetland Determination Data Forms – Midwest Region**

**WETLAND DETERMINATION DATA FORM – Midwest Region**

Project/Site: Ament Road City/County: Unincorporated/Kendall Sampling Date: 06/16/2023

Applicant/Owner: New Leaf Energy State: IL Sampling Point: A

Investigator(s) R. Van Herik & S. DeDina Section, Township, Range: Sec. 16, T36N, R7E

Landform (hillslope, terrace, etc.): Swale, toe slope Local Relief (concave, convex, none): concave

Slope (%): 3% *Lat: 41.59041116 *Long: -88.4415898 Datum: Upland Grassed Swale 1

Soil Map Unit Name: Drummer silty clay loam, 0 to 2 percent slopes (152A) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no explain in remarks)

Are vegetation ☐ Soil ☐ Hydrology ☒ significantly disturbed? Are normal circumstances present? Yes ☐ No ☒

Are vegetation ☐ Soil ☐ 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 ☐ No ☒
Hydric Soils Present? Yes ☒ No ☐ **Is the Sampled Area Within a Wetland?** **Yes ☐ No ☒**
Wetland Hydrology Present? Yes ☐ No ☒

**Remarks: Precipitation data from the previous 3 months indicates the climatic/hydrologic conditions have been drier than normal. Sample Point is located in an upland grassed swale located within an agricultural field that has been tiled, tilled, and planted with corn (*Zea mays*).**

*Coordinates obtained from Site Photograph.

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

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | = Total Cover | |
| **Sapling/Shrub Stratum (Plot size: 15')** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | =Total Cover | |
| **Herb Stratum (Plot size: 5')** | | | |
| 1. *Schedonorus pratense* | 40 | Y | FACU |
| 2. *Bromus inermis* | 35 | Y | FACU |
| 3. *Dactylis glomerata* | 25 | Y | FACU |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 100 | =Total Cover | |
| **Woody Vine Stratum (Plot size: 30' )** | | | |
| 1. | | | |
| 2. | | | |
| | 0 | =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: 3 (B)
Percent of Dominant Species That are OBL, FACW, or FAC 0 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | | x 1 | |
| FACW species | | x 2 | |
| FAC species | | x 3 | |
| FACU species | | x 4 | |
| UPL species | | x 5 | |
| TOTALS (A) | | (B) | |

Prevalence Index (B/A) =

**Hydrophytic Vegetation Indicators:**

☐ Rapid Test for Hydrophytic Vegetation
☐ Dominance Test is >50%
☐ Prevalence Index is ≤ 3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic Vegetation Present? Yes☐ No ☒**

**Remarks:** (Include photo numbers here or on a separate sheet)
Photograph 3

## SOIL

Sampling Point A

**Profile Description: (Describe the depth needed to document the indicator or confirm the absence of indicators**

| Depth (Inches) | Matrix Color (Moist) | Matrix % | Redox Features Color (Moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-6 | 10YR 3/1 | 100 | | | | | SiCL | |
| 6-24 | 10YR 5/1 | 70 | 10YR 5/8 | 20 | C | M | C | |
| | | | 10YR 6/2 | 5 | D | M | | |
| | | | 10YR 3/1 | 5 | n/a | PL | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C = Concentration, D= Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains [2]Locaton: PL =Pore Lining, M = Matrix

**Hydric Soil Indicators**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☒ Depleted below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]**

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron- Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present unless disturbed or problematic.

**Restrictive Layer (if observed)**

Type:

Depth:

**Hydric Soil Present? Yes ☒ No ☐**

**Remarks:**

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (Minimum of one is required: check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water Stained Leaves (B9)
- ☐ Aquatic Fauna (B 3)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ☐ No ☒ Depth (inches) N/A

Water Table Present? Yes ☐ No ☒ Depth (inches) N/A

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches) N/A

**Wetland Hydrology Present? Yes ☐ No ☒**

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

**Remarks: This area displayed color tone differences during 5 of 5 reviewed historic aerial photographs with normal precipitation; however, the signature was determined to be attributed to the difference in vegetation between the planted field and upland grassed swale and not due to wet conditions.**

**WETLAND DETERMINATION DATA FORM – Midwest Region**

Project/Site: Ament Road City/County: Unincorporated/Kendall Sampling Date: 06/16/2023

Applicant/Owner: New Leaf Energy State: IL Sampling Point: B

Investigator(s) R. Van Herik & S. DeDina Section, Township, Range: Sec. 16, T36N, R7E

Landform (hillslope, terrace, etc.): Closed Depression Local Relief (concave, convex, none): concave

Slope (%): 2% *Lat: 41.59017131 *Long: -88.44094792 Datum: Farmed Wetland 1

Soil Map Unit Name: Graymont silt loam, 5 to 10 percent slopes, eroded (541C2) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no explain in remarks)

Are vegetation ☒ Soil ☒ Hydrology ☒ significantly disturbed? Are normal circumstances present? Yes ☐ No ☒

Are vegetation ☐ Soil ☐ 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 ☐ No ☒
Hydric Soils Present? Yes ☒ No ☐
Wetland Hydrology Present? Yes ☒ No ☐

**Is the Sampled Area Within a Wetland?** **Yes ☒** **No ☐**

**Remarks: Precipitation data from the previous 3 months indicates the climatic/hydrologic conditions have been drier than normal. Sample Point is located within an agricultural field that has been tiled, tilled, and planted with corn (*Zea mays*).**

*Coordinates obtained from Site Photograph.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | = Total Cover | |
| **Sapling/Shrub Stratum (Plot size: 15')** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | =Total Cover | |
| **Herb Stratum (Plot size: 5')** | | | |
| 1. *Zea mays** | 30 | N | UPL |
| 2. *Amaranthus retroflexus* | 10 | Y | FACU |
| 3. *Cyperus esculentus* | 5 | N | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 45 | =Total Cover | |
| **Woody Vine Stratum (Plot size: 30' )** | | | |
| 1. | | | |
| 2. | | | |
| | 0 | =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 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | | x 1 | |
| FACW species | | x 2 | |
| FAC species | | x 3 | |
| FACU species | | x 4 | |
| UPL species | | x 5 | |
| TOTALS (A) | | (B) | |

Prevalence Index (B/A) =

**Hydrophytic Vegetation Indicators:**

☐ Rapid Test for Hydrophytic Vegetation
☐ Dominance Test is >50%
☐ Prevalence Index is ≤ 3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic Vegetation Present? Yes☐ No ☒**

**Remarks:** (Include photo numbers here or on a separate sheet)
Photograph 1
*The agricultural field and sample point was dominated by planted corn (*Zea mays*); however, the corn is not included in the overall dominance calculation since it is an unnatural planted crop.

## SOIL

Sampling Point B

**Profile Description: (Describe the depth needed to document the indicator or confirm the absence of indicators**

| Depth (Inches) | Matrix Color (Moist) | Matrix % | Redox Features Color (Moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-8 | 10YR 3/1 | 100 | | | | | SiCL | |
| 8-14 | 10YR 5/1 | 70 | 10YR 5/8 | 20 | C | M | C | |
| | | | 10YR 7/6 | 5 | C | M | | |
| | | | 10YR 6/2 | 5 | D | M | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C = Concentration, D= Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains [2]Locaton: PL =Pore Lining, M = Matrix

**Hydric Soil Indicators**

- ☐ Histosol (A1)
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- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☒ Depleted below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
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- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]**

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron- Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present unless disturbed or problematic.

**Restrictive Layer (if observed)**

Type:

Depth:

**Hydric Soil Present? Yes ☒ No ☐**

**Remarks:**

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (Minimum of one is required: check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water Stained Leaves (B9)
- ☐ Aquatic Fauna (B 3)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☒ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ☐ No ☒ Depth (inches) N/A

Water Table Present? Yes ☐ No ☒ Depth (inches) N/A

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches) N/A

**Wetland Hydrology Present? Yes ☒ No ☐**

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

**Remarks: This area displayed wetland signatures during 3 of 5 (60%) reviewed historic aerial photographs with normal precipitation.**

**WETLAND DETERMINATION DATA FORM – Midwest Region**

Project/Site: Ament Road City/County: Unincorporated/Kendall Sampling Date: 06/16/2023

Applicant/Owner: New Leaf Energy State: IL Sampling Point: C

Investigator(s) R. Van Herik & S. DeDina Section, Township, Range: Sec. 16, T36N, R7E

Landform (hillslope, terrace, etc.): Closed depression Local Relief (concave, convex, none): concave

Slope (%): 3% *Lat: 41.59165442 *Long: -88.44048658 Datum: Investigated Area 1

Soil Map Unit Name: Drummer silty clay loam, 0 to 2 percent slopes (152A) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no explain in remarks)

Are vegetation ☒ Soil ☒ Hydrology ☒ significantly disturbed? Are normal circumstances present? Yes ☐ No ☒

Are vegetation ☐ Soil ☐ 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 ☐ No ☒
Hydric Soils Present? Yes ☒ No ☐
Wetland Hydrology Present? Yes ☐ No ☒

**Is the Sampled Area Within a Wetland?** **Yes ☐** **No ☒**

**Remarks: Precipitation data from the previous 3 months indicates the climatic/hydrologic conditions have been drier than normal. Sample Point is located within an agricultural field that has been tiled, tilled, and planted with corn (*Zea mays*).**

*Coordinates obtained from Site Photograph.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | = Total Cover | |
| **Sapling/Shrub Stratum (Plot size: 15')** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | =Total Cover | |
| **Herb Stratum (Plot size: 5')** | | | |
| 1. *Zea mays** | 30 | N | UPL |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 0 | =Total Cover | |
| **Woody Vine Stratum (Plot size: 30' )** | | | |
| 1. | | | |
| 2. | | | |
| | 0 | =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: 0 (B)
Percent of Dominant Species That are OBL, FACW, or FAC 0 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | | x 1 | |
| FACW species | | x 2 | |
| FAC species | | x 3 | |
| FACU species | | x 4 | |
| UPL species | | x 5 | |
| TOTALS (A) | | (B) | |

Prevalence Index (B/A) =

**Hydrophytic Vegetation Indicators:**

☐ Rapid Test for Hydrophytic Vegetation
☐ Dominance Test is >50%
☐ Prevalence Index is ≤ 3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic Vegetation Present? Yes☐ No ☒**

**Remarks:** (Include photo numbers here or on a separate sheet)
Photograph 7
*The agricultural field and sample point was dominated by planted corn (*Zea mays*); however, the corn is not included in the overall dominance calculation since it is an unnatural planted crop.

## SOIL

Sampling Point C

**Profile Description: (Describe the depth needed to document the indicator or confirm the absence of indicators**

| Depth (Inches) | Matrix Color (Moist) | Matrix % | Redox Features Color (Moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-24 | 10YR 2/1 | 100 | | | | | SiCL | |
| 24-36 | 10YR 4/1 | 91 | 10YR 5/6 | 5 | C | M | SiC | |
| | | | 10YR 6/1 | 2 | D | M | | |
| | | | 10YR 2/1 | 2 | n/a | PL | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C = Concentration, D= Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains [2]Locaton: PL =Pore Lining, M = Matrix

**Hydric Soil Indicators**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted below Dark Surface (A11)
- ☒ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]**

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron- Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present unless disturbed or problematic.

**Restrictive Layer (if observed)**

Type:

Depth:

**Hydric Soil Present? Yes ☒ No ☐**

**Remarks:**

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (Minimum of one is required: check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water Stained Leaves (B9)
- ☐ Aquatic Fauna (B 3)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ☐ No ☒ Depth (inches) N/A

Water Table Present? Yes ☐ No ☒ Depth (inches) N/A

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches) N/A

**Wetland Hydrology Present? Yes ☐ No ☒**

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

**Remarks: This area displayed wetland signatures during 1 of 5 (20%) reviewed historic aerial photographs with normal precipitation**

**WETLAND DETERMINATION DATA FORM – Midwest Region**

Project/Site: Ament Road City/County: Unincorporated/Kendall Sampling Date: 06/16/2023

Applicant/Owner: New Leaf Energy State: IL Sampling Point: D

Investigator(s) R. Van Herik & S. DeDina Section, Township, Range: Sec. 16, T36N, R7E

Landform (hillslope, terrace, etc.): Closed depression Local Relief (concave, convex, none): concave

Slope (%): 2% *Lat: 41.59175063 *Long: -88.44280742 Datum: Investigated Area 2

Soil Map Unit Name: Drummer silty clay loam, 0 to 2 percent slopes (152A) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no explain in remarks)

Are vegetation ☒ Soil ☒ Hydrology ☒ significantly disturbed? Are normal circumstances present? Yes ☐ No ☒

Are vegetation ☐ Soil ☐ 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 ☐ No ☒
Hydric Soils Present? Yes ☒ No ☐
Wetland Hydrology Present? Yes ☐ No ☒

**Is the Sampled Area Within a Wetland? Yes ☐ No ☒**

**Remarks: Precipitation data from the previous 3 months indicates the climatic/hydrologic conditions have been drier than normal. Sample Point is located within an agricultural field that has been tiled, tilled, and planted with corn (*Zea mays*).**

*Coordinates obtained from Site Photograph.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | = Total Cover | |
| **Sapling/Shrub Stratum (Plot size: 15')** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | =Total Cover | |
| **Herb Stratum (Plot size: 5')** | | | |
| 1. *Zea mays** | 40 | N | UPL |
| 2. *Amaranthus retroflexus* | 2 | N | FACU |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 42 | =Total Cover | |
| **Woody Vine Stratum (Plot size: 30' )** | | | |
| 1. | | | |
| 2. | | | |
| | 0 | =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: 0 (B)
Percent of Dominant Species That are OBL, FACW, or FAC 0 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | | x 1 | |
| FACW species | | x 2 | |
| FAC species | | x 3 | |
| FACU species | | x 4 | |
| UPL species | | x 5 | |
| TOTALS (A) | | (B) | |

Prevalence Index (B/A) =

**Hydrophytic Vegetation Indicators:**

☐ Rapid Test for Hydrophytic Vegetation
☐ Dominance Test is >50%
☐ Prevalence Index is ≤ 3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic Vegetation Present? Yes☐ No ☒**

**Remarks:** (Include photo numbers here or on a separate sheet)
Photograph 8
*The agricultural field and sample point was dominated by planted corn (*Zea mays*); however, the corn is not included in the overall dominance calculation since it is an unnatural planted crop.

## SOIL

Sampling Point D

**Profile Description: (Describe the depth needed to document the indicator or confirm the absence of indicators**

| Depth (Inches) | Matrix Color (Moist) | Matrix % | Redox Features Color (Moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-28 | 10YR 2/1 | 100 | | | | | SiCL | |
| 28-36 | 10YR 4/1 | 65 | 10YR 5/6 | 10 | C | M | SiC | |
| | | | 10YR 7/6 | 15 | C | M | | |
| | | | 10YR 6/2 | 5 | D | M | | |
| | | | 10YR 2/1 | 5 | n/a | PL | | |
| | | | | | | | | |

[1]Type: C = Concentration, D= Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains [2]Locaton: PL =Pore Lining, M = Matrix

**Hydric Soil Indicators**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted below Dark Surface (A11)
- ☒ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]**

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron- Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present unless disturbed or problematic.

**Restrictive Layer (if observed)**

Type:

Depth:

**Hydric Soil Present? Yes ☒ No ☐**

**Remarks:**

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (Minimum of one is required: check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water Stained Leaves (B9)
- ☐ Aquatic Fauna (B 3)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ☐ No ☒ Depth (inches) N/A

Water Table Present? Yes ☐ No ☒ Depth (inches) N/A

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches) N/A

**Wetland Hydrology Present? Yes ☐ No ☒**

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

**Remarks: This area displayed wetland signatures during 1 of 5 (20%) reviewed historic aerial photographs with normal precipitation**

**WETLAND DETERMINATION DATA FORM – Midwest Region**

Project/Site: Ament Road City/County: Unincorporated/Kendall Sampling Date: 06/16/2023

Applicant/Owner: New Leaf Energy State: IL Sampling Point: E

Investigator(s) R. Van Herik & S. DeDina Section, Township, Range: Sec. 16, T36N, R7E

Landform (hillslope, terrace, etc.): Closed depression Local Relief (concave, convex, none): concave

Slope (%): 3% *Lat: 41.58997421 *Long: -88.44267921 Datum: Investigated Area 3

Soil Map Unit Name: Graymont silt loam, 2 to 5 percent slopes (541B) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no explain in remarks)

Are vegetation ☒ Soil ☒ Hydrology ☒ significantly disturbed? Are normal circumstances present? Yes ☐ No ☒

Are vegetation ☐ Soil ☐ 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 ☒ No ☐
Hydric Soils Present? Yes ☐ No ☒
Wetland Hydrology Present? Yes ☐ No ☒

**Is the Sampled Area Within a Wetland?** **Yes** ☐ **No** ☒

**Remarks: Precipitation data from the previous 3 months indicates the climatic/hydrologic conditions have been drier than normal. Sample Point is located within an agricultural field that has been tiled, tilled, and planted with corn (*Zea mays*).**

*Coordinates obtained from Site Photograph.

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

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | = Total Cover | |
| **Sapling/Shrub Stratum (Plot size: 15')** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | =Total Cover | |
| **Herb Stratum (Plot size: 5')** | | | |
| 1. *Zea mays** | 45 | N | UPL |
| 2. *Echinochloa crus-galli* | 20 | Y | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 65 | =Total Cover | |
| **Woody Vine Stratum (Plot size: 30' )** | | | |
| 1. | | | |
| 2. | | | |
| | 0 | =Total Cover | |

**Dominance Test worksheet:**
Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That are OBL, FACW, or FAC 100% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | | x 1 | |
| FACW species | | x 2 | |
| FAC species | | x 3 | |
| FACU species | | x 4 | |
| UPL species | | x 5 | |
| TOTALS | (A) | | (B) |

Prevalence Index (B/A) =

**Hydrophytic Vegetation Indicators:**

☐ Rapid Test for Hydrophytic Vegetation
☒ Dominance Test is >50%
☐ Prevalence Index is ≤ 3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic Vegetation Present? Yes** ☒ **No** ☐

**Remarks:** (Include photo numbers here or on a separate sheet)
Photograph 9
*The agricultural field and sample point was dominated by planted corn (*Zea mays*); however, the corn is not included in the overall dominance calculation since it is an unnatural planted crop.

## SOIL

Sampling Point E

**Profile Description: (Describe the depth needed to document the indicator or confirm the absence of indicators**

| Depth (Inches) | Matrix Color (Moist) | Matrix % | Redox Features Color (Moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-10 | 10YR 3/1 | 100 | | | | | SiCL | |
| 10-24 | 10YR 5/3 | 98 | 10YR 5/6 | 2 | C | M | SiCL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C = Concentration, D= Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains [2]Locaton: PL =Pore Lining, M = Matrix

**Hydric Soil Indicators**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]**

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron- Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present unless disturbed or problematic.

**Restrictive Layer (if observed)**

Type:

Depth:

**Hydric Soil Present? Yes ☐ No ☒**

**Remarks:**

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (Minimum of one is required: check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water Stained Leaves (B9)
- ☐ Aquatic Fauna (B 3)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ☐ No ☒ Depth (inches) N/A

Water Table Present? Yes ☐ No ☒ Depth (inches) N/A

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches) N/A

**Wetland Hydrology Present? Yes ☐ No ☒**

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

**Remarks: This area displayed wetland signatures during 0 of 5 reviewed historic aerial photographs with normal precipitation**

**WETLAND DETERMINATION DATA FORM – Midwest Region**

Project/Site: Ament Road City/County: Unincorporated/Kendall Sampling Date: 06/16/2023

Applicant/Owner: New Leaf Energy State: IL Sampling Point: F

Investigator(s) R. Van Herik & S. DeDina Section, Township, Range: Sec. 16, T36N, R7E

Landform (hillslope, terrace, etc.): Swale toe slope Local Relief (concave, convex, none): concave

Slope (%): 3% *Lat: 41.59021822 *Long: -88.4445272 Datum: Upland Grassed Swale 2

Soil Map Unit Name: Drummer silty clay loam, 0 to 2 percent slopes (152A) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no explain in remarks)

Are vegetation ☐ Soil ☐ Hydrology ☒ significantly disturbed? Are normal circumstances present? Yes ☐ No ☒

Are vegetation ☐ Soil ☐ 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 ☐ No ☒
Hydric Soils Present? Yes ☐ No ☒
Wetland Hydrology Present? Yes ☐ No ☒

**Is the Sampled Area Within a Wetland?** **Yes ☐** **No ☒**

**Remarks: Precipitation data from the previous 3 months indicates the climatic/hydrologic conditions have been drier than normal. Sample Point is located in an upland grassed swale located within an agricultural field that has been tiled, tilled, and planted with corn (*Zea mays*).**

*Coordinates obtained from Site Photograph.

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

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | = Total Cover | |
| **Sapling/Shrub Stratum (Plot size: 15')** | | | |
| 1. *Morus alba* | 5 | Y | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 5 | =Total Cover | |
| **Herb Stratum (Plot size: 5')** | | | |
| 1. *Bromus inermis* | 45 | Y | FACU |
| 2. *Schedonorus pratensis* | 30 | Y | FACU |
| 3. *Poa pratensis* | 15 | N | FACU |
| 4. *Lolium perenne* | 6 | N | FACU |
| 5. *Apocynum cannabinum* | 4 | N | FAC |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 100 | =Total Cover | |
| **Woody Vine Stratum (Plot size: 30' )** | | | |
| 1. | | | |
| 2. | | | |
| | 0 | =Total Cover | |

**Dominance Test worksheet:**
Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That are OBL, FACW, or FAC 33.3% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | | x 1 | |
| FACW species | | x 2 | |
| FAC species | | x 3 | |
| FACU species | | x 4 | |
| UPL species | | x 5 | |
| TOTALS (A) | | (B) | |

Prevalence Index (B/A) =

**Hydrophytic Vegetation Indicators:**

☐ Rapid Test for Hydrophytic Vegetation
☐ Dominance Test is >50%
☐ Prevalence Index is ≤ 3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic Vegetation Present? Yes☐ No ☒**

**Remarks:** (Include photo numbers here or on a separate sheet)
Photograph 5
*The agricultural field and sample point was dominated by planted corn (*Zea mays*); however, the corn is not included in the overall dominance calculation since it is an unnatural planted crop.

## SOIL

Sampling Point F

**Profile Description: (Describe the depth needed to document the indicator or confirm the absence of indicators**

| Depth (Inches) | Matrix Color (Moist) | Matrix % | Redox Features Color (Moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-14 | 10YR 3/1 | 100 | | | | | SiCL | |
| 14-24 | 10YR 3/1 | 90 | 10YR 5/4 | 10 | C | M | C | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C = Concentration, D= Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains [2]Locaton: PL =Pore Lining, M = Matrix

**Hydric Soil Indicators**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]**

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron- Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present unless disturbed or problematic.

**Restrictive Layer (if observed)**

Type:

Depth:

**Hydric Soil Present? Yes ☐ No ☒**

**Remarks:**

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (Minimum of one is required: check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water Stained Leaves (B9)
- ☐ Aquatic Fauna (B 3)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ☐ No ☒ Depth (inches) N/A

Water Table Present? Yes ☐ No ☒ Depth (inches) N/A

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches) N/A

**Wetland Hydrology Present? Yes ☐ No ☒**

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

**Remarks: This area displayed wetland signatures during 4 of 5 reviewed historic aerial photographs with normal precipitation; however, the signature was determined to be attributed to the difference in vegetation between the planted field and upland grassed swale and not due to wet conditions.**

**WETLAND DETERMINATION DATA FORM – Midwest Region**

Project/Site: Ament Road City/County: Unincorporated/Kendall Sampling Date: 06/16/2023

Applicant/Owner: New Leaf Energy State: IL Sampling Point: G

Investigator(s) R. Van Herik & S. DeDina Section, Township, Range: Sec. 16, T36N, R7E

Landform (hillslope, terrace, etc.): Slight depression Local Relief (concave, convex, none): Concave

Slope (%): 2% *Lat: 41.59635204 *Long: -88.44514887 Datum: Investigated Area 4

Soil Map Unit Name: Elpaso silty clay loam, 0 to 2 percent slopes (356A) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no explain in remarks)

Are vegetation ☒ Soil ☒ Hydrology ☒ significantly disturbed? Are normal circumstances present? Yes ☐ No ☒

Are vegetation ☐ Soil ☐ 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 ☐ No ☒
Hydric Soils Present? Yes ☒ No ☐
Wetland Hydrology Present? Yes ☐ No ☒

**Is the Sampled Area Within a Wetland?** **Yes ☐** **No ☒**

**Remarks: Precipitation data from the previous 3 months indicates the climatic/hydrologic conditions have been drier than normal. Sample Point is located within an agricultural field that has been tiled, tilled, and planted with corn (*Zea mays*).**

*Coordinates obtained from Site Photograph.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | = Total Cover | |
| **Sapling/Shrub Stratum (Plot size: 15')** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | =Total Cover | |
| **Herb Stratum (Plot size: 5')** | | | |
| 1. *Zea mays** | 45 | N | UPL |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 45 | =Total Cover | |
| **Woody Vine Stratum (Plot size: 30' )** | | | |
| 1. | | | |
| 2. | | | |
| | 0 | =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: 0 (B)
Percent of Dominant Species That are OBL, FACW, or FAC 0 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | | x 1 | |
| FACW species | | x 2 | |
| FAC species | | x 3 | |
| FACU species | | x 4 | |
| UPL species | | x 5 | |
| TOTALS (A) | | (B) | |

Prevalence Index (B/A) =

**Hydrophytic Vegetation Indicators:**

☐ Rapid Test for Hydrophytic Vegetation
☐ Dominance Test is >50%
☐ Prevalence Index is ≤ 3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic Vegetation Present? Yes☐ No ☒**

**Remarks:** (Include photo numbers here or on a separate sheet)
Photograph 10
*The agricultural field and sample point was dominated by planted corn (*Zea mays*); however, the corn is not included in the overall dominance calculation since it is an unnatural planted crop.

## SOIL

Sampling Point G

**Profile Description: (Describe the depth needed to document the indicator or confirm the absence of indicators**

| Depth (Inches) | Matrix Color (Moist) | Matrix % | Redox Features Color (Moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-26 | 10YR 2/1 | 100 | | | | | SiCL | |
| 26-32 | 10YR 4/1 | 83 | 10YR 5/8 | 5 | C | M | C | |
| | | | 10YR 5/2 | 10 | D | M | | |
| | | | 10YR 2/1 | 2 | n/a | PL | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C = Concentration, D= Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains [2]Locaton: PL =Pore Lining, M = Matrix

**Hydric Soil Indicators**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted below Dark Surface (A11)
- ☒ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]**

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron- Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present unless disturbed or problematic.

**Restrictive Layer (if observed)**

Type:

Depth:

**Hydric Soil Present? Yes ☒ No ☐**

**Remarks:**

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (Minimum of one is required: check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water Stained Leaves (B9)
- ☐ Aquatic Fauna (B 3)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ☐ No ☒ Depth (inches) N/A

Water Table Present? Yes ☐ No ☒ Depth (inches) N/A

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches) N/A

**Wetland Hydrology Present? Yes ☐ No ☒**

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

**Remarks: This area displayed wetland signatures during 0 of 5 reviewed historic aerial photographs with normal precipitation.**

**WETLAND DETERMINATION DATA FORM – Midwest Region**

Project/Site: Ament Road City/County: Unincorporated/Kendall Sampling Date: 06/16/2023

Applicant/Owner: New Leaf Energy State: IL Sampling Point: H

Investigator(s) R. Van Herik & S. DeDina Section, Township, Range: Sec. 16, T36N, R7E

Landform (hillslope, terrace, etc.): Slight Depression Local Relief (concave, convex, none): concave

Slope (%): 2% *Lat: 41.5967233 *Long: -88.44348945 Datum: Investigated Area 5

Soil Map Unit Name: Elpaso silty clay loam, 0 to 2 percent slopes (356A) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no explain in remarks)

Are vegetation ☒ Soil ☒ Hydrology ☒ significantly disturbed? Are normal circumstances present? Yes ☐ No ☒

Are vegetation ☐ Soil ☐ 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 ☐ No ☒
Hydric Soils Present? Yes ☒ No ☐
Wetland Hydrology Present? Yes ☐ No ☒

**Is the Sampled Area Within a Wetland?** **Yes ☐** **No ☒**

**Remarks: Precipitation data from the previous 3 months indicates the climatic/hydrologic conditions have been drier than normal. Sample Point is located within an agricultural field that has been tiled, tilled, and planted with corn (*Zea mays*).**

*Coordinates obtained from Site Photograph.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | = Total Cover | |
| **Sapling/Shrub Stratum (Plot size: 15')** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | =Total Cover | |
| **Herb Stratum (Plot size: 5')** | | | |
| 1. *Zea mays** | 45 | N | UPL |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 45 | =Total Cover | |
| **Woody Vine Stratum (Plot size: 30' )** | | | |
| 1. | | | |
| 2. | | | |
| | 0 | =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: 0 (B)
Percent of Dominant Species That are OBL, FACW, or FAC 0 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | | x 1 | |
| FACW species | | x 2 | |
| FAC species | | x 3 | |
| FACU species | | x 4 | |
| UPL species | | x 5 | |
| TOTALS | (A) | | (B) |

Prevalence Index (B/A) =

**Hydrophytic Vegetation Indicators:**

☐ Rapid Test for Hydrophytic Vegetation
☐ Dominance Test is >50%
☐ Prevalence Index is ≤ 3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic Vegetation Present? Yes☐ No ☒**

**Remarks:** (Include photo numbers here or on a separate sheet)
Photograph 11
*The agricultural field and sample point was dominated by planted corn (*Zea mays*); however, the corn is not included in the overall dominance calculation since it is an unnatural planted crop.

## SOIL

Sampling Point H

**Profile Description: (Describe the depth needed to document the indicator or confirm the absence of indicators**

| Depth (Inches) | Matrix Color (Moist) | Matrix % | Redox Features Color (Moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-14 | 10YR 2/1 | 100 | | | | | SiCL | |
| 14-24 | 10YR 5/1 | 78 | 10YR 5/8 | 10 | C | M | C | |
| | | | 10YR 6/2 | 10 | D | M | | |
| | | | 10YR 7/6 | 2 | C | M | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C = Concentration, D= Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains [2]Locaton: PL =Pore Lining, M = Matrix

**Hydric Soil Indicators**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted below Dark Surface (A11)
- ☒ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]**

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron- Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present unless disturbed or problematic.

**Restrictive Layer (if observed)**

Type:

Depth:

**Hydric Soil Present? Yes ☒ No ☐**

**Remarks:**

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (Minimum of one is required: check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water Stained Leaves (B9)
- ☐ Aquatic Fauna (B 3)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ☐ No ☒ Depth (inches) N/A

Water Table Present? Yes ☐ No ☒ Depth (inches) N/A

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches) N/A

**Wetland Hydrology Present? Yes ☐ No ☒**

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

**Remarks: This area displayed wetland signatures during 0 of 5 reviewed historic aerial photographs with normal precipitation.**

## Site Photographs

| **PHOTOGRAPH 1** |  |
|---|---|
| DESCRIPTION:<br><br>Farmed Wetland 1 / Sample Point B | |



| **PHOTOGRAPH 2** |  |
|---|---|
| DESCRIPTION:<br><br>Farmed Wetland 1 / Overview | |

| **PHOTOGRAPH 3** |  |
|---|---|
| DESCRIPTION:<br><br>Upland Grassed Swale 1 (East Swale) / Sample Point A | |



| **PHOTOGRAPH 4** |  |
|---|---|
| DESCRIPTION:<br><br>Upland Grassed Swale 1 (East Swale) / Overview | |

| **PHOTOGRAPH 5** |  |
|---|---|
| DESCRIPTION:<br><br>Upland Grassed Swale 2 (West Swale) / Sample Point F | |



| **PHOTOGRAPH 6** |  |
|---|---|
| DESCRIPTION:<br><br>Upland Grassed Swale 2 (West Swale) / Overview | |

| **PHOTOGRAPH 7** |  |
|---|---|
| DESCRIPTION:<br><br>Investigated Area 1 / Sample Point C | |



| **PHOTOGRAPH 8** |  |
|---|---|
| DESCRIPTION:<br><br>Investigated Area 2 / Sample Point D | |

| **PHOTOGRAPH 9** |  |
|---|---|
| DESCRIPTION:<br><br>Investigated Area 3 / Sample Point E | |



| **PHOTOGRAPH 10** |  |
|---|---|
| DESCRIPTION:<br><br>Investigated Area 4 / Sample Point G | |

| **PHOTOGRAPH 11** |  |
|---|---|
| DESCRIPTION:<br><br>Investigated Area 5 / Sample Point H | |



| **PHOTOGRAPH 12** |  |
|---|---|
| DESCRIPTION:<br><br>Site Overview / Northeast Corner of Site | |

| **PHOTOGRAPH 13** |  |
|---|---|
| DESCRIPTION:<br><br>Site Overview / Central Portion of Site | |



| **PHOTOGRAPH 14** |  |
|---|---|
| DESCRIPTION:<br><br>Site Overview / South Portion of Site | |

**PHOTOGRAPH 15**

DESCRIPTION:

Site Overview / Southwest Portion of Site




**PHOTOGRAPH 16**

DESCRIPTION:

Site Overview / Central Portion of Site



**PHOTOGRAPH 17**

DESCRIPTION:

Site Overview / North Portion of Site




**PHOTOGRAPH 18**

DESCRIPTION:

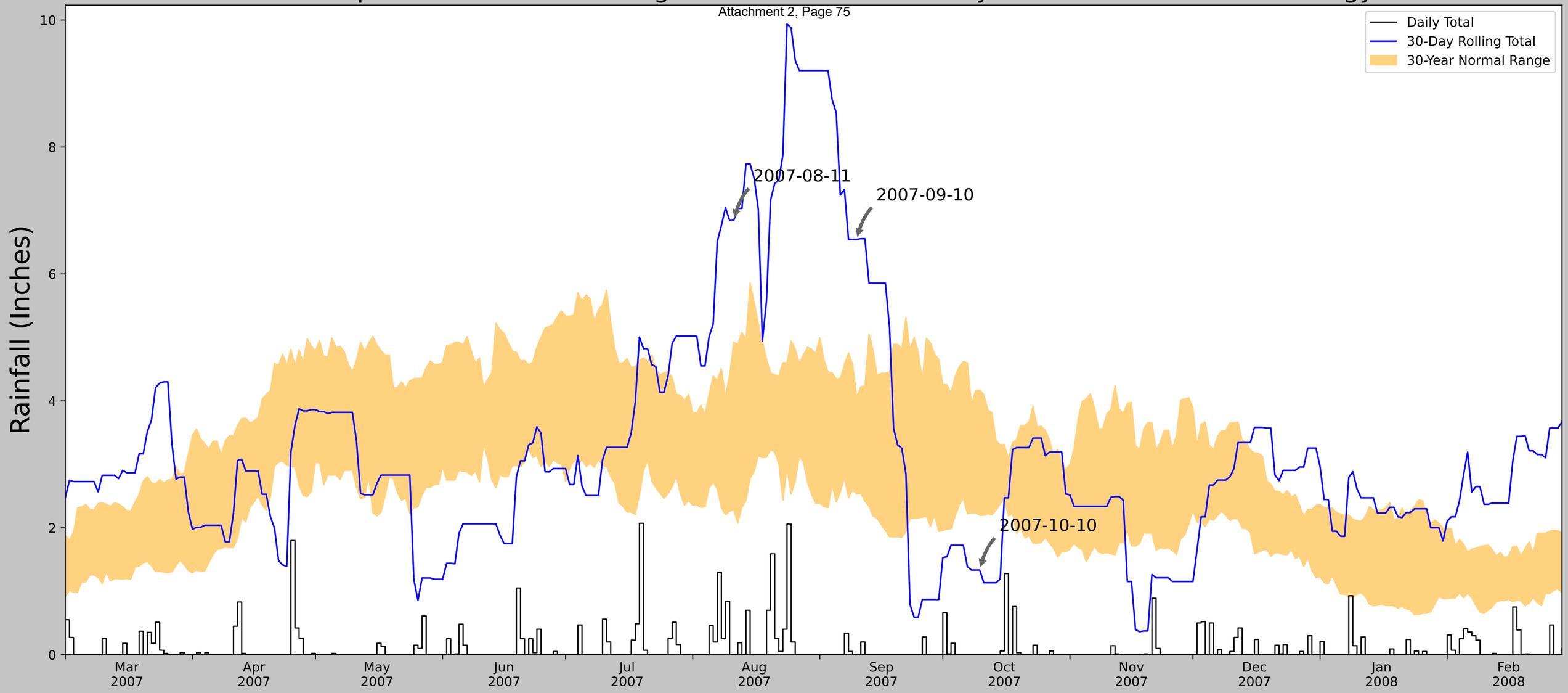
Site Overview / North Portion of Site



**USACE Antecedent Precipitation Tool Figure & Tables (2007, 2009, 2010-WET, 2011, 2015, 2018, 06/16/2023)**

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






| | |
|---|---|
| Coordinates | 41.593804, -88.444237 |
| Observation Date | 2007-10-10 |
| Elevation (ft) | 709.834 |
| Drought Index (PDSI) | Moderate wetness |
| WebWIMP $H_2O$ Balance | Wet Season |

| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2007-10-10 | 2.19685 | 4.170473 | 1.334646 | Dry | 1 | 3 | 3 |
| 2007-09-10 | 2.53189 | 4.063386 | 6.543307 | Wet | 3 | 2 | 6 |
| 2007-08-11 | 2.286614 | 4.928347 | 6.84252 | Wet | 3 | 1 | 3 |
| Result | | | | | | | Normal Conditions - 12 |

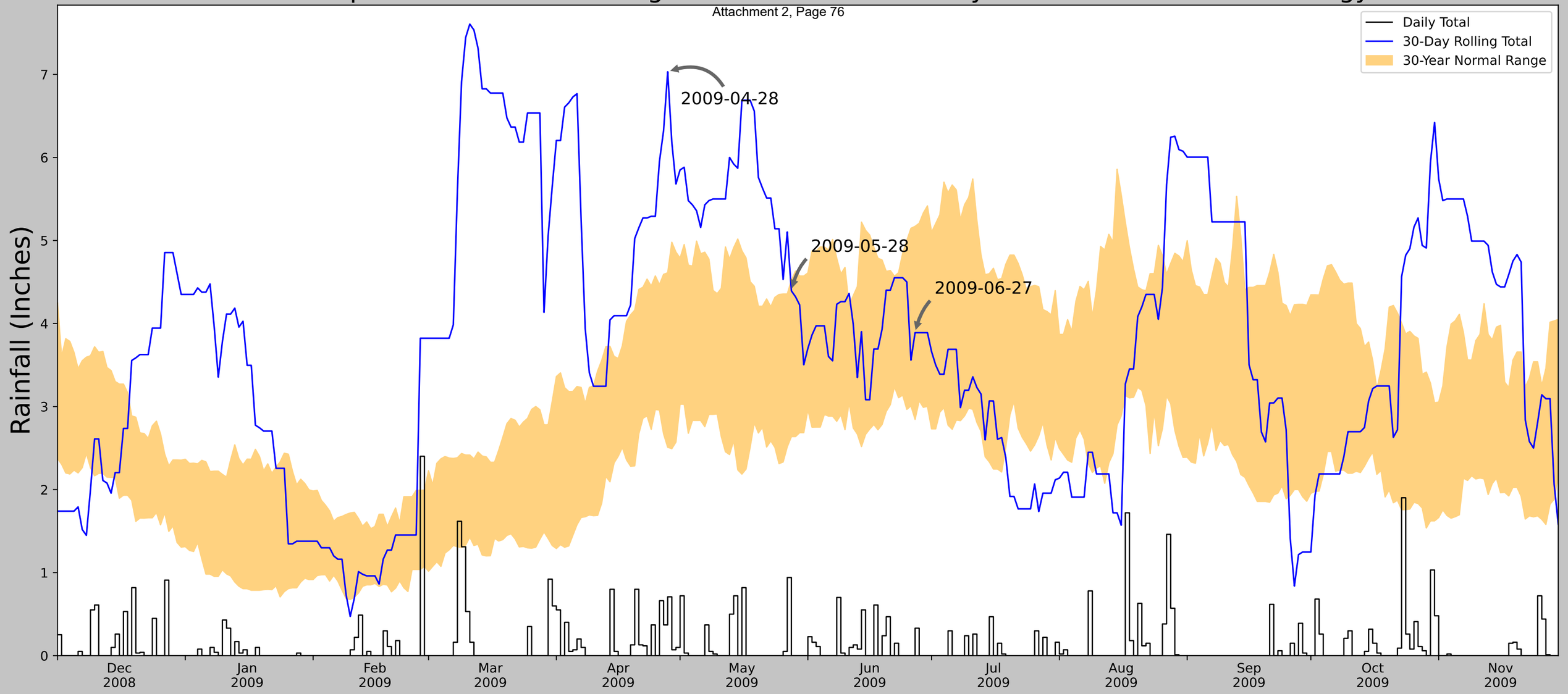
Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| AURORA | 41.7803, -88.3092 | 660.105 | 14.649 | 49.729 | 7.321 | 11024 | 90 |
| CHICAGO AURORA MUNI AP | 41.7714, -88.4814 | 701.116 | 8.894 | 41.011 | 4.367 | 5 | 0 |
| WHEATON 3 SE | 41.8128, -88.0728 | 680.118 | 12.382 | 20.013 | 5.82 | 292 | 0 |
| JOLIET BRANDON RD DAM | 41.5033, -88.1033 | 542.979 | 21.893 | 117.126 | 12.416 | 31 | 0 |

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






| | |
|---|---|
| Coordinates | 41.593804, -88.444237 |
| Observation Date | 2009-06-27 |
| Elevation (ft) | 709.834 |
| Drought Index (PDSI) | Extreme wetness |
| WebWIMP $H_2O$ Balance | Dry Season |

| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2009-06-27 | 2.845276 | 5.170473 | 3.889764 | Normal | 2 | 3 | 6 |
| 2009-05-28 | 2.637795 | 4.520866 | 4.393701 | Normal | 2 | 2 | 4 |
| 2009-04-28 | 2.509843 | 4.611024 | 7.031496 | Wet | 3 | 1 | 3 |
| Result | | | | | | | Normal Conditions - 13 |

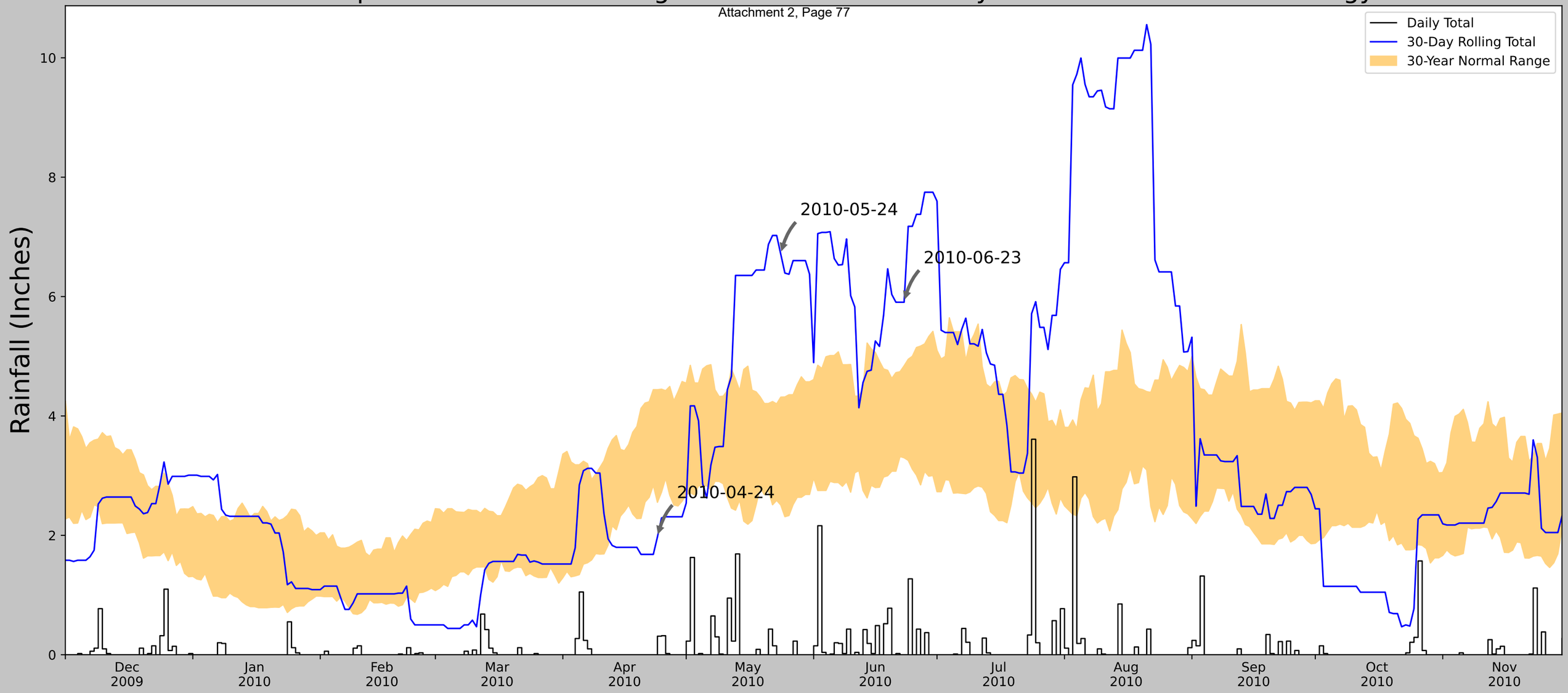
Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| AURORA | 41.7803, -88.3092 | 660.105 | 14.649 | 49.729 | 7.321 | 11025 | 90 |
| CHICAGO AURORA MUNI AP | 41.7714, -88.4814 | 701.116 | 8.894 | 41.011 | 4.367 | 5 | 0 |
| WHEATON 3 SE | 41.8128, -88.0728 | 680.118 | 12.382 | 20.013 | 5.82 | 292 | 0 |
| JOLIET BRANDON RD DAM | 41.5033, -88.1033 | 542.979 | 21.893 | 117.126 | 12.416 | 31 | 0 |

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






| | |
|---|---|
| Coordinates | 41.593804, -88.444237 |
| Observation Date | 2010-06-23 |
| Elevation (ft) | 709.834 |
| Drought Index (PDSI) | Severe wetness |
| WebWIMP $H_2O$ Balance | Dry Season |

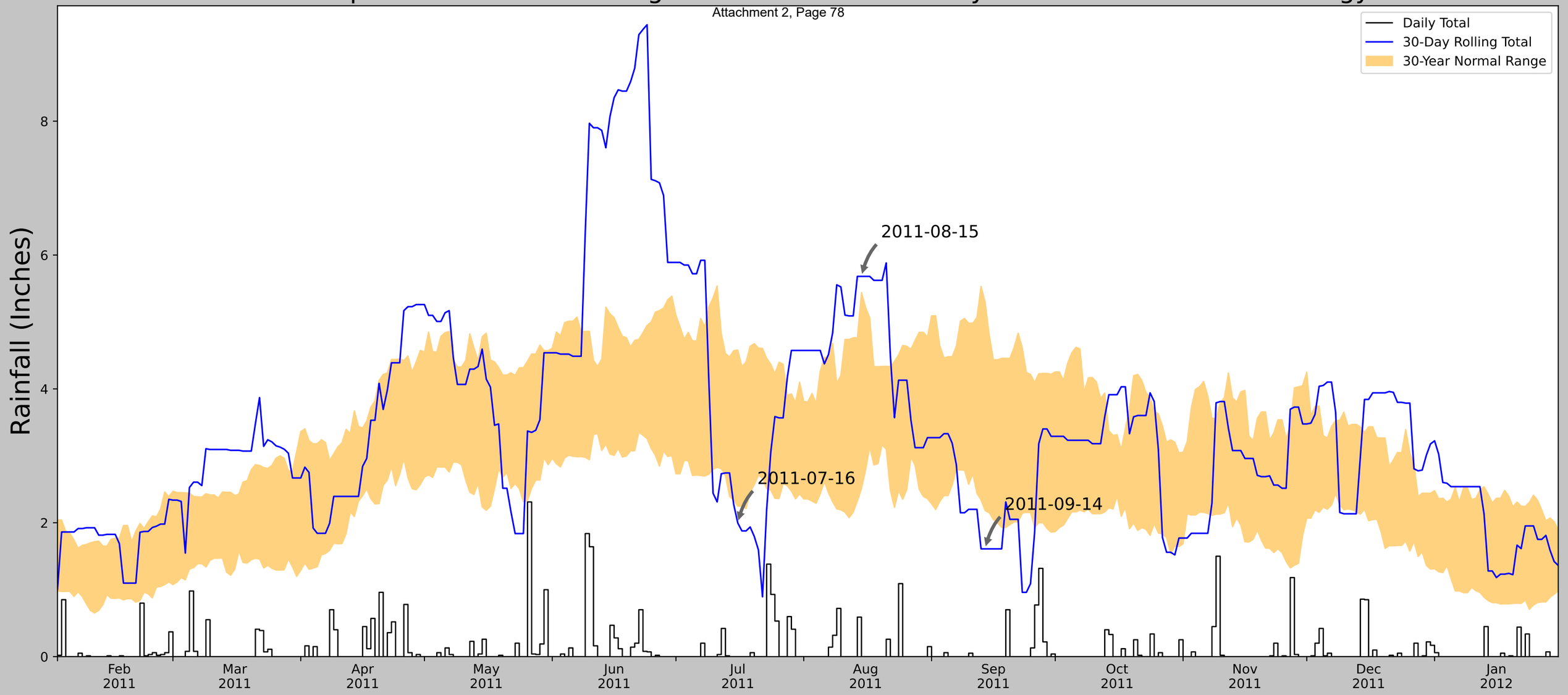
| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2010-06-23 | 3.299606 | 4.840158 | 5.905512 | Wet | 3 | 3 | 9 |
| 2010-05-24 | 2.508661 | 4.315354 | 6.712599 | Wet | 3 | 2 | 6 |
| 2010-04-24 | 2.553543 | 4.43937 | 1.972441 | Dry | 1 | 1 | 1 |
| Result | | | | | | | Wetter than Normal - 16 |

Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| AURORA | 41.7803, -88.3092 | 660.105 | 14.649 | 49.729 | 7.321 | 11025 | 90 |
| CHICAGO AURORA MUNI AP | 41.7714, -88.4814 | 701.116 | 8.894 | 41.011 | 4.367 | 5 | 0 |
| WHEATON 3 SE | 41.8128, -88.0728 | 680.118 | 12.382 | 20.013 | 5.82 | 292 | 0 |
| JOLIET BRANDON RD DAM | 41.5033, -88.1033 | 542.979 | 21.893 | 117.126 | 12.416 | 31 | 0 |

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




| | |
|---|---|
| Coordinates | 41.593804, -88.444237 |
| Observation Date | 2011-09-14 |
| Elevation (ft) | 709.834 |
| Drought Index (PDSI) | Severe wetness |
| WebWIMP $H_2O$ Balance | Wet Season |

| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2011-09-14 | 2.181102 | 5.291732 | 1.610236 | Dry | 1 | 3 | 3 |
| 2011-08-15 | 2.509843 | 5.438977 | 5.681103 | Wet | 3 | 2 | 6 |
| 2011-07-16 | 2.247638 | 4.580709 | 1.996063 | Dry | 1 | 1 | 1 |
| Result | | | | | | | Normal Conditions - 10 |

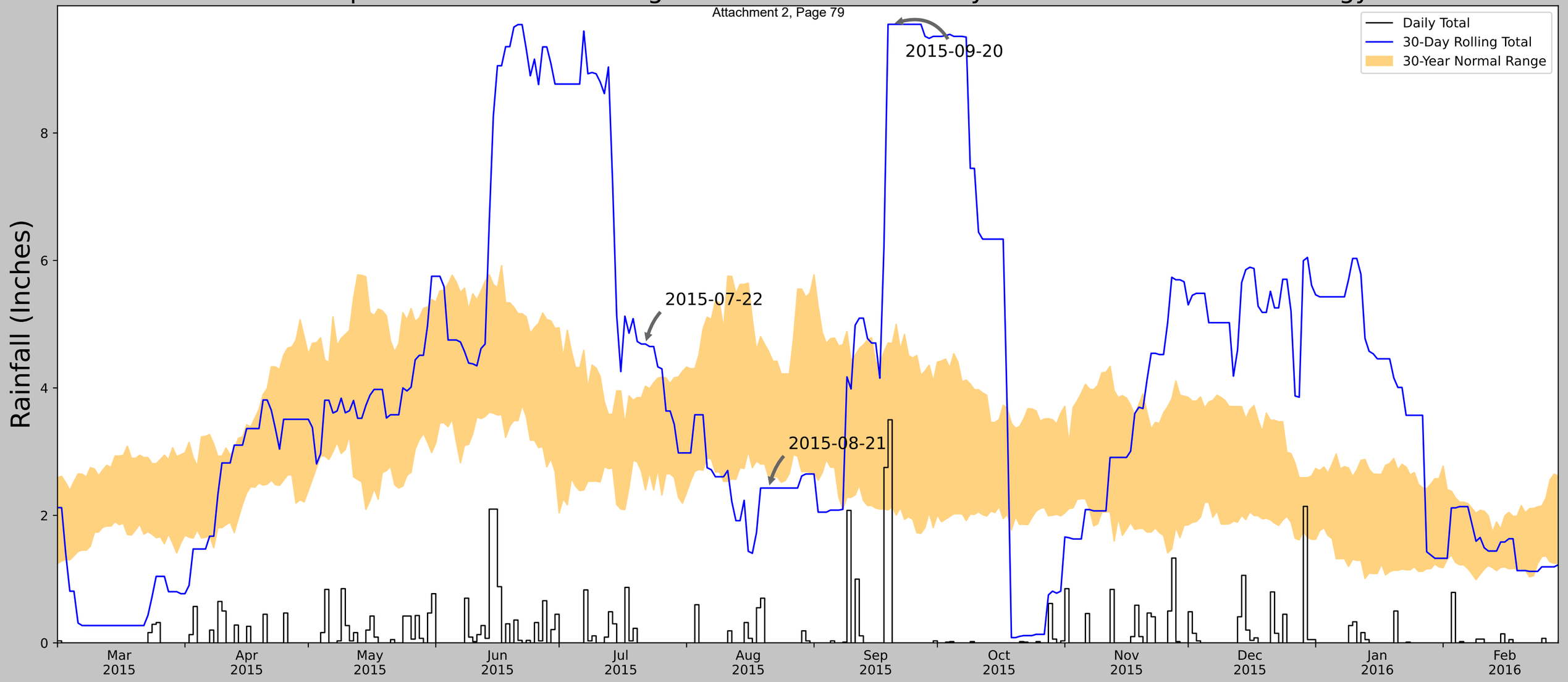
Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| AURORA | 41.7803, -88.3092 | 660.105 | 14.649 | 49.729 | 7.321 | 11025 | 90 |
| CHICAGO AURORA MUNI AP | 41.7714, -88.4814 | 701.116 | 8.894 | 41.011 | 4.367 | 5 | 0 |
| WHEATON 3 SE | 41.8128, -88.0728 | 680.118 | 12.382 | 20.013 | 5.82 | 292 | 0 |
| JOLIET BRANDON RD DAM | 41.5033, -88.1033 | 542.979 | 21.893 | 117.126 | 12.416 | 31 | 0 |

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






| | |
|---|---|
| Coordinates | 41.593804, -88.444237 |
| Observation Date | 2015-09-20 |
| Elevation (ft) | 709.834 |
| Drought Index (PDSI) | Moderate wetness |
| WebWIMP $H_2O$ Balance | Wet Season |

| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2015-09-20 | 2.133858 | 4.699213 | 9.704725 | Wet | 3 | 3 | 9 |
| 2015-08-21 | 2.587795 | 4.569291 | 2.429134 | Dry | 1 | 2 | 2 |
| 2015-07-22 | 2.399213 | 4.029134 | 4.688977 | Wet | 3 | 1 | 3 |
| Result | | | | | | | Normal Conditions - 14 |

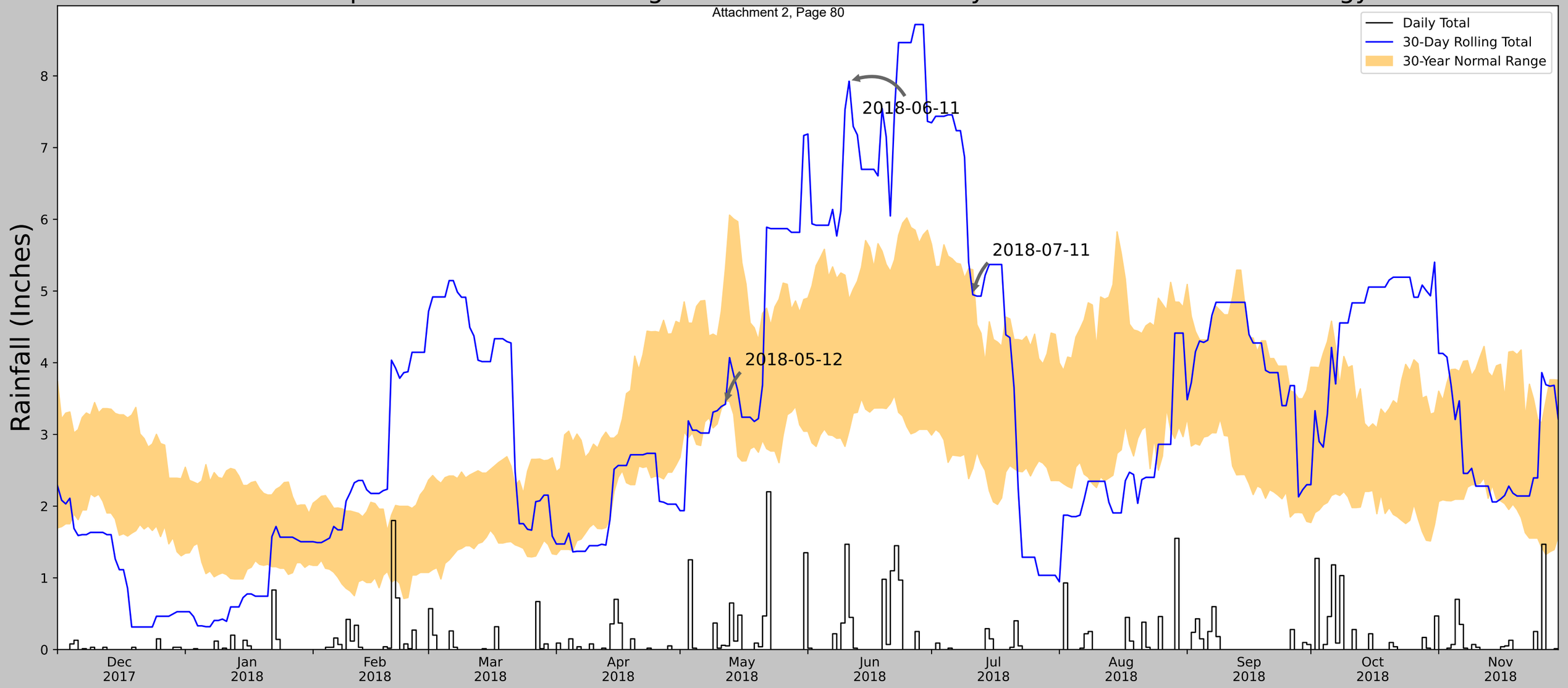
Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| LITTLE RED SCHOOL HSE | 41.7092, -87.8761 | 714.895 | 30.395 | 5.061 | 13.832 | 7875 | 69 |
| PALOS PARK 3.6 WNW | 41.6768, -87.9114 | 713.911 | 2.886 | 0.984 | 1.302 | 27 | 11 |
| BURR RIDGE 1.2 ESE | 41.7473, -87.8974 | 660.105 | 2.852 | 54.79 | 1.44 | 0 | 4 |
| PALOS PARK 1.7 WSW | 41.6585, -87.8759 | 717.848 | 3.503 | 2.953 | 1.587 | 3 | 0 |
| PALOS PARK 1.3 SW | 41.6528, -87.8631 | 702.1 | 3.954 | 12.795 | 1.83 | 0 | 3 |
| BURR RIDGE 1.9 SW | 178 41.7319, -87.9486 | 724.081 | 4.055 | 9.186 | 1.862 | 2 | 3 |
| CHICAGO MIDWAY AP 3SW | 41.7372, -87.7775 | 620.079 | 5.44 | 94.816 | 2.964 | 3446 | 0 |

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






| | |
|---|---|
| Coordinates | 41.593804, -88.444237 |
| Observation Date | 2018-07-11 |
| Elevation (ft) | 709.834 |
| Drought Index (PDSI) | Moderate wetness |
| WebWIMP $H_2O$ Balance | Dry Season |

| 30 Days Ending | 30$^{th}$ %ile (in) | 70$^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2018-07-11 | 2.525984 | 5.298032 | 4.948819 | Normal | 2 | 3 | 6 |
| 2018-06-11 | 3.050787 | 4.883071 | 7.925197 | Wet | 3 | 2 | 6 |
| 2018-05-12 | 3.46378 | 5.31811 | 3.42126 | Dry | 1 | 1 | 1 |
| Result | | | | | | | Normal Conditions - 13 |

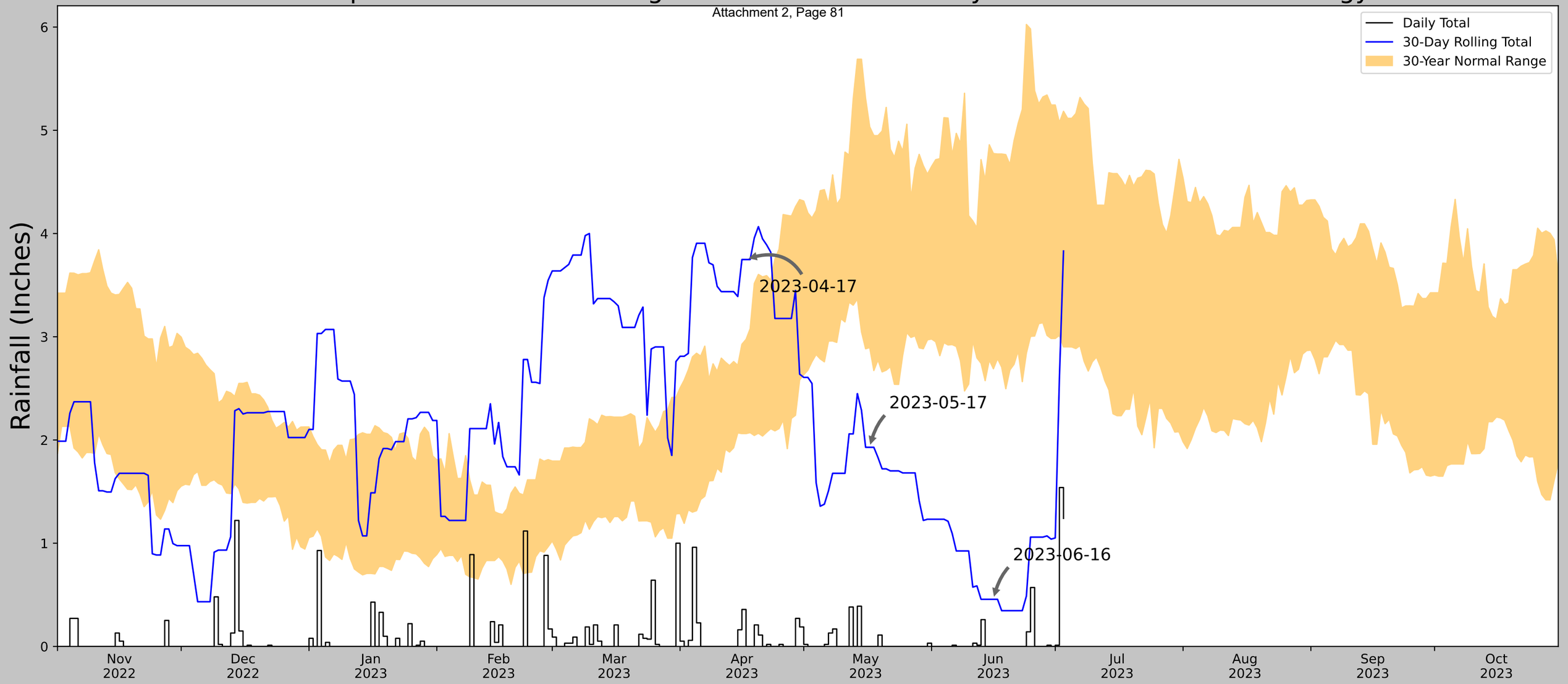
Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| AURORA | 41.7803, -88.3092 | 660.105 | 14.649 | 49.729 | 7.321 | 11110 | 90 |
| AURORA 3.4 W | 41.7723, -88.3577 | 689.961 | 2.559 | 29.856 | 1.228 | 6 | 0 |
| NORTH AURORA 1.5 NE | 41.8163, -88.3068 | 719.16 | 2.49 | 59.055 | 1.268 | 2 | 0 |
| CHICAGO AURORA MUNI AP | 41.7714, -88.4814 | 701.116 | 8.894 | 41.011 | 4.367 | 5 | 0 |
| WHEATON 3 SE | 41.8128, -88.0728 | 680.118 | 12.382 | 20.013 | 5.82 | 230 | 0 |

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






| | |
|---|---|
| Coordinates | 41.593804, -88.444237 |
| Observation Date | 2023-06-16 |
| Elevation (ft) | 709.834 |
| Drought Index (PDSI) | Mild drought (2023-05) |
| WebWIMP $H_2O$ Balance | Dry Season |

| 30 Days Ending | 30$^{th}$ %ile (in) | 70$^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2023-06-16 | 2.68937 | 4.774803 | 0.456693 | Dry | 1 | 3 | 3 |
| 2023-05-17 | 2.895276 | 5.033858 | 1.929134 | Dry | 1 | 2 | 2 |
| 2023-04-17 | 2.061811 | 2.97441 | 3.748032 | Wet | 3 | 1 | 3 |
| Result | | | | | | | Drier than Normal - 8 |

Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| CHICAGO AURORA MUNI AP | 41.7714, -88.4814 | 701.116 | 12.42 | 8.718 | 5.697 | 8701 | 90 |
| SUGAR GROVE 0.7 NE | 41.7762, -88.4478 | 714.895 | 1.763 | 13.779 | 0.818 | 29 | 0 |
| SUGAR GROVE 1.4 ENE | 41.7787, -88.4343 | 688.976 | 2.479 | 12.14 | 1.146 | 2 | 0 |
| AURORA 3.1 WSW | 41.7565, -88.3518 | 704.068 | 6.758 | 2.952 | 3.061 | 1 | 0 |
| AURORA | 41.7803, -88.3092 | 660.105 | 8.894 | 41.011 | 4.367 | 2573 | 0 |
| WHEATON 3 SE | 41.8128, -88.0728 | 680.118 | 21.242 | 20.998 | 10.005 | 47 | 0 |

**Historical Aerial Photographs: 2007, 2009, 2010-WET, 2011, 2015, 2018**

**Map data: Google, Maxar Technologies**

# Year: 2007



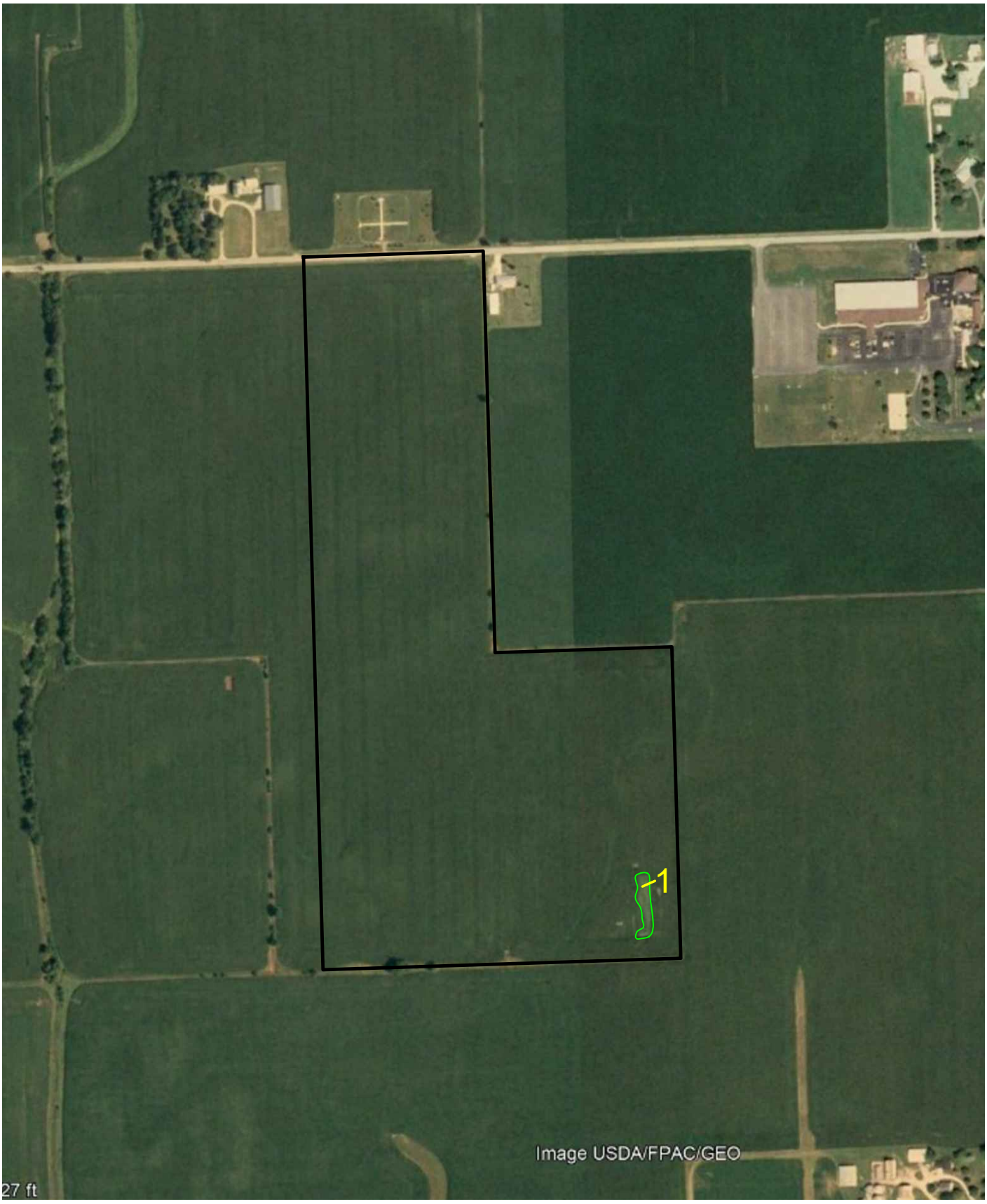

0 250 500 1000

SCALE: 1"=500'

N

**Map data: Google, Maxar Technologies**

# Year: 2009



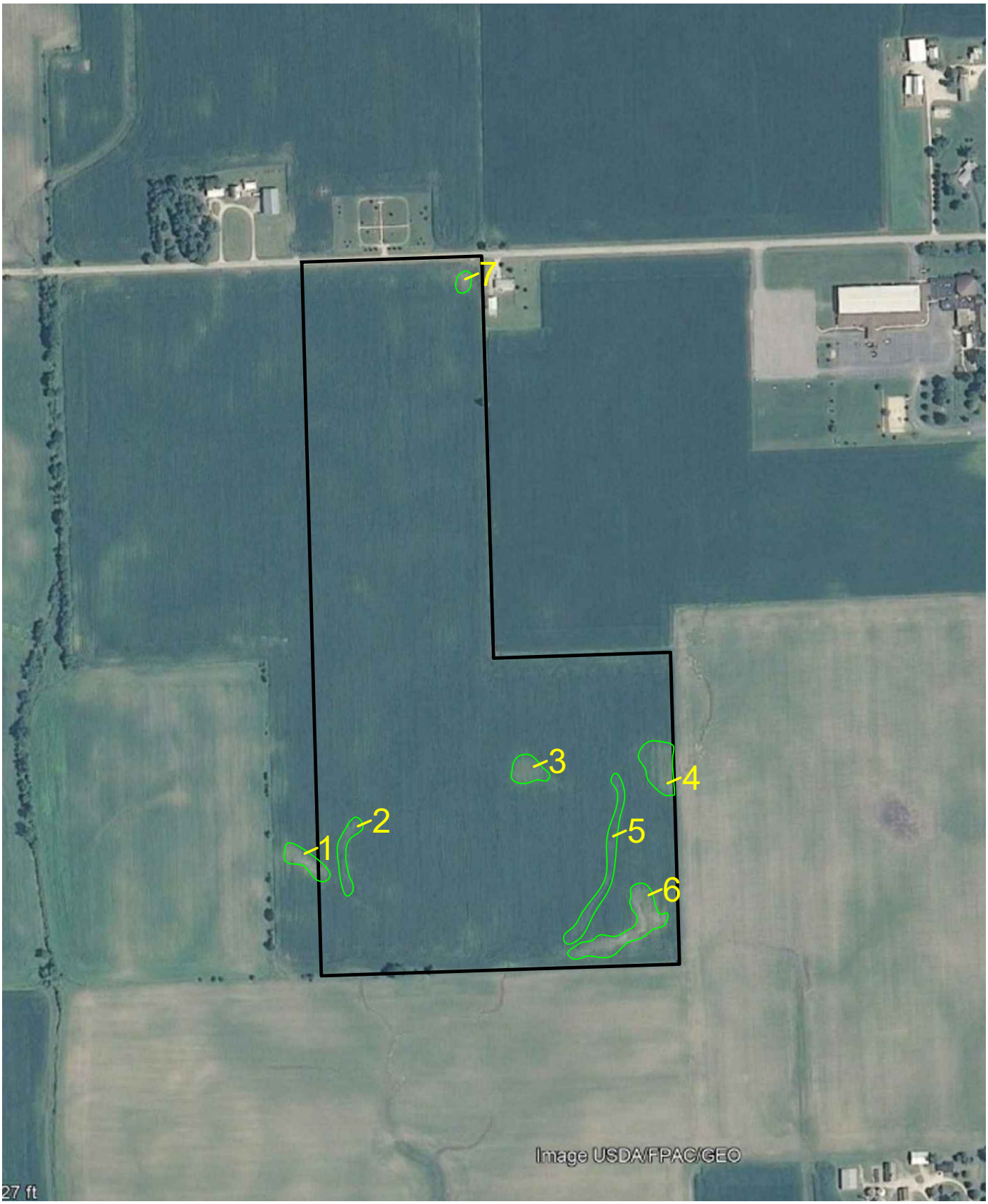

0 250 500 1000

SCALE: 1"=500'

N

**Map data: Google, Maxar Technologies**

# Year: 2010 WET




0 250 500 1000

SCALE: 1"=500'

N

**Map data: Google, Maxar Technologies**

# Year: 2011




0 250 500 1000

SCALE: 1"=500'

N

**Map data: Google, Maxar Technologies**

# Year: 2015



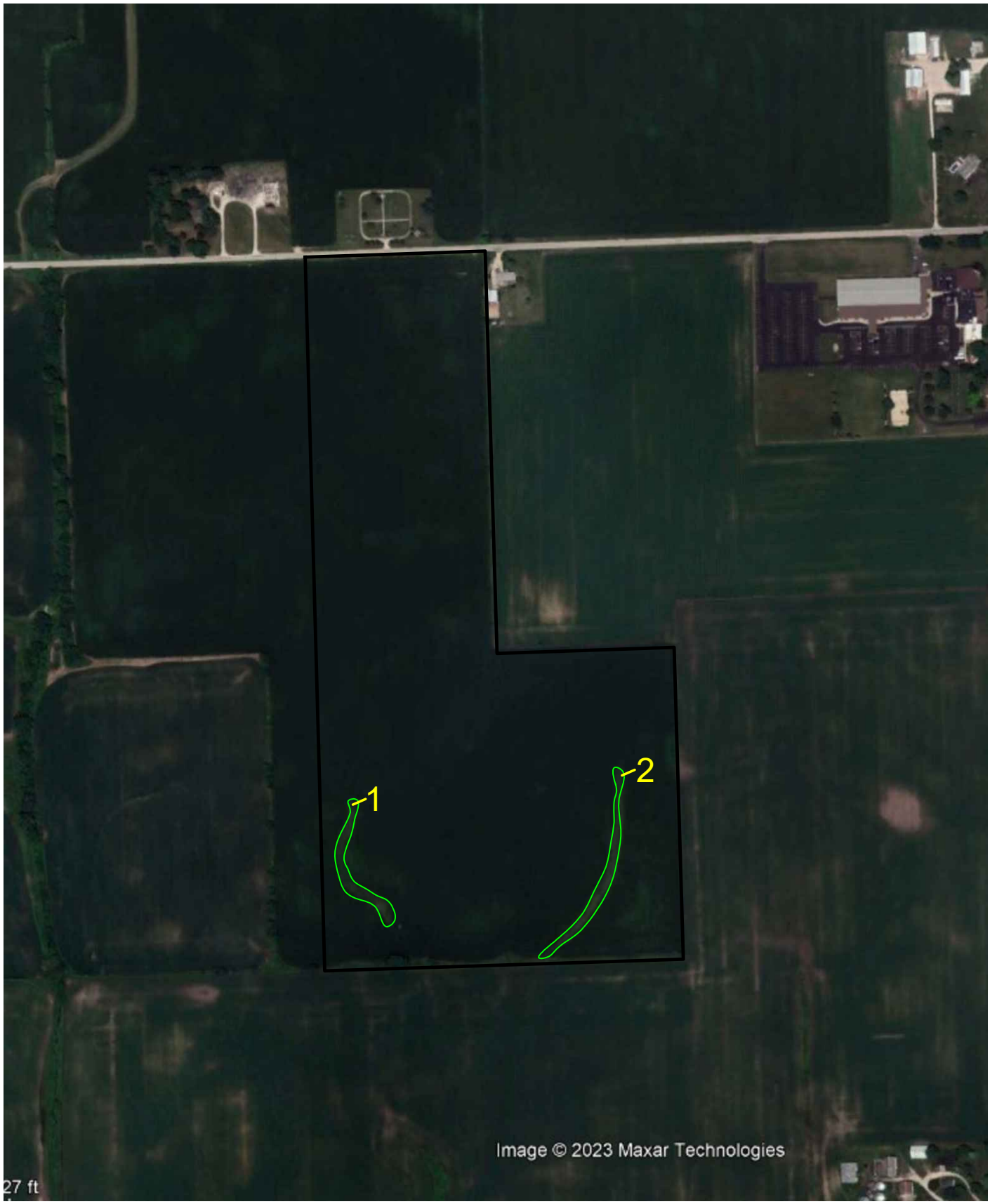

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SCALE: 1"=500'

N

**Map data: Google, Maxar Technologies**

# Year: 2018

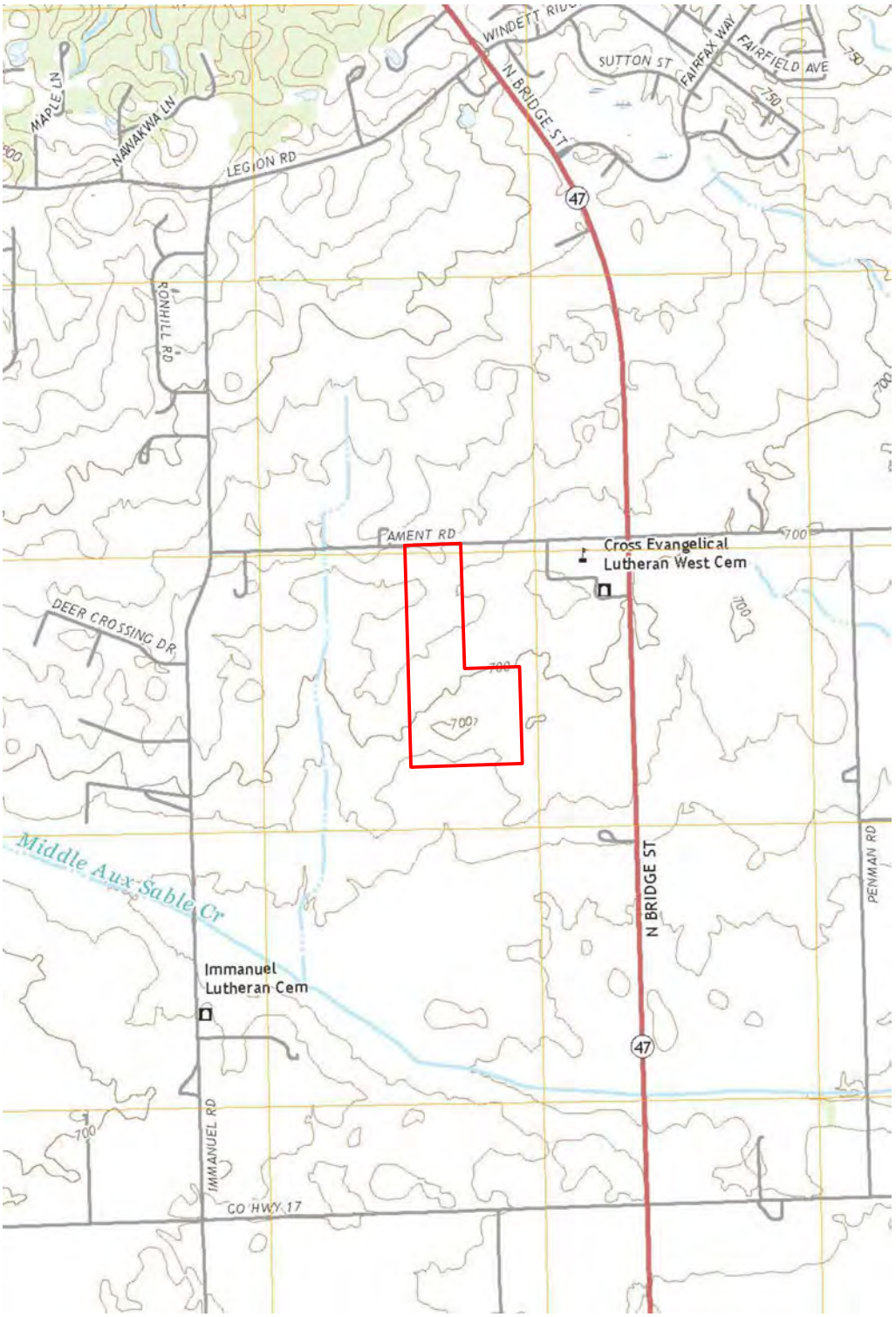



0 250 500 1000

SCALE: 1"=500'

N

**Exhibits A - G**




ENCAP INCORPORATED

**LEGEND:**

Project Area

# Location Map

Source: U.S. Geological Survey
Section 16 T36N R7E
Latitude: 41.593804 Longitude: -88.444237

# Ament Road

Project Number: 23-0519B

**New Leaf Energy**

0 1000 2000 4000

SCALE: 1"= 2000'

NORTH

Exhibit A



ENCAP INCORPORATED

**LEGEND:**

Project Area

**Wetlands**

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

# National Wetlands Inventory

Source: U.S. Fish & Wildlife Service

0 250 500 1000

SCALE: 1"=500'

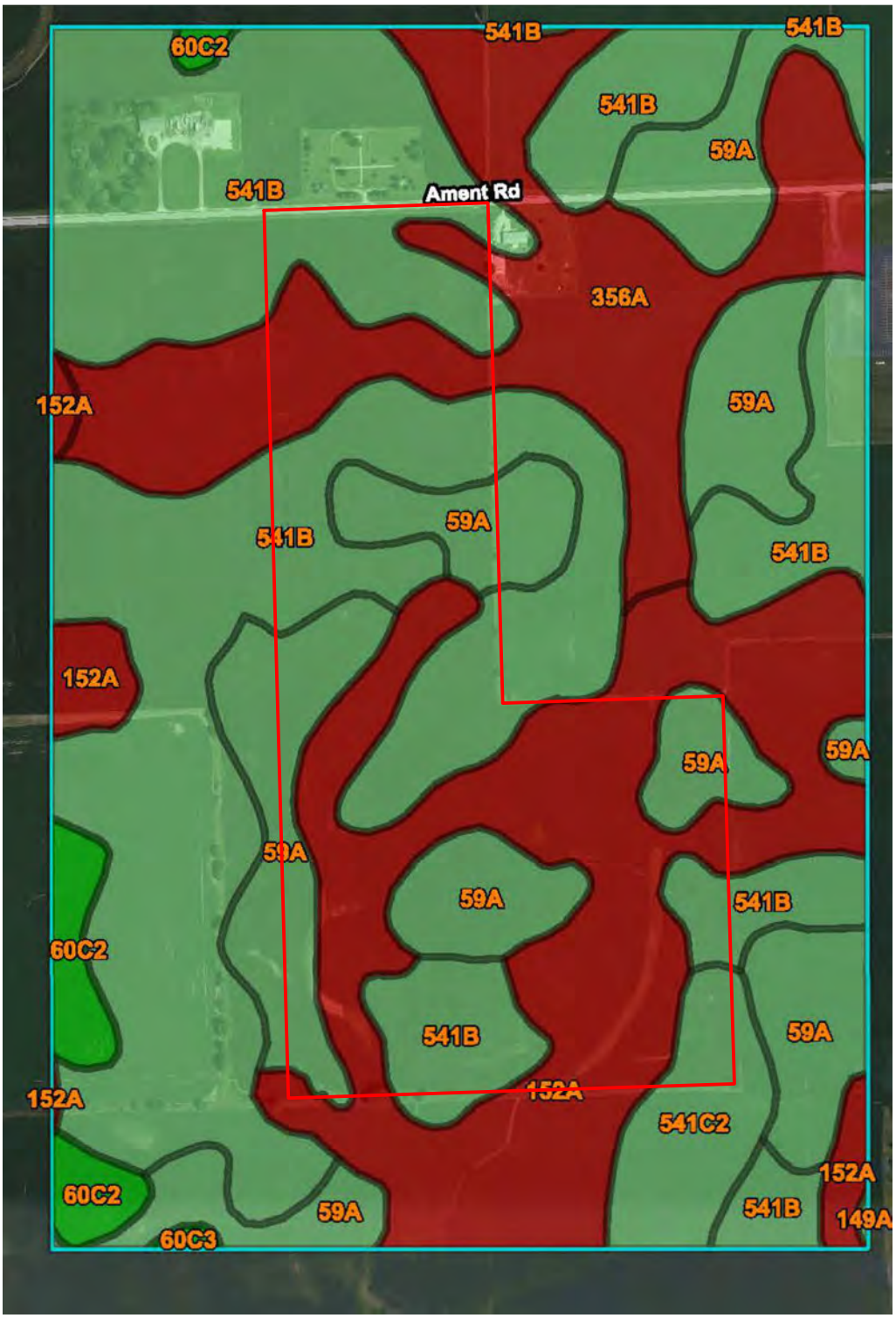
NORTH

# Ament Road

Project Number: 23-0519B

**New Leaf Energy**

Exhibit B




ENCAP INCORPORATED

**LEGEND:**

Project Area

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

# Soil Map

Source: U.S. Department of Agriculture
Natural Resources Conservation Service
Web Soil Survey 3.1

0 250 500 1000
SCALE: 1"=500'

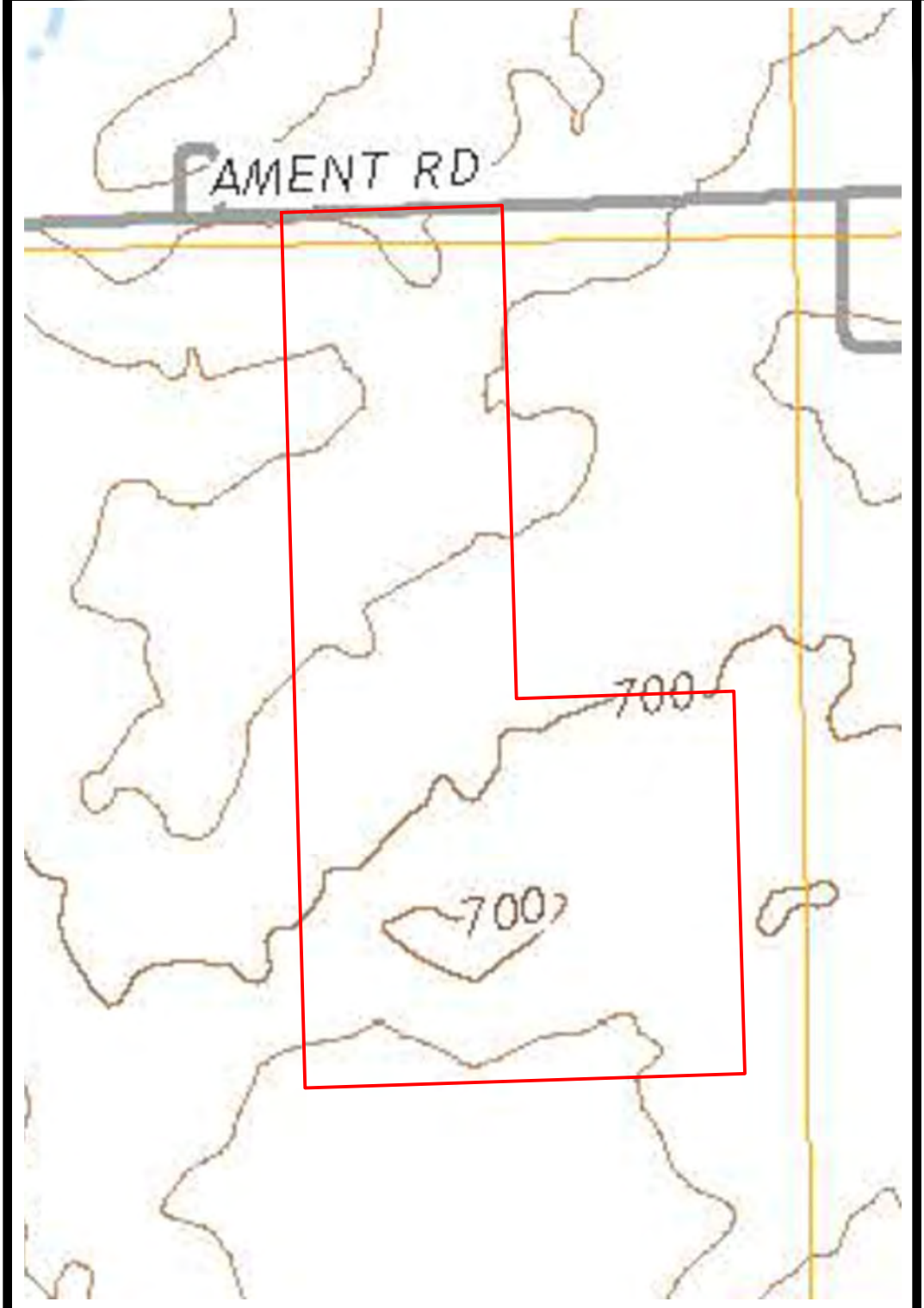
NORTH

# Ament Road

Project Number: 23-0519B

**New Leaf Energy**

Exhibit C




ENCAP INCORPORATED

**LEGEND:**

Project Area

RIVERS, LAKES, AND CANALS
- Perennial stream
- Perennial river
- Intermittent stream
- Intermittent river
- Disappearing stream

SUBMERGED AREAS AND BOGS
- Marsh or swamp
- Submerged marsh or swamp
- Wooded marsh or swamp
- Submerged wooded marsh or swamp
- Land subject to inundation

VEGETATION
- Woodland
- Shrubland
- Orchard
- Vineyard
- Mangrove
- Land subject to inundation

# 2021 USGS Topographic Map

Source: U.S. Geological Survey
Platville, IL Quadrangle

0 250 500 1000
SCALE: 1"=500'

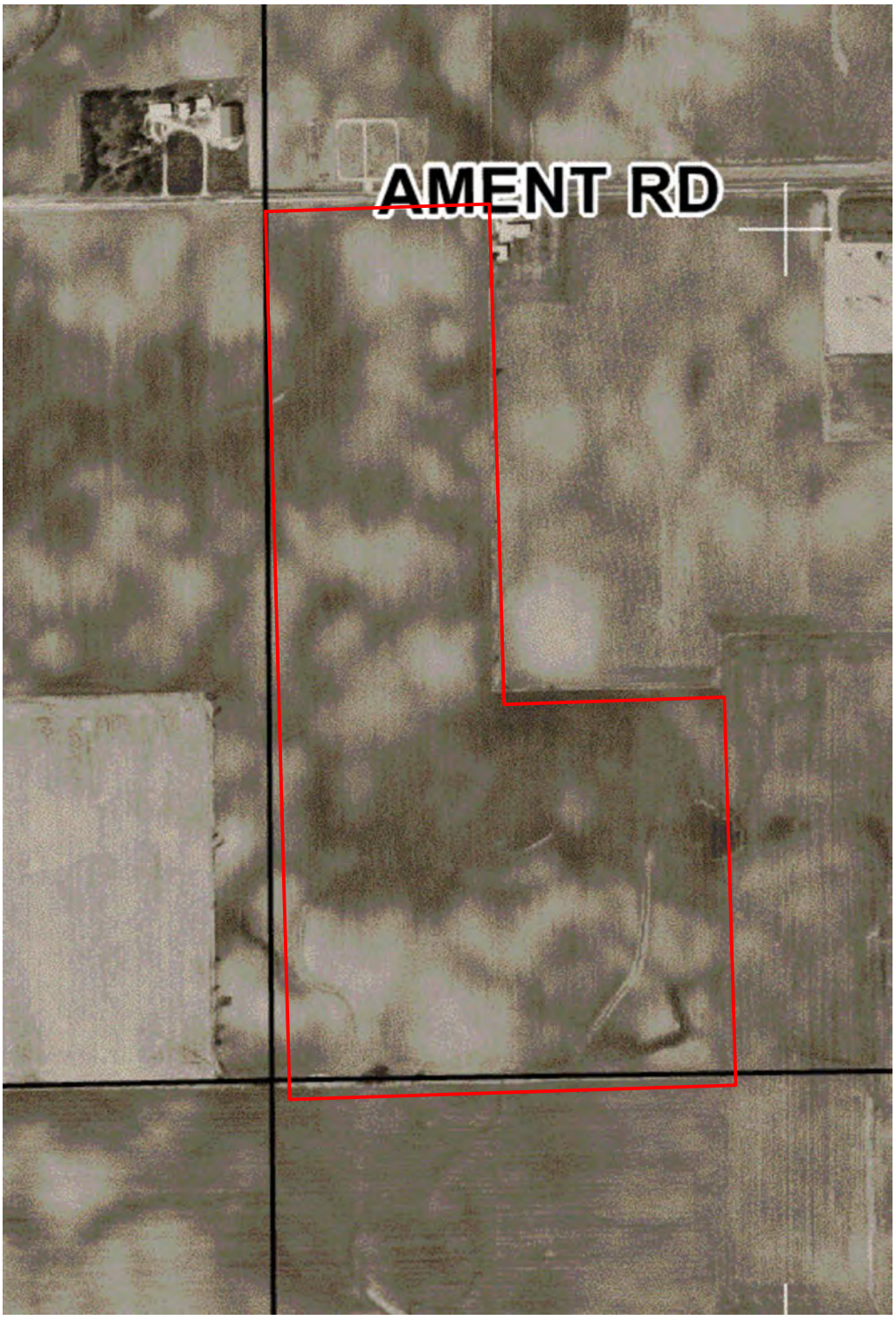
NORTH

# Ament Road

Project Number: 23-0519B

**New Leaf Energy**

Exhibit D




ENCAP INCORPORATED

**LEGEND:**

Project Area




# Flood Insurance Rate Map

Source: Federal Emergency Management Agency (FEMA)
Panel Number: 1709C0125G
Effective Date: February 4, 2009

## Ament Road

Project Number: 23-0519B

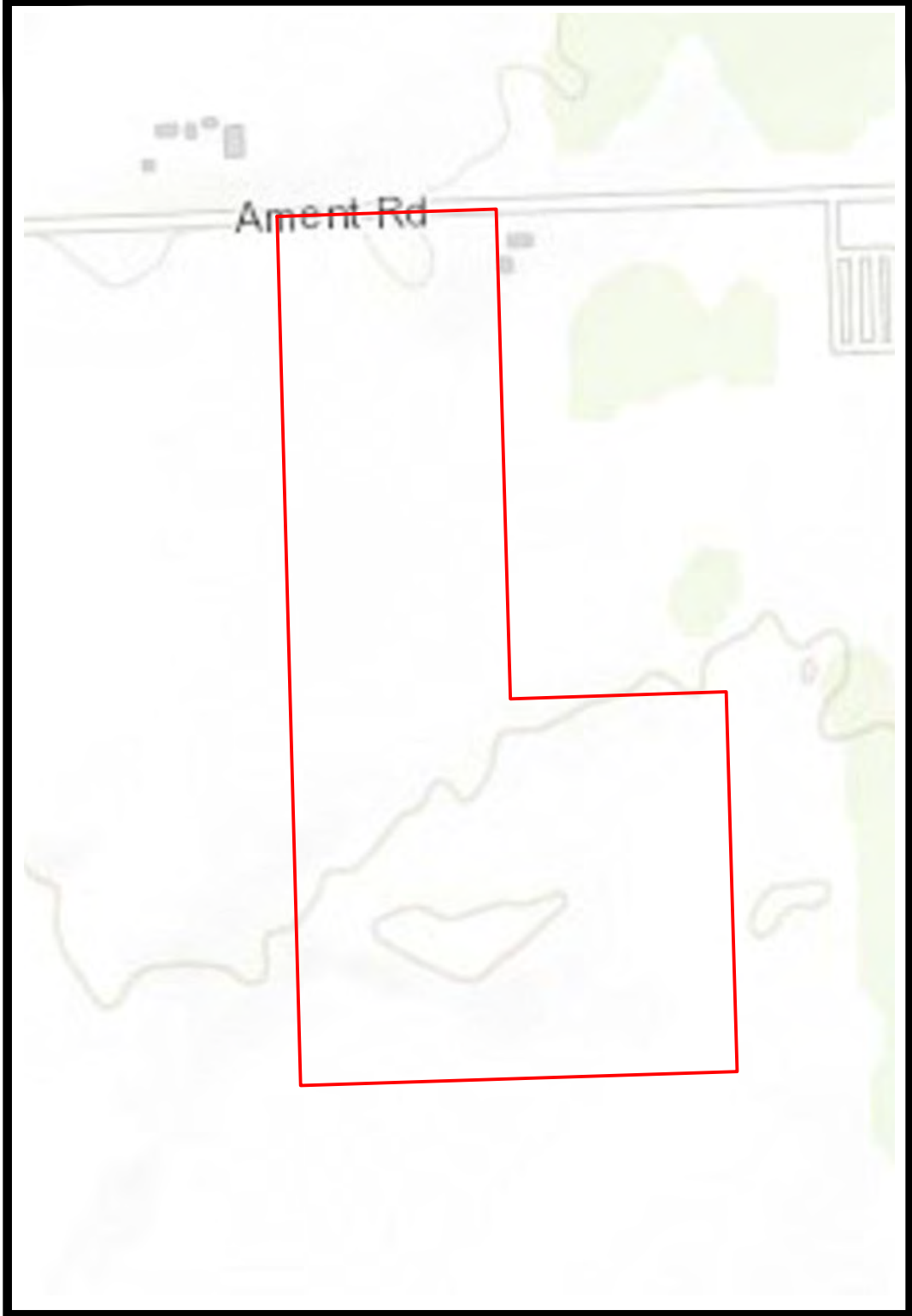
**New Leaf Energy**

0 250 500 1000

SCALE: 1"=500'

NORTH

Exhibit E




ENCAP INCORPORATED

**LEGEND:**

Project Area

National Register Properties

- Part of a NR Historic District
- Determined eligible for the NR
- Part of a NR Historic District - contributing
- Entered in the NR
- Undetermined
- Other

# Historic Architectural Resources Geographic Information System

Source: Illinois State Historic Preservation Office

0 250 500 1000

SCALE: 1"=500'

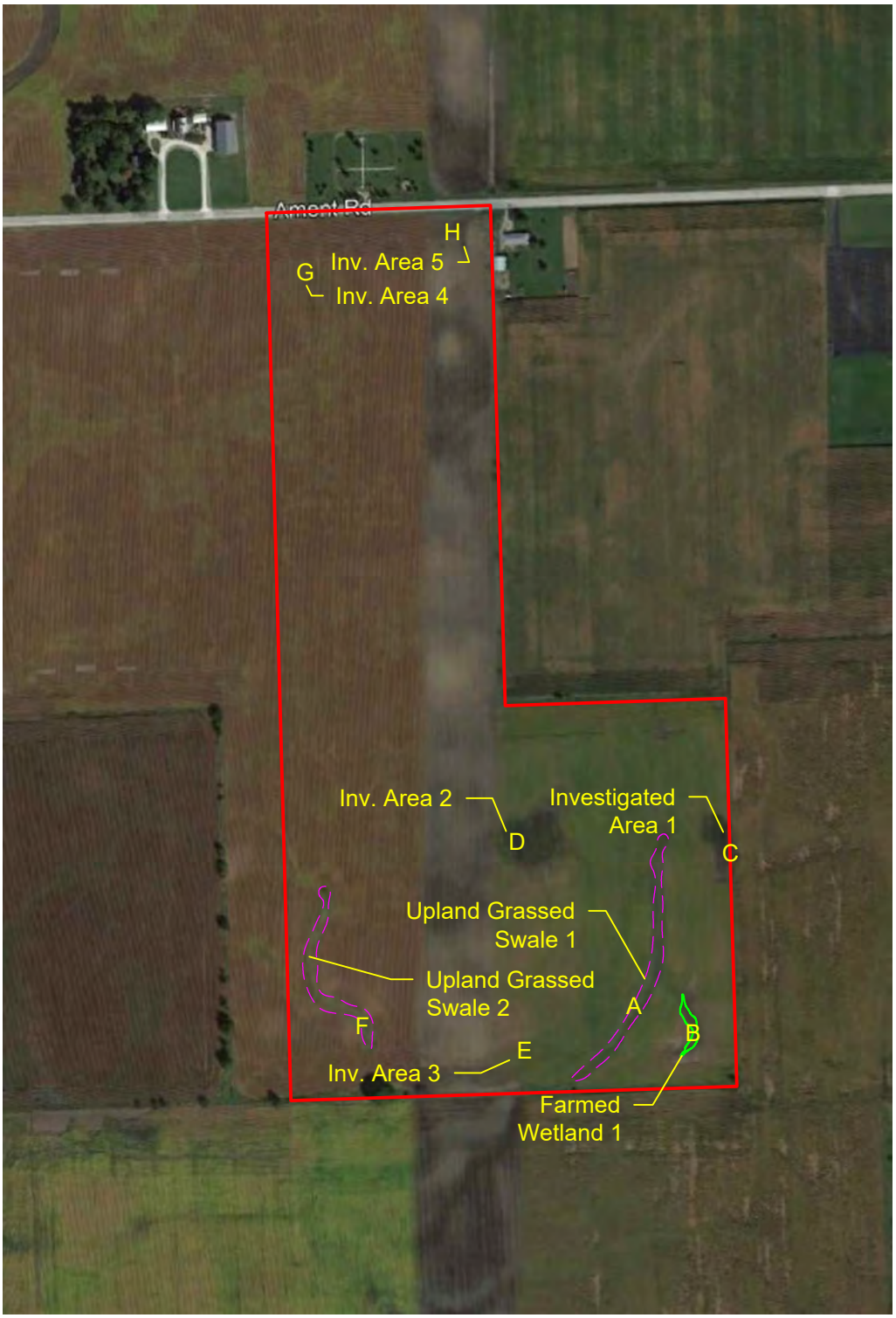
NORTH

# Ament Road

Project Number: 23-0519B

**New Leaf Energy**

Exhibit F




ENCAP INCORPORATED

**LEGEND:**

Project Area

Approximate Location of Upland Grass Swale

On-site Farmed Wetland Boundary

Sample Points A-H

WL Delineation Field Work Completed 06.16.2023

# Aerial Photograph

Map data: ©2023Google
Image Date: 2021

0 250 500 1000
SCALE: 1"=500'

NORTH

# Ament Road

Project Number: 23-0519B

**New Leaf Energy**

Exhibit G

ENCAP INCORPORATED

2585 Wagner Ct.
DeKalb, IL 60115
Phone: 815.748.4500
Fax: 815.748.4255
www.encapinc.net

## TRANSMITTAL LETTER

| | | | |
|---|---|---|---|
| **TO:** | **New Leaf Energy** | **DATE:** | June 18, 2024 |
| | [redacted] | **PROJECT:** | Ament Road Build Area Extension |
| | [redacted] | | |
| **ATTN:** | **Mr. Nicholas Bellone** [redacted] | **ENCAP Project #** | 23-0815A |

| **We are sending you:** | **Date of Enclosed Materials** | **# of Copies** |
|---|---|---|
| 2023-2024 Water Resources Delineation Report | June 18, 2024 | PDF |
| | | |
| | | |
| | | |

| **CC:** | **Date of Enclosed Materials** | **# of Copies** |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**Via:** ☐ **UPS Ground** ☐ **UPS Overnight** ☐ **U.S. Mail** ☒ **Electronic**

**THESE ARE TRANSMITTED AS CHECKED BELOW:**

☐ **For Approval** ☐ **As Requested** ☒ **For your review** ☒ **For your use**

REMARKS: _____

_____

_____

_____

**Signed: Robert Van Herik, PWS, CWS**
**rvanherik@encapinc.net**

# WATER RESOURCES DELINEATION REPORT

# AMENT ROAD BUILD AREA EXTENSION

# KENDALL TOWNSHIP, KENDALL COUNTY, ILLINOIS

**Prepared for:** New Leaf Energy
[redacted]
Attn: Mr. Nicholas Bellone

**Prepared by:** ENCAP, Inc.
Mr. Robert Van Herik, PWS, CWS
Ms. Susan Rowley, PWS, CWS, LEED AP

**Date Prepared:** June 18, 2024

**ENCAP, Inc. Project #:** 23-0815A

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# WATER RESOURCES DELINEATION REPORT

## Ament Road Build Area Extension / New Leaf Energy

## Table of Contents


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| Regulatory Statement | 10 |
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**Attachments**


USFWS Section 7 Consult. Review Summary + Official Threatened & Endangered Species List
IDNR EcoCAT Natural Resource Review Results & Termination Letter
Floristic Quality Data Sheets
USACE Wetland Determination Data Forms – Midwest Region
Site Photographs
USACE Antecedent Precipitation Tool Figure & Tables (2007, 2009, 2010, 2011, 2015, 2018, 11.08.2023)
Historical Aerial Photographs: 2007, 2009, 2010-WET, 2011, 2015, 2018
Exhibits
- A – Location Map
- B – National Wetlands Inventory
- C – Soil Map
- D – 2021 USGS Topographic Map
- E – FEMA Flood Insurance Rate Map
- F – ISHPO HARGIS Map
- G – Aerial Photograph

# WATER RESOURCES DELINEATION REPORT

**Project Name and Client:** Ament Road Build Area Extension / New Leaf Energy

**Project Number:** 23-0815A

**Location:** Illinois, Kendall County, Kendall Township, Unincorporated, T36N R7E, SE 1/4 of Section 17; Latitude 41.593804; Longitude -88.444237

**Date of Site Visit:** November 8, 2023

**Field Investigators:** S. DeDina, CWS & R. Van Herik PWS, CWS

## EXECUTIVE SUMMARY

The project area (approximately 36.5 acres in size) is located in Unincorporated Kendall Township, Kendall County, Illinois (Exhibit A: Location Map). The project area, as presented in this report, represents the property limits investigated by ENCAP, Inc. for the presence of regulated surface water resources. These limits do not necessarily reflect the boundaries of any proposed development activities. The project area is generally bounded by Ament Road to the north, and agricultural land to the south, east, and west. The project area is located within the Illinois River watershed and the Middle Aux Sable Creek sub-watershed.

The project area consists predominately of agricultural land most recently planted with corn (*Zea mays*) and harvested. An intermittent tributary to Middle Aux Sable Creek and its wooded buffer are located along the western boundary of the project area. Topographically, the project area decreases in elevation from north to south, with a few slight depressional areas found throughout the site.

Two wetlands totaling approximately 0.55 acres on-site were identified on the project area. A wetland associated with an intermittent tributary to Middle Aux Sable Creek was identified along the western project boundary of the site and totals approximately 0.45 acres on-site. A small depressional farmed wetland was identified within the southern portion of the project area and totals 0.10 acres. The limits of farmed wetlands were identified using protocol established by the U.S. Department of Agriculture and were not staked. Non-farmed wetland boundaries were identified and staked using methods sanctioned by the United States Army Corps of Engineers. Non-farmed wetland acreages provided in this report are estimations; a survey of the staked wetland boundaries must be performed in order to obtain exact size and location information. The locations of the two wetlands are identified on the attached aerial photograph (Exhibit G).

Basic information regarding wetland regulations may be found in the Regulatory Statement portion of this report. Briefly, the U.S. Army Corps of Engineers (USACE) regulates all Waters of the United States that are currently or historically navigable and all wetlands that are connected to or associated with these waterways. The Kendall County Stormwater Management Ordinance provides for the protection of wetlands and other depressional storage areas from damaging modifications and adverse changes in runoff quality and quantity associated with land developments. Due to its status as a mapped intermittent tributary of the Middle Aux Sable Creek, a tributary of the Illinois River, Wetland 1 / Intermittent Creek is

assumed to be under the jurisdiction of the USACE. A direct surface connection from Farmed Wetland 1 to jurisdictional waters was not observed; therefore, the feature may be considered isolated. The USACE has the final authority to determine the jurisdiction of the identified resources. If considered isolated, Farmed Wetland 1 will be regulated by Kendall County. Buffers are not explicitly enforced by USACE or Kendall County, however, the USACE or Kendall County may enforce buffers during development to protect the identified resources.

Based on a November 16, 2023 review of the U.S. Fish and Wildlife Service (USFWS) technical assistance website, sensitive (federally threatened or endangered) plant or animal species habitat may be located within or adjacent to the project area but the proposed project is unlikely to negatively affect sensitive species (see attached USFWS Review Summary). Further consultation with this agency is likely not required for a Section 404 Permit from the USACE.

According to the Illinois Department of Natural Resources (IDNR), sensitive (threatened or endangered) plant or animal species are not known to exist within the vicinity of the project area and consultation with the IDNR has been terminated. The formal consultation from the IDNR is valid for 2 years from the submittal date of November 16, 2023 (see attached IDNR EcoCAT Results Report).

At the time of this wetland delineation report, current regulations state that this delineation is valid for 5 years from the date of site visit.

## PROJECT PURPOSE

The purpose of the site visit was to identify regulated surface water resources on, or within 100 feet of the project area. A floodplain determination was not included as part of our investigation. On-site wetland areas encountered were delineated using standard methods sanctioned by the United States Army Corps of Engineers in the Corps of Engineers Wetlands Delineation Manual (1987) and 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region and the United States Department of Agriculture National Food Security Act Manual (1994 and 1996). Plant observations were made in order to calculate the Coefficient of Conservatism (ĉ) and Floristic Quality Index (FQI) for each wetland plant community using the Chicago Region FQA Calculator (Herman, B., Sliwinski, R. and S. Whitaker. 2017). Observed wildlife and evaluation of resource quality are also reported as required by the Chicago District USACE.

## METHODS

**1987 USACE Wetland Delineation Manual and 2010 Midwest Regional Supplement.**

Prior to the site visit, a preliminary site evaluation is performed using aerial photography and natural resource mapping. Potential wetland areas identified by these resources are evaluated in the field to determine if they meet the requirements for a wetland based on the USACE parameters of vegetation, hydrology, and soils. In general, positive indication of each of the three parameters must be demonstrated to classify an area as wetland. Each of these parameters is discussed below.

- **Vegetation** – Three vegetative indicators are applied to plant communities in order to determine if the hydrophytic vegetation criterion is met.
  1. More than 50% of the dominant plant species across all strata must be hydrophytic (water tolerant). The U.S. Army Corps of Engineers has prepared a regional list of plants occurring in wetlands which assigns the plant species different indicators. Wetland plants fall into three indicator classes based on differing tolerances to water level and soil saturation. These indicators are rated obligate wetland (OBL), facultative wetland (FACW), or facultative (FAC). Dominant plant species are recorded at sample points within investigated areas.
  2. The prevalence index is 3.0 or less. The prevalence index is a weighted-average wetland indicator status of all plant species in a sampling plot. Each indicator status category is given a numeric value (OBL = 1, FACW = 2, FAC = 3, FACU = 4, and UPL = 5) and weighting is by abundance. A prevalence index of 3.0 or less indicates that hydrophytic vegetation is present. The prevalence index is used to determine whether hydrophytic vegetation is present on sites where indicators of hydric soil and wetland hydrology are present but the vegetation initially fails the dominance test.
  3. The plant community passes either the dominance test (Indictor 1) or the prevalence index (Indicator 2) after reconsideration of the indicator status of certain plant species that exhibit morphological adaptations for life in wetlands. Common morphological adaptations include but are not limited to adventitious roots, multi-stemmed trunks, shallow root systems developed on or near the soil surface, and buttressing in tree species. To apply this indicator, these morphological features must be observed on more than 50% of the individuals of a FACU species living in an area where indicators of hydric soil and wetland hydrology are present.

- **Hydrology** – To be considered a wetland, an area must have 14 or more consecutive days of flooding or ponding, or a water table 12 inches or less below the soil surface, during the growing season at a minimum frequency of 5 years in 10. Wetland hydrology indicators are divided into four groups as described below:
  - **Group A** – indicators are based on the direct observation of surface water or groundwater during a site visit.
  - **Group B** – consists of evidence that the site is subject to flooding or ponding, although it may not be inundated currently. These indicators include water marks, drift deposits, sediment deposits, and similar features.
  - **Group C** – consists of other evidence that the soil is saturated currently or was saturated recently. Some of these indicators, such as oxidized rhizopheres surrounding living roots and the presence of reduced iron or sulfur in the soil profile, indicate that the soil has been saturated for an extended period.

- **Group D** – consists of landscape and vegetation characteristics that indicate contemporary rather than historical wet conditions. These indicators include stunted or stressed plants, geomorphic position, and the FAC-neutral test.

Wetland hydrology indicators are intended as one-time observations of site conditions that are sufficient evidence of wetland hydrology. Within each group, indicators are divided into two categories – *primary* and *secondary*. One primary indicator from any group is sufficient to conclude that wetland hydrology is present. In the absence of a primary indicator, two or more secondary indicators from any group are required to conclude that wetland hydrology is present.

- **Soils** - To be considered a wetland, an area must contain hydric soil. Hydric soils are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic (lacking oxygen) conditions in the upper part. Soils generally, but not always, will develop indicators that are formed predominantly by the accumulation or loss of iron, manganese, sulfur, or carbon compounds in a saturated and anaerobic environment. The most current edition of the United States Department of Agriculture, Natural Resource Conservation Service *Field Indicators of Hydric Soils in the United States* is used for identification of hydric soils. Field indicators of hydric soils include but are not limited to the presence of any of the following: histic epipedon, sulfidic odor, at least 2 centimeters of muck, depleted matrix, and/or redoximorphic features. Field indicators are usually examined in the top 24 inches of the soil. Soil colors are determined using *Munsell Soil Color Charts*.

In most circumstances, areas meeting these three criteria are staked in the field for surveying purposes. Boundaries are demarcated in the field with pink flagged pin stakes labeled "WETLAND DELINEATION." Staked boundaries are mapped on an aerial photograph included in this report. Approximate off-site wetland boundaries are identified on the aerial photograph and were determined using available aerial photographs, wetland maps, and field observation.

**Farmed Wetland Determinations.**

ENCAP, Inc. conducted a wetland determination on the farmed portion of the project area using National Food Security Act Manual (NFSAM) methodology. Aerial photographs are reviewed in order to identify potential farmed wetland signatures. The identified suspect areas are then field investigated to confirm that the areas are in fact wetlands. Copies of the aerial photographs used in identifying farmed wetlands are included in this report.

**MAP REVIEW**

- The **National Wetlands Inventory** identifies a *Riverine, Intermittent, Streambed, Seasonally Flooded* (R4SBC) water feature within the western boundary of the project area (Exhibit B).

- The **Soil Map** identifies the following soils within the project area: Lisbon silt loam, 0 to 2 percent slopes (59A), La Rose silt loam, 5 to 10 percent slopes, eroded (60C2), Drummer silty clay loam, 0 to 2 percent slopes (152A), Elpaso silty clay loam (356A), and Graymont silt loam, 0 to 2 percent slopes (541B). Drummer silty clay loam (152A) and Elpaso silty clay loam (356A) are considered predominantly hydric in Kendall County (Exhibit C).

- The **2021 United States Geological Survey (USGS) Topographic Map** identifies an unnamed intermittent tributary to Middle Aux Sable Creek in the western boundary of the project area. (Exhibit D).

- The **FEMA Flood Insurance Rate Map** identifies the project area outside the 500-year floodplain (Exhibit E).

- The **Illinois State Historic Preservation Office (ISHPO) Historic Architectural Resources Geographic Information System (HARGIS) Map** does not identify any properties or objects that have been listed in the National Register of Historic Places, determined eligible, or surveyed without determination within the project area (Exhibit F).

## SPECIFIC DESCRIPTION OF IDENTIFIED WATER RESOURCES

**Wetland 1 / Intermittent Creek.** This wetland (approximately 0.45 acres in on-site size) is located within the western portion of the project area. The intermittent creek originates north of the site and enters the site from a large culvert located under Ament Road. The creek flows south through the western boundary of the project area before turning slightly to the southwest, continuing in a generally southern direction until its connection with Middle Aux Sable Creek approximately 0.75 miles south of site. The channel of the waters unit averages 5 feet in width and its banks average 3 feet in height. At the time of the field investigation, water depth within the channel varied between approximately 4 inches to 2 feet.

The boundaries of the creek and associated fringe wetland were marked with 70 pink flagged pin stakes. The limits were generally staked at the Ordinary High Water Mark (OHWM). The OHWM was identified by a clear, natural line on the bank, shelving, scour, and abrupt change in plant community. The buffer surrounding the wetland consisted of a wooded corridor dominated by mature hackberry (*Celtis occidentalis*) and Osage orange (*Maclura pomifera*), Tartarian honeysuckle (*Lonicera tatarica*), and smooth brome (*Bromus inermis*), which provides moderate buffer functions to the intermittent creek.

Wetland 1 / Intermittent Creek appears to be under the jurisdiction of the U.S. Army Corps of Engineers due to its connection to Middle Aux Sable Creek, a tributary of the Illinois River. Based on the definition of a high-quality aquatic resource, Wetland 1 would not be considered a high quality aquatic resource. No waterfowl or amphibian species were observed while at the project area.

Two sample points were established within and adjacent to the on-site portion of Wetland 1 to characterize the vegetation, soils, and hydrology (Exhibit G: Aerial Photograph).

The on-site portion of Wetland 1 was primarily vegetated by reed canary grass (*Phalaris arundinacea*). The mapped soil series is Drummer silty clay loam, 0 to 2 percent slopes (152A), a hydric soil. USDA field indicators F6: Redox Dark Surface provided evidence of hydric soil. high water table, saturation, water-stained leaves, drainage patterns, and geomorphic position provided evidence of persistent hydrology (See Wetland Determination Data Forms).

The native mean Coefficient of Conservatism (ĉ) for the on-site portion of Wetland 1 was 2.41, and the native Floristic Quality Index (FQI) of Wetland 1 was 13.61 (see attached Floristic Quality Data). These values indicate a low to moderate quality plant community.

**Farmed Wetland 1.** This wetland (0.10 acres in total size) is located within the southern portion of the project area. This wetland is a small, closed depression that appears to be isolated from the nearby jurisdictional resource and receives its hydrology from overland flow. Farmed Wetland 1 exhibited wetland signatures in 3 out of 5 historic aerial photographs from years with normal precipitation. The location and acreage of Farmed Wetland 1 were determined through aerial photograph interpretation, and its boundaries were not field staked by ENCAP, Inc. Based on the definition of a high-quality aquatic resource, Farmed Wetland 1 would not be considered a high-quality aquatic resource. No waterfowl or amphibian species were observed while at the project area.

The buffer surrounding Farmed Wetland 1 consisted of an active agricultural field that provides very little buffer function.

Farmed Wetland 1 appears to be isolated and therefore, not under the jurisdiction of the U.S. Army Corps of Engineers; however, the wetland is regulated by Kendall County through implementation of the County Stormwater Ordinance.

One sample point was established within Farmed Wetland 1 to characterize the vegetation, soils, and hydrology (Exhibit G: Aerial Photograph).

Farmed Wetland 1 was primarily unvegetated but had previously been vegetated by planted corn. The mapped soil series is Libson silt loam, 0 to 2 percent slopes (59A), a non-hydric soil. USDA field indicators A11: Depleted Below Dark Surface provided evidence of hydric soil. Geomorphic position and a review of historic aerial photographs provided evidence of persistent hydrology (See Wetland Determination Data Forms).

The native mean Coefficient of Conservatism (ĉ) for Farmed Wetland 1 was 0.00, and the native Floristic Quality Index (FQI) of Farmed Wetland 1 was 0.00 (see attached Floristic Quality Data). These values indicate a low-quality plant community.

## INVESTIGATION OF FARMED AREAS

During the field investigation, the majority of the site consisted of agricultural land. ENCAP, Inc. evaluated aerial photographs obtained from Google Earth year-by-year using NRCS wetland signature criteria. Wetland signatures consist of wetland vegetation, surface water, drowned-out crops, patches of greener vegetation, and avoided areas. Areas exhibiting wetland signatures in >50% or more of reviewed aerial photographs and containing hydric soils are considered farmed wetlands. Additionally, if areas do not exhibit wetland signatures in >50% or more of reviewed aerial photographs but do exhibit positive primary or secondary wetland hydrology indicators in the field and contain hydric soils, they are also considered farmed wetlands.

See the attached aerial photographs for years reviewed and wetland signatures observed. Figures and tables from the U.S. Army Corps of Engineers Antecedent Precipitation Tool, which indicate the hydrologic conditions for each historic aerial image, are also attached.

**Table 1. Slide Analysis Summary**
**Ament Road Build Area Extension / New Leaf Energy**

| Year | Google Earth Source | Precipitation | Sample Points Type of Signature / Corresponding Number | | |
|---|---|---|---|---|---|
| | | | **A** | **B** | **E** |
| 2007 | Google, USDA/FPAC/ GEO | Normal | N | N | CT 1 |
| 2009 | Google, USDA/FPAC/ GEO | Normal | N | N | N |
| 2010 | Google, USDA/FPAC/ GEO | *WET* | N | N | CT 1 |
| 2011 | Google, USDA/FPAC/ GEO | Normal | CT 2 | CT 1 | N |
| 2015 | Google, Maxar Technologies | Normal | N | N | CT 1 |
| 2018 | Google, Maxar Technologies | Normal | N | N | CT 1 |
| Percent wetland signatures present in years with normal precipitation | | | 20% | 20% | 60% |
| Hydric soil present based on field inspection | | | Yes | Yes | Yes |
| Identified as wetland on the NWI | | | No | No | No |
| Qualifies as Farmed Wetland | | | No | No | Yes |

INU = Inundation
CT = Color Tone Difference
SAT = Saturation
N = No Wetland Signatures Observed
Y = Yes / Identified

## ADDITIONAL AREAS INVESTIGATED FOR WETLAND STATUS

Two additional vegetated sites located within the project area were examined to determine if they satisfied wetland criteria. Neither of these sites so qualified; therefore, they are referred to as Investigated Areas in this report. Each area is briefly described herein and USACE data forms are provided to support our negative findings (See USACE data forms).

**Investigated Area 1.** This investigated area is located in the northwestern portion of the project area (Exhibit G: Aerial Photograph – Sample Point A). This area was investigated because it consisted of an area that displayed color tone differences in 1 of 5 (20%) of examined historical aerials from years with normal precipitation.

Investigated Area 1 was primarily unvegetated but was previously vegetated by corn before harvest. The mapped soil series is Drummer silty clay loam, 0 to 2 percent slopes (152A), a hydric soil. USDA field indicators A12: Thick Dark and F6: Redox Dark Surface provided evidence of hydric soil. Evidence of persistent hydrology was not observed (See Wetland Determination Data Forms).

Based on the non-persistent hydrology, Investigated Area 1 does not qualify as farmed wetland.

**Investigated Area 2.** This investigated area is located in the northwestern portion of the project area (Exhibit G: Aerial Photograph – Sample Point B). This area was investigated because it consisted of an area that displayed color tone differences in 1 of 5 (20%) of examined historical aerials from years with normal precipitation.

Investigated Area 2 was primarily unvegetated but was previously vegetated by corn before harvest. The mapped soil series is Drummer silty clay loam, 0 to 2 percent slopes (152A), a hydric soil. USDA field indicators F6: Redox Dark Surface and F7: Depleted Dark Surface provided evidence of hydric soil. Evidence of persistent hydrology was not observed (See Wetland Determination Data Forms).

Based on the non-persistent hydrology, Investigated Area 2 does not qualify as farmed wetland.

## REGULATORY STATEMENT

**Federal Regulations:** The deposition of dredged or fill materials into federally jurisdictional wetlands or Waters of the United States is regulated by the USACE under Section 404 of the Clean Water Act.

The Nationwide Permit Program authorizes 0.10 acre or less of low quality wetlands to be filled without mitigation. If over 0.1 acre is proposed for filling or is subject to secondary impacts, in-kind mitigation may be required at a ratio of 1.5:1, or greater. The aggregate total loss of waters of the U.S. authorized by NWP 39 cannot exceed 0.5 acre or 300 linear feet of streambed.

Under the existing regulations, secondary impacts (both on-site and off-site) from filling also must be evaluated. Mitigation may be required at a higher rate if a project will significantly alter wetland functions such as stormwater detention, water filtration, sediment trapping, and/or wildlife habitat.

Before mitigation will be approved, reasonable proof that avoidance or minimization of wetland impacts has been attempted must be provided to the Corps.

A USACE permit is not required if the wetlands are avoided and construction erosion near wetlands is controlled.

**Kendall County Stormwater Management Ordinance:** On December 15, 2011, Kendall County adopted a Stormwater Management Ordinance, with a most recent update of May 18, 2021. The ordinance provides for the protection of wetlands and other depressional storage areas from damaging modifications and adverse changes in runoff quality and quantity associated with land developments.

Natural vegetation shall be retained and protected. Areas immediately adjacent to natural watercourses, lakes, ponds, and wetlands shall be left undisturbed during development to the greatest extent possible. Temporary crossings of watercourses, when permitted, must include appropriate watercourse and bank stabilization measures.

Special precautions shall be taken to prevent damages resulting from any necessary development activity within or adjacent to any stream, lake, pond, or wetland. Preventative measures shall reflect the sensitivity of these areas to erosion and sedimentation.

**Illinois Department of Natural Resources Agency Action Plans for Interagency Wetlands Policy Act of 1989:** The Illinois Interagency Wetlands Policy Act of 1989 is intended to ensure that there is no overall net loss of the State's existing wetland acres or their functional values resulting from State-supported activities. The Act charges State agencies with a further duty to "preserve, enhance and create wetlands where necessary to increase the quality and quantity of the State's wetland resource base."

The Interagency Wetlands Policy Act of 1989 states that any construction, land management or other activity performed by, or for which financial assistance is administered or provided by, a State agency that will result in an adverse impact to a wetland shall be subject to compliance. This includes, but is not limited to the following:

- The alteration, removal, excavation, or dredging of soil, sand, gravel, minerals, organic matter, vegetation, or naturally occurring minerals of any kind from a wetland;
- The discharge or deposit of fill material or dredged material in a wetland;
- The alteration of existing drainage characteristics, sedimentation patterns, or flood retention characteristics of a wetland;
- The disturbance of water level or water table of a wetland;
- The destruction or removal of plant life that would alter the character of a wetland, except for activities undertaken in accordance with the Illinois Noxious Weed Act;
- The transfer of State owned wetlands to any entity other than another state agency; and
- Other actions that cause or may cause adverse wetland impacts.

The Act is to be implemented through a State Wetland Mitigation Policy. The State Wetland Mitigation Policy requires preservation of wetlands as the primary objective. Where adverse wetland impacts are unavoidable, progressive levels of compensation based upon the level of impact to the existing wetland and the location of compensation wetlands are required.

**Archaeological Survey Requirements:** An archaeological survey may be required before a Section 404 permit will be issued for wetland impacts. The U.S. Army Corps of Engineers will make this determination as part of the permit application review. The archaeological survey must cover all areas of the project area, not wetlands only. If you already have a letter from the Illinois State Historic Preservation Office (ISHPO) stating an archaeological survey is required, you should act on it because the USACE will support this notification.

## RECOMMENDATIONS

Two wetlands totaling approximately 0.55 acres were identified on the project area. The boundaries of Farmed Wetland 1 were not field staked by ENCAP, Inc. Farmed wetland boundaries must be scaled from the attached aerial photograph (Exhibit G) onto the property boundary survey.

The U.S. Army Corps of Engineers has the final authority in determining the jurisdictional status of the wetlands and water resources identified on site. In the past, projects have been able to apply to the USACE for a jurisdictional determination (JD) to find out which governing body regulates the wetlands on site. JD's, however, have been deprioritized and are being discouraged by the USACE Chicago District. In lieu of a JD, which can take over a year to be processed, if wetlands can be completely avoided by project development, a No Permit Required (NPR) may be obtained from the USACE. A No Permit Required letter may take between 2-5 months to receive from the USACE offices.

If impacts cannot be avoided, the fastest way to attain a permit for proposed work is to assume that all wetlands are under USACE jurisdiction. If wetlands cannot be avoided and assuming USACE jurisdiction of the wetlands will not work for the project, a lengthier permit review process may be initialed with the Corps.

Any impacts to Wetland 1, Farmed Wetland 1, Waters of the U.S., or enforced buffers will require U.S. Army Corps of Engineers and County notification and approval. ENCAP, Inc. can assist you with the request for No Permit Required, permit applications, agency negotiations, wetland design plans, and mitigation plans which may be applicable to your project. The wetland consultant should be involved during the planning and design stages of the project to avoid complications with the agencies after the plan has been drafted. Proper planning regarding wetlands can reduce delays caused by the permitting process and costly changes in site plans.

## REFERENCES

Cowardin, L.M., Carter, V., Golet, F.D., and LaRoe, E.T., 1979, "Classification of Wetlands and Deepwater Habitats of the United States," FWA/OBS-79/31, U.S. Fish & Wildlife Service, Office of Biological Services, Washington, D.C.

Environmental Laboratory. 1987. "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Gutenson, J. L., and J. C. Deters. 2022. Antecedent Precipitation Tool (APT) Version 1.0: Technical and User Guide. ERDC/TN WRAP-22-1. Vicksburg, MS: US Army Engineer Research and Development Center. http://dx.doi.org/10.21079/11681/43160.

Herman, B., Sliwinski, R. and S. Whitaker. 2017. Chicago Region FQA (Floristic Quality Assessment) Calculator. U.S. Army Corps of Engineers, Chicago, IL.

Illinois Department of Natural Resources. "Agency Action Plans for Interagency Wetlands Policy Act of 1989." **http://dnr.state.il.us/wetlands/ch6d.htm**.

Kendall County Stormwater Management Ordinance. Adopted December 15, 2011. Revised October 15, 2019.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X.

Munsell Soil Color Charts. 2023. GretagMacbeth, New Windsor, New York.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at the following link: https://websoilsurvey.sc.egov.usda.gov/. Accessed [month/day/year].

Swink F. and G. Wilhelm, 1994, "Plants of the Chicago Region", 4th Edition, Indianapolis: Indiana Academy of Science.

United States Army Corps of Engineers 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0), U.S. Army Engineer Research and Development Center.

United States Army Corps of Engineers 2016. National Wetland Plant List, version 3.3. http://wetland_plants.usace.army.mil/ U.S. Army Corps of Engineers. Engineer Research and Development Center. Cold Regions Research and Engineering Laboratory, Hanover, NH.

United States Department of Agriculture. 1994. National Food Security Act manual, 180-V-NFSAM, Third Edition, 2nd Amendment, December 20, 1996.

United States Department of Agriculture, Natural Resources Conservation Service. 2018. Field Indicators of Hydric Soils in the United States, Version 8.2. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

United States Department of the Army, Corps of Engineers, “Nationwide Permit Program,” February 25, 2022.

United States Government, Joint Guidance From The Natural Resources Conservation Service And The Army Corps Of Engineers Concerning Wetland Determinations For The Clean Water Act And The Food Security Act Of 1985, March 25, 2005.

Wilhelm, G. and L. Rericha. 2017, “Flora of the Chicago Region: A Floristic and Ecological Synthesis”, Indianapolis: Indiana Academy of Science.

**USFWS Section 7 Consultation Review Summary**
**+ Official Threatened & Endangered Species List**

ENCAP INCORPORATED

2585 Wagner Ct.
DeKalb, IL 60115
Phone: 815.748.4500
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www.encapinc.net

November 16, 2023

U.S. Fish and Wildlife Service
Illinois & Iowa Ecological Services Field Office
1511 47th Ave
Moline, IL 61265-7022

**Re: USFWS Review Summary - Section 7 Endangered Species Act Consultation**
**Project: Ament Road Build Area Extension, located in Illinois, Kendall County, Kendall Township, Unincorporated, T36N R7E Section 17; Latitude 41.593804 N; Longitude -88.444237 W**
**ENCAP, Inc. project # 23-0815A**
**Client: New Leaf Energy**

The project area consists predominately of agricultural land most recently planted with corn (*Zea mays*) and harvested. An intermittent tributary to Middle Aux Sable Creek and its wooded buffer is located along the western boundary of the project area. Topographically the project area decreases in elevation from north to south, with a few slight depressional areas found throughout the site. The proposed project includes conversion of the agricultural field to a solar array and attendant features.

ENCAP, Inc. carefully reviewed the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPAC) technical assistance website on November 16, 2023 for federally listed threatened and endangered species. According to the website, 4 threatened or endangered species are listed and may be present in Kendall County: Indiana Bat (*Myotis sodalis*), Northern Long-eared Bat (*Myotis septentrionalis*), Eastern Prairie Fringed Orchid (*Platanthera leucophaea*), and the Whooping Crane (*Grus americana*). Additionally, the Tricolored Bat (*Perimyotis subflavus*) is proposed to be listed as an endangered species, and the Monarch Butterfly (*Danaus plexippus*) is included as a candidate species.

Two major types of habitat exist on the project area. The majority of the project area is an active agricultural field, most recently in production of corn. This area provides very little habitat for listed species. The remainder of the project area consists of an intermittent creek corridor with herbaceous, scrub-shrub, and mature wooded plant communities. Scattered flowering forbs and shrubs were found throughout the corridor. These areas provide some wildlife habitat on-site. Along the southern border of the parcel, a few mature trees and several saplings were found consisting of hackberry (*Celtis occidentalis*) and white mulberry (*Morus alba*). Two wetlands were identified on-site. Further information regarding the wetlands can be found in Table 1 below.

Table 1. Sizes in acres, floristic quality, dominant plant species, and the required Lake County buffer width in feet for each wetland.

| Feature | Size (ac) | Native FQI | Native Mean C | Dominant Species | Quality |
|---|---|---|---|---|---|
| Wetland 1 / Intermittent Creek | 0.45 | 13.61 | 2.41 | Reed canary grass (*Phalaris arundinacea*) | Low-Moderate |
| Farmed Wetland 1 | 0.10 | 0.00 | 0.00 | Unvegetated | Low |

The project area does not contain medium to high quality wetland with species associated with Eastern prairie fringed orchid. The limited number of mature trees provides minimal foraging habitat for listed bat species. If tree clearing is avoided, or is conducted during the winter months, it is likely this project will have “no effect” on the Northern long-eared or Indiana bat species.

The minimal flowering forbs found on-site may support limited habitat for the Monarch Butterfly. Further guidance for this species is not required since it is a candidate species and not yet fully listed as threatened or endangered. The Monarch Butterfly was found to warrant listing and protection under the Endangered Species Act (ESA), but resources must go to higher priority species at this time. Candidate species have no legal protection under the ESA, but agencies can still provide recommendations for them. The USFWS broadly urges the public to provide habitat for this imperiled species by planting native milkweed and nectar plants. The Monarch Butterfly should be considered in any landscaping plans.

The Whooping Crane Eastern Migratory population, which travels through Illinois, is a reintroduced flock started in 2001 with captive raised chicks. Whooping Cranes require wetlands, particularly wetland mosaic landscapes, in Illinois while migrating, so the greatest threat to them in Illinois is wetland loss. The Eastern Migratory population is designated “non-essential” by the Endangered Species Act to reduce regulatory restrictions on reintroductions. Non-essential, experimental populations are treated as threatened under the U.S. Fish & Wildlife Service’s 10(j) policy. The Eastern Migratory population is important to the recovering Whooping Crane population overall, but formal consultation with the USFWS for the Whooping Crane Eastern Migratory population is likely not required.

None of the two areas on-site contain suitable habitats for the Indiana Bat, Northern Long Eared Bat, Tricolored Bat, Eastern Prairie Fringed Orchid, Monarch Butterfly or Whooping Crane. Therefore, ENCAP, Inc. concludes that the Ament Road solar project does not contain the aforementioned listed species, their habitats, or designated critical habitat and will have “no effect” on the aforementioned species.



Robert Van Herik, PWS, CWS
Senior Ecological Consultant
ENCAP, Inc.

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Illinois-Iowa Ecological Services Field Office
Illinois & Iowa Ecological Services Field Office
1511 47th Ave
Moline, IL 61265-7022
Phone: (309) 757-5800 Fax: (309) 757-5807

In Reply Refer To:
Project Code: 2024-0016976
Project Name: Ament Road Build Area Extension

November 16, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The attached species list identifies federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat, if present, within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Under 50 CFR 402.12(e) (the regulations that implement Section 7 of the Endangered Species Act) **the accuracy of this species list should be verified after 90 days**. This verification can be completed formally or informally. You may verify the list by visiting the ECOSPHERE Information for Planning and Consultation (IPaC) website https://ipac.ecosphere.fws.gov at regular intervals during project planning and implementation and completing the same process you used to receive the attached list.

**Section 7 Consultation**

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the U.S. Fish and Wildlife Service (Service) if they determine their project “may affect” listed species or designated critical habitat. Under the ESA, it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action may affect endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service to make "no effect" determinations. If you determine that your proposed action will have no effect on threatened or endangered species or their respective designated critical habitat, you do not need to seek concurrence with the Service.

**Note:** For some species or projects, IPaC will present you with *Determination Keys*. You may be able to use one or

more Determination Keys to conclude consultation on your action.

***Technical Assistance for Listed Species***

1. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain information on the species life history, species status, current range, and other documents by selecting the species from the thumbnails or list view and visiting the species profile page.

***No Effect Determinations for Listed Species***

1. If there are *no* species or designated critical habitats on the Endangered Species portion of the species list: conclude "no species and no critical habitat present" and document your finding in your project records. No consultation under ESA section 7(a)(2) is required if the action would result in no effects to listed species or critical habitat. Maintain a copy of this letter and IPaC official species list for your records.
2. If any species or designated critical habitat are listed as potentially present in the **action area** of the proposed project the project proponents are responsible for determining if the proposed action will have “no effect” on any federally listed species or critical habitat. No effect, with respect to species, means that no individuals of a species will be exposed to any consequence of a federal action or that they will not respond to such exposure.
3. If the species habitat is not present within the action area or current data (surveys) for the species in the action area are negative: conclude “no species habitat or species present” and document your finding in your project records. For example, if the project area is located entirely within a “developed area” (an area that is already graveled/paved or supports structures and the only vegetation is limited to frequently mowed grass or conventional landscaping, is located within an existing maintained facility yard, or is in cultivated cropland conclude no species habitat present. Be careful when assessing actions that affect: 1) rights-of-ways that contains natural or semi-natural vegetation despite periodic mowing or other management; structures that have been known to support listed species (example: bridges), and 2) surface water or groundwater. Several species inhabit rights-of-ways, and you should carefully consider effects to surface water or groundwater, which often extend outside of a project’s immediate footprint.
4. Adequacy of Information & Surveys - Agencies may base their determinations on the best evidence that is available or can be developed during consultation. Agencies must give the benefit of any doubt to the species when there are any inadequacies in the information. Inadequacies may include uncertainty in any step of the analysis. To provide adequate information on which to base a determination, it may be appropriate to conduct surveys to determine whether listed species or their habitats are present in the action area. Please contact our office for more information or see the survey guidelines that the Service has made available in IPaC.

***May Effect Determinations for Listed Species***

1. If the species habitat is present within the action area and survey data is unavailable or inconclusive: assume the species is present or plan and implement surveys and interpret results in coordination with our office. If assuming species present or surveys for the species are positive continue with the may affect determination process. May affect, with respect to a species, is the appropriate conclusion when a species might be exposed to a consequence of a federal action and could respond to that exposure. For critical habitat, ‘may affect’ is the appropriate conclusion if the action area overlaps with mapped areas of critical habitat and an essential physical or biological feature may be exposed to a consequence of a federal action and could change in response to that exposure.
2. Identify stressors or effects to the species and to the essential physical and biological features of critical habitat that overlaps with the action area. Consider all consequences of the action and assess the potential for each life stage of the species that occurs in the action area to be exposed to the stressors. Deconstruct the action into its component parts to be sure that you do not miss any part of the action that could cause effects to the species or physical and biological features of critical habitat. Stressors that affect species’ resources may have consequences even if the species is not present when the project is implemented.
3. If no listed or proposed species will be exposed to stressors caused by the action, a ‘no effect’ determination may be appropriate – be sure to separately assess effects to critical habitat, if any overlaps with the action

area. If you determined that the proposed action or other activities that are caused by the proposed action may affect a species or critical habitat, the next step is to describe the manner in which they will respond or be altered. Specifically, to assess whether the species/critical habitat is "not likely to be adversely affected" or "likely to be adversely affected."

4. Determine how the habitat or the resource will respond to the proposed action (for example, changes in habitat quality, quantity, availability, or distribution), and assess how the species is expected to respond to the effects to its habitat or other resources. Critical habitat analyses focus on how the proposed action will affect the physical and biological features of the critical habitat in the action area. If there will be only beneficial effects or the effects of the action are expected to be insignificant or discountable, conclude "may affect, not likely to adversely affect" and submit your finding and supporting rationale to our office and request concurrence.
5. If you cannot conclude that the effects of the action will be wholly beneficial, insignificant, or discountable, check IPaC for species-specific Section 7 guidance and conservation measures to determine whether there are any measures that may be implemented to avoid or minimize the negative effects. If you modify your proposed action to include conservation measures, assess how inclusion of those measures will likely change the effects of the action. If you cannot conclude that the effects of the action will be wholly beneficial, insignificant, or discountable, contact our office for assistance.
6. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

For additional information on completing Section 7 Consultation including a Glossary of Terms used in the Section 7 Process, information requirements for completing Section 7, and example letters visit the Midwest Region Section 7 Consultations website at: https://www.fws.gov/office/midwest-region-headquarters/midwest-section-7-technical-assistance.

You may find more specific information on completing Section 7 on communication towers and transmission lines on the following websites:

- Incidental Take Beneficial Practices: Power Lines - https://www.fws.gov/story/incidental-take-beneficial-practices-power-lines
- Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning. - https://www.fws.gov/media/recommended-best-practices-communication-tower-design-siting-construction-operation

Tricolored Bat Update

On September 14, 2022, the Service published a proposal in the Federal Register to list the tricolored bat (Perimyotis subflavus) as endangered under the Endangered Species Act (ESA). The Service has up to 12-months from the date the proposal published to make a final determination, either to list the tricolored bat under the Act or to withdraw the proposal. The Service determined the bat faces extinction primarily due to the rangewide impacts of white-nose syndrome (WNS), a deadly fungal disease affecting cave-dwelling bats across North America. Because tricolored bat populations have been greatly reduced due to WNS, surviving bat populations are now more vulnerable to other stressors such as human disturbance and habitat loss. Species proposed for listing are not afforded protection under the ESA; however, as soon as a listing becomes effective (typically 30 days after publication of the final rule in the Federal Register), the prohibitions against jeopardizing its continued existence and “take” will apply. Therefore, if your future or existing project has the potential to adversely affect tricolored bats after the potential new listing goes into effect, we recommend that the effects of the project on tricolored bat and their habitat be analyzed to determine whether authorization under ESA section 7 or 10 is necessary. Projects with an existing section 7 biological opinion may require

reinitiation of consultation, and projects with an existing section 10 incidental take permit may require an amendment to provide uninterrupted authorization for covered activities. Contact our office for assistance.

Other Trust Resources and Activities

***Bald and Golden Eagles***

Although no longer protected under the Endangered Species Act, be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act, as are golden eagles. Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near an eagle nest or winter roost area, please contact our office for further coordination. For more information on permits and other eagle information visit our website https://www.fws.gov/library/collections/bald-and-golden-eagle-management.
We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

# OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Illinois-Iowa Ecological Services Field Office**
Illinois & Iowa Ecological Services Field Office
1511 47th Ave
Moline, IL 61265-7022
(309) 757-5800

# PROJECT SUMMARY

Project Code: 2024-0016976
Project Name: Ament Road Build Area Extension
Project Type: Power Gen - Solar
Project Description: Proposed project is a commercial solar project and attendant features. Creek Corridor will be avoided. Low quality farmed wetlands will be avoided
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@41.593254099999996,-88.44709934482674,14z



Counties: Kendall County, Illinois

# ENDANGERED SPECIES ACT SPECIES

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. 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.

## MAMMALS

| NAME | STATUS |
|---|---|
| Indiana Bat *Myotis sodalis*<br>There is **final** critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/5949 | Endangered |
| Northern Long-eared Bat *Myotis septentrionalis*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/9045 | Endangered |
| Tricolored Bat *Perimyotis subflavus*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/10515 | Proposed Endangered |

## BIRDS

| NAME | STATUS |
|---|---|
| Whooping Crane *Grus americana*<br>Population: U.S.A. (AL, AR, CO, FL, GA, ID, IL, IN, IA, KY, LA, MI, MN, MS, MO, NC, NM, OH, SC, TN, UT, VA, WI, WV, western half of WY)<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/758 | Experimental Population, Non-Essential |

## INSECTS

| NAME | STATUS |
|---|---|
| Monarch Butterfly *Danaus plexippus*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/9743 | Candidate |

## FLOWERING PLANTS

| NAME | STATUS |
|---|---|
| Eastern Prairie Fringed Orchid *Platanthera leucophaea*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/601 | Threatened |

## CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

# USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

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 OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

# BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

**There are bald and/or golden eagles in your project area.**

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

| 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 Oct 15 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 the supplemental information and specifically the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

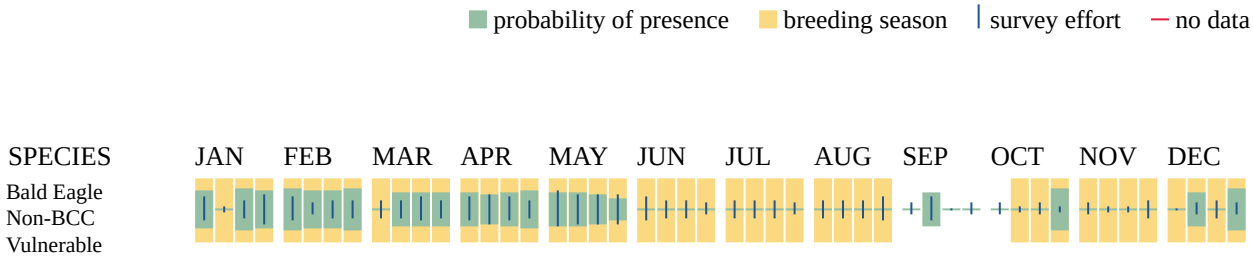
**Probability of Presence** (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

**Breeding Season** (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

**Survey Effort** (|)
Vertical black lines; 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.




Additional information can be found using the following links:

- Eagle Managment 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 conservation 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

# MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

| NAME | BREEDING SEASON |
|---|---|
| American Golden-plover *Pluvialis dominica*<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/10561 | Breeds elsewhere |
| 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 Oct 15 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 |

| NAME | BREEDING SEASON |
|---|---|
| Bobolink *Dolichonyx oryzivorus*<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/9454 | Breeds May 20 to Jul 31 |
| Cerulean Warbler *Dendroica cerulea*<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/2974 | Breeds Apr 21 to Jul 20 |
| Chimney Swift *Chaetura pelagica*<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/9406 | Breeds Mar 15 to Aug 25 |
| Henslow's Sparrow *Ammodramus henslowii*<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/3941 | Breeds May 1 to Aug 31 |
| Kentucky Warbler *Oporornis formosus*<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/9443 | Breeds Apr 20 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.<br>https://ecos.fws.gov/ecp/species/9561 | Breeds elsewhere |
| Prothonotary Warbler *Protonotaria citrea*<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/9439 | Breeds Apr 1 to Jul 31 |
| Red-headed Woodpecker *Melanerpes erythrocephalus*<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/9398 | 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<br>https://ecos.fws.gov/ecp/species/9478 | Breeds elsewhere |

| NAME | BREEDING SEASON |
|---|---|
| Upland Sandpiper *Bartramia longicauda*<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/9294 | Breeds May 1 to Aug 31 |
| Wood Thrush *Hylocichla mustelina*<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/9431 | 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 the supplemental information and specifically the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

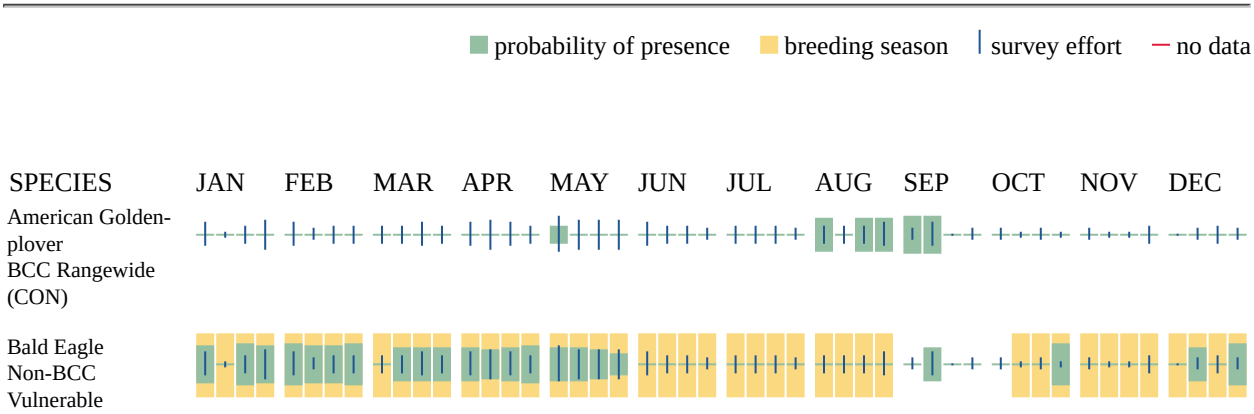
**Probability of Presence** (▪)

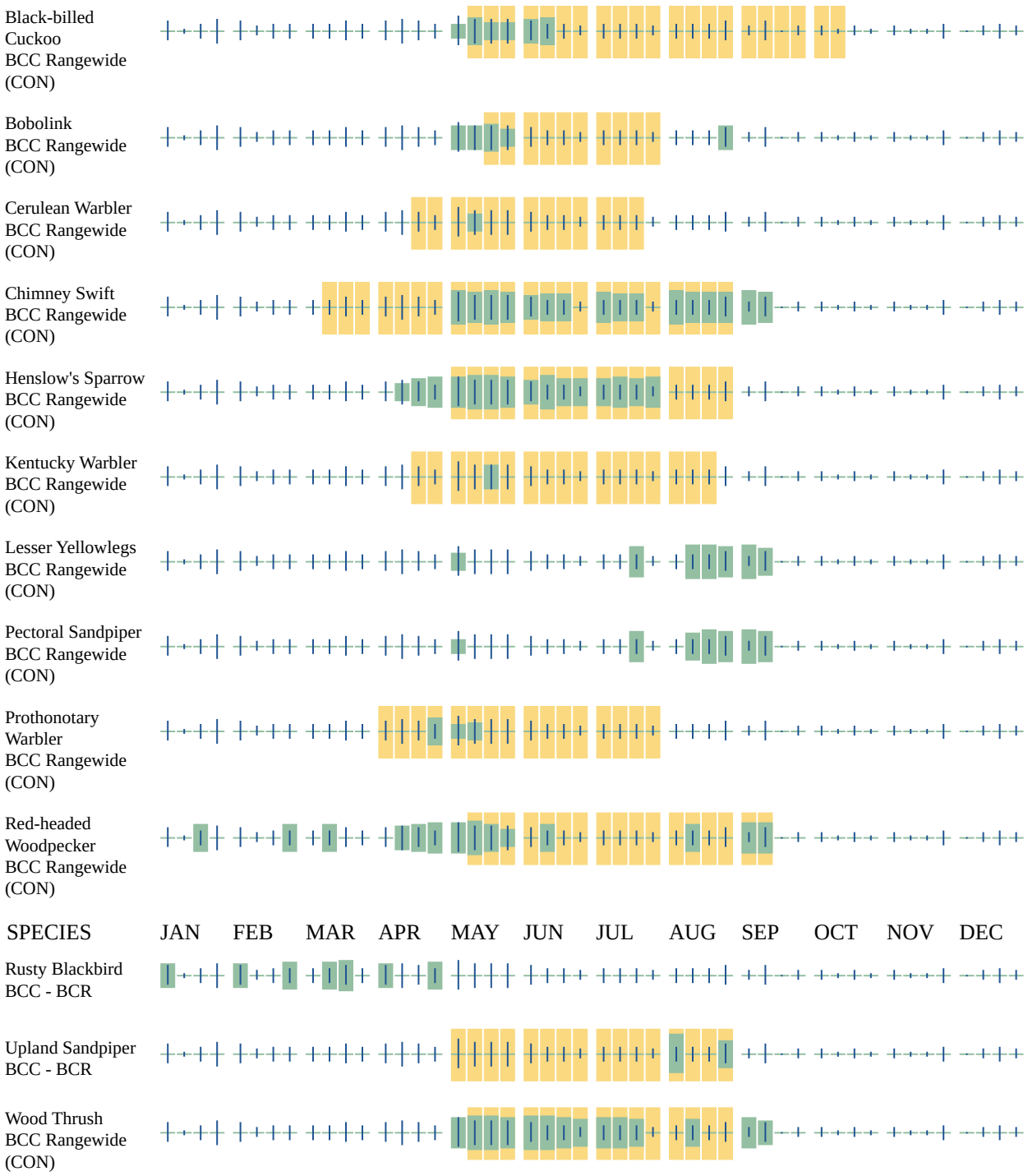
Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

**Breeding Season** (▪)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

**Survey Effort** (|)
Vertical black lines; 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.






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 conservation 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

# WETLANDS

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.

RIVERINE

- R4SBC

# IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Robert Van Herik
Address: [redacted]
City: [redacted]
State: [redacted]
Zip: [redacted]
[redacted]
Phone: [redacted]

# LEAD AGENCY CONTACT INFORMATION

Lead Agency: Army Corps of Engineers

## IDNR EcoCAT Natural Resources Review Results & Termination Letter

EcoCAT
Ecological Compliance Assessment Tool

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

*Applicant:* ENCAP, Inc.
*Contact:* Robert Van Herik, Jr.
*Address:* [redacted]

*IDNR Project Number:* 2406936
*Date:* 11/16/2023
*Alternate Number:* 23-0519B

*Project:* Ament Road Build Area Extension
*Address:* Ament Road, Yorkville

*Description:* Commercial Solar Development with attendant features. Creek corridor will be avoided.

## 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:* Kendall

*Township, Range, Section:*
36N, 7E, 16
36N, 7E, 17
36N, 7E, 20
36N, 7E, 21



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

**Government Jurisdiction**
Kendall County Planning, Building, & Zoning
Matt Asselmeier,
masselmeier@kendallcountyil.gov
111 West Fox Street
Yorkville, Illinois 60560

**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.

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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.

*IDNR Project Number: 2406936*

EcoCAT
Ecological Compliance Assessment Tool

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

# EcoCAT Receipt

**Project Code** 2406936

| APPLICANT | DATE |
|---|---|
| ENCAP, Inc.<br>Robert Van Herik, Jr.<br>[redacted] | 11/16/2023 |

| 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

## Floristic Quality Data Sheets

SITE: Ament Road Build Area Extension
LOCALE: Wetland 1 / Intermittent Creek
BY: S. DeDina & R. Van Herik
NOTES: 11.08.2023

| CONSERVATISM-BASED METRICS | | ADDITIONAL METRICS | |
|---|---|---|---|
| MEAN C (NATIVE SPECIES) | 2.41 | SPECIES RICHNESS (ALL) | 48 |
| MEAN C (ALL SPECIES) | 1.60 | SPECIES RICHNESS (NATIVE) | 32 |
| MEAN C (NATIVE TREES) | 2.00 | % NON-NATIVE | 0.33 |
| MEAN C (NATIVE SHRUBS) | 2.67 | WET INDICATOR (ALL) | -0.10 |
| MEAN C (NATIVE HERBACEOUS) | 2.47 | WET INDICATOR (NATIVE) | -0.22 |
| FQAI (NATIVE SPECIES) | 13.61 | % HYDROPHYTE (MIDWEST) | 0.75 |
| FQAI (ALL SPECIES) | 11.11 | % NATIVE PERENNIAL | 0.60 |
| ADJUSTED FQAI | 19.65 | % NATIVE ANNUAL | 0.06 |
| % C VALUE 0 | 0.44 | % ANNUAL | 0.06 |
| % C VALUE 1-3 | 0.33 | % PERENNIAL | 0.88 |
| % C VALUE 4-6 | 0.23 | | |
| % C VALUE 7-10 | 0.00 | | |

| SPECIES ACRONYM | SPECIES NAME (NWPL/ MOHLENBROCK) | SPECIES (SYNONYM) | COMMON NAME | C VALUE | MIDWEST WET INDICATOR | NC-NE WET INDICATOR | WET INDICATOR (NUMERIC) | HABIT | DURATION | NATIVITY |
|---|---|---|---|---|---|---|---|---|---|---|
| ACENEG | Acer negundo | Acer negundo var. violaceum | Ash-Leaf Maple | 0 | FAC | FAC | 0 | Tree | Perennial | Native |
| ACESAI | Acer saccharinum | Acer saccharinum | Silver Maple | 1 | FACW | FACW | -1 | Tree | Perennial | Native |
| AEGPOD | Aegopodium podagraria | AEGOPODIUM PODAGRARIA | Bishop's Goutweed | 0 | FAC | FAC | 0 | Forb | Perennial | Adventive |
| AGEALT | Ageratina altissima | Eupatorium rugosum | White Snakeroot | 3 | FACU | FACU | 1 | Forb | Perennial | Native |
| AMBTRI | Ambrosia trifida | Ambrosia trifida | Great Ragweed | 0 | FAC | FAC | 0 | Forb | Annual | Native |
| APOCAN | Apocynum cannabinum | Apocynum sibiricum | Indian-Hemp | 2 | FAC | FAC | 0 | Forb | Perennial | Native |
| ARCMIN | Arctium minus | ARCTIUM MINUS | Lesser Burrdock | 0 | FACU | FACU | 1 | Forb | Biennial | Adventive |
| BIDFRO | Bidens frondosa | Bidens frondosa | Devil's-Pitchfork | 1 | FACW | FACW | -1 | Forb | Annual | Native |
| BROINE | Bromus inermis | BROMUS INERMIS | Smooth Brome | 0 | FACU | UPL | 1 | Grass | Perennial | Adventive |
| CXBLAN | Carex blanda | Carex blanda | Eastern Woodland Sedge | 1 | FAC | FAC | 0 | Sedge | Perennial | Native |
| CELOCC | Celtis occidentalis | Celtis occidentalis | Common Hackberry | 2 | FAC | FAC | 0 | Tree | Perennial | Native |
| CONMAC | Conium maculatum | CONIUM MACULATUM | Poison-Hemlock | 0 | FACW | FACW | -1 | Forb | Biennial | Adventive |
| CORALB | Cornus alba | Cornus stolonifera; Cornus baileyi; Cornus sericea | Red Osier | 5 | FACW | FACW | -1 | Shrub | Perennial | Native |
| CORRAC | Cornus racemosa | Cornus racemosa | Gray Dogwood | 1 | FAC | FAC | 0 | Shrub | Perennial | Native |
| ELYRIP | Elymus riparius | Elymus riparius | River-Bank Wild Rye | 5 | FACW | FACW | -1 | Grass | Perennial | Native |
| SOLGRA | Euthamia graminifolia | Solidago graminifolia; Solidago graminifolia nuttallii; Euthamia nuttallii | Flat-Top Goldentop | 4 | FACW | FAC | -1 | Forb | Perennial | Native |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| FRAPEN | Fraxinus pennsylvanica | Fraxinus pennsylvanica subintegerrima; Fraxinus lanceolata | Green Ash | 4 | FACW | FACW | -1 Tree | Perennial | Native |
| GEUCAN | Geum canadense | Geum canadense | White Avens | 1 | FAC | FAC | 0 Forb | Perennial | Native |
| GEULAC | Geum laciniatum | Geum laciniatum | Rough Avens | 3 | FACW | FACW | -1 Forb | Perennial | Native |
| GLYSTR | Glyceria striata | Glyceria striata var. stricta | Fowl Manna Grass | 4 | OBL | OBL | -2 Grass | Perennial | Native |
| HELGRO | Helianthus grosseserratus | Helianthus grosseserratus | Saw-Tooth Sunflower | 4 | FACW | FACW | -1 Forb | Perennial | Native |
| LAPCAN | Laportea canadensis | Laportea canadensis | Canadian Wood-Nettle | 5 | FACW | FACW | -1 Forb | Perennial | Native |
| LONTAT | Lonicera tatarica | LONICERA TATARICA | Twinsisters | 0 | FACU | FACU | 1 Shrub | Perennial | Adventive |
| MORALB | Morus alba | MORUS ALBA VAR. TATARICA | White Mulberry | 0 | FAC | FACU | 0 Tree | Perennial | Adventive |
| NASOFF | Nasturtium officinale | NASTURTIUM OFFICINALE | Watercress | 0 | OBL | OBL | -2 Forb | Perennial | Adventive |
| PASSAT | Pastinaca sativa | PASTINACA SATIVA | Parsnip | 0 | UPL | UPL | 2 Forb | Biennial | Adventive |
| PHAARU | Phalaris arundinacea | PHALARIS ARUNDINACEA | Reed Canary Grass | 0 | FACW | FACW | -1 Grass | Perennial | Adventive |
| PHRAUSU | Phragmites australis ssp. australis | PHRAGMITES AUSTRALIS | Common Reed | 0 | FACW | FACW | -1 Grass | Perennial | Adventive |
| POPDEL | Populus deltoides | Populus deltoides | Eastern Cottonwood | 0 | FAC | FAC | 0 Tree | Perennial | Native |
| RHACAT | Rhamnus cathartica | RHAMNUS CATHARTICA | European Buckthorn | 0 | FAC | FAC | 0 Shrub | Perennial | Adventive |
| RIBMIS | Ribes missouriense | Ribes missouriense | Missouri Gooseberry | 2 | UPL | UPL | 2 Shrub | Perennial | Native |
| ROSBLA | Rosa blanda | Rosa blanda | Smooth Rose | 4 | FACU | FACU | 1 Shrub | Perennial | Native |
| RUBOCC | Rubus occidentalis | Rubus occidentalis | Black Raspberry | 0 | UPL | UPL | 2 Shrub | Perennial | Native |
| RUDLAC | Rudbeckia laciniata | Rudbeckia laciniata | Green-Head Coneflower | 4 | FACW | FACW | -1 Forb | Perennial | Native |
| RUMALT | Rumex altissimus | Rumex altissimus | Pale Dock | 1 | FACW | FACW | -1 Forb | Perennial | Native |
| RUMCRI | Rumex crispus | RUMEX CRISPUS | Curly Dock | 0 | FAC | FAC | 0 Forb | Perennial | Adventive |
| SALNIG | Salix nigra | Salix nigra | Black Willow | 5 | OBL | OBL | -2 Tree | Perennial | Native |
| SAMCAN | Sambucus nigra ssp. canadensis | Sambucus canadensis | Black Elder | 4 | FAC | FACW | -1 Shrub | Perennial | Native |
| SANODO | Sanicula odorata | Sanicula gregaria | Clustered Black-Snakeroot | 3 | FAC | FAC | 0 Forb | Perennial | Native |
| SOLDUL | Solanum dulcamara | SOLANUM DULCAMARA | Climbing Nightshade | 0 | FAC | FAC | 0 Vine | Perennial | Adventive |
| SOLALT | Solidago altissima | Solidago altissima | Tall Goldenrod | 1 | FACU | FACU | 1 Forb | Perennial | Native |
| SYMDRU | Symphyotrichum drummondii | Aster sagittifolius drummondii | Drummond's Aster | 3 | UPL | UPL | 2 Forb | Perennial | Native |
| TAROFF | Taraxacum officinale | TARAXACUM OFFICINALE | Common Dandelion | 0 | FACU | FACU | 1 Forb | Perennial | Adventive |
| TOXRAD | Toxicodendron radicans | Rhus radicans | Eastern Poison-Ivy | 2 | FAC | FAC | 0 Vine | Perennial | Native |
| TRIHYB | Trifolium hybridum | TRIFOLIUM HYBRIDUM | Alsike Clover | 0 | FACU | FACU | 1 Forb | Perennial | Adventive |
| VERURT | Verbena urticifolia | Verbena urticifolia var. leiocarpa | White Vervain | 2 | FAC | FAC | 0 Forb | Perennial | Native |
| VIBOPU | Viburnum opulus var. opulus | VIBURNUM OPULUS | Highbush-Cranberry | 0 | FAC | FACW | 0 Shrub | Perennial | Adventive |
| XANSTR | Xanthium strumarium | Xanthium strumarium var. canadense; Xanthium strumarium var. glabratum | Rough Cockleburr | 0 | FAC | FAC | 0 Forb | Annual | Native |

# USACE Wetland Determination Data Forms – Midwest Region

**WETLAND DETERMINATION DATA FORM – Midwest Region**

Project/Site: Ament Road Build Area Extension City/County: Unincorporated/Kendall Sampling Date: 11/08/2023

Applicant/Owner: New Leaf Energy State: IL Sampling Point: A

Investigator(s) S. DeDina & R. Van Herik Section, Township, Range: Sec. 17, T36N, R7E

Landform (hillslope, terrace, etc.): Agricultural field Local Relief (concave, convex, none): Concave

Slope (%): 3% *Lat: 41.595242 *Long: -88.448686 Datum: Investigated Area 1

Soil Map Unit Name: Drummer silty clay loam, 0 to 2 percent slopes (152A) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no explain in remarks)

Are vegetation ☒ Soil ☒ Hydrology ☒ significantly disturbed? Are normal circumstances present? Yes ☐ No ☒

Are vegetation ☐ Soil ☐ 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 ☐ No ☒ | |
| Hydric Soils Present? | Yes ☒ No ☐ | **Is the Sampled Area Within a Wetland?** **Yes ☐ No ☒** |
| Wetland Hydrology Present? | Yes ☐ No ☒ | |

**Remarks: Precipitation data from the previous 3 months indicates the climatic/hydrologic conditions have been normal. The sample point is located in an agricultural field that has been tiled, tilled, planted with corn (*Zea mays*), and harvested.**

*Coordinates obtained from Google Earth.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | | = Total Cover | |
| **Sapling/Shrub Stratum (Plot size: 15')** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | | =Total Cover | |
| **Herb Stratum (Plot size: 5')** | | | |
| 1. *Zea mays** stubble | 60 | N | UPL |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 60 | =Total Cover | |
| **Woody Vine Stratum (Plot size: 30' )** | | | |
| 1. | | | |
| 2. | | | |
| | | =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: 0 (B)

Percent of Dominant Species That are OBL, FACW, or FAC 0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | | x 1 | |
| FACW species | | x 2 | |
| FAC species | | x 3 | |
| FACU species | | x 4 | |
| UPL species | | x 5 | |
| TOTALS | (A) | | (B) |

Prevalence Index (B/A) =

**Hydrophytic Vegetation Indicators:**

☐ Rapid Test for Hydrophytic Vegetation
☐ Dominance Test is >50%
☐ Prevalence Index is ≤ 3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic Vegetation Present? Yes☐ No ☒**

**Remarks:** (Include photo numbers here or on a separate sheet)
Photograph 10
*The agricultural field and sample point was dominated by planted corn (*Zea mays*) that had recently been harvested; however, the corn is not included in the overall dominance calculation since it is an unnatural planted crop.

## SOIL

Sampling Point A

**Profile Description: (Describe the depth needed to document the indicator or confirm the absence of indicators**

| Depth (Inches) | Matrix Color (Moist) | Matrix % | Redox Features Color (Moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-8 | 10YR 2/1 | 100 | | | | | SiCL | |
| 8-15 | 10YR 2/1 | 94 | 10YR 5/3 | 5 | C | M | SiCL | |
| | | | 10YR 5/8 | 1 | C | M | | |
| 15-24 | 10YR 2/1 | 88 | 10YR 5/3 | 10 | C | M | SiC | |
| | | | 10YR 5/8 | 2 | C | M | | |
| 24-28 | 10YR 5/1 | 50 | 10YR 5/3 | 15 | C | M | SiC | |
| | | | 10YR 5/8 | 15 | C | M | | |
| | | | 10YR 2/1 | 20 | n/a | M | | |

[1]Type: C = Concentration, D= Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains [2]Locaton: PL =Pore Lining, M = Matrix

**Hydric Soil Indicators**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]**

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron- Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present unless disturbed or problematic.

**Restrictive Layer (if observed)**

Type:

Depth:

**Hydric Soil Present? Yes ☒ No ☐**

**Remarks:**

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (Minimum of one is required: check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water Stained Leaves (B9)
- ☐ Aquatic Fauna (B 3)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ☐ No ☒ Depth (inches) N/A

Water Table Present? Yes ☐ No ☒ Depth (inches) N/A

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches) N/A

**Wetland Hydrology Present? Yes ☐ No ☒**

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

**Remarks: This area displayed wetland signatures during 1 of 5 (20%) reviewed historic aerial photographs with normal precipitation.**

**WETLAND DETERMINATION DATA FORM – Midwest Region**

Project/Site: Ament Road Build Area Extension City/County: Unincorporated/Kendall Sampling Date: 11/08/2023

Applicant/Owner: New Leaf Energy State: IL Sampling Point: B

Investigator(s) S. DeDina & R. Van Herik Section, Township, Range: Sec. 17, T36N, R7E

Landform (hillslope, terrace, etc.): Agricultural field Local Relief (concave, convex, none): Concave

Slope (%): 2% *Lat: 41.594917 *Long: -88.448194 Datum: Investigated Area 2

Soil Map Unit Name: Drummer silty clay loam, 0 to 2 percent slopes (152A) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no explain in remarks)

Are vegetation ☒ Soil ☒ Hydrology ☒ significantly disturbed? Are normal circumstances present? Yes ☐ No ☒

Are vegetation ☐ Soil ☐ 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 ☐ No ☒
Hydric Soils Present? Yes ☒ No ☐ **Is the Sampled Area Within a Wetland?** **Yes ☐ No ☒**
Wetland Hydrology Present? Yes ☐ No ☒

**Remarks: Precipitation data from the previous 3 months indicates the climatic/hydrologic conditions have been normal. The Sample Point is located in an agricultural field that has been tiled, tilled, planted with corn (*Zea mays*), and harvested.**

*Coordinates obtained from Site Photograph.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | = Total Cover | |
| **Sapling/Shrub Stratum (Plot size: 15')** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | =Total Cover | |
| **Herb Stratum (Plot size: 5')** | | | |
| 1. *Zea mays** stubble | 65 | N | UPL |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 65 | =Total Cover | |
| **Woody Vine Stratum (Plot size: 30' )** | | | |
| 1. | | | |
| 2. | | | |
| | 0 | =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: 0 (B)
Percent of Dominant Species That are OBL, FACW, or FAC 0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | | x 1 | |
| FACW species | | x 2 | |
| FAC species | | x 3 | |
| FACU species | | x 4 | |
| UPL species | | x 5 | |
| TOTALS (A) | | (B) | |

Prevalence Index (B/A) =

**Hydrophytic Vegetation Indicators:**

☐ Rapid Test for Hydrophytic Vegetation
☐ Dominance Test is >50%
☐ Prevalence Index is ≤ 3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic Vegetation Present? Yes☐ No ☒**

**Remarks:** (Include photo numbers here or on a separate sheet)
Photograph 11
*The agricultural field and sample point was dominated by planted corn (*Zea mays*) that had recently been harvested; however, the corn is not included in the overall dominance calculation since it is an unnatural planted crop.

## SOIL

Sampling Point B

**Profile Description: (Describe the depth needed to document the indicator or confirm the absence of indicators**

| Depth (Inches) | Matrix Color (Moist) | Matrix % | Redox Features Color (Moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-15 | 10YR 2/1 | 92 | 10YR 5/4 | 5 | C | M | SiCL | |
| | | | 10YR 5/1 | 3 | D | M | | |
| 15-24 | 10YR 2/1 | 73 | 10YR 5/1 | 15 | D | M | SiC | |
| | | | 10YR 5/4 | 10 | C | M | | |
| | | | 10YR 5/8 | 2 | C | M | | |
| | | | | | | | | |

[1]Type: C = Concentration, D= Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains [2]Locaton: PL =Pore Lining, M = Matrix

**Hydric Soil Indicators**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]**

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron- Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present unless disturbed or problematic.

**Restrictive Layer (if observed)**

Type:

Depth:

**Hydric Soil Present? Yes ☒ No ☐**

**Remarks:**

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (Minimum of one is required: check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water Stained Leaves (B9)
- ☐ Aquatic Fauna (B 3)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ☐ No ☒ Depth (inches) N/A

Water Table Present? Yes ☐ No ☒ Depth (inches) N/A

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches) N/A

**Wetland Hydrology Present? Yes ☐ No ☒**

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

**Remarks: This area displayed wetland signatures during 1 of 5 (20%) reviewed historic aerial photographs with normal precipitation.**

**WETLAND DETERMINATION DATA FORM – Midwest Region**

Project/Site: Ament Road Build Area Extension City/County: Unincorporated/Kendall Sampling Date: 11/08/2023

Applicant/Owner: New Leaf Energy State: IL Sampling Point: C

Investigator(s) S. DeDina & R. Van Herik Section, Township, Range: Sec. 17, T36N, R7E

Landform (hillslope, terrace, etc.): Toe Slope, Creekbed Local Relief (concave, convex, none): Concave

Slope (%): 10% *Lat: 41.594073 *Long: -88.448824 Datum: Wetland 1 / Intermittent Creek

Soil Map Unit Name: Drummer silty clay loam, 0 to 2 percent slopes (152A) NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no explain in remarks)

Are vegetation ☐ Soil ☐ Hydrology ☐ significantly disturbed? Are normal circumstances present? Yes ☒ No ☐

Are vegetation ☐ Soil ☐ 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 ☒ No ☐
Hydric Soils Present? Yes ☒ No ☐
Wetland Hydrology Present? Yes ☒ No ☐

**Is the Sampled Area Within a Wetland?** **Yes ☒** **No ☐**

**Remarks: Precipitation data from the previous 3 months indicates the climatic/hydrologic conditions have been normal. The Sample Point is located in an incised creek channel with a wooded buffer.**

*Coordinates obtained from Site Photograph.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Celtis occidentalis* | 25 | Y | FAC |
| 2. *Tilia americana* | 25 | Y | FACU |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 50 | = Total Cover | |
| **Sapling/Shrub Stratum (Plot size: 15')** | | | |
| 1. *Rubus occidentalis* | 20 | Y | UPL |
| 2. *Sambucus canadensis* | 15 | Y | FAC |
| 3. *Lonicera tatarica* | 10 | Y | FACU |
| 4. | | | |
| 5. | | | |
| | 45 | =Total Cover | |
| **Herb Stratum (Plot size: 5')** | | | |
| 1. *Phalaris arundinacea* | 40 | Y | FACW |
| 2. *Rudbeckia laciniata* | 20 | Y | FACW |
| 3. *Bromus inermis* | 15 | N | FACU |
| 4. *Aegopodium podagraria* | 10 | N | FAC |
| 5. *Solanum dulcamara* | 8 | N | FAC |
| 6. *Rumex altissimus* | 3 | N | FACW |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 96 | =Total Cover | |
| **Woody Vine Stratum (Plot size: 30' )** | | | |
| 1. | | | |
| 2. | | | |
| | 0 | =Total Cover | |

**Dominance Test worksheet:**
Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 7 (B)
Percent of Dominant Species That are OBL, FACW, or FAC 57% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | | x 1 | |
| FACW species | | x 2 | |
| FAC species | | x 3 | |
| FACU species | | x 4 | |
| UPL species | | x 5 | |
| TOTALS (A) | | (B) | |

Prevalence Index (B/A) =

**Hydrophytic Vegetation Indicators:**

☐ Rapid Test for Hydrophytic Vegetation
☒ Dominance Test is >50%
☐ Prevalence Index is ≤ 3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic Vegetation Present? Yes☒ No ☐**

**Remarks:** (Include photo numbers here or on a separate sheet)
Photograph 1

## SOIL

Sampling Point C

**Profile Description: (Describe the depth needed to document the indicator or confirm the absence of indicators**

| Depth (Inches) | Matrix Color (Moist) | Matrix % | Redox Features Color (Moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-8 | 10YR 3/1 | 80 | 10YR 5/8 | 10 | C | M | SiL | with sand |
| | | | 10YR 5/4 | 10 | C | M | | |
| 8-10 | 10YR 4/1 | 85 | 10YR 5/4 | 15 | C | M | SiL | With gravel |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C = Concentration, D= Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains [2]Locaton: PL =Pore Lining, M = Matrix

**Hydric Soil Indicators**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]**

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron- Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present unless disturbed or problematic.

**Restrictive Layer (if observed)**

Type: **Gravel / Rock**

Depth: **10"**

**Hydric Soil Present? Yes ☒ No ☐**

**Remarks:**

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (Minimum of one is required: check all that apply)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☒ Water Stained Leaves (B9)
- ☐ Aquatic Fauna (B 3)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ☐ No ☒ Depth (inches) N/A

Water Table Present? Yes ☒ No ☐ Depth (inches) 6"

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches) 3"

**Wetland Hydrology Present? Yes ☒ No ☐**

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

**Remarks:**

**WETLAND DETERMINATION DATA FORM – Midwest Region**

Project/Site: Ament Road Build Area Extension City/County: Unincorporated/Kendall Sampling Date: 11/08/2023

Applicant/Owner: New Leaf Energy State: IL Sampling Point: D

Investigator(s) S. DeDina & R. Van Herik Section, Township, Range: Sec. 17, T36N, R7E

Landform (hillslope, terrace, etc.): Creek Terrace Local Relief (concave, convex, none): None

Slope (%): 0% *Lat: 41.594190 *Long: -88.448709 Datum: Wetland 1 / Intermittent Creek - Upland

Soil Map Unit Name: Drummer silty clay loam, 0 to 2 percent slopes (152A) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no explain in remarks)

Are vegetation ☒ Soil ☒ Hydrology ☒ significantly disturbed? Are normal circumstances present? Yes ☐ No ☒

Are vegetation ☐ Soil ☐ 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 ☐ No ☒ | |
| Hydric Soils Present? | Yes ☐ No ☒ | **Is the Sampled Area Within a Wetland?** **Yes ☐ No ☒** |
| Wetland Hydrology Present? | Yes ☐ No ☒ | |

**Remarks: Precipitation data from the previous 3 months indicates the climatic/hydrologic conditions have been normal.**

*Coordinates obtained from Site Photograph.

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

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Tilia americana* | 60 | Y | FACU |
| 2. *Celtis occidentalis* | 15 | N | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 75 | = Total Cover | |
| Sapling/Shrub Stratum (Plot size: 15') | | | |
| 1. *Lonicera tatarica* | 25 | Y | FACU |
| 2. *Rubus occidentalis* | 15 | Y | UPL |
| 3. *Cornus alba* | 5 | N | FACW |
| 4. | | | |
| 5. | | | |
| | 45 | =Total Cover | |
| Herb Stratum (Plot size: 5') | | | |
| 1. *Bromus inermis* | 99 | Y | FACU |
| 2. *Cirsium arvense* | 1 | N | FACU |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 100 | =Total Cover | |
| Woody Vine Stratum (Plot size: 30' ) | | | |
| 1. | | | |
| 2. | | | |
| | 0 | =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: 4 (B)
Percent of Dominant Species That are OBL, FACW, or FAC 0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | | x 1 | |
| FACW species | | x 2 | |
| FAC species | | x 3 | |
| FACU species | | x 4 | |
| UPL species | | x 5 | |
| TOTALS (A) | | (B) | |

Prevalence Index (B/A) =

**Hydrophytic Vegetation Indicators:**

☐ Rapid Test for Hydrophytic Vegetation
☐ Dominance Test is >50%
☐ Prevalence Index is ≤ 3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic Vegetation Present? Yes☐ No ☒**

**Remarks:** (Include photo numbers here or on a separate sheet)
Photograph 2

## SOIL

Sampling Point _____

**Profile Description: (Describe the depth needed to document the indicator or confirm the absence of indicators**

| Depth (Inches) | Matrix Color (Moist) | Matrix % | Redox Features Color (Moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-18 | 10YR 3/1 | 100 | | | | | SiCL | |
| 18-20 | 10YR 3/1 | 85 | 10YR 4/3 | 15 | C | M | SiCL | |
| 20-24 | 10YR 4/3 | 80 | 10YR 5/4 | 15 | C | M | SiCL | |
| | | | 10YR 3/1 | 5 | n/a | M | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C = Concentration, D= Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains [2]Locaton: PL =Pore Lining, M = Matrix

**Hydric Soil Indicators**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]**

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron- Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present unless disturbed or problematic.

**Restrictive Layer (if observed)**

Type: _____

Depth: _____

**Hydric Soil Present? Yes ☐ No ☒**

**Remarks:**

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (Minimum of one is required: check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water Stained Leaves (B9)
- ☐ Aquatic Fauna (B 3)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ☐ No ☒ Depth (inches) N/A

Water Table Present? Yes ☐ No ☒ Depth (inches) N/A

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches) N/A

**Wetland Hydrology Present? Yes ☐ No ☒**

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

**Remarks:**

**WETLAND DETERMINATION DATA FORM – Midwest Region**

Project/Site: Ament Road Build Area Extension City/County: Unincorporated/Kendall Sampling Date: 11/08/2023

Applicant/Owner: New Leaf Energy State: IL Sampling Point: E

Investigator(s) S. DeDina & R. Van Herik Section, Township, Range: Sec. 17, T36N, R7E

Landform (hillslope, terrace, etc.): Agricultural field Local Relief (concave, convex, none): Concave

Slope (%): 3% *Lat: 41.590806 *Long: -88.445576 Datum: Farmed Wetland 1

Soil Map Unit Name: Libson silt loam, 0 to 2 percent slopes (59A) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no explain in remarks)

Are vegetation ☒ Soil ☒ Hydrology ☒ significantly disturbed? Are normal circumstances present? Yes ☐ No ☒

Are vegetation ☐ Soil ☐ 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 ☐ No ☒
Hydric Soils Present? Yes ☒ No ☐ **Is the Sampled Area Within a Wetland?** **Yes ☐ No ☐**
Wetland Hydrology Present? Yes ☒ No ☐

**Remarks: Precipitation data from the previous 3 months indicates the climatic/hydrologic conditions have been normal. The Sample Point is located in an agricultural field that has been tiled, tilled, planted with corn (*Zea mays*), and harvested.**

*Coordinates obtained from Site Photograph.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | = Total Cover | |
| **Sapling/Shrub Stratum (Plot size: 15')** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | =Total Cover | |
| **Herb Stratum (Plot size: 5')** | | | |
| 1. *Zea mays** stubble | 60 | N | UPL |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 0 | =Total Cover | |
| **Woody Vine Stratum (Plot size: 30' )** | | | |
| 1. | | | |
| 2. | | | |
| | 0 | =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: 0 (B)
Percent of Dominant Species That are OBL, FACW, or FAC 0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | | x 1 | |
| FACW species | | x 2 | |
| FAC species | | x 3 | |
| FACU species | | x 4 | |
| UPL species | | x 5 | |
| TOTALS | (A) | | (B) |

Prevalence Index (B/A) =

**Hydrophytic Vegetation Indicators:**

☐ Rapid Test for Hydrophytic Vegetation
☐ Dominance Test is >50%
☐ Prevalence Index is ≤ 3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic Vegetation Present? Yes☐ No ☒**

**Remarks:** (Include photo numbers here or on a separate sheet)
Photograph 9
*The agricultural field and sample point were dominated by planted corn (*Zea mays*) that had recently been harvested; however, the corn is not included in the overall dominance calculation since it is an unnatural planted crop.

## SOIL

Sampling Point E

**Profile Description: (Describe the depth needed to document the indicator or confirm the absence of indicators**

| Depth (Inches) | Matrix Color (Moist) | Matrix % | Redox Features Color (Moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-10 | 10YR 2/1 | 100 | | | | | SiCL | |
| 10-18 | 10YR 4/1 | 75 | 10YR 5/6 | 20 | C | M | SiCL | |
| | | | 10YR 2/1 | 5 | n/a | M | | |
| 18-24 | 10YR 4/1 | 53 | 10YR 4/6 | 40 | C | M | SiCL | |
| | | | 10YR 5/6 | 5 | C | M | | |
| | | | 10YR 2/1 | 2 | | | | |

[1]Type: C = Concentration, D= Depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains [2]Locaton: PL =Pore Lining, M = Matrix

**Hydric Soil Indicators**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☒ Depleted below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]**

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron- Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present unless disturbed or problematic.

**Restrictive Layer (if observed)**

Type:

Depth:

**Hydric Soil Present? Yes ☒ No ☐**

**Remarks:**

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (Minimum of one is required: check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water Stained Leaves (B9)
- ☐ Aquatic Fauna (B 3)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☒ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ☐ No ☒ Depth (inches) N/A

Water Table Present? Yes ☐ No ☒ Depth (inches) N/A

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches) N/A

**Wetland Hydrology Present? Yes ☒ No ☐**

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

**Remarks: This area displayed wetland signatures during 3 of 5 (60%) reviewed historic aerial photographs with normal precipitation.**

## Site Photographs

**PHOTOGRAPH 1**

DESCRIPTION:

Wetland 1 / Intermittent Creek

Sample Point C

Facing Northwest




**PHOTOGRAPH 2**

DESCRIPTION:

Wetland 1 / Intermittent Creek Upland

Sample Point D

Facing North



**PHOTOGRAPH 3**

DESCRIPTION:

Wetland 1 / Intermittent Creek

Pipe Under Ament Road




**PHOTOGRAPH 4**

DESCRIPTION:

Wetland 1 / Intermittent Creek

Overview



**PHOTOGRAPH 5**

DESCRIPTION:

Wetland 1 /
Intermittent Creek

Overview




**PHOTOGRAPH 6**

DESCRIPTION:

Wetland 1 /
Intermittent Creek

Off-site Overview



**PHOTOGRAPH 7**

DESCRIPTION:

Wetland 1 /
Intermittent Creek

Buffer Overview




**PHOTOGRAPH 8**

DESCRIPTION:

Wetland 1 /
Intermittent Creek

Piped Crossing at
Property Border



**PHOTOGRAPH 9**

DESCRIPTION:

Farmed Wetland 1

Sample Point E




**PHOTOGRAPH 10**

DESCRIPTION:

Investigated Area 1

Sample Point A

Facing South



| **PHOTOGRAPH 11** |  |
|---|---|
| DESCRIPTION:<br>Investigated Area 2<br>Sample Point B<br>Facing South | |



| **PHOTOGRAPH 12** |  |
|---|---|
| DESCRIPTION:<br>Site Overview<br>Facing Southwest | |



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| **PHOTOGRAPH 13** |  |
|---|---|
| DESCRIPTION:<br><br>Site Overview | |



| **PHOTOGRAPH 14** |  |
|---|---|
| DESCRIPTION:<br><br>Southern Site Boundary Overview | |

**PHOTOGRAPH 15**

DESCRIPTION:

Site Overview




**PHOTOGRAPH 16**

DESCRIPTION:

North Site
Boundary Overview




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**PHOTOGRAPH 17**

DESCRIPTION:

North Site Boundary Overview




**PHOTOGRAPH 18**

DESCRIPTION:

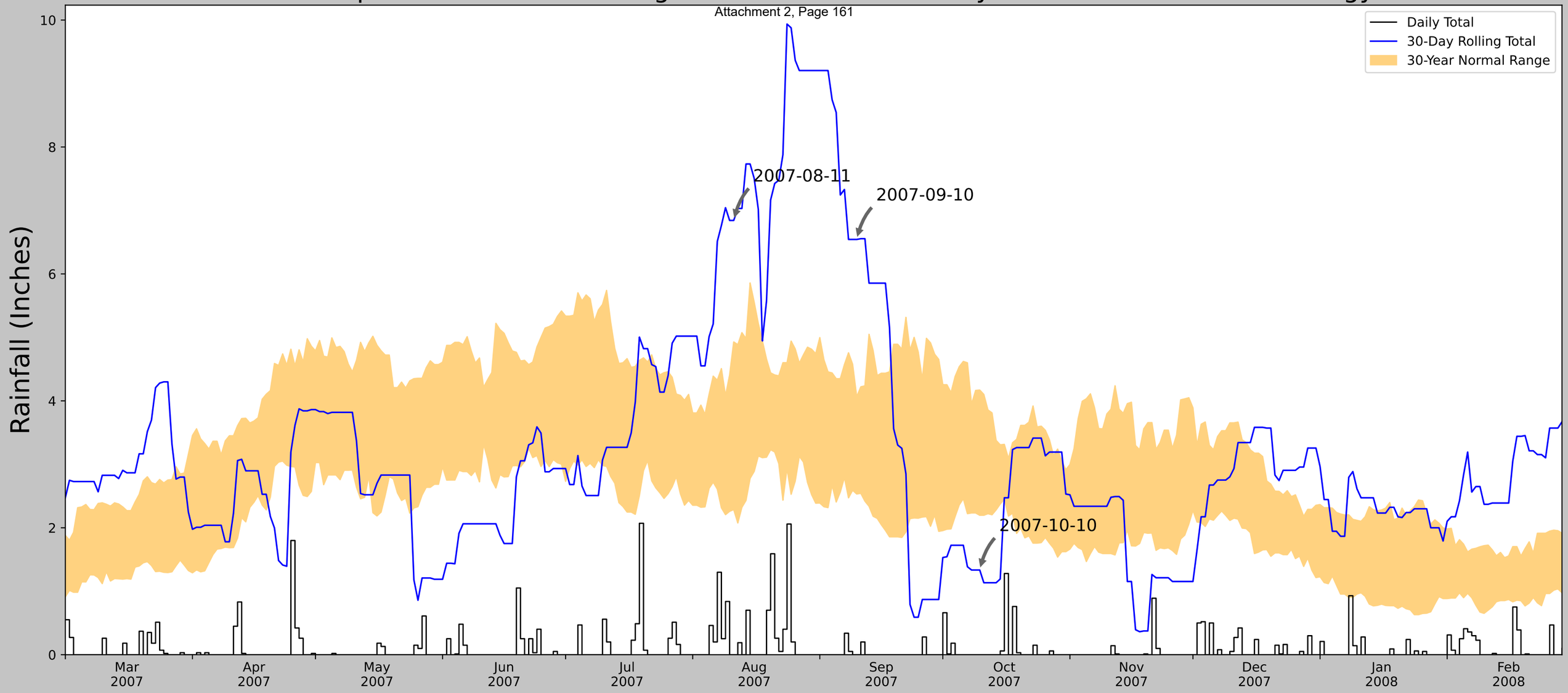
Pipe From Roadside Ditch Located Across Ament Road



**USACE Antecedent Precipitation Tool Figure & Tables (2007, 2009, 2010, 2011, 2015, 2018, 11.08.2023)**

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






| | |
|---|---|
| Coordinates | 41.593804, -88.444237 |
| Observation Date | 2007-10-10 |
| Elevation (ft) | 709.834 |
| Drought Index (PDSI) | Moderate wetness |
| WebWIMP $H_2O$ Balance | Wet Season |

| 30 Days Ending | 30$^{th}$ %ile (in) | 70$^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2007-10-10 | 2.19685 | 4.170473 | 1.334646 | Dry | 1 | 3 | 3 |
| 2007-09-10 | 2.53189 | 4.063386 | 6.543307 | Wet | 3 | 2 | 6 |
| 2007-08-11 | 2.286614 | 4.928347 | 6.84252 | Wet | 3 | 1 | 3 |
| Result | | | | | | | Normal Conditions - 12 |

Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| AURORA | 41.7803, -88.3092 | 660.105 | 14.649 | 49.729 | 7.321 | 11024 | 90 |
| CHICAGO AURORA MUNI AP | 41.7714, -88.4814 | 701.116 | 8.894 | 41.011 | 4.367 | 5 | 0 |
| WHEATON 3 SE | 41.8128, -88.0728 | 680.118 | 12.382 | 20.013 | 5.82 | 292 | 0 |
| JOLIET BRANDON RD DAM | 41.5033, -88.1033 | 542.979 | 21.893 | 117.126 | 12.416 | 31 | 0 |

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






| | |
|---|---|
| Coordinates | 41.593804, -88.444237 |
| Observation Date | 2009-06-27 |
| Elevation (ft) | 709.834 |
| Drought Index (PDSI) | Extreme wetness |
| WebWIMP $H_2O$ Balance | Dry Season |

| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2009-06-27 | 2.845276 | 5.170473 | 3.889764 | Normal | 2 | 3 | 6 |
| 2009-05-28 | 2.637795 | 4.520866 | 4.393701 | Normal | 2 | 2 | 4 |
| 2009-04-28 | 2.509843 | 4.611024 | 7.031496 | Wet | 3 | 1 | 3 |
| Result | | | | | | | Normal Conditions - 13 |

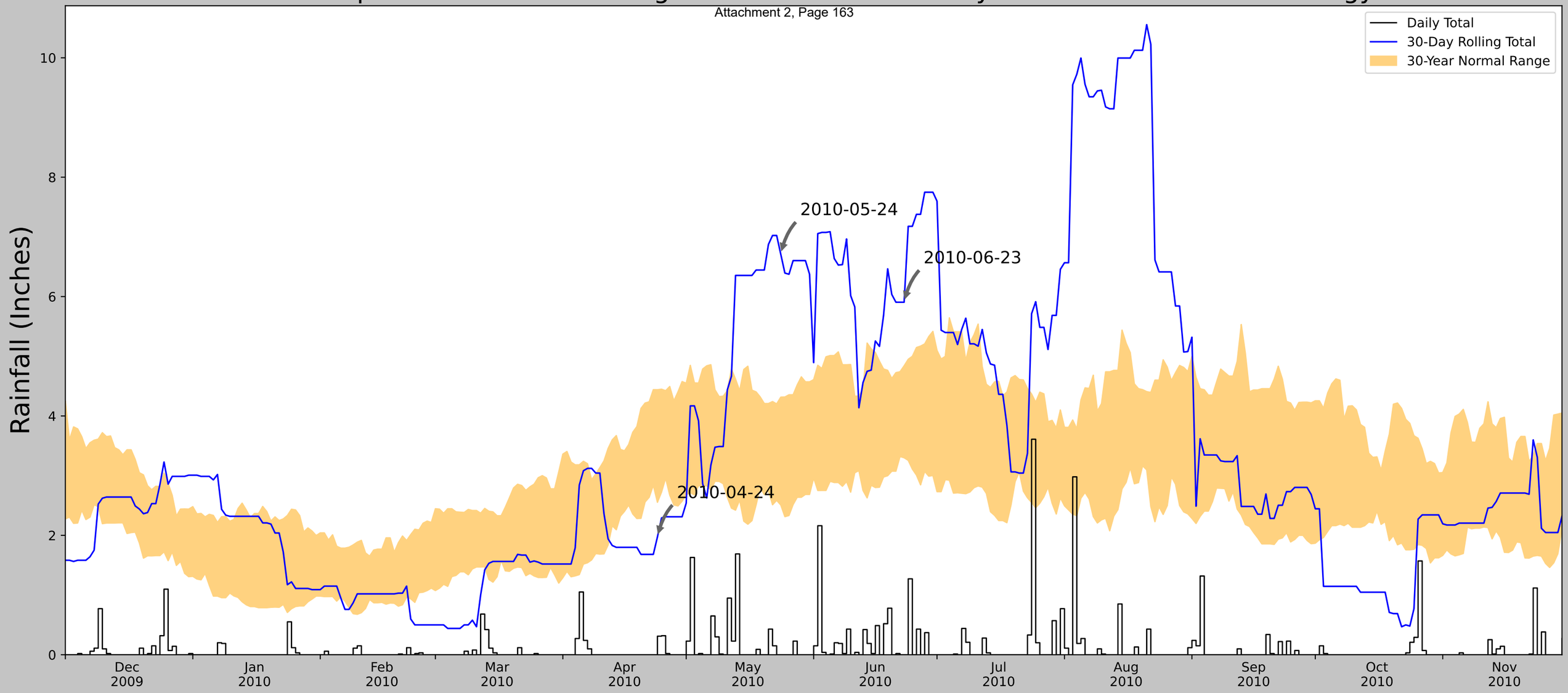
Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| AURORA | 41.7803, -88.3092 | 660.105 | 14.649 | 49.729 | 7.321 | 11025 | 90 |
| CHICAGO AURORA MUNI AP | 41.7714, -88.4814 | 701.116 | 8.894 | 41.011 | 4.367 | 5 | 0 |
| WHEATON 3 SE | 41.8128, -88.0728 | 680.118 | 12.382 | 20.013 | 5.82 | 292 | 0 |
| JOLIET BRANDON RD DAM | 41.5033, -88.1033 | 542.979 | 21.893 | 117.126 | 12.416 | 31 | 0 |

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






| | |
|---|---|
| Coordinates | 41.593804, -88.444237 |
| Observation Date | 2010-06-23 |
| Elevation (ft) | 709.834 |
| Drought Index (PDSI) | Severe wetness |
| WebWIMP $H_2O$ Balance | Dry Season |

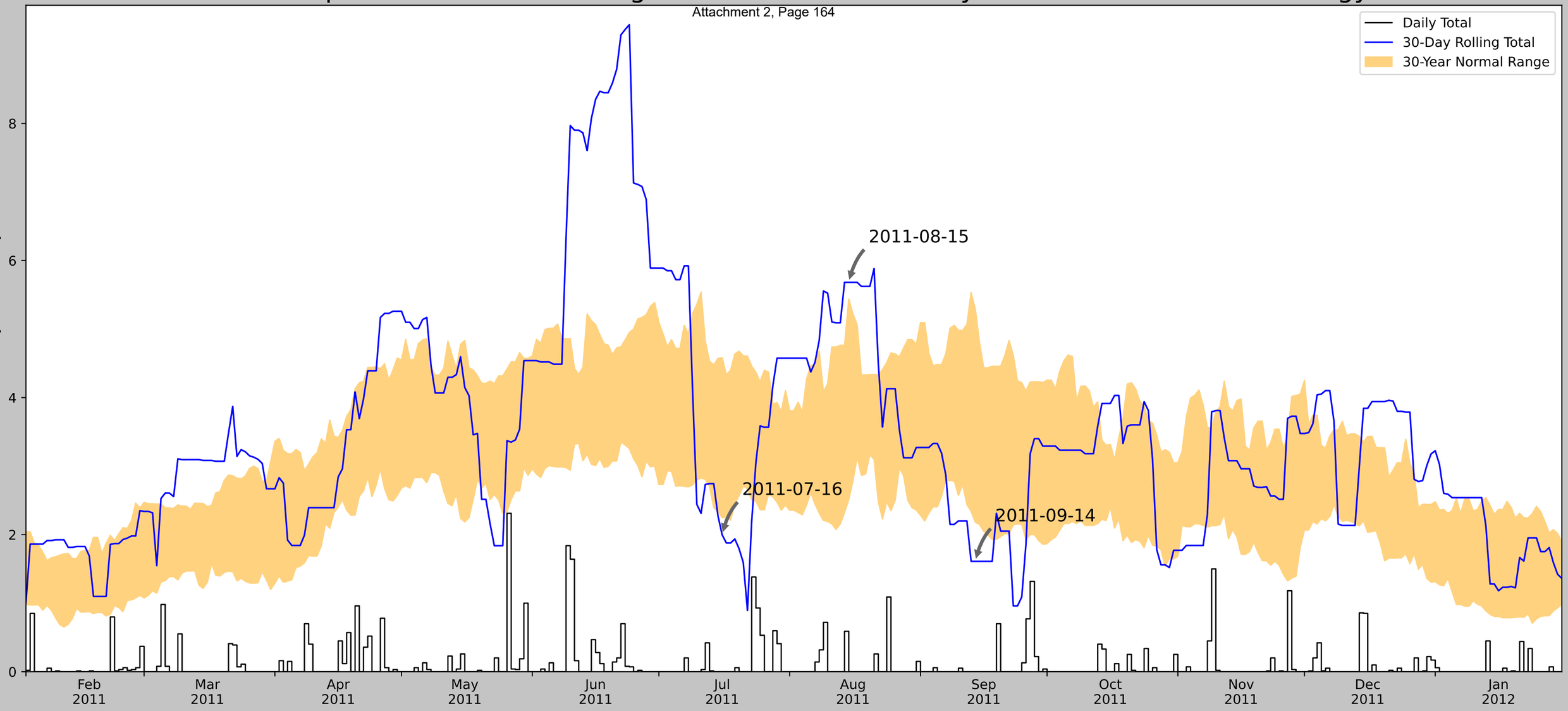
| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2010-06-23 | 3.299606 | 4.840158 | 5.905512 | Wet | 3 | 3 | 9 |
| 2010-05-24 | 2.508661 | 4.315354 | 6.712599 | Wet | 3 | 2 | 6 |
| 2010-04-24 | 2.553543 | 4.43937 | 1.972441 | Dry | 1 | 1 | 1 |
| Result | | | | | | | Wetter than Normal - 16 |

Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| AURORA | 41.7803, -88.3092 | 660.105 | 14.649 | 49.729 | 7.321 | 11025 | 90 |
| CHICAGO AURORA MUNI AP | 41.7714, -88.4814 | 701.116 | 8.894 | 41.011 | 4.367 | 5 | 0 |
| WHEATON 3 SE | 41.8128, -88.0728 | 680.118 | 12.382 | 20.013 | 5.82 | 292 | 0 |
| JOLIET BRANDON RD DAM | 41.5033, -88.1033 | 542.979 | 21.893 | 117.126 | 12.416 | 31 | 0 |

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




| | |
|---|---|
| Coordinates | 41.593804, -88.444237 |
| Observation Date | 2011-09-14 |
| Elevation (ft) | 709.834 |
| Drought Index (PDSI) | Severe wetness |
| WebWIMP $H_2O$ Balance | Wet Season |

| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2011-09-14 | 2.181102 | 5.291732 | 1.610236 | Dry | 1 | 3 | 3 |
| 2011-08-15 | 2.509843 | 5.438977 | 5.681103 | Wet | 3 | 2 | 6 |
| 2011-07-16 | 2.247638 | 4.580709 | 1.996063 | Dry | 1 | 1 | 1 |
| Result | | | | | | | Normal Conditions - 10 |

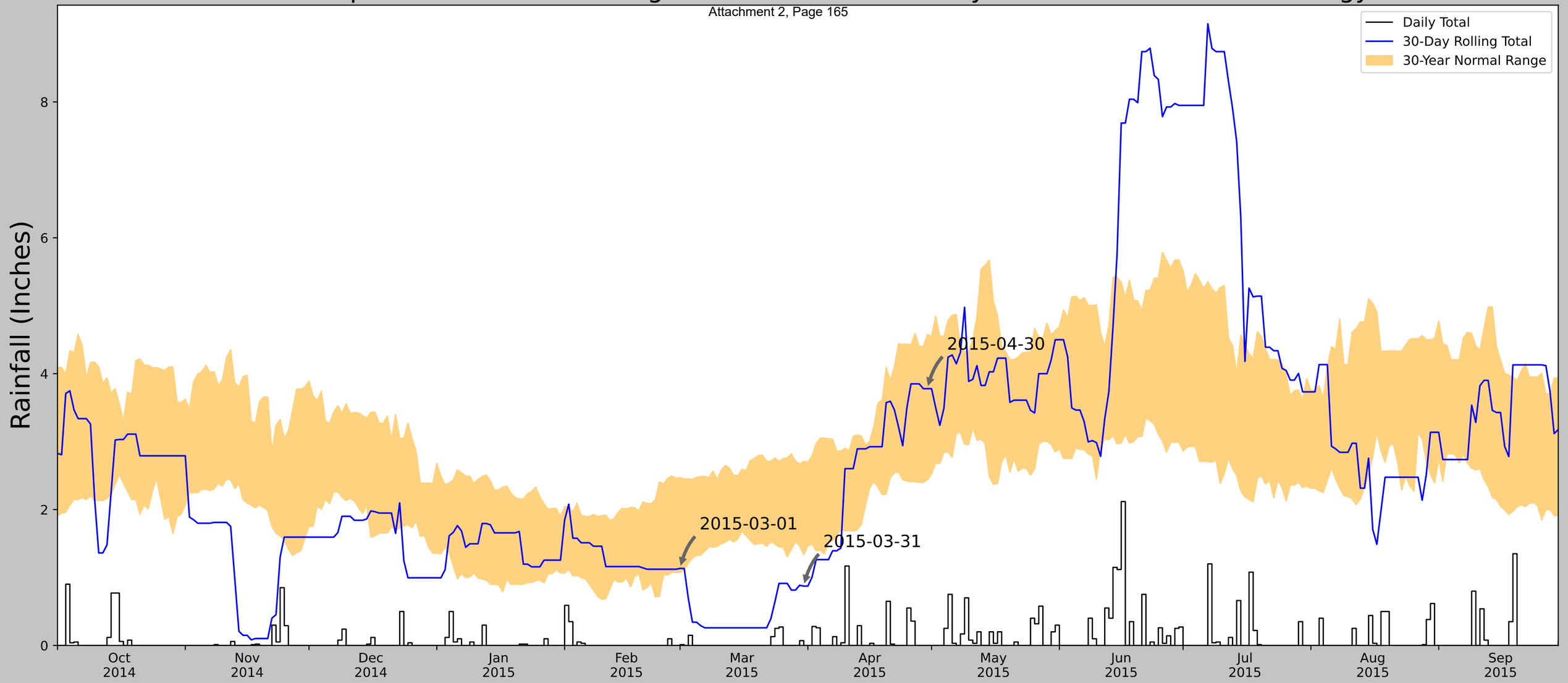
Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| AURORA | 41.7803, -88.3092 | 660.105 | 14.649 | 49.729 | 7.321 | 11025 | 90 |
| CHICAGO AURORA MUNI AP | 41.7714, -88.4814 | 701.116 | 8.894 | 41.011 | 4.367 | 5 | 0 |
| WHEATON 3 SE | 41.8128, -88.0728 | 680.118 | 12.382 | 20.013 | 5.82 | 292 | 0 |
| JOLIET BRANDON RD DAM | 41.5033, -88.1033 | 542.979 | 21.893 | 117.126 | 12.416 | 31 | 0 |

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






| | |
|---|---|
| Coordinates | 41.593804, -88.444237 |
| Observation Date | 2015-04-30 |
| Elevation (ft) | 709.834 |
| Drought Index (PDSI) | Incipient wetness |
| WebWIMP $H_2O$ Balance | Wet Season |

| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2015-04-30 | 2.440551 | 4.576378 | 3.779528 | Normal | 2 | 3 | 6 |
| 2015-03-31 | 1.335433 | 2.711024 | 0.874016 | Dry | 1 | 2 | 2 |
| 2015-03-01 | 1.075197 | 2.470866 | 1.133858 | Normal | 2 | 1 | 2 |
| Result | | | | | | | Normal Conditions - 10 |

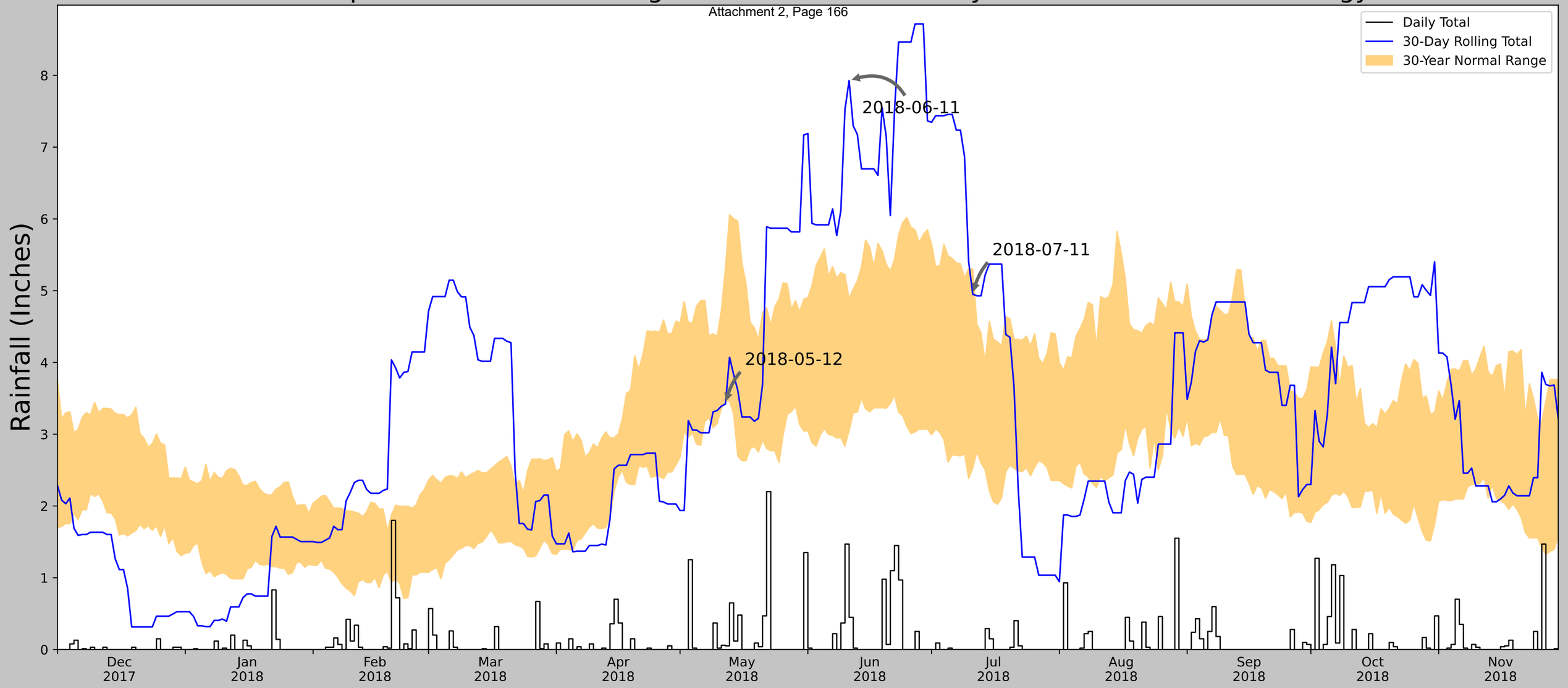
Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| AURORA | 41.7803, -88.3092 | 660.105 | 14.649 | 49.729 | 7.321 | 11080 | 90 |
| AURORA 3.4 W | 41.7723, -88.3577 | 689.961 | 2.559 | 29.856 | 1.228 | 6 | 0 |
| NORTH AURORA 1.5 NE | 41.8163, -88.3068 | 719.16 | 2.49 | 59.055 | 1.268 | 1 | 0 |
| CHICAGO AURORA MUNI AP | 41.7714, -88.4814 | 701.116 | 8.894 | 41.011 | 4.367 | 5 | 0 |
| WHEATON 3 SE | 41.8128, -88.0728 | 680.118 | 12.382 | 20.013 | 5.82 | 230 | 0 |
| JOLIET BRANDON RD DAM | 41.5033, -88.1033 | 542.979 | 21.893 | 117.126 | 12.416 | 31 | 0 |

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






| | |
|---|---|
| Coordinates | 41.593804, -88.444237 |
| Observation Date | 2018-07-11 |
| Elevation (ft) | 709.834 |
| Drought Index (PDSI) | Moderate wetness |
| WebWIMP $H_2O$ Balance | Dry Season |

| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2018-07-11 | 2.525984 | 5.298032 | 4.948819 | Normal | 2 | 3 | 6 |
| 2018-06-11 | 3.050787 | 4.883071 | 7.925197 | Wet | 3 | 2 | 6 |
| 2018-05-12 | 3.46378 | 5.31811 | 3.42126 | Dry | 1 | 1 | 1 |
| Result | | | | | | | Normal Conditions - 13 |

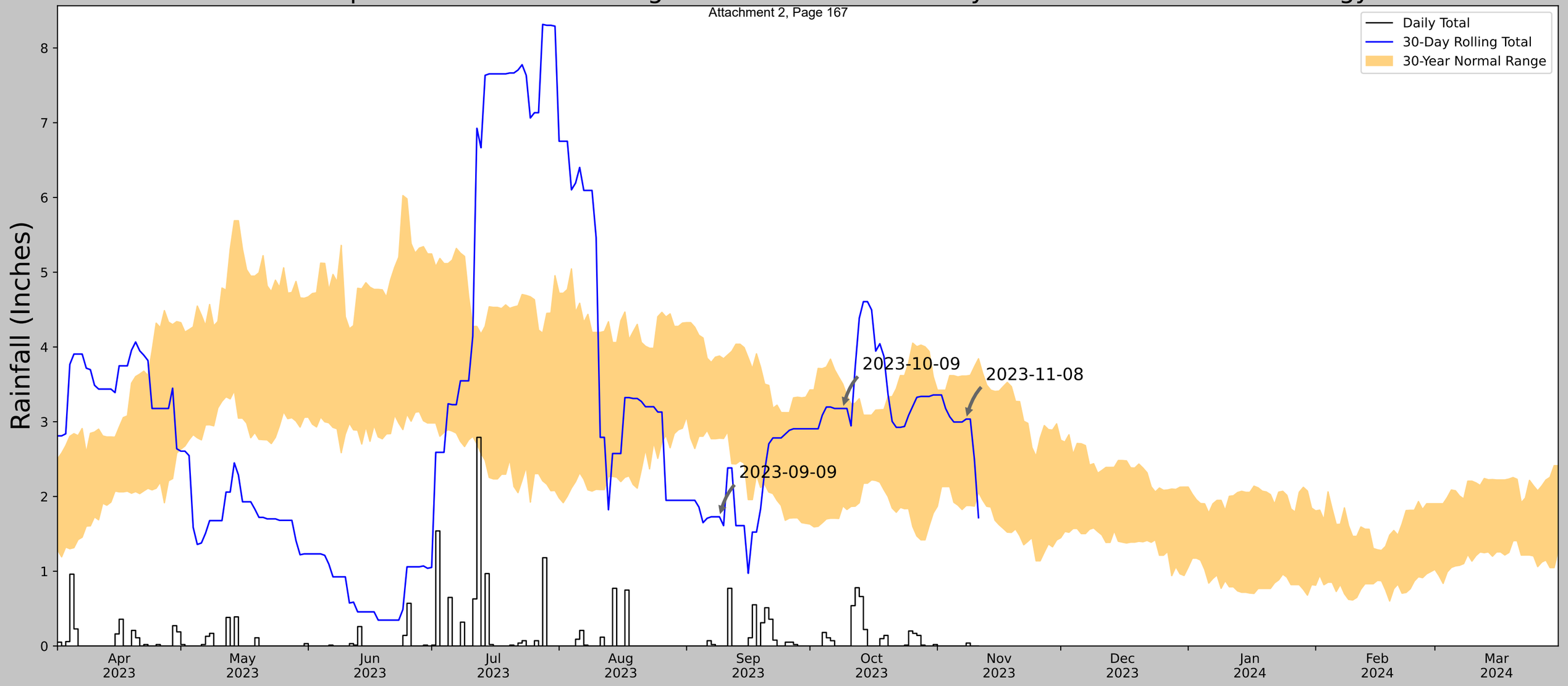
Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| AURORA | 41.7803, -88.3092 | 660.105 | 14.649 | 49.729 | 7.321 | 11110 | 90 |
| AURORA 3.4 W | 41.7723, -88.3577 | 689.961 | 2.559 | 29.856 | 1.228 | 6 | 0 |
| NORTH AURORA 1.5 NE | 41.8163, -88.3068 | 719.16 | 2.49 | 59.055 | 1.268 | 2 | 0 |
| CHICAGO AURORA MUNI AP | 41.7714, -88.4814 | 701.116 | 8.894 | 41.011 | 4.367 | 5 | 0 |
| WHEATON 3 SE | 41.8128, -88.0728 | 680.118 | 12.382 | 20.013 | 5.82 | 230 | 0 |

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






| | |
|---|---|
| Coordinates | 41.594760, -88.447141 |
| Observation Date | 2023-11-08 |
| Elevation (ft) | 709.415 |
| Drought Index (PDSI) | Incipient wetness (2023-10) |
| WebWIMP $H_2O$ Balance | Wet Season |

| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2023-11-08 | 1.87874 | 3.611811 | 3.035433 | Normal | 2 | 3 | 6 |
| 2023-10-09 | 1.875591 | 3.503937 | 3.177165 | Normal | 2 | 2 | 4 |
| 2023-09-09 | 2.779528 | 3.879134 | 1.728347 | Dry | 1 | 1 | 1 |
| Result | | | | | | | Normal Conditions - 11 |

Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

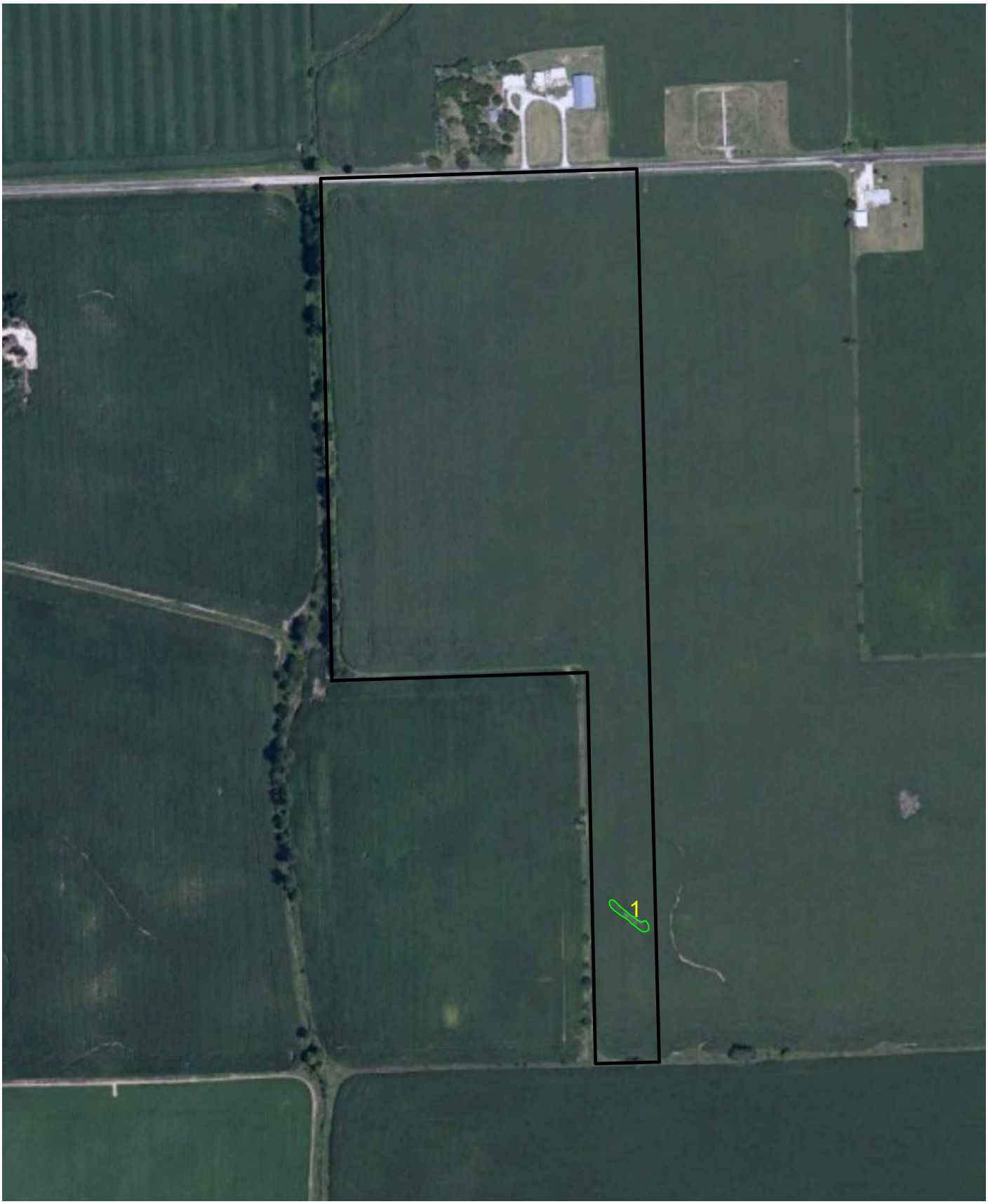
Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| CHICAGO AURORA MUNI AP | 41.7714, -88.4814 | 701.116 | 12.332 | 8.299 | 5.652 | 9066 | 90 |
| SUGAR GROVE 0.7 NE | 41.7762, -88.4478 | 714.895 | 1.763 | 13.779 | 0.818 | 29 | 0 |
| SUGAR GROVE 1.4 ENE | 41.7787, -88.4343 | 688.976 | 2.479 | 12.14 | 1.146 | 2 | 0 |
| AURORA 3.1 WSW | 41.7565, -88.3518 | 704.068 | 6.758 | 2.952 | 3.061 | 1 | 0 |
| AURORA | 41.7803, -88.3092 | 660.105 | 8.894 | 41.011 | 4.367 | 2212 | 0 |
| WHEATON 3 SE | 41.8128, -88.0728 | 680.118 | 21.242 | 20.998 | 10.005 | 42 | 0 |

**Historical Aerial Photographs: 2007, 2009, 2010-WET, 2011, 2015, 2018**

**Map data: Google, USDA/FPAC/GEO**

# Year: 2007




0 200 400 800

SCALE: 1"=400'

N

**Map data: Google, USDA/FPAC/GEO**

# Year: 2009



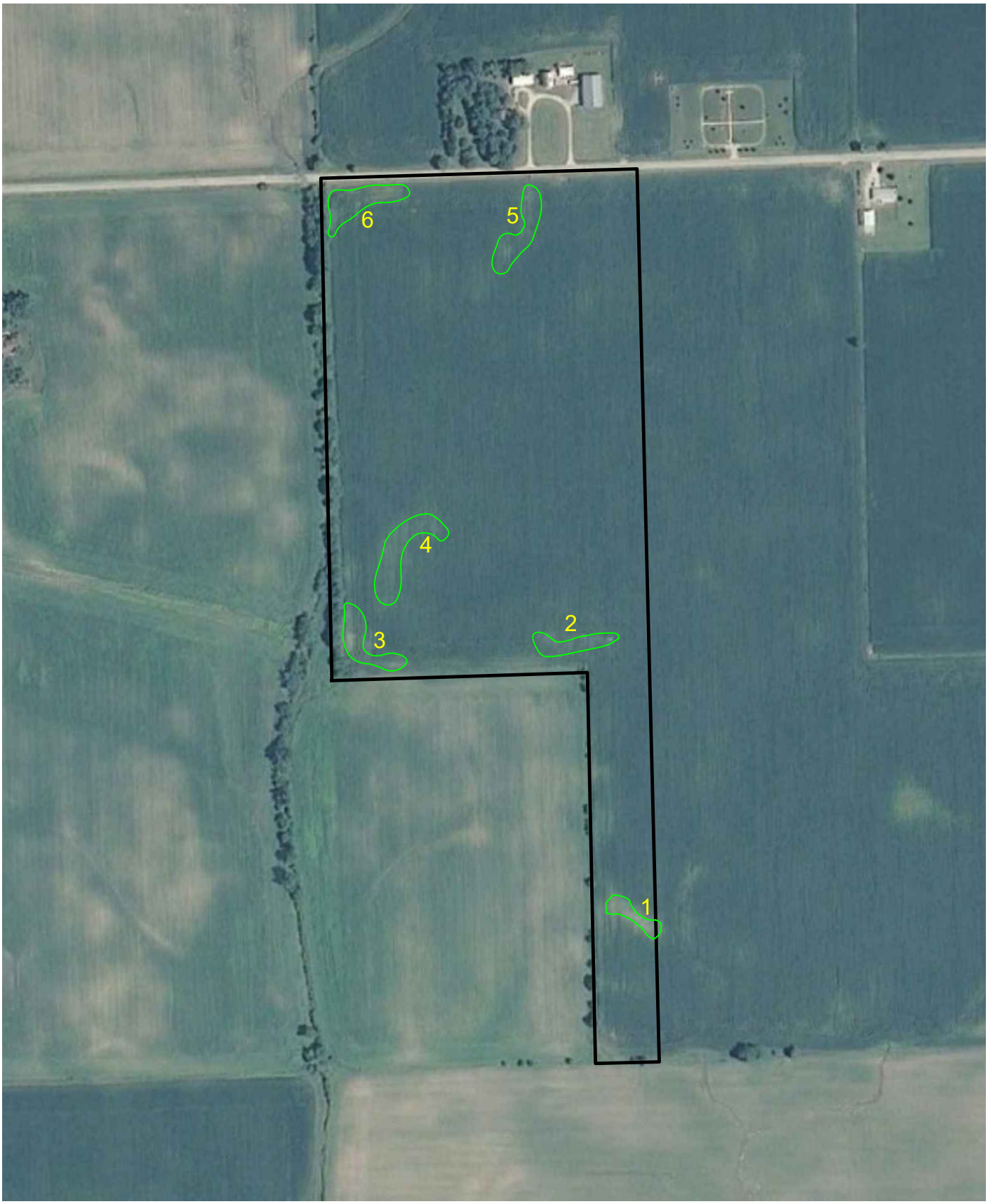
0 200 400 800

SCALE: 1"=400'

N

**Map data: Google, USDA/FPAC/GEO**

# Year: 2010 WET




0 200 400 800

SCALE: 1"=400'

N

**Map data: Google, USDA/FPAC/GEO**

# Year: 2011




0 200 400 800

SCALE: 1"=400'

N

**Map data: Google, Maxar Technologies**

# Year: 2015




0 200 400 800

SCALE: 1"=400'

N

**Map data: Google, Maxar Technologies**

# Year: 2018

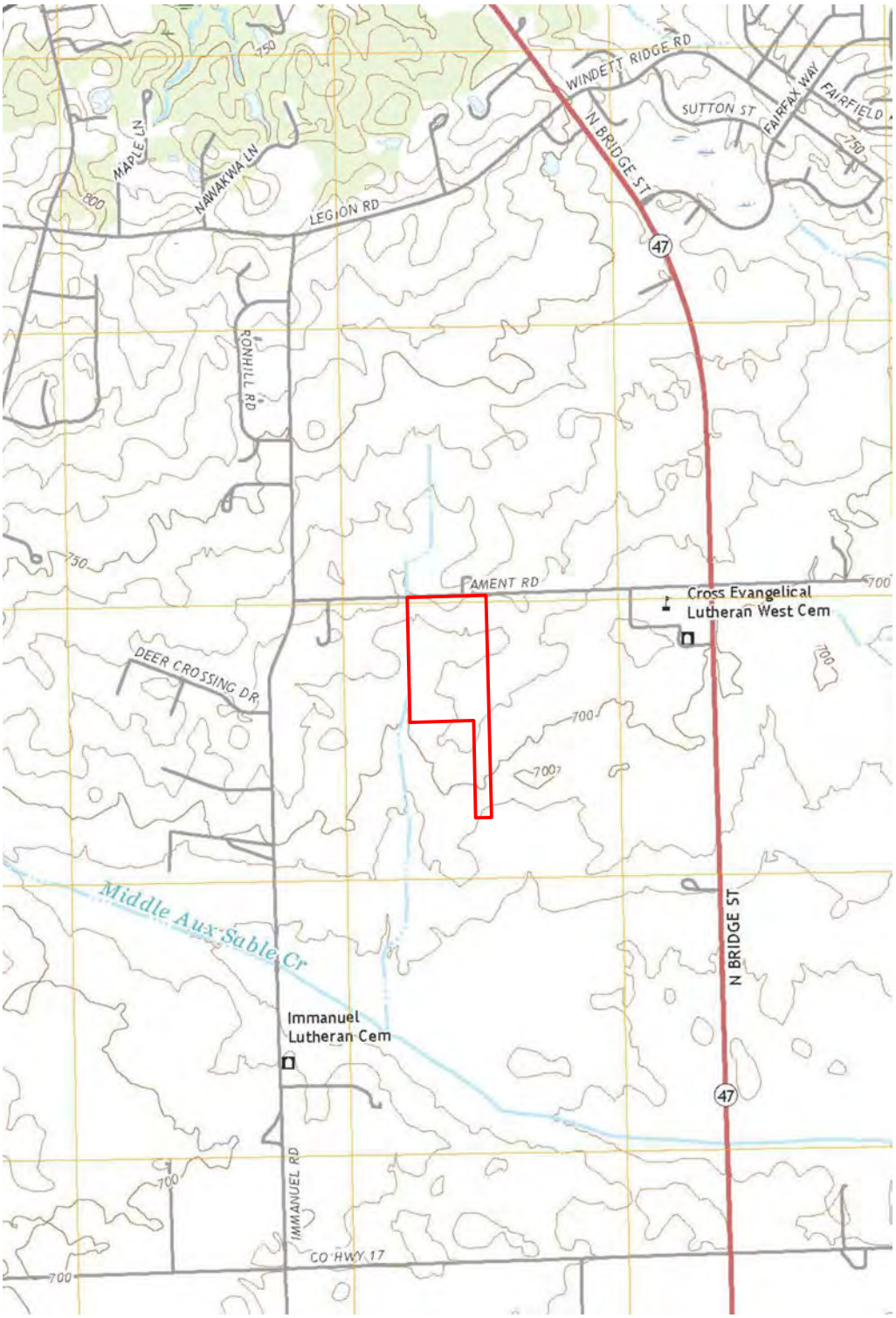



0 200 400 800

SCALE: 1"=400'

N

**Exhibits A - G**




ENCAP INCORPORATED

**LEGEND:**

Project Area

# Location Map

Source: U.S. Geological Survey
Section 17 T36N R7E
Latitude: 41.594760 Longitude: -88.447141

## Ament Road Build Area Extension

Project Number: 23-0815A

## New Leaf Energy

0 1000 2000 4000

SCALE: 1"= 2000'

NORTH

Exhibit A



ENCAP INCORPORATED

**LEGEND:**

Project Area

**Wetlands**

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

# National Wetlands Inventory

Source: U.S. Fish & Wildlife Service

0 200 400 800

SCALE: 1"=400'

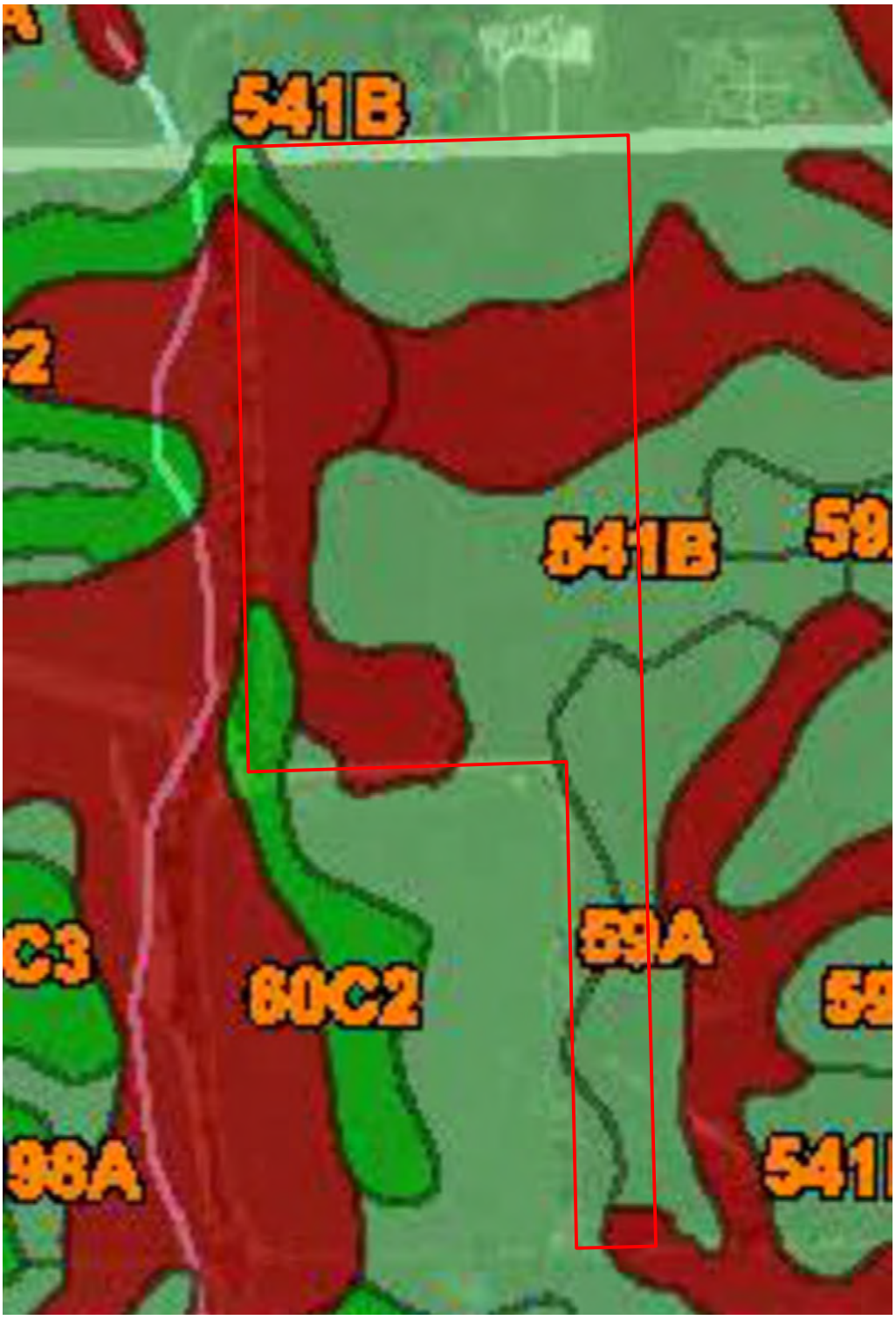
NORTH

## Ament Road Build Area Extension

Project Number: 23-0815A

## New Leaf Energy

Exhibit B




ENCAP INCORPORATED

**LEGEND:**

Project Area

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

# Soil Map

Source: U.S. Department of Agriculture
Natural Resources Conservation Service
Web Soil Survey 3.1

0 200 400 800

SCALE: 1"=400'

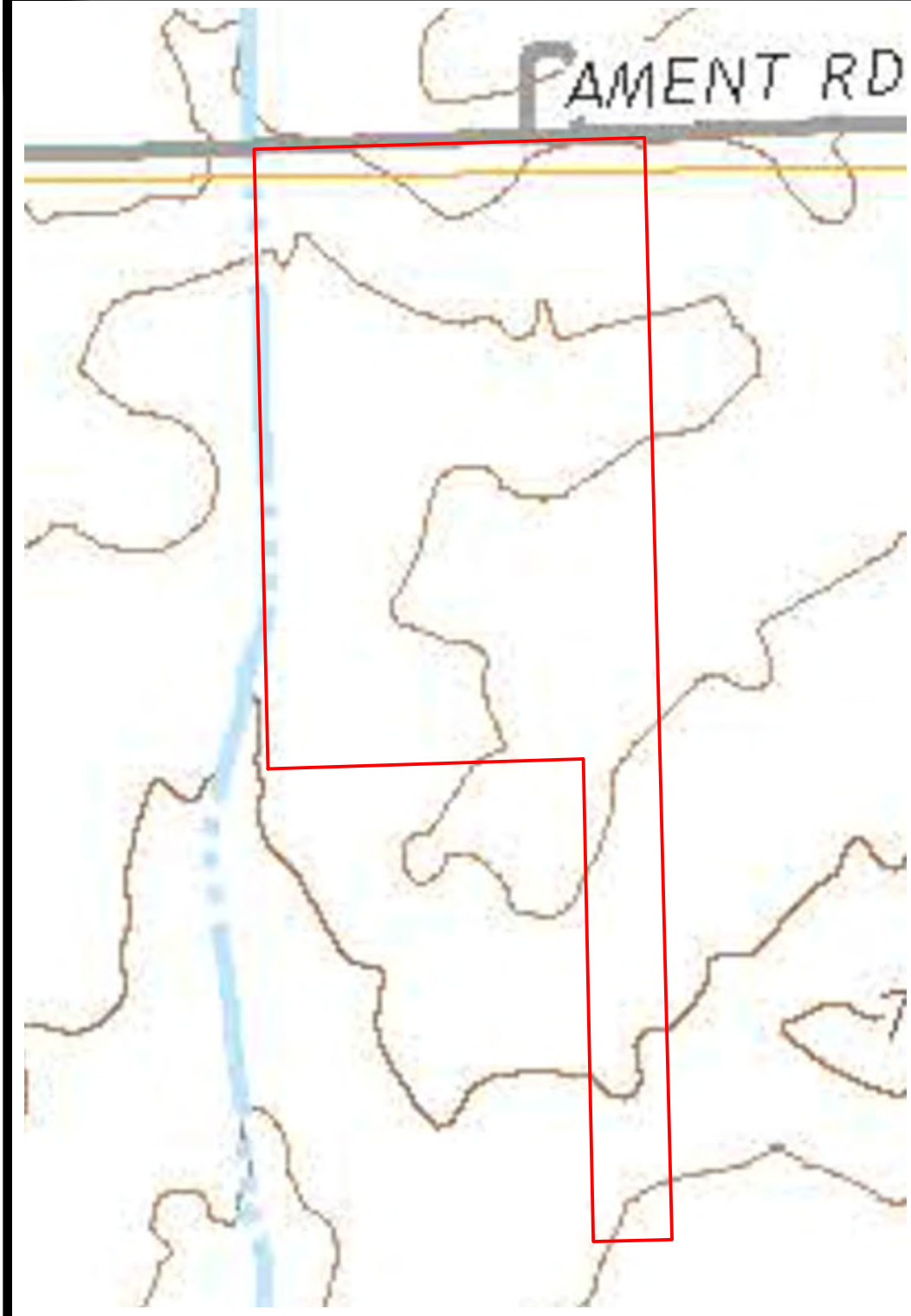
NORTH

## Ament Road Build Area Extension

Project Number: 23-0815A

**New Leaf Energy**

Exhibit C




ENCAP INCORPORATED

**LEGEND:**

Project Area

RIVERS, LAKES, AND CANALS
- Perennial stream
- Perennial river
- Intermittent stream
- Intermittent river
- Disappearing stream

SUBMERGED AREAS AND BOGS
- Marsh or swamp
- Submerged marsh or swamp
- Wooded marsh or swamp
- Submerged wooded marsh or swamp
- Land subject to inundation

VEGETATION
- Woodland
- Shrubland
- Orchard
- Vineyard
- Mangrove
- Land subject to inundation

# 2021 USGS Topographic Map

Source: U.S. Geological Survey
Quadrangle: Platville, IL

0 200 400 800
SCALE: 1"=400'

NORTH

## Ament Road Build Area Extension

Project Number: 23-0815A

## New Leaf Energy

Exhibit D




ENCAP INCORPORATED

**LEGEND:**

Project Area




# Flood Insurance Rate Map

Source: Federal Emergency Management Agency (FEMA)
Panel Number: 1709C0125G
Effective Date: Febraury 4, 2009

## Ament Road Build Area Extension

Project Number: 23-0815A

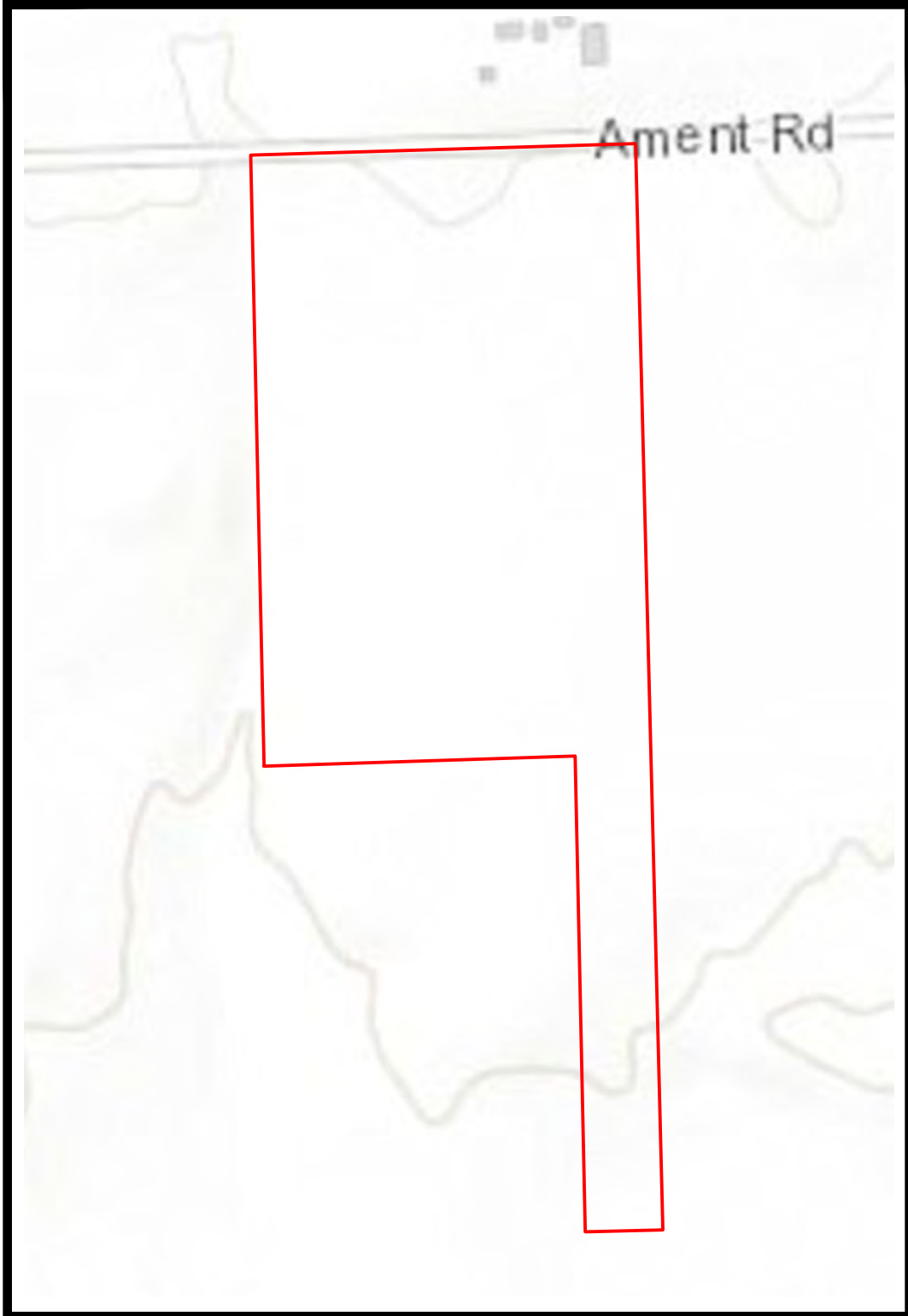
## New Leaf Energy

0 200 400 800

SCALE: 1"=400'

NORTH

Exhibit E




ENCAP INCORPORATED

**LEGEND:**

Project Area

National Register Properties

- Part of a NR Historic District
- Determined eligible for the NR
- Part of a NR Historic District - contributing
- Entered in the NR
- Undetermined
- Other

# Historic Architectural Resources Geographic Information System

Source: Illinois State Historic Preservation Office

0 200 400 800

SCALE: 1"=400'

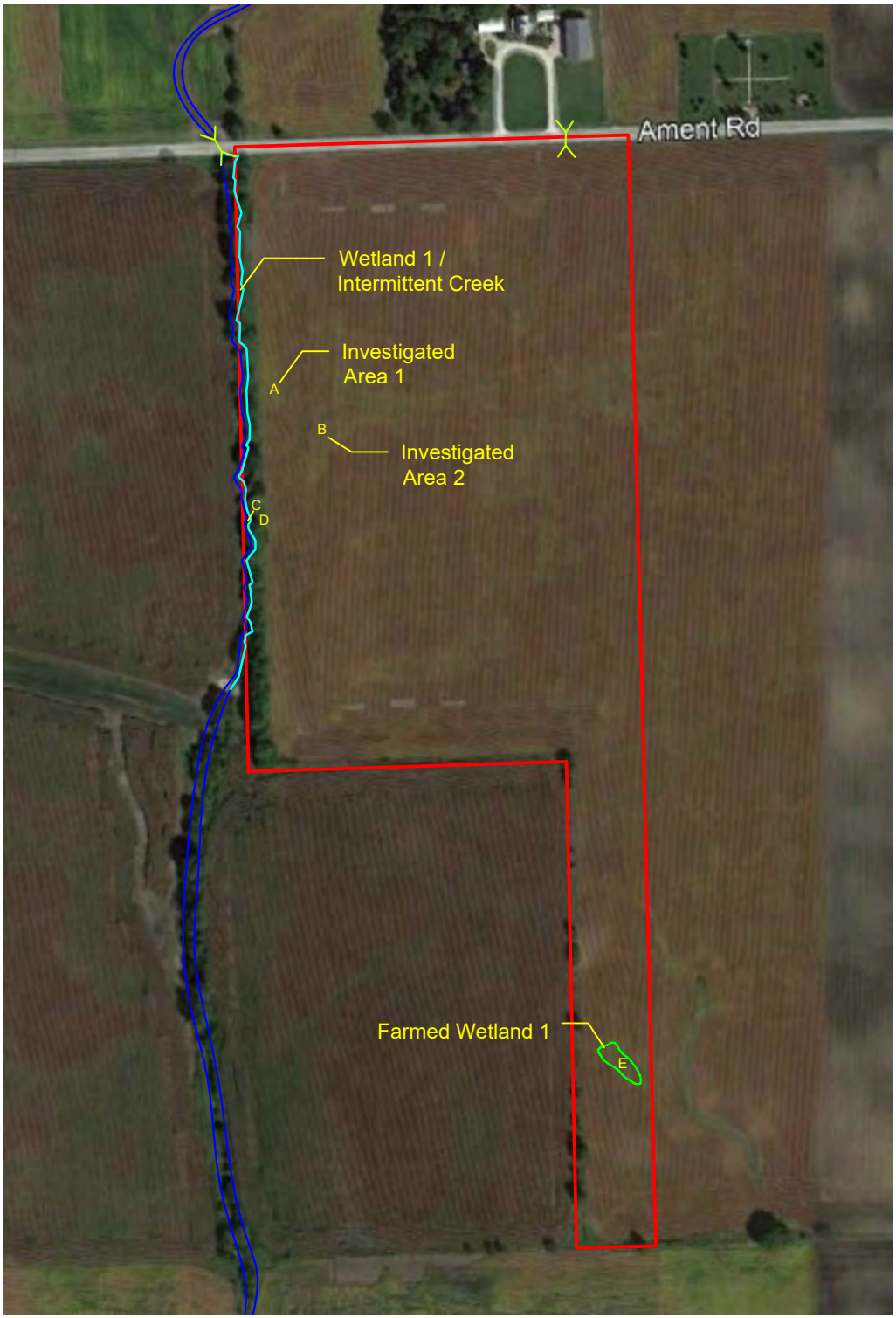
NORTH

## Ament Road Build Area Extension

Project Number: 23-0815A

## New Leaf Energy

Exhibit F




ENCAP INCORPORATED

**LEGEND:**

- Project Area
- Approximate Staked Wetland Boundary
- Approximate Off-site Wetland Boundary
- Farmed Wetland Boundary
- Culvert
- Sample Points A-E

WL Delineation Field Work Completed 11.08.2023

# Aerial Photograph

Map data: ©2023Google
Image Date: 2017

0 200 400 800
SCALE: 1"=400'

NORTH

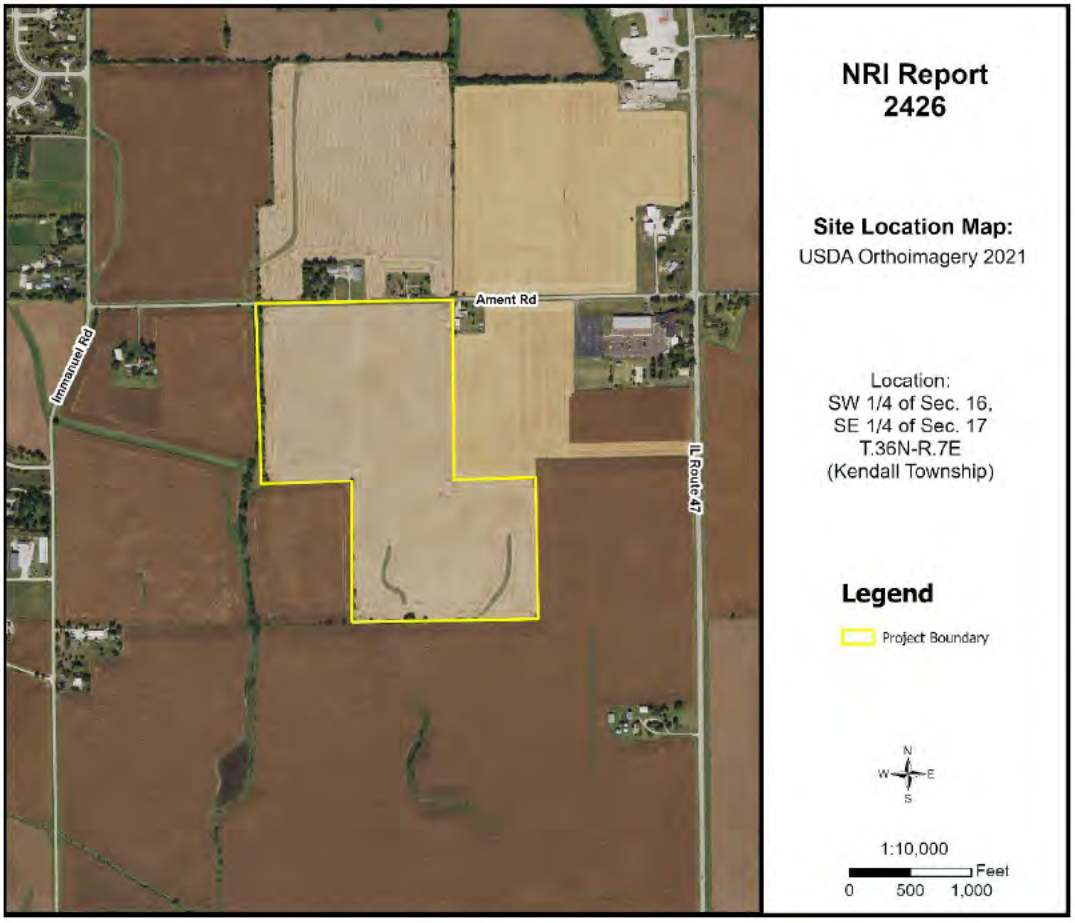
## Ament Road Build Area Extension

Project Number: 23-0815A

## New Leaf Energy

Exhibit G

# NATURAL RESOURCES INFORMATION (NRI) REPORT: #2426




Aug 2024

Petitioner: Ament Solar 1, LLC
Contact: Nicholas Bellone (New Leaf Energy)

Prepared By:

Kendall County Soil & Water Conservation District

7775A Route 47
Yorkville, Illinois 60560
Phone: (630) 553-5821 x3
www.kendallswcd.org

# KENDALL COUNTY SOIL AND WATER CONSERVATION DISTRICT NATURAL RESOURCES INFORMATION (NRI) REPORT

| | |
|---|---|
| Natural Resources Information Report Number | 2426 |
| | |
| Date District Board Reviews Application | August 2024 |
| | |
| Applicant's Name | Ament Solar 1, LLC |
| | |
| Size of Parcel | (+/-) 95.07 acres |
| | |
| Current Zoning & Use | A-1 Agricultural District (Kendall County), R-1 Single-Family Residence (City of Yorkville); Agricultural land |
| | |
| Proposed Zoning & Use | A-1 Agricultural Special Use; Solar Facility |
| | |
| Parcel Index Number(s) | 05-16-300-006 and 05-17-400-005 |
| | |
| Contact Person | Nicholas Bellone (New Leaf Energy) |

| **Copies of this report or notification of the proposed land-use change was provided to:** | **Yes** | **No** |
|---|---|---|
| The Applicant | X | |
| The Applicant's Legal Representation | | X |
| The Local/Township Planning Commission | X | |
| The Village/**City**/County Planning and Zoning Department or Appropriate Agency | X | |
| The Kendall County Soil and Water Conservation District Files | X | |

Report Prepared By: *Alyse Olson* Position: *Resource Conservationist*

# *PURPOSE AND INTENT*

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

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

Due to the limitations of scale encountered with the various resource maps, the property boundaries depicted in the various exhibits in this report provide a generalized representation of the property location and may not precisely reflect the legal description of the PIQ (Parcel in Question).

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

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

**Kendall County Soil and Water Conservation District**
**7775A Route 47, Yorkville, IL 60560**
**Phone: (630) 553-5821 ext. 3**
**E-mail: Alyse.Olson@il.nacdnet.net**

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# EXECUTIVE SUMMARY

| | |
|---|---|
| Natural Resources Information Report Number | 2426 |
| | |
| Petitioner | Ament Solar 1, LLC |
| | |
| Contact Person | Nicholas Bellone (New Leaf Energy) |
| | |
| County or Municipality the Petition is Filed With | United City of Yorkville |
| | |
| Location of Parcel | Southwest ¼ of Section 16, Southeast ¼ of Section 17, Township 36 North, Range 7 East (Kendall Township) of the 3rd Principal Meridian |
| | |
| Project or Subdivision Name | Ament Solar 1, LLC |
| | |
| Existing Zoning & Land Use | A-1 Agricultural District (Kendall County), R-1 Single-Family Residence (City of Yorkville); Agricultural land |
| | |
| Proposed Zoning & Land Use | A-1 Agricultural Special Use; Solar Facility |
| | |
| Proposed Water Source | Not applicable |
| | |
| Proposed Type of Sewage Disposal System | Not applicable |
| | |
| Proposed Type of Storm Water Management | Not indicated |
| | |
| Size of Site | (+/-) 95.07 acres |
| | |
| Land Evaluation Site Assessment (LESA) Score | Land Evaluation: 96; Site Assessment: N/A |

## NATURAL RESOURCE CONSIDERATIONS

### SOIL INFORMATION

Based on information from the United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) 2008 Kendall County Soil Survey, this project area contains the soil types shown in Figure 1 and Table 1. Please note this does not replace the need for or results of onsite soil testing. If completed, please refer to onsite soil test results for planning/engineering purposes.

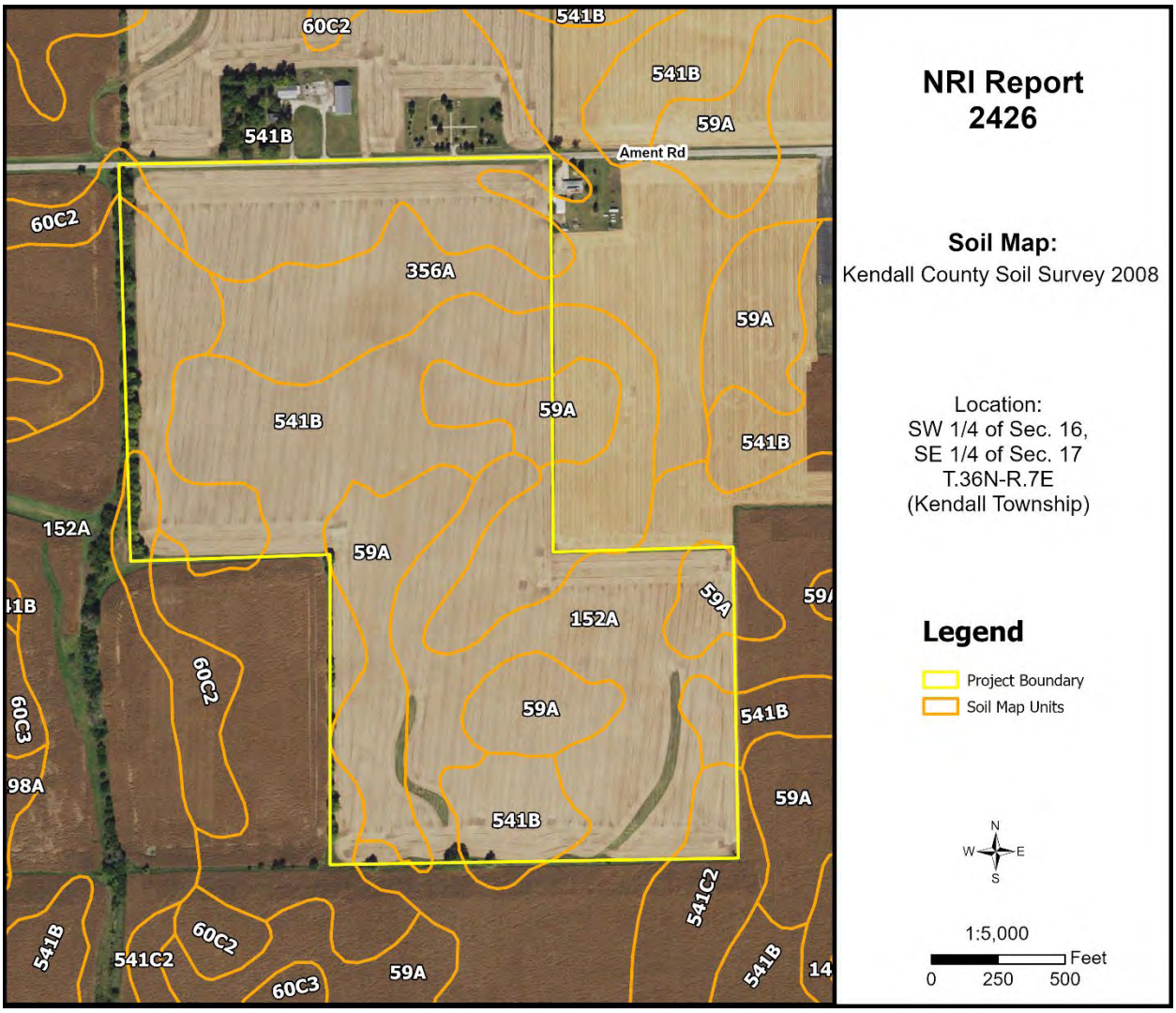



**Figure 1:** Soil Map

**Table 1:** Soils Information

| Soil Type | Soil Name | Drainage Class | Hydrologic Group | Hydric Designation | Farmland Designation | Acres | % Area |
|---|---|---|---|---|---|---|---|
| 59A | Lisbon silt loam, 0-2% slopes | Somewhat Poorly Drained | C/D | Non-Hydric with Hydric Inclusions | Prime Farmland | 16.3 | 17.1% |
| 60C2 | La Rose silt loam, 5-10% slopes | Moderately Well Drained | C | Non-Hydric | Farmland of Statewide Importance | 1.7 | 1.8% |
| 152A | Drummer silty clay loam, 0-2% slopes | Poorly Drained | B/D | Hydric | Prime Farmland if Drained | 27.4 | 28.8% |
| 356A | Elpaso silty clay loam, 0-2% slopes | Poorly Drained | B/D | Hydric | Prime Farmland if Drained | 9.8 | 10.3% |
| 541B | Graymont silt loam, 2-5% slopes | Moderately Well Drained | C | Non-Hydric with Hydric Inclusions | Prime Farmland | 38.6 | 40.5% |
| 541C2 | Graymont silt loam, 5-10% slopes, eroded | Moderately Well Drained | C | Non-Hydric with Hydric Inclusions | Farmland of Statewide Importance | 1.4 | 1.5% |

**Hydrologic Soil Groups** – Soils have been classified into four (A, B, C, D) hydrologic groups based on runoff characteristics due to rainfall. 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 letter is for undrained areas.

- **Hydrologic group A:** Soils have 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.
- **Hydrologic group B:** Soils have a moderate infiltration rate when thoroughly wet, consist chiefly of moderately deep to deep, moderately well drained to well drained soils that have a moderately fine to moderately coarse texture. These soils have a moderate rate of water transmission.
- **Hydrologic 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.
- **Hydrologic 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, 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.

**Hydric Soils** – A hydric soil is one that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile that supports the growth or regeneration of hydrophytic vegetation. Soils with hydric inclusions have map units dominantly made up of non-hydric soils that may have inclusions of hydric soils in the lower positions on the landscape. Of the soils found onsite, two are classified as hydric soil (152A Drummer silty clay loam and 356A Elpaso silty clay loam), one is classified as non-hydric soil (60C2 La Rose silt loam), and three are classified as non-hydric soil with hydric inclusions likely (59A Lisbon silt loam, 541B Graymont silt loam, and 541C2 Graymont silt loam).

**Prime Farmland** – Prime farmland is land that has the best combination of physical and chemical characteristics for agricultural production. Prime farmland soils are an important resource to Kendall County and some of the most productive soils in the United States occur locally. Of the soils found onsite, two are designated as prime farmland (59A Lisbon silt loam and 541B Graymont silt loam), two are designated as prime farmland if drained (152A Drummer silty clay loam and 356A Elpaso silty clay loam), and two are designated as farmland of statewide importance (60C2 La Rose silt loam and 541C2 Graymont silt loam).

**Soil Limitations** – The USDA-NRCS Web Soil Survey rates the limitations of soils for dwellings, small commercial buildings, solar arrays, shallow excavations, lawns/landscaping, local roads and streets, etc. Soils have different properties which influence the development of building sites. The USDA-NRCS classifies soils as Not Limited, Somewhat Limited, and Very Limited. Soils that are Not Limited indicates that the soil has properties that are favorable for the specified use. They will perform well and will have low maintenance. Soils that are Somewhat Limited are moderately favorable, and their limitations can be overcome through special planning, design, or installation. Soils that are Very Limited have features that are unfavorable for the specified use, and their limitations cannot easily be overcome.

**Table 2:** Soil Limitations

| Soil Type | Solar Arrays | Shallow Excavations | Lawns/ Landscaping | Local Roads & Streets |
|---|---|---|---|---|
| 59A | Very Limited | Very Limited | Somewhat Limited | Very Limited |
| 60C2 | Somewhat Limited | Very Limited | Somewhat Limited | Somewhat Limited |
| 152A | Very Limited | Very Limited | Very Limited | Very Limited |
| 356A | Very Limited | Very Limited | Very Limited | Very Limited |
| 541B | Very Limited | Somewhat Limited | Somewhat Limited | Very Limited |
| 541C2 | Very Limited | Very Limited | Somewhat Limited | Very Limited |

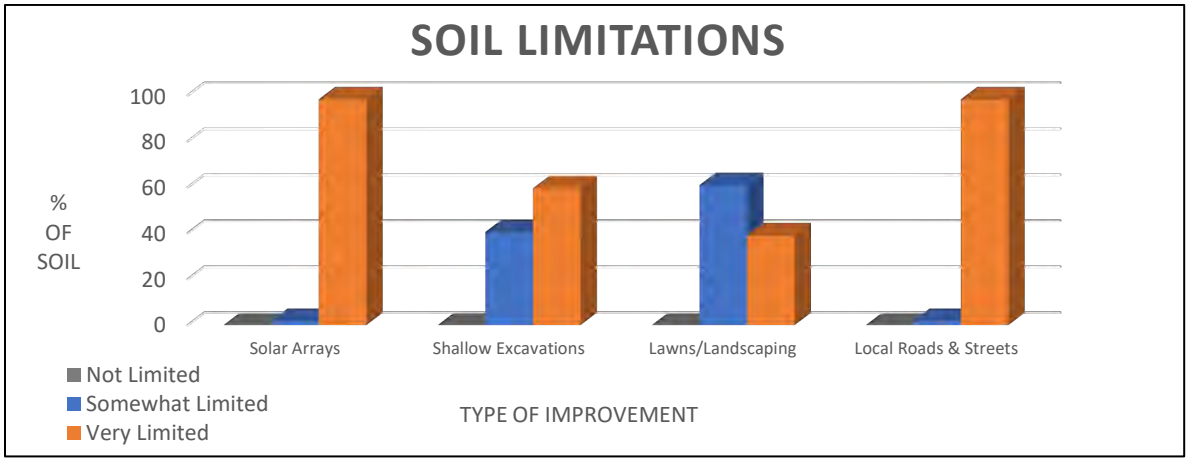



**Figure 2:** Soil Limitations

**KENDALL COUNTY LAND EVALUATION AND SITE ASSESSMENT (LESA)**

Decision-makers in Kendall County 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 was developed by the United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) and takes into consideration local conditions such as physical characteristics of the land, compatibility of surrounding land-uses, and urban growth factors. The LESA system is a two-step procedure that includes:

- **Land Evaluation (LE)**: The soils of a given area are rated and placed in groups ranging from the best to worst suited for a stated agriculture use, cropland, or forestland. The best group is assigned a value of 100 and all other groups are assigned lower values. The Land Evaluation is based on data from the Kendall County Soil Survey. The Kendall County Soil and Water Conservation District is responsible for this portion of the LESA system.
    - The Land Evaluation score for this site is **96 out of 100**, indicating that the soils are **well suited** for agricultural uses.
- **Site Assessment (SA)**: The site is numerically evaluated according to important factors that contribute to the quality of the site. Each factor selected is assigned values in accordance with the local needs and objectives. The Site Assessment value is based on a 200-point scale and accounts for 2/3 of the total score. The Kendall County LESA Committee is responsible for this portion of the LESA system.
  **Please Note**: A land evaluation (LE) score will be compiled for every project parcel. However, when a parcel is located within municipal planning boundaries, a site assessment (SA) score is not compiled as the scoring factors are not applicable. As a result, only the LE score is available, and a full LESA score is unavailable for the parcel.
    - The Site Assessment score for this site is **not applicable**.

**WETLANDS**

The U.S. Fish & Wildlife Service's National Wetlands Inventory map indicates the presence of wetland(s)/waters on or near the proposed project site. To determine if a wetland is present, a wetland delineation specialist, who is recognized by the U.S. Army Corps of Engineers, should determine the exact boundaries and value of the wetlands. Water Resources Delineation Reports dated July 13, 2023 and June 18, 2024, were prepared by ENCAP, Inc. The results of their review indicated the presence of two farmed wetlands and one intermittent creek on the site.

**FLOODPLAIN**

The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) for Kendall County, Community Panel No. 17093C0125G (effective date February 4, 2009) was reviewed to determine the presence of floodplain and floodway areas within the project site. According to the map, the site does not appear to contain areas of regulated floodplain or floodway.

**SEDIMENT AND EROSION CONTROL**

Development on this site should include an erosion and sediment control plan in accordance with local, state, and federal regulations. Soil erosion on construction sites is a resource concern as suspended sediment from areas undergoing development is a primary nonpoint source of water pollution. Please consult the *Illinois Urban Manual* (https://illinoisurbanmanual.org/) for appropriate best management practices.

**STORMWATER POLLUTION**

A National Pollutant Discharge Elimination System (NPDES) permit (Permit No. ILR10) from the Illinois Environmental Protection Agency (IEPA) is required for stormwater discharges from construction sites that will disturb 1 or more acres of land. Conditions of the NPDES ILR10 permit require the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) to reduce stormwater pollutants on the construction site before they can cause environmental issues.

**ECOLOGICAL CONSIDERATIONS**

Developers of solar project sites are encouraged to plant native groundcover. Native shrubs, grasses, and wildflowers offer benefits such as improved erosion control, pesticide avoidance, stormwater infiltration, wildlife habitat, and reduced overall maintenance. Naturalized areas, once established, are more drought tolerant, require little to no fertilization, and only need to be mowed once or twice a year. Native fruiting and flowering plants also provide a food source and habitat for native pollinators which offer the ecological service of pollinating our agricultural crops.

The District recognizes two potential sources of water pollution from solar farms including cracked panels and oil leaks or spills from transformers. Cracked panels can leach toxic materials if many broken panels are exposed to precipitation over a long period of time. To prevent this issue, solar farm operators should regularly inspect for cracked panels. Cracked or broken panels must be immediately stored under protective cover and should be periodically transported offsite for recycling or proper offsite storage.

Electrical transformers are used to increase output voltage from solar farms to the electrical grid. These transformers contain oil, which can leak or spill resulting in environmental damage. To reduce environmental damage, biodegradable oil can be used in the transformers. Larger transformers typically use mineral-based oil unless biodegradable oil is specifically requested. Leaks and spills of biodegradable oil must still be prevented, but the risk for groundwater contamination would be reduced and clean-up efforts simplified in the event of a release. Secondary containment systems such as trays, membranes, or vaults can also be used in the event of a leak or spill. Containment systems must be designed to manage stormwater so adequate containment volume is maintained. This would be the responsibility of the solar developer.

## LAND USE FINDINGS:

The Kendall County Soil and Water Conservation District (SWCD) Board has reviewed the proposed site plans for petitioner Ament Solar 1, LLC. The petitioner is requesting a change in zoning from R-1 Single Family Residence to A-1 Agricultural Special Use from the United City of Yorkville on two parcels (Parcel Index Numbers 05-16-300-006 and 05-17-400-005), totaling approximately 95.07 acres. The petitioner plans to construct a solar facility within Sections 16 and 17 of Kendall Township (T.36N – R.7E) in Kendall County, IL. Based on the information provided by the petitioner and a review of natural resource related data available to the Kendall County SWCD, the SWCD Board presents the following information.

The Kendall County SWCD has always had the opinion that prime farmland soils should be preserved whenever feasible due to their highly productive qualities for growing agriculturally important crops in our community. Of the soils found onsite, 96.7% are designated as prime farmland or prime farmland if drained. A land evaluation (LE), which is a part of the Land Evaluation and Site Assessment (LESA), was conducted on this parcel. The soils on this parcel scored a 96 out of a possible 100 points indicating that the soils are well suited for agricultural uses. A site assessment (SA) was not completed on this parcel. When a parcel is located within municipal planning boundaries, the site assessment scoring factors, utilizing the Kendall County LESA system, are not applicable.

Soils found on the project site are rated for specific uses and can have potential limitations for development. Soil types with severe limitations do not preclude the ability to develop the site for the proposed use, but it is important to note that the limitation may require soil reclamation, special design/engineering, or maintenance to obtain suitable soil conditions to support development with significant limitations. This report indicates that for soils located on the parcel, 98.2% are considered very limited for supporting solar arrays and local roads & streets, 59.5% are considered very limited for supporting shallow excavations, and 39.1% are considered very limited for supporting lawns/landscaping. The remaining soils are considered somewhat limited for these types of developments/uses. This information is based on the soil in an undisturbed state.

This site is located within the Upper Illinois River watershed and the Middle Aux Sable Creek sub watershed (HUC 12 – 071200050103). The sub watershed comprises approximately 16,397 acres covering parts of Yorkville and Minooka.

This development should include a soil erosion and sediment control plan to be implemented during construction. It is critical to have vegetative cover during and after construction to protect the soil from erosion. Sediment may become a primary non-point source of pollution; eroded soils during the construction phase can create unsafe conditions on roadways, degrade water quality and destroy aquatic ecosystems lower in the watershed.

The Kendall County SWCD strongly recommends the use of native ground cover, specifically plant varieties beneficial to pollinator species, be used to vegetate the site. Native vegetation benefits soil health, creates habitat, provides resiliency to drought and prolonged wet conditions, and reduces maintenance needs after successful establishment.

For intense use, it is recommended that a drainage tile survey be completed on the parcel to locate the subsurface drainage tile and should be taken into consideration during the land use planning process. Drainage tile expedites drainage and facilitates farming. It is imperative that these drainage tiles remain undisturbed. Impaired tile may affect a few acres or hundreds of acres of drainage.

The information that is included in this Natural Resources Information Report is to assure that the Land Developers take into full consideration the limitations of that land that they wish to develop. Guidelines and recommendations are also a part of this report and should be considered in the planning process. The Natural Resource Information Report is required by the Illinois Soil and Water Conservation District Act (Ill. Complied Statues, Ch. 70, Par 405/22.02a).

[redacted]

SWCD Board Representative

8-12-24

Date

# PARCEL LOCATION

Southwestern ¼ of Section 16, Southeastern ¼ of Section 17, Township 36 North, Range 7 East (Kendall Township). This site is approximately 95 acres and is located on the south side of Ament Road, north of the Middle Aux Sable Creek, west of Illinois Route 47, and east of Immanuel Road in Yorkville, IL.

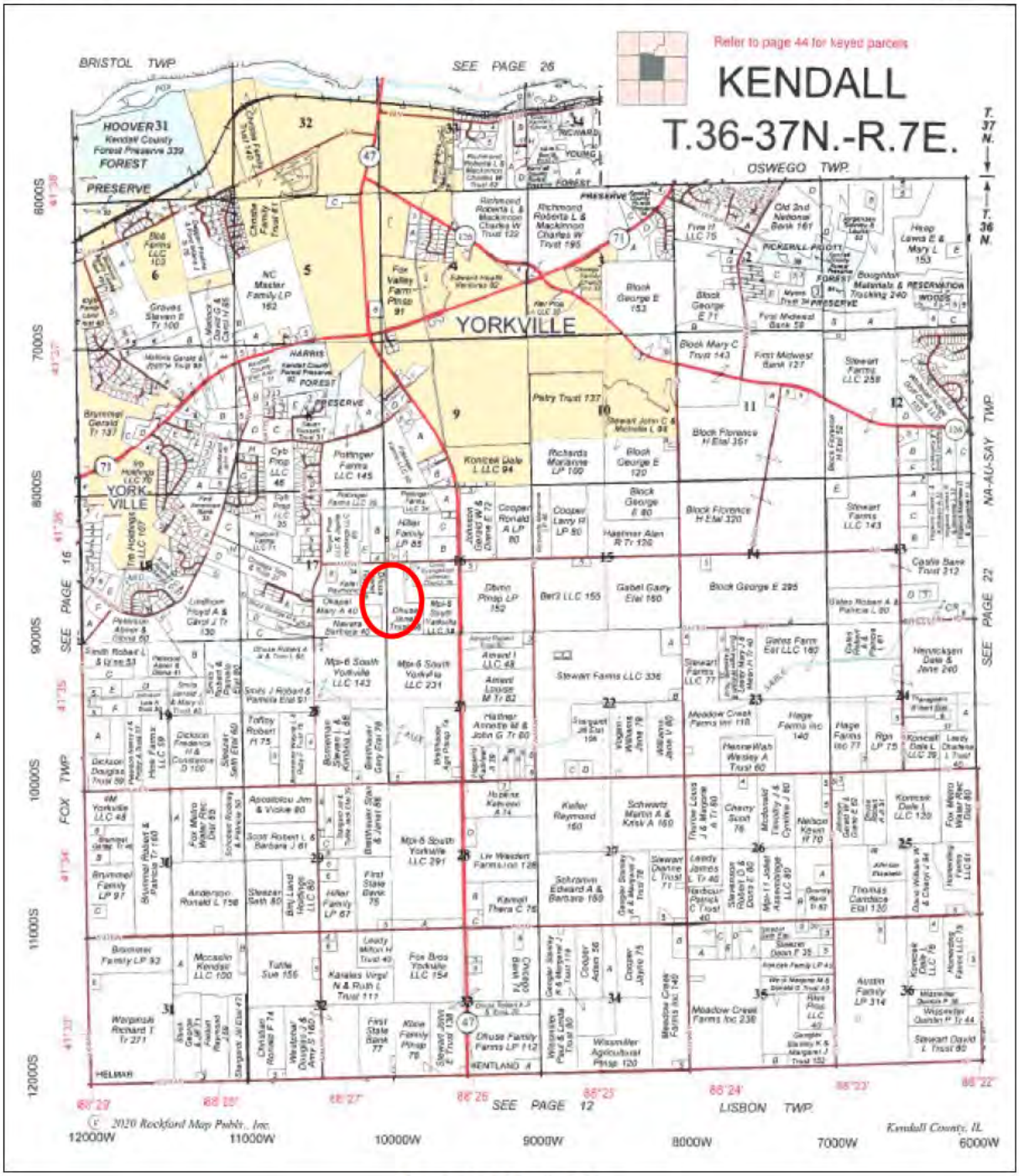



**Figure 3:** 2021 Plat Map

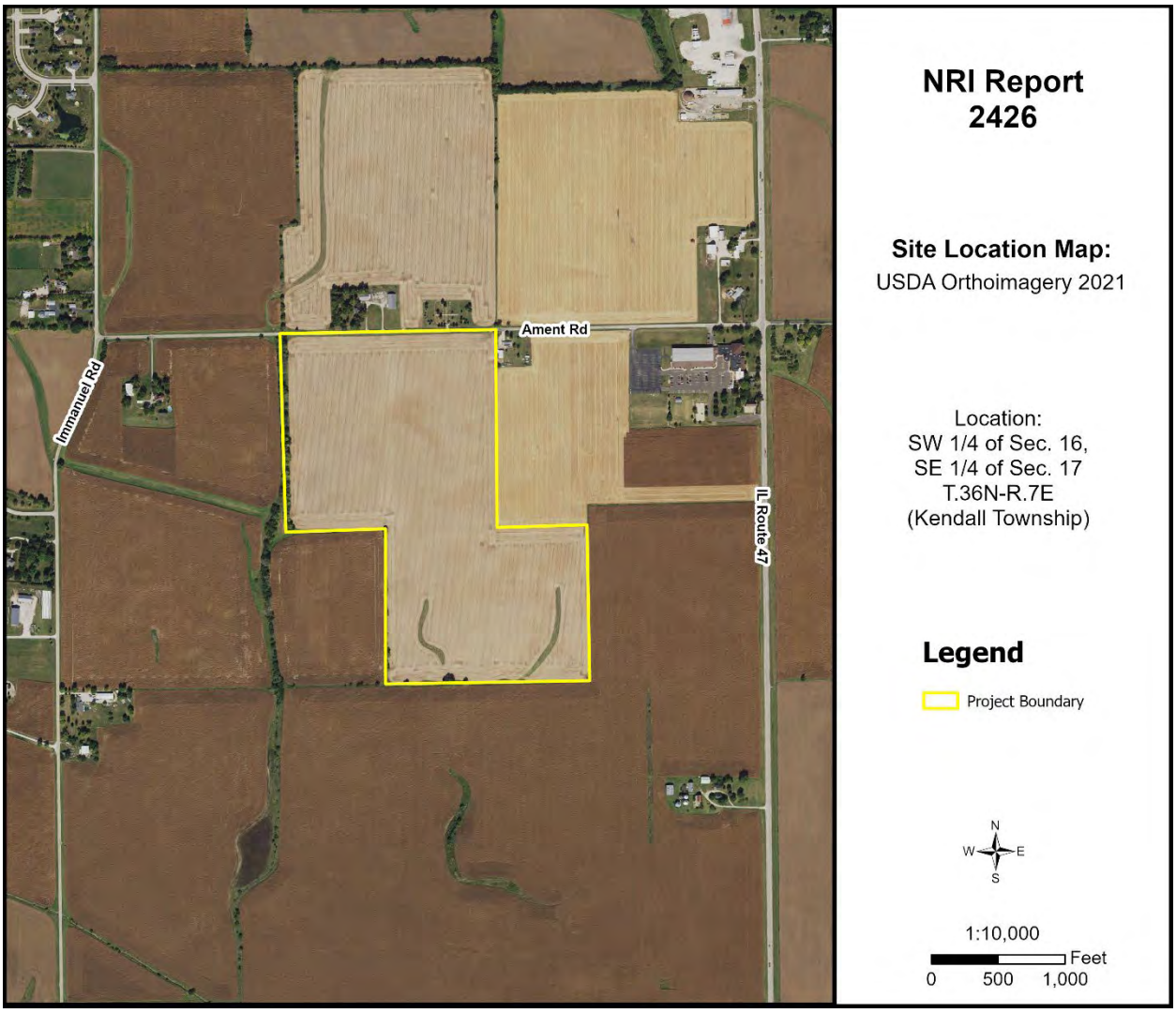



**Figure 4:** Aerial Map with NRI Project Boundary

# *ARCHAEOLOGIC/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. However, the State of Illinois owns all the following: human remains, grave markers, burial mounds, and artifacts associated with graves and human remains.

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

**The Illinois State Historic Preservation Office has not been notified of the proposed land use change by the Kendall County SWCD. There may be historic features in the area. The applicant may need to contact them according to current Illinois law.**

# *ECOLOGICALLY SENSITIVE AREAS*

**WHAT IS BIOLOGICAL DIVERSITY AND WHY SHOULD IT BE CONSERVED?[1]**

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

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

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

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

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

Further, every species is a potential source of human medicine. In 1980, a published report identified the market value of prescription drugs from higher plants at over $3 billion. Organic alkaloids, a class of

chemical compounds used in medicines, are found in an estimated 20% of plant species. Yet only 2% of plant species have been screened for these compounds (Hoose 1981).

The third reason for protecting diversity is that humans benefit from natural areas and depend on healthy ecosystems. The natural world supplies our air, our water, our food and supports human economic activity. Further, humans are creatures that evolved in a diverse natural environment between forest and grasslands. People need to be reassured that such places remain. When people speak of "going to the country," they generally mean more than getting out of town. For reasons of their own sanity and wellbeing, they need a holistic, organic experience. Prolonged exposure to urban monotony produces neuroses, for which cultural and natural diversity cure.

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

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

**BIOLOGICAL RESOURCES CONCERNING THE SUBJECT PARCEL**

As part of the Natural Resources Information Report, staff checks office maps to determine if any nature preserves or ecologically sensitive areas 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, stormwater management, and groundwater monitoring.

**Office maps indicate that there are no nature preserves in the vicinity of the parcel in question (PIQ). The parcel does contain ecologically sensitive areas, however. An unnamed tributary to Middle Aux Sable Creek flows along the western project boundary.**

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

# SOILS INFORMATION

**IMPORTANCE OF SOILS INFORMATION**

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

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

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

The limitation categories (not limited, somewhat limited, or very limited) indicate the potential for difficulty in using that soil unit for the proposed activity and, thus, the degree of need for thorough soil borings and engineering studies. A limitation does not necessarily mean that the proposed activity cannot be done on that soil type. It does mean that the reasons for the limitation need to be thoroughly understood and dealt with to complete the proposed activity successfully. Very limited indicates that the proposed activity will be more difficult and costly to do on that soil type than on a soil type with a somewhat limited or not limited rating.

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

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

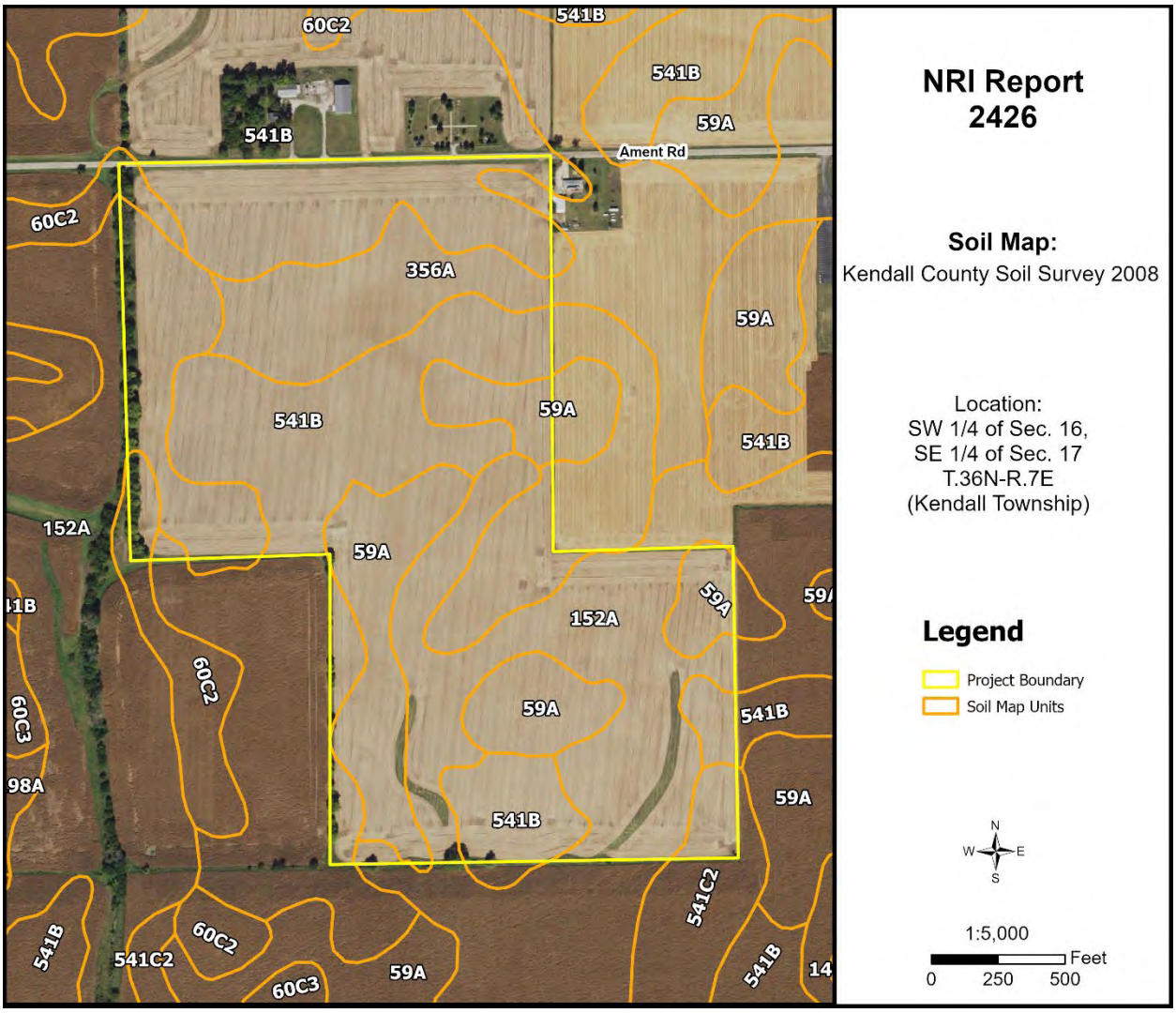



**Figure 5**: Soil Map

**Table 3**: Soil Map Unit Descriptions

| Soil Type | Soil Name | Acres | Percent |
|---|---|---|---|
| 59A | Lisbon silt loam, 0-2% slopes | 16.3 | 17.1% |
| 60C2 | La Rose silt loam, 5-10% slopes | 1.7 | 1.8% |
| 152A | Drummer silty clay loam, 0-2% slopes | 27.4 | 28.8% |
| 356A | Elpaso silty clay loam, 0-2% slopes | 9.8 | 10.3% |
| 541B | Graymont silt loam, 2-5% slopes | 38.6 | 40.5% |
| 541C2 | Graymont silt loam, 5-10% slopes, eroded | 1.4 | 1.5% |

**Source**: National Cooperative Soil Survey – USDA-NRCS

# *SOILS INTERPRETATIONS EXPLANATION*

**GENERAL – NONAGRICULTURAL**

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

Other features may need treatment to overcome soil limitations for a specific purpose. Ratings come from the soil's "natural" state, that is, no unusual modification occurs other than that which is considered normal practice for the rated use. Even though soils may have limitations, an engineer may alter soil features or adjust building plans for a structure to compensate for most degrees of limitations. Most of these practices, however, are costly. The final decision in selecting a site for a particular use generally involves weighing the costs for site preparation and maintenance. Soil properties influence development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Soil limitation ratings of not limited, somewhat limited, and very limited are given for the types of proposed improvements that are listed or inferred by the petitioner as entered on the report application and/or zoning petition. The most common types of building limitation that this report gives limitations ratings for is septic systems. It is understood that engineering practices can overcome most limitations for buildings with and without basements, and small commercial buildings. Limitation ratings for these types of buildings are not commonly provided. Organic soils, when present on the parcel, are referenced in the hydric soils section of the report. This type of soil is considered unsuitable for all types of construction.

**LIMIATIONS RATINGS**

- **Not Limited:** This soil has favorable properties for the use. The degree of limitation is minor. The people involved can expect good performance and low maintenance.
- **Somewhat Limited**: 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.
- **Very Limited**: 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.

# BUILDING LIMITATIONS

**BUILDING ON POORLY SUITED OR UNSUITABLE SOILS**

Building on poorly suited or unsuitable soils can present problems to future property owners such as cracked foundations, wet basements, lowered structural integrity and high maintenance costs associated with these problems. The staff of the Kendall County SWCD strongly urges scrutiny by the plat reviewers when granting parcels with these soils exclusively.

**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 the soil to provide a stable foundation.

**Shallow Excavations** – Trenches or holes dug to a maximum depth of 5 or 6 feet for utility lines, open ditches, or other purposes. Ratings are based on soil properties that influence the ease of digging and the resistance to sloughing.

**Lawns and Landscaping** – Require soils on which turf and ornamental trees and shrubs can be established and maintained (irrigation is not considered in the ratings). The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established.

**Local Roads and Streets** – They 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.

**Table 4:** Building Limitations

| Soil Type | Solar Arrays | Shallow Excavations | Lawns & Landscaping | Local Roads & Streets | Acres | % |
|---|---|---|---|---|---|---|
| 59A | **Very Limited**:<br>Frost action<br>Low strength<br>Steel corrosion<br>Depth to saturated zone<br>Shrink-swell<br>Ponding | **Very Limited**:<br>Depth to saturated zone<br>Dense layer<br>Dusty<br>Unstable excavation walls<br>Ponding | **Somewhat Limited**:<br>Depth to saturated zone<br>Dusty | **Very Limited:**<br>Frost action<br>Low strength<br>Depth to saturated zone<br>Shrink-swell<br>Ponding | 16.3 | 17.1% |
| 60C2 | **Somewhat Limited**:<br>Steel corrosion<br>Frost action<br>Low strength<br>Hillslope position<br>Depth to saturated zone | **Very Limited**:<br>Depth to saturated zone<br>Dusty<br>Unstable excavation walls | **Somewhat Limited**:<br>Depth to saturated zone<br>Dusty | **Somewhat Limited:**<br>Frost action<br>Low strength<br>Depth to saturated zone | 1.7 | 1.8% |
| 152A | **Very Limited**:<br>Ponding<br>Depth to saturated zone<br>Frost action<br>Low strength<br>Steel corrosion<br>Shrink-swell | **Very Limited**:<br>Ponding<br>Depth to saturated zone<br>Dusty<br>Unstable excavation walls<br>Too clayey | **Very Limited**:<br>Ponding<br>Depth to saturated zone<br>Dusty | **Very Limited:**<br>Ponding<br>Depth to saturated zone<br>Frost action<br>Low strength<br>Shrink-swell | 27.4 | 28.8% |
| 356A | **Very Limited:**<br>Ponding<br>Depth to saturated zone<br>Frost action<br>Low strength<br>Steel corrosion<br>Shrink-swell | **Very Limited:**<br>Ponding<br>Depth to saturated zone<br>Dusty<br>Unstable excavation walls<br>Too clayey | **Very Limited:**<br>Ponding<br>Depth to saturated zone<br>Dusty | **Very Limited:**<br>Ponding<br>Depth to saturated zone<br>Frost action<br>Low strength<br>Shrink-swell | 9.8 | 10.3% |

| Soil Type | Solar Arrays | Shallow Excavations | Lawns & Landscaping | Local Roads & Streets | Acres | % |
|---|---|---|---|---|---|---|
| 541B | **Very Limited**:<br>Frost action<br>Low strength<br>Steel corrosion<br>Shrink-swell<br>Hillslope position<br>Ponding<br>Depth to saturated zone | **Somewhat Limited**:<br>Depth to saturated zone<br>Dusty<br>Unstable excavation walls | **Somewhat Limited**:<br>Dusty | **Very Limited:**<br>Frost action<br>Low strength<br>Shrink-swell<br>Ponding<br>Depth to saturated zone | 38.6 | 40.5% |
| 541C2 | **Very Limited:**<br>Frost action<br>Low strength<br>Steel corrosion<br>Shrink-swell<br>Hillslope position<br>Ponding<br>Depth to saturated zone | **Very Limited:**<br>Depth to saturated zone<br>Dusty<br>Unstable excavation walls<br>Ponding | **Somewhat Limited:**<br>Dusty | **Very Limited:**<br>Frost action<br>Low strength<br>Shrink-swell<br>Ponding<br>Depth to saturated zone | 1.4 | 1.5% |
| **% Very Limited** | **98.2%** | **59.5%** | **39.1%** | **98.2%** | | |

**Figure 6A:** Map of Building Limitations - Solar Arrays & Roads/Streets



**Figure 6B:** Map of Building Limitations - Shallow Excavations

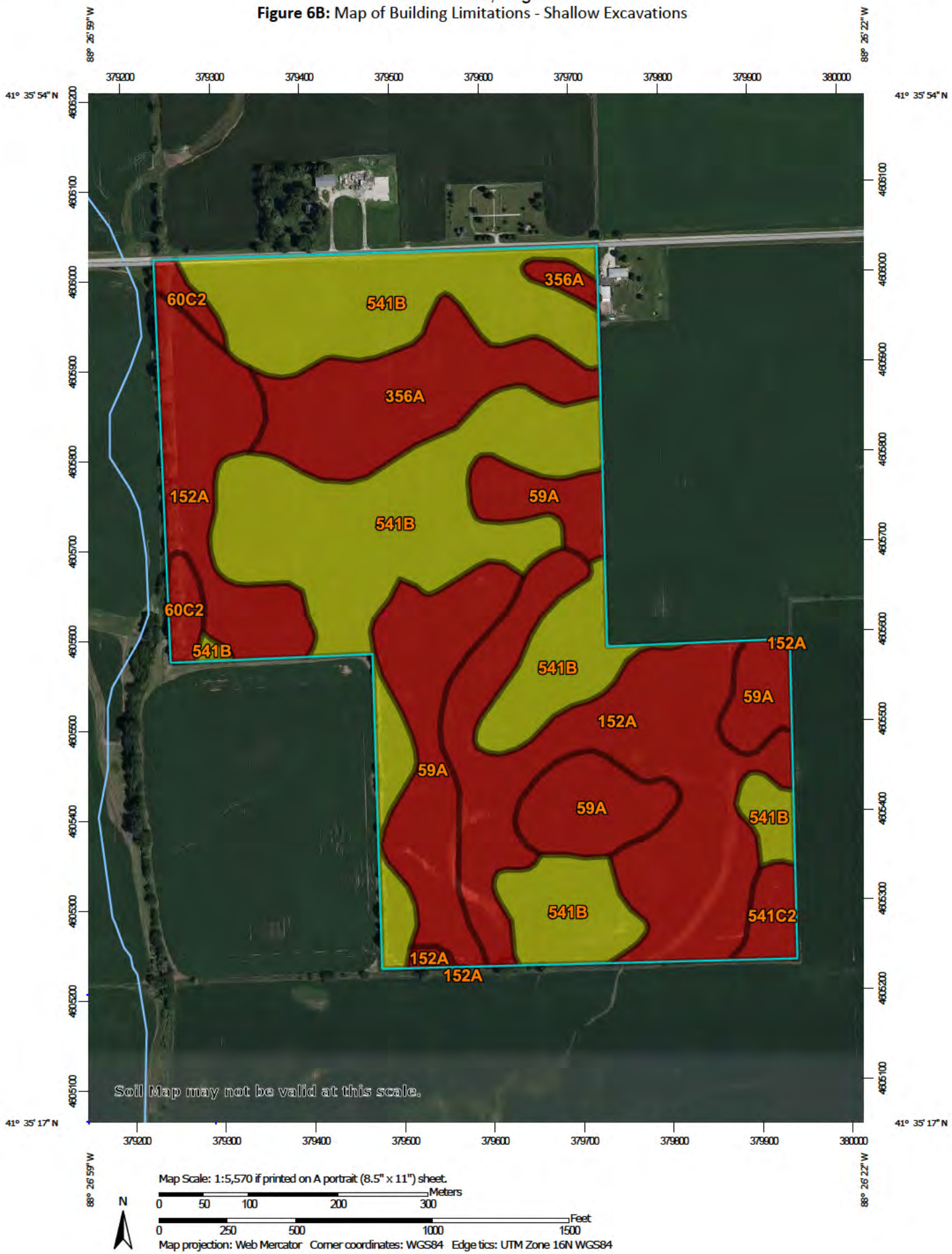
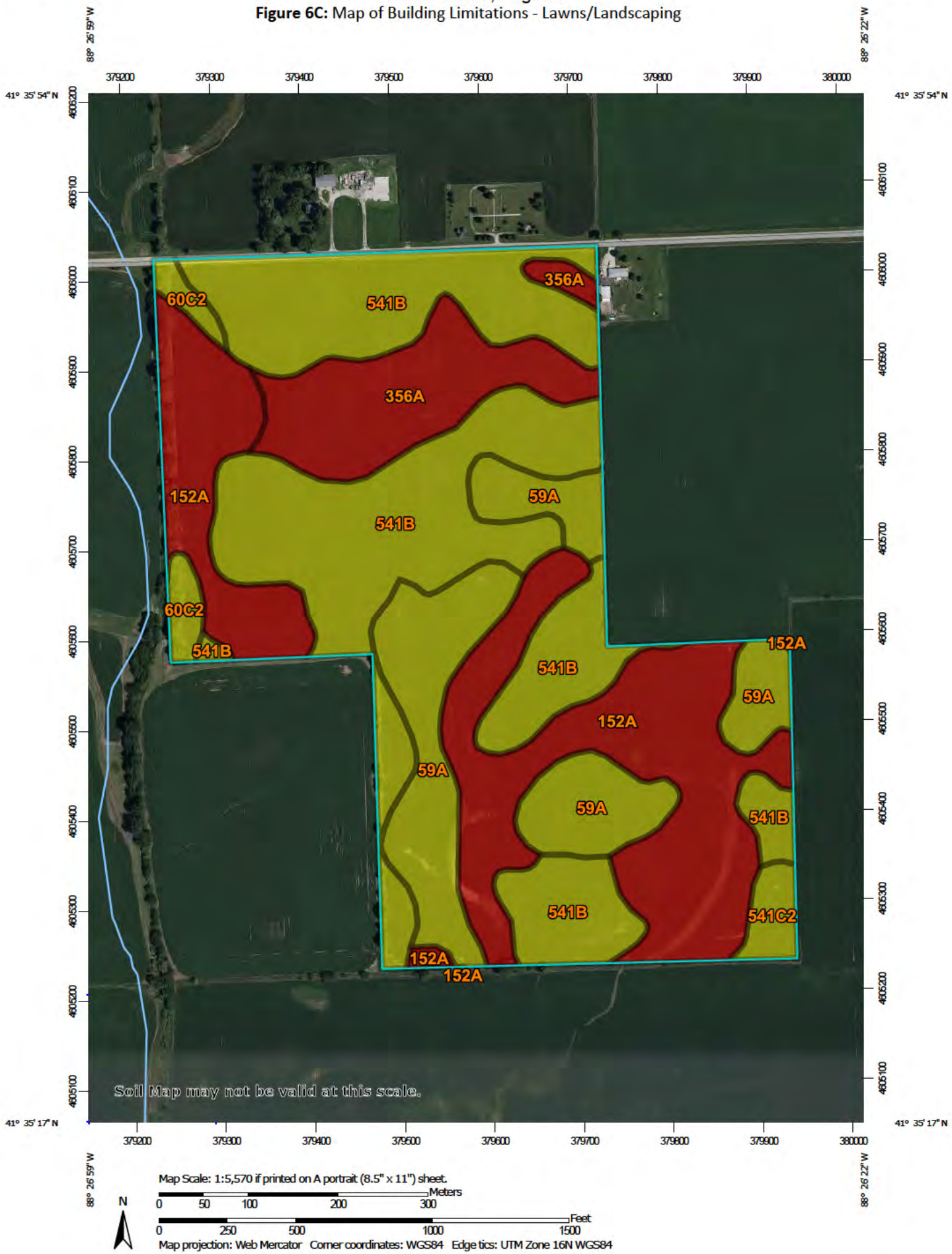


**Figure 6C:** Map of Building Limitations - Lawns/Landscaping



# SOIL WATER FEATURES

Table 5, below, gives estimates of various soil water features that should be taken into consideration when reviewing engineering for a land use project.

**HYDROLOGIC SOIL GROUPS (HSGs)** – The 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.

- **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.

**Note:** 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** – Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based upon slope, climate and vegetative cover and 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.

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

**WATER TABLE** – Water table refers to a saturated zone in the soil and the data indicates, by month, depth to the top (upper limit) and base (lower limit) of the saturated zone in most years. These estimates are based upon observations of the water table at selected sites and on evidence of a saturated zone (grayish colors or mottles (redoximorphic features)) in the soil. Note: A saturated zone that lasts for less than a month is not considered a water table.

**PONDING** – Ponding refers to standing water in a closed depression, and the data indicates surface water depth, duration, and frequency of ponding.

- **Duration:** 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:** Expressed as: *none* meaning ponding is not possible; *rare* means unlikely but possible under unusual weather conditions (chance of ponding is 0-5% in any year); *occasional* means that it occurs, on the average, once or less in 2 years (chance of ponding is 5 to 50% in any year); and *frequent* means that it occurs, on the average, more than once in 2 years (chance of ponding is more than 50% in any year).

**FLOODING** – 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:** 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:** Expressed as: *none* means flooding is not probable; *very rare* means that it is very unlikely but possible under extremely unusual weather conditions (chance of flooding is less than 1% in any year); *rare* means that it is unlikely but possible under unusual weather conditions (chance of flooding is 1 to 5% in any year); *occasional* means that it occurs infrequently under normal weather conditions (chance of flooding is 5 to 50% in any year but is less than 50% in all months in any year); and *very frequent* means that it is likely to occur very often under normal weather conditions (chance of flooding is more than 50% in all months of any year).

**Note:** The information is based on evidence in the soil profile. In addition, consideration is also given to 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.

**Table 5:** Water Features

| Soil Type | Hydrologic Group | Surface Runoff | Water Table | Ponding | Flooding |
|---|---|---|---|---|---|
| 59A | C/D | Low | January – May<br>**Upper Limit:** 1.0’-2.0’<br>**Lower Limit:** 2.0’-4.0’ | January – December<br>**Frequency**: None | January – December<br>**Frequency**: None |
| 60C2 | C | High | February – April<br>**Upper Limit:** 2.0’-3.5’<br>**Lower Limit:** 2.2’-4.0’ | January – December<br>**Frequency**: None | January – December<br>**Frequency**: None |
| 152A | B/D | Negligible | January – May<br>**Upper Limit:** 0.0’-1.0’<br>**Lower Limit:** 6.0’ | January – May<br>**Surface Water Depth**: 0.0’-0.5’<br>**Duration**: Brief (2-7 days)<br>**Frequency**: Frequent | January – December<br>**Frequency**: None |
| 356A | B/D | Negligible | January – May<br>**Upper Limit:** 0.0’-1.0’<br>**Lower Limit:** 6.0’ | January – May<br>**Surface Water Depth**: 0.0’-0.5’<br>**Duration**: Brief (2-7 days)<br>**Frequency**: Frequent | January – December<br>**Frequency**: None |
| 541B | C | Low | February – April<br>**Upper Limit:** 2.0’-3.5’<br>**Lower Limit:** 2.2’-4.3’ | January – December<br>**Frequency**: None | January – December<br>**Frequency**: None |
| 541C2 | C | Medium | February – April<br>**Upper Limit:** 2.0’-3.5’<br>**Lower Limit:** 2.2’-4.3’ | January – December<br>**Frequency**: None | January – December<br>**Frequency**: None |

# 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: texture, slope, structure, and 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/diverting flow from exposed areas, storing flows, or limiting runoff from exposed areas
- Staging construction to keep disturbed areas to a minimum
- Establishing or maintaining 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. Soil erosion and sedimentation control plans, including maintenance responsibilities, should be clearly communicated to all contractors working on the site.

The SWCD recommends an erosion and sediment control plan for all building sites, especially if there is a wetland or stream nearby. Additionally, a National Pollutant Discharge Elimination System (NPDES) permit (Permit No. ILR10) from the Illinois Environmental Protection Agency (IEPA) is required for stormwater discharges from construction sites that will disturb 1 or more acres of land. Conditions of the NPDES ILR10 permit require the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) to reduce stormwater pollutants on the construction site before they can cause environmental issues.

**Table 6:** Soil Erosion Potential

| Soil Type | Slope | Rating | Acreage | Percent of Project Area |
|---|---|---|---|---|
| 59A | 0-2% | Slight | 16.3 | 17.1% |
| 60C2 | 5-10% | Moderate | 1.7 | 1.8% |
| 152A | 0-2% | Slight | 27.4 | 28.8% |
| 356A | 0-2% | Slight | 9.8 | 10.3% |
| 541B | 2-5% | Slight | 38.6 | 40.5% |
| 541C2 | 5-10% | Moderate | 1.4 | 1.5% |

# PRIME FARMLAND SOILS

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

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

**Table 7:** Prime Farmland Soils

| Soil Type | Prime Designation | Acreage | Percent |
|---|---|---|---|
| 59A | Prime Farmland | 16.3 | 17.1% |
| 60C2 | Farmland of Statewide Importance | 1.7 | 1.8% |
| 152A | Prime Farmland if Drained | 27.4 | 28.8% |
| 356A | Prime Farmland if Drained | 9.8 | 10.3% |
| 541B | Prime Farmland | 38.6 | 40.5% |
| 541C2 | Farmland of Statewide Importance | 1.4 | 1.5% |
| **% Prime Farmland** | **96.7%** | | |

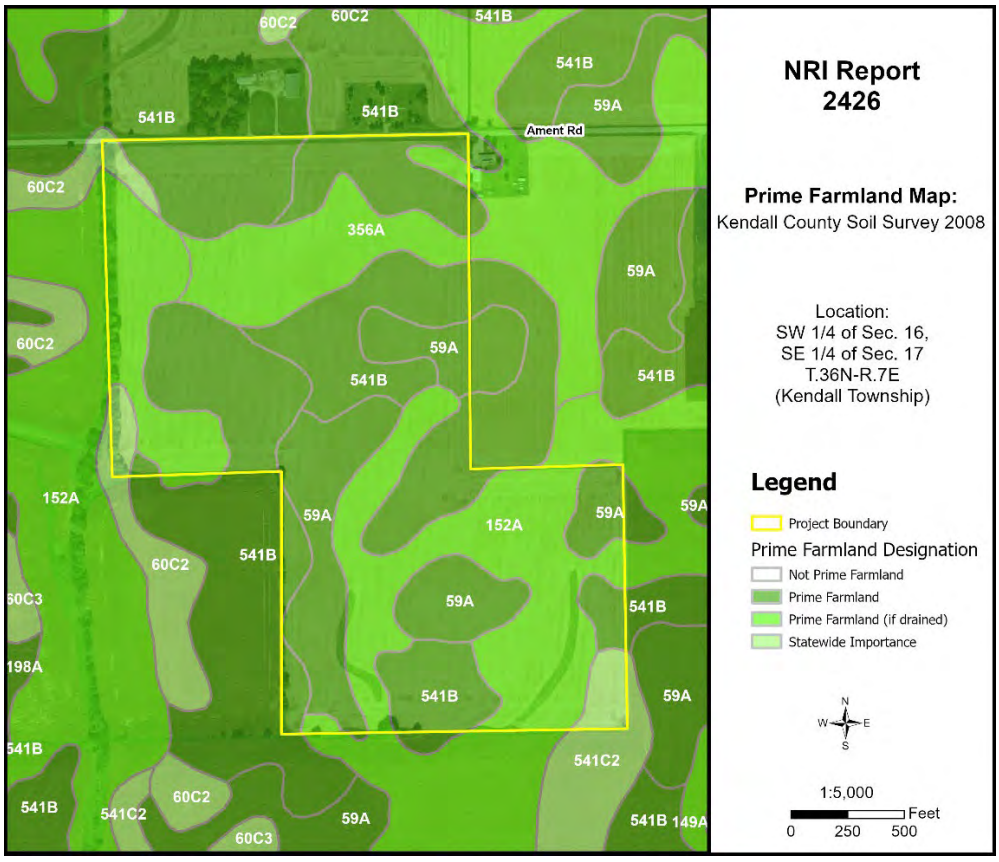



**Figure 7**: Prime Farmland Soils

# *LAND EVALUATION AND SITE ASSESSMENT (LESA)*

Decision-makers in Kendall County 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 was developed by the United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) and takes into consideration local conditions such as physical characteristics of the land, compatibility of surrounding land-uses, and urban growth factors. The LESA system is a two-step procedure that includes:

**LAND EVALUATION (LE)**

The soils of a given area are rated and placed in groups ranging from the best to worst suited for a stated agriculture use, cropland, or forestland. The best group is assigned a value of 100, and all other groups are assigned lower values. The Land Evaluation is based on data from the Kendall County Soil Survey. The LE score is calculated by multiplying the relative value of each soil type by the number of acres of that soil. The sum of the products is then divided by the total number of acres; the answer is the Land Evaluation score on this site. The Kendall County Soil and Water Conservation District is responsible for this portion of the LESA system.

**SITE ASSESSMENT (SA)**

The site is numerically evaluated according to important factors that contribute to the quality of the site. Each factor selected is assigned values in accordance with the local needs and objectives. The value group is a predetermined value based upon prime farmland designation. The Kendall County LESA Committee is responsible for this portion of the LESA system.

**Please Note:** A land evaluation (LE) score will be compiled for every project parcel. However, when a parcel is located within municipal planning boundaries, a site assessment (SA) score is not compiled as the scoring factors are not applicable. As a result, only the LE score is available, and a full LESA score is unavailable for the parcel.

**Table 8:** Land Evaluation Computation

| Soil Type | Value Group | Relative Value | Acres* | Product (Relative Value x Acres) |
|---|---|---|---|---|
| 59A | 2 | 94 | 16.3 | 1,532.2 |
| 60C2 | 5 | 82 | 1.7 | 139.4 |
| 152A | 1 | 100 | 27.4 | 2,740.0 |
| 356A | 1 | 100 | 9.8 | 980.0 |
| 541B | 2 | 94 | 38.6 | 3,628.4 |
| 541C2 | 5 | 82 | 1.4 | 114.8 |
| | | | **95.2** | **9,134.8** |
| **LE Calculation** | | | (Product of relative value / Total Acres)<br>9,134.8 / 95.2 = 95.9 | |
| **LE Score** | | | **LE = 96** | |

*Acreage listed in this chart provides a generalized representation and may not precisely reflect exact acres of each soil type.

**The Land Evaluation (LE) score for this site is 96 out of 100, indicating that the soils are well suited for agricultural uses since the score is at or above 80. A Site Assessment (SA) score was not calculated for this site. Since the site is located within municipal planning boundaries, the scoring factors, utilizing the Kendall County LESA scoring system, are not applicable.**

# LAND USE PLANS

Many counties, municipalities, villages, and townships have developed land-use plans. These plans are intended to reflect the existing and future land-use needs of a given community. Please contact United City of Yorkville for information regarding their comprehensive land use plan and map.

# DRAINAGE, RUNOFF, AND FLOOD INFORMATION

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

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

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

**WHAT IS A WATERSHED?**
Simply stated, a watershed is the area of land that contributes water to a certain point. The watershed boundary is important because the area of land in the watershed can now be calculated using an irregular shape area calculator such as a dot counter or planimeter.

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

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

Theoretically, if each development, no matter how large or small, maintains their preconstruction Q value after construction by the installation of stormwater management systems, the streams and wetlands and lakes will not suffer damage from excessive urban stormwater.

For this reason, the Kendall County SWCD recommends that the developer for intense uses, such as a subdivision, calculate the preconstruction Q value for the exit point(s). A stormwater management system

should be designed, installed, and maintained to limit the postconstruction Q value to be at or below the preconstruction value.

**IMPORTANCE OF FLOOD INFORMATION**

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

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

Flood Insurance Rate Maps (FIRMs), produced by the Federal Emergency Management Agency (FEMA), define flood elevation adjacent to tributaries and major bodies of water and superimpose that onto a simplified USGS topographic map. The scale of the FIRM maps is generally dependent on the size and density of parcels in that area. This is to correctly determine the parcel location and floodplain location. The FIRM map has three (3) zones. Zone A includes the 100-year flood (1% annual chance flood), Zone B or Zone X (shaded) is the 100 to 500-year flood (between limits of the 1% and the 0.2% annual chance flood), and Zone C or Zone X (unshaded) is outside the floodplain (outside the 0.2% annual chance flood).

The Hydrologic Atlas (H.A.) Series of the Flood of Record Map is also used for the topographic information. This map is different from the FIRM map mainly because it will show isolated or pocketed flooded areas. Kendall County uses both these maps in conjunction with each other for flooded area determinations. The Flood of Record maps show the areas of flood for various years. Both maps stress that the recurrence of flooding is merely statistical. A 100-year flood may occur twice in one year, or twice in one week, for that matter.

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

Floodplains play a vital role in reducing the flood damage potential associated with an urbanizing area and, when left in an undisturbed state, also provide valuable wildlife habitat benefits. If it is the petitioner's intent to conduct floodplain filling or modification activities, the petitioner, and the Unit of Government responsible need to consider the potentially adverse effects this type of action could have on adjacent properties. The change or loss of natural floodplain storage often increases the frequency and severity of flooding on adjacent property.

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

Another indication of flooding potential can be found in the soils information. Hydric soils indicate the presence of drainage ways, areas subject to ponding, or a naturally occurring high water table. These need to be considered along with the floodplain information when developing the site plan and the stormwater management plan. Development on hydric soils can contribute to the loss of water storage within the soil and the potential for increased flooding in the area.

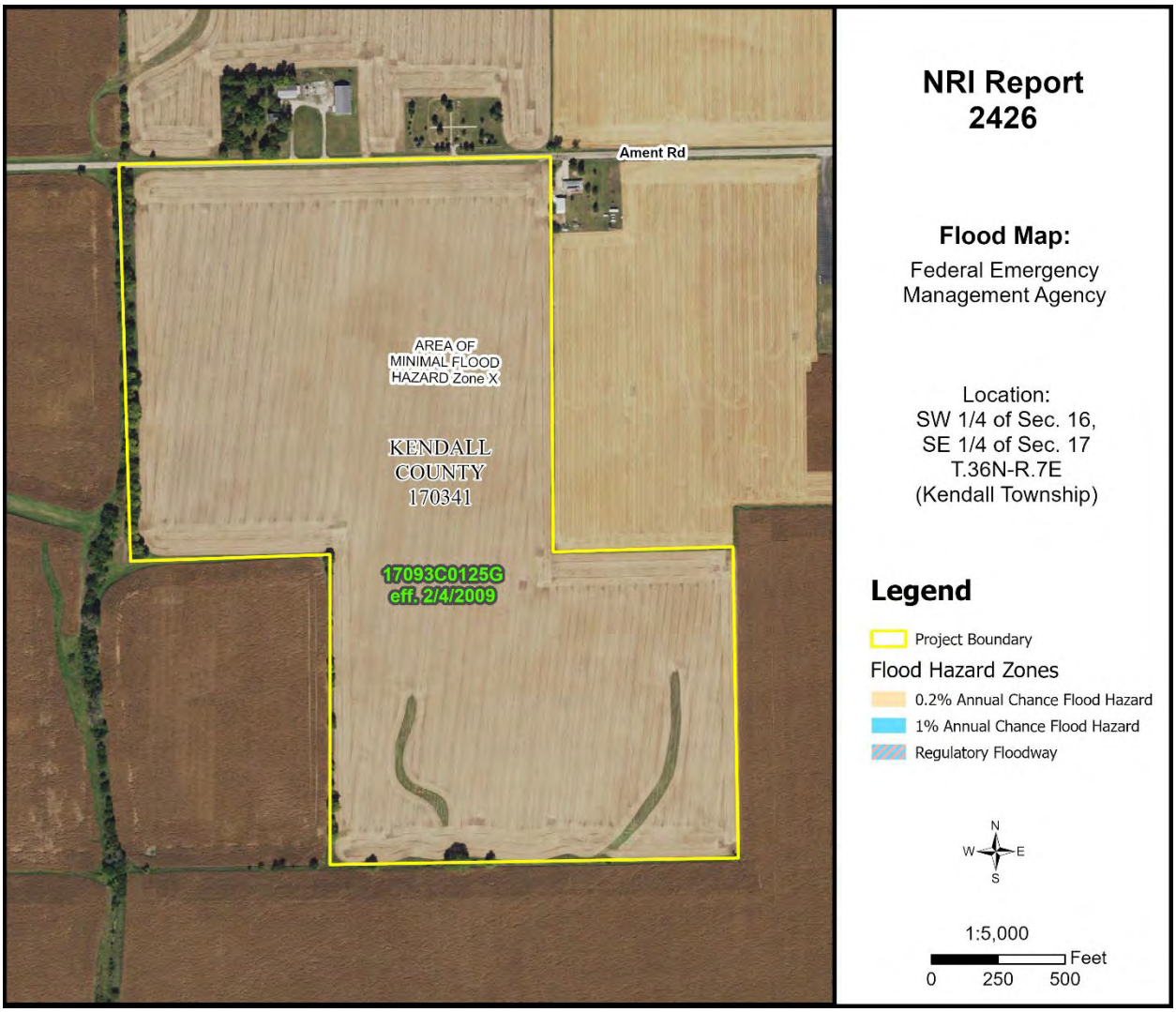



**Figure 8:** Flood Map

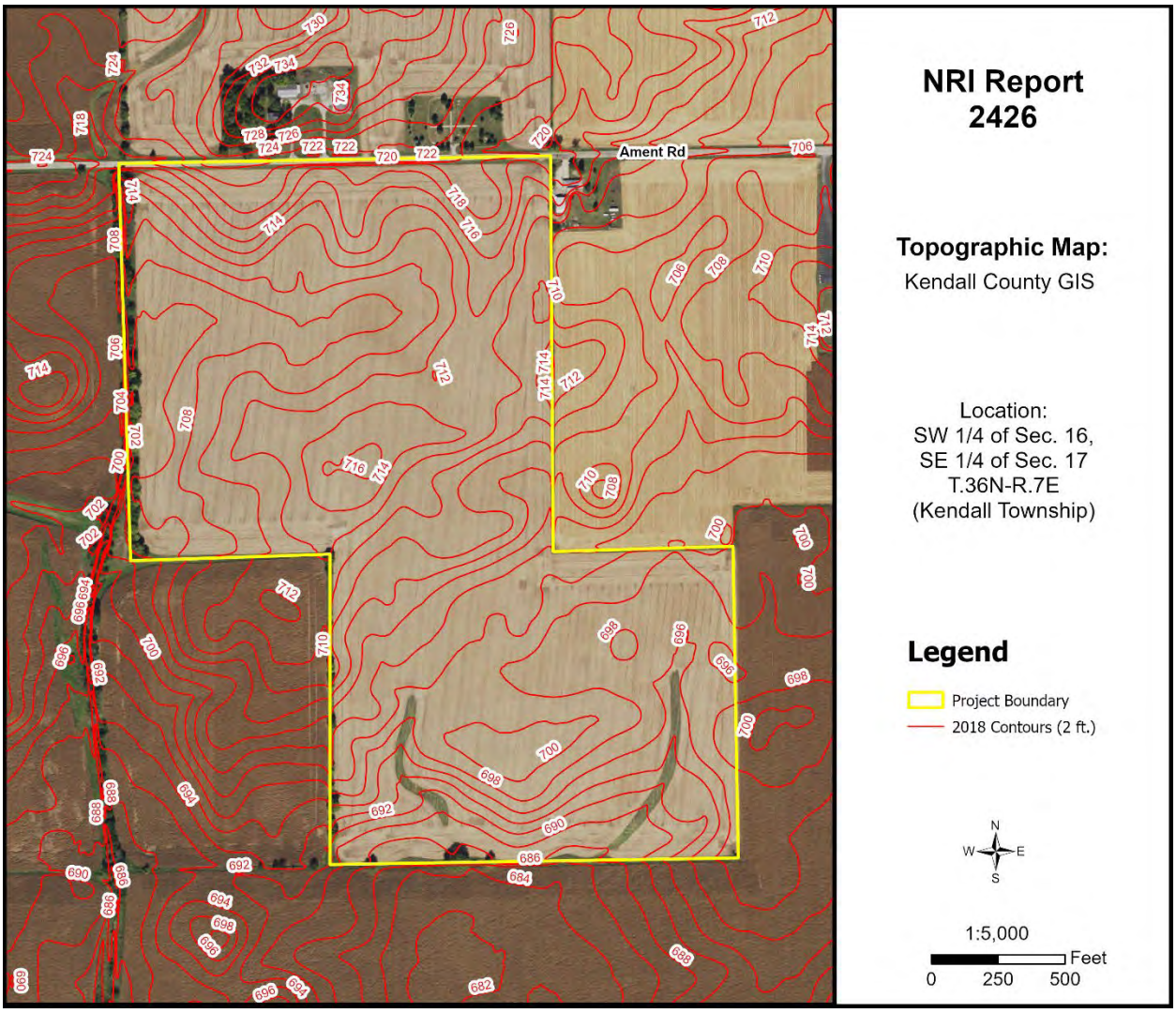



**Figure 9:** Topographic Map

**This parcel contains slopes of 0% to 10% with an elevation range of approximately 684'-720' above sea level. The highest point is in the northern portion of the site, and the lowest point is in the southern portion. According to the FEMA Flood Map (Figure 8), the parcel does not appear to contain areas of regulated floodplain or floodway. The parcel is mapped as Zone X (unshaded), an area of minimal flood hazard determined to be outside of the 0.2% annual chance floodplain.**

# WATERSHED PLANS

**WATERSHED AND SUB WATERSHED INFORMATION**

A watershed is the area of land that drains into a specific point including a stream, lake, or other body of water. High points on the Earth's surface, such as hills and ridges define watersheds. When rain falls in the watershed, it flows across the ground towards a stream or lake. Rainwater carries pollutants such as oils, pesticides, and soil.

Everyone lives in a watershed. Their actions can impact natural resources and people living downstream. Residents can minimize this impact by being aware of their environment and the implications of their activities, implementing practices recommended in watershed plans, and educating others about their watershed.

The following are recommendations to developers for protection of this watershed: Preserve open space; maintain wetlands as part of development; use natural water management; prevent soil from leaving a construction site; protect subsurface drainage; use native vegetation; retain natural features; mix housing styles and types; decrease impervious surfaces; reduce area disturbed by mass grading; shrink lot size and create more open space; maintain historical and cultural resources; treat water where it falls; preserve views; and establish and link trails.

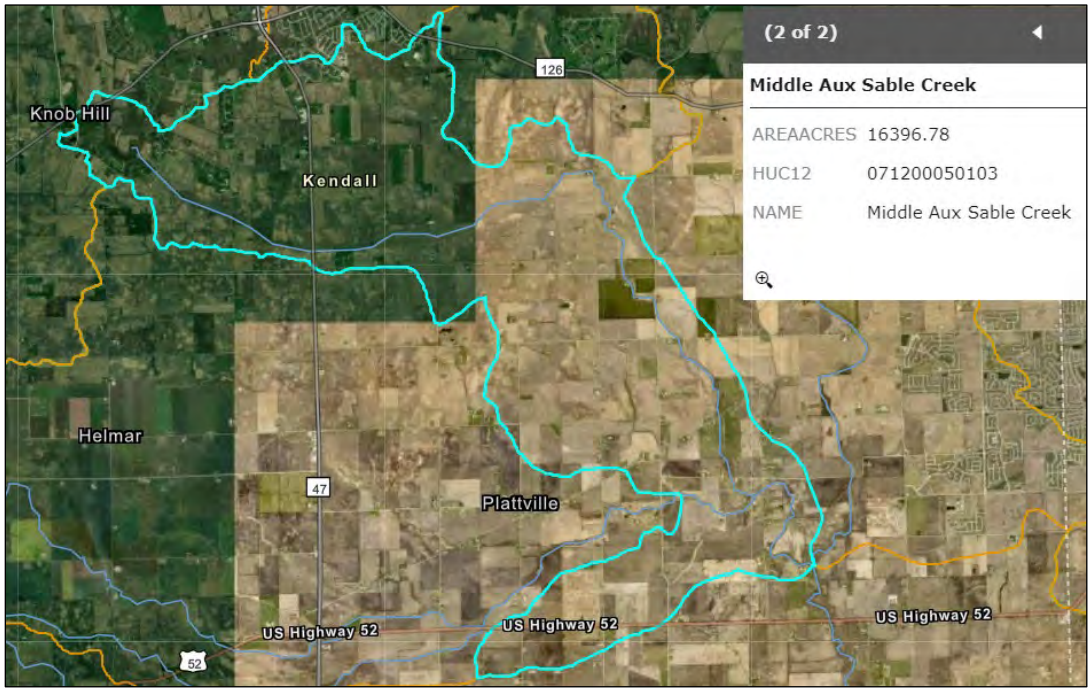



**Figure 10**: Sub Watershed Map

**This parcel is located within the Upper Illinois River watershed and the Middle Aux Sable Creek sub watershed (HUC 12 – 071200050103). The sub watershed comprises approximately 16,397 acres covering parts of Yorkville and Minooka.**

# WETLAND INFORMATION

**IMPORTANCE OF WETLAND INFORMATION**

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

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

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

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

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

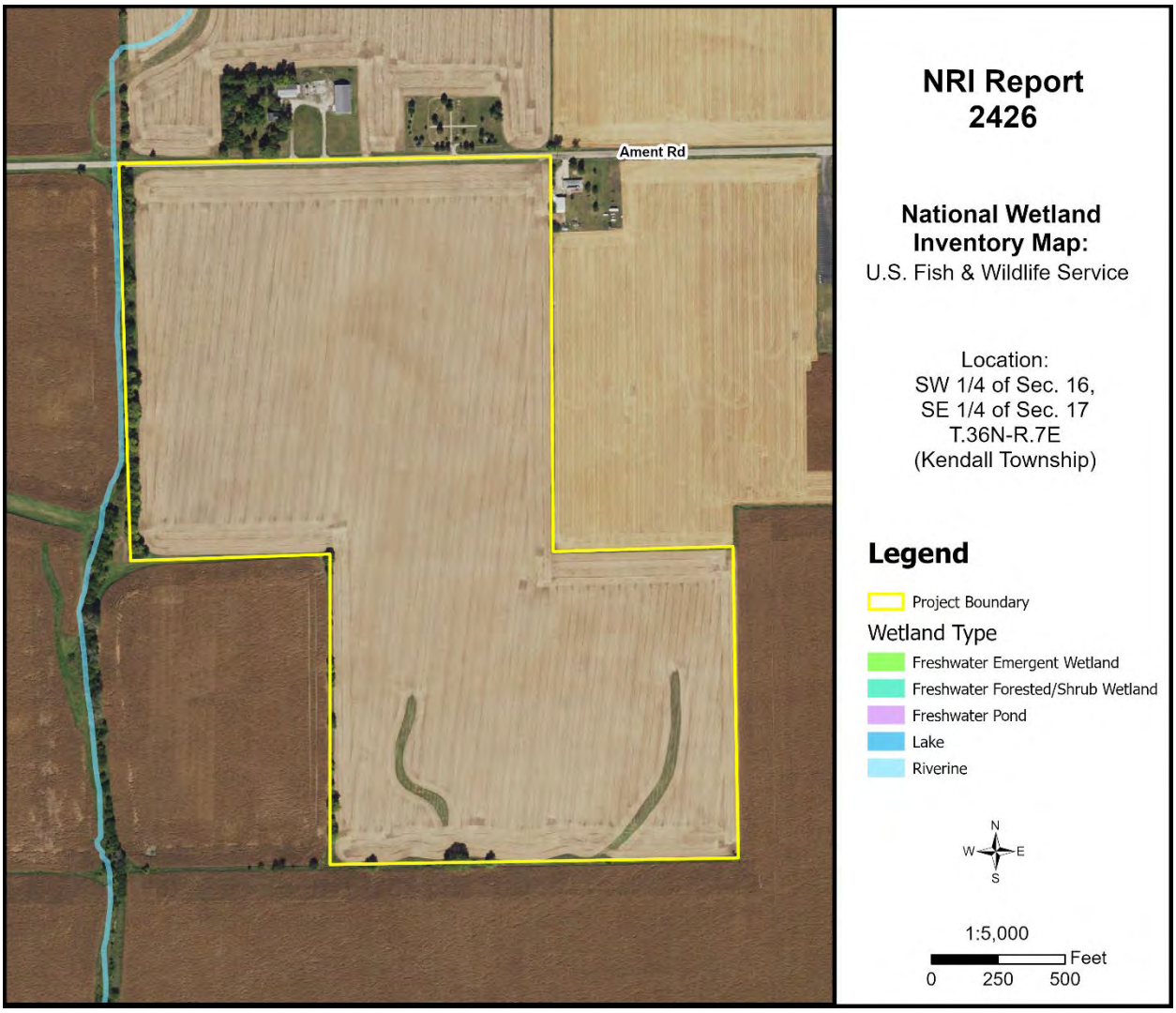



**Figure 11:** Wetland Map

**Office maps indicate that mapped wetlands/waters are present on or near the parcel in question (PIQ). To determine the presence of wetlands, a wetland delineation specialist, who is recognized by the U.S. Army Corps of Engineers, should determine the exact boundaries and value of the wetlands. Water Resources Delineation Reports dated July 13, 2023 and June 18, 2024, were prepared by ENCAP, Inc. The results of their review indicated the presence of two farmed wetlands and one intermittent creek on the site. Please see their report for more details.**

# HYDRIC SOILS

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

It is 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 the areas that drained through the tile (ranging from less than one acre to many square miles.)

For an intense land use, the Kendall County SWCD recommends the following: a topographical survey with 1 foot contour intervals to accurately define the flood area on the parcel, an intensive soil survey to define most accurately the locations of the hydric soils and inclusions, and a drainage tile survey on the area to locate the tiles that must be preserved to maintain subsurface drainage.

**Table 9:** Hydric Soils

| Soil Types | Drainage Class | Hydric Designation | Hydric Inclusions Likely | Hydric Rating % | Acreage | Percent |
|---|---|---|---|---|---|---|
| 59A | Somewhat Poorly Drained | Non-Hydric | Yes | 8% | 16.3 | 17.1% |
| 60C2 | Moderately Well Drained | Non-Hydric | No | 0% | 1.7 | 1.8% |
| 152A | Poorly Drained | Hydric | N/A | 100% | 27.4 | 28.8% |
| 356A | Poorly Drained | Hydric | N/A | 100% | 9.8 | 10.3% |
| 541B | Moderately Well Drained | Non-Hydric | Yes | 5% | 38.6 | 40.5% |
| 541C2 | Moderately Well Drained | Non-Hydric | Yes | 3% | 1.4 | 1.5% |

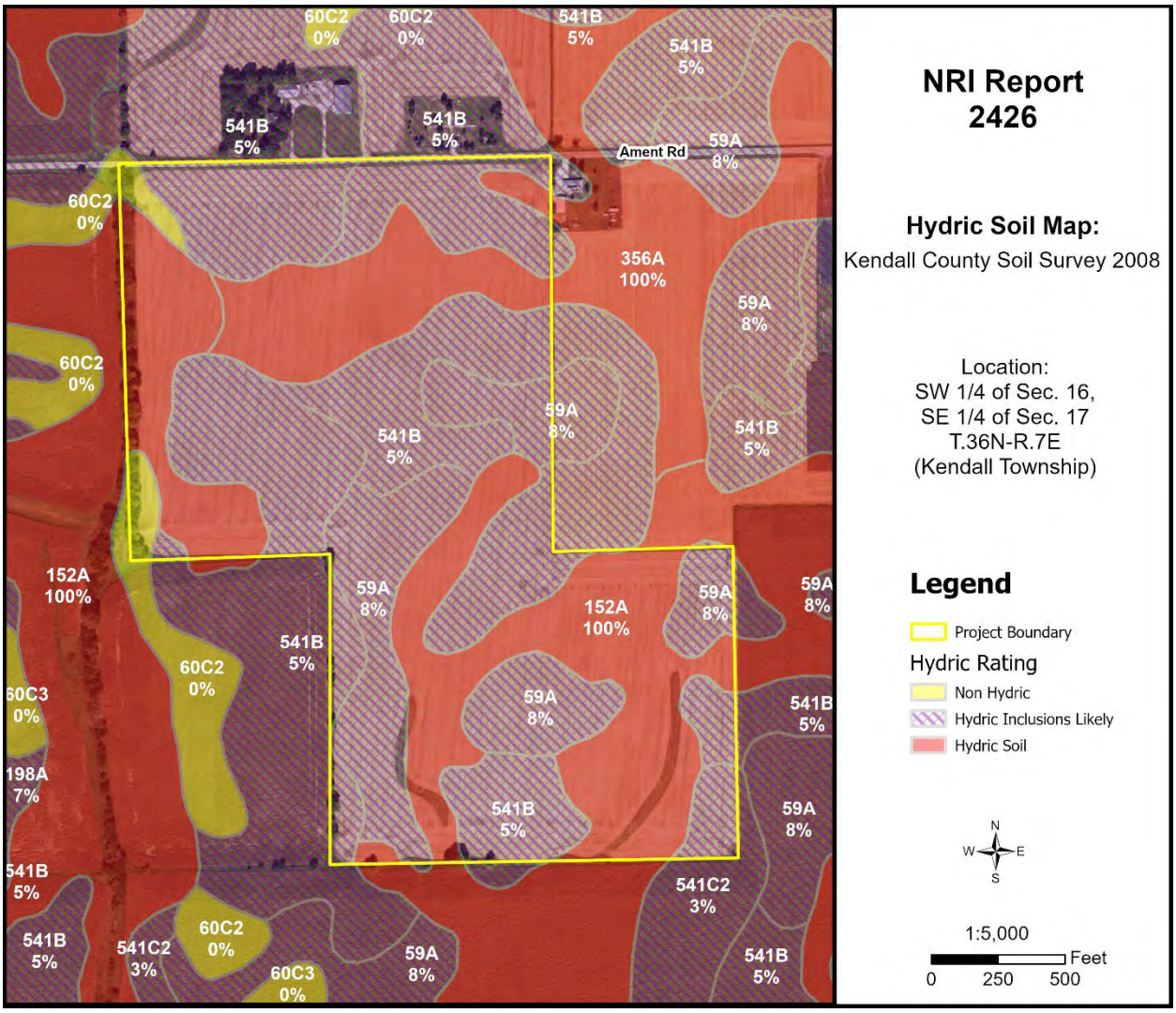



**Figure 12:** Hydric Soil Map

# *WETLAND AND FLOODPLAIN REGULATIONS*

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

The laws of the United States and the State of Illinois assign certain agencies specific and different regulatory roles to protect the waters within the State's boundaries. These roles, when considered together, include protection of navigation channels and harbors, protection against floodway 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, floodplain or floodway subject to State or Federal regulatory jurisdiction should apply for agency approvals.

**REGULATORY AGENCIES**

- **Wetland or U.S. Waters**: U.S. Army Corps of Engineers, Chicago District, 231 South LaSalle Street, Suite 1500, Chicago, IL 60604. Phone: (312) 846-5530
- **Floodplains**: Illinois Department of Natural Resources - Office of Water Resources, One Natural Resources Way, Springfield, IL 62702-1270. Phone: (217) 782-6302
- **Water Quality/Erosion Control**: Illinois Environmental Protection Agency, 1021 North Grand Avenue East, P.O. Box 19276, Springfield, IL 62794-9276. Phone: (217) 782-3397

**COORDINATION**

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

**CAUTION: Contact with the United States Army Corps of Engineers is strongly advised before commencement of any work in or near a Waters 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 Harbors Appropriation Act of 1899 or Section 404 of the Clean Water Act are subject to fines ranging up to $16,000 per day of violation, with a maximum cap of $187,500 in any single enforcement action, as well as criminal enforcement.**

# GLOSSARY

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

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

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

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

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

- **Water table, Apparent**: A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.
- **Water table, Artesian**: A water table under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.
- **Water table, Perched**: A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

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

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

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

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

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

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

**PERMEABILITY** - Values listed estimate the range (in rate and time) it takes for downward movement of water in the major soil layers when saturated but allowed to drain freely. The estimates are based on soil texture, soil structure, available data on permeability and infiltration tests, and observation of water movement through soils or other geologic materials.

**PIQ** - Parcel in question

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

**PRIME FARMLAND** - Prime farmland soils are lands that are best suited to food, feed, forage, fiber and oilseed crops. It may be cropland, pasture, woodland, or other land, but it is not urban and built up land or water areas. It either is used for food or fiber or is available for those uses. The soil qualities, growing season, and moisture supply are those needed for a well-managed soil economically to produce a sustained high yield of crops. Prime farmland produces in highest yields with minimum inputs of energy and economic resources and farming the land results in the least damage to the environment. Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 5 percent (USDA Natural Resources Conservation Service).

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

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

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

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

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

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

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

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

# REFERENCES

Association of Illinois Soil & Water Conservation Districts. 2020. Illinois Urban Manual.

Berg, R. C., and J. P. Kempton. 1984. Potential for contamination of shallow aquifers from land burial of municipal wastes: Champaign, Illinois, Illinois State Geological Survey map, scale 1:500,000.

Clean Water Act of 1972, Sections 309 and 404.

Federal Emergency Management Agency. National Flood Hazard Layer (NFHL) Viewer. https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd. Accessed August 2024.

Illinois State Geological Survey, Department of Natural Resources. 2021. Geologic Road Map of Illinois.

Kendall County Department of Planning Building and Zoning and Kendall County Soil and Water Conservation District In cooperation with NRCS, USDA. Land Evaluation and Site Assessment System.

Kendall County. 2023. Land Resource Management Plan Map.

Natural Resources Conservation Service, United States Department of Agriculture. General Manual, Title 310, Land Use.

Natural Resources Conservation Service, United States Department of Agriculture. 2007. Hydric Soils of the United States.

Natural Resources Conservation Service, United States Department of Agriculture. Hydrologic Unit Map for Kendall County.

Natural Resources Conservation Service, United States Department of Agriculture. 1987. Soil Erosion by Water. Agriculture Information Bulletin 513.

Natural Resources Conservation Service, United States Department of Agriculture. 2008. Soil Survey of Kendall County.

Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. http://websoilsurvey.sc.egov.usda.gov/. Accessed August 2024.

Rivers and Harbors Appropriation Act of 1899, Section 10.

Rockford Map Publishers, Inc. 2021. Land Atlas and Plat Book, Kendall County, Illinois, 21st Edition.

United City of Yorkville. 2016. United City of Yorkville Comprehensive Plan Update.

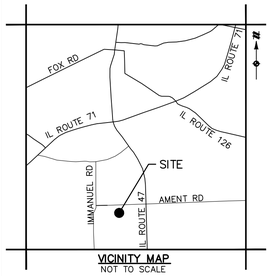
United States Fish & Wildlife Service. 2018. National Wetlands Inventory. https://data.nal.usda.gov/dataset/national-wetlands-inventory. Accessed August 2024.

Nature Conservancy (U.S.) Great Lakes Program. 1994. *The Conservation of Biological Diversity in the Great Lakes Ecosystem: Issues and Opportunities*. The Program, 1994.

# ALTA/NSPS LAND TITLE SURVEY

OF

PART OF SECTIONS 16 & 17 TOWNSHIP 36 NORTH, RANGE 7, EAST OF THE THIRD PRINCIPAL MERIDIAN, IN KENDALL COUNTY, ILLINOIS




VICINITY MAP
NOT TO SCALE

| 811 UTILITIES – TICKET NO.: X242501362–00X | | | | |
|---|---|---|---|---|
| OWNER | RESPONDED | PLOTTED | MARKED | NOTES |
| BP PIPELINES | NO | NO | NO | NO RESPONSE |
| ANR PIPELINE COMPANY (TC ENERGY) | 9/6/2024 | NO | NO | UTILITY MAP PROVIDED (NO LINES IN AREA) |
| ATT/DISTRIBUTION | NO | NO | NO | NO RESPONSE |
| UTILITY NAME | NO | NO | NO | NO RESPONSE |
| COMED | 9/9/2024 | YES | NO | UTILITY MAP PROVIDED |
| COMCAST | NO | NO | NO | NO RESPONSE |
| GUARDIAN PIPELINE | 9/9/2024 | NO | NO | UTILITY MAP PROVIDED (NO LINES IN AREA) |
| ENBRIDGE ENERGY PARTNERS LP | NO | NO | NO | NO RESPONSE |
| NICOR GAS | 9/10/2024 | NO | NO | UTILITY MAP PROVIDED (NO LINES IN AREA) |

## SURVEYOR'S TITLE RESPONSE TO SURVEY RELATED SCHEDULE B PART II EXCEPTIONS WITHIN STEWART TITLE GUARANTY COMPANY COMMITMENT NUMBER: 23000373393–02, COMMITMENT DATE: AUGUST 5, 2024

SCHEDULE B PART II EXCEPTIONS NUMBERS 1–9 ARE NOT SURVEY RELATED MATTERS AND INTENTIONALLY NOT LISTED BELOW.

10. UNRECORDED EASEMENT OR RIGHT–OF–WAY FOR TRANSMISSION LINES RUNNING THROUGH THE SUBJECT PROPERTY AS EVIDENCED BY KENDALL COUNTY ASSESSOR'S MAP. NOTE: THERE IS NO DOCUMENTATION OF RECORD FOR THIS EASEMENT OR RIGHT–OF–WAY OTHER THAN THE ASSESSOR'S MAP. (PARCEL 1)

**RESPONSE: NOT PLOTTED. THE PROVIDED TAX MAP DOES NOT DEPICT AN UNRECORDED EASEMENT OR RIGHT–OF–WAY FOR TRANSMISSION LINES. NO EVIDENCE OF A TRANSMISSION LINE RUNNING THROUGH THE SITE OBSERVED AT TIME OF FIELD WORK.**

11. UNRECORDED EASEMENT OR RIGHT–OF–WAY FOR TRANSMISSION LINES RUNNING THROUGH THE SUBJECT PROPERTY AS EVIDENCED BY KENDALL COUNTY ASSESSOR'S MAP. NOTE: THERE IS NO DOCUMENTATION OF RECORD FOR THIS EASEMENT OR RIGHT–OF–WAY OTHER THAN THE ASSESSOR'S MAP. (PARCEL 2)

**RESPONSE: NOT PLOTTED. THE PROVIDED TAX MAP DOES NOT DEPICT AN UNRECORDED EASEMENT OR RIGHT–OF–WAY FOR TRANSMISSION LINES. NO EVIDENCE OF A TRANSMISSION LINE RUNNING THROUGH THE SITE OBSERVED AT TIME OF FIELD WORK.**

12. PLAT OF RIGHT–OF–WAY DATED MARCH 27, 1990, AND RECORDED MARCH 27, 1990 AS DOCUMENT NO. 901890, PUBLIC RECORDS OF KENDALL COUNTY, STATE OF ILLINOIS. (PARCEL 1)

**RESPONSE: NOT PLOTTED. THE LOCATION CANNOT BE DETERMINED FROM RECORD DOCUMENT. (FLAT FILE FF2–4 REFERENCED WITHIN RECORDED DOCUMENT NOT PROVIDED.)**

13. SUBORDINATION OF SURFACE RIGHTS FOR PUBLIC ROAD PURPOSES BY AND BETWEEN ILLINOIS BELL TELEPHONE COMPANY AS GRANTOR AND THE PEOPLE OF THE STATE OF ILLINOIS AS GRANTEE DATED JANUARY 7, 1991, AND RECORDED FEBRUARY 14, 1991 AS DOCUMENT NO. 910891, PUBLIC RECORDS OF KENDALL COUNTY, STATE OF ILLINOIS. (PARCEL 1)

**RESPONSE: NOT PLOTTED. NOT ON AND DOES NOT TOUCH SURVEYED PROPERTY. (SUBORDINATION FOR IL 47)**

14. SUBORDINATION OF SURFACE RIGHTS FOR PUBLIC ROAD PURPOSES BY AND BETWEEN NORTHERN ILLINOIS GAS COMPANY AS GRANTOR AND THE PEOPLE OF THE STATE OF ILLINOIS AS GRANTEE DATED FEBRUARY 1, 1991, AND RECORDED FEBRUARY 14, 1991 AS DOCUMENT NO. 910893, PUBLIC RECORDS OF KENDALL COUNTY, STATE OF ILLINOIS. (PARCEL 1)

**RESPONSE: NOT PLOTTED. NOT ON AND DOES NOT TOUCH SURVEYED PROPERTY. (SUBORDINATION FOR IL 47)**

15. SUBORDINATION OF SURFACE RIGHTS FOR PUBLIC ROAD PURPOSES BY AND BETWEEN NORTHERN ILLINOIS GAS COMPANY AS GRANTOR AND THE PEOPLE OF THE STATE OF ILLINOIS AS GRANTEE DATED FEBRUARY 1, 1991, AND RECORDED FEBRUARY 14, 1991 AS DOCUMENT NO. 910894, PUBLIC RECORDS OF KENDALL COUNTY, STATE OF ILLINOIS. (PARCEL 1)

**RESPONSE: NOT PLOTTED. NOT ON AND DOES NOT TOUCH SURVEYED PROPERTY. (SUBORDINATION FOR IL 47)**

16. SUBORDINATION OF SURFACE RIGHTS FOR PUBLIC ROAD PURPOSES BY AND BETWEEN NORTHERN ILLINOIS GAS COMPANY AS GRANTOR AND THE PEOPLE OF THE STATE OF ILLINOIS AS GRANTEE DATED MARCH 12, 1993, AND RECORDED MARCH 16, 1993 AS DOCUMENT NO. 9302247, PUBLIC RECORDS OF KENDALL COUNTY, STATE OF ILLINOIS. (PARCEL 1)

**RESPONSE: NOT PLOTTED. NOT ON AND DOES NOT TOUCH SURVEYED PROPERTY. (SUBORDINATION FOR IL 47)**

17. AN ORDINANCE AUTHORIZING THE EXECUTION OF AN ANNEXATION AND PLANNED UNIT DEVELOPMENT AGREEMENT, ORDINANCE NO. 2007–24, DATED FEBRUARY 27, 2007, AND RECORDED MAY 15, 2007 AS DOCUMENT NO. 200700015755, PUBLIC RECORDS OF KENDALL COUNTY, STATE OF ILLINOIS. (PARCEL 1)

**RESPONSE: NOT PLOTTED. NOT ON SURVEYED PROPERTY.**

## ALTA TABLE A NOTES:
## (CORRESPONDING NUMBERS COINCIDE WITH TABLE A ITEMS)

1. MONUMENTS TO BE SET AT ALL CORNERS OF THE SURVEYED PROPERTY, UNLESS ALREADY MARKED OR REFERENCED BY EXISTING MONUMENTS OR WITNESSES.
2. SITE ADDRESS: AMENT ROAD, YORKVILLE, IL 60560.
3. SURVEYED PARCELS ARE IN "ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN)" PER FLOOD INSURANCE RATE MAP NUMBER 17093C0125G WITH EFFECTIVE DATE FEBRUARY 4, 2009.
4. THE MEASURED ACREAGE OF EACH PARCEL IS AS SHOWN HEREON.
6. A ZONING REPORT OR LETTER NOT PROVIDED TO THE SURVEYOR.
7. THE EXTERIOR PORTION OF THE SHED SHOWN ON SURVEYED PROPERTY DIMENSIONED ON SHEET 2.
8. SUBSTANTIAL FEATURES OBSERVED IN THE PROCESS OF CONDUCTING THE SURVEY ARE SHOWN HEREON.

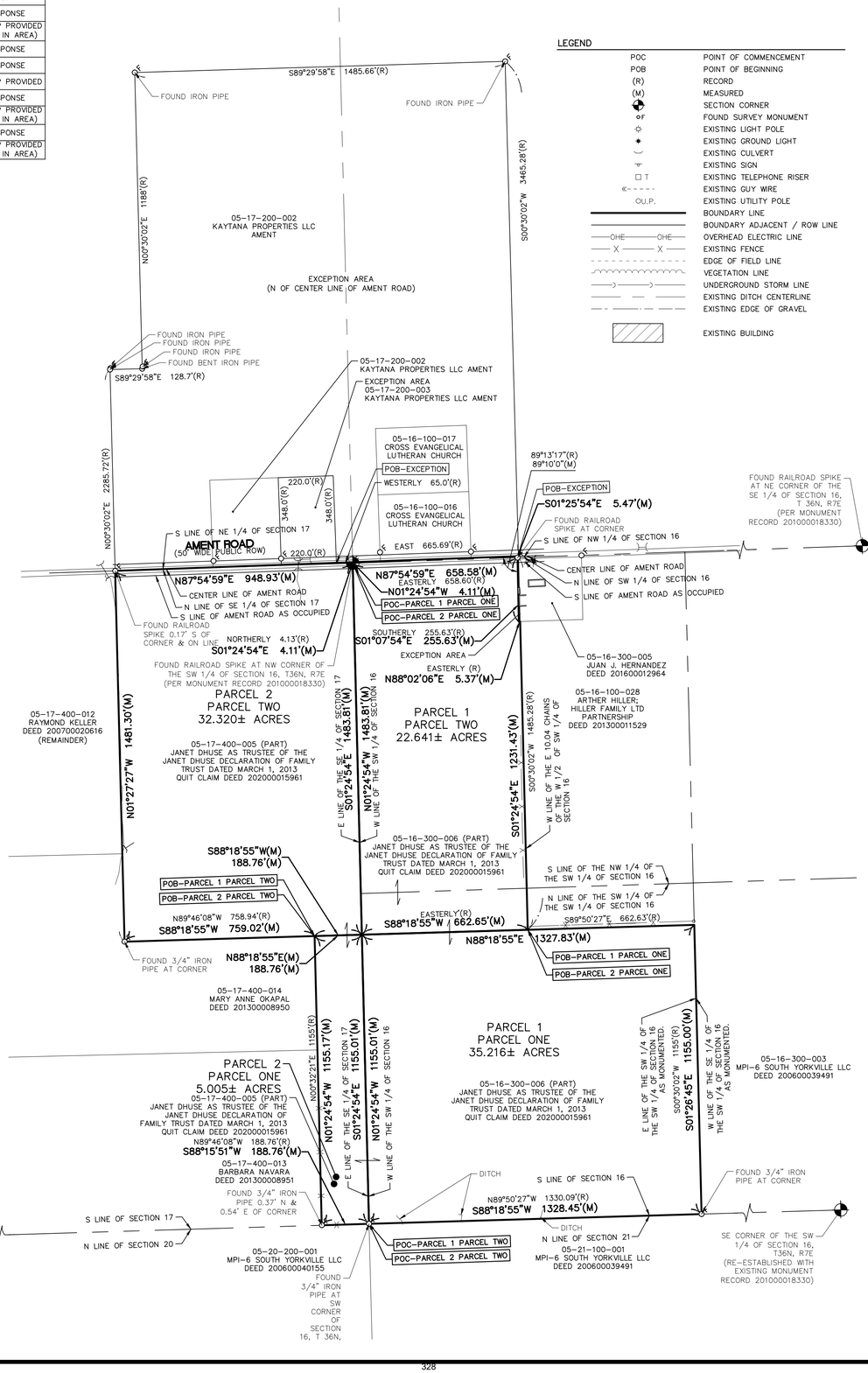
11a. NO PLANS AND/OR REPORTS OF UNDERGROUND UTILITIES EXISTING ON OR SERVING THE SURVEYED PROPERTY PROVIDED BY CLIENT. UNDERGROUND UTILITIES ARE SHOWN PER MAPS PROVIDED THROUGH AN 811 DESIGN STAGE TICKET (NUMBER X242501362–00X). SEE 811 UTILITIES TABLE FOR DETAILED INFORMATION REGARDING STATUS OF RESPONSES TO ONE CALL TICKET.

ADDITIONALLY, SURFACE EVIDENCE OF UTILITIES LYING WITHIN THE SURVEYED PROPERTY WERE LOCATED WHILE CONDUCTING THIS SURVEY AND ARE DEPICTED.

SURVEYOR MAKES NO GUARANTEE THAT THE UTILITIES SHOWN COMPRISE ALL UNMARKED AND/OR BURIED UTILITIES IN THE AREA, EITHER IN–SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE THE EXACT LOCATION INDICATED.

NOTE TO THE CLIENT, INSURER, AND LENDER – WITH REGARD TO TABLE A, ITEM 11, SOURCE INFORMATION FROM PLANS AND MARKINGS WILL BE COMBINED WITH OBSERVED EVIDENCE OF UTILITIES PURSUANT TO SECTION 5.E.IV. TO DEVELOP A VIEW OF THE UNDERGROUND UTILITIES. HOWEVER, LACKING EXCAVATION, THE EXACT LOCATION OF UNDERGROUND FEATURES CANNOT BE ACCURATELY, COMPLETELY, AND RELIABLY DEPICTED. IN ADDITION, IN SOME JURISDICTIONS, 811 OR OTHER SIMILAR UTILITY LOCATE REQUESTS FROM SURVEYORS MAY BE IGNORED OR RESULT IN AN INCOMPLETE RESPONSE, IN WHICH CASE THE SURVEYOR SHALL NOTE ON THE PLAT OR MAP HOW THIS AFFECTED THE SURVEYOR'S ASSESSMENT OF THE LOCATION OF THE UTILITIES. WHERE ADDITIONAL OR MORE DETAILED INFORMATION IS REQUIRED, THE CLIENT IS ADVISED THAT EXCAVATION AND/OR A PRIVATE UTILITY LOCATE REQUEST MAY BE NECESSARY.

13. NAMES OF ADJOINING OWNERS OR ADJOINING LANDS ARE SHOWN HEREON.
14. THE NORTHWEST CORNER OF THE SURVEYED PROPERTY IS LOCATED 1380' EAST OF THE INTERSECTION OF AMENT ROAD WITH IMMANUEL ROAD.
16. NO EVIDENCE OF RECENT EARTH MOVING WORK, BUILDING CONSTRUCTION, OR BUILDING ADDITIONS OBSERVED IN THE PROCESS OF CONDUCTING THE FIELD WORK.
17. THERE WAS NO INFORMATION OF PROPOSED CHANGES IN STREET RIGHT OF WAYS PROVIDED AND THERE WAS NO OBSERVED EVIDENCE OF RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS.
19. PROFESSIONAL LIABILITY INSURANCE IN THE REQUESTED AMOUNT OF HAS BEEN OBTAINED THROUGH THE DURATION OF THIS PROJECT.




## GENERAL NOTES

1. COMPARE ALL DISTANCES AND POINTS IN FIELD AND REPORT ANY DISCREPANCIES IN SAME TO SURVEYOR AT ONCE.
2. UTILITIES SHOWN HEREON ARE BY VISIBLE LOCATION OF ABOVE GROUND STRUCTURES, MARKS IN FIELD AND PROVIDED MAPS. UNDERGROUND UTILITIES MAY EXIST THAT ARE NOT SHOWN HEREON.
3. CALL 811 ("COMMON GROUND ALLIANCE" NATIONAL UNDERGROUND UTILITY LOCATOR SERVICE) FOR FIELD LOCATION OF UNDERGROUND UTILITY LINES PRIOR TO ANY DIGGING OR CONSTRUCTION.
4. NO DIMENSIONS SHOULD BE ASSUMED BY SCALING.

## LEGEND

| | |
|---|---|
| POC | POINT OF COMMENCEMENT |
| POB | POINT OF BEGINNING |
| (R) | RECORD |
| (M) | MEASURED |
| | SECTION CORNER |
| | FOUND SURVEY MONUMENT |
| | EXISTING LIGHT POLE |
| | EXISTING GROUND LIGHT |
| | EXISTING CULVERT |
| | EXISTING SIGN |
| T | EXISTING TELEPHONE RISER |
| | EXISTING GUY WIRE |
| | EXISTING UTILITY POLE |
| | BOUNDARY LINE |
| | BOUNDARY ADJACENT / ROW LINE |
| OHE OHE | OVERHEAD ELECTRIC LINE |
| X X | EXISTING FENCE |
| | EDGE OF FIELD LINE |
| | VEGETATION LINE |
| | UNDERGROUND STORM LINE |
| | EXISTING DITCH CENTERLINE |
| | EXISTING EDGE OF GRAVEL |
| | EXISTING BUILDING |

250 0 250 500 750

GRAPHIC SCALE
SCALE: 1"=250'

BASIS OF BEARING:
ILLINOIS STATE PLANE
EAST ZONE (NAD83)
2011 ADJUSTMENT

## LEGAL DESCRIPTION PER STEWART TITLE GUARANTY COMPANY COMMITMENT NUMBER: 23000373393–02, COMMITMENT DATE: AUGUST 5, 2024

VESTED IN: JANET DHUSE AS TRUSTEE OF THE JANET DHUSE DECLARATION OF FAMILY TRUST DATED MARCH 1, 2013

**PARCEL 1:**

PARCEL ID NO.: 05–16–300–006

58.0 ACRES, MORE OR LESS, BEING OUT OF SECTION 16, TOWNSHIP 36 NORTH, RANGE 7 EAST OF THE THIRD PRINCIPAL MERIDIAN, KENDALL COUNTY, ILLINOIS, AND BEING A PART OF THAT CERTAIN 93.4 ACRES, MORE OR LESS, OF LAND, AND SAID 58.0 ACRES BEING ALL OF THE 93.4 ACRES, MORE OR LESS, THAT LIES WITHIN THE LATERAL BOUNDARIES OF SAID SECTION 16, TOWNSHIP 36 NORTH, RANGE 7 EAST OF THE THIRD PRINCIPAL MERIDIAN, KENDALL COUNTY, ILLINOIS, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

THE SOUTHERLY 93.4 ACRES, MORE OR LESS, OF THE FOLLOWING DESCRIBED PARCELS 1 AND 2, SAID ACREAGE LYING SOUTH OF A LINE BEING THE CENTER OF AMENT ROAD:
*SURVEYOR'S NOTE: THIS PORTION OF THE LEGAL DESCRIPTION IS NOT FOUND WITHIN A VESTING DEED.

**PARCEL ONE**

THAT PART OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 16 AND PART OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 17, TOWNSHIP 36 NORTH, RANGE 7 EAST OF THE THIRD PRINCIPAL MERIDIAN DESCRIBED AS FOLLOWS: COMMENCING AT THE NORTHWEST CORNER OF THE SOUTHWEST QUARTER OF SAID SECTION 16; THENCE DUE EAST ALONG THE NORTH LINE OF SAID SOUTHWEST QUARTER, 665.69 FEET TO THE WEST LINE OF THE EAST 10.04 CHAINS OF THE WEST HALF OF THE WEST HALF OF SAID SECTION 16; THENCE SOUTH 0° 30' 2" WEST ALONG SAID WEST LINE 1485.28 FEET TO A LINE DRAWN PARALLEL WITH AND 1155 FEET NORTH OF, AS MEASURED ALONG THE EAST LINE OF THE SOUTHWEST QUARTER OF SAID SOUTHWEST QUARTER, THE SOUTH LINE OF SAID SOUTHWEST QUARTER FOR THE POINT OF BEGINNING; THENCE SOUTH 89° 50' 27" EAST ALONG SAID PARALLEL LINE 662.63 FEET TO THE EAST LINE OF SAID QUARTER QUARTER; THENCE SOUTH 0° 30' 2" WEST ALONG SAID EAST LINE 1155 FEET TO THE SOUTHEAST CORNER OF SAID QUARTER QUARTER; THENCE NORTH 89° 50' 27" WEST ALONG THE SOUTH LINE OF SAID QUARTER QUARTER 1330.09 FEET TO THE SOUTHWEST CORNER THEREOF; THENCE NORTH 89° 46' 8" WEST ALONG THE SOUTH LINE OF THE SOUTHEAST QUARTER OF SAID SECTION 17, 188.76 FEET; THENCE NORTH 0° 32' 21" EAST PARALLEL WITH THE EAST LINE OF SAID SOUTHEAST QUARTER, 1155 FEET; THENCE EASTERLY TO THE POINT OF BEGINNING IN THE TOWNSHIP OF KENDALL, KENDALL COUNTY, ILLINOIS.

**PARCEL TWO**

THAT PART OF THE WEST HALF OF SECTION 16 AND PART OF THE EAST HALF OF SECTION 17, TOWNSHIP 36 NORTH, RANGE 7 EAST OF THE THIRD PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS: COMMENCING AT THE SOUTHEAST CORNER OF SAID SECTION 17; THENCE NORTH 89° 46' 8" WEST ALONG THE SOUTH LINE OF SAID SECTION 17, 188.76 FEET; THENCE NORTH 0° 32' 21" EAST PARALLEL WITH THE EAST LINE OF SAID SECTION 17, 1155 FEET FOR THE POINT OF BEGINNING; THENCE NORTH 89° 46' 8" WEST PARALLEL WITH THE SOUTH LINE OF SAID SECTION 17, 758.94 FEET; THENCE NORTH 0° 30' 2" EAST PARALLEL WITH THE WEST LINE OF THE EAST 10.04 CHAINS OF THE WEST HALF OF THE WEST HALF OF SAID SECTION 16, 2285.72 FEET; THENCE SOUTH 89° 29' 58" EAST 128.7 FEET; THENCE NORTH 0° 30' 2" EAST PARALLEL WITH THE WEST LINE OF THE EAST 10.04 CHAINS OF THE WEST HALF OF THE WEST HALF OF SAID SECTION 16, 1188 FEET; THENCE SOUTH 89° 29' 58" EAST 1485.66 FEET TO THE WEST LINE OF THE EAST 10.04 CHAINS OF THE WEST HALF OF THE WEST HALF OF SAID SECTION 16; THENCE SOUTH 0° 30' 2" WEST ALONG SAID WEST LINE 3465.28 FEET TO A LINE DRAWN PARALLEL WITH AND1155 FEET NORTH OF THE SOUTH LINE OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SAID SECTION 16, AS MEASURED ALONG THE EAST LINE OF SAID QUARTER QUARTER; THENCE WESTERLY TO THE POINT OF BEGINNING; EXCEPTING THEREFROM THE FOLLOWING: THAT PART OF THE NORTHEAST QUARTER OF SECTION 17, TOWNSHIP 36 NORTH, RANGE 7 EAST OF THE THIRD PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS: COMMENCING AT THE SOUTHEAST CORNER OF SAID NORTHEAST QUARTER; THENCE NORTHERLY ALONG THE EAST LINE OF SAID NORTHEAST QUARTER, 4.13 FEET TO THE CENTER LINE OF AMENT ROAD; THENCE WESTERLY ALONG SAID CENTER LINE, 65.0 FEET FOR THE POINT OF BEGINNING; THENCE WESTERLY ALONG SAID CENTER LINE, 220.0 FEET; THENCE NORTHERLY AT RIGHT ANGLES TO SAID CENTER LINE, 348.0 FEET; THENCE EASTERLY PARALLEL WITH SAID CENTER LINE, 220.0 FEET; THENCE SOUTHERLY AT RIGHT ANGLES TO THE LAST DESCRIBED COURSE, 348.0 FEET TO THE POINT OF BEGINNING, IN KENDALL TOWNSHIP, KENDALL COUNTY, ILLINOIS; AND THAT PART OF THE SOUTHWEST QUARTER OF SECTION 16, TOWNSHIP 36 NORTH, RANGE 7 EAST OF THE THIRD PRINCIPAL MERIDIAN DESCRIBED AS FOLLOWS: COMMENCING AT THE NORTHWEST CORNER OF SAID SOUTHWEST QUARTER; THENCE EASTERLY ALONG THE NORTH LINE OF SAID SOUTHWEST QUARTER, 658.60 FEET FOR THE POINT OF BEGINNING; THENCE SOUTHERLY ALONG THE LINE OF A FENCE WHICH FORMS AN ANGLE OF 89° 13' 17" WITH THE LAST DESCRIBED COURSE (MEASURED COUNTER–CLOCKWISE THEREFROM) 255.63 FEET; THENCE EASTERLY PARALLEL WITH SAID NORTH LINE TO THE WEST LINE OF THE EASTERLY 10.04 CHAINS OF THE WEST HALF OF SAID SOUTHWEST QUARTER; THENCE NORTHERLY ALONG SAID WEST LINE TO SAID NORTH LINE; THENCE WESTERLY ALONG SAID NORTH LINE TO THE POINT OF BEGINNING, ALL IN THE TOWNSHIP OF KENDALL, KENDALL COUNTY, ILLINOIS.

**PARCEL 2:**

PARCEL ID NO.: 05–17–400–005

35.4 ACRES, MORE OR LESS, BEING OUT OF SECTION 17, TOWNSHIP 36 NORTH, RANGE 7 EAST OF THE THIRD PRINCIPAL MERIDIAN, KENDALL COUNTY, ILLINOIS, AND BEING A PART OF THAT CERTAIN 93.4 ACRES, MORE OR LESS, OF LAND, AND SAID 35.4 ACRES BEING ALL OF THE 93.4 ACRES, MORE OR LESS, THAT LIES WITHIN THE LATERAL BOUNDARIES OF SAID SECTION 17, TOWNSHIP 36 NORTH, RANGE 7 EAST OF THE THIRD PRINCIPAL MERIDIAN, KENDALL COUNTY, ILLINOIS, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

THE SOUTHERLY 93.4 ACRES, MORE OR LESS, OF THE FOLLOWING DESCRIBED PARCELS1 AND 2, SAID ACREAGE LYING SOUTH OF A LINE BEING THE CENTER OF AMENT ROAD:
*SURVEYOR'S NOTE: THIS PORTION OF THE LEGAL DESCRIPTION IS NOT FOUND WITHIN A VESTING DEED.

**PARCEL ONE**

THAT PART OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 16 AND PART OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 17, TOWNSHIP 36 NORTH, RANGE 7 EAST OF THE THIRD PRINCIPAL MERIDIAN DESCRIBED AS FOLLOWS: COMMENCING AT THE NORTHWEST CORNER OF THE SOUTHWEST QUARTER OF SAID SECTION 16; THENCE DUE EAST ALONG THE NORTH LINE OF SAID SOUTHWEST QUARTER, 665.69 FEET TO THE WEST LINE OF THE EAST 10.04 CHAINS OF THE WEST HALF OF THE WEST HALF OF SAID SECTION 16; THENCE SOUTH 0° 30' 2" WEST ALONG SAID WEST LINE 1485.28 FEET TO A LINE DRAWN PARALLEL WITH AND 1155 FEET NORTH OF, AS MEASURED ALONG THE EAST LINE OF THE SOUTHWEST QUARTER OF SAID SOUTHWEST QUARTER, THE SOUTH LINE OF SAID SOUTHWEST QUARTER FOR THE POINT OF BEGINNING; THENCE SOUTH 89° 50' 27" EAST ALONG SAID PARALLEL LINE 662.63 FEET TO THE EAST LINE OF SAID QUARTER QUARTER; THENCE SOUTH 0° 30' 2" WEST ALONG SAID EAST LINE 1155 FEET TO THE SOUTHEAST CORNER OF SAID QUARTER QUARTER; THENCE NORTH 89° 50' 27" WEST ALONG THE SOUTH LINE OF SAID QUARTER QUARTER 1330.09 FEET TO THE SOUTHWEST CORNER THEREOF; THENCE NORTH 89° 46' 8" WEST ALONG THE SOUTH LINE OF THE SOUTHEAST QUARTER OF SAID SECTION 17, 188.76 FEET; THENCE NORTH 0° 32' 21" EAST PARALLEL WITH THE EAST LINE OF SAID SOUTHEAST QUARTER, 1155 FEET; THENCE EASTERLY TO THE POINT OF BEGINNING IN THE TOWNSHIP OF KENDALL, KENDALL COUNTY, ILLINOIS.

**PARCEL TWO**

THAT PART OF THE WEST HALF OF SECTION 16 AND PART OF THE EAST HALF OF SECTION 17, TOWNSHIP 36 NORTH, RANGE 7 EAST OF THE THIRD PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS: COMMENCING AT THE SOUTHEAST CORNER OF SAID SECTION 17; THENCE NORTH 89° 46' 8" WEST ALONG THE SOUTH LINE OF SAID SECTION 17, 188.76 FEET; THENCE NORTH 0° 32' 21" EAST PARALLEL WITH THE EAST LINE OF SAID SECTION 17, 1155 FEET FOR THE POINT OF BEGINNING; THENCE NORTH 89° 46' 8" WEST PARALLEL WITH THE SOUTH LINE OF SAID SECTION 17, 758.94 FEET; THENCE NORTH 0° 30' 2" EAST PARALLEL WITH THE WEST LINE OF THE EAST 10.04 CHAINS OF THE WEST HALF OF THE WEST HALF OF SAID SECTION 16, 2285.72 FEET; THENCE SOUTH 89° 29' 58" EAST 128.7 FEET; THENCE NORTH 0° 30' 2" EAST PARALLEL WITH THE WEST LINE OF THE EAST 10.04 CHAINS OF THE WEST HALF OF THE WEST HALF OF SAID SECTION 16, 1188 FEET; THENCE SOUTH 89° 29' 58" EAST 1485.66 FEET TO THE WEST LINE OF THE EAST 10.04 CHAINS OF THE WEST HALF OF THE WEST HALF OF SAID SECTION 16; THENCE SOUTH 0° 30' 2" WEST ALONG SAID WEST LINE 3465.28 FEET TO A LINE DRAWN PARALLEL WITH AND1155 FEET NORTH OF THE SOUTH LINE OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SAID SECTION 16, AS MEASURED ALONG THE EAST LINE OF SAID QUARTER QUARTER; THENCE WESTERLY TO THE POINT OF BEGINNING; EXCEPTING THEREFROM THE FOLLOWING: THAT PART OF THE NORTHEAST QUARTER OF SECTION 17, TOWNSHIP 36 NORTH, RANGE 7 EAST OF THE THIRD PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS: COMMENCING AT THE SOUTHEAST CORNER OF SAID NORTHEAST QUARTER; THENCE NORTHERLY ALONG THE EAST LINE OF SAID NORTHEAST QUARTER, 4.13 FEET TO THE CENTER LINE OF AMENT ROAD; THENCE WESTERLY ALONG SAID CENTER LINE, 65.0 FEET FOR THE POINT OF BEGINNING; THENCE WESTERLY ALONG SAID CENTER LINE, 220.0 FEET; THENCE NORTHERLY AT RIGHT ANGLES TO SAID CENTER LINE, 348.0 FEET; THENCE EASTERLY PARALLEL WITH SAID CENTERLINE, 220.0 FEET; THENCE SOUTHERLY AT RIGHT ANGLES TO THE LAST DESCRIBED COURSE, 348.0 FEET TO THE POINT OF BEGINNING, IN KENDALL TOWNSHIP, KENDALL COUNTY, ILLINOIS; AND THAT PART OF THE SOUTHWEST QUARTER OF SECTION 16,TOWNSHIP 36 NORTH, RANGE 7 EAST OF THE THIRD PRINCIPAL MERIDIAN DESCRIBED AS FOLLOWS: COMMENCING AT THE NORTHWEST CORNER OF SAID SOUTHWEST QUARTER; THENCE EASTERLY ALONG THE NORTH LINE OF SAID SOUTHWEST QUARTER, 658.60 FEET FOR THE POINT OF BEGINNING; THENCE SOUTHERLY ALONG THE LINE OF A FENCE WHICH FORMS AN ANGLE OF 89° 13' 17" WITH THE LAST DESCRIBED COURSE (MEASURED COUNTER–CLOCKWISE THEREFROM) 255.63 FEET; THENCE EASTERLY PARALLEL WITH SAID NORTH LINE TO THE WEST LINE OF THE EASTERLY 10.04 CHAINS OF THE WEST HALF OF SAID SOUTHWEST QUARTER; THENCE NORTHERLY ALONG SAID WEST LINE TO SAID NORTH LINE; THENCE WESTERLY ALONG SAID NORTH LINE TO THE POINT OF BEGINNING ,ALL IN THE TOWNSHIP OF KENDALL, KENDALL COUNTY, ILLINOIS.

STATE OF ILLINOIS )
) SS
COUNTY OF DUPAGE )

CERTIFIED TO: STEWART TITLE GUARANTY COMPANY;
AMENT ROAD SOLAR 1, LLC

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 & b

# ALTA/NSPS LAND TITLE SURVEY

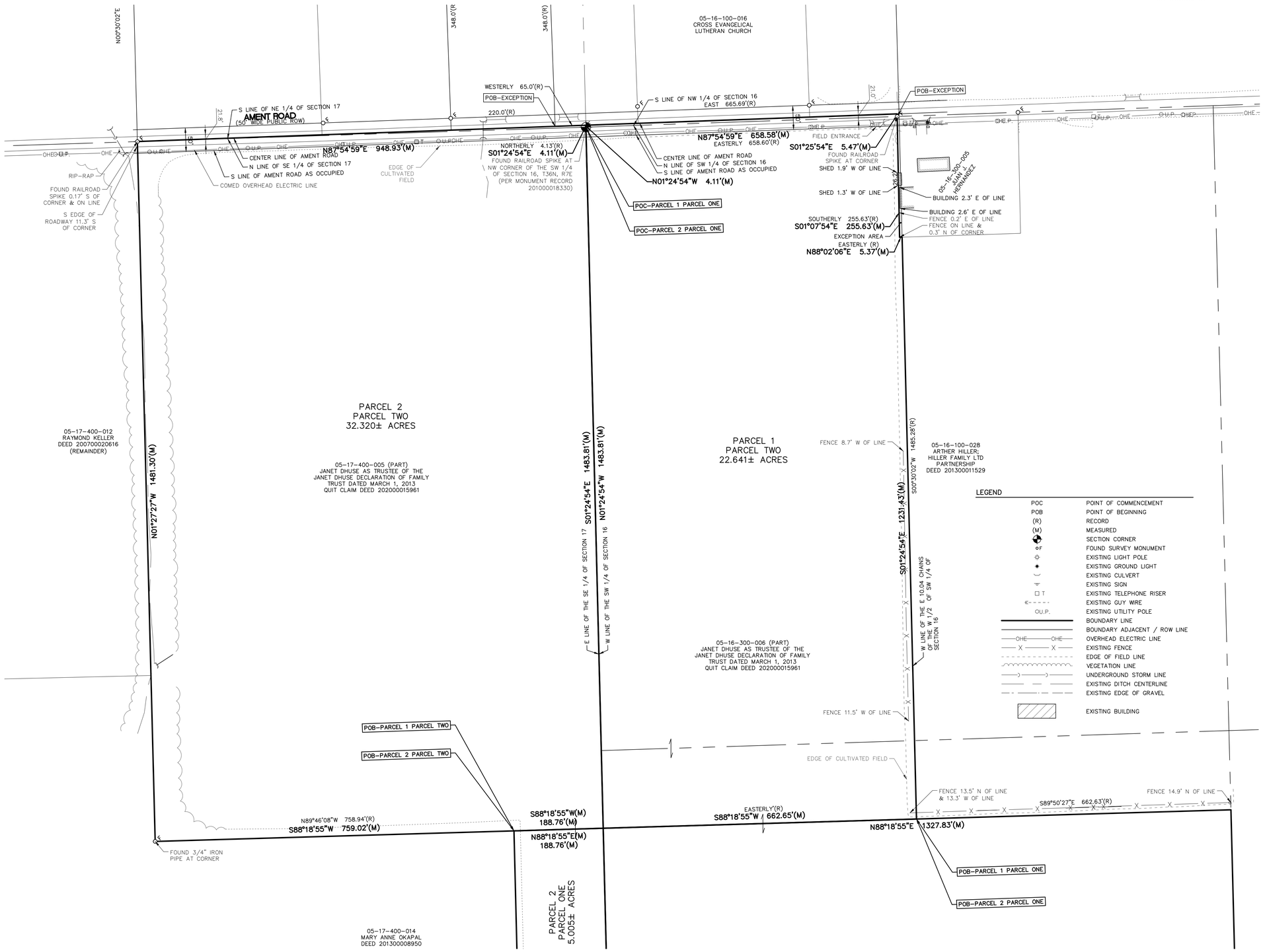
OF

PART OF SECTIONS 16 & 17 TOWNSHIP 36 NORTH, RANGE 7, EAST OF THE THIRD PRINCIPAL MERIDIAN, IN KENDALL COUNTY, ILLINOIS

100 0 100 200 300

GRAPHIC SCALE
SCALE: 1"=100'

BASIS OF BEARING:
ILLINOIS STATE PLANE
EAST ZONE (NAD83)
2011 ADJUSTMENT




SEE SHEET 3

LEGEND

| | |
|---|---|
| POC | POINT OF COMMENCEMENT |
| POB | POINT OF BEGINNING |
| (R) | RECORD |
| (M) | MEASURED |
| | SECTION CORNER |
| O F | FOUND SURVEY MONUMENT |
| | EXISTING LIGHT POLE |
| | EXISTING GROUND LIGHT |
| | EXISTING CULVERT |
| | EXISTING SIGN |
| T | EXISTING TELEPHONE RISER |
| | EXISTING GUY WIRE |
| O.U.P. | EXISTING UTILITY POLE |
| | BOUNDARY LINE |
| | BOUNDARY ADJACENT / ROW LINE |
| OHE OHE | OVERHEAD ELECTRIC LINE |
| X X | EXISTING FENCE |
| | EDGE OF FIELD LINE |
| | VEGETATION LINE |
| | UNDERGROUND STORM LINE |
| | EXISTING DITCH CENTERLINE |
| | EXISTING EDGE OF GRAVEL |
| | EXISTING BUILDING |

811 Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

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866.850.4200 www.atwell-group.com
1250 EAST DIEHL ROAD, SUITE 300
NAPERVILLE, IL 60563
DESIGN FIRM #184-005876

SECTION 16 & 17
TOWN 36 NORTH, RANGE 7 EAST
KENDALL TOWNSHIP
KENDALL COUNTY, ILLINOIS

CLIENT
AMENT ROAD SOLAR 1, LLC

ALTA/NSPS LAND TITLE SURVEY
AMENT ROAD

DATE
10/7/2024

REVISIONS
10/17/2024 CLIENT COMMENTS
--
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SCALE 0 50 100
1" = 100 FEET
DR. MJF | CH. BDE
P.M. S. ADAMS
BOOK 319
JOB 2300239BAS-01
SHEET NO.
2 OF 3

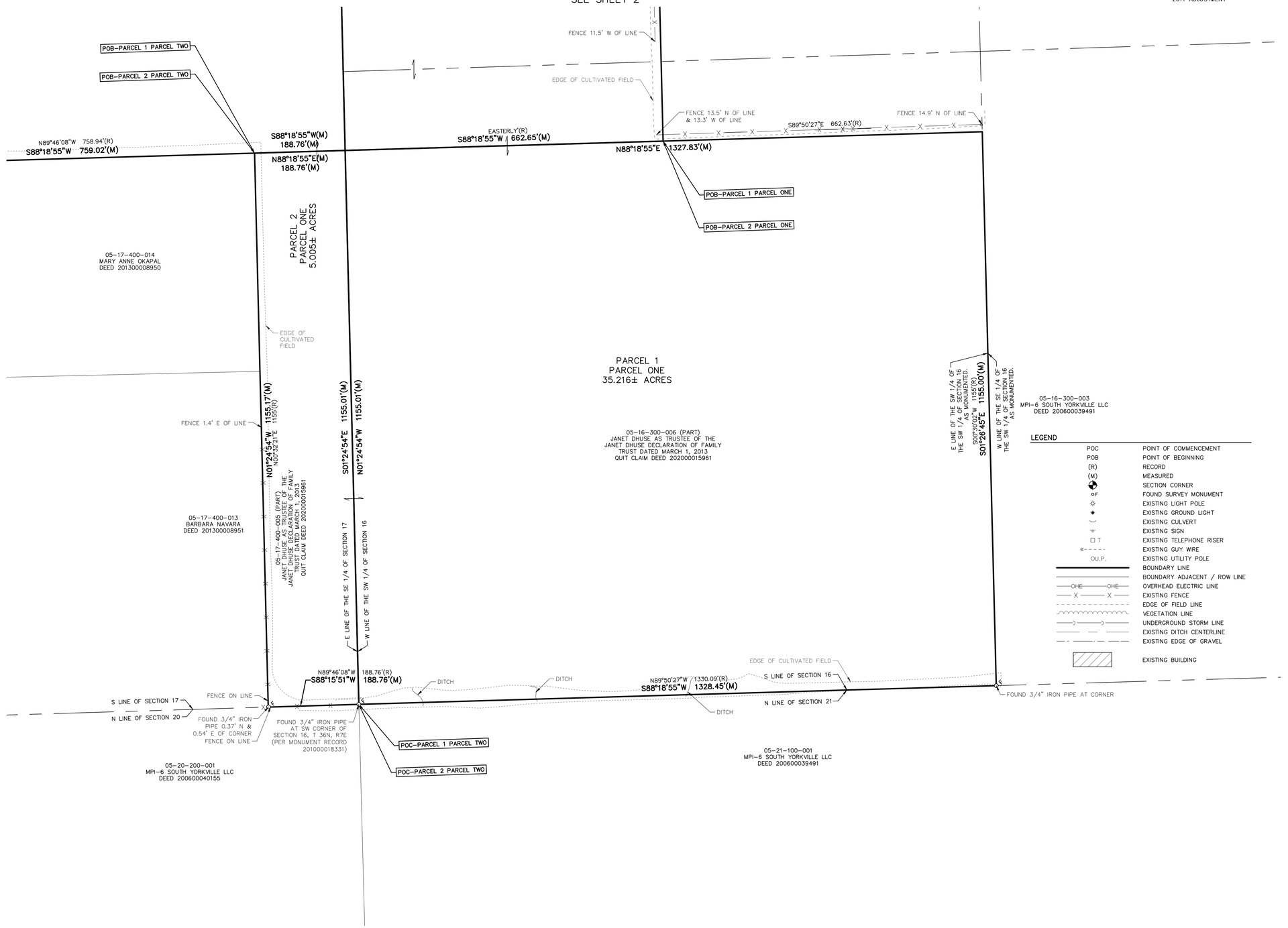
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# ALTA/NSPS LAND TITLE SURVEY

OF

PART OF SECTIONS 16 & 17 TOWNSHIP 36 NORTH, RANGE 7, EAST OF THE THIRD PRINCIPAL MERIDIAN, IN KENDALL COUNTY, ILLINOIS




## LEGEND

| | |
|---|---|
| POC | POINT OF COMMENCEMENT |
| POB | POINT OF BEGINNING |
| (R) | RECORD |
| (M) | MEASURED |
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| O.U.P. | EXISTING UTILITY POLE |
| | BOUNDARY LINE |
| | BOUNDARY ADJACENT / ROW LINE |
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| X X | EXISTING FENCE |
| | EDGE OF FIELD LINE |
| | VEGETATION LINE |
| | UNDERGROUND STORM LINE |
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| | EXISTING BUILDING |

811 Know what's **below.** **Call** before you dig.

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866.850.4200 www.atwell-group.com
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NAPERVILLE, IL 60563
DESIGN FIRM #184-005876

SECTION 16 & 17
TOWN 36 NORTH, RANGE 7 EAST
KENDALL TOWNSHIP
KENDALL COUNTY, ILLINOIS

CLIENT
AMENT ROAD SOLAR 1, LLC

ALTA/NSPS LAND TITLE SURVEY
AMENT ROAD

DATE
10/7/2024

REVISIONS
10/17/2024 CLIENT COMMENTS
--
--

SCALE 0 50 100
1" = 100 FEET
DR. MJF CH. BDE
P.M. S. ADAMS
BOOK 319
JOB 23002398AS-01
SHEET NO.
3 OF 3

CAD FILE: 23002398AS-01.DWG

L:\ATWELL\DWG\23002398\CAD\SURVEY\23002398AS-01.dwg, 10/17/2024 8:31 AM, BEN ADAMS

# SPECIAL USE PERMIT SET

## AMENT ROAD - KENDALL IL
## KENDALL COUNTY, IL
## 4.990 MWAC STC RATED SOLAR ELECTRIC SYSTEM

## GENERAL NOTES

1. AS CONTAINED HEREIN, "CONTRACTOR" IS ASSUMED TO BE THE EPC PROVIDER HIRED BY THE SYSTEM/PROJECT OWNER.
2. WHEN THERE IS A CONFLICT BETWEEN THESE GENERAL NOTES AND THE DRAWINGS, THE DRAWINGS SHALL GOVERN.
3. ALL WORK SHALL CONFORM TO THE MINIMUM STANDARDS OF THE FOLLOWING: LOCAL BUILDING CODE, LOCAL ELECTRICAL CODE, ANY OTHER REGULATING AGENCIES WHICH HAVE AUTHORITY OVER ANY PORTION OF THE WORK AND THOSE CODES AND STANDARDS LISTED IN THESE DRAWINGS.
4. THESE DRAWINGS SHALL NOT BE USED FOR CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEVELOPING A CONSTRUCTION LEVEL DESIGN AND ASSOCIATED DRAWINGS AND DETAILS.
5. COORDINATE THESE DRAWINGS WITH SPECIFICATIONS AND MANUFACTURER INSTALLATION AND OPERATION MANUALS.
6. UNLESS OTHERWISE NOTED, THE DESIGN REPRESENTED ON THESE PLANS IS BASED ON THE INFORMATION AND CRITERIA LISTED IN THE "BASIS OF DESIGN" SECTION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY SUCH INFORMATION IN PREPARATION OF THE CONSTRUCTION DESIGN.
7. THE EXISTING CONDITIONS REPRESENTED ON THESE PLANS ARE BASED ON PUBLICLY AVAILABLE INFORMATION AND THE SITE DISCOVERY SUMMARIZED IN THESE DRAWINGS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE ACCURACY OF SUCH INFORMATION AND SUPPLEMENT WITH ANY ADDITIONAL REQUIRED INFORMATION.
8. UNLESS INDICATED AS EXISTING (E), ALL PROPOSED MATERIALS AND EQUIPMENT SHALL BE CONSIDERED TO BE NEW.
9. ALL EQUIPMENT AND COMPONENTS SHALL BE MOUNTED IN COMPLIANCE WITH THE MANUFACTURER'S REQUIREMENTS, CONSTRUCTION DETAILS, AND/OR PRUDENT INDUSTRY STANDARDS.
10. TO THE EXTENT THAT TREES AND OTHER FEATURES AFFECT THE SYSTEM'S PRODUCTION, SUCH PRODUCTION MODELING IS BASED ON THE EXISTING APPROXIMATE HEIGHTS AND LOCATIONS RELATIVE TO THE SYSTEM AND MAY BE IMPACTED AS TREES GROW AND OTHER FEATURES CHANGE.

## PROJECT SCOPE

THIS PROJECT CONSISTS OF THE INSTALLATION OF SOLAR MODULES PER THE SYSTEM DESCRIPTION, BELOW. THE MODULES WILL BE INSTALLED ON A GROUND MOUNTED RACKING SYSTEM. THE MODULES WILL BE WIRED IN SERIES STRINGS AND CONNECTED IN PARALLEL TO THE INVERTER(S), WHICH CONVERT THE PHOTOVOLTAIC OUTPUT POWER FROM DC TO AC. THE SOLAR ELECTRIC SYSTEM WILL BE INTERCONNECTED WITH THE EXISTING SITE ELECTRICAL SYSTEM IN ACCORDANCE WITH THE APPLICABLE ELECTRICAL CODE AND COM ED REQUIREMENTS.

## SYSTEM DESCRIPTION

| | | | |
|---|---|---|---|
| MODULES | ASTRONERGY | SYSTEM SIZE (KWAC) | 4990 KWAC |
| STC RATING (W) | 7,734 WDC | INVERTER(S) | (20) SOLECTRIA 250 XGI |
| RACKING | ATI DURATRACK | CEC EFFICIENCY | 93.5 % |
| AZIMUTH | 180 | TILT ANGLE | 52 |

## SPECIAL INSPECTIONS

| GENERAL CONSTRUCTION SPECIAL INSPECTIONS | CODE/SECTION |
|---|---|
| 1. FIRE RESISTANT PENETRATIONS AND JOINTS | BC 1704.27 |
| 2. ENERGY CODE COMPLIANCE INSPECTIONS | BC 110.3.5 |
| FINAL | |

## LOCATION MAP




## AERIAL VIEW




## DRAWING LIST

| Sheet Number | Sheet Title |
|---|---|
| T-1.0 | TITLE PAGE |
| | CIVIL |
| C-0.0 | CIVIL NOTES |
| C-1.0 | EXISTING CONDITIONS PLAN |
| C-2.0 | LAYOUT AND MATERIALS PLAN |
| C-3.0 | GRADING AND EROSION CONTROL PLAN |
| C-4.0 | CIVIL DETAILS IL |
| C-5.0 | LANDSCAPE PLAN |
| C-5.1 | LANDSCAPE NOTES & DETAILS |
| C-5.2 | DRAIN TILE NOTES & DETAILS |

## APPLICABLE CODES AND STANDARDS

2008 NATIONAL ELECTRICAL CODE
INTERNATIONAL BUILDING CODE
UL-1703 – SOLAR MODULES
UL-1741 – INVERTERS, COMBINER BOXES
UL-2703 – RACKING MOUNTING SYSTEMS AND CLAMPING DEVICES FOR PV MODULES

## PROJECT DIRECTORY

SYSTEM / PROJECT OWNER
AMENT ROAD SOLAR 1, LLC
[redacted]

LAND OWNER / HOST
JANET DHUSE
[redacted]

AUTHORITY HAVING JURISDICTION
KENDALL COUNTY PLANNING, BUILDING, & ZONING DEPARTMENT
111 W FOX STREET
YORKVILLE, IL 60560

UTILITY
COM ED

CIVIL ENGINEER
FIRM: ATWELL, LLC
CONTACT: MICHAEL KEITH, P.E.
PHONE: [redacted]

## GENERAL ABBREVIATIONS

| | |
|---|---|
| (E) | EXISTING |
| AHJ | AUTHORITY HAVING JURISDICTION |
| AL | ALUMINUM |
| APPROX | APPROXIMATE |
| ARY | ARRAY |
| BLDG | BUILDING |
| NLE | NEW LEAF ENERGY |
| CL | CENTERLINE |
| DAS | DATA ACQUISITION SYSTEM |
| DIA | DIAMETER |
| DO | DITTO |
| EW | EAST-WEST |
| ESS | ENERGY STORAGE SYSTEM |
| ESU | ENERGY STORAGE UNIT |
| FBO | FURNISHED BY OTHERS |
| FF | FORWARD FACING |
| GALV | GALVANIZED |
| HDG | HOT DIP GALVANIZED |
| HVAC | HEATING VENTILATION AND AIR CONDITIONING |
| ID | INSIDE DIAMETER |
| MFR | MANUFACTURER |
| MOD | SOLAR MODULE |
| NS | NORTH-SOUTH |
| NTS | NOT TO SCALE |
| OAE | OR APPROVED EQUAL |
| OC | ON CENTER |
| OD | OUTSIDE DIAMETER |
| OFCI | OWNER FURNISHED CONTRACTOR INSTALLED |
| PCS | POWER CONVERSION SYSTEM |
| PV | PHOTOVOLTAIC |
| PVC | POLY VINYL CHLORIDE |
| SCH | SCHEDULE |
| SS | STAINLESS STEEL |
| SSS | SOLAR SUPPORT STRUCTURE |
| STC | STANDARD TEST CONDITIONS |
| TBD | TO BE DETERMINED |
| TP | TAMPER PROOF |
| TYP | TYPICAL |
| UON | UNLESS OTHERWISE NOTED |
| VIF | VERIFY IN FIELD |
| WP | WEATHER PROOF |

REV 1.0

## BASIS OF DESIGN

BOUNDARY & TOPOGRAPHIC SURVEY:
WILLIAMS AND WORKS
JUNE 2024

WETLAND STREAM AND DELINEATION REPORT:
ENCAP INCORPORATED
JULY 2023 & JUNE 2024

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SPECIAL USE PERMIT SET
AMENT ROAD- KENDALL IL

PROJECT NUMBER:
22-4525

| REV | DATE | DRAWN | CHECKED | RELEASE LEVEL |
|---|---|---|---|---|
| | 08/29/24 | CMP | MBK | SPECIAL USE PERMIT SET |
| | 09/13/24 | CMP | MBK | SPECIAL USE PERMIT SET |
| 1 | 10/17/24 | CMP | MBK | SPECIAL USE PERMIT SET REV 1 |
| | 12/19/24 | CMP | MBK | SUP SET - COUNTY COMMENTS |
| | 01/14/25 | CMP | MBK | SUP SET - COUNTY COMMENTS |

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T-1.0
TITLE PAGE

# GENERAL CIVIL NOTES

APPROVALS

1. SPECIAL USE PERMIT DATED: IN PROGRESS.

GENERAL NOTES

1. AS CONTAINED HEREIN, "CONTRACTOR" IS ASSUMED TO BE THE EPC PROVIDER HIRED BY THE SYSTEM OWNER. "SUBCONTRACTOR" IS THE EPC PROVIDER'S INSTALLATION SUBCONTRACTORS (INCLUDING SITE WORK SUBCONTRACTOR) AND CIVIL ENGINEER OF RECORD (CEOR) IS THE EPC PROVIDER'S DESIGNATED CIVIL ENGINEER.
2. EXISTING CONDITIONS SURVEY INFORMATION WAS PREPARED BY WILLIAMS & WORKS PERFORMED ON APRIL 18, 2023 UPDATED JUNE 18, 2024. BEARINGS ARE BASED ON NAD83 ILLINOIS STATE PLANE, EAST ZONE, US FOOT. DISTANCES ARE SHOWN SCALED TO GROUND. CSF = 0.99994688 1/CSF = 1.000053123
3. THERE IS NO GUARANTEE THAT ALL THE EXISTING UTILITIES, WHETHER FUNCTIONAL OR ABANDONED WITHIN THE PROJECT LIMITS ARE ON THIS DRAWING. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL UNDERGROUND UTILITIES BEFORE STARTING WORK AND SHALL BE RESPONSIBLE FOR ALL DAMAGE RESULTING FROM THIS WORK. PRIOR TO THE START OF ANY SITE DEMOLITION OR CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES FOR ONSITE LOCATIONS OF EXISTING UTILITIES.
4. THE LOCATION, SIZE, DEPTH, AND SPECIFICATIONS FOR CONSTRUCTION OF PRIVATE UTILITY SERVICES SHALL BE INSTALLED ACCORDING TO THE REQUIREMENTS PROVIDED BY, AND APPROVED BY, THE RESPECTIVE ELECTRIC UTILITY COMPANY. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF THE UTILITY CONNECTIONS WITH THE RESPECTIVE COMPANIES PRIOR TO ANY UTILITY CONSTRUCTION.
5. THE SUBCONTRACTORS SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD AND REPORT TO THE CONTRACTOR.
6. CITY, COUNTY, AND STATE APPROVALS SHALL BE KEPT ON SITE AT ALL TIMES.
7. PRIOR TO CONSTRUCTING THE SITE ENTRANCES ONTO AMENT ROAD, THE CONTRACTOR SHALL OBTAIN A HIGHWAY/DRIVEWAY PERMIT FROM THE APPLICABLE AHJ.
8. SUBCONTRACTOR(S) SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL CONSTRUCTION DOCUMENTS, SPECIFICATIONS, AND SITE CONDITIONS PRIOR TO BIDDING AND PRIOR TO CONSTRUCTION.
9. ANY DISCREPANCIES BETWEEN DRAWINGS, SPECIFICATIONS, AND SITE CONDITIONS SHALL BE REPORTED IMMEDIATELY TO THE CONTRACTOR/CEOR FOR CLARIFICATION AND RESOLUTION PRIOR TO BIDDING OR CONSTRUCTION.
10. AREAS USED AS FOR PARKING DURING CONSTRUCTION SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITIONS INCLUDING, BUT NOT LIMITED TO, REGRADING, LOAMING AND SEEDING. IN NO CASE SHALL PARKING AREAS, LAYDOWN AREAS, CONSTRUCTION TRAILERS, AND PORTABLE TOILETS BE LOCATED WITHIN A WETLAND RESOURCE AREA AND/OR ANY BUFFER ZONES.

SITE PREPARATION NOTES

1. AREAS DESIGNATED FOR TREE CUTTING SHALL BE CUT ONLY. NO GRUBBING OR STRIPPING OF TOPSOIL IS NECESSARY UNLESS SPECIFICALLY SHOWN OTHERWISE AND APPROVAL HAS BEEN GIVEN BY THE CONTRACTOR.
2. TREE CLEARING AND STUMP REMOVAL SHALL BE IN ACCORDANCE WITH APPROVED LOCAL, STATE, AND FEDERAL PERMITS. TREES TO BE REMOVED SHALL BE MARKED BY THE CONTRACTOR'S PROJECT MANAGER OR SITE SUPERINTENDENT PRIOR TO COMMENCEMENT OF WORK ON-SITE.
3. SEASONAL TREE CLEARING RESTRICTIONS MAY BE REQUIRED FOR ENDANGERED SPECIES PROTECTION. THE CONTRACTOR SHALL REFER TO THE TREE CLEARING PLAN FOR ANY RESTRICTIONS.
4. THE SUBCONTRACTOR(S) IS/ARE RESPONSIBLE FOR ANY DAMAGE TO EXISTING SITE CONDITIONS TO REMAIN THAT ARE DUE TO SUBCONTRACTOR(S) OPERATIONS.
5. ITEMS TO BE REMOVED THAT ARE NOT STOCKPILED FOR LATER REUSE ON THE PROJECT OR DELIVERED TO THE OWNER SHALL BE LEGALLY DISPOSED OF OFF SITE BY THE SUBCONTRACTOR(S).
6. THE SUBCONTRACTOR(S) SHALL BE RESPONSIBLE FOR COORDINATING THEIR EFFORTS WITH ALL TRADES.
7. THE SUBCONTRACTOR(S) SHALL COORDINATE ALL ADJUSTMENT OR ABANDONMENT OF UTILITIES WITH THE RESPECTIVE UTILITY COMPANY.
8. TEMPORARY CONSTRUCTION HAUL ROADS SHALL BE USED DURING CONSTRUCTION IF DEEMED NECESSARY BY THE CONTRACTOR. THE USE OF SEPARATION FABRICS SHALL BE USED TO FACILITATE FUTURE REMOVAL AND RECOVERY OF GRANULAR MATERIALS. HAUL ROADS SHALL BE MAINTAINED DURING CONSTRUCTION WITH APPROPRIATE EROSION CONTROL AND STORMWATER REDUCTION MEASURES. ONCE REMOVED, THE SUB-BASE AREA SHOULD BE DECOMPACTED WITH A YORK RAKE, LOAM REPLACED, AND RESEEDED.
9. THE SITE ACCESS ROADS ARE DESIGNED TO MEET STATE FIRE CODE FOR FIRE TRUCK ACCESS. MEANS AND METHODS FOR ACCOMMODATING LARGER CONSTRUCTION DELIVERY VEHICLES MUST BE DETERMINED BY THE CONTRACTOR.
10. THE PROPOSED ROAD DESIGN SHOWN IN THESE PLANS SHALL BE CONSIDERED THE FINAL DESIGN CONDITION. ADDITIONAL MEANS AND METHODS OF CONSTRUCTION DEEMED NECESSARY BY THE OWNER OR CONTRACTOR SHALL BE DESIGNED BY OTHERS AND INCLUDED IN THE INITIAL EPC BID PRICE (INCLUDING, BUT NOT LIMITED TO: TEMPORARY HAUL ROADS, WIDENED OR LENGTHENED ROADS AND TURN OUT AREAS FOR LARGER CONSTRUCTION AND DELIVERY VEHICLES, TEMPORARY PARKING AND LAYDOWN AREAS, MODIFIED GRADING TO SUPPORT CONSTRUCTION AND DELIVERY VEHICLES, ETC.).

EROSION AND SEDIMENT CONTROL MEASURES

1. A SPDES PERMIT SHALL BE IN PLACE PRIOR TO COMMENCING ANY EARTH DISTURBANCE.
2. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY SITE EXCAVATION OR DISTURBANCE AND SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PROCESS. THE SMALLEST PRACTICAL AREA OF LAND SHALL BE EXPOSED AT ANY ONE TIME.
3. SEDIMENT BARRIERS SHALL BE INSPECTED AND APPROVED BY KENDALL COUNTY OR THEIR REPRESENTATIVE AND THE CONTRACTOR/CEOR BEFORE CONSTRUCTION BEGINS.
4. STRAW BALES AND MULCH SHALL BE MOWINGS OF ACCEPTABLE HERBACEOUS GROWTH, FREE OF NOXIOUS WEEDS OR WOODY STEMS, AND SHALL BE DRY WHEN INSTALLED.
5. DISTURBED AREAS SHALL BE BLANKETED OR SEEDED AND MULCHED AS SOON AS PRACTICAL AFTER CONSTRUCTION ACTIVITIES IN THAT AREA HAVE CONCLUDED. ALL ERODABLE/BARE AREAS SHALL BE BLANKETED OR SEEDED AND MULCHED WITHIN 7 DAYS WITH TEMPORARY EROSION CONTROL SEEDING.
6. PRIOR TO SEEDING, ACCESS AISLES, TEMPORARY STAGING, STORAGE, AND PARKING AREAS ARE TO BE DE-COMPACTED AND RESTORED PER THE SWPPP.
7. SEDIMENT BARRIERS SHALL BE CONSTRUCTED AROUND ALL SOIL STOCKPILE AREAS.
8. CLEAN OUT PROJECT DRAINAGE FEATURES AND STRUCTURES (I.E. CULVERTS, BASINS, SWALES, ETC.) AFTER COMPLETION OF CONSTRUCTION.
9. SEDIMENT COLLECTED DURING CONSTRUCTION BY THE VARIOUS EROSION CONTROL SYSTEMS SHALL BE DISPOSED OF ON THE SITE ON A REGULAR BASIS. SEDIMENT SHALL BE REMOVED FROM EROSION CONTROL SYSTEMS WHEN THE HEIGHT OF THE SEDIMENT EXCEEDS ONE-HALF OF THE HEIGHT OF THE SEDIMENT CONTROL MEASURE.
10. AFTER ALL DISTURBED AREAS HAVE BEEN FULLY STABILIZED, THE SUBCONTRACTOR(S) SHALL REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AT THE CONTRACTOR/CEOR DIRECTION.
11. AFTER THE REMOVAL OF TEMPORARY EROSION CONTROL MEASURES, THE SUBCONTRACTOR(S) SHALL GRADE AND SEED AREA OF TEMPORARY EROSION CONTROL MEASURE.
12. DAMAGED OR DETERIORATED EROSION AND SEDIMENT CONTROL ITEMS WILL BE REPAIRED IMMEDIATELY AFTER IDENTIFICATION OR AS DIRECTED BY THE CONTRACTOR/CEOR.
13. THE TRAINED CONTRACTOR SHALL INSPECT EROSION AND SEDIMENT CONTROL PRACTICES AND POLLUTION PREVENTION MEASURES BEING IMPLEMENTED WITHIN THE ACTIVE WORK AREA DAILY TO ENSURE THAT THEY ARE BEING MAINTAINED IN EFFECTIVE OPERATING CONDITION AT ALL TIMES. IF DEFICIENCIES ARE IDENTIFIED, THE CONTRACTOR SHALL BEGIN IMPLEMENTING CORRECTIVE ACTIONS WITHIN ONE BUSINESS DAY AND SHALL COMPLETE THE CORRECTIVE ACTIONS IN A REASONABLE TIME FRAME.
14. THE OWNER/OPERATOR SHALL HAVE THE QUALIFIED INSPECTOR CONDUCT INSPECTIONS ONCE EVERY SEVEN CALENDAR DAYS FOR SITE DISTURBANCES LESS THAN FIVE ACRES.
15. PIPE OUTLETS (IF ANY) SHALL BE STABILIZED WITH STONE. REFER TO DETAILS.
16. WATER PUMPED OR OTHERWISE DISCHARGED FROM THE SITE DURING CONSTRUCTION DEWATERING SHALL BE DISCHARGED TO AN APPROPRIATE SEDIMENT TRAPPING DEVICE.
17. WHEN TEMPORARY DRAINAGE IS ESTABLISHED, EROSION/SEDIMENTATION CONTROL MEASURES MAY BE REQUIRED BY CONTRACTOR/CEOR.
18. GRAVEL ROADS, ACCESS DRIVES, PARKING AREAS OF SUFFICIENT WIDTH AND LENGTH, AND VEHICLE WASH DOWN FACILITIES, SHALL BE PROVIDED TO PREVENT SOIL FROM BEING TRACKED ONTO PUBLIC OR PRIVATE ROADWAYS. ANY SOIL REACHING A PUBLIC OR PRIVATE ROADWAY SHALL BE REMOVED BEFORE THE END OF EACH WORKDAY.
19. NECESSARY MEASURES SHALL BE TAKEN TO CONTAIN ANY FUEL OR POLLUTION RUNOFF. NO RE-FUELING SHALL OCCUR WITHIN 100 FEET OF ANY WETLAND RESOURCE AREA AND 200 FEET FROM RIVERFRONT. LEAKING EQUIPMENT OR SUPPLIES SHALL BE IMMEDIATELY REPAIRED OR REMOVED FROM THE SITE.
20. THE COST OF REPAIRING EROSION CONTROL MEASURES OR REMOVING SEDIMENT FROM EROSION CONTROL SYSTEMS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR THE APPLICABLE EROSION CONTROL ITEM.
21. EROSION CONTROL MEASURES SHALL BE KEPT OPERATIONAL AND MAINTAINED CONTINUOUSLY THROUGHOUT THE PERIOD OF LAND DISTURBANCE UNTIL PERMANENT SEDIMENT AND EROSION CONTROL MEASURES ARE OPERATIONAL.
22. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT DUST FROM FORMING.
23. EROSION CONTROL MEASURES AS SHOWN ON THESE DRAWINGS IS INTENDED TO CONVEY MINIMUM REQUIREMENTS. THE CONTRACTOR SHALL IMPLEMENT ADDITIONAL MEASURES AS NECESSARY TO PREVENT SOIL EROSION AND TO COMPLY WITH THE PROJECT'S SPDES PERMIT STORMWATER POLLUTION PREVENTION PLAN.
24. THE NATURE OF THE CONSTRUCTION ACTIVITY WILL BE THE CONSTRUCTION OF A SOLAR FARM. THE NAME OF THE RECEIVING WATER IS MIDDLE AUX SABLE CREEK. THE TOTAL AREA OF THE SITE IS 35.65 ACRES. THE TOTAL AREA OF THE SITE THAT IS EXPECTED TO BE DISTURBED BY EXCAVATION, GRADING, OR OTHER ACTIVITIES IS 39.32 ACRES.
25. THE EXISTING SITE CONSISTS OF ROW CROP FARMLAND THAT IS ALREADY CLEARED. THERE WILL BE NO SIGNIFICANT GRADING ACTIVITIES AS PART OF THIS PROJECT. ANY OFF-SITE TRIBUTARY AREAS THAT WILL CAUSE RUNOFF TO THE PROJECT SITE WILL NOT ADVERSELY AFFECT THE AREA.
26. DUST CONTROL MEASURES WILL BE PROVIDED PER ILLINOIS URBAN MANUAL PRACTICE STANDARD CODE 825.

LAYOUT AND MATERIAL NOTES

1. THE CONTRACTOR SHALL HAVE PERIMETER FENCE, ELECTRICAL TRENCHES, AND RACKING STAKED OUT BY A LICENSED LAND SURVEYOR PRIOR TO ANY INSTALLATION OF RACKING OR TRENCHES.
2. EXCESS TRENCH MATERIAL SHALL BE PLACED ON THE SIDES OF THE TRENCH AND PLACED AT OR NEAR THE SAME LOCATION AS WHERE EXCAVATED. AFTER TRENCH HAS BEEN BACKFILLED TOPSOIL REMOVED SHALL BE PLACED ON TOP AND LIGHTLY COMPACTED.
3. SUBCONTRACTOR SHALL INSTALL CONDUITS FOR ALL ELECTRIC CONDUIT CROSSINGS PRIOR TO INSTALLATION OF THE GEOGRID MATERIAL. THE GEOGRID SHALL NOT BE HORIZONTALLY CUT ONCE INSTALLED.

GRADING NOTES

1. WHERE PROPOSED GRADES MEET EXISTING GRADES, SUBCONTRACTOR(S) SHALL BLEND GRADES TO PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING AND NEW WORK. PONDING AT TRANSITION AREAS WILL NOT BE ALLOWED.
2. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM ALL BUILDING FOUNDATIONS, STRUCTURES, PUBLIC ROADWAYS, AND ELECTRICAL EQUIPMENT AREAS.

PLANTING NOTES

1. THE LANDSCAPE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE ALL PLANTINGS SHOWN ON THE DRAWINGS.
2. MATERIALS SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION.
3. PLANTS SHALL BEAR THE SAME RELATIONSHIP TO FINISH GRADE AS TO ORIGINAL GRADES BEFORE DIGGING.
4. PLANTS TO BE BALLED IN BURLAP OR CONTAINERIZED.
5. PLANT SIZE AND QUANTITY SHALL NOT CHANGE WITHOUT APPROVAL OF CONTRACTOR/CEOR.

# ABBREVIATIONS

| | |
|---|---|
| BIT | BITUMINOUS |
| BMP | BEST MANAGEMENT PRACTICE |
| BVW | BORDERING VEGETATED WETLANDS |
| CB | CONCRETE BOUND |
| CONC | CONCRETE |
| CMP | CORRUGATED METAL PIPE |
| CPP | CORRUGATED PLASTIC PIPE |
| DH | DRILL HOLE |
| DIP | DUCTILE IRON PIPE |
| DMH | DRAIN MANHOLE |
| ECB | EROSION CONTROL BARRIER |
| FES | FLARED END SECTION |
| FH | FIRE HYDRANT |
| FND | FOUND |
| GG | GAS GATE |
| HDPE | HIGH-DENSITY POLYETHYLENE |
| HW | HEADWALL |
| ILSF | ISOLATED LANDS SUBJECT TO FLOODING |
| IP | IRON PIPE |
| ISW | ISOLATED WETLANDS (FEDERAL JURISDICTION) |
| LA | LANDSCAPED AREA |
| LOW | LIMIT OF WORK |
| N/F | NOW OR FORMERLY |
| NTS | NOT TO SCALE |
| OCS | OUTLET CONTROL STRUCTURE |
| OHW | OVERHEAD WIRE |
| RCP | REINFORCED CONCRETE PIPE |
| RET | RETAINING |
| ROW | RIGHT-OF-WAY |
| SB | STONE BOUND |
| TEL | TELEPHONE CABLE |
| TYP | TYPICAL |
| UP | UTILITY POLE |
| WG | WATER GATE |

REV 1.1

# LEGEND

- ROAD (GRAVEL)
- FENCE LINE
- PROPERTY LINE
- FLOW DIRECTION
- BANK LINE/FLAG (WF 4)
- WETLAND LINE/FLAG (WF 4)
- (E) MAJOR CONTOUR (100)
- (E) MINOR CONTOUR (99)
- PROPOSED MAJOR CONTOUR (100)
- PROPOSED MINOR CONTOUR (99)
- WETLAND BUFFER ZONE (WTB)
- RIVERFRONT AREA (RFA)
- 100-YEAR FLOOD HAZARD AREA (FHA)
- TREELINE
- SILT FENCE (SF)
- SILT SOCK
- STORM PIPE (STM)
- DITCH/SWALE
- ELECTRICAL TRENCH (E)
- OVERHEAD ELECTRIC (E)
- SEWER LINE (SAN)
- WATER LINE (W)
- GAS MAIN (G)
- APPROX. LOCATION OF EXISTING DRAIN TILE
- 23-23A ASSESSORS MAP-LOT
- SIGN
- UTILITY POLE (WITH GUY ANCHOR)
- HYDRANT
- WATER VALVE
- INDIVIDUAL TREE
- FOUND REBAR PROPERTY MARKERS

NOTE: ITALIC FONTS INDICATE EXISTING CONDITIONS.
STANDARD FONTS INDICATE PROPOSED CONDITIONS.

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SPECIAL USE PERMIT SET
AMENT ROAD- KENDALL IL

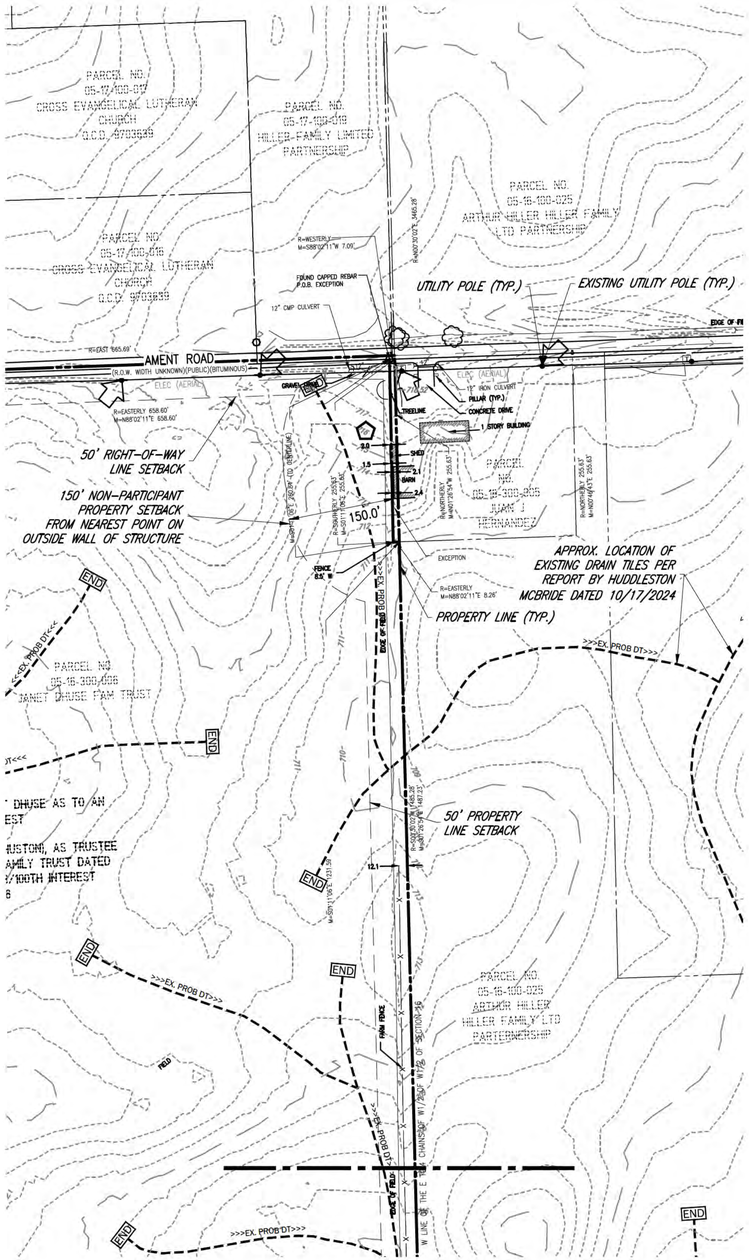
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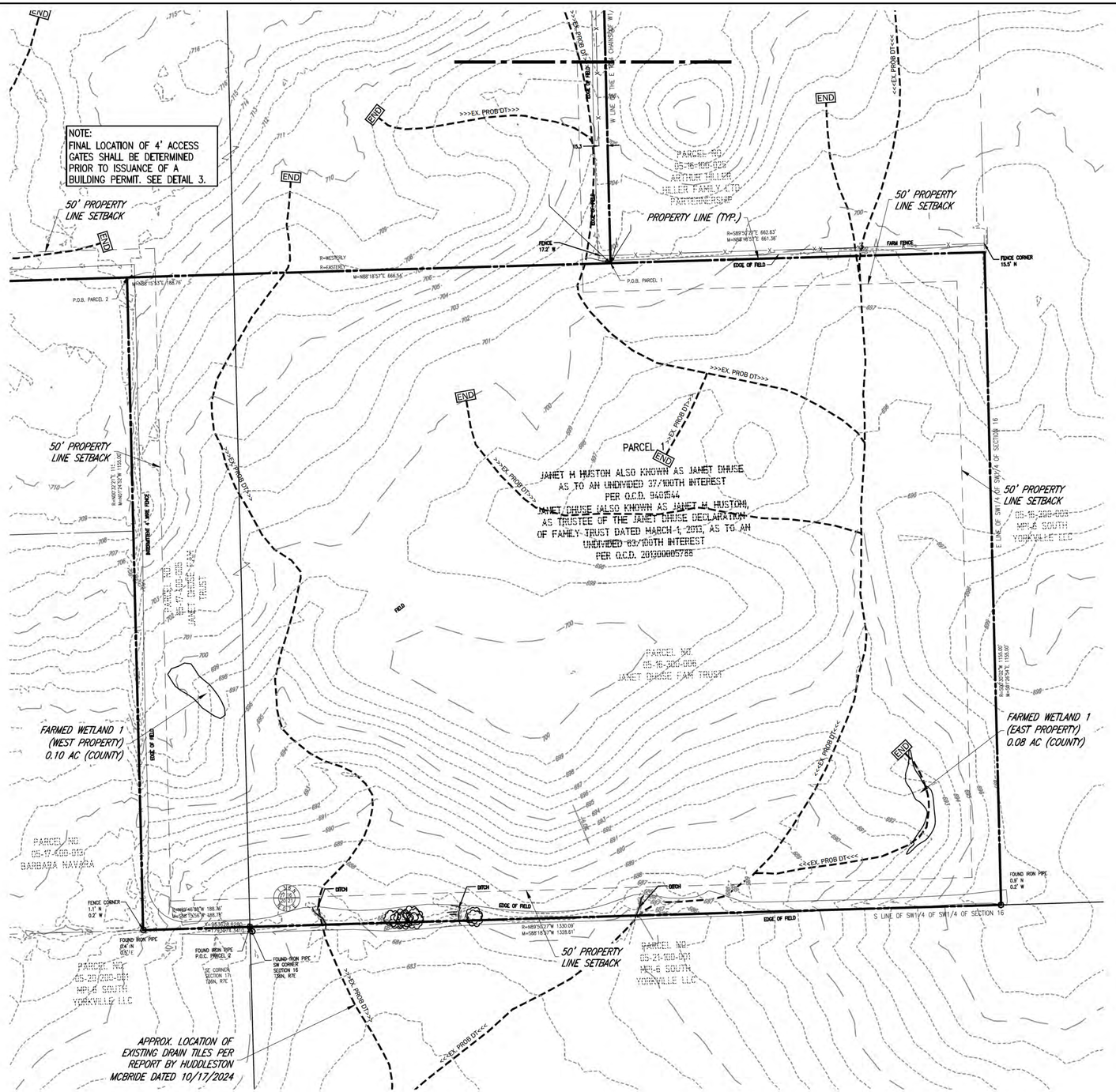
| REV | DATE | DRAWN | CHECKED | RELEASE LEVEL |
|---|---|---|---|---|
| | 08/29/24 | CMP | MBK | SPECIAL USE PERMIT SET |
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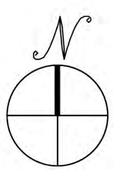
SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

C-0.0

CIVIL NOTES



# EXISTING CONDITIONS PLAN

SCALE: 1" = 100'

0 100' 200'

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SPECIAL USE PERMIT SET
AMENT ROAD- KENDALL IL

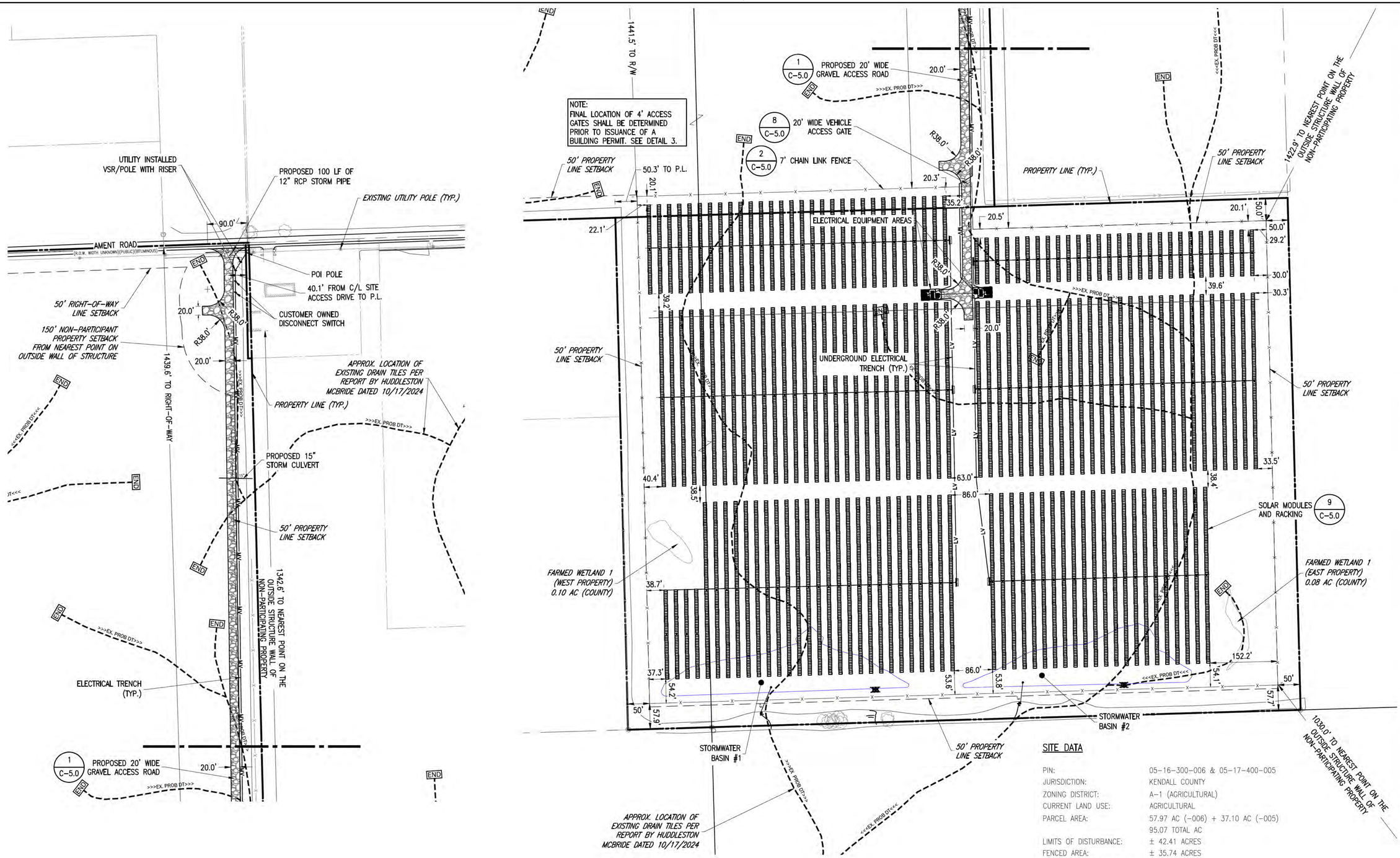
PROJECT NUMBER: 22-4525

| REV | DATE | DRAWN | CHECKED | RELEASE LEVEL |
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SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

C-1.0

EXISTING CONDITIONS PLAN




# LAYOUT AND MATERIALS PLAN

SCALE: 1" = 100'

0 100' 200'

## SITE DATA

| | |
|---|---|
| PIN: | 05-16-300-006 & 05-17-400-005 |
| JURISDICTION: | KENDALL COUNTY |
| ZONING DISTRICT: | A-1 (AGRICULTURAL) |
| CURRENT LAND USE: | AGRICULTURAL |
| PARCEL AREA: | 57.97 AC (-006) + 37.10 AC (-005) 95.07 TOTAL AC |
| LIMITS OF DISTURBANCE: | ± 42.41 ACRES |
| FENCED AREA: | ± 35.74 ACRES |
| EXISTING IMPERVIOUS AREA: | ± 0.04 ACRES |
| NEW IMPERVIOUS AREA: | ± 0.97 ACRES |
| FEMA FLOOD HAZARD: | ZONE X PER FIRM MAP #17093C0125G DATED 02/04/2009 |

| SETBACK REQUIREMENT* | REQUIRED | PROVIDED |
|---|---|---|
| OCCUPIED BLDG (NON-PARTICIPANT) | 150' | 1,030' |
| BOUNDARY LINES (PARTICIPANT) | N/A | N/A |
| BOUNDARY LINES (NON-PARTICIPANT) | 50' | 50' |
| PUBLIC ROAD RIGHTS-OF-WAY | 50' | 1,440' |
| MAXIMUM HEIGHT | 20' | 9' |

* SETBACK REQUIREMENTS ARE FOR ALL COMPONENTS OF A SOLAR ARRAY FACILITY, INCLUDING FENCES.

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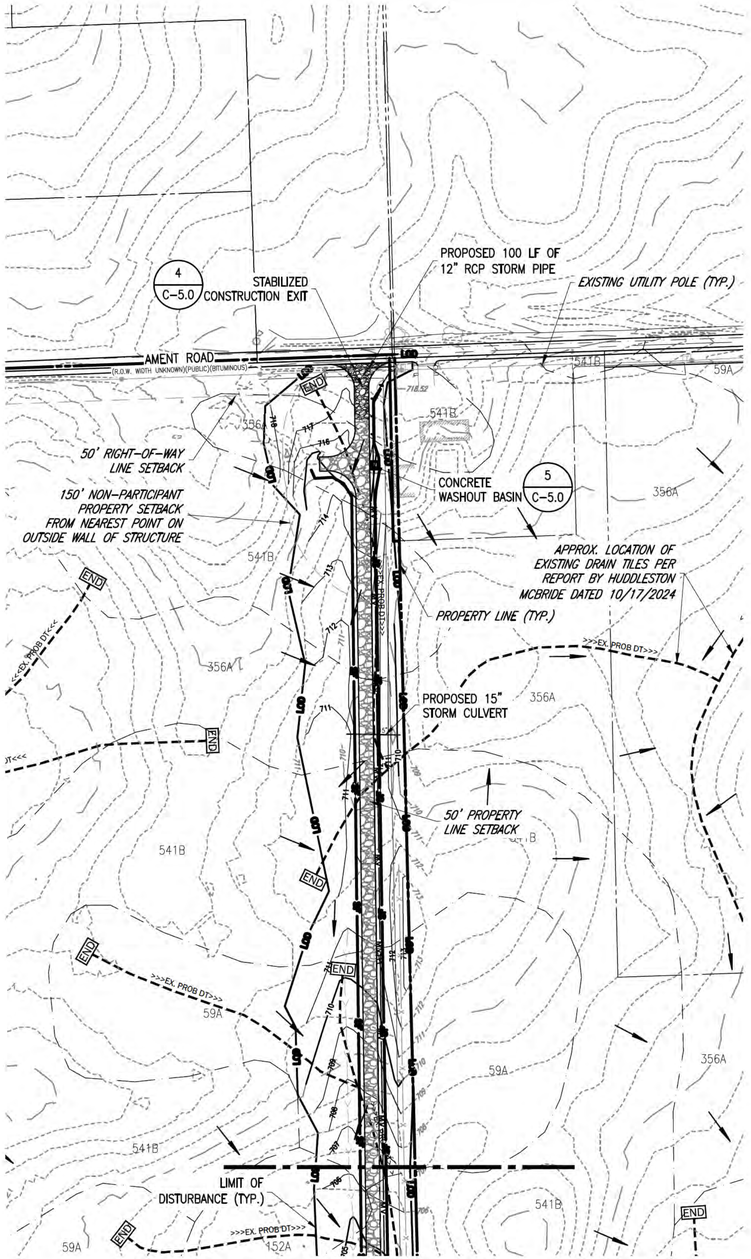
SPECIAL USE PERMIT SET
AMENT ROAD- KENDALL IL

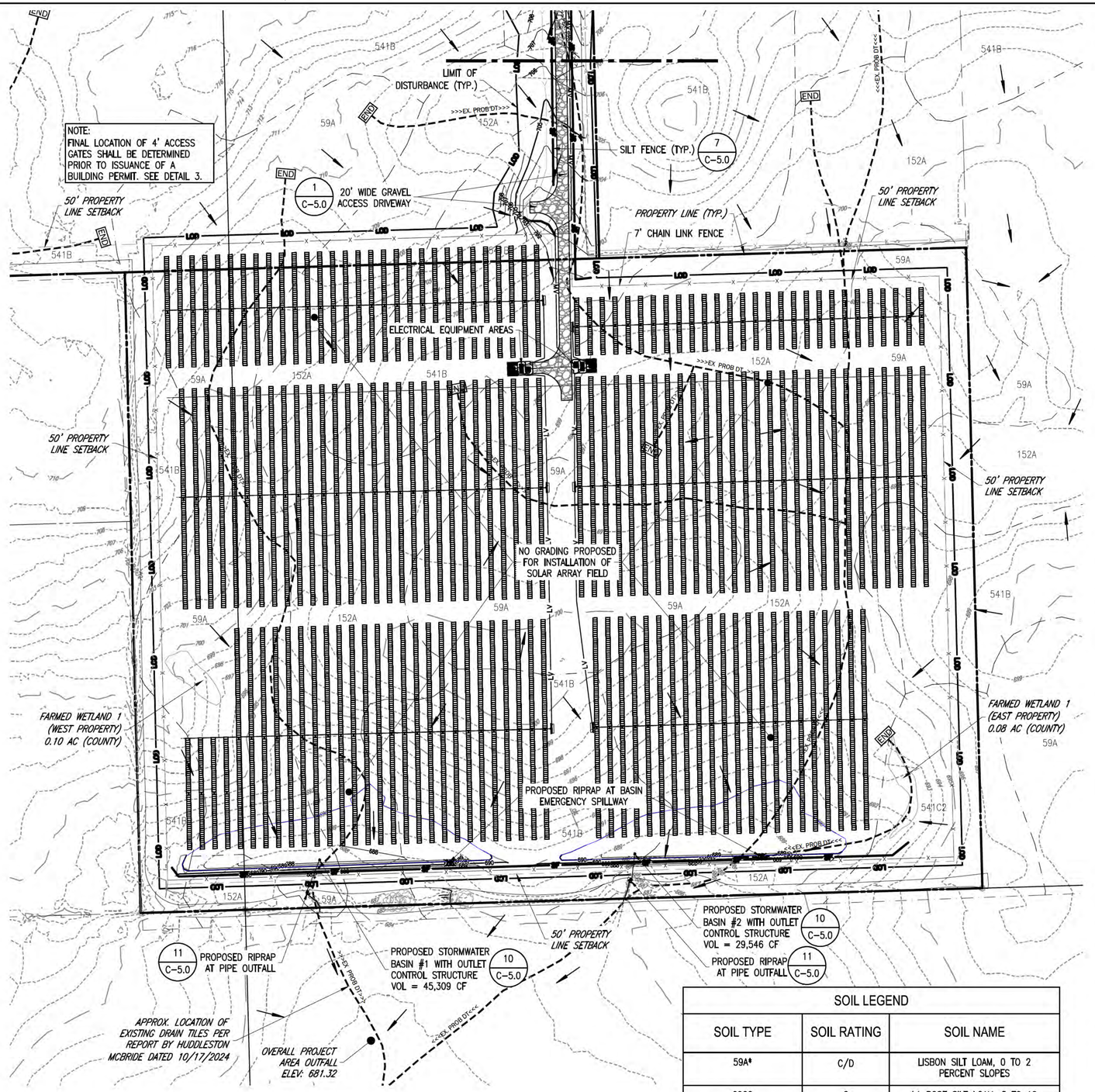
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C-2.0
LAYOUT AND MATERIALS PLAN




| LAND USE OR COVERTYPE | AVERAGE CURVE NUMBER | IMPERVIOUS SQUARE FOOTAGE |
|---|---|---|
| PRE-DEVELOPMENT | 88 | 0.41 AC |
| POST DEVELOPMENT | 84 | 1.38 AC |
| | CHANGE | +/- 0.97 AC |

| SOIL LEGEND | | |
|---|---|---|
| SOIL TYPE | SOIL RATING | SOIL NAME |
| 59A* | C/D | LISBON SILT LOAM, 0 TO 2 PERCENT SLOPES |
| 60C2 | C | LA ROSE SILT LOAM, 5 TO 10 PERCENT SLOPES, ERODED |
| 152A* | B/D | DRUMMER SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES |
| 356A* | B/D | ELPASO SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES |
| 541B* | C | GRAYMONT SILT LOAM, 2 TO 5 PERCENT SLOPES |
| 541C2* | C | GRAYMONT SILT LOAM, 5 TO 10 PERCENT SLOPES, ERODED |

* DENOTES SOIL TYPES WITHIN PROJECT LIMITS OF DISTURBANCE (LOD).

# GRADING AND EROSION CONTROL PLAN

SCALE: 1" = 100'

0 100' 200'

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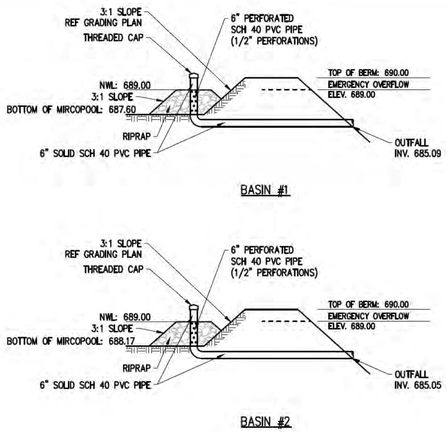
SPECIAL USE PERMIT SET
AMENT ROAD- KENDALL IL

PROJECT NUMBER: 22-4525

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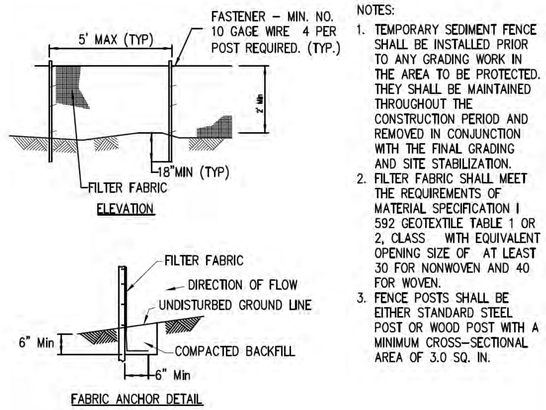
SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

C-3.0
GRADING AND EROSION CONTROL PLAN




## 10 STORMWATER OUTLET CONTROL STRUCTURE

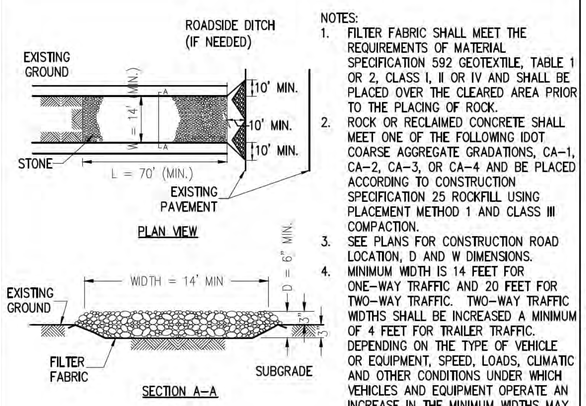
SCALE: N.T.S.




NOTES:
1. TEMPORARY SEDIMENT FENCE SHALL BE INSTALLED PRIOR TO ANY GRADING WORK IN THE AREA TO BE PROTECTED. THEY SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD AND REMOVED IN CONJUNCTION WITH THE FINAL GRADING AND SITE STABILIZATION.
2. FILTER FABRIC SHALL MEET THE REQUIREMENTS OF MATERIAL SPECIFICATION I 592 GEOTEXTILE TABLE 1 OR 2, CLASS WITH EQUIVALENT OPENING SIZE OF AT LEAST 30 FOR NONWOVEN AND 40 FOR WOVEN.
3. FENCE POSTS SHALL BE EITHER STANDARD STEEL POST OR WOOD POST WITH A MINIMUM CROSS–SECTIONAL AREA OF 3.0 SQ. IN.

## 7 SILT FENCE

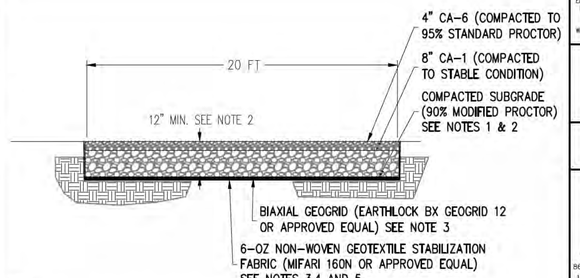
SCALE: NTS




NOTES:
1. FILTER FABRIC SHALL MEET THE REQUIREMENTS OF MATERIAL SPECIFICATION 592 GEOTEXTILE, TABLE 1 OR 2, CLASS I, II OR IV AND SHALL BE PLACED OVER THE CLEARED AREA PRIOR TO THE PLACING OF ROCK.
2. ROCK OR RECLAIMED CONCRETE SHALL MEET ONE OF THE FOLLOWING IDOT COARSE AGGREGATE GRADATIONS, CA–1, CA–2, CA–3, OR CA–4 AND BE PLACED ACCORDING TO CONSTRUCTION SPECIFICATION 25 ROCKFILL USING PLACEMENT METHOD 1 AND CLASS III COMPACTION.
3. SEE PLANS FOR CONSTRUCTION ROAD LOCATION, D AND W DIMENSIONS.
4. MINIMUM WIDTH IS 14 FEET FOR ONE–WAY TRAFFIC AND 20 FEET FOR TWO–WAY TRAFFIC. TWO–WAY TRAFFIC WIDTHS SHALL BE INCREASED A MINIMUM OF 4 FEET FOR TRAILER TRAFFIC. DEPENDING ON THE TYPE OF VEHICLE OR EQUIPMENT, SPEED, LOADS, CLIMATIC AND OTHER CONDITIONS UNDER WHICH VEHICLES AND EQUIPMENT OPERATE AN INCREASE IN THE MINIMUM WIDTHS MAY BE REQUIRED.
5. ROADWAY SHALL FOLLOW THE CONTOUR OF THE NATURAL TERRAIN TO THE EXTENT POSSIBLE.

## 4 STABILIZED CONSTRUCTION ENTRANCE

SCALE: NTS

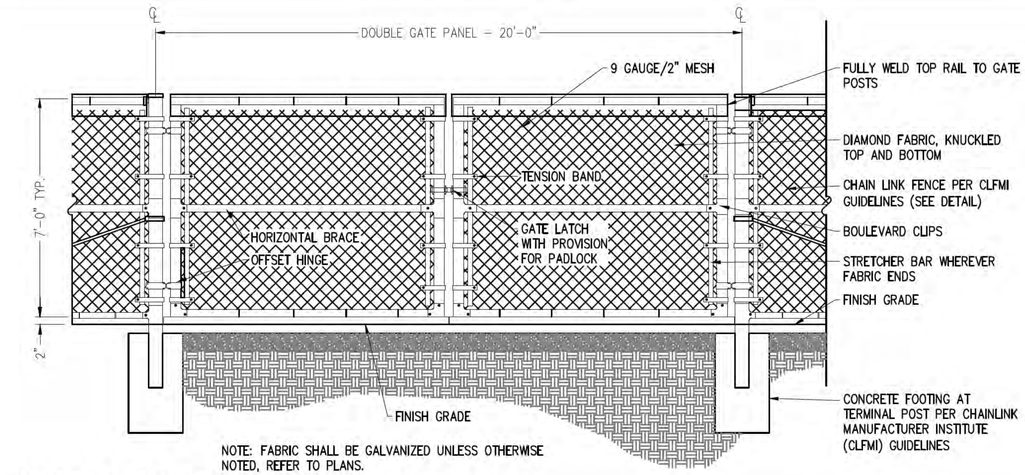



NOTES:
1. SUBCONTRACTOR SHALL EXCAVATE TO SUITABLE MATERIAL FOR SUBGRADE.
2. SUBCONTRACTOR SHALL COMPACT SUBGRADE TO PROVIDE SUITABLE SURFACE TO PLACE ROAD. REFER TO GEOTECHNICAL REPORT FOR SUBGRADE PREPERATION CRITERIA.
3. SUBCONTRACTOR SHALL FOLLOW MANUFACTURER INSTALLATION PROCEDURES.
4. WHERE OVERLAPPING OF GEOTEXTILE FABRIC IS REQUIRED, SUBCONTRACTOR SHALL OVERLAP A MINIMUM OF 24".
5. SUBCONTRACTOR SHALL REMOVE TEMPORARY CONSTRUCTION ACCESS ROADS, AND RESTORE TO PRE–CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE CEOR AND THE GOVERNING AGENCIES.

## 1 GRAVEL ACCESS ROAD

SCALE: NTS

XD_CIVIL_GRAVEL_ROAD.ai 04-30-2018

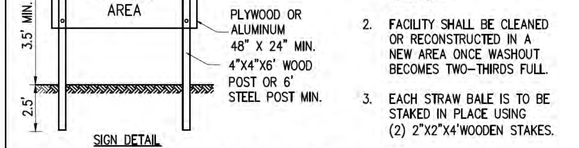



NOTE: FABRIC SHALL BE GALVANIZED UNLESS OTHERWISE NOTED, REFER TO PLANS.

## 8 VEHICLE GATE

SCALE: NTS

XD_CIVIL_FENCE_VEHICLE GATE_7' OR 8' 07-25-2017



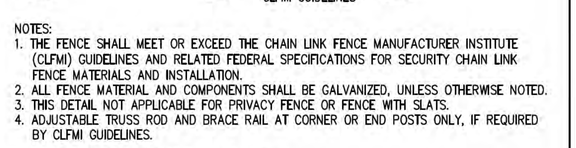




NOTES:
1. MAINTAINING TEMPORARY CONCRETE WASHOUT FACILITIES SHALL INCLUDE REMOVING AND DISPOSING OF HARDEN CONCRETE AND/OR SLURRY AND RETURNING THE FACILITIES TO A FUNCTIONAL CONDITION.
2. FACILITY SHALL BE CLEANED OR RECONSTRUCTED IN A NEW AREA ONCE WASHOUT BECOMES TWO–THIRDS FULL.
3. EACH STRAW BALE IS TO BE STAKED IN PLACE USING (2) 2"X2"X4'WOODEN STAKES.

## 5 CONCRETE WASHOUT

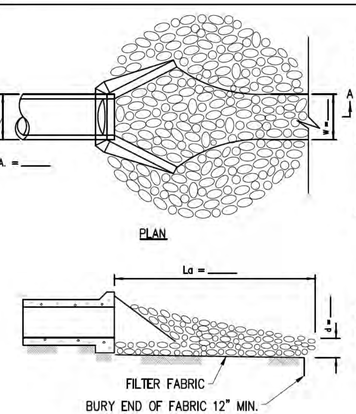
SCALE: NTS




NOTES:
1. THE FENCE SHALL MEET OR EXCEED THE CHAIN LINK FENCE MANUFACTURER INSTITUTE (CLFMI) GUIDELINES AND RELATED FEDERAL SPECIFICATIONS FOR SECURITY CHAIN LINK FENCE MATERIALS AND INSTALLATION.
2. ALL FENCE MATERIAL AND COMPONENTS SHALL BE GALVANIZED, UNLESS OTHERWISE NOTED.
3. THIS DETAIL NOT APPLICABLE FOR PRIVACY FENCE OR FENCE WITH SLATS.
4. ADJUSTABLE TRUSS ROD AND BRACE RAIL AT CORNER OR END POSTS ONLY, IF REQUIRED BY CLFMI GUIDELINES.

## 2 CHAIN LINK FENCE

SCALE: NTS




NOTES:
1. THE FILTER FABRIC SHALL MEET THE REQUIREMENTS OF MATERIAL SPECIFICATION 592 GEOTEXTILE TABLE 1 OR 2, CLASS I, II, OR III.
2. THE ROCK RIPRAP SHALL MEET THE IDOT REQUIREMENTS FOR THE FOLLOWING GRADATION
3. THE RIPRAP SHALL BE PLACED ACCORDING TO CONSTRUCTION SPECIFICATION 61 LOOSE ROCK RIPRAP. THE ROCK MAY BE EQUIPMENT PLACED.

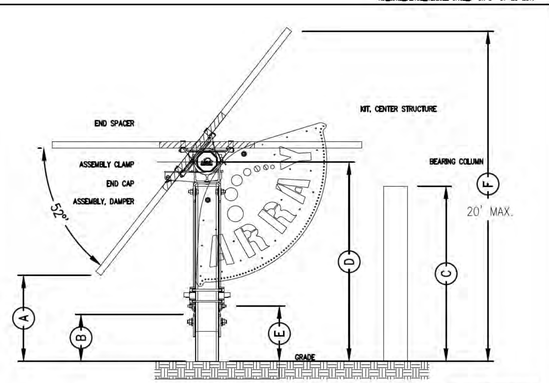
MAINTENANCE:
1. INSPECT RIPRAP OUTLET STRUCTURES AFTER HEAVY RAINS TO SEE IF ANY EROSION AROUND OR BELOW THE RIPRAP HAS TAKEN PLACE OR IF STONES HAVE BEEN DISLODGED.
2. IMMEDIATELY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE.

## 11 PIPE OUTLET TO CHANNEL

NRCS

SCALE: N.T.S.

STANDARD DWG NO IL–611 1994–08–18




| A | B | C | D | E | F |
|---|---|---|---|---|---|
| BOTTOM EDGE OF 77" MODULE AT 52° (IN) | GEARBOX COLUMN (IN) | BEARING COLUMN HEIGHT (IN) | CENTER OF ROTATION (IN) | TO BOTTOM OF DRIVELINE (IN) | TOP EDGE OF 77" MODULE AT 52° (IN) |
| 32 | 22 | 54 | 60 | 24 | 94 |

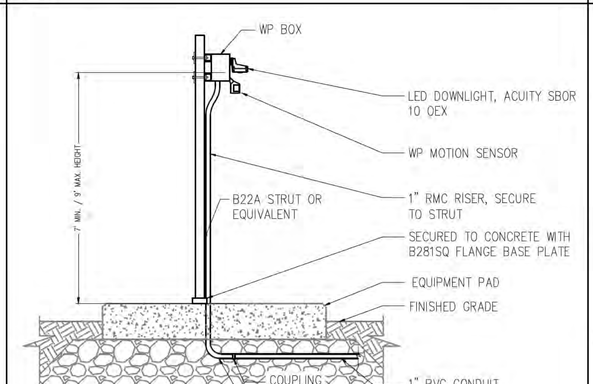
NOTE: CLEARANCES HAVE ± INSTALL TOLERANCES.

## 9 VERTICAL MOUNT MOTOR CLEARANCES

ATI

SCALE: N.T.S.

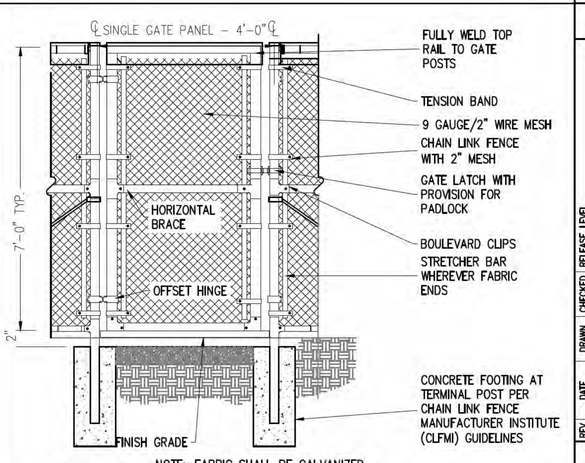
XD_STRUC_ATI_ARRAY_ELEVATION 2018-02-15




## 6 LIGHTING MOUNTING - DOWNLIGHT

SCALE: NTS

XD_ELEC_ LIGHT MOUNTING–DOWNLIGHT 2018–06–22 JPL




NOTE: FABRIC SHALL BE GALVANIZED

## 3 4' MAN GATE

SCALE: NTS

XD_CIVIL_SITE CONSTRUCTION_4' WALK THROUGH GATE 07-25-2017

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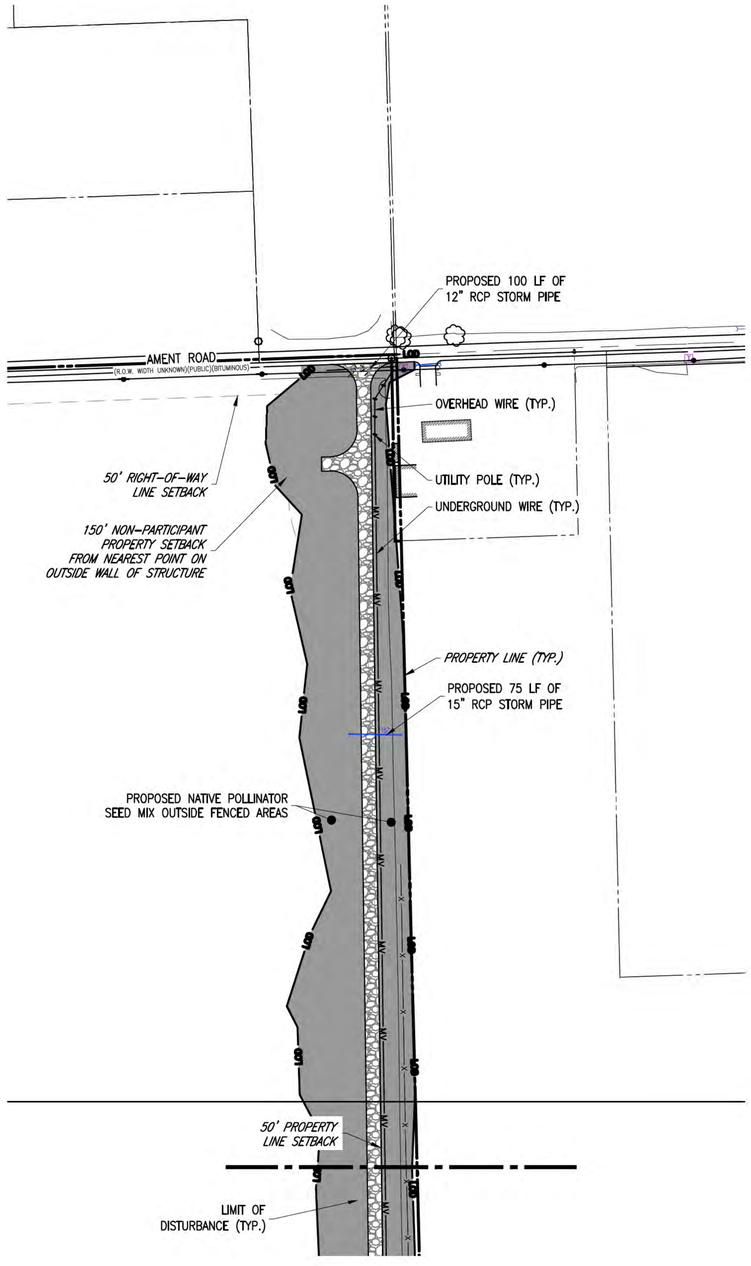
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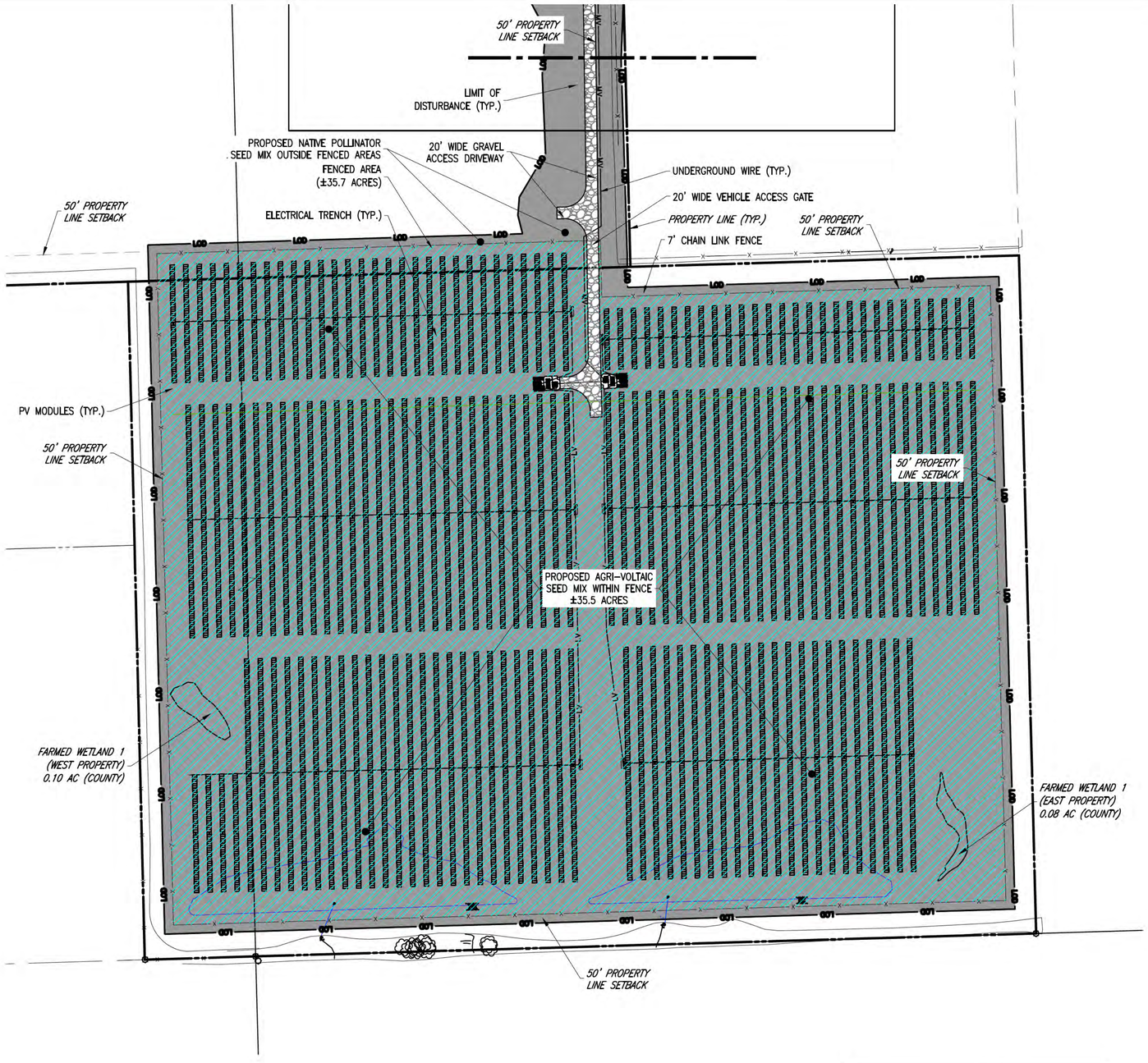
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C-4.0

CIVIL DETAILS IL




LEGEND

- NATIVE POLLINATOR SEED MIX OUTSIDE OF FENCED AREA
- NATIVE GRAZING AGRI-VOLTAIC SEED MIX WITHIN FENCED AREA
- PROPOSED FENCE
- LIMITS OF DISTURBANCE

# LANDSCAPE PLAN

SCALE: 1" = 100'

0 100' 200'

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C-5.0

LANDSCAPE PLAN

# MONITORING & MAINTENANCE NOTES

1. MONITORING METHODOLOGY – SHORT TERM (YEARS 1–3)

1.1. THE PLANTED AREAS WILL BE MONITORED ANNUALLY FOR A THREE–YEAR PERIOD TO ENSURE SUCCESSFUL ESTABLISHMENT OF THE PLANTINGS. THE PRIMARY OBJECTIVE OF THE SHORT–TERM MONITORING PROGRAM IS TO TRACK THE SUCCESS OF THE PLANTED SPECIES OVER THE 3–YEAR PERIOD OF REGULARLY SCHEDULED MONITORING SESSIONS. THE MONITORING DOCUMENTS CHANGES IN PLANT COMMUNITY COMPOSITION AND REVEALS THE NEED FOR MANAGEMENT CHANGES TO IMPROVE FLORISTIC QUALITY AND COVERAGE. SPECIFIC GOALS OF THE MONITORING ARE TO DETERMINE THE VEGETATIVE SPECIES PRESENT, THE PERCENT COVER BY VEGETATION, AND IDENTIFY HYDROLOGY AND EROSION PROBLEMS.

1.2. MONITORING WITHIN THE PLANTED AREAS SHALL BE CONDUCTED ANNUALLY UTILIZING A MEANDER SURVEY METHODOLOGY. THE MONITORING SHALL IDENTIFY:
- 1.2.1. THE FIVE DOMINANT VEGETATIVE SPECIES WITHIN EACH PLANTING ZONE,
- 1.2.2. THE APPROXIMATE PERCENT COVERAGE BY OVERALL VEGETATION IN EACH PLANTING ZONE,
- 1.2.3. THE APPROXIMATE PERCENT VEGETATIVE COVERAGE BY NATIVE AND NON–NATIVE/INVASIVE SPECIES WITHIN EACH PLANTING ZONE,
- 1.2.4. EROSION OR SEDIMENTATION ISSUES,
- 1.2.5. BARE AREAS OR AREAS NOT FULLY VEGETATED,
- 1.2.6. MANAGEMENT RECOMMENDATIONS FOR IMPROVED QUALITY AND INVASIVE SPECIES REMOVALS, AND
- 1.2.7. WILDLIFE AND POLLINATOR USAGE (VIUSAL OBSERVATIONS).

1.3. OBSERVATIONS SHALL BE MADE DURING THE MONITORING TO IDENTIFY SPECIFIC MANAGEMENT STRATEGIES NECESSARY TO REACH DESIGN GOALS. SITE CONDITIONS SHALL BE PHOTO DOCUMENTED DURING MONITORING SESSIONS.

1.4. POST–CONSTRUCTION MAINTENANCE WILL BE CONDUCTED BY AMENT ROAD SOLAR 1, LLC.

2. PERFORMANCE CRITERIA (YEARS 1–3)

2.1. BY THE END OF THE FIRST FULL GROWING SEASON, THE PLANTED AREAS SHALL EXHIBIT AT LEAST 75% VEGETATIVE COVERAGE, PRIMARILY BY SPECIES CONTAINED IN THE COVER CROP SEED MIX. THERE SHALL BE NO AREAS GREATER THAN 1.0 SQUARE METER DEVOID OF VEGETATION, AND AT LEAST 25% OF THE SPECIES PRESENT AS MEASURED BY AERIAL COVERAGE SHALL BE NATIVE AND NON–INVASIVE, OR PLANTED SPECIES.

2.2. BY THE END OF THE SECOND GROWING SEASON, AT LEAST 90% OF THE GROUND AS MEASURED BY AERIAL COVERAGE SHALL BE VEGETATED, AND AT LEAST 50% OF THE SPECIES PRESENT AS MEASURED BY AERIAL COVERAGE SHALL BE NATIVE AND NON–INVASIVE, OR PLANTED SPECIES. THERE SHALL BE NO AREAS GREATER THAN 1.0 SQUARE METER DEVOID OF VEGETATION.

2.3. BY THE END OF THE THIRD GROWING SEASON, AT LEAST 90% OF THE GROUND AS MEASURED BY AERIAL COVERAGE SHALL BE VEGETATED, AND AT LEAST 75% OF THE SPECIES PRESENT SHALL BE NATIVE AND NON–INVASIVE, OR PLANTED SPECIES. THERE SHALL BE NO AREAS GREATER THAN 0.5 SQUARE METER DEVOID OF VEGETATION.

2.4. AT THE END OF EACH GROWING SEASON, NONE OF THE THREE MOST DOMINANT SPECIES WITHIN THE PLANTED AREAS SHALL BE NON–NATIVE OR INVASIVE SPECIES INCLUDING BUT NOT LIMITED TO: RAGWEED (AMBROSIA SPP.), WILD CARROT (DAUCUS CAROTA), PURPLE LOOSESTRIFE (LYTHRUM SALICARIA), TEASEL (DIPSACUS SPP.), REED CANARY GRASS (PHALARIS ARUNDINACEA), SWEET CLOVER (MELILOTUS SPP.), COMMON BUCKTHORN (RHAMNUS CATHARTICA), KENTUCKY BLUE GRASS (POA PRATENSIS), THISTLE (CIRSIUM SPP.), HONEYSUCKLE (LONICERA SP.), COMMON REED (PHRAGMITES AUSTRALIS), OR SANDBAR WILLOW (SALIX EXIGUA).

3. REPORTING (YEARS 1–3)

3.1. AN ANNUAL VEGETATION MONITORING REPORT WILL BE SUBMITTED TO THE OWNER AND KENDALL COUNTY BY JANUARY 31ST/ FOLLOWING THE MONITORING SEASON EACH YEAR. THIS REPORT WILL BE USED TO DETERMINE IF THE NATURAL AREAS ARE MEETING PERFORMANCE STANDARDS. THE REPORT SHALL INCLUDE INFORMATION ON SITE LOCATION; PERMIT NUMBERS; METHODOLOGY USED (INCLUDING MONITORING DATES); DATA RESULTS; SUMMARY RELATIVE TO PERFORMANCE CRITERIA; A SUMMARY OF THE ANNUAL MONITORING OBSERVATIONS; A DESCRIPTION OF THE MANAGEMENT PERFORMED DURING THE YEAR; A LIST OF RECOMMENDATIONS FOR MANAGEMENT DURING THE UPCOMING YEAR; AND REPRESENTATIVE PHOTOGRAPHS OF THE NATURAL AREAS. THE NATURAL AREAS SHALL MEET CERTIFICATION REQUIREMENTS, ASSOCIATED PERFORMANCE STANDARDS, AND WILL BE MONITORED AND MAINTAINED FOR A PERIOD OF THREE YEARS OR UNTIL PERFORMANCE STANDARDS HAVE BEEN MET TO ENSURE SUCCESSFUL ESTABLISHMENT.

4. SHORT–TERM MANAGEMENT PLAN (YEARS 1–3)

4.1. FIRST YEAR. MOW THE PLANTED AREAS TO A HEIGHT OF 8–12 INCHES, 2–4 TIMES DURING THE EARLY GROWING SEASON OR AS NEEDED TO CONTROL NON–NATIVE AND INVASIVE SPECIES. MOWING (INCLUDING WEED WHIPPING) SHALL TAKE PLACE PRIOR TO OR WHEN NON–NATIVE AND INVASIVE SPECIES ARE FLOWERING TO PREVENT SEED SET. CONTROL UNDESIRABLE PLANT SPECIES, WHEN PRESENT IN SMALL QUANTITIES, BY HAND PULLING PRIOR TO THE DEVELOPMENT AND MATURITY OF THE PLANT. HAND REMOVAL SHALL INCLUDE THE REMOVAL OF ALL ABOVEGROUND AND BELOWGROUND STEMS, ROOTS AND FLOWER MASSES PRIOR TO DEVELOPMENT OF SEEDS. APPLY HERBICIDE (AS NECESSARY) TO NON–NATIVE AND INVASIVE PERENNIAL SPECIES WITHIN THE NATURAL AREAS WITH APPROPRIATE HERBICIDE. MANAGEMENT SITE VISITS SHOULD BE CONDUCTED AT A MINIMUM OF 3 TIMES ANNUALLY. SOIL EROSION AND SEDIMENT CONTROLS SHALL BE REGULARLY MAINTAINED.

4.2. SECOND YEAR. CONTROL OF UNDESIRABLE PLANT SPECIES DURING THE SECOND GROWING SEASON SHALL CONSIST PRIMARILY OF HERBICIDE APPLICATION. MOWING (INCLUDING WEED WHIPPING) SHALL BE CONDUCTED TWO TO FOUR TIMES DURING THE EARLY GROWING SEASON AND AS NEEDED TO A HEIGHT OF 8–12 INCHES TO PREVENT ANNUAL WEEDS FROM PRODUCING SEED. MANAGEMENT SITE VISITS SHOULD BE CONDUCTED AT A MINIMUM OF 3 TIMES ANNUALLY. SOIL EROSION AND SEDIMENT CONTROLS SHALL BE REGULARLY MAINTAINED.

4.3. THIRD YEAR. UNDESIRABLE PLANT SPECIES WILL BE CONTROLLED (AS NECESSARY) BY MOWING (INCLUDING WEED WHIPPING), HAND PULLING, AND/OR SPOT HERBICIDE APPLICATION. CONTINUE TO PERFORM MANAGEMENT SITE VISIT AT LEAST 3 TIMES ANNUALLY DURING THE GROWING SEASON. SOIL EROSION AND SEDIMENT CONTROLS SHALL BE REGULARLY MAINTAINED.

4.4. SINCE THE SITE IS NOT SUITABLE FOR PRESCRIBED BURNING, IT IS RECOMMENDED TO CONDUCT A LATE FALL MOWING WITH MULCHING/THATCH REMOVAL AT THE COMPLETION OF THE THIRD GROWING SEASON. THIS REGIMEN WILL MIMIC THE CONDITIONS AND BENEFITS OF A CONTROLLED BURN.

5. LONG–TERM MANAGEMENT PLAN (YEARS 4+)

5.1. LONG TERM. AS THE PLANTED AREAS MATURE, REQUIRED SUPPLEMENTAL MANAGEMENT WILL BE SIGNIFICANTLY REDUCED. THE PLANT COMMUNITIES WILL STABILIZE AND BE EFFECTIVELY MANAGED THROUGH A REDUCED SCHEDULE OF SPOT MOWING, HERBICIDE APPLICATION, AND HAND PULLING AS NECESSARY. EVERY 3–5 YEARS A LATE FALL MOWING WITH THATCH MULCHING/REMOVAL SHOULD BE CONDUCTED DURING THE DORMANT SEASON (NOVEMBER–APRIL). MANAGEMENT SITE VISITS SHOULD BE CONDUCTED 2–3 TIMES ANNUALLY. SOIL EROSION AND SEDIMENT CONTROLS SHALL BE REGULARLY MAINTAINED.

5.2. THE NATURAL AREAS REQUIRE LONG–TERM MANAGEMENT TO MAINTAIN THEIR FUNCTION AS DESIGNED. IT IS EXPECTED THAT THE NATURAL AREAS WILL BE MAINTAINED IN THEIR PERMITTED CONDITION. THE LONG–TERM MANAGER FOR THE NATURAL AREAS WILL BE THE LESSEE, AMENT ROAD SOLAR 1 LLC, OR THE OWNER. AN ANNUAL LETTER REPORT DOCUMENTING THE COMPLETION OF INSPECTION AND MANAGEMENT TASKS BASED ON THE INFORMATION HEREIN SHOULD BE SUBMITTED TO THE OWNER EACH YEAR.

5.3. MANAGEMENT TASKS SHOULD BE PRECEDED BY A SITE INSPECTION TO DETERMINE IF REMEDIAL MEASURES ARE REQUIRED AND TO RECOMMEND PROCEDURES TO CORRECT ANY DEFICIENCIES. THE SITE INSPECTION SHOULD BE CONDUCTED BY A QUALIFIED INDIVIDUAL KNOWLEDGEABLE IN NATIVE PLANTS AND MANAGEMENT OF NATIVE PLANTINGS. AREAS OF OBSERVATION DURING THE SITE INSPECTION SHOULD INCLUDE BUT ARE NOT LIMITED TO: DOMINANT SPECIES WITHIN DISTINCT PLANTING COMMUNITIES; EROSION OR HERBIVORY CONCERNS THAT DEVELOP OVER TIME; CHANGES IN HYDROLOGY THAT MAY REQUIRE ADDITIONAL PLANTING TO ADJUST FOR HIGHER OR LOWER WATER LEVELS; OR THE APPEARANCE OF INVASIVE SPECIES IN THE MANAGED AREA THAT REQUIRE ALTERNATIVE MANAGEMENT METHODS.

5.4. THE FOLLOWING MANAGEMENT TASKS SHOULD BE COMPLETED ANNUALLY, UNLESS OTHERWISE SPECIFIED BELOW:
- 5.4.1. DEBRIS REMOVAL: ALL DEBRIS SHALL BE REMOVED, VIA NON–INVASIVE METHODS, FROM WITHIN THE NATURAL AREAS.
- 5.4.2. HERBICIDE APPLICATION: SELECTIVE HERBICIDE TO CONTROL INVASIVE SPECIES SHOULD BE COMPLETED 2–3 TIMES ANNUALLY. A CERTIFIED AND LICENSED PESTICIDE APPLICATOR SHALL SELECT HERBICIDE, APPROPRIATE FOR THE AREA OF USE (SUCH AS WETLANDS OR OTHER SPECIAL MANAGEMENT AREA), AND SHALL APPLY THE HERBICIDE BY THE APPROPRIATE METHOD, TO PREVENT KILLING OF DESIRABLE NATIVE SPECIES. INVASIVE AND NON–NATIVE SPECIES, AND WOODY PLANT SPECIES NOT SPECIFIED AS PART OF THE PLANTING PLAN, SHALL BE CONTROLLED BY APPROPRIATE MANAGEMENT PRACTICES OF THE APPROVED PLAN.
- 5.4.3. MOWING: SELECTIVE MOWING IS A PREFERRED METHOD FOR CONTROL OF ANNUAL NON–NATIVE AND INVASIVE SPECIES TO PREVENT SEED PROLIFERATION. MOWING WITH A SPECIALTY FLAIL–TYPE MOWER TO MULCH THATCH OR WEED WHIP WITH THATCH REMOVAL (OR COMBINATION) MAY BE SUBSTITUTED FOR PRESCRIBED BURNS IN INSTANCES WHERE A BURN IS NOT PERMISSIBLE OR WEATHER DOES NOT ALLOW FOR A SAFE/EFFECTIVE BURN.
- 5.4.4. EROSION CONTROL & STABILIZATION: WHEN CONDUCTING THE ANNUAL INSPECTION, IT IS IMPORTANT TO OBSERVE AND NOTE AREAS OF BARE SOIL AND OTHER EARLY WARNING SIGNS OF EROSION. IF CAUGHT EARLY ENOUGH, THEY MAY BE EASILY STABILIZED WITH SEED AND EROSION CONTROL BLANKET.
- 5.4.5. BRUSH CLEARING: MANAGEMENT OF WOODY SPECIES IS NOT LIKELY NECESSARY IF HERBICIDE APPLICATIONS ARE SUCCESSFUL AND CONTINUED EACH YEAR. IF INVASIVE SHRUBS BECOME A PROBLEM THEY SHOULD BE CUT AND ALL REMAINING STUMPS SHOULD BE TREATED WITH AN APPROPRIATE HERBICIDE TO PREVENT RESPROUT; EITHER THROUGH A BASAL OIL TREATMENT, HAND WICK APPLICATOR, OR OTHER APPROVED METHOD. BRUSH CLEARING SHOULD BE CONDUCTED IN THE WINTER MONTHS WITH FROZEN GROUND CONDITIONS.

5.5. TYPICAL MANAGEMENT SCHEDULE FOR NATURAL AREAS

TABLE 4: TYPICAL MANAGEMENT SCHEDULE FOR NATURAL AREAS

| MANAGEMENT TASK | SPRING | SUMMER | FALL | WINTER |
|---|---|---|---|---|
| ANNUAL SITE INSPECTION | | X | | |
| ANNUAL LETTER REPORT | | | | X |
| DEBRIS REMOVAL (AS NECESSARY) | X | X | X | X |
| HERBICIDE APPLICATION | X | X | X | |
| MOWING | X | X | X | |
| EROSION CONTROL & STABILIZATION | X | X | X | |
| BRUSH CLEARING | | | X | X |

6. HERBICIDE APPLICATION

6.1. THIS SECTION APPLIES TO ALL SITE PREPARATION AND MANAGEMENT HERBICIDE APPLICATION THAT IS PROPOSED TO OCCUR ONSITE:
- 6.1.1. ANY PERSON APPLYING HERBICIDE SHALL HOLD APPROPRIATE LICENSURE FOR PESTICIDE APPLICATION IN THE STATE OF ILLINOIS: A LICENSED ILLINOIS PESTICIDE APPLICATOR SHALL BE ON–SITE AT ALL TIMES WHEN HERBICIDE IS BEING APPLIED
- 6.1.2. HERBICIDE USAGE WILL VARY BASED ON SITE CONDITIONS AND TARGET SPECIES. THE FOLLOWING HERBICIDES ARE ALLOWED FOR USE IN NATURAL AREAS; AQUATIC APPROVED GLYPHOSATE FORMULATIONS (AQUANEAT®, RODEO®, ETC.), CLETHODIM (INTENSITY®, ETC.), AQUATIC APPROVED IMAZAPYR (HABITAT®, ETC.), TRICLOPYR 3A (TAHOE 3A®, GARLON 3A®, ETC.), GARLON 4 ULTRA® (NO SUBSTITUTIONS), AND AMINOPYRALID (MILESTONE®) TO CONTROL TARGET SPECIES. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO EVALUATE THE SITE AND SELECT THE APPROPRIATE HERBICIDE FOR BOTH SITE CONDITIONS AND TARGET SPECIES IN ACCORDANCE WITH HERBICIDE LABELING.

# LANDSCAPE PLAN GENERAL NOTES

CONTRACTOR QUALIFICATIONS

1. THE NATIVE LANDSCAPE CONTRACTOR CHOSEN FOR THE ESTABLISHMENT AND ENHANCEMENT OF THE NATURAL AREAS MUST BE EXPERIENCED IN THE RESTORATION, INSTALLATION, AND MANAGEMENT OF SAID AREAS. THEY MUST HAVE A MINIMUM FIVE YEARS OF EXPERIENCE CONDUCTING ECOLOGICAL RESTORATION AND MANAGEMENT PROJECTS.
2. THERE SHALL BE A SUPERVISOR AVAILABLE AT ALL TIMES THAT CAN IDENTIFY NON–NATIVE AND NATIVE PLANTS BY GENUS AND SPECIES. THE GOAL OF INSTALLING SUCCESSFUL NATIVE PLANT COMMUNITIES IS A LONG–TERM PROCESS. THEREFORE, IT IS IMPERATIVE THAT A QUALIFIED NATIVE LANDSCAPE CONTRACTOR PERFORM THE INITIAL INSTALLATION AND MAINTENANCE.

QUALITY AND CONDITION

1. ALL NATIVE SEED PROPOSED FOR THE PROJECT SHALL BE PROVIDED AS PURE LIVE SEED (PLS) AND SOURCED FROM WITHIN A 200–MILE RADIUS OF THE PROJECT LOCATION. PLANT ORIGINS OUTSIDE OF THIS RANGE MUST BE APPROVED BY THE WETLAND CONSULTANT.
2. NATIVE SEEDS SHALL BE BLENDED BY THE VENDOR, AND THE MIXTURE AND RATIO SHALL BE GUARANTEED IN WRITING TO BE AS SPECIFIED. THE AMOUNT OF SEED INDICATED ON THE SPECIFICATIONS SHALL MEAN THE TOTAL AMOUNT OF PURE LIVE SEED (PLS) PER ACRE FOR ALL SPECIES LISTED. IT IS THE SOLE RESPONSIBILITY OF THE NATIVE LANDSCAPE CONTRACTOR TO PROVIDE APPROVED SEED THAT MEETS INDUSTRY–STANDARD PLS REQUIREMENTS.
3. NATIVE LANDSCAPE CONTRACTOR SHALL PROVIDE THE WETLAND CONSULTANT WITH THE NAME AND LOCATION OF THE SEED SUPPLIER, ORIGIN OF THE VARIOUS KINDS OF PLANTS, AND A STATEMENT OF THE PURITY OF THE SEED.
4. SEED SHALL CONFORM TO APPLICABLE STATE AND FEDERAL REGULATIONS AS IN EFFECT ON THE DATE OF LETTING. UNLESS OTHERWISE SPECIFIED, SEED SHALL NOT CONTAIN IN EXCESS OF 1 PERCENT WEED SEEDS; 0 PERCENT IS DESIRABLE.
5. ALL STORAGE REQUIREMENTS, STRATIFICATION, AND SCARIFICATION CONSIDERATIONS SHALL BE THE SOLE RESPONSIBILITY OF THE NATIVE LANDSCAPE CONTRACTOR.
6. IF SPECIFIED FOR THE SEED MIXTURE, MYCORRHIZAL INOCULANTS SHALL BE PELLETIZED AND MIXED AT 1 LB. PER ACRE WITH THE FINE SEEDS BEFORE INSTALLATION. THE INOCULANTS SHALL CONTAIN A DIVERSE MIXTURE OF GLOMALES FUNGAL SPECIES (GLOMUS SPP.) IN PELLETIZED FORM.
7. UNDER NO CIRCUMSTANCES SHALL WHEAT (TRITICUM AESTIVUM), CEREAL RYE (SECALE CEREALE), PERENNIAL RYE (LOLIUM PERENNE), OR BARLEY (HORDEUM VULGARE) BE USED AS A TEMPORARY COVER CROP.

HANDLING

1. NATIVE LANDSCAPE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE PROPER HANDLING AND STORAGE OF THE SEED ACCORDING TO THE BEST SEED HANDLING AND STORAGE PRACTICES, INCLUDING FUNGICIDE TREATMENTS AND STRATIFICATION CONSIDERATIONS. OWNER SHALL MAKE NO COMPENSATION FOR DAMAGE TO THE SEED BECAUSE OF IMPROPER STORAGE, CLEANING, THRESHING, OR SCREENING OPERATIONS.
2. ALL NATIVE SEEDS SHALL BE PACKED AND COVERED IN SUCH A MANNER AS TO ENSURE ADEQUATE PROTECTION AGAINST DAMAGE AND MAINTAIN DORMANCY WHILE IN TRANSIT, STORAGE, OR DURING PLANTING OPERATIONS.
3. SEED SHALL BE KEPT DRY AND UNOPENED UNTIL NEEDED FOR USE. SEED SHALL NOT BE STORED OR TEMPORARILY STORED IN LOCATIONS OR VEHICLES WHERE THE TEMPERATURE WILL BE IN EXCESS OF 90 DEGREES F.

SITE PREPARATION

1. SITE SHOULD BE CLEARED OF UNDESIRABLE VEGETATION PRIOR TO SEEDING. IF NECESSARY, NON–SELECTIVE HERBICIDE (AQUATIC–APPROVED GLYPHOSATE FORMULATION) SHOULD BE APPLIED WITHIN THE PROPOSED PLANTING ZONES AT LEAST 2 WEEKS PRIOR TO SEEDBED PREPARATION.
2. THE GENERAL CONTRACTOR AND NATIVE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING ALL WORK NECESSARY TO ACHIEVE AND MAINTAIN AN ACCEPTABLE SEEDBED PRIOR TO SEEDING. ALL AREAS MUST BE PROPERLY PREPARED BEFORE SEEDING BEGINS. UNDERGROUND UTILITY LOCATION MAPS AND PLANS SHOULD BE REVIEWED PRIOR TO WORK. EQUIPMENT HAVING LOW UNIT PRESSURE GROUND CONTACT SHALL BE UTILIZED WITHIN THE PLANTING AREAS.
3. UNLESS THE WETLAND CONSULTANT AGREES TO ANOTHER APPROACH, THE SEEDBED SHALL BE PREPARED BY WORKING THE TOPSOIL TO A DEPTH OF 3 INCHES. SITE PREPARATION EQUIPMENT SHALL BE OF A DESIGN THAT CAN BE UTILIZED EFFICIENTLY BY THE NATIVE LANDSCAPE CONTRACTOR TO MEET THE REQUIREMENTS FOR THE WORK SPECIFIED. THE EQUIPMENT PROPOSED FOR USE BY THE NATIVE LANDSCAPE CONTRACTOR FOR DISKING AND HERBICIDE APPLICATIONS SHALL BE SUBJECT TO APPROVAL BY THE WETLAND CONSULTANT.
4. PRIOR TO SEEDING, AT LEAST 6 INCHES OF TOPSOIL SHALL BE PRESENT AND FREE OF ALL CLODS, STONES, ROOTS, STICKS, RIVULETS, GULLIES, CRUSTING, AND CRACKING. THE SOIL AGGREGATE SIZE WILL BE NO GREATER THAN 2 INCHES IN THE LARGEST DIAMETER.
5. IF PRESENT, COMPACTED SOILS SHALL BE DISKED OR RAKED PRIOR TO SEEDING. REMEDIAL MEASURES FOR THE ACCESS AREA MAY, AT THE DIRECTION OF THE WETLAND CONSULTANT, INVOLVE RIPPING FROM 12 TO 18 INCHES OF THE SOIL HORIZON PRIOR TO DISKING. IF COMPACTION IS NOT A CONCERN AND THE SEEDBED NEEDS TO BE LOOSENED PRIOR TO SEEDING TO ENSURE GOOD SEED–SOIL CONTACT, DISKING OR RAKING SHALL BE PERFORMED USING EQUIPMENT AND THE APPROACH RECOMMENDED BY THE NATIVE LANDSCAPE CONTRACTOR, SUBJECT TO APPROVAL BY THE WETLAND CONSULTANT.
6. IF NEEDED, CULTIVATION SHALL OCCUR WITHIN 24 HOURS PRIOR TO SEEDING. SEEDING SHOULD OCCUR IMMEDIATELY AFTER THE LAST CULTIVATION, PREFERABLY BEFORE A RAIN.

SEED INSTALLATION

1. SEEDING SHALL TAKE PLACE AFTER SOLAR PANEL INSTALLATION IS COMPLETED.
2. EXCEPT WHERE SITE CONDITIONS PRECLUDE THEIR USE, SEEDING SHALL BE PERFORMED USING A TRUAX DRILL, TRUAX TRILLION SEEDER, OR COMPARABLE EQUIPMENT DESIGNED SPECIFICALLY FOR INSTALLATION OF NATIVE SEED. FOR AREAS WHERE SITE CONDITIONS PRECLUDE THE USE OF SPECIALIZED EQUIPMENT, SEED MAY BE INSTALLED THROUGH HAND BROADCASTING AND LIGHTLY RAKING IN THE SEED. HAND BROADCAST SEED SHALL BE SPREAD AT TWICE THE SPECIFIED RATE. OTHER METHODS OF SEED INSTALLATION MAY BE USED WITH PRIOR APPROVAL FROM THE WETLAND CONSULTANT.
3. PRIOR TO STARTING WORK, ALL SEEDING EQUIPMENT SHALL BE CALIBRATED AND ADJUSTED TO SOW SEEDS AT THE PROPER SEEDING RATE. IN GENERAL, THE OPTIMUM SEEDING DEPTH IS 0.25 INCH BELOW THE SOIL SURFACE. AREAS WHERE THE SEED HAS NOT BEEN INCORPORATED INTO THE SOIL TO THE PROPER DEPTHS WILL NOT BE ACCEPTED, AND NO COMPENSATION FOR MATERIALS OR LABOR FOR THE REJECTED WORK WILL BE MADE BY THE OWNER.
4. EQUIPMENT SHALL BE OPERATED IN A MANNER TO ENSURE COMPLETE, UNIFORM COVERAGE OF THE ENTIRE AREA TO BE SEEDED AND TO AVOID DAMAGE TO EXISTING WOODY PLANTS. ANY AREA INADEQUATELY COVERED, AS SOLELY DETERMINED BY THE WETLAND CONSULTANT, SHALL BE RETREATED AT NO ADDITIONAL COST TO THE OWNER.
5. SEEDING AND SOIL TRACKING/FIRMING SHALL NOT BE DONE DURING PERIODS OF RAIN, SEVERE DROUGHT, HIGH WINDS, EXCESSIVE MOISTURE, FROZEN GROUND, OR OTHER CONDITIONS THAT PRECLUDE SATISFACTORY RESULTS.
6. TO ACHIEVE BEST RESULTS, SEED BOXES SHOULD BE KEPT MORE THAN ONE–QUARTER FULL AT ALL TIMES AND GROUND SPEED SHOULD BE NO MORE THAN 2 TO 3 MPH.
7. SEEDING OPERATIONS MUST OCCUR WHEN SOIL MOISTURE IS APPROPRIATE FOR SEEDING OPERATION.
8. NATIVE PLANT SEED SHALL NOT RECEIVE FERTILIZER.
9. WET SEED THAT IS MOLDY OR OTHERWISE DAMAGED IN TRANSIT OR STORAGE SHALL NOT BE USED.

EROSION CONTROL

1. THE NATIVE LANDSCAPE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR IMPLEMENTING EROSION CONTROL MEASURES WITHIN PRESCRIBED PLANTING AREAS.

CLEAN–UP AND PROTECTION

1. DURING LANDSCAPE WORK, STORE MATERIALS AND EQUIPMENT WHERE DIRECTED. KEEP PAVEMENTS CLEAN AND WORK AREAS AND ADJOINING AREAS IN AN ORDERLY CONDITION.
2. PROTECT LANDSCAPE WORK AND MATERIALS FROM DAMAGE DUE TO LANDSCAPE OPERATIONS OR OPERATIONS BY OTHER TRADES AND TRESPASSERS. MAINTAIN PROTECTION DURING INSTALLATION AND MAINTENANCE PERIODS. TREAT, REPAIR, OR REPLACE DAMAGED LANDSCAPE WORK AS DIRECTED BY THE WETLAND CONSULTANT.

INSPECTIONS AND ACCEPTANCE

1. OWNER RESERVES THE RIGHT TO INSPECT ALL SEEDS AND PLANTS EITHER AT PLACE OF GROWTH OR AT SITE BEFORE PLANTING FOR COMPLIANCE WITH REQUIREMENTS FOR NAME, VARIETY, SIZE, QUANTITY, QUALITY OR MIX PROPORTION.
2. NATIVE LANDSCAPE CONTRACTOR IS TO KEEP RECORDS OF THE CERTIFICATES OF COMPOSITION OR INVOICES OF SEED MIXTURES AND INTEGRITY OF PLANT MATERIALS WITH RESPECT TO SPECIES, VARIETY, AND SOURCE AFTER PURCHASE.
3. NATIVE LANDSCAPE CONTRACTOR IS TO NOTIFY OWNER WITHIN FIVE DAYS AFTER COMPLETING INITIAL AND/OR SUPPLEMENTAL PLANTINGS IN EACH AREA.

# SEED LIST

FENCED ARRAY AREA (±35.41 ac) TOTAL SEEDED AREA (±42.4 ac)

## COVER CROP SEED MIX (±35.5 ac)

| Botanical Name (Common Name) | % by wt. |
|---|---|
| Avena Sativa (Seed Oats) | 40.00 |
| TOTAL | 40.00 |

## NATIVE GRAZING SEED MIX (±35.5 ac)

AGRI–VOLTAIC 100.0% OF FENCED AREA

SHEEP PASTURE MIX
7.19 lbs per acre

| Botanical Name (Common Name) | % by wt. |
|---|---|
| GRASSES | |
| Bouteloua curtipendula (Side–oats Grama) | 41.74 |
| Bouteloua gracilis (Blue Grama Grass) | 13.91 |
| Koeleria cristata (June Grass) | 2.61 |
| Poa palustris (Fowl Bluegrass) | 6.96 |
| TOTAL | 65.22 |
| FORBS | |
| Cassia fasciculata (Partridge Pea) | 13.91 |
| Dalea candida (White Prairie Clover) | 10.43 |
| Dalea purpurea (Purple Prairie Clover) | 10.43 |
| TOTAL | 34.78 |
| Total: | 100.0 % |

## NATIVE POLLINATOR SEED MIX (±42.4 ac)

POLLINATOR SEED MIX
8.33 lbs per acre

| Botanical Name (Common Name) | % by wt. |
|---|---|
| GRASSES | |
| Bouteloua curtipendula (Side–oats Grama) | 30.02 |
| Bromus kalmii (Prairie Brome) | 6.00 |
| Carex brevior (Plains Oval Sedge) | 1.50 |
| Carex lupulina (Hop Sedge) | 0.75 |
| Carex molesta (Field Oval Sedge) | 1.50 |
| Carex vulpinoidea (Fox Sedge) | 1.50 |
| Chasmanthium latifolium (See Uniola l.) | 3.75 |
| Elymus villosus (Silky Wild Rye) | 6.00 |
| Glyceria canadensis (Canada Manna Grass) | 1.50 |
| Koeleria cristata (June Grass) | 2.25 |
| Sporobolus heterolepis (Prairie Dropseed) | 2.25 |
| TOTAL | 57.04 |
| FORBS | |
| Achillea millefolium (Yarrow) | 0.38 |
| Allium cernuum (Nodding Wild Onion) | 0.38 |
| Aquilegia canadensis (Wild Columbine) | 0.38 |
| Asclepias tuberosa (Butterfly Milkweed) | 1.13 |
| Chamaecrista fasciculata (Partridge Pea) | 7.50 |
| Coreopsis lanceolata (Lance–leaf Coreopsis) | 6.00 |
| Coreopsis palmata (Prairie Coreopsis) | 0.38 |
| Dalea candida (White Prairie Clover) | 6.00 |
| Dalea purpurea (Purple Prairie Clover) | 6.00 |
| Echinacea pallida (Pale Purple Coneflower) | 3.00 |
| Heuchera richardsonii (Prairie Alum Root) | 0.19 |
| Lespedeza virginica (Slender Bush Clover) | 0.38 |
| Liatris aspera (Rough Blazingstar) | 0.75 |
| Lupinus perennis (Lupine) | 0.75 |
| Penstemon hirsutus (Hairy Beardtongue) | 0.19 |
| Pycnanthemum virginianum (Mountain mint) | 0.19 |
| Rudbeckia fulgida (Orange Coneflower) | 0.75 |
| Rudbeckia hirta (Black–eyed Susan) | 6.00 |
| Solidago nemoralis (Old–field Goldenrod) | 0.19 |
| Solidago riddellii (Riddell's Goldenrod) | 0.19 |
| Symphyotrichum cordifolium (Heart–leaved Aster) | 0.19 |
| Symphyotrichum oolentangiense (Sky Blue Aster) | 0.19 |
| Verbena stricta (Hoary Vervain) | 0.38 |
| Zizia aptera (Prairie Golden Alexander) | 0.38 |
| Zizia aurea (Golden Alexander) | 1.13 |
| TOTAL | 42.96 |
| Total: | 100.0 % |

# LANDSCAPE NOTES & DETAILS

SCALE: N.T.S.

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| | 09/13/24 | CMP | MBK | SPECIAL USE PERMIT SET |
| | 10/17/24 | CMP | MBK | SPECIAL USE PERMIT SET REV 1 |
| | 12/19/24 | CMP | MBK | SUP SET – COUNTY COMMENTS |
| | 01/14/25 | CMP | MBK | SUP SET – COUNTY COMMENTS |

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C-5.1
LANDSCAPE NOTES & DETAILS

# AGRICULTURAL IMPACT MITIGATION AGREEMENT (AIMA) AND ILLINOIS DEPARTMENT OF AGRICULTURE (IDOA) CONSTRUCTION NOTES

1. GUY WIRES AND ANCHORS
   - A. BEST EFFORTS SHALL BE MADE TO PLACE GUY WIRES AND THEIR ANCHORS, IF USED, OUT OF CROPLAND, PASTURELAND AND HAYLAND, PLACING THEM INSTEAD ALONG EXISTING UTILIZATION LINES AND ON LAND OTHER THAN CROPLAND. WHERE THIS IS NOT FEASIBLE, BEST EFFORTS SHALL BE MADE TO MINIMIZE GUY WIRE IMPACT ON CROPLAND.

2. UNDERGROUND CABLING DEPT
   - A. UNDERGROUND ELECTRICAL CABLES LOCATED OUTSIDE THE PERIMETER OF THE FENCE OF THE SOLAR PANELS SHALL BE BURIED WITH:
     - A.1. A MINIMUM OF 5 FEET OF TOP COVER WHERE THEY CROSS CROPLAND.
     - A.2. A MINIMUM OF 5 FEET OF TOP COVER WHERE THEY CROSS PASTURE LAND OR OTHER NON– CROPLAND CLASSIFIED AS PRIME FARMLAND.
     - A.3. A MINIMUM OF 3 FEET OF TOP COVER WHERE THEY CROSS PASTURE LAND AND OTHER AGRICULTURAL LAND NOT CLASSIFIED AS PRIME FARMLAND.
     - A.4. A MINIMUM OF 3 FEET OF TOP COVER WHERE THEY CROSS WOODED/BRUSHY LAND.

3. TOPSOIL REMOVAL AND REPLACEMENT
   - A. ANY EXCAVATION SHALL BE PERFORMED IN A MANNER TO PRESERVE TOPSOIL. BEST EFFORTS SHALL BE MADE TO STORE THE TOPSOIL NEAR THE EXCAVATION SITE IN SUCH A MANNER THAT IT SHALL NOT BECOME INTERMIXED WITH SUBSOIL MATERIALS.
   - B. BEST EFFORTS SHALL BE MADE TO STORE ALL DISTURBED SUBSOIL MATERIAL NEAR THE EXCAVATION SITE AND SEPARATE FROM THE TOPSOIL.
   - C. WHEN BACKFILLING AN EXCAVATION SITE, BEST EFFORTS SHALL BE USED TO ENSURE THE STOCKPILED SUBSOIL MATERIAL WILL BE PLACED BACK INTO THE EXCAVATION SITE BEFORE REPLACING THE TOPSOIL.
   - D. REFER TO NOTE 5 FOR PROCEDURES PERTAINING TO ROCK REMOVAL FROM THE SUBSOIL AND TOPSOIL.
   - E. REFER TO NOTE 6 FOR PROCEDURES PERTAINING TO THE REPAIR OF COMPACTION AND RUTTING OF THE TOPSOIL.
   - F. BEST EFFORTS SHALL BE PERFORMED TO PLACE THE TOPSOIL IN A MANNER SO THAT AFTER SETTLING OCCURS, THE TOPSOIL'S ORIGINAL DEPTH AND CONTOUR WILL BE RESTORED AS CLOSE AS REASONABLY PRACTICABLE. THE SAME SHALL APPLY WHERE EXCAVATIONS ARE MADE FOR ROAD, STREAM, DRAINAGE DITCH, OR OTHER CROSSINGS. IN NO INSTANCE SHALL THE TOPSOIL MATERIALS BE USED FOR ANY OTHER PURPOSE UNLESS AGREED TO EXPLICITLY AND IN WRITING BY THE LANDOWNER.
   - G. BASED ON THE MUTUAL AGREEMENT OF THE LANDOWNER AND FACILITY OWNER, EXCESS SOIL MATERIAL RESULTING FROM SOLAR FACILITY EXCAVATION SHALL EITHER BE REMOVED OR STORED ON THE LANDOWNER'S PROPERTY AND RESEEDED PER THE APPLICABLE NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT/STORMWATER POLLUTION PREVENTION PLAN (SWPPP).

4. REROUTING AND PERMANENT REPAIR OF AGRICULTURAL DRAINAGE TILES
   THE FOLLOWING STANDARDS AND POLICIES SHALL APPLY TO UNDERGROUND DRAINAGE TILE LINE(S) DIRECTLY OR INDIRECTLY AFFECTED BY CONSTRUCTION:
   - A. PRIOR TO CONSTRUCTION, THE CONTRACTOR AND OWNER SHALL WORK WITH THE LANDOWNER TO IDENTIFY DRAINAGE TILE LINES TRAVERSING THE PROPERTY SUBJECT TO THE UNDERLYING AGREEMENT TO THE EXTENT REASONABLY PRACTICABLE. ALL DRAINAGE TILE LINES IDENTIFIED IN THIS MANNER SHALL BE SHOWN ON THE CONSTRUCTION PLANS.
   - B. THE LOCATION OF ALL DRAINAGE TILE LINES LOCATED ADJACENT TO OR WITHIN THE FOOTPRINT OF THE FACILITY SHALL BE RECORDED USING GLOBAL POSITIONING SYSTEMS (GPS) TECHNOLOGY. WITHIN 60 DAYS AFTER CONSTRUCTION IS COMPLETE, THE CONTRACTOR SHALL PROVIDE THE OWNER, LANDOWNER, THE IDOA, AND THE RESPECTIVE COUNTY SOIL AND WATER CONSERVATION DISTRICT (SWCD) WITH "AS BUILT"DRAWINGS (STRIP MAPS) SHOWING THE LOCATION OF ALL DRAINAGE TILE LINES BY SURVEY STATION ENCOUNTERED IN THE CONSTRUCTION OF THE FACILITY, INCLUDING ANY TILE LINE REPAIR LOCATION(S), AND ANY UNDERGROUND CABLE INSTALLED AS PART OF THE FACILITY.
   - C. MAINTAINING SURROUNDING AREA SUBSURFACE DRAINAGE
     IF DRAINAGE TILE LINES ARE DAMAGED BY THE FACILITY, THE CONTRACTOR SHALL REPAIR THE LINES OR INSTALL NEW DRAINAGE TILE LINE(S) OF COMPARABLE QUALITY AND COST TO THE ORIGINAL(S), AND OF SUFFICIENT SIZE AND APPROPRIATE SLOPE IN LOCATIONS THAT LIMIT DIRECT IMPACT FROM THE FACILITY. IF THE DAMAGED TILE LINES CAUSE AN UNREASONABLE DISRUPTION TO THE DRAINAGE SYSTEM, AS DETERMINED BY THE LANDOWNER, TEMPORARY REPAIRS SHALL BE MADE PROMPTLY TO ENSURE APPROPRIATE DRAINAGE. ANY NEW LINE(S) MAY BE LOCATED OUTSIDE OF, BUT ADJACENT TO THE PERIMETER OF THE FACILITY. DISRUPTED ADJACENT DRAINAGE TILE LINES SHALL BE ATTACHED THERETO TO PROVIDE AN ADEQUATE OUTLET FOR THE DISRUPTED ADJACENT TILE LINES.

5. ROCK REMOVAL
   WITH ANY EXCAVATIONS, THE FOLLOWING ROCK REMOVAL PROCEDURES PERTAIN ONLY TO ROCKS FOUND IN THE UPPERMOST 42 INCHES OF SOIL, THE COMMON FREEZE ZONE IN ILLINOIS, WHICH EMERGED OR WERE BROUGHT TO THE SITE AS A RESULT OF CONSTRUCTION.
   - A. BEFORE REPLACING ANY TOPSOIL, BEST EFFORTS SHALL BE TAKEN TO REMOVE ALL ROCKS GREATER THAN 3 INCHES IN ANY DIMENSION FROM THE SURFACE OF EXPOSED SUBSOIL WHICH EMERGED OR WERE BROUGHT TO THE SITE AS A RESULT OF CONSTRUCTION.
   - B. IF TRENCHING, BLASTING, OR BORING OPERATIONS ARE REQUIRED THROUGH ROCKY TERRAIN, PRECAUTIONS SHALL BE TAKEN TO MINIMIZE THE POTENTIAL FOR OVERSIZED ROCKS TO BECOME INTERSPERSED IN ADJACENT SOIL MATERIAL.
   - C. ROCKS AND SOIL CONTAINING ROCKS REMOVED FROM THE SUBSOIL AREAS, TOPSOIL, OR FROM ANY EXCAVATIONS, SHALL BE REMOVED FROM THE LANDOWNER'S PREMISES OR DISPOSED OF ON THE LANDOWNER'S PREMISES AT A LOCATION THAT IS ACCEPTABLE TO THE LANDOWNER AND THE OWNER.

6. REPAIR OF COMPACTION AND RUTTING
   - A. AFTER THE TOPSOIL HAS BEEN REPLACED, ALL AREAS THAT ARE NOT DIRECTLY UNDER PHOTOVOLTAIC PANELS THAT WERE TRAVERSED BY VEHICLES AND CONSTRUCTION EQUIPMENT SHALL BE RIPPED AT LEAST 18 INCHES DEEP, AND ALL PASTURE AND WOODLAND SHALL BE RIPPED AT LEAST 12 INCHES DEEP TO THE EXTENT PRACTICABLE. THE EXISTENCE OF TILE LINES OR UNDERGROUND UTILITIES MAY NECESSITATE LESS DEPTH. THE DISTURBED AREA SHALL THEN BE DISKED.
   - B. ALL RIPPING AND DISKING SHALL BE DONE AT A TIME WHEN THE SOIL IS DRY ENOUGH FOR NORMAL TILLAGE OPERATIONS TO OCCUR ON LAND ADJACENT TO THE FACILITY.
   - C. THE CONTRACTOR SHALL RESTORE ALL RUTTED LAND TO A CONDITION AS CLOSE AS POSSIBLE TO ITS ORIGINAL CONDITION.

7. CONSTRUCTION DURING WET WEATHER
   EXCEPT AS PROVIDED BELOW, CONSTRUCTION ACTIVITIES ARE NOT ALLOWED ON AGRICULTURAL LAND WHERE NORMAL FARMING OPERATIONS, SUCH AS PLOWING, DISKING, PLANTING OR HARVESTING, CANNOT TAKE PLACE DUE TO EXCESSIVELY WET SOILS. WET WEATHER CONDITIONS ARE TO BE DETERMINED ON A FIELD BY FIELD BASIS AND NOT FOR THE PROJECT AS A WHOLE.
   - A. CONSTRUCTION ACTIVITIES ON PREPARED SURFACES, SURFACES WHERE TOPSOIL AND SUBSOIL HAVE BEEN REMOVED), HEAVILY COMPACTED IN PREPARATION, OR OTHERWISE STABILIZED (E.G. THROUGH CEMENT MIXING) MAY OCCUR AT THE DISCRETION OF THE CONTRACTOR IN WET WEATHER CONDITIONS.
   - B. CONSTRUCTION ACTIVITIES ON UNPREPARED SURFACES SHALL BE DONE ONLY WHEN WORK SHALL NOT RESULT IN RUTTING CREATING A MIXING OF SUBSOIL AND TOPSOIL. DETERMINATION AS TO THE POTENTIAL OF SUBSOIL AND TOPSOIL MIXING SHALL BE IN CONSULTATION WITH THE UNDERLYING LANDOWNER, OR, IF APPROVED BY THE LANDOWNER, HIS/HER DESIGNATED TENANT.

8. WEED/VEGETATION CONTROL
   - A. THE CONTRACTOR SHALL PROVIDE FOR WEED CONTROL IN A MANNER THAT PREVENTS THE SPREAD OF WEEDS. SPRAYING SHALL BE DONE BY A PESTICIDE APPLICATOR THAT IS APPROPRIATELY LICENSED FOR DOING SUCH WORK IN THE STATE OF ILLINOIS.

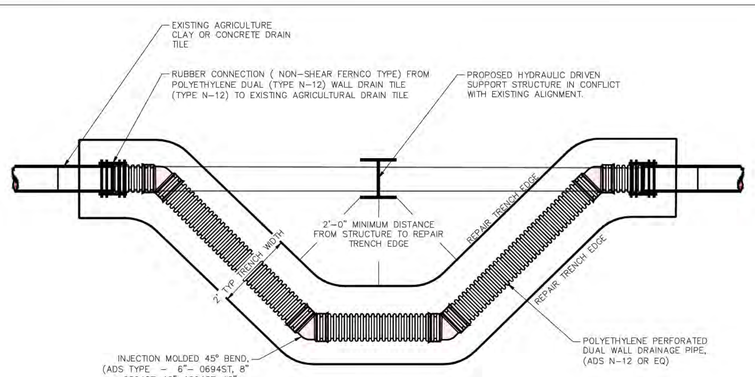
# DECOMPACTION NOTES

1. DECOMPACTION IS REQUIRED WHEN ALL THREE CONDITIONS APPLY.
   - A. THE AREA HAS BEEN TRAFFICKED OR TRAVERSED BY VEHICLES OR CONSTRUCTION EQUIPMENT, AND
   - B. THE SOIL PENETROMETER READINGS ARE 300 PSI OR GREATER, AND
   - C. THE SOIL STRENGTH (PSI) IN THE RIGHT–OF–WAY AREA IS GREATER THAN THAT OF THE NON–TRAFFICKED AREA.
2. AN ENVIRONMENTAL AND/OR AGRICULTURAL INSPECTOR (AI), WITH EXPERIENCE AND TRAINING IN THE PROPER IDENTIFICATION OF COMPACTED SOIL AND OPERATION METHODS OF DEEP DECOMPACTION TOOLS IS REQUIRED TO OBSERVE THE DAILY OPERATION OF THE RIPPER/SUBSOILER TO ENSURE THE CONDITIONS ARE APPROPRIATE FOR DECOMPACTION EFFORTS AND THAT THE PROPER EQUIPMENT IS UTILIZED AND THAT EQUIPMENT IS SET–UP AND OPERATED CORRECTLY.
3. TO ACHIEVE THE MOST EFFECTIVE SHATTER OF THE COMPACTED SOIL THE FOLLOWING GUIDELINES HAVE BEEN ESTABLISHED:
   - A. CONDUCT RIPPING WHEN THE SOIL IS DRY. FOLLOW THE "SOIL PLASTICITY TEST PROCEDURES" TO DETERMINE IF SOIL CONDITIONS ARE ADEQUATELY DRY TO CONDUCT DECOMPACTION EFFORTS.
   - B. DEEP RIPPING SHALL BE CONDUCTED USING A RIPPER OR SUBSOILING TOOL WITH A SHANK LENGTH OF NO LESS THAN 18 INCHES AND A SHANK SPACING OF APPROXIMATELY THE SAME MEASUREMENT AS THE SHANK LENGTH.
   - C. USE A RIPPER WITH A KNIFE LENGTH OF NO LESS THAN 2 INCHES MORE THAN THE DESIRED DEPTH OF DECOMPACTION.
   - D. TO BEST PROMOTE REVEGETATION AND RESTORE CROP PRODUCTION, A TOTAL DEPTH OF 30 OR MORE INCHES OF SOIL (TOPSOIL PLUS SUBSOIL) IS REQUIRED.
   - E. THE MINIMUM DEPTHS OF DECOMPACTION STATED ABOVE IN 3.D. ARE REQUIRED WHERE POSSIBLE. A SAFE DISTANCE FROM SUB–SURFACE STRUCTURES (TILE DRAINS, PIPELINES, BURIED UTILITIES, BEDROCK, ETC.) MUST BE MAINTAINED AT ALL TIMES. WHERE SUCH STRUCTURES EXIST, A LESSER DEPTH OF DECOMPACTION WILL BE REQUIRED TO PREVENT DAMAGE TO EQUIPMENT AND THE STRUCTURES AS WELL AS TO MAINTAIN A SAFE WORK ENVIRONMENT. THE ALLOWABLE DECOMPACTION DEPTH IN THESE INSTANCES WILL BE DETERMINED ON A SITE BY SITE BASIS.
   - F. WHEN THE KNIVES ARE IN THE SOIL TO THE DESIRED DEPTH, THE TONGUE OF THE RIPPER SHOULD BE PARALLEL TO THE SURFACE OF THE GROUND.
   - G. SELECT A TRACTOR THAT HAS ENOUGH HORSEPOWER TO PULL THE RIPPER AT A SPEED OF 1.5 TO 2 MPH AND WHOSE FOOTPRINT IS OF EQUAL OR LESSER WIDTH THAN THE RIPPER. TRACKED EQUIPMENT IS PREFERRED AND TYPICALLY REQUIRED TO ACHIEVE THIS CRITERIA.
   - H. THE RIPPER SHANKS SHOULD NOT CREATE RUTS, CHANNELS, OR MIXING OF THE SUB–SOIL WITH TOPSOIL. A SPEED OF 1.5 TO 2 MPH IS RECOMMENDED TO MINIMIZE THE RISK OF RUTTING AND SOIL MIXING. THE IDEAL OPERATING SPEED CAN VARY WITH SOIL CHARACTERISTICS, TRACTOR AND RIPPING TOOL USED. AN EXCESSIVE TRAVEL SPEED WILL OFTEN INCREASE MIXING OF SOIL HORIZONS.
   - I. WHEN THE EQUIPMENT IS SET UP AND OPERATED CORRECTLY, THE RIPPER SHOULD CREATE A WAVE ACROSS THE SURFACE OF THE GROUND AS IT LIFTS AND DROPS THE SOIL.
   - J. MAKE ONE RIPPING PASS THROUGH THE COMPACTED AREA. USING A PENETROMETER, THE AI WILL MEASURE THE PSI BETWEEN THE RIPPED KNIFE TRACKS TO DETERMINE IF THE SINGLE RIPPING PASS WAS SUCCESSFUL. ADDITIONAL PASSES SHOULD ONLY BE USED WHERE NEEDED AS THEY MAY REDUCE THE EFFECTIVENESS OF THE RIPPING BY RECOMPACTING THE SOIL SHATTERED IN THE PREVIOUS PASS.
   - K. IF THE FIRST PASS DOES NOT SUCCESSFULLY DECOMPACT THE SOIL, ADDITIONAL PASSES WILL BE NEEDED. SHOULD MULTIPLE PASSES OF THE RIPPER BE NEEDED TO ACHIEVE DECOMPACTION BETWEEN THE KNIVES TRACKS OF THE RIPPING TOOL, THE SUBSEQUENT PASSES SHOULD BE POSITIONED SO THE KNIFE TRACKS FROM THE PREVIOUS PASS ARE SPLIT BY THE SECOND PASS. IF THREE OR MORE PASSES HAVE BEEN MADE AND SUFFICIENT DECOMPACTION HAS NOT YET BEEN ACHIEVED THE AI MAY CHOOSE TO HALT FURTHER DECOMPACTION EFFORTS IN THAT AREA UNTIL CONDITIONS IMPROVE OR BETTER METHODS ARE DETERMINED.
   - L. FOLLOWING RIPPING, ALL STONE AND ROCK THREE OR MORE INCHES IN SIZE WHICH HAS BEEN LIFTED TO THE SURFACE SHALL BE COLLECTED AND REMOVED FROM AGRICULTURAL AREAS.
   - M. AFTER RIPPING HAS BEEN CONDUCTED, DO NOT ALLOW UNNECESSARY TRAFFIC ON THE RIPPED AREA.
   - N. IN AGRICULTURAL LANDS AND CROPLANDS THAT WILL NOT BE REPLANTED TO VEGETATION AS SHOWN ON THE PLANS, RECOMMEND TO LANDOWNERS TO PLANT A COVER CROP (CEREAL RYE, CLOVER, ALFALFA, TILLAGE RADISH, TURNIPS, ETC.) FOLLOWING DECOMPACTION. REDUCED COMPACTION CREATED BY THE RIPPER PASS WILL NOT REMAIN OVER TIME WITHOUT SUBSEQUENT ROOT PENETRATION. ROOT PENETRATION INTO THE SHATTERED SOIL IS NECESSARY TO ESTABLISH PERMANENT STABILIZED CHANNELS TO CONDUCT AIR AND WATER INTO THE SOIL PROFILE. TWO GOOD SOURCES FOR LANDOWNER COVER CROP EDUCATION ARE: HTTP://WWW.MCCC.MSU.EDU/CCINFO/CROPBYCROP.HTML AND HTTP://MCCCDEV.ANR.MSU.EDU/, FOR LOCAL EXPERTISE, CONSULT WITH YOUR COUNTY'S SOIL AND WATER CONSERVATION DISTRICT /USDA NATURAL RESOURCE CONSERVATION SERVICE (NRCS) OFFICE FOR COVER CROP SELECTION AND COMPLIANCE WITH NRCS PLANTING DEADLINES.

# SOIL PLASTICITY TEST PROCEDURES

THE AGRICULTURAL INSPECTOR WILL TEST THE CONSISTENCY OF THE SURFACE SOIL TO A DEPTH OF APPROXIMATELY 4 TO 8 INCHES USING THE FIELD PLASTICITY TEST PROCEDURE DEVELOPED FROM THE ANNUAL BOOK OF ASTM STANDARDS, PLASTIC LIMIT OF SOILS (ASTM D–4318).

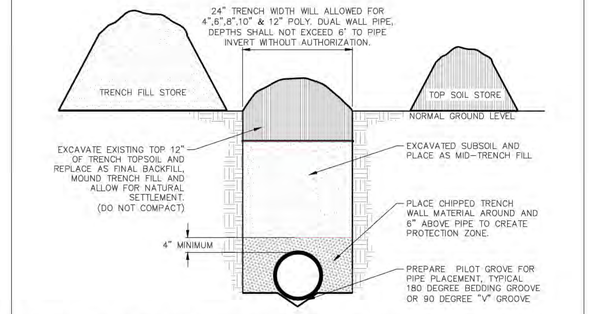
1. PULL A SOIL PLUG FROM THE AREA TO BE TILLED, MOVED, OR TRAFFICKED TO A DEPTH OF 4–8 INCHES.
2. ROLL A PORTION OF THE SAMPLE BETWEEN THE PALMS OF THE HANDS TO FORM A WIRE WITH A DIAMETER OF ONE–EIGHTH INCH.
3. THE SOIL CONSISTENCY IS:
   - A. TILLABLE (ABLE TO BE WORKED) IF THE SOIL WIRE BREAKS INTO SEGMENTS NOT EXCEEDING 3/8 OF AN INCH IN LENGTH.
   - B. PLASTIC (NOT TILLABLE) IF THE SEGMENTS ARE LONGER THAN 3/8 OF AN INCH BEFORE BREAKING.
4. THIS PROCEDURE IS TO BE USED TO AID IN DETERMINING WHEN SOIL CONDITIONS ARE DRY ENOUGH FOR CONSTRUCTION ACTIVITIES TO PROCEED.
5. ONCE THE SOIL CONSISTENCY HAS BEEN DETERMINED TO BE OF ADEQUATE DRYNESS, THE PLASTICITY TEST IS NOT REQUIRED AGAIN UNTIL THE NEXT PRECIPITATION EVENT.




PLAN VIEW

SAFETY NOTE:
OPEN CUT TRENCHES SHALL BE SHEETED AND BRACED AS REQUIRED BY THE GOVERNING STATE AND FEDERAL LAWS AND MUNICIPAL ORDINANCES, AND AS MAY BE NECESSARY TO PROTECT LIFE. THE CONTRACTOR SHALL COMPLY WITH ALL STATE AND FEDERAL SAFETY REGULATIONS AS OUTLINED IN THE LATEST REVISIONS OF THE FEDERAL CONSTRUCTION SAFETY STANDARDS AND WITH APPLICABLE PROVISIONS AND REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

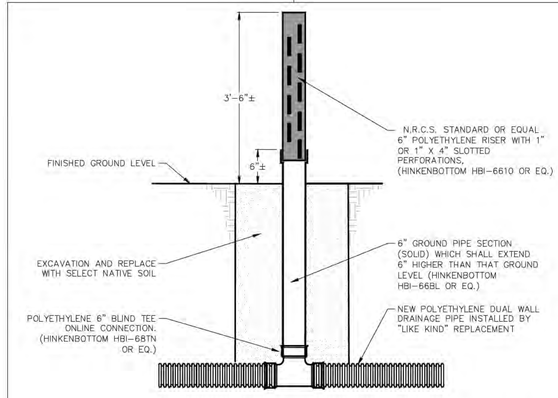
**EXISTING DRAIN TILE BYPASS REROUTE**
**FOR COMMERCIAL SOLAR ENERGY PROJECTS**
**EXISTING DRAIN TILE REROUTE WHICH IS IN CONFLICT WITH FIXED IMPROVEMENT INSTALLED AS MODIFICATION TO ORIGINAL ROUTE**
**HUDDLESTON – MCBRIDE TYPICAL SECTION NO. 360D**
NOT TO SCALE




NEW POLYETHYLENE DUAL WALL PERFORATED DRAIN TILE INSTALLATION FOR AGRICULTURAL LAND USE
1. EXCAVATE 12" (+–) TOPSOIL, STORE SEPARATE AND SAVE FOR FINAL BACKFILL.
2. EXCAVATE SUBSOIL TO PROPOSED GRADE LINE, STORE SEPARATE AND SAVE FOR MID–TRENCH FILL.
3. HAND EXCAVATE DRAIN TILE PILOT GROOVE TO PROPOSED LASER GRADE, AND INSTALL NEW POLYETHYLENE PERFORATED DUAL WALL DRAIN TILE (ADS N–12 OR EQUAL) (FILTER PIPE WRAP OPTIONAL FOR SANDY SOILS)
4. PLACE "HAND SPADED CHIPPED" CLEAN TOP SOIL MATERIAL AROUND NEW PIPE TO CREATE BEDDING SUPPORT AND PIPE PROTECTION.
5. BACKFILL EXCAVATION TRENCH WITH MID TRENCH MATERIAL AND REPLACE SAVED TOP SOIL AS FINAL BACKFILL.

NOTE:
TYPICAL SINGLE WALL POLYETHYLENE PERFORATED DRAIN TILE INSTALLATION BY AGRICULTURAL DRAINAGE TRENCHERS IN ACCORDANCE WITH A.S.T.M. F–405, F–449 OR F–667, A.A.S.H.T.O. M–252, OR M–294. INSTALLATION PROCEDURE MAY BE ALLOWED ONLY BY DIRECTION OF THE RESIDENT PROJECT ENGINEER.

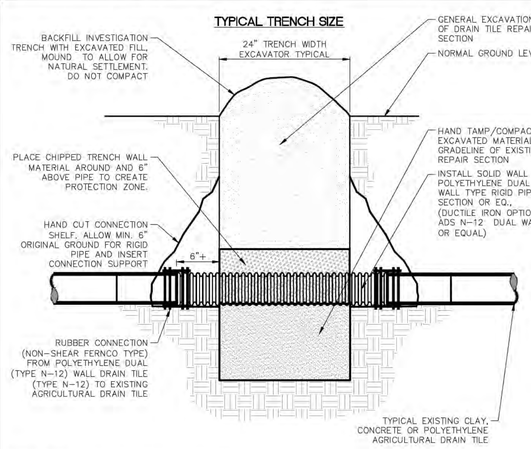
**EXISTING CLAY DRAIN TILE REPLACEMENT SECTION**
**FOR COMMERCIAL SOLAR ENERGY PROJECTS**
**EXISTING AGRICULTURAL DRAIN TILE REPLACEMENT SECTION**
**TYPICAL FIELD INSTALLATION FOR POLYETHYLENE DUAL WALL DRAIN TILE**
**HUDDLESTON – MCBRIDE TYPICAL SECTION NO. 20A**
NOT TO SCALE




**NOTE:**
**THESE TYPICAL STANDARD SPECIFICATION MAY BE FIELD ADJUSTED WITH THE PROPER AUTHORIZATION FROM THE PROJECT MANAGER, ALL CHANGES SHALL BE RECORDED ON FINAL AS–BUILT DRAWINGS.**

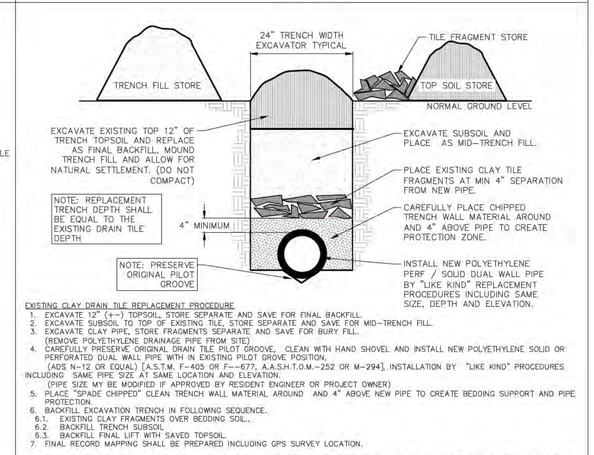
SAFETY NOTE:
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**6" OBSERVATION RISER STRUCTURE**
**FOR COMMERCIAL SOLAR ENERGY PROJECTS**
**INSTALLED AT PARCEL INGRESS AND EGRESS LOCATIONS**
**HUDDLESTON – MCBRIDE TYPICAL SECTION NO. 27D**
NOT TO SCALE




SAFETY NOTE:
OPEN CUT TRENCHES SHALL BE SHEETED AND BRACED AS REQUIRED BY THE GOVERNING STATE AND FEDERAL LAWS AND MUNICIPAL ORDINANCES, AND AS MAY BE NECESSARY TO PROTECT LIFE. THE CONTRACTOR SHALL COMPLY WITH ALL STATE AND FEDERAL SAFETY REGULATIONS AS OUTLINED IN THE LATEST REVISIONS OF THE FEDERAL CONSTRUCTION SAFETY STANDARDS AND WITH APPLICABLE PROVISIONS AND REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

**EXISTING DRAIN TILE REPAIR SECTION**
**FOR COMMERCIAL SOLAR ENERGY PROJECTS**
**EXISTING AGRICULTURAL DRAIN TILE REPLACEMENT SECTION**
**TYPICAL REPAIR SECTION FOR DRAIN TILE "BLOW OUT" OR FAILURE**
**HUDDLESTON DRAINAGE TYPICAL SECTION NO. 62A**
NOT TO SCALE




EXISTING CLAY DRAIN TILE REPLACEMENT PROCEDURE
1. EXCAVATE 12" (+–) TOPSOIL, STORE SEPARATE AND SAVE FOR FINAL BACKFILL.
2. EXCAVATE SUBSOIL TO TOP OF EXISTING TILE, STORE SEPARATE AND SAVE FOR MID–TRENCH FILL.
3. EXCAVATE CLAY PIPE, STORE FRAGMENTS SEPARATE AND SAVE FOR BURY FILL. (REMOVE POLYETHYLENE DRAINAGE PIPE FROM SITE)
4. CAREFULLY PRESERVE ORIGINAL DRAIN TILE PILOT GROOVE, CLEAN WITH HAND SHOVEL AND INSTALL NEW POLYETHYLENE SOLID OR PERFORATED DUAL WALL PIPE WITH IN EXISTING PILOT GROVE POSITION. (ADS N–12 OR EQUAL) [A.S.T.M. F–405 OR F–667, A.A.S.H.T.O.M.–252 OR M–294], INSTALLATION BY "LIKE KIND" PROCEDURES INCLUDING SAME PIPE SIZE AT SAME LOCATION AND ELEVATION. (PIPE SIZE MY BE MODIFIED IF APPROVED BY RESIDENT ENGINEER OR PROJECT OWNER)
5. PLACE "SPADE CHIPPED" CLEAN TRENCH WALL MATERIAL AROUND AND 4" ABOVE NEW PIPE TO CREATE BEDDING SUPPORT AND PIPE PROTECTION.
6. BACKFILL EXCAVATION TRENCH IN FOLLOWING SEQUENCE.
   - 6.1. EXISTING CLAY FRAGMENTS OVER BEDDING SOIL.,
   - 6.2. BACKFILL TRENCH SUBSOIL
   - 6.3. BACKFILL FINAL LIFT WITH SAVED TOPSOIL.
7. FINAL RECORD MAPPING SHALL BE PREPARED INCLUDING GPS SURVEY LOCATION.

SAFETY NOTE: OPEN CUT TRENCHES SHALL BE SHEETED AND BRACED AS REQUIRED BY THE GOVERNING STATE AND FEDERAL LAWS AND MUNICIPAL ORDINANCES, AND AS MAY BE NECESSARY TO PROTECT LIFE. THE CONTRACTOR SHALL COMPLY WITH ALL STATE AND FEDERAL SAFETY REGULATIONS AS OUTLINED IN THE LATEST REVISIONS OF THE FEDERAL CONSTRUCTION SAFETY STANDARDS AND WITH APPLICABLE PROVISIONS AND REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

**NOTE:**
**ALL EXISTING UNKNOWN LATERAL DRAIN TILES ENCOUNTERED DURING "LIKE KIND" REPLACEMENT PROCESS SHALL BE REPLACED BY SAME PROCEDURE**

**EXISTING DRAIN TILE REPLACEMENT SECTION**
**FOR COMMERCIAL SOLAR ENERGY PROJECTS**
**EXISTING AGRICULTURAL DRAIN TILE "LIKE KIND" Replacement**
**TRENCH REPLACEMENT INCLUDING EXISTING LATERALS BY MID SIZE EXCAVATOR**
**HUDDLESTON – MCBRIDE TYPICAL SECTION NO. 20Ar1**
NOT TO SCALE

# DRAIN TILE NOTES & DETAILS

SCALE: N.T.S.

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SPECIAL USE PERMIT SET
AMENT ROAD- KENDALL IL

PROJECT NUMBER: 22–4525

| REV | DATE | DRAWN | CHECKED | RELEASE LEVEL |
|---|---|---|---|---|
| | 08/29/24 | CMP | MBK | SPECIAL USE PERMIT SET |
| | 09/13/24 | CMP | MBK | SPECIAL USE PERMIT SET |
| | 10/17/24 | CMP | MBK | SPECIAL USE PERMIT SET REV 1 |
| | 12/19/24 | CMP | MBK | SUP SET – COUNTY COMMENTS |
| | 01/14/25 | CMP | MBK | SUP SET – COUNTY COMMEN

# Management and Monitoring (M&M) Specifications & Guidelines

**Project Name: Ament Road Solar Farm**

**Applicant: Ament Road Solar 1, LLC**

**ENCAP, Inc. Project Number: 24-0923D**

**Document Preparer: S. Rowley, PWS, ENCAP, Inc.**

**Date Prepared: October 17, 2024**

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# NATIVE AREA SPECIFICATIONS

# AMENT ROAD SOLAR FARM – KENDALL COUNTY

## 1.0 PURPOSE

The purpose of this plan is to provide native area specifications for the Ament Road Solar Farm project. The areas underneath and around the solar array panels will be planted with a native grazing seed mix and a native pollinator seed mix. These native plantings will provide water quality benefits, pollinator friendly habitat, soil stabilization, and watershed benefits for the local streams.

## 2.0 CONTRACTOR QUALIFICATIONS

1. The Native Landscape Contractor chosen for the establishment and enhancement of the natural areas must be experienced in the restoration, installation, and management of said areas. They must have a minimum five years of experience conducting ecological restoration and management projects.

2. There shall be a supervisor available at all times that can identify non-native and native plants by genus and species. The goal of installing successful native plant communities is a long-term process. Therefore, it is imperative that a qualified Native Landscape Contractor perform the initial installation and maintenance.

## 3.0 QUALITY AND CONDITION

1. All native seed proposed for the project shall be provided as Pure Live Seed (PLS) and sourced from within a 200-mile radius of the project location. Plant origins outside of this range must be approved by the Wetland Consultant.

2. Native seeds shall be blended by the vendor, and the mixture and ratio shall be guaranteed in writing to be as specified. The amount of seed indicated on the specifications shall mean the total amount of pure live seed (PLS) per acre for all species listed. It is the sole responsibility of the Native Landscape Contractor to provide approved seed that meets industry-standard PLS requirements.

3. Native Landscape Contractor shall provide the Wetland Consultant with the name and location of the seed supplier, origin of the various kinds of plants, and a statement of the purity of the seed.

4. Seed shall conform to applicable State and Federal regulations as in effect on the date of letting. Unless otherwise specified, seed shall not contain in excess of 1 percent weed seeds; 0 percent is desirable.

5. All storage requirements, stratification, and scarification considerations shall be the sole responsibility of the Native Landscape Contractor.

6. If specified for the seed mixture, mycorrhizal inoculants shall be pelletized and mixed at 1 lb. per acre with the fine seeds before installation. The inoculants shall contain a diverse mixture of Glomales fungal species (*Glomus* spp.) in pelletized form.

7. Under no circumstances shall Wheat (*Triticum aestivum*), Cereal Rye (*Secale cereale*), Perennial Rye (*Lolium perenne*), or Barley (*Hordeum vulgare*) be used as a temporary cover crop.

## 4.0 HANDLING

1. Native Landscape Contractor shall be solely responsible for the proper handling and storage of the seed according to the best seed handling and storage practices, including fungicide treatments and stratification considerations. Owner shall make no compensation for damage to the seed because of improper storage, cleaning, threshing, or screening operations.

2. All native seeds shall be packed and covered in such a manner as to ensure adequate protection against damage and maintain dormancy while in transit, storage, or during planting operations.

3. Seed shall be kept dry and unopened until needed for use. Seed shall not be stored or temporarily stored in locations or vehicles where the temperature will be in excess of 90 degrees F.

## 5.0 SITE PREPARATION

1. Site should be cleared of undesirable vegetation prior to seeding. If necessary, non-selective herbicide (Aquatic-approved Glyphosate formulation) should be applied within the proposed planting zones at least 2 weeks prior to seedbed preparation.

2. The General Contractor and Native Landscape Contractor shall be responsible for performing all work necessary to achieve and maintain an acceptable seedbed prior to seeding. All areas must be properly prepared before seeding begins. Underground utility location maps and plans should be reviewed prior to work. Equipment having low unit pressure ground contact shall be utilized within the planting areas.

3. Unless the Wetland Consultant agrees to another approach, the seedbed shall be prepared by working the topsoil to a depth of 3 inches. Site preparation equipment shall be of a design that can be utilized efficiently by the Native Landscape Contractor to meet the requirements for the work specified. The equipment proposed for use by the Native Landscape Contractor for disking and herbicide applications shall be subject to approval by the Wetland Consultant.

4. Prior to seeding, at least 6 inches of topsoil shall be present and free of all clods, stones, roots, sticks, rivulets, gullies, crusting, and cracking. The soil aggregate size will be no greater than 2 inches in the largest diameter.

5. If present, compacted soils shall be disked or raked prior to seeding. Remedial measures for the access area may, at the direction of the Wetland Consultant, involve ripping from 12 to 18 inches of the soil horizon prior to disking. If compaction is not a concern and the seedbed needs to be loosened prior to seeding to ensure good seed-soil contact, disking or raking shall be performed using equipment and the approach recommended by the Native Landscape Contractor, subject to approval by the Wetland Consultant.

6. If needed, cultivation shall occur within 24 hours prior to seeding. Seeding should occur immediately after the last cultivation, preferably before a rain.

## 6.0 PLANT MATERIALS

**See Sheet C-5.1 for Seed Mixes; however, the following cover crop should be added to both seed mixes during installation.**

| Scientific Name | Common Name | Lbs/Acre |
|---|---|---|
| Avena sativa | Seed Oats | 40.000 |

## 7.0 SEED INSTALLATION

1. Seeding shall take place AFTER solar panel installation is completed.

2. Except where site conditions preclude their use, seeding shall be performed using a Truax drill, Truax Trillion seeder, or comparable equipment designed specifically for installation of native seed. For areas where site conditions preclude the use of specialized equipment, seed may be installed through hand broadcasting and lightly raking in the seed. **Hand broadcast seed shall be spread at twice the specified rate.** Other methods of seed installation may be used with prior approval from the Wetland Consultant.

3. Seasonal Considerations:

   *November 1 through February 28*: Seed must be protected from displacement due to water and wind erosion. Seeding on bare, graded surfaces must be protected with double netted erosion control blankets on slopes. Less cover crop will be observed during the following spring due to frost damage.

   *March 1 through June 29*: Seeding during this period is appropriate but germination of a portion of the seed may not occur until the following season due to lack of cold stratification to break seed dormancy. Cover crop generally germinates within 2-3 weeks of seeding operation. Seeding on bare, graded surfaces must be protected with erosion control blankets on slopes.

   *June 30 through September 15*: Installation of native seed should be suspended unless irrigation can be provided or unseasonably cool conditions persist. Also, any annual forbs planted with the mix during this time period may germinate but not have sufficient time to flower before fall senescence. Seeding on bare, graded surfaces must be protected with erosion control blankets on slopes.

   *September 15 through October 31*: Seeding on bare, graded surfaces must be protected with double netted erosion control blankets on slopes. Less cover crop will be observed during the following spring due to frost damage.

4. Prior to starting work, all seeding equipment shall be calibrated and adjusted to sow seeds at the proper seeding rate. In general, the optimum seeding depth is 0.25 inch below the soil surface. Areas where the seed has not been incorporated into the soil to the proper depths will not be accepted, and no compensation for materials or labor for the rejected work will be made by the Owner.

5. Equipment shall be operated in a manner to ensure complete, uniform coverage of the entire area to be seeded and to avoid damage to existing woody plants. Any area inadequately covered, as solely determined by the Wetland Consultant, shall be retreated at no additional cost to the Owner.

6. Seeding and soil tracking/firming shall not be done during periods of rain, severe drought, high winds, excessive moisture, frozen ground, or other conditions that preclude satisfactory results.

7. To achieve best results, seed boxes should be kept more than one-quarter full at all times and ground speed should be no more than 2 to 3 mph.

8. Seeding operations must occur when soil moisture is appropriate for seeding operation.

9. Native plant seed shall not receive fertilizer.

10. Wet seed that is moldy or otherwise damaged in transit or storage shall not be used.

11. After seeding operation is completed, install erosion control blanket per manufacturer's specifications as necessary.

## 8.0 EROSION CONTROL

1. The Native Landscape Contractor shall be fully responsible for implementing erosion control measures within prescribed planting areas.

2. All disturbed areas or areas of bare soil are recommended to be covered with erosion control blanket; North American Green S-75 or equivalent will be used at a minimum. Fall-winter plantings and/or 3:1 slopes require North American Green S-150 or equivalent. Erosion control blanket shall be installed within 24 hours after an area is seeded. See manufacturer's specifications for erosion control blanket composition.

## 9.0 CLEAN-UP AND PROTECTION

1. During landscape work, store materials and equipment where directed. Keep pavements clean and work areas and adjoining areas in an orderly condition.

2. Protect landscape work and materials from damage due to landscape operations or operations by other trades and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed by the Wetland Consultant.

## 10.0 INSPECTIONS AND ACCEPTANCE

1. Owner reserves the right to inspect all seeds and plants either at place of growth or at site before planting for compliance with requirements for name, variety, size, quantity, quality or mix proportion.

2. Native Landscape Contractor is to keep records of the certificates of composition or invoices of seed mixtures and integrity of plant materials with respect to species, variety, and source after purchase.

3. Native Landscape Contractor is to notify Owner within five days after completing initial and/or supplemental plantings in each area.

# MONITORING AND MANAGEMENT PLAN

# AMENT ROAD SOLAR FARM – KENDALL COUNTY

## 1.0 MONITORING METHODOLOGY – SHORT TERM (YEARS 1-3)

The planted areas will be monitored annually for a three-year period to ensure successful establishment of the plantings. The primary objective of the short-term monitoring program is to track the success of the planted species over the 3-year period of regularly scheduled monitoring sessions. The monitoring documents changes in plant community composition and reveals the need for management changes to improve floristic quality and coverage. Specific goals of the monitoring are to determine the vegetative species present, the percent cover by vegetation, and identify hydrology and erosion problems.

Monitoring within the planted areas shall be conducted annually utilizing a meander survey methodology. The monitoring shall identify:

1. the five dominant vegetative species within each planting zone,
2. the approximate percent coverage by overall vegetation in each planting zone,
3. the approximate percent vegetative coverage by native and non-native/invasive species within each planting zone,
4. erosion or sedimentation issues,
5. bare areas or areas not fully vegetated,
6. management recommendations for improved quality and invasive species removals, and
7. wildlife and pollinator usage (visual observations).

Observations shall be made during the monitoring to identify specific management strategies necessary to reach design goals. Site conditions shall be photo documented during monitoring sessions.

## 2.0 PERFORMANCE CRITERIA (YEARS 1-3)

1. By the end of the first full growing season, the planted areas shall exhibit at least 75% vegetative coverage, primarily by Seed Oats (*Avena sativa*). There shall be no areas greater than 1.0 square meter devoid of vegetation, and at least 25% of the species present as measured by aerial coverage shall be native and non-invasive, or planted species.

2. By the end of the second growing season, at least 90% of the ground as measured by aerial coverage shall be vegetated, and at least 50% of the species present as measured by aerial coverage shall be native and non-invasive, or planted species. There shall be no areas greater than 1.0 square meter devoid of vegetation.

3. By the end of the third growing season, at least 90% of the ground as measured by aerial coverage shall be vegetated, and at least 75% of the species present shall be native and non-invasive, or planted species. There shall be no areas greater than 0.5 square meter devoid of vegetation.

4. At the end of each growing season, none of the three most dominant species within the planted areas shall be non-native or invasive species, including but not limited to: Ragweed (*Ambrosia* spp.), Wild Carrot (*Daucus carota*), Purple Loosestrife *(Lythrum salicaria)*, Teasel (*Dipsacus* spp.), Reed Canary Grass (*Phalaris arundinacea*), Sweet Clover (*Melilotus* spp.), Common

Buckthorn (*Rhamnus cathartica*), Kentucky Blue Grass *(Poa pratensis)*, Thistle *(Cirsium* spp.*)*, Honeysuckle (*Lonicera sp.*), Common Reed *(Phragmites australis)*, or Sandbar Willow (*Salix exigua*).

## 3.0 REPORTING (YEARS 1-3)

An annual vegetation monitoring report will be submitted to the Owner and Kendall County by January 31st following the monitoring season each year. This report will be used to determine if the natural areas are meeting performance standards. The report shall include information on site location; permit numbers; methodology used (including monitoring dates); data results; summary relative to performance criteria; a summary of the annual monitoring observations; a description of the management performed during the year; a list of recommendations for management during the upcoming year; and representative photographs of the natural areas. The natural areas shall meet certification requirements, associated performance standards, and will be monitored and maintained for a period of three years or until performance standards have been met to ensure successful establishment.

## 4.0 SHORT-TERM MANAGEMENT PLAN (YEARS 1-3)

1. First Year. Mow the planted areas to a height of 8-12 inches, 3 times during the early growing season or as needed to control non-native and invasive annual species. Mowing (including weed whipping) shall take place prior to or when non-native and invasive species are flowering to prevent seed set. Control undesirable plant species, when present in small quantities, by hand pulling prior to the development and maturity of the plant. Hand removal shall include the removal of all aboveground and belowground stems, roots and flower masses prior to development of seeds. Apply herbicide (as necessary) to non-native and invasive perennial species within the natural areas with appropriate herbicide. Management site visits should be conducted at a minimum of 3 times annually. Soil erosion and sediment controls shall be regularly maintained.

2. Second Year. Control of undesirable plant species during the second growing season shall consist primarily of selective herbicide application, spot mowing, and hand pulling. Mowing (including weed whipping) shall be conducted 3 times during the early growing season and as needed to a height of 8-12 inches to prevent annual weeds from producing seed. Management site visits should be conducted at a minimum of 3 times annually. Soil erosion and sediment controls shall be regularly maintained.

3. Third Year. Undesirable plant species will be controlled (as necessary) by mowing (including weed whipping), hand pulling, and/or selective herbicide application. Continue to perform management site visit at least 3 times annually during the growing season. Soil erosion and sediment controls shall be regularly maintained.

   Since the site is not suitable for prescribed burning, it is recommended to conduct a late fall mowing with mulching/thatch removal at the completion of the third growing season, during the dormant season (November-April). This regimen will mimic the conditions and benefits of a controlled burn.

## 5.0 LONG-TERM MANAGEMENT PLAN (YEARS 4+)

1. Long Term. As the planted areas mature, required supplemental management will be significantly reduced. The plant communities will stabilize and be effectively managed through a

reduced schedule of spot mowing, selective herbicide application, and hand pulling as necessary. Every 3-5 years, a late fall mowing with thatch mulching/removal should be conducted during the dormant season (November-April). Management site visits should be conducted 2-3 times annually. Soil erosion and sediment controls shall be regularly maintained.

The natural areas require long-term management to maintain their function as designed. It is expected that the natural areas will be maintained in their permitted condition. The long-term manager for the natural areas will be the Lessee or Owner. An annual letter report documenting the completion of inspection and management tasks based on the information herein should be submitted to the Owner each year.

Management tasks should be preceded by a site inspection to determine if remedial measures are required and to recommend procedures to correct any deficiencies. The site inspection should be conducted by a qualified individual knowledgeable in native plants and management of native plantings. Areas of observation during the site inspection should include but are not limited to: dominant species within distinct planting communities; erosion or herbivory concerns that develop over time; changes in hydrology that may require additional planting to adjust for higher or lower water levels; or the appearance of invasive species in the managed area that require alternative management methods.

The following management tasks should be completed annually, unless otherwise specified below:

a. Debris Removal: All debris shall be removed, via non-invasive methods, from within the natural areas.
b. Herbicide Application: Selective herbicide to control invasive species should be completed 2-3 times annually. A certified and licensed pesticide applicator shall select herbicide, appropriate for the area of use (such as wetlands or other special management area), and shall apply the herbicide by the appropriate method, to prevent killing of desirable native species. Invasive and non-native species, and woody plant species not specified as part of the planting plan, shall be controlled by appropriate management practices of the approved plan.
c. Mowing: Selective mowing is a preferred method for control of annual non-native and invasive species to prevent seed proliferation. Mowing with a specialty flail-type mower to mulch thatch or weed whip with thatch removal (or combination) may be substituted for prescribed burns in instances where a burn is not permissible or weather does not allow for a safe/effective burn.
d. Erosion Control & Stabilization: When conducting the annual inspection, it is important to observe and note areas of bare soil and other early warning signs of erosion. If caught early enough, they may be easily stabilized with seed and erosion control blanket.
e. Brush Clearing: Management of woody species is not likely necessary if herbicide applications are successful and continued each year. If invasive shrubs become a problem they should be cut and all remaining stumps should be treated with an appropriate herbicide to prevent resprout, either through a basal oil treatment, hand wick applicator, or other approved method. Brush clearing should be conducted in the winter months with frozen ground conditions.

**Table 1: Typical Management Schedule for Natural Areas**

| Management Task | Spring | Summer | Fall | Winter |
|---|---|---|---|---|
| Annual Site Inspection | | X | | |

| | | | | |
|---|---|---|---|---|
| Annual Letter Report | | | | X |
| Debris Removal (As Necessary) | X | X | X | X |
| Herbicide Application | X | X | X | |
| Mowing | X | X | X | |
| Erosion Control & Stabilization | X | X | X | |
| Brush Clearing | | | X | X |

## 6.0 HERBICIDE APPLICATION

This section applies to all site preparation and management herbicide application that is proposed to occur onsite.

1. Any person applying herbicide shall hold appropriate licensure for pesticide application in the state of Illinois. A licensed Illinois Pesticide Applicator shall be on-site at all times when herbicide is being applied.

2. Herbicide usage will vary based on site conditions and target species. The following herbicides are allowed for use in natural areas; aquatic approved Glyphosate formulations (Aquaneat®, Rodeo®, etc.), Clethodim (Intensity®, etc.), aquatic approved Imazapyr (Habitat®, etc.), Triclopyr 3A (Tahoe 3A®, Garlon 3A®, etc.), Garlon 4 Ultra® (no substitutions), and Aminopyralid (Milestone®) to control target species. It is the sole responsibility of the Contractor to evaluate the site and select the appropriate herbicide for both site conditions and target species in accordance with herbicide labeling.

# Decommissioning Estimate/Plan

Ament Road, Sheet 1

Ament Road
Kendall County, IL

Date: 9/17/2024
Calculated By: CG

This Decommissioning Estimate has been prepared by New Leaf Energy in an attempt to predict the cost associated with the removal of the proposed solar facility. The primary cost of decommissioning is the labor to dismantle and load as well as the cost of trucking and equipment. All material will be removed from the site, including the concrete equipment pads, which will be broken up at the site and hauled to the nearest transfer station.

No salvage values have been assumed in this calculation.

The following values were used in this Decommissioning Estimate:

| System Specifications | |
|---|---|
| Number of Modules | 13,390 |
| Linear Feet of Racking (ft) | 50,213 |
| Number of Inverters | 20 |
| Number of Transformers | 2 |
| Number of Tracker Motors | 6 |
| Electrical Wiring Length (ft) | 3,276 |
| Number of Foundation Piles | 3,044 |
| Length of Perimeter Fence (ft) | 5,096 |
| Number of Power Poles | 5 |
| Access Rd Material Volume (YD) | 1,791 |
| Total Disturbed Area (SF) | 49,851 |
| Total Fence Weight (lbs) | 3,618 |
| Total Racking Weight (lbs) | 314,665 |
| Total Foundation Pile Weight (lbs) | 410,940 |
| Total Solar Module Weight (lbs) | 803,400 |

| Labor and Equipment Costs | | |
|---|---|---|
| Labor Rate ($/hr) | $ | 35.00 |
| Operator Rate ($/hr) | $ | 47.00 |
| Bobcat Cost ($/hr) | $ | 101.90 |
| Front End Loader Cost ($/Day) | $ | 845.77 |
| Excavator Cost ($/Day) | $ | 1,365.46 |
| Trucking Cost ($/hr) | $ | 127.38 |
| Backhoe Cost ($/hr) | $ | 101.90 |
| Power Pole Removal Cost ($/pole) | $ | 1,500.00 |
| Grader Cost ($/day) | $ | 1,324.70 |
| Gravel Export Cost ($/YD) | $ | 8.00 |
| Loam Import Cost ($/YD) | $ | 20.00 |
| Seeding Cost ($/SF) | $ | 0.10 |
| Fuel Cost ($/mile) | $ | 0.50 |

| Equipment & Material Removal Rates | |
|---|---|
| Module Removal Rate (min/module) | 1 |
| Rack Wiring Rem. Rate (min/mod) | 0.25 |
| Racking Dismantling Rate (min/LF) | 0.2 |
| Inverter Removal Rate (hr/unit) | 0.5 |
| Transformer Removal Rate (hr/unit) | 1 |
| Motor Removal Rate (hr/unit) | 1 |
| Rack Loading Rate (min/LF) | 0.1 |
| Elect. Wiring Removal Rate (min/LF) | 0.5 |
| Pile Rem. Rate (piles/day) | 300 |
| Fence Removal Rate (min/LF) | 1 |
| Days req. to break up concrete pads | 1 |
| Days req. with Rough Grader | 1 |
| Days req. with Fine Grader | 2 |
| Total Truckloads Required | 29 |
| Round-Trip Dist. to Trans. Sta.(miles) | 17 |
| Round-Trip Time to Trans. Sta. (hr) | 0.5 |

## Labor, Material, and Equipment Costs

### 1. Remove Modules

The solar modules are fastened to racking with clamps. They slide in a track. A laborer needs only unclamp the module and reach over and slide the module out of the track.

*Module Removal Rate • Total Number of Solar Modules • Labor Rate = Module Removal Cost*

**Total = $ 7,810.83**

### 2. Remove Rack Wiring

The modules are plugged together in the same manner as an electrical cord from a light is plugged into a wall socket. The string wires are in a tray. A laborer needs only unplug the module, reach into the tray and remove the strands of wire.

*Wire Removal Rate • Total Number of Solar Modules • Labor Rate = Rack Wiring Removal Cost*

**Total = $ 1,952.71**

### 3. Dismantle Racks

Tracker module racking primarily consists of torque tubes and a driveline. These are supported on driven piles. The torque tubes and driveline unbolt from the foundation piles.

*Linear feet of Racking • Rack Dismantling Rate • Labor Rate = Rack Dismantling Cost*

**Total = $ 5,858.18**

### 4. Remove and Load Electrical Equipment

Electrical equipment includes transformers, inverters, and tracker motors.

*(Number of Inverters • Inverter Removal Rate + Number of Transformers • Transformer Removal Rate + Number of Motors • Motor Removal Rate) • (Operator Rate + Bobcat Cost) = Electrical Equipment Removal Cost*

**Total = $ 2,680.20**

### 5. Break Up Concrete Pads

Concrete pads are broken up using an excavator and jackhammer.

*Number of Demolition Days • (Excavator Cost + Operator Cost) = Total Concrete Pad Removal*

**Total = $ 1,221.77**

### 6. Load Racks

Once the racking has been dismantled, it will be loaded onto trucks for removal from the site. The trucking cost associated with this line item represents the additional time a truck will be needed during loading. Please see item # 13 for the cost of trucking off-site.

*Linear feet of Racking • Rack Loading Rate • (Operator Cost + Front End Loader Cost + Trucking Cost) = Total Rack Removal Cost*

**Total = $ 23,120.99**

### 7. Remove Electrical Wiring

Electrical wiring will be removed from all underground conduits.

*Cable Length • Cable Removal Rate • (Operator Cost + Backhoe Cost) = Total Cable Removal Cost*

**Total = $ 4,064.97**

### 8. Remove Foundation Piles

Foundation piles will be pulled out of the ground and loaded onto a truck to be removed from site.

*(Total Number of Piles / Daily Pile Removal Rate) • (Operator Rate + Excavator Cost) = Total Pile Removal Cost*

**Total = $ 26,505.02**

### 9. Remove Fencing

Fencing posts, mesh, and foundations will be loaded onto a truck and removed from site. Trucking costs included in this line item are for the removal process. Trucking to a recycling facility are included in item #13.

*(Total Length of Fence • Fence Removal Rate) • (Operator Rate + Bobcat Cost + Trucking Cost) =*

**Total = $ 23,464.96**

### 10. Remove Power Poles

Power poles will be removed and shipped off site.

*Number of Power Poles • Pole Removal cost = Total Power Pole Removal Cost*

**Total = $ 7,500.00**

## 11. Gravel Road Reclamation

Reclamation of the gravel access road will entail removing the gravel material and exporting it off site. The area will then be backfilled with loam and graded.

*(Days with Rough Grader + Days with Fine Grader) • (Grader Cost per Day+Operator Cost per Day) + [Roadway Material Volume • (Gravel Export Cost + Loam Import Cost)] = Gravel Road Reclamation Cost*

**Total = $ 55,253.21**

## 12. Seed Disturbed Areas

Seeding cost includes labor and materials for reseeding all disturbed areas including the reclaimed gravel road area, former electrical areas, and areas disturbed by racking foundation removal.

*Seeding Cost • Disturbed Area = Total Seeding Cost*

**Total = $ 4,985.06**

## 13. Truck to Transfer Station

All material will be trucked to the nearest Transfer station that accepts construction material. The nearest transfer station is Groot Recycling & Waste - Aurora

*(Total Truckloads • Roundtrip Distance • Fuel Cost) + (Total Truckloads • Round Trip Time • Trucking Cost) = Total Trucking Cost to Transfer Station*

**Total = $ 2,093.44**

Salvage Values

Salvage Value Not Included

## Racking Disposal Cost

**1S. Racking Disposal Cost**

The racking can be disposed of at the Transfer Station. They will be trucked to Groot Recycling & Waste - Aurora.

*(Total Racking Weight)/2000 • Cost per Ton of disposal =*

**Total =** $ 32,831.25

## Panel Disposal

**2S. Solar Panel Disposal Cost**

The panels can be disposed of at facilities which except electronics. They will be trucked to Groot Recycling & Waste - Aurora.

*(Total Panel Weight)/2000 • Cost per Ton of disposal =*

**Total =** $ 60,255.00

new leaf energy

Ament Road
Kendall County, IL

## Summary of Decommissioning Costs and Salvage Values

| Line Item | Task | Cost |
|---|---|---|
| 1 | Module Removal | $ 7,810.83 |
| 2 | Rack Wiring Removal | $ 1,952.71 |
| 3 | Rack Dismantling | $ 5,858.18 |
| 4 | Electrical Equipment Loading and Removal | $ 2,680.20 |
| 5 | Break Up Concrete Pads | $ 1,221.77 |
| 6 | Load Racks | $ 23,120.99 |
| 7 | Electrical Wiring Removal | $ 4,064.97 |
| 8 | Foundation Pile Removal | $ 26,505.02 |
| 9 | Fence Removal | $ 23,464.96 |
| 10 | Power Pole Removal | $ 7,500.00 |
| 11 | Gravel Road Reclamation | $ 55,253.21 |
| 12 | Seed Disturbed Areas | $ 4,985.06 |
| 13 | Trucking to Transfer Station | $ 2,093.44 |
| | Subtotal = | $ 166,511.35 |

| Additional Item | Task | Value |
|---|---|---|
| Salvage Values Not Included | | |
| 1S | Racking Disposal Cost | $ 32,831.25 |
| 2S | Solar Panel Disposal Cost | $ 60,255.00 |
| | Additional Item Subtotal | $ 93,086.25 |

**Present Value Total = $ 255,048.39**

| Task | Future Value |
|---|---|

Inflation

# of Years= 25

Inflation Rate= 2.0%

*Total • (1+ Inflation Rate)^Number of Years =Grand Total*

**Grand Total = $ 425,897.37**

# STORMWATER/DRAINAGE MEMORANDUM
**KENDALL COUNTY, IL**

## AMENT ROAD – COMMUNITY SOLAR
AMENT ROAD
KENDALL COUNTY, ILLINOIS

## A 5 MW (AC) GROUND-MOUNTED SOLAR POWER GENERATING FACILITY

*Prepared for*

**NEW LEAF ENERGY**

[redacted]

***Submitted by: Atwell, LLC***

**Atwell Project No.**
23002398

**Date: September 27, 2024**
**REVISED: January 14, 2025**

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# 1 PROJECT NARRATIVE

New Leaf Energy (NLE) is proposing a 5 MW (AC) ground-mounted solar generating facility to be constructed along Ament Road located in Kendall County, Illinois outside of the limits of the United City of Yorkville. The solar development proposes approximately 0.97 acres of new impervious area and will stabilize the ground within the fenced area and other limits of disturbance that will not be farmed with a native pollinator friendly prairie seed mix. The existing topography and flow patterns will remain the same throughout the project area. Per the Kendall County Stormwater Ordinance, the allowable release rate for proposed hydraulically disturbed areas (impervious areas) is 0.04 cfs/acre for a 24-hr 2-year storm and 0.15 cfs/acre for a 24-hr 100-year storm. Based on the nature of this project and the construction, it is assumed that the proposed impervious area is the only hydraulically disturbed area. The site runoff reduction was analyzed to demonstrate that the total projected post-development peak flow rate is below the allowable release rate, and this is expected to provide a net positive impact on the existing watershed.

# 2 EXISTING CONDITIONS

The existing 95.28-acre property consists of straight row crops with no existing structures. The only impervious area within the project limits of disturbance is a small portion of the eastbound lane of Ament Road and the existing site gravel entrance. The drainage areas contain additional impervious areas (the eastbound lane of Ament Road and some off-site structures). The project site consists of two parcels, of which “Parcel 1” will contain the proposed solar array field, and “Parcel 2” will contain only the proposed site access road and connection to Ament Road.

Existing Drainage Area #1 flows from a high point near the site entrance to the east property line of Parcel 2. Runoff then flows into Existing Drainage Area #2, which flows toward Parcel 1 through mostly off-site areas before transitioning onsite and out falling at an existing ditch along the Parcel 1 southern property line. Existing Drainage Area #3 flows from a high point at the middle of the east property line of Parcel 2 southward to the center of Parcel 1, which creates depressional storage before flowing into Existing Drainage Area #2. Existing Drainage Area #4 flows from a high point at the southern side of Parcel 2 across the Parcel 1 north property line and southward to an existing ditch along the Parcel 1 southern property line before flowing offsite.

Drainage Area #3 includes an existing depression that holds approximately 28,145 cubic feet of storage. There is no planned grading in this area and the storage within this depression will remain in the proposed condition.

Per the USDA NRCS Web Soil Survey included in **Appendix A**, the soil types and hydrologic soil groups consist of Lisbon silt loam (C/D), Drummer silty clay loam (B/D), Elpaso silty clay loam (B/D), and Graymont silt loam (C). The average existing hydrologic soil group rating for the project area is D. A pre-development drainage area map is included in **Appendix B**. On the next page, **Table 2.1** details the pre-development drainage area characteristics and **Table 2.2** details the pre-development curve number.

**Table 2.1 – Pre-Development Drainage Area Characteristics**

| Drainage Area | Undisturbed | | Disturbed | | Total (ac) |
|---|---|---|---|---|---|
| | Impervious (ac) | Pervious (ac) | Impervious (ac) | Pervious (ac) | |
| Existing Drainage Area #1 | 0.09 | 5.49 | 0.01 | - | **5.59** |
| Existing Drainage Area #2 | 0.31 | 62.20 | - | - | **62.51** |
| Existing Drainage Area #3 | - | 20.76 | - | - | **20.76** |
| Existing Drainage Area #4 | - | 11.54 | - | - | **11.54** |
| | | | | **Total** | **100.40** |

**Table 2.2 – Pre-Development Curve Numbers**

| Soil Rating | Cover Description | CN |
|---|---|---|
| C | Row Crops; Straight Row (SR) Good | 85 |
| D | Row Crops; Straight Row (SR) Good | 89 |
| - | Impervious Area | 98 |
| | **Combined CN** | **88** |

## 3 PROPOSED CONDITIONS

The proposed development will consist of a solar generating facility and equipment pads enclosed within a minimum 7-foot-high perimeter fence, as well as a gravel access road connecting Ament Road to the project site. Proposed Drainage Areas #1 and #3 will be modified from existing conditions to reduce the amount of runoff onto the adjacent property to the east. Drainage Area #1 will contain a portion of the proposed site access road and connection to Ament Road within Parcel 2. Proposed Drainage Areas #2 and #4 will be modified from existing conditions to accommodate the proposed stormwater management basins which will reduce runoff flowing offsite to the south.

**Appendix B** includes the Post-Development Drainage Area Map and **Table 3.1** on the following page details the post-development drainage area characteristics. The post-development drainage area includes the undisturbed areas outside of the project limits of disturbance, the disturbed row crop ground cover which will be converted to pasture, and the hydrologic disturbed area (equipment pads and access road). The total project limits of disturbance is 42.4 acres, with 0.97 acres of proposed hydrologically disturbed area.

**Table 3.1 – Post-Development Drainage Area Characteristics (disturbed and undisturbed)**

| Drainage Area | Undisturbed | | Disturbed | | Total (ac) |
|---|---|---|---|---|---|
| | Impervious (ac) | Pervious (ac) | Impervious (ac) | Pervious (ac) | |
| Proposed Drainage Area #1 | 0.09 | 3.72 | 0.32 | - | **4.13** |
| Proposed Drainage Area #2 | 0.31 | 61.84 | - | - | **62.15** |
| Proposed Drainage Area #3 | - | 21.57 | 0.65 | - | **22.22** |
| Proposed Drainage Area #4 | - | 11.70 | - | - | **11.70** |
| | | | | **Total** | **100.20** |

Runoff from the proposed drainage areas will flow offsite to their respective drainage area low points shown on the drainage area maps. The entire area within the project limits of disturbance is being converted from straight row crops to pasture by planting native pollinator friendly prairie seed. This is expected to result in a reduction in the total peak flow rate.

**Table 3.2 - Post-Development Curve Numbers**

| Soil Rating | Cover Description | CN |
|---|---|---|
| C | Pasture; Good | 74 |
| D | Pasture; Good | 80 |
| - | Impervious Area | 98 |
| | **Combined CN** | **84** |

For this report, the total runoff reduction was analyzed to demonstrate that the change in cover type decreases the total peak flow rate and is below the allowable release rate for the project (per Kendall County requirements). By decreasing the total runoff, there will be a net positive impact to the existing watershed. Rainfall depth frequency from the Illinois State Water Survey Bulletin 75 is provided in **Appendix C**. For the design of this report, the Huff Distribution Method in HydroCAD was used. Design was completed using the 2-year, 24-hour and 100-year, 24-hour storm events. Pre- and post-development stormwater calculations, as well as a graphical depiction of the models, are included with the HydroCAD reports in **Appendix D**.

## 4 CONCLUSION

A comparison of the peak flow rate (PFR) for each drainage area and the total hydrologic study area is provided in **Table 4.1** on the following page. **Appendix D-1** contains the HydroCAD report for the pre-development condition, and **Appendix D-2** includes the HydroCAD report for the post-development condition without the use of stormwater basins.

**Table 4.1 – Pre- vs. Post-Development Storm Event Comparison without SWM Basins**

| | 2-Year Storm Event | | | 100-Year Storm Event | | |
|---|---|---|---|---|---|---|
| | Pre-Developed Flow (cfs) | Post-Developed Flow (cfs) | % Change | Pre-Developed Flow (cfs) | Post-Developed Flow (cfs) | % Change |
| D.A. #1* | 1.60 | 1.11 | -30.6% | 4.99 | 3.60 | -27.9% |
| D.A. #2 | 17.97 | 16.64 | -7.4% | 54.18 | 52.41 | -3.3% |
| D.A. #3 | 6.23 | 5.44 | -12.7% | 18.65 | 18.83 | +1.0% |
| D.A. #4 | 3.44 | 2.58 | -25.0% | 10.32 | 9.54 | -7.6% |
| **Total** | **28.55** | **24.99** | **-12.5%** | **86.46** | **82.12** | **-5.0%** |

* Includes gravel road and pollinator seed mixes to stabilize the areas outside of the gravel road but within the limits of disturbance. Flow off site to adjacent property is negligent and not anticipated to create any off-site issues.

As shown, total flow rates for both storm events are decreased in the post-development condition without the use of the stormwater basins.

A comparison of the total allowable PFR and total post-development PFR for the 2-year and 100-year, 24-hour storm events is summarized in **Table 4.2**. The disturbed area flow rate was calculated by taking the disturbed area allowable release rate for each storm event and multiplying it by the total hydraulically disturbed area (impervious area). This value was then added to the pre-development PFR for the undisturbed areas (from HydroCAD) to calculate the total allowable post-development PFR for the project. This was compared to the total post-development PFR (from HydroCAD) to confirm that the proposed project decreases the total peak flow rate on site without the use of the stormwater basins.

**Table 4.2 – Storm Frequency Flows (Total Allowable vs. Total Post-Development)**

| | Area (ac) | Peak Flow Rate (cfs) | |
|---|---|---|---|
| | | 2-Yr | 100-Yr |
| **Allowable Pre-Development PFR for Disturbed Area** (per Kendall County requirements: **2-Yr:** 0.04 cfs/acre disturbed area **100-Yr:** 0.15 cfs/disturbed area) | 0.97 | 0.04 | 0.15 |
| **Pre-Development PFR for Undisturbed Area** (from HydroCAD) | 99.23 | 29.24 | 88.13 |
| **Total Allowable Post-Development PFR** (Allowable Pre-Development PFR for Disturbed Area + Pre-Development PFR for Undisturbed Area) | **100.20** | **29.28** | **88.28** |
| **Total Post-Development PFR** (from HydroCAD) | **100.20** | **24.99** | **82.12** |

As shown in **Table 4.2**, the total post-development PFR for the project area is reduced for both storm events due to an increase in infiltration from the proposed native pollinator friendly prairie seed mix, which results in the use of a lower curve number. The proposed project utilizes a low-impact design by stabilizing the disturbed areas with a native pollinator friendly prairie seed mix. Therefore, the project will have a net positive impact on the watershed. The total post-development peak flow rates for both the 2-year and 100-year, 24-hour storm events are below the total allowable peak flow rate; thus, detention is not required.

A published study by the American Society of Civil Engineers (ASCE) is included in **Appendix E**. This report shows that the net increase in flow from a Solar Facility does not change so long as the ground cover does not change. In the case of this project, we do change the ground cover but to a cover that reduces the flow from the pre-development flows. So, in conjunction with this study and the revised ground cover, we feel that no detention or further stormwater management measures are required.

Per discussions with the local jurisdictions, it was requested to add stormwater management basins to the project to further reduce runoff to offsite areas south of the project area from Drainage Areas #2 and #4. Basin #1 receives stormwater runoff from Drainage Area #4, and Basin #2 receives stormwater runoff from Drainage Area #2. **Table 4.3** shows the storm event comparison with the stormwater basins included. The HydroCAD report for this analysis is provided in **Appendix D-3**.

**Table 4.3 – Pre- vs. Post-Development Storm Event Comparison with SWM Basins**

| | 2-Year Storm Event | | | 100-Year Storm Event | | |
|---|---|---|---|---|---|---|
| | Pre-Developed Flow (cfs) | Post-Developed Flow (cfs) | % Change | Pre-Developed Flow (cfs) | Post-Developed Flow (cfs) | % Change |
| D.A. #1* | 1.60 | 1.11 | -30.6% | 4.99 | 3.60 | -27.9% |
| **D.A. #2** | **17.97** | **16.59** | **-7.7%** | **54.18** | **52.26** | **-3.5%** |
| D.A. #3 | 6.23 | 5.44 | -12.7% | 18.65 | 18.83 | +1.0% |
| **D.A. #4** | **3.44** | **2.10** | **-38.9%** | **10.32** | **9.40** | **-8.9%** |
| **Total** | **28.55** | **23.95** | **-16.1%** | **86.46** | **81.19** | **-6.1%** |

* Includes gravel road and pollinator seed mixes to stabilize the areas outside of the gravel road but within the limits of disturbance. Flow off site to adjacent property is negligent and not anticipated to create any off-site issues.

As shown, the total post-development PFR for the project area is reduced further for Drainage Areas #2 and #4 (shown in bold) due to the use of the stormwater basins.

# APPENDIX A

## USDA NRCS SOILS REPORT

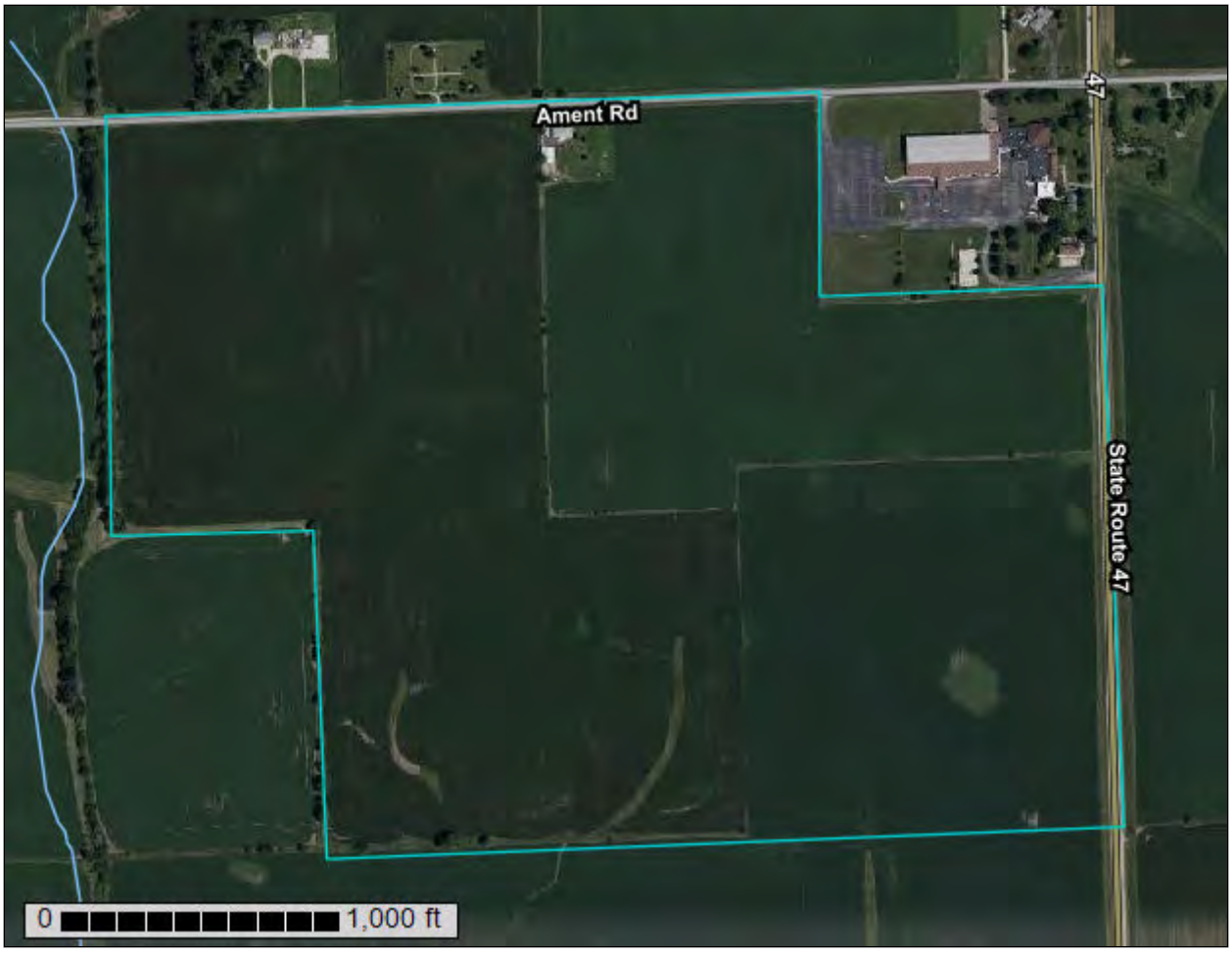
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

# Custom Soil Resource Report for Kendall County, Illinois



# Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report
## Soil Map



## 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.

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: Kendall County, Illinois
Survey Area Data: Version 20, Aug 28, 2023

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

Date(s) aerial images were photographed: Aug 3, 2019—Oct 13, 2020

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 |
|---|---|---|---|
| 59A | Lisbon silt loam, 0 to 2 percent slopes | 40.6 | 22.1% |
| 60C2 | La Rose silt loam, 5 to 10 percent slopes, eroded | 2.9 | 1.6% |
| 149A | Brenton silt loam, 0 to 2 percent slopes | 2.7 | 1.4% |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes | 49.1 | 26.7% |
| 356A | Elpaso silty clay loam, 0 to 2 percent slopes | 21.0 | 11.4% |
| 541B | Graymont silt loam, 2 to 5 percent slopes | 65.1 | 35.5% |
| 541C2 | Graymont silt loam, 5 to 10 percent slopes, eroded | 2.2 | 1.2% |
| **Totals for Area of Interest** | | **183.5** | **100.0%** |

# Map Unit Descriptions

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, along with the maps, can be used to determine the composition and properties of a unit.

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.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit

descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

# Kendall County, Illinois

## 59A—Lisbon silt loam, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol:* 2ytd7
*Elevation:* 690 to 850 feet
*Mean annual precipitation:* 35 to 42 inches
*Mean annual air temperature:* 48 to 54 degrees F
*Frost-free period:* 165 to 180 days
*Farmland classification:* All areas are prime farmland

### Map Unit Composition

*Lisbon and similar soils:* 92 percent
*Minor components:* 8 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Lisbon

#### Setting

*Landform:* End moraines, ground moraines
*Landform position (two-dimensional):* Summit, footslope
*Landform position (three-dimensional):* Interfluve
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loess over till

#### Typical profile

*Ap - 0 to 11 inches:* silt loam
*Bt - 11 to 36 inches:* silty clay loam
*2Bt - 36 to 39 inches:* clay loam
*2C - 39 to 60 inches:* loam

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat poorly drained
*Runoff class:* Low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.60 in/hr)
*Depth to water table:* About 12 to 24 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 40 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* High (about 10.0 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 1
*Hydrologic Soil Group:* C/D
*Ecological site:* F095XB005WI - Moist Loamy or Clayey Lowland
*Hydric soil rating:* No

**Minor Components**

**Elpaso, drained**

*Percent of map unit:* 3 percent
*Landform:* Ground moraines
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Linear
*Across-slope shape:* Concave
*Ecological site:* R110XY024IL - Ponded Depressional Sedge Meadow
*Hydric soil rating:* Yes

**Drummer, drained**

*Percent of map unit:* 3 percent
*Landform:* Ground moraines
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R110XY024IL - Ponded Depressional Sedge Meadow
*Hydric soil rating:* Yes

**Sable, drained**

*Percent of map unit:* 2 percent
*Landform:* Swales, ground moraines
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* F095XB004WI - Wet Loamy or Clayey Lowland
*Hydric soil rating:* Yes

## 60C2—La Rose silt loam, 5 to 10 percent slopes, eroded

**Map Unit Setting**

*National map unit symbol:* pfmv
*Elevation:* 540 to 930 feet
*Mean annual precipitation:* 28 to 40 inches
*Mean annual air temperature:* 45 to 54 degrees F
*Frost-free period:* 140 to 180 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

*La rose and similar soils:* 90 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of La Rose**

**Setting**

*Landform:* Ground moraines, end moraines

*Landform position (two-dimensional):* Shoulder, backslope
*Landform position (three-dimensional):* Interfluve
*Down-slope shape:* Convex
*Across-slope shape:* Linear
*Parent material:* Till

**Typical profile**

*Ap - 0 to 7 inches:* silt loam
*Bt - 7 to 19 inches:* clay loam
*C - 19 to 60 inches:* loam

**Properties and qualities**

*Slope:* 5 to 10 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Runoff class:* High
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.60 in/hr)
*Depth to water table:* About 24 to 42 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 40 percent
*Available water supply, 0 to 60 inches:* Moderate (about 6.8 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3e
*Hydrologic Soil Group:* C
*Ecological site:* R108XA006IL - Loess Upland Prairie
*Hydric soil rating:* No

**Minor Components**

**Elpaso**

*Percent of map unit:*
*Landform:* Ground moraines, end moraines
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Linear
*Across-slope shape:* Concave
*Ecological site:* R108XA008IL - Ponded Loess Sedge Meadow, R108XA007IL - Wet Loess Upland Prairie
*Hydric soil rating:* Yes

## 149A—Brenton silt loam, 0 to 2 percent slopes

**Map Unit Setting**

*National map unit symbol:* 2sssp
*Elevation:* 490 to 1,010 feet
*Mean annual precipitation:* 35 to 43 inches
*Mean annual air temperature:* 46 to 54 degrees F

*Frost-free period:* 155 to 200 days
*Farmland classification:* All areas are prime farmland

**Map Unit Composition**

*Brenton and similar soils:* 97 percent
*Minor components:* 3 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Brenton**

**Setting**

*Landform:* Stream terraces, outwash plains
*Landform position (two-dimensional):* Summit, footslope
*Landform position (three-dimensional):* Interfluve, tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loess over stratified loamy outwash

**Typical profile**

*Ap - 0 to 14 inches:* silt loam
*Bt1 - 14 to 33 inches:* silty clay loam
*2Bt2 - 33 to 54 inches:* loam
*2Cg - 54 to 79 inches:* stratified silt loam to loamy sand

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat poorly drained
*Runoff class:* Low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 2.00 in/hr)
*Depth to water table:* About 12 to 24 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 15 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* High (about 9.7 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 1
*Hydrologic Soil Group:* B/D
*Ecological site:* R108XA012IL - Outwash Prairie, R111XD020IN - Wet Outwash Mollisol
*Hydric soil rating:* No

**Minor Components**

**Drummer, drained**

*Percent of map unit:* 3 percent
*Landform:* Swales on till plains, swales on outwash plains
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Linear
*Across-slope shape:* Concave
*Ecological site:* R110XY024IL - Ponded Depressional Sedge Meadow, R108XA013IL - Wet Outwash Prairie

*Hydric soil rating:* Yes

## 152A—Drummer silty clay loam, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol:* 2ssrz
*Elevation:* 490 to 1,020 feet
*Mean annual precipitation:* 33 to 43 inches
*Mean annual air temperature:* 46 to 54 degrees F
*Frost-free period:* 160 to 190 days
*Farmland classification:* Prime farmland if drained

### Map Unit Composition

*Drummer, drained, and similar soils:* 94 percent
*Minor components:* 6 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Drummer, Drained

#### Setting

*Landform:* Swales on till plains, swales on outwash plains, stream terraces on till plains, stream terraces on outwash plains
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope, talf
*Down-slope shape:* Linear
*Across-slope shape:* Linear, concave
*Parent material:* Loess over stratified loamy outwash

#### Typical profile

*Ap - 0 to 14 inches:* silty clay loam
*Btg - 14 to 41 inches:* silty clay loam
*2Btg - 41 to 47 inches:* loam
*2Cg - 47 to 60 inches:* stratified sandy loam to clay loam

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Poorly drained
*Runoff class:* Negligible
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 2.00 in/hr)
*Depth to water table:* About 0 to 12 inches
*Frequency of flooding:* None
*Frequency of ponding:* Frequent
*Calcium carbonate, maximum content:* 30 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* High (about 9.6 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2w

*Hydrologic Soil Group:* B/D
*Ecological site:* R110XY024IL - Ponded Depressional Sedge Meadow, R111XD020IN - Wet Outwash Mollisol, R108XA013IL - Wet Outwash Prairie
*Hydric soil rating:* Yes

**Minor Components**

**Harpster, drained**
*Percent of map unit:* 3 percent
*Landform:* Depressions on outwash plains
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Ecological site:* R110XY025IL - Ponded Calcareous Sedge Meadow
*Hydric soil rating:* Yes

**Peotone, drained**
*Percent of map unit:* 3 percent
*Landform:* Depressions on outwash plains
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Ecological site:* R110XY024IL - Ponded Depressional Sedge Meadow
*Hydric soil rating:* Yes

## 356A—Elpaso silty clay loam, 0 to 2 percent slopes

**Map Unit Setting**
*National map unit symbol:* 2t6zs
*Elevation:* 580 to 1,020 feet
*Mean annual precipitation:* 34 to 42 inches
*Mean annual air temperature:* 46 to 54 degrees F
*Frost-free period:* 155 to 190 days
*Farmland classification:* Prime farmland if drained

**Map Unit Composition**
*Elpaso, drained, and similar soils:* 94 percent
*Minor components:* 6 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Elpaso, Drained**

**Setting**
*Landform:* Till plains, ground moraines
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Linear
*Across-slope shape:* Concave

*Parent material:* Loess over till

**Typical profile**

*Ap - 0 to 21 inches:* silty clay loam
*Btg1 - 21 to 44 inches:* silty clay loam
*2Btg2 - 44 to 69 inches:* silty clay loam
*2C - 69 to 79 inches:* silty clay loam

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Poorly drained
*Runoff class:* Negligible
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.60 in/hr)
*Depth to water table:* About 0 to 12 inches
*Frequency of flooding:* None
*Frequency of ponding:* Frequent
*Calcium carbonate, maximum content:* 30 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* High (about 10.5 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2w
*Hydrologic Soil Group:* B/D
*Ecological site:* R108XA008IL - Ponded Loess Sedge Meadow, R110XY024IL - Ponded Depressional Sedge Meadow, R108XA007IL - Wet Loess Upland Prairie
*Hydric soil rating:* Yes

**Minor Components**

**Harpster, drained**

*Percent of map unit:* 4 percent
*Landform:* Depressions on till plains
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Ecological site:* R110XY025IL - Ponded Calcareous Sedge Meadow
*Hydric soil rating:* Yes

**Peotone, drained**

*Percent of map unit:* 2 percent
*Landform:* Depressions on till plains
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Ecological site:* R110XY024IL - Ponded Depressional Sedge Meadow
*Hydric soil rating:* Yes

## 541B—Graymont silt loam, 2 to 5 percent slopes

### Map Unit Setting

*National map unit symbol:* 2ww9q
*Elevation:* 550 to 850 feet
*Mean annual precipitation:* 36 to 40 inches
*Mean annual air temperature:* 48 to 52 degrees F
*Frost-free period:* 140 to 195 days
*Farmland classification:* All areas are prime farmland

### Map Unit Composition

*Graymont and similar soils:* 94 percent
*Minor components:* 6 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Graymont

#### Setting

*Landform:* Ground moraines, till plains
*Landform position (two-dimensional):* Summit, backslope
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Loess over till

#### Typical profile

*Ap - 0 to 12 inches:* silt loam
*Bt1 - 12 to 33 inches:* silty clay loam
*2Bt2 - 33 to 38 inches:* silty clay loam
*2C - 38 to 60 inches:* silty clay loam

#### Properties and qualities

*Slope:* 2 to 5 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Runoff class:* Low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
*Depth to water table:* About 24 to 42 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 30 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* High (about 9.5 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2e
*Hydrologic Soil Group:* C

*Ecological site:* R108XA006IL - Loess Upland Prairie, R110XY010IL - Moist Glacial Drift Upland Savanna
*Hydric soil rating:* No

**Minor Components**

**Ashkum, drained**
*Percent of map unit:* 5 percent
*Landform:* Ground moraines, end moraines
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Linear
*Across-slope shape:* Concave
*Ecological site:* R110XY024IL - Ponded Depressional Sedge Meadow
*Hydric soil rating:* Yes

**Urban land**
*Percent of map unit:* 1 percent
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 541C2—Graymont silt loam, 5 to 10 percent slopes, eroded

**Map Unit Setting**
*National map unit symbol:* 2t6zv
*Elevation:* 540 to 880 feet
*Mean annual precipitation:* 34 to 42 inches
*Mean annual air temperature:* 46 to 54 degrees F
*Frost-free period:* 155 to 190 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**
*Graymont, eroded, and similar soils:* 97 percent
*Minor components:* 3 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Graymont, Eroded**

**Setting**
*Landform:* Till plains, ground moraines
*Landform position (two-dimensional):* Shoulder, backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Convex
*Across-slope shape:* Linear
*Parent material:* Loess over till

**Typical profile**
*Ap - 0 to 8 inches:* silt loam
*Bt1 - 8 to 30 inches:* silty clay loam
*2Bt2 - 30 to 38 inches:* silty clay loam

*2C - 38 to 60 inches:* silty clay loam

**Properties and qualities**

*Slope:* 5 to 10 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Runoff class:* Medium
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
*Depth to water table:* About 24 to 42 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 30 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* High (about 9.5 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3e
*Hydrologic Soil Group:* C
*Ecological site:* R108XA006IL - Loess Upland Prairie, R110XY010IL - Moist Glacial Drift Upland Savanna
*Hydric soil rating:* No

**Minor Components**

**Elpaso, drained**

*Percent of map unit:* 3 percent
*Landform:* Till plains, ground moraines
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Linear
*Across-slope shape:* Concave
*Ecological site:* R108XA008IL - Ponded Loess Sedge Meadow, R110XY024IL - Ponded Depressional Sedge Meadow, R108XA007IL - Wet Loess Upland Prairie
*Hydric soil rating:* Yes

# Soil Information for All Uses

## Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

## Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

### Hydrologic Soil Group (Ament Road)

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.

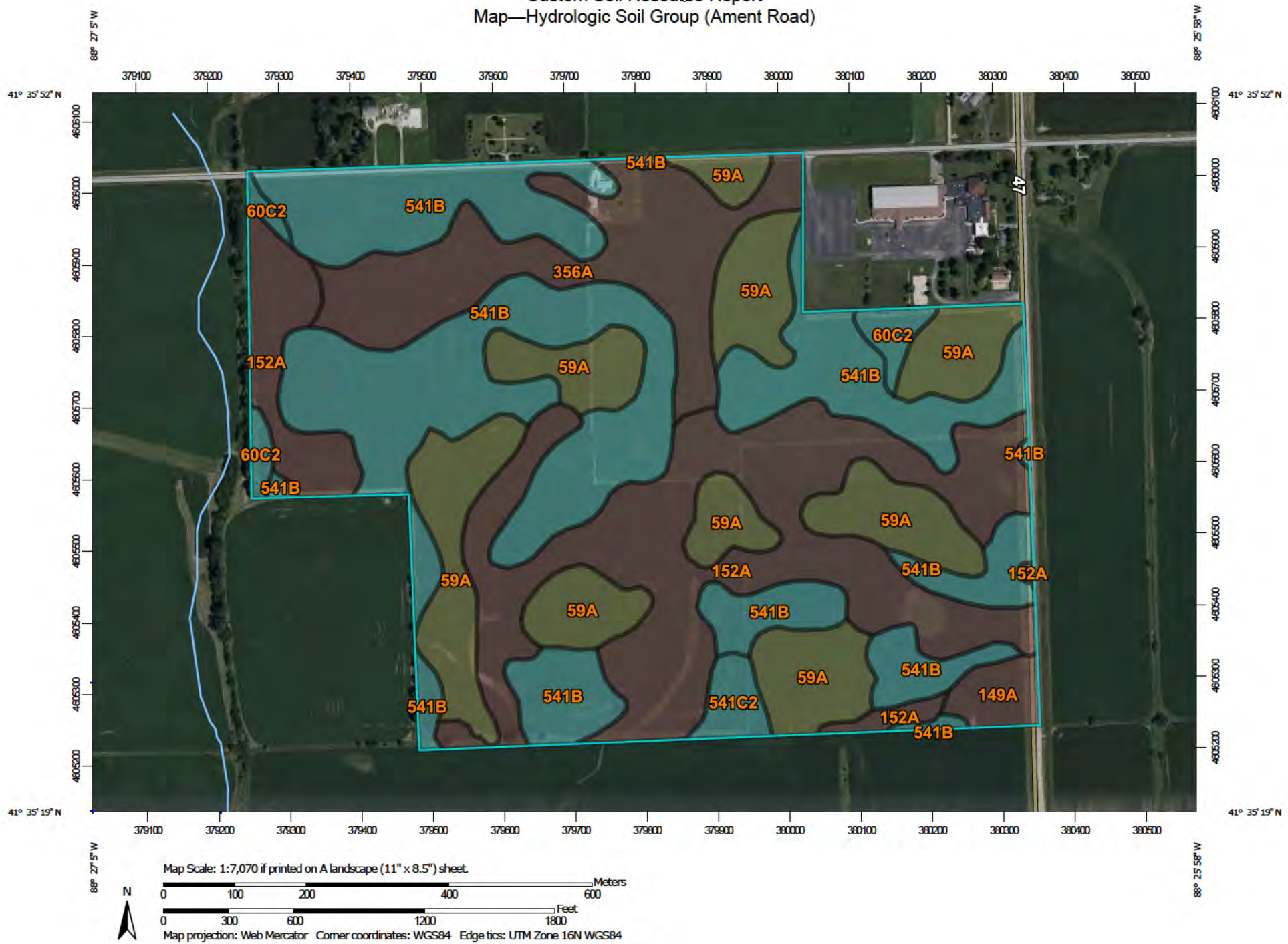
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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.

Custom Soil Resource Report
Map—Hydrologic Soil Group (Ament Road)



## 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.

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: Kendall County, Illinois
Survey Area Data: Version 20, Aug 28, 2023

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

Date(s) aerial images were photographed: Aug 3, 2019—Oct 13, 2020

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.

## Table—Hydrologic Soil Group (Ament Road)

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| 59A | Lisbon silt loam, 0 to 2 percent slopes | C/D | 40.6 | 22.1% |
| 60C2 | La Rose silt loam, 5 to 10 percent slopes, eroded | C | 2.9 | 1.6% |
| 149A | Brenton silt loam, 0 to 2 percent slopes | B/D | 2.7 | 1.4% |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes | B/D | 49.1 | 26.7% |
| 356A | Elpaso silty clay loam, 0 to 2 percent slopes | B/D | 21.0 | 11.4% |
| 541B | Graymont silt loam, 2 to 5 percent slopes | C | 65.1 | 35.5% |
| 541C2 | Graymont silt loam, 5 to 10 percent slopes, eroded | C | 2.2 | 1.2% |
| **Totals for Area of Interest** | | | **183.5** | **100.0%** |

## Rating Options—Hydrologic Soil Group (Ament Road)

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

# References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

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.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

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. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

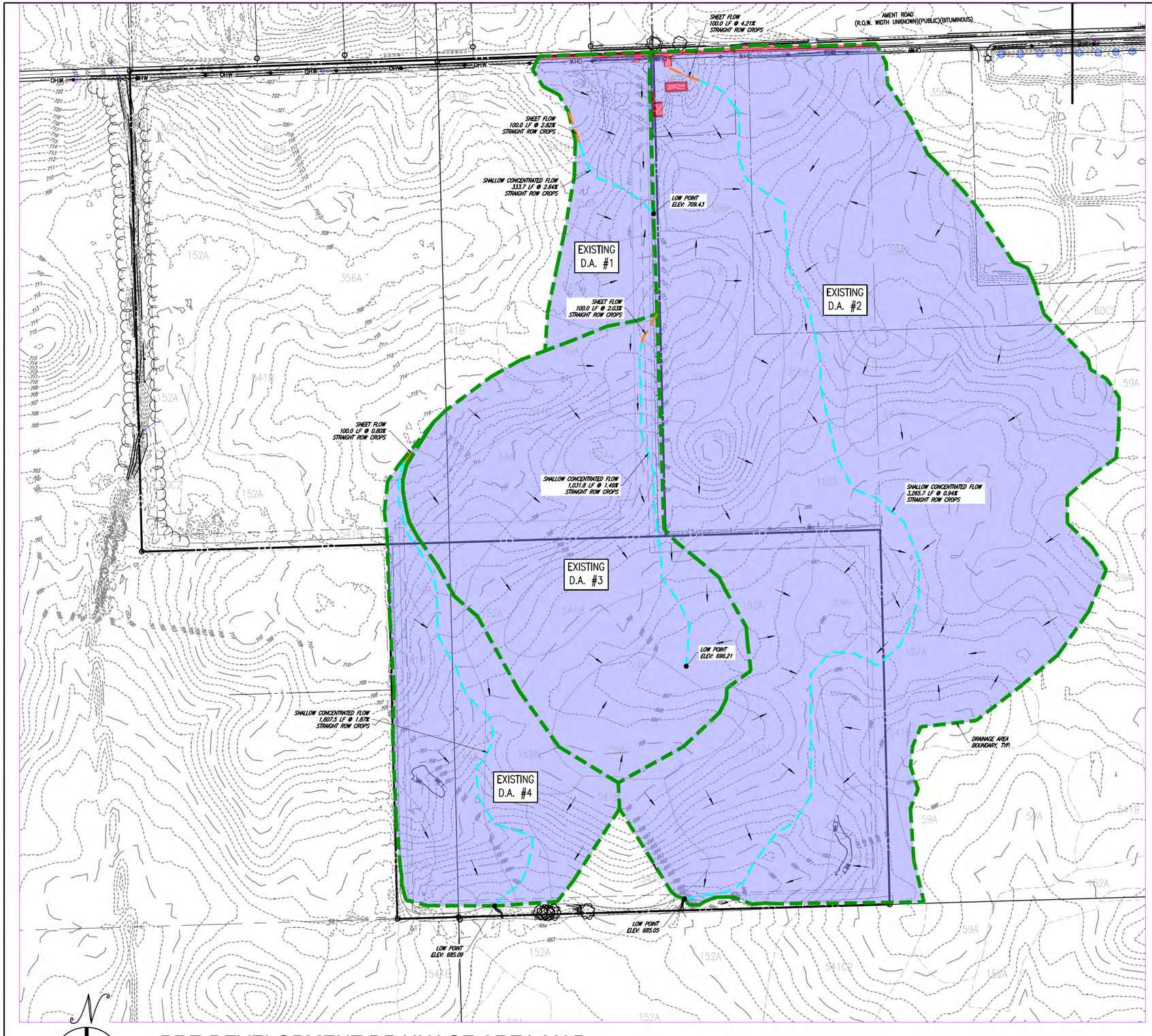
United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

# APPENDIX B

## PRE- AND POST-DEVELOPMENT DRAINAGE AREA MAPS




## LEGEND

- ROAD (GRAVEL)
- FENCE LINE
- PROPERTY LINE
- WETLAND LINE/FLAG
- (E) MAJOR CONTOUR
- (E) MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WETLAND BUFFER ZONE
- RIVERFRONT AREA
- 100-YEAR FLOOD HAZARD AREA
- TREELINE
- SILT FENCE
- SILT SOCK
- STORM PIPE
- ELECTRICAL TRENCH
- OVERHEAD ELECTRIC
- SEWER LINE
- WATER LINE
- GAS MAIN
- SIGN
- UTILITY POLE (WITH GUY ANCHOR)
- INDIVIDUAL TREE
- PROJECT LIMITS OF DISTURBANCE
- DRAINAGE AREA BOUNDARY
- SHEET FLOW
- SHALLOW CONCENTRATED FLOW
- ROW CROPS – GOOD CONDITION
- IMPERVIOUS AREA
- DRAINAGE FLOW ARROW

**SOIL LEGEND**

| SOIL TYPE | SOIL RATING | SOIL NAME |
|---|---|---|
| 59A | C/D | LISBON SILT LOAM, 0 TO 2 PERCENT SLOPES |
| 60C2 | C/D | LA ROSE SILT LOAM, 5 TO 10 PERCENT SLOPES, ERODED |
| 152A | B/D | DRUMMER SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES |
| 356A | B/D | ELPASO SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES |
| 541B | C | GRAYMONT SILT LOAM, 2 TO 5 PERCENT SLOPES |
| 541C2 | C | GRAYMONT SILT LOAM, 5 TO 10 PERCENT SLOPES, ERODED |

# PRE-DEVELOPMENT DRAINAGE AREA MAP

SCALE: 1" = 150'

0 150' 300'

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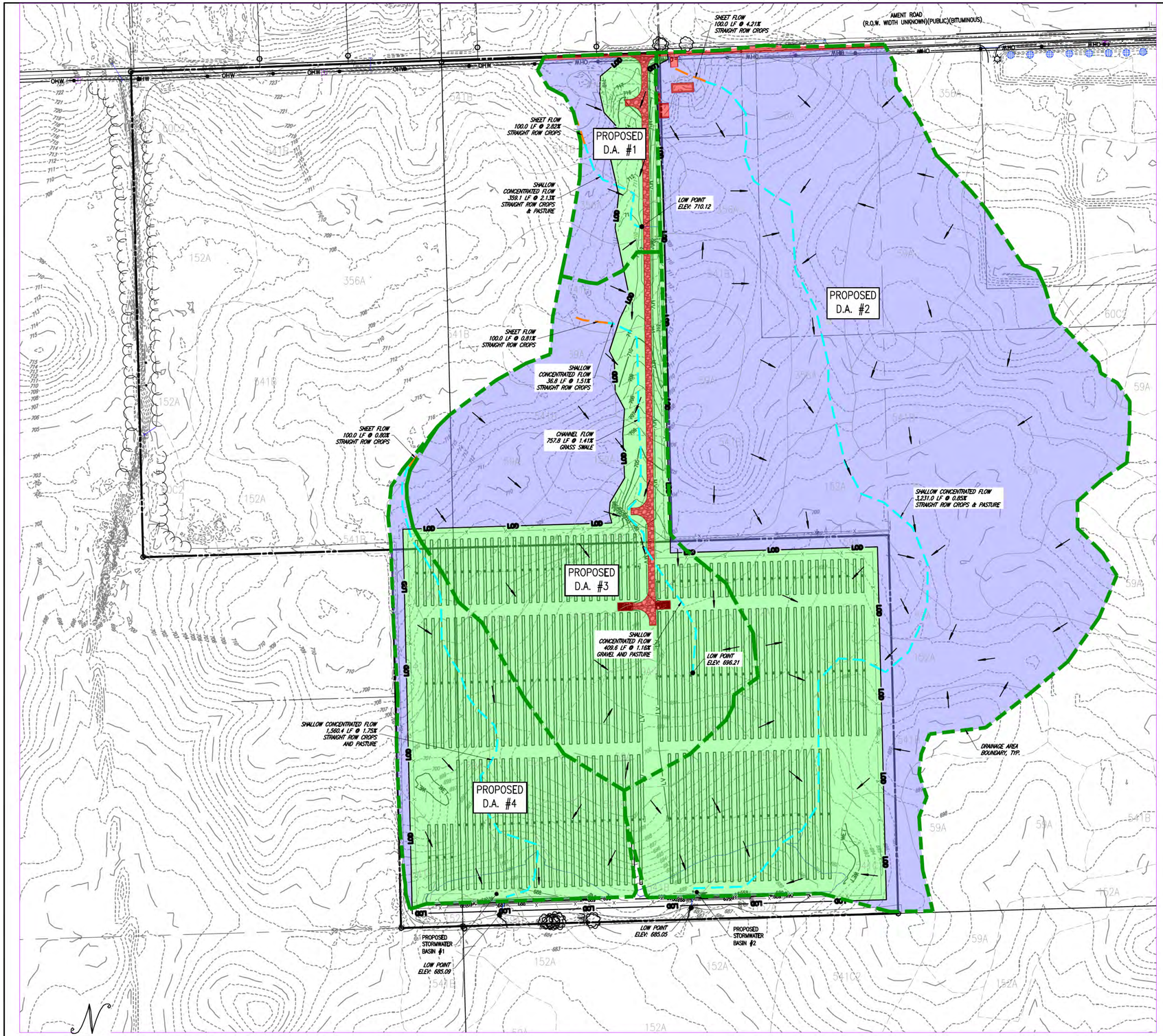
SPECIAL USE PERMIT SET
AMENT ROAD- KENDALL IL

PROJECT NUMBER:
22-4525

| REV | DATE | DRAWN | CHECKED | RELEASE LEVEL |
|---|---|---|---|---|
| | 08/29/24 | CMP | MBK | SPECIAL USE PERMIT SET |
| | 09/13/24 | CMP | MBK | SPECIAL USE PERMIT SET |
| | 10/17/24 | CMP | MBK | SPECIAL USE PERMIT SET REV 1 |
| | 12/19/24 | CMP | MBK | SUP SET - COUNTY COMMENTS |
| | 01/14/25 | CMP | MBK | SUP SET - COUNTY COMMENTS |

SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

SWM-1
PRE-DEVELOPMENT DRAINAGE AREA MAP




# POST-DEVELOPMENT DRAINAGE AREA MAP

SCALE: 1" = 150'

0 150' 300'

## LEGEND

- ROAD (GRAVEL)
- FENCE LINE
- PROPERTY LINE
- WETLAND LINE/FLAG
- (E) MAJOR CONTOUR
- (E) MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WETLAND BUFFER ZONE
- RIVERFRONT AREA
- 100-YEAR FLOOD HAZARD AREA
- TREELINE
- SILT FENCE
- SILT SOCK
- STORM PIPE
- ELECTRICAL TRENCH
- OVERHEAD ELECTRIC
- SEWER LINE
- WATER LINE
- GAS MAIN
- SIGN
- UTILITY POLE (WITH GUY ANCHOR)
- INDIVIDUAL TREE
- PROJECT LIMITS OF DISTURBANCE
- DRAINAGE AREA BOUNDARY
- SHEET FLOW
- SHALLOW CONCENTRATED FLOW
- ROW CROPS – GOOD CONDITION
- PASTURE
- IMPERVIOUS AREA
- DRAINAGE FLOW ARROW

**SOIL LEGEND**

| SOIL TYPE | SOIL RATING | SOIL NAME |
|---|---|---|
| 59A | C/D | LISBON SILT LOAM, 0 TO 2 PERCENT SLOPES |
| 60C2 | C/D | LA ROSE SILT LOAM, 5 TO 10 PERCENT SLOPES, ERODED |
| 152A | B/D | DRUMMER SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES |
| 356A | B/D | ELPASO SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES |
| 541B | C | GRAYMONT SILT LOAM, 2 TO 5 PERCENT SLOPES |
| 541C2 | C | GRAYMONT SILT LOAM, 5 TO 10 PERCENT SLOPES, ERODED |

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SPECIAL USE PERMIT SET
AMENT ROAD- KENDALL IL

PROJECT NUMBER:
22-4525

| REV | DATE | DRAWN | CHECKED | RELEASE LEVEL |
|---|---|---|---|---|
| | 08/29/24 | CMP | MBK | SPECIAL USE PERMIT SET |
| | 09/13/24 | CMP | MBK | SPECIAL USE PERMIT SET |
| 1 | 10/17/24 | CMP | MBK | SPECIAL USE PERMIT SET REV 1 |
| | 12/19/24 | CMP | MBK | SUP SET - COUNTY COMMENTS |
| | 01/14/25 | CMP | MBK | SUP SET - COUNTY COMMENTS |

SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

SWM-2

POST-DEVELOPMENT DRAINAGE AREA MAP

# APPENDIX C

## ISWS BULLETIN 75 PRECIPITATION DATA

Table 7. Rainfall (inches) for Given Recurrence Interval for Section 2 (Northeast)

| Storm Duration | 2-month | 3-month | 4-month | 6-month | 9-month | 1-year | 2-year | 5-year | 10-year | 25-year | 50-year | 100-year | 500-year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 minutes | 0.19 | 0.22 | 0.24 | 0.27 | 0.31 | 0.33 | 0.40 | 0.52 | 0.62 | 0.77 | 0.90 | 1.03 | 1.35 |
| 10 minutes | 0.33 | 0.38 | 0.41 | 0.47 | 0.53 | 0.58 | 0.70 | 0.90 | 1.08 | 1.35 | 1.58 | 1.80 | 2.36 |
| 15 minutes | 0.42 | 0.49 | 0.53 | 0.61 | 0.69 | 0.75 | 0.90 | 1.16 | 1.39 | 1.74 | 2.03 | 2.32 | 3.04 |
| 30 minutes | 0.58 | 0.66 | 0.73 | 0.83 | 0.94 | 1.03 | 1.24 | 1.59 | 1.91 | 2.39 | 2.78 | 3.17 | 4.16 |
| 1 hour | 0.74 | 0.84 | 0.93 | 1.05 | 1.20 | 1.30 | 1.57 | 2.02 | 2.42 | 3.03 | 3.53 | 4.03 | 5.28 |
| 2 hours | 0.91 | 1.04 | 1.14 | 1.30 | 1.48 | 1.61 | 1.94 | 2.49 | 2.99 | 3.74 | 4.35 | 4.97 | 6.52 |
| 3 hours | 1.00 | 1.15 | 1.26 | 1.44 | 1.63 | 1.77 | 2.14 | 2.75 | 3.30 | 4.13 | 4.80 | 5.49 | 7.20 |
| 6 hours | 1.18 | 1.35 | 1.48 | 1.68 | 1.91 | 2.08 | 2.51 | 3.23 | 3.86 | 4.84 | 5.63 | 6.43 | 8.43 |
| 12 hours | 1.37 | 1.56 | 1.71 | 1.95 | 2.21 | 2.41 | 2.91 | 3.74 | 4.48 | 5.61 | 6.53 | 7.46 | 9.78 |
| 18 hours | 1.48 | 1.69 | 1.85 | 2.11 | 2.39 | 2.61 | 3.14 | 4.04 | 4.84 | 6.06 | 7.05 | 8.06 | 10.57 |
| 24 hours | 1.57 | 1.80 | 1.97 | 2.24 | 2.55 | 2.77 | 3.34 | 4.30 | 5.15 | 6.45 | 7.50 | 8.57 | 11.24 |
| 48 hours | 1.72 | 1.97 | 2.16 | 2.46 | 2.79 | 3.04 | 3.66 | 4.71 | 5.62 | 6.99 | 8.13 | 9.28 | 12.10 |
| 72 hours | 1.87 | 2.14 | 2.34 | 2.67 | 3.03 | 3.30 | 3.97 | 5.08 | 6.05 | 7.49 | 8.64 | 9.85 | 12.81 |
| 120 hours | 2.08 | 2.38 | 2.61 | 2.97 | 3.37 | 3.67 | 4.42 | 5.63 | 6.68 | 8.16 | 9.39 | 10.66 | 13.81 |
| 240 hours | 2.63 | 3.01 | 3.30 | 3.76 | 4.27 | 4.65 | 5.60 | 7.09 | 8.25 | 9.90 | 11.26 | 12.65 | 16.00 |

# APPENDIX D

## HYDROCAD REPORT FOR 2-YEAR & 100-YEARSTORM EVENT

**D-1 PRE-DEVELOPMENT CONDITION**

**D-2 POST-DEVELOPMENT CONDITION WITHOUT STORMWATER BASINS**

**D-3 POST-DEVELOPMENT CONDITION WITH STORMWATER BASINS**

# APPENDIX D-1

## HYDROCAD REPORT FOR
## 2-YEAR & 100-YEARSTORM EVENT

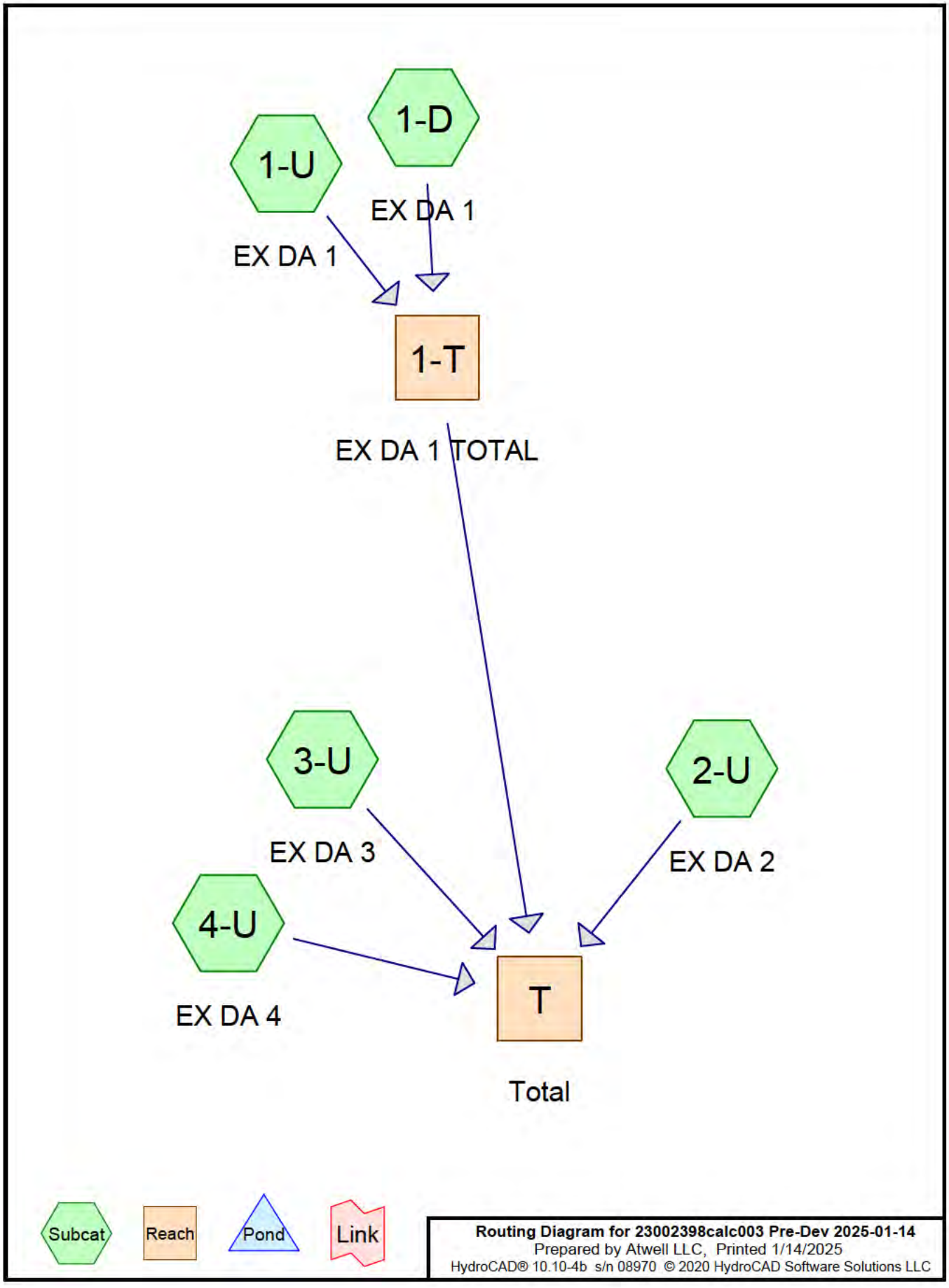
## PRE-DEVELOPMENT CONDITION

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1-D
1-U
EX DA 1
EX DA 1
1-T
EX DA 1 TOTAL
3-U
2-U
EX DA 3
EX DA 2
4-U
T
EX DA 4
Total
Subcat
Reach
Pond
Link
Routing Diagram for 23002398calc003 Pre-Dev 2025-01-14
Prepared by Atwell LLC, Printed 1/14/2025
HydroCAD® 10.10-4b s/n 08970 © 2020 HydroCAD Software Solutions LLC

## Rainfall Events Listing

| Event# | Event Name | Storm Type | Curve | Mode | Duration (hours) | B/B | Depth (inches) | AMC |
|---|---|---|---|---|---|---|---|---|
| 1 | 2-year | Huff 0-10sm | 3Q | Scale | 24.00 | 1 | 3.34 | 2 |
| 2 | 100-year | Huff 0-10sm | 3Q | Scale | 24.00 | 1 | 8.57 | 2 |

## Area Listing (all nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 0.409 | 98 | Impervious Area (1-D, 1-U, 2-U) |
| 32.293 | 85 | Row crops, straight row, Good, HSG C (1-U, 2-U, 3-U, 4-U) |
| 67.691 | 89 | Row crops, straight row, Good, HSG D (1-U, 2-U, 3-U, 4-U) |
| **100.393** | **88** | **TOTAL AREA** |

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment1-D: EX DA 1** Runoff Area=0.010 ac 100.00% Impervious Runoff Depth>3.10"
Flow Length=434' Tc=7.8 min CN=98 Runoff=0.00 cfs 0.003 af

**Subcatchment1-U: EX DA 1** Runoff Area=5.582 ac 1.54% Impervious Runoff Depth>1.95"
Flow Length=434' Tc=7.8 min CN=86 Runoff=1.60 cfs 0.907 af

**Subcatchment2-U: EX DA 2** Runoff Area=62.508 ac 0.50% Impervious Runoff Depth>2.06"
Flow Length=3,366' Tc=67.7 min CN=88 Runoff=17.97 cfs 10.713 af

**Subcatchment3-U: EX DA 3** Runoff Area=20.755 ac 0.00% Impervious Runoff Depth>2.10"
Flow Length=1,132' Tc=20.3 min CN=88 Runoff=6.23 cfs 3.636 af

**Subcatchment4-U: EX DA 4** Runoff Area=11.538 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=1,707' Tc=28.4 min CN=88 Runoff=3.44 cfs 2.013 af

**Reach 1-T: EX DA 1 TOTAL** Inflow=1.60 cfs 0.910 af
Outflow=1.60 cfs 0.910 af

**Reach T: Total** Inflow=28.55 cfs 17.272 af
Outflow=28.55 cfs 17.272 af

**Total Runoff Area = 100.393 ac Runoff Volume = 17.272 af Average Runoff Depth = 2.06"**
**99.59% Pervious = 99.984 ac 0.41% Impervious = 0.409 ac**

## Summary for Subcatchment 1-D: EX DA 1

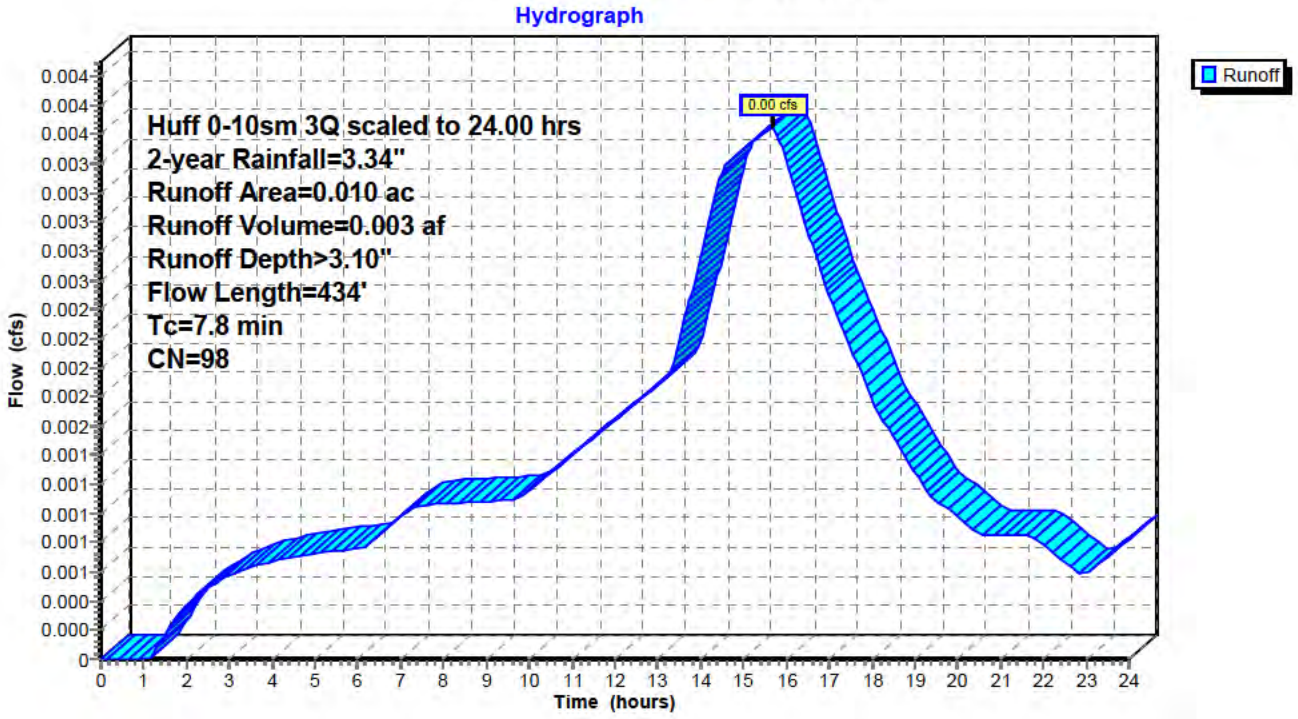
Runoff = 0.00 cfs @ 15.67 hrs, Volume= 0.003 af, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.010 | 98 | Impervious Area |
| | 0.010 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.0 | 100 | 0.0282 | 0.42 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 3.8 | 334 | 0.0264 | 1.46 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 7.8 | 434 | Total | | | |

## Subcatchment 1-D: EX DA 1



## Hydrograph for Subcatchment 1-D: EX DA 1

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 1.37 | 1.15 | 0.00 |
| 0.25 | 0.00 | 0.00 | 0.00 | 13.25 | 1.42 | 1.20 | 0.00 |
| 0.50 | 0.01 | 0.00 | 0.00 | 13.50 | 1.47 | 1.25 | 0.00 |
| 0.75 | 0.02 | 0.00 | 0.00 | 13.75 | 1.53 | 1.31 | 0.00 |
| 1.00 | 0.04 | 0.00 | 0.00 | 14.00 | 1.60 | 1.38 | 0.00 |
| 1.25 | 0.06 | 0.00 | 0.00 | 14.25 | 1.68 | 1.46 | 0.00 |
| 1.50 | 0.08 | 0.01 | 0.00 | 14.50 | 1.76 | 1.54 | 0.00 |
| 1.75 | 0.10 | 0.01 | 0.00 | 14.75 | 1.85 | 1.63 | 0.00 |
| 2.00 | 0.12 | 0.02 | 0.00 | 15.00 | 1.94 | 1.71 | 0.00 |
| 2.25 | 0.14 | 0.03 | 0.00 | 15.25 | 2.03 | 1.80 | 0.00 |
| 2.50 | 0.16 | 0.04 | 0.00 | 15.50 | 2.12 | 1.89 | **0.00** |
| 2.75 | 0.18 | 0.06 | 0.00 | 15.75 | 2.21 | 1.98 | **0.00** |
| 3.00 | 0.20 | 0.07 | 0.00 | 16.00 | 2.29 | 2.06 | 0.00 |
| 3.25 | 0.22 | 0.09 | 0.00 | 16.25 | 2.37 | 2.14 | 0.00 |
| 3.50 | 0.25 | 0.10 | 0.00 | 16.50 | 2.45 | 2.22 | 0.00 |
| 3.75 | 0.27 | 0.12 | 0.00 | 16.75 | 2.51 | 2.28 | 0.00 |
| 4.00 | 0.29 | 0.14 | 0.00 | 17.00 | 2.58 | 2.35 | 0.00 |
| 4.25 | 0.31 | 0.15 | 0.00 | 17.25 | 2.63 | 2.40 | 0.00 |
| 4.50 | 0.33 | 0.17 | 0.00 | 17.50 | 2.69 | 2.46 | 0.00 |
| 4.75 | 0.35 | 0.19 | 0.00 | 17.75 | 2.74 | 2.51 | 0.00 |
| 5.00 | 0.37 | 0.21 | 0.00 | 18.00 | 2.78 | 2.55 | 0.00 |
| 5.25 | 0.39 | 0.22 | 0.00 | 18.25 | 2.82 | 2.59 | 0.00 |
| 5.50 | 0.42 | 0.24 | 0.00 | 18.50 | 2.86 | 2.63 | 0.00 |
| 5.75 | 0.44 | 0.26 | 0.00 | 18.75 | 2.89 | 2.66 | 0.00 |
| 6.00 | 0.46 | 0.28 | 0.00 | 19.00 | 2.93 | 2.70 | 0.00 |
| 6.25 | 0.48 | 0.30 | 0.00 | 19.25 | 2.96 | 2.72 | 0.00 |
| 6.50 | 0.50 | 0.32 | 0.00 | 19.50 | 2.98 | 2.75 | 0.00 |
| 6.75 | 0.53 | 0.34 | 0.00 | 19.75 | 3.01 | 2.78 | 0.00 |
| 7.00 | 0.55 | 0.37 | 0.00 | 20.00 | 3.03 | 2.80 | 0.00 |
| 7.25 | 0.58 | 0.39 | 0.00 | 20.25 | 3.06 | 2.82 | 0.00 |
| 7.50 | 0.61 | 0.42 | 0.00 | 20.50 | 3.08 | 2.85 | 0.00 |
| 7.75 | 0.64 | 0.45 | 0.00 | 20.75 | 3.10 | 2.87 | 0.00 |
| 8.00 | 0.67 | 0.47 | 0.00 | 21.00 | 3.12 | 2.89 | 0.00 |
| 8.25 | 0.70 | 0.50 | 0.00 | 21.25 | 3.14 | 2.91 | 0.00 |
| 8.50 | 0.72 | 0.53 | 0.00 | 21.50 | 3.16 | 2.93 | 0.00 |
| 8.75 | 0.75 | 0.55 | 0.00 | 21.75 | 3.18 | 2.95 | 0.00 |
| 9.00 | 0.78 | 0.58 | 0.00 | 22.00 | 3.20 | 2.97 | 0.00 |
| 9.25 | 0.81 | 0.61 | 0.00 | 22.25 | 3.22 | 2.99 | 0.00 |
| 9.50 | 0.84 | 0.63 | 0.00 | 22.50 | 3.24 | 3.00 | 0.00 |
| 9.75 | 0.86 | 0.66 | 0.00 | 22.75 | 3.25 | 3.02 | 0.00 |
| 10.00 | 0.89 | 0.69 | 0.00 | 23.00 | 3.27 | 3.03 | 0.00 |
| 10.25 | 0.93 | 0.72 | 0.00 | 23.25 | 3.28 | 3.05 | 0.00 |
| 10.50 | 0.96 | 0.75 | 0.00 | 23.50 | 3.30 | 3.07 | 0.00 |
| 10.75 | 0.99 | 0.78 | 0.00 | 23.75 | 3.32 | 3.09 | 0.00 |
| 11.00 | 1.03 | 0.82 | 0.00 | 24.00 | **3.34** | **3.11** | 0.00 |
| 11.25 | 1.07 | 0.86 | 0.00 | | | | |
| 11.50 | 1.10 | 0.89 | 0.00 | | | | |
| 11.75 | 1.15 | 0.93 | 0.00 | | | | |
| 12.00 | 1.19 | 0.97 | 0.00 | | | | |
| 12.25 | 1.23 | 1.01 | 0.00 | | | | |
| 12.50 | 1.27 | 1.06 | 0.00 | | | | |
| 12.75 | 1.32 | 1.10 | 0.00 | | | | |

## Summary for Subcatchment 1-U: EX DA 1

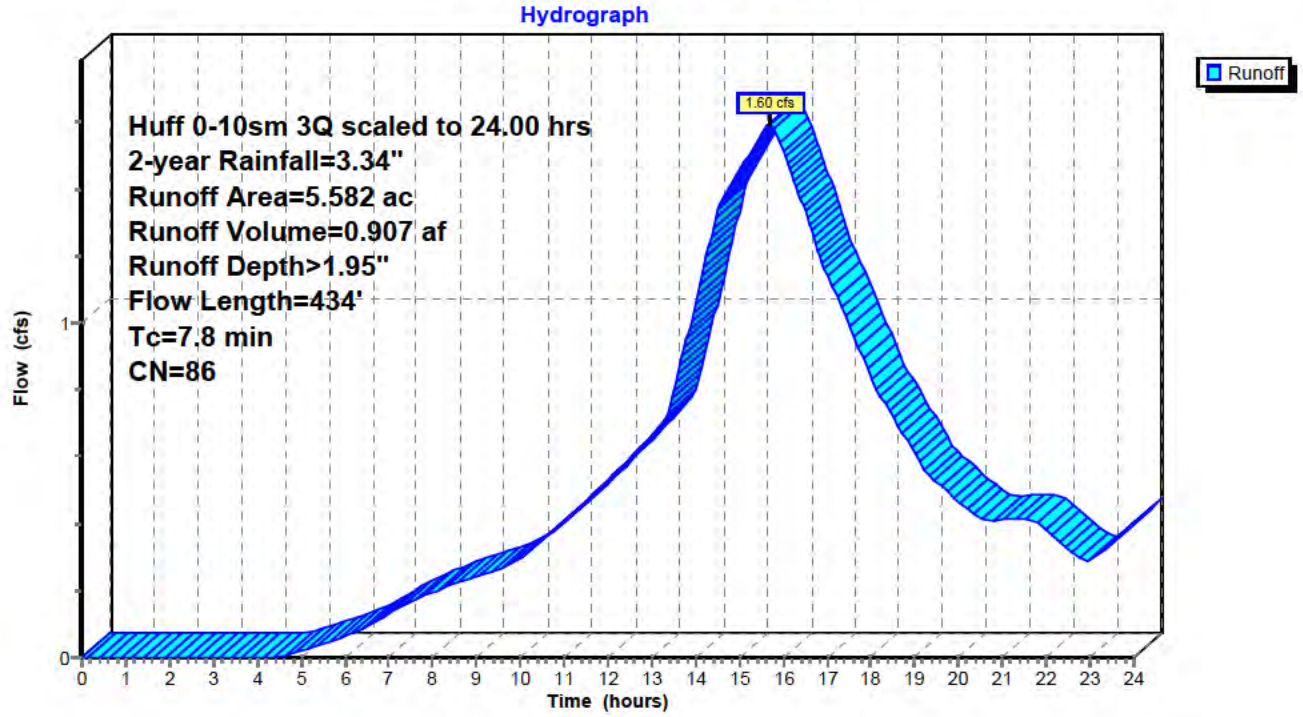
Runoff = 1.60 cfs @ 15.70 hrs, Volume= 0.907 af, Depth> 1.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 0.200 | 89 | Row crops, straight row, Good, HSG D |
| | 1.277 | 89 | Row crops, straight row, Good, HSG D |
| | 0.327 | 89 | Row crops, straight row, Good, HSG D |
| | 2.982 | 85 | Row crops, straight row, Good, HSG C |
| | 0.710 | 85 | Row crops, straight row, Good, HSG C |
| * | 0.086 | 98 | Impervious Area |
| | 5.582 | 86 | Weighted Average |
| | 5.496 | | 98.46% Pervious Area |
| | 0.086 | | 1.54% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.0 | 100 | 0.0282 | 0.42 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 3.8 | 334 | 0.0264 | 1.46 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 7.8 | 434 | Total | | | |

## Subcatchment 1-U: EX DA 1



## Hydrograph for Subcatchment 1-U: EX DA 1

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 1.37 | 0.41 | 0.67 |
| 0.25 | 0.00 | 0.00 | 0.00 | 13.25 | 1.42 | 0.44 | 0.70 |
| 0.50 | 0.01 | 0.00 | 0.00 | 13.50 | 1.47 | 0.47 | 0.80 |
| 0.75 | 0.02 | 0.00 | 0.00 | 13.75 | 1.53 | 0.51 | 0.93 |
| 1.00 | 0.04 | 0.00 | 0.00 | 14.00 | 1.60 | 0.56 | 1.06 |
| 1.25 | 0.06 | 0.00 | 0.00 | 14.25 | 1.68 | 0.61 | 1.20 |
| 1.50 | 0.08 | 0.00 | 0.00 | 14.50 | 1.76 | 0.67 | 1.34 |
| 1.75 | 0.10 | 0.00 | 0.00 | 14.75 | 1.85 | 0.74 | 1.41 |
| 2.00 | 0.12 | 0.00 | 0.00 | 15.00 | 1.94 | 0.80 | 1.46 |
| 2.25 | 0.14 | 0.00 | 0.00 | 15.25 | 2.03 | 0.87 | 1.51 |
| 2.50 | 0.16 | 0.00 | 0.00 | 15.50 | 2.12 | 0.94 | **1.56** |
| 2.75 | 0.18 | 0.00 | 0.00 | 15.75 | 2.21 | 1.01 | **1.59** |
| 3.00 | 0.20 | 0.00 | 0.00 | 16.00 | 2.29 | 1.08 | 1.52 |
| 3.25 | 0.22 | 0.00 | 0.00 | 16.25 | 2.37 | 1.14 | 1.43 |
| 3.50 | 0.25 | 0.00 | 0.00 | 16.50 | 2.45 | 1.20 | 1.34 |
| 3.75 | 0.27 | 0.00 | 0.00 | 16.75 | 2.51 | 1.25 | 1.24 |
| 4.00 | 0.29 | 0.00 | 0.00 | 17.00 | 2.58 | 1.31 | 1.15 |
| 4.25 | 0.31 | 0.00 | 0.00 | 17.25 | 2.63 | 1.35 | 1.07 |
| 4.50 | 0.33 | 0.00 | 0.00 | 17.50 | 2.69 | 1.40 | 1.00 |
| 4.75 | 0.35 | 0.00 | 0.01 | 17.75 | 2.74 | 1.44 | 0.92 |
| 5.00 | 0.37 | 0.00 | 0.02 | 18.00 | 2.78 | 1.48 | 0.84 |
| 5.25 | 0.39 | 0.00 | 0.03 | 18.25 | 2.82 | 1.51 | 0.78 |
| 5.50 | 0.42 | 0.00 | 0.04 | 18.50 | 2.86 | 1.54 | 0.72 |
| 5.75 | 0.44 | 0.01 | 0.05 | 18.75 | 2.89 | 1.57 | 0.67 |
| 6.00 | 0.46 | 0.01 | 0.06 | 19.00 | 2.93 | 1.60 | 0.61 |
| 6.25 | 0.48 | 0.01 | 0.08 | 19.25 | 2.96 | 1.62 | 0.56 |
| 6.50 | 0.50 | 0.02 | 0.09 | 19.50 | 2.98 | 1.65 | 0.52 |
| 6.75 | 0.53 | 0.02 | 0.11 | 19.75 | 3.01 | 1.67 | 0.50 |
| 7.00 | 0.55 | 0.03 | 0.13 | 20.00 | 3.03 | 1.69 | 0.47 |
| 7.25 | 0.58 | 0.03 | 0.15 | 20.25 | 3.06 | 1.71 | 0.44 |
| 7.50 | 0.61 | 0.04 | 0.17 | 20.50 | 3.08 | 1.73 | 0.41 |
| 7.75 | 0.64 | 0.05 | 0.18 | 20.75 | 3.10 | 1.75 | 0.41 |
| 8.00 | 0.67 | 0.06 | 0.20 | 21.00 | 3.12 | 1.77 | 0.41 |
| 8.25 | 0.70 | 0.07 | 0.21 | 21.25 | 3.14 | 1.78 | 0.41 |
| 8.50 | 0.72 | 0.08 | 0.22 | 21.50 | 3.16 | 1.80 | 0.41 |
| 8.75 | 0.75 | 0.09 | 0.23 | 21.75 | 3.18 | 1.82 | 0.41 |
| 9.00 | 0.78 | 0.10 | 0.24 | 22.00 | 3.20 | 1.84 | 0.38 |
| 9.25 | 0.81 | 0.11 | 0.25 | 22.25 | 3.22 | 1.85 | 0.35 |
| 9.50 | 0.84 | 0.12 | 0.26 | 22.50 | 3.24 | 1.87 | 0.33 |
| 9.75 | 0.86 | 0.13 | 0.28 | 22.75 | 3.25 | 1.88 | 0.30 |
| 10.00 | 0.89 | 0.15 | 0.30 | 23.00 | 3.27 | 1.89 | 0.29 |
| 10.25 | 0.93 | 0.16 | 0.32 | 23.25 | 3.28 | 1.91 | 0.32 |
| 10.50 | 0.96 | 0.18 | 0.35 | 23.50 | 3.30 | 1.92 | 0.35 |
| 10.75 | 0.99 | 0.19 | 0.38 | 23.75 | 3.32 | 1.94 | 0.37 |
| 11.00 | 1.03 | 0.21 | 0.41 | 24.00 | **3.34** | **1.96** | 0.40 |
| 11.25 | 1.07 | 0.23 | 0.44 | | | | |
| 11.50 | 1.10 | 0.25 | 0.47 | | | | |
| 11.75 | 1.15 | 0.27 | 0.50 | | | | |
| 12.00 | 1.19 | 0.30 | 0.53 | | | | |
| 12.25 | 1.23 | 0.32 | 0.56 | | | | |
| 12.50 | 1.27 | 0.35 | 0.60 | | | | |
| 12.75 | 1.32 | 0.38 | 0.63 | | | | |

## Summary for Subcatchment 2-U: EX DA 2

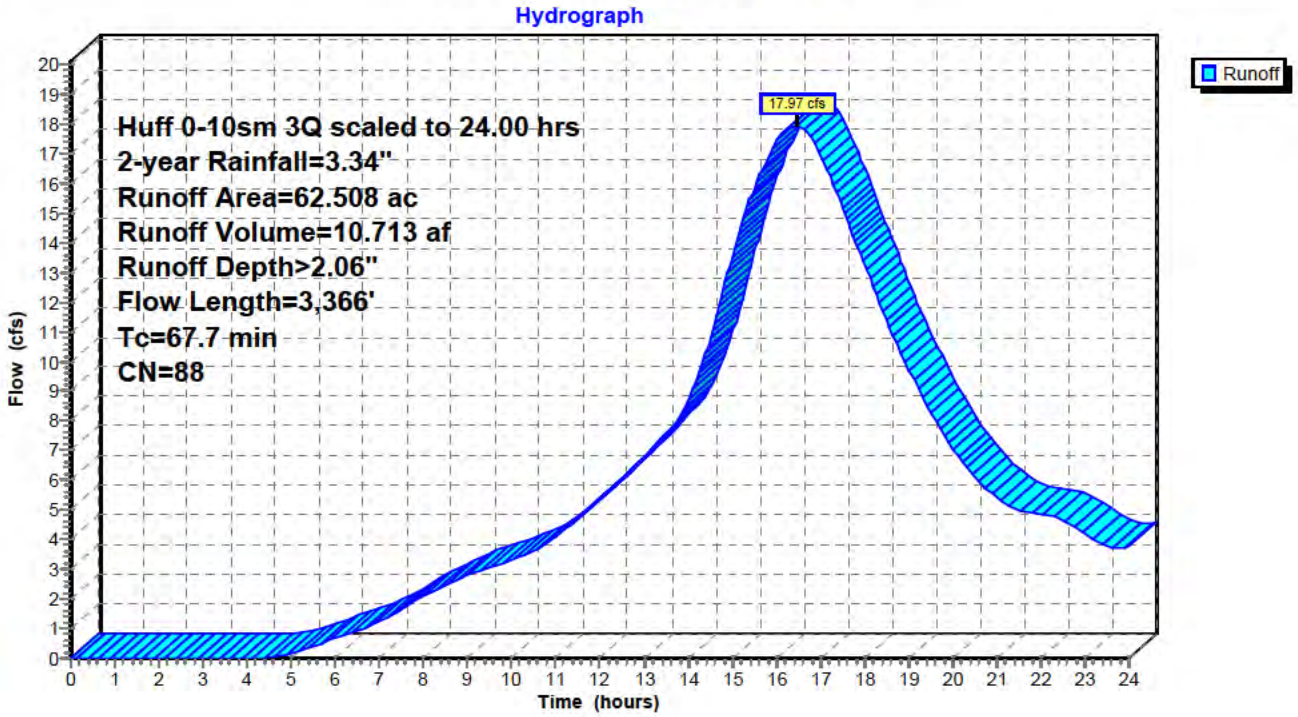
Runoff = 17.97 cfs @ 16.45 hrs, Volume= 10.713 af, Depth> 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 11.150 | 89 | Row crops, straight row, Good, HSG D |
| | 2.052 | 89 | Row crops, straight row, Good, HSG D |
| | 0.061 | 89 | Row crops, straight row, Good, HSG D |
| | 11.220 | 89 | Row crops, straight row, Good, HSG D |
| | 8.588 | 89 | Row crops, straight row, Good, HSG D |
| | 10.020 | 89 | Row crops, straight row, Good, HSG D |
| | 14.950 | 85 | Row crops, straight row, Good, HSG C |
| | 2.184 | 85 | Row crops, straight row, Good, HSG C |
| | 0.951 | 85 | Row crops, straight row, Good, HSG C |
| | 1.019 | 85 | Row crops, straight row, Good, HSG C |
| * | 0.313 | 98 | Impervious Area |
| | 62.508 | 88 | Weighted Average |
| | 62.195 | | 99.50% Pervious Area |
| | 0.313 | | 0.50% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.4 | 100 | 0.0421 | 0.49 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 1.5 | 141 | 0.0306 | 1.57 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 62.8 | 3,125 | 0.0085 | 0.83 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 67.7 | 3,366 | Total | | | |

## Subcatchment 2-U: EX DA 2



## Hydrograph for Subcatchment 2-U: EX DA 2

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 1.37 | 0.49 | 6.80 |
| 0.25 | 0.00 | 0.00 | 0.00 | 13.25 | 1.42 | 0.52 | 7.18 |
| 0.50 | 0.01 | 0.00 | 0.00 | 13.50 | 1.47 | 0.56 | 7.58 |
| 0.75 | 0.02 | 0.00 | 0.00 | 13.75 | 1.53 | 0.61 | 8.04 |
| 1.00 | 0.04 | 0.00 | 0.00 | 14.00 | 1.60 | 0.66 | 8.68 |
| 1.25 | 0.06 | 0.00 | 0.00 | 14.25 | 1.68 | 0.71 | 9.60 |
| 1.50 | 0.08 | 0.00 | 0.00 | 14.50 | 1.76 | 0.78 | 10.78 |
| 1.75 | 0.10 | 0.00 | 0.00 | 14.75 | 1.85 | 0.85 | 12.12 |
| 2.00 | 0.12 | 0.00 | 0.00 | 15.00 | 1.94 | 0.91 | 13.53 |
| 2.25 | 0.14 | 0.00 | 0.00 | 15.25 | 2.03 | 0.99 | 14.79 |
| 2.50 | 0.16 | 0.00 | 0.00 | 15.50 | 2.12 | 1.06 | 15.82 |
| 2.75 | 0.18 | 0.00 | 0.00 | 15.75 | 2.21 | 1.13 | 16.69 |
| 3.00 | 0.20 | 0.00 | 0.00 | 16.00 | 2.29 | 1.21 | 17.39 |
| 3.25 | 0.22 | 0.00 | 0.00 | 16.25 | 2.37 | 1.27 | **17.84** |
| 3.50 | 0.25 | 0.00 | 0.00 | 16.50 | 2.45 | 1.34 | **17.95** |
| 3.75 | 0.27 | 0.00 | 0.00 | 16.75 | 2.51 | 1.39 | 17.63 |
| 4.00 | 0.29 | 0.00 | 0.00 | 17.00 | 2.58 | 1.45 | 16.97 |
| 4.25 | 0.31 | 0.00 | 0.00 | 17.25 | 2.63 | 1.50 | 16.14 |
| 4.50 | 0.33 | 0.00 | 0.03 | 17.50 | 2.69 | 1.54 | 15.19 |
| 4.75 | 0.35 | 0.00 | 0.08 | 17.75 | 2.74 | 1.59 | 14.22 |
| 5.00 | 0.37 | 0.01 | 0.17 | 18.00 | 2.78 | 1.62 | 13.28 |
| 5.25 | 0.39 | 0.01 | 0.29 | 18.25 | 2.82 | 1.66 | 12.35 |
| 5.50 | 0.42 | 0.01 | 0.42 | 18.50 | 2.86 | 1.69 | 11.42 |
| 5.75 | 0.44 | 0.02 | 0.55 | 18.75 | 2.89 | 1.72 | 10.55 |
| 6.00 | 0.46 | 0.02 | 0.68 | 19.00 | 2.93 | 1.75 | 9.74 |
| 6.25 | 0.48 | 0.03 | 0.81 | 19.25 | 2.96 | 1.78 | 8.99 |
| 6.50 | 0.50 | 0.03 | 0.94 | 19.50 | 2.98 | 1.80 | 8.31 |
| 6.75 | 0.53 | 0.04 | 1.08 | 19.75 | 3.01 | 1.83 | 7.65 |
| 7.00 | 0.55 | 0.05 | 1.24 | 20.00 | 3.03 | 1.85 | 7.06 |
| 7.25 | 0.58 | 0.06 | 1.43 | 20.25 | 3.06 | 1.87 | 6.57 |
| 7.50 | 0.61 | 0.07 | 1.64 | 20.50 | 3.08 | 1.89 | 6.13 |
| 7.75 | 0.64 | 0.08 | 1.86 | 20.75 | 3.10 | 1.91 | 5.75 |
| 8.00 | 0.67 | 0.09 | 2.09 | 21.00 | 3.12 | 1.92 | 5.43 |
| 8.25 | 0.70 | 0.10 | 2.29 | 21.25 | 3.14 | 1.94 | 5.17 |
| 8.50 | 0.72 | 0.11 | 2.47 | 21.50 | 3.16 | 1.96 | 5.00 |
| 8.75 | 0.75 | 0.12 | 2.63 | 21.75 | 3.18 | 1.98 | 4.91 |
| 9.00 | 0.78 | 0.14 | 2.79 | 22.00 | 3.20 | 2.00 | 4.85 |
| 9.25 | 0.81 | 0.15 | 2.93 | 22.25 | 3.22 | 2.02 | 4.78 |
| 9.50 | 0.84 | 0.16 | 3.06 | 22.50 | 3.24 | 2.03 | 4.67 |
| 9.75 | 0.86 | 0.18 | 3.19 | 22.75 | 3.25 | 2.04 | 4.47 |
| 10.00 | 0.89 | 0.19 | 3.31 | 23.00 | 3.27 | 2.06 | 4.22 |
| 10.25 | 0.93 | 0.21 | 3.44 | 23.25 | 3.28 | 2.07 | 3.96 |
| 10.50 | 0.96 | 0.23 | 3.62 | 23.50 | 3.30 | 2.09 | 3.75 |
| 10.75 | 0.99 | 0.25 | 3.84 | 23.75 | 3.32 | 2.10 | 3.68 |
| 11.00 | 1.03 | 0.27 | 4.10 | 24.00 | **3.34** | **2.12** | 3.77 |
| 11.25 | 1.07 | 0.29 | 4.39 | | | | |
| 11.50 | 1.10 | 0.32 | 4.70 | | | | |
| 11.75 | 1.15 | 0.34 | 5.02 | | | | |
| 12.00 | 1.19 | 0.37 | 5.35 | | | | |
| 12.25 | 1.23 | 0.39 | 5.71 | | | | |
| 12.50 | 1.27 | 0.42 | 6.06 | | | | |
| 12.75 | 1.32 | 0.46 | 6.43 | | | | |

## Summary for Subcatchment 3-U: EX DA 3

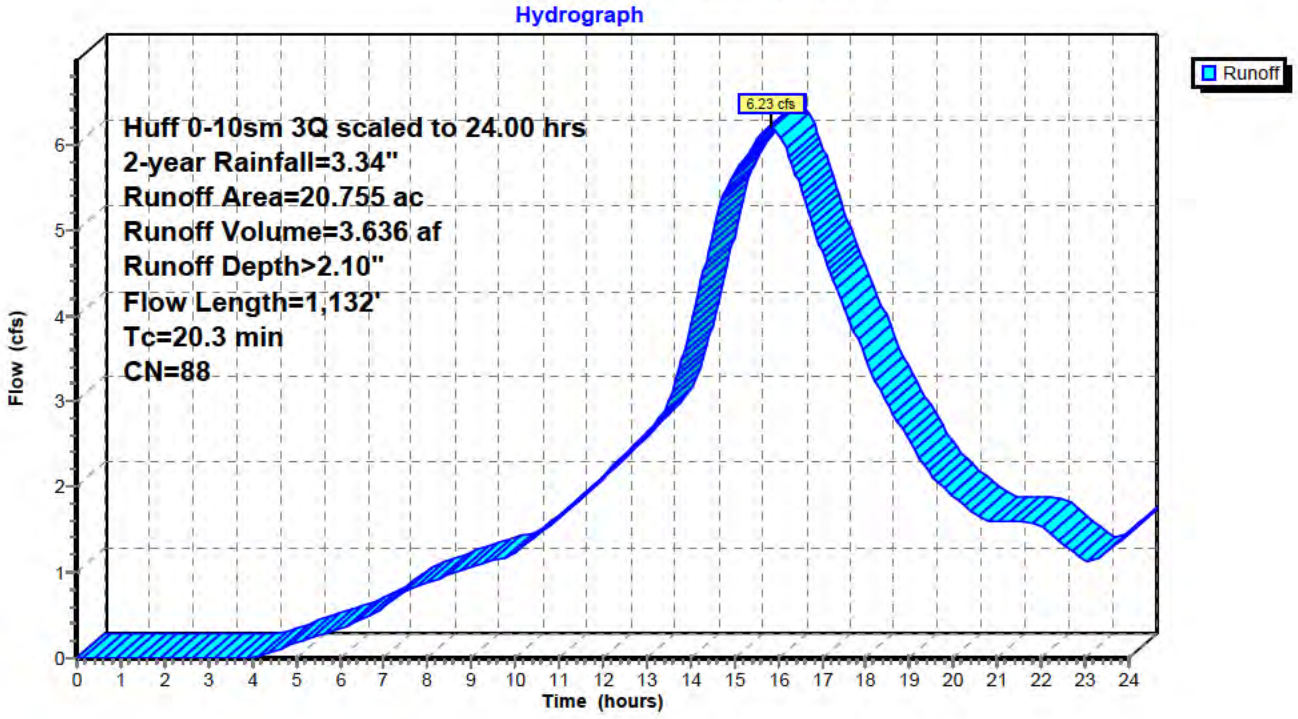
Runoff = 6.23 cfs @ 15.84 hrs, Volume= 3.636 af, Depth> 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

| Area (ac) | CN | Description |
|---|---|---|
| 3.643 | 89 | Row crops, straight row, Good, HSG D |
| 4.215 | 89 | Row crops, straight row, Good, HSG D |
| 1.296 | 89 | Row crops, straight row, Good, HSG D |
| 5.307 | 89 | Row crops, straight row, Good, HSG D |
| 3.064 | 85 | Row crops, straight row, Good, HSG C |
| 3.230 | 85 | Row crops, straight row, Good, HSG C |
| 20.755 | 88 | Weighted Average |
| 20.755 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.6 | 100 | 0.0203 | 0.36 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 15.7 | 1,032 | 0.0149 | 1.10 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 20.3 | 1,132 | Total | | | |

## Subcatchment 3-U: EX DA 3



## Hydrograph for Subcatchment 3-U: EX DA 3

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 1.37 | 0.49 | 2.63 |
| 0.25 | 0.00 | 0.00 | 0.00 | 13.25 | 1.42 | 0.52 | 2.76 |
| 0.50 | 0.01 | 0.00 | 0.00 | 13.50 | 1.47 | 0.56 | 2.97 |
| 0.75 | 0.02 | 0.00 | 0.00 | 13.75 | 1.53 | 0.61 | 3.39 |
| 1.00 | 0.04 | 0.00 | 0.00 | 14.00 | 1.60 | 0.66 | 3.88 |
| 1.25 | 0.06 | 0.00 | 0.00 | 14.25 | 1.68 | 0.71 | 4.41 |
| 1.50 | 0.08 | 0.00 | 0.00 | 14.50 | 1.76 | 0.78 | 4.96 |
| 1.75 | 0.10 | 0.00 | 0.00 | 14.75 | 1.85 | 0.85 | 5.40 |
| 2.00 | 0.12 | 0.00 | 0.00 | 15.00 | 1.94 | 0.91 | 5.65 |
| 2.25 | 0.14 | 0.00 | 0.00 | 15.25 | 2.03 | 0.99 | 5.84 |
| 2.50 | 0.16 | 0.00 | 0.00 | 15.50 | 2.12 | 1.06 | 6.03 |
| 2.75 | 0.18 | 0.00 | 0.00 | 15.75 | 2.21 | 1.13 | **6.20** |
| 3.00 | 0.20 | 0.00 | 0.00 | 16.00 | 2.29 | 1.21 | **6.15** |
| 3.25 | 0.22 | 0.00 | 0.00 | 16.25 | 2.37 | 1.27 | 5.86 |
| 3.50 | 0.25 | 0.00 | 0.00 | 16.50 | 2.45 | 1.34 | 5.50 |
| 3.75 | 0.27 | 0.00 | 0.00 | 16.75 | 2.51 | 1.39 | 5.13 |
| 4.00 | 0.29 | 0.00 | 0.00 | 17.00 | 2.58 | 1.45 | 4.75 |
| 4.25 | 0.31 | 0.00 | 0.03 | 17.25 | 2.63 | 1.50 | 4.41 |
| 4.50 | 0.33 | 0.00 | 0.08 | 17.50 | 2.69 | 1.54 | 4.11 |
| 4.75 | 0.35 | 0.00 | 0.13 | 17.75 | 2.74 | 1.59 | 3.81 |
| 5.00 | 0.37 | 0.01 | 0.18 | 18.00 | 2.78 | 1.62 | 3.50 |
| 5.25 | 0.39 | 0.01 | 0.22 | 18.25 | 2.82 | 1.66 | 3.20 |
| 5.50 | 0.42 | 0.01 | 0.27 | 18.50 | 2.86 | 1.69 | 2.96 |
| 5.75 | 0.44 | 0.02 | 0.31 | 18.75 | 2.89 | 1.72 | 2.75 |
| 6.00 | 0.46 | 0.02 | 0.35 | 19.00 | 2.93 | 1.75 | 2.53 |
| 6.25 | 0.48 | 0.03 | 0.39 | 19.25 | 2.96 | 1.78 | 2.32 |
| 6.50 | 0.50 | 0.03 | 0.45 | 19.50 | 2.98 | 1.80 | 2.13 |
| 6.75 | 0.53 | 0.04 | 0.52 | 19.75 | 3.01 | 1.83 | 2.00 |
| 7.00 | 0.55 | 0.05 | 0.60 | 20.00 | 3.03 | 1.85 | 1.89 |
| 7.25 | 0.58 | 0.06 | 0.69 | 20.25 | 3.06 | 1.87 | 1.78 |
| 7.50 | 0.61 | 0.07 | 0.77 | 20.50 | 3.08 | 1.89 | 1.68 |
| 7.75 | 0.64 | 0.08 | 0.83 | 20.75 | 3.10 | 1.91 | 1.60 |
| 8.00 | 0.67 | 0.09 | 0.88 | 21.00 | 3.12 | 1.92 | 1.59 |
| 8.25 | 0.70 | 0.10 | 0.93 | 21.25 | 3.14 | 1.94 | 1.59 |
| 8.50 | 0.72 | 0.11 | 0.97 | 21.50 | 3.16 | 1.96 | 1.59 |
| 8.75 | 0.75 | 0.12 | 1.02 | 21.75 | 3.18 | 1.98 | 1.59 |
| 9.00 | 0.78 | 0.14 | 1.06 | 22.00 | 3.20 | 2.00 | 1.54 |
| 9.25 | 0.81 | 0.15 | 1.10 | 22.25 | 3.22 | 2.02 | 1.44 |
| 9.50 | 0.84 | 0.16 | 1.14 | 22.50 | 3.24 | 2.03 | 1.34 |
| 9.75 | 0.86 | 0.18 | 1.17 | 22.75 | 3.25 | 2.04 | 1.23 |
| 10.00 | 0.89 | 0.19 | 1.24 | 23.00 | 3.27 | 2.06 | 1.13 |
| 10.25 | 0.93 | 0.21 | 1.33 | 23.25 | 3.28 | 2.07 | 1.15 |
| 10.50 | 0.96 | 0.23 | 1.43 | 23.50 | 3.30 | 2.09 | 1.24 |
| 10.75 | 0.99 | 0.25 | 1.54 | 23.75 | 3.32 | 2.10 | 1.35 |
| 11.00 | 1.03 | 0.27 | 1.65 | 24.00 | **3.34** | **2.12** | 1.46 |
| 11.25 | 1.07 | 0.29 | 1.76 | | | | |
| 11.50 | 1.10 | 0.32 | 1.88 | | | | |
| 11.75 | 1.15 | 0.34 | 2.00 | | | | |
| 12.00 | 1.19 | 0.37 | 2.12 | | | | |
| 12.25 | 1.23 | 0.39 | 2.24 | | | | |
| 12.50 | 1.27 | 0.42 | 2.37 | | | | |
| 12.75 | 1.32 | 0.46 | 2.50 | | | | |

## Summary for Subcatchment 4-U: EX DA 4

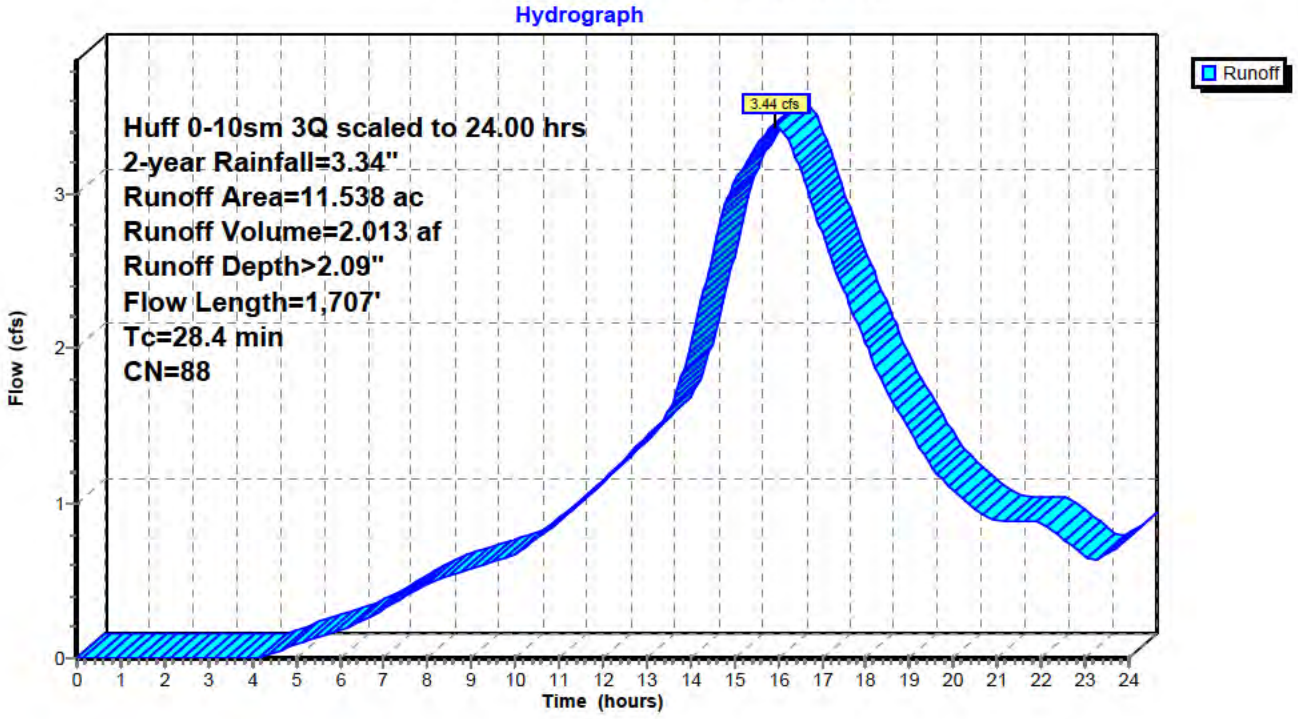
Runoff = 3.44 cfs @ 15.94 hrs, Volume= 2.013 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

| Area (ac) | CN | Description |
|---|---|---|
| 0.430 | 89 | Row crops, straight row, Good, HSG D |
| 4.644 | 89 | Row crops, straight row, Good, HSG D |
| 0.045 | 89 | Row crops, straight row, Good, HSG D |
| 3.216 | 89 | Row crops, straight row, Good, HSG D |
| 0.697 | 85 | Row crops, straight row, Good, HSG C |
| 2.506 | 85 | Row crops, straight row, Good, HSG C |
| 11.538 | 88 | Weighted Average |
| 11.538 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0080 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 21.8 | 1,607 | 0.0187 | 1.23 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 28.4 | 1,707 | Total | | | |

## Subcatchment 4-U: EX DA 4



## Hydrograph for Subcatchment 4-U: EX DA 4

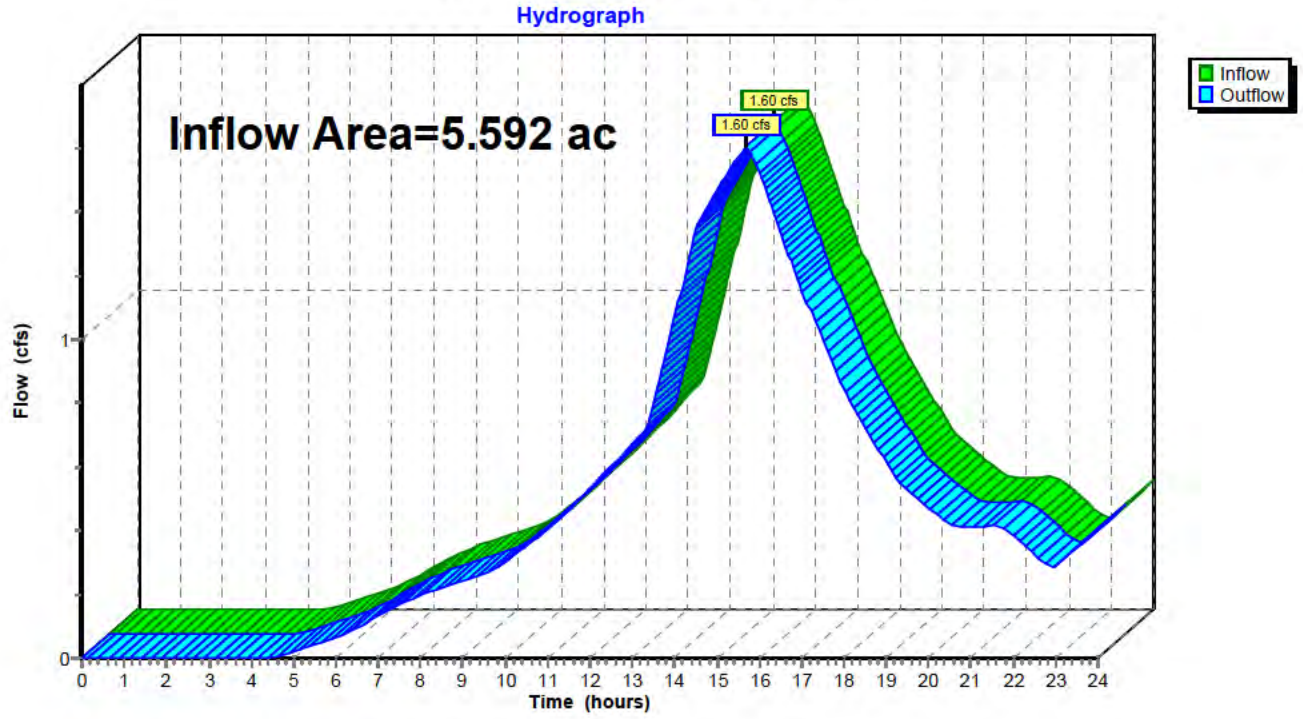
| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 1.37 | 0.49 | 1.43 |
| 0.25 | 0.00 | 0.00 | 0.00 | 13.25 | 1.42 | 0.52 | 1.50 |
| 0.50 | 0.01 | 0.00 | 0.00 | 13.50 | 1.47 | 0.56 | 1.59 |
| 0.75 | 0.02 | 0.00 | 0.00 | 13.75 | 1.53 | 0.61 | 1.77 |
| 1.00 | 0.04 | 0.00 | 0.00 | 14.00 | 1.60 | 0.66 | 2.03 |
| 1.25 | 0.06 | 0.00 | 0.00 | 14.25 | 1.68 | 0.71 | 2.31 |
| 1.50 | 0.08 | 0.00 | 0.00 | 14.50 | 1.76 | 0.78 | 2.60 |
| 1.75 | 0.10 | 0.00 | 0.00 | 14.75 | 1.85 | 0.85 | 2.88 |
| 2.00 | 0.12 | 0.00 | 0.00 | 15.00 | 1.94 | 0.91 | 3.06 |
| 2.25 | 0.14 | 0.00 | 0.00 | 15.25 | 2.03 | 0.99 | 3.19 |
| 2.50 | 0.16 | 0.00 | 0.00 | 15.50 | 2.12 | 1.06 | 3.30 |
| 2.75 | 0.18 | 0.00 | 0.00 | 15.75 | 2.21 | 1.13 | **3.40** |
| 3.00 | 0.20 | 0.00 | 0.00 | 16.00 | 2.29 | 1.21 | **3.44** |
| 3.25 | 0.22 | 0.00 | 0.00 | 16.25 | 2.37 | 1.27 | 3.33 |
| 3.50 | 0.25 | 0.00 | 0.00 | 16.50 | 2.45 | 1.34 | 3.15 |
| 3.75 | 0.27 | 0.00 | 0.00 | 16.75 | 2.51 | 1.39 | 2.95 |
| 4.00 | 0.29 | 0.00 | 0.00 | 17.00 | 2.58 | 1.45 | 2.75 |
| 4.25 | 0.31 | 0.00 | 0.01 | 17.25 | 2.63 | 1.50 | 2.55 |
| 4.50 | 0.33 | 0.00 | 0.03 | 17.50 | 2.69 | 1.54 | 2.37 |
| 4.75 | 0.35 | 0.00 | 0.06 | 17.75 | 2.74 | 1.59 | 2.20 |
| 5.00 | 0.37 | 0.01 | 0.08 | 18.00 | 2.78 | 1.62 | 2.03 |
| 5.25 | 0.39 | 0.01 | 0.11 | 18.25 | 2.82 | 1.66 | 1.86 |
| 5.50 | 0.42 | 0.01 | 0.14 | 18.50 | 2.86 | 1.69 | 1.71 |
| 5.75 | 0.44 | 0.02 | 0.16 | 18.75 | 2.89 | 1.72 | 1.59 |
| 6.00 | 0.46 | 0.02 | 0.18 | 19.00 | 2.93 | 1.75 | 1.47 |
| 6.25 | 0.48 | 0.03 | 0.21 | 19.25 | 2.96 | 1.78 | 1.35 |
| 6.50 | 0.50 | 0.03 | 0.23 | 19.50 | 2.98 | 1.80 | 1.24 |
| 6.75 | 0.53 | 0.04 | 0.27 | 19.75 | 3.01 | 1.83 | 1.15 |
| 7.00 | 0.55 | 0.05 | 0.31 | 20.00 | 3.03 | 1.85 | 1.08 |
| 7.25 | 0.58 | 0.06 | 0.36 | 20.25 | 3.06 | 1.87 | 1.02 |
| 7.50 | 0.61 | 0.07 | 0.41 | 20.50 | 3.08 | 1.89 | 0.96 |
| 7.75 | 0.64 | 0.08 | 0.44 | 20.75 | 3.10 | 1.91 | 0.91 |
| 8.00 | 0.67 | 0.09 | 0.48 | 21.00 | 3.12 | 1.92 | 0.89 |
| 8.25 | 0.70 | 0.10 | 0.50 | 21.25 | 3.14 | 1.94 | 0.88 |
| 8.50 | 0.72 | 0.11 | 0.53 | 21.50 | 3.16 | 1.96 | 0.88 |
| 8.75 | 0.75 | 0.12 | 0.55 | 21.75 | 3.18 | 1.98 | 0.88 |
| 9.00 | 0.78 | 0.14 | 0.58 | 22.00 | 3.20 | 2.00 | 0.87 |
| 9.25 | 0.81 | 0.15 | 0.60 | 22.25 | 3.22 | 2.02 | 0.83 |
| 9.50 | 0.84 | 0.16 | 0.62 | 22.50 | 3.24 | 2.03 | 0.77 |
| 9.75 | 0.86 | 0.18 | 0.64 | 22.75 | 3.25 | 2.04 | 0.71 |
| 10.00 | 0.89 | 0.19 | 0.67 | 23.00 | 3.27 | 2.06 | 0.65 |
| 10.25 | 0.93 | 0.21 | 0.71 | 23.25 | 3.28 | 2.07 | 0.63 |
| 10.50 | 0.96 | 0.23 | 0.77 | 23.50 | 3.30 | 2.09 | 0.67 |
| 10.75 | 0.99 | 0.25 | 0.83 | 23.75 | 3.32 | 2.10 | 0.72 |
| 11.00 | 1.03 | 0.27 | 0.89 | 24.00 | **3.34** | **2.12** | 0.78 |
| 11.25 | 1.07 | 0.29 | 0.95 | | | | |
| 11.50 | 1.10 | 0.32 | 1.01 | | | | |
| 11.75 | 1.15 | 0.34 | 1.08 | | | | |
| 12.00 | 1.19 | 0.37 | 1.14 | | | | |
| 12.25 | 1.23 | 0.39 | 1.21 | | | | |
| 12.50 | 1.27 | 0.42 | 1.28 | | | | |
| 12.75 | 1.32 | 0.46 | 1.35 | | | | |

## Summary for Reach 1-T: EX DA 1 TOTAL

Inflow Area = 5.592 ac, 1.72% Impervious, Inflow Depth > 1.95" for 2-year event
Inflow = 1.60 cfs @ 15.70 hrs, Volume= 0.910 af
Outflow = 1.60 cfs @ 15.70 hrs, Volume= 0.910 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## Reach 1-T: EX DA 1 TOTAL



## Hydrograph for Reach 1-T: EX DA 1 TOTAL

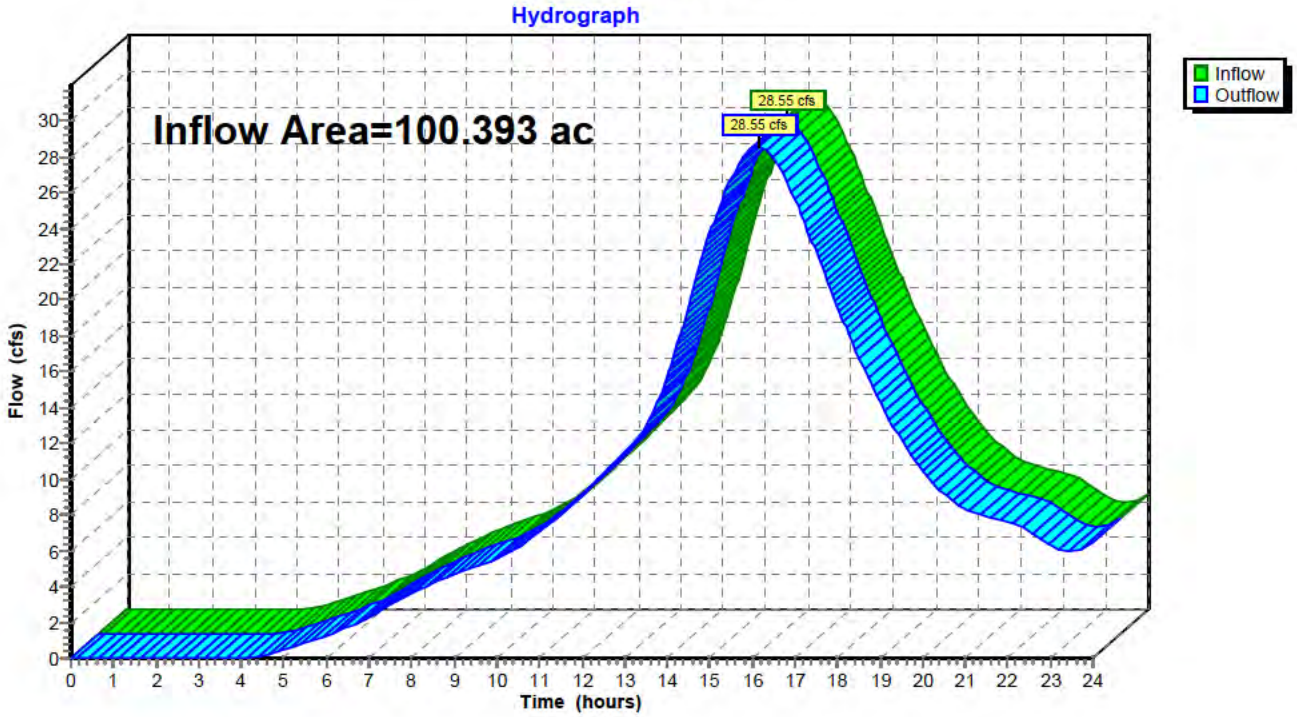
| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 0.67 | | 0.67 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 0.70 | | 0.70 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 0.80 | | 0.80 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 0.93 | | 0.93 |
| 1.00 | 0.00 | | 0.00 | 14.00 | 1.06 | | 1.06 |
| 1.25 | 0.00 | | 0.00 | 14.25 | 1.20 | | 1.20 |
| 1.50 | 0.00 | | 0.00 | 14.50 | 1.34 | | 1.34 |
| 1.75 | 0.00 | | 0.00 | 14.75 | 1.41 | | 1.41 |
| 2.00 | 0.00 | | 0.00 | 15.00 | 1.46 | | 1.46 |
| 2.25 | 0.00 | | 0.00 | 15.25 | 1.52 | | 1.52 |
| 2.50 | 0.00 | | 0.00 | 15.50 | **1.57** | | **1.57** |
| 2.75 | 0.00 | | 0.00 | 15.75 | **1.60** | | **1.60** |
| 3.00 | 0.00 | | 0.00 | 16.00 | 1.52 | | 1.52 |
| 3.25 | 0.00 | | 0.00 | 16.25 | 1.43 | | 1.43 |
| 3.50 | 0.00 | | 0.00 | 16.50 | 1.34 | | 1.34 |
| 3.75 | 0.00 | | 0.00 | 16.75 | 1.24 | | 1.24 |
| 4.00 | 0.00 | | 0.00 | 17.00 | 1.15 | | 1.15 |
| 4.25 | 0.00 | | 0.00 | 17.25 | 1.08 | | 1.08 |
| 4.50 | 0.00 | | 0.00 | 17.50 | 1.00 | | 1.00 |
| 4.75 | 0.01 | | 0.01 | 17.75 | 0.92 | | 0.92 |
| 5.00 | 0.02 | | 0.02 | 18.00 | 0.84 | | 0.84 |
| 5.25 | 0.03 | | 0.03 | 18.25 | 0.78 | | 0.78 |
| 5.50 | 0.04 | | 0.04 | 18.50 | 0.72 | | 0.72 |
| 5.75 | 0.05 | | 0.05 | 18.75 | 0.67 | | 0.67 |
| 6.00 | 0.06 | | 0.06 | 19.00 | 0.61 | | 0.61 |
| 6.25 | 0.08 | | 0.08 | 19.25 | 0.56 | | 0.56 |
| 6.50 | 0.09 | | 0.09 | 19.50 | 0.52 | | 0.52 |
| 6.75 | 0.11 | | 0.11 | 19.75 | 0.50 | | 0.50 |
| 7.00 | 0.13 | | 0.13 | 20.00 | 0.47 | | 0.47 |
| 7.25 | 0.15 | | 0.15 | 20.25 | 0.44 | | 0.44 |
| 7.50 | 0.17 | | 0.17 | 20.50 | 0.42 | | 0.42 |
| 7.75 | 0.18 | | 0.18 | 20.75 | 0.41 | | 0.41 |
| 8.00 | 0.20 | | 0.20 | 21.00 | 0.41 | | 0.41 |
| 8.25 | 0.21 | | 0.21 | 21.25 | 0.41 | | 0.41 |
| 8.50 | 0.22 | | 0.22 | 21.50 | 0.41 | | 0.41 |
| 8.75 | 0.23 | | 0.23 | 21.75 | 0.41 | | 0.41 |
| 9.00 | 0.24 | | 0.24 | 22.00 | 0.38 | | 0.38 |
| 9.25 | 0.25 | | 0.25 | 22.25 | 0.35 | | 0.35 |
| 9.50 | 0.26 | | 0.26 | 22.50 | 0.33 | | 0.33 |
| 9.75 | 0.28 | | 0.28 | 22.75 | 0.30 | | 0.30 |
| 10.00 | 0.30 | | 0.30 | 23.00 | 0.29 | | 0.29 |
| 10.25 | 0.33 | | 0.33 | 23.25 | 0.32 | | 0.32 |
| 10.50 | 0.35 | | 0.35 | 23.50 | 0.35 | | 0.35 |
| 10.75 | 0.38 | | 0.38 | 23.75 | 0.38 | | 0.38 |
| 11.00 | 0.41 | | 0.41 | 24.00 | 0.40 | | 0.40 |
| 11.25 | 0.44 | | 0.44 | | | | |
| 11.50 | 0.47 | | 0.47 | | | | |
| 11.75 | 0.50 | | 0.50 | | | | |
| 12.00 | 0.53 | | 0.53 | | | | |
| 12.25 | 0.56 | | 0.56 | | | | |
| 12.50 | 0.60 | | 0.60 | | | | |
| 12.75 | 0.63 | | 0.63 | | | | |

## Summary for Reach T: Total

Inflow Area = 100.393 ac, 0.41% Impervious, Inflow Depth > 2.06" for 2-year event
Inflow = 28.55 cfs @ 16.14 hrs, Volume= 17.272 af
Outflow = 28.55 cfs @ 16.14 hrs, Volume= 17.272 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## Reach T: Total



## Hydrograph for Reach T: Total

| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 11.53 | | 11.53 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 12.15 | | 12.15 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 12.94 | | 12.94 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 14.13 | | 14.13 |
| 1.00 | 0.00 | | 0.00 | 14.00 | 15.65 | | 15.65 |
| 1.25 | 0.00 | | 0.00 | 14.25 | 17.53 | | 17.53 |
| 1.50 | 0.00 | | 0.00 | 14.50 | 19.69 | | 19.69 |
| 1.75 | 0.00 | | 0.00 | 14.75 | 21.82 | | 21.82 |
| 2.00 | 0.00 | | 0.00 | 15.00 | 23.70 | | 23.70 |
| 2.25 | 0.00 | | 0.00 | 15.25 | 25.34 | | 25.34 |
| 2.50 | 0.00 | | 0.00 | 15.50 | 26.72 | | 26.72 |
| 2.75 | 0.00 | | 0.00 | 15.75 | 27.89 | | 27.89 |
| 3.00 | 0.00 | | 0.00 | 16.00 | **28.49** | | **28.49** |
| 3.25 | 0.00 | | 0.00 | 16.25 | **28.46** | | **28.46** |
| 3.50 | 0.00 | | 0.00 | 16.50 | 27.95 | | 27.95 |
| 3.75 | 0.00 | | 0.00 | 16.75 | 26.96 | | 26.96 |
| 4.00 | 0.00 | | 0.00 | 17.00 | 25.62 | | 25.62 |
| 4.25 | 0.04 | | 0.04 | 17.25 | 24.18 | | 24.18 |
| 4.50 | 0.14 | | 0.14 | 17.50 | 22.67 | | 22.67 |
| 4.75 | 0.28 | | 0.28 | 17.75 | 21.15 | | 21.15 |
| 5.00 | 0.46 | | 0.46 | 18.00 | 19.66 | | 19.66 |
| 5.25 | 0.66 | | 0.66 | 18.25 | 18.18 | | 18.18 |
| 5.50 | 0.87 | | 0.87 | 18.50 | 16.81 | | 16.81 |
| 5.75 | 1.07 | | 1.07 | 18.75 | 15.55 | | 15.55 |
| 6.00 | 1.28 | | 1.28 | 19.00 | 14.36 | | 14.36 |
| 6.25 | 1.48 | | 1.48 | 19.25 | 13.22 | | 13.22 |
| 6.50 | 1.72 | | 1.72 | 19.50 | 12.20 | | 12.20 |
| 6.75 | 1.98 | | 1.98 | 19.75 | 11.30 | | 11.30 |
| 7.00 | 2.29 | | 2.29 | 20.00 | 10.50 | | 10.50 |
| 7.25 | 2.63 | | 2.63 | 20.25 | 9.81 | | 9.81 |
| 7.50 | 2.98 | | 2.98 | 20.50 | 9.19 | | 9.19 |
| 7.75 | 3.32 | | 3.32 | 20.75 | 8.68 | | 8.68 |
| 8.00 | 3.64 | | 3.64 | 21.00 | 8.32 | | 8.32 |
| 8.25 | 3.93 | | 3.93 | 21.25 | 8.06 | | 8.06 |
| 8.50 | 4.20 | | 4.20 | 21.50 | 7.89 | | 7.89 |
| 8.75 | 4.44 | | 4.44 | 21.75 | 7.80 | | 7.80 |
| 9.00 | 4.67 | | 4.67 | 22.00 | 7.65 | | 7.65 |
| 9.25 | 4.88 | | 4.88 | 22.25 | 7.41 | | 7.41 |
| 9.50 | 5.08 | | 5.08 | 22.50 | 7.10 | | 7.10 |
| 9.75 | 5.28 | | 5.28 | 22.75 | 6.71 | | 6.71 |
| 10.00 | 5.52 | | 5.52 | 23.00 | 6.29 | | 6.29 |
| 10.25 | 5.81 | | 5.81 | 23.25 | 6.05 | | 6.05 |
| 10.50 | 6.17 | | 6.17 | 23.50 | 6.01 | | 6.01 |
| 10.75 | 6.59 | | 6.59 | 23.75 | 6.13 | | 6.13 |
| 11.00 | 7.04 | | 7.04 | 24.00 | 6.42 | | 6.42 |
| 11.25 | 7.53 | | 7.53 | | | | |
| 11.50 | 8.06 | | 8.06 | | | | |
| 11.75 | 8.59 | | 8.59 | | | | |
| 12.00 | 9.15 | | 9.15 | | | | |
| 12.25 | 9.73 | | 9.73 | | | | |
| 12.50 | 10.31 | | 10.31 | | | | |
| 12.75 | 10.91 | | 10.91 | | | | |

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment1-D: EX DA 1** Runoff Area=0.010 ac 100.00% Impervious Runoff Depth>8.31"
Flow Length=434' Tc=7.8 min CN=98 Runoff=0.01 cfs 0.007 af

**Subcatchment1-U: EX DA 1** Runoff Area=5.582 ac 1.54% Impervious Runoff Depth>6.87"
Flow Length=434' Tc=7.8 min CN=86 Runoff=4.98 cfs 3.193 af

**Subcatchment2-U: EX DA 2** Runoff Area=62.508 ac 0.50% Impervious Runoff Depth>6.94"
Flow Length=3,366' Tc=67.7 min CN=88 Runoff=54.18 cfs 36.153 af

**Subcatchment3-U: EX DA 3** Runoff Area=20.755 ac 0.00% Impervious Runoff Depth>7.07"
Flow Length=1,132' Tc=20.3 min CN=88 Runoff=18.65 cfs 12.224 af

**Subcatchment4-U: EX DA 4** Runoff Area=11.538 ac 0.00% Impervious Runoff Depth>7.04"
Flow Length=1,707' Tc=28.4 min CN=88 Runoff=10.32 cfs 6.773 af

**Reach 1-T: EX DA 1 TOTAL** Inflow=4.99 cfs 3.200 af
Outflow=4.99 cfs 3.200 af

**Reach T: Total** Inflow=86.46 cfs 58.350 af
Outflow=86.46 cfs 58.350 af

**Total Runoff Area = 100.393 ac Runoff Volume = 58.350 af Average Runoff Depth = 6.97"**
**99.59% Pervious = 99.984 ac 0.41% Impervious = 0.409 ac**

## Summary for Subcatchment 1-D: EX DA 1

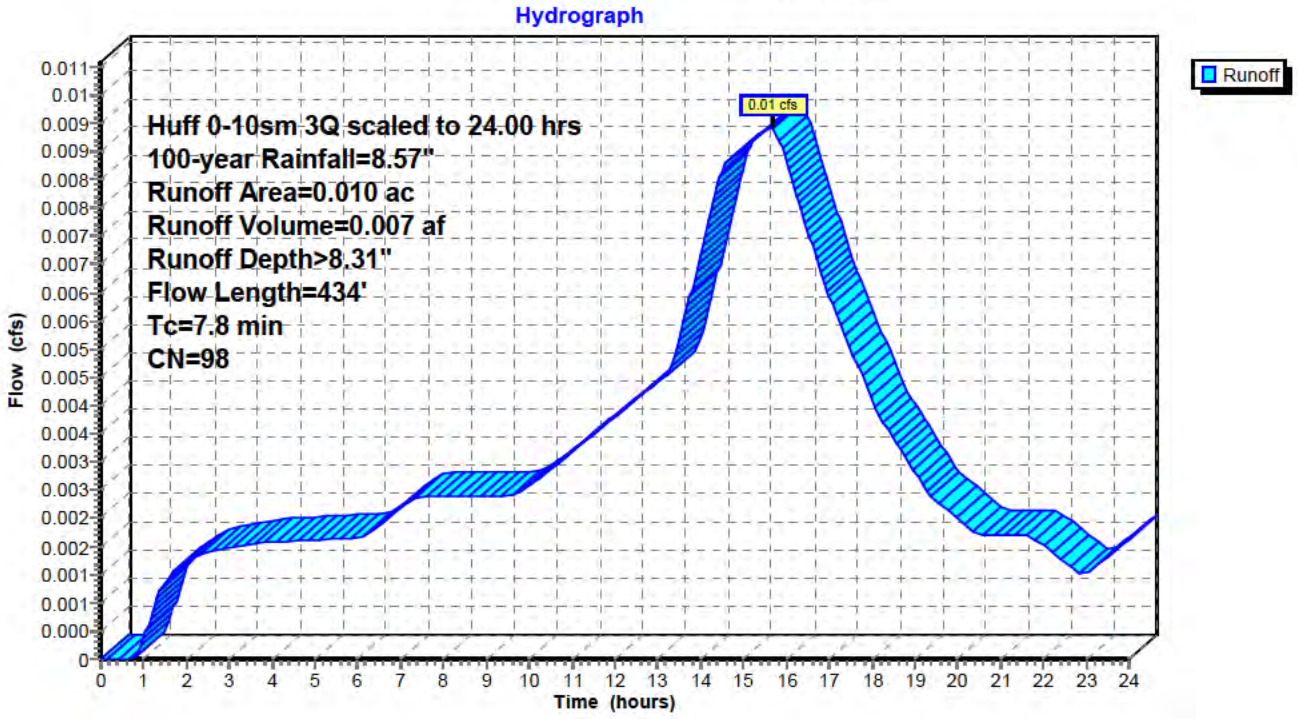
Runoff = 0.01 cfs @ 15.67 hrs, Volume= 0.007 af, Depth> 8.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.010 | 98 | Impervious Area |
| | 0.010 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.0 | 100 | 0.0282 | 0.42 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 3.8 | 334 | 0.0264 | 1.46 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 7.8 | 434 | Total | | | |

## Subcatchment 1-D: EX DA 1



## Hydrograph for Subcatchment 1-D: EX DA 1

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 3.51 | 3.28 | 0.00 |
| 0.25 | 0.01 | 0.00 | 0.00 | 13.25 | 3.64 | 3.40 | 0.01 |
| 0.50 | 0.02 | 0.00 | 0.00 | 13.50 | 3.78 | 3.54 | 0.01 |
| 0.75 | 0.05 | 0.00 | 0.00 | 13.75 | 3.94 | 3.70 | 0.01 |
| 1.00 | 0.09 | 0.01 | 0.00 | 14.00 | 4.11 | 3.88 | 0.01 |
| 1.25 | 0.14 | 0.03 | 0.00 | 14.25 | 4.31 | 4.07 | 0.01 |
| 1.50 | 0.20 | 0.07 | 0.00 | 14.50 | 4.52 | 4.29 | 0.01 |
| 1.75 | 0.25 | 0.11 | 0.00 | 14.75 | 4.75 | 4.51 | 0.01 |
| 2.00 | 0.30 | 0.15 | 0.00 | 15.00 | 4.97 | 4.73 | 0.01 |
| 2.25 | 0.36 | 0.19 | 0.00 | 15.25 | 5.20 | 4.96 | 0.01 |
| 2.50 | 0.41 | 0.24 | 0.00 | 15.50 | 5.43 | 5.19 | **0.01** |
| 2.75 | 0.47 | 0.29 | 0.00 | 15.75 | 5.66 | 5.43 | **0.01** |
| 3.00 | 0.52 | 0.34 | 0.00 | 16.00 | 5.88 | 5.64 | 0.01 |
| 3.25 | 0.58 | 0.39 | 0.00 | 16.25 | 6.09 | 5.85 | 0.01 |
| 3.50 | 0.63 | 0.44 | 0.00 | 16.50 | 6.28 | 6.04 | 0.01 |
| 3.75 | 0.69 | 0.49 | 0.00 | 16.75 | 6.45 | 6.21 | 0.01 |
| 4.00 | 0.74 | 0.54 | 0.00 | 17.00 | 6.61 | 6.37 | 0.01 |
| 4.25 | 0.79 | 0.59 | 0.00 | 17.25 | 6.76 | 6.52 | 0.01 |
| 4.50 | 0.85 | 0.64 | 0.00 | 17.50 | 6.89 | 6.66 | 0.01 |
| 4.75 | 0.90 | 0.70 | 0.00 | 17.75 | 7.02 | 6.78 | 0.01 |
| 5.00 | 0.96 | 0.75 | 0.00 | 18.00 | 7.13 | 6.90 | 0.00 |
| 5.25 | 1.01 | 0.80 | 0.00 | 18.25 | 7.24 | 7.00 | 0.00 |
| 5.50 | 1.07 | 0.85 | 0.00 | 18.50 | 7.34 | 7.10 | 0.00 |
| 5.75 | 1.12 | 0.91 | 0.00 | 18.75 | 7.43 | 7.19 | 0.00 |
| 6.00 | 1.17 | 0.96 | 0.00 | 19.00 | 7.51 | 7.27 | 0.00 |
| 6.25 | 1.23 | 1.02 | 0.00 | 19.25 | 7.58 | 7.34 | 0.00 |
| 6.50 | 1.29 | 1.07 | 0.00 | 19.50 | 7.65 | 7.41 | 0.00 |
| 6.75 | 1.35 | 1.14 | 0.00 | 19.75 | 7.72 | 7.48 | 0.00 |
| 7.00 | 1.42 | 1.20 | 0.00 | 20.00 | 7.78 | 7.54 | 0.00 |
| 7.25 | 1.49 | 1.27 | 0.00 | 20.25 | 7.84 | 7.60 | 0.00 |
| 7.50 | 1.57 | 1.35 | 0.00 | 20.50 | 7.90 | 7.66 | 0.00 |
| 7.75 | 1.64 | 1.42 | 0.00 | 20.75 | 7.95 | 7.71 | 0.00 |
| 8.00 | 1.71 | 1.49 | 0.00 | 21.00 | 8.00 | 7.76 | 0.00 |
| 8.25 | 1.78 | 1.56 | 0.00 | 21.25 | 8.06 | 7.82 | 0.00 |
| 8.50 | 1.86 | 1.63 | 0.00 | 21.50 | 8.11 | 7.87 | 0.00 |
| 8.75 | 1.93 | 1.70 | 0.00 | 21.75 | 8.17 | 7.93 | 0.00 |
| 9.00 | 2.00 | 1.78 | 0.00 | 22.00 | 8.22 | 7.98 | 0.00 |
| 9.25 | 2.07 | 1.85 | 0.00 | 22.25 | 8.26 | 8.02 | 0.00 |
| 9.50 | 2.15 | 1.92 | 0.00 | 22.50 | 8.31 | 8.07 | 0.00 |
| 9.75 | 2.22 | 1.99 | 0.00 | 22.75 | 8.35 | 8.11 | 0.00 |
| 10.00 | 2.30 | 2.07 | 0.00 | 23.00 | 8.38 | 8.14 | 0.00 |
| 10.25 | 2.38 | 2.15 | 0.00 | 23.25 | 8.42 | 8.18 | 0.00 |
| 10.50 | 2.46 | 2.23 | 0.00 | 23.50 | 8.47 | 8.23 | 0.00 |
| 10.75 | 2.55 | 2.32 | 0.00 | 23.75 | 8.52 | 8.28 | 0.00 |
| 11.00 | 2.64 | 2.41 | 0.00 | 24.00 | **8.57** | **8.33** | 0.00 |
| 11.25 | 2.74 | 2.51 | 0.00 | | | | |
| 11.50 | 2.84 | 2.60 | 0.00 | | | | |
| 11.75 | 2.94 | 2.71 | 0.00 | | | | |
| 12.00 | 3.05 | 2.81 | 0.00 | | | | |
| 12.25 | 3.16 | 2.92 | 0.00 | | | | |
| 12.50 | 3.27 | 3.04 | 0.00 | | | | |
| 12.75 | 3.39 | 3.16 | 0.00 | | | | |

## Summary for Subcatchment 1-U: EX DA 1

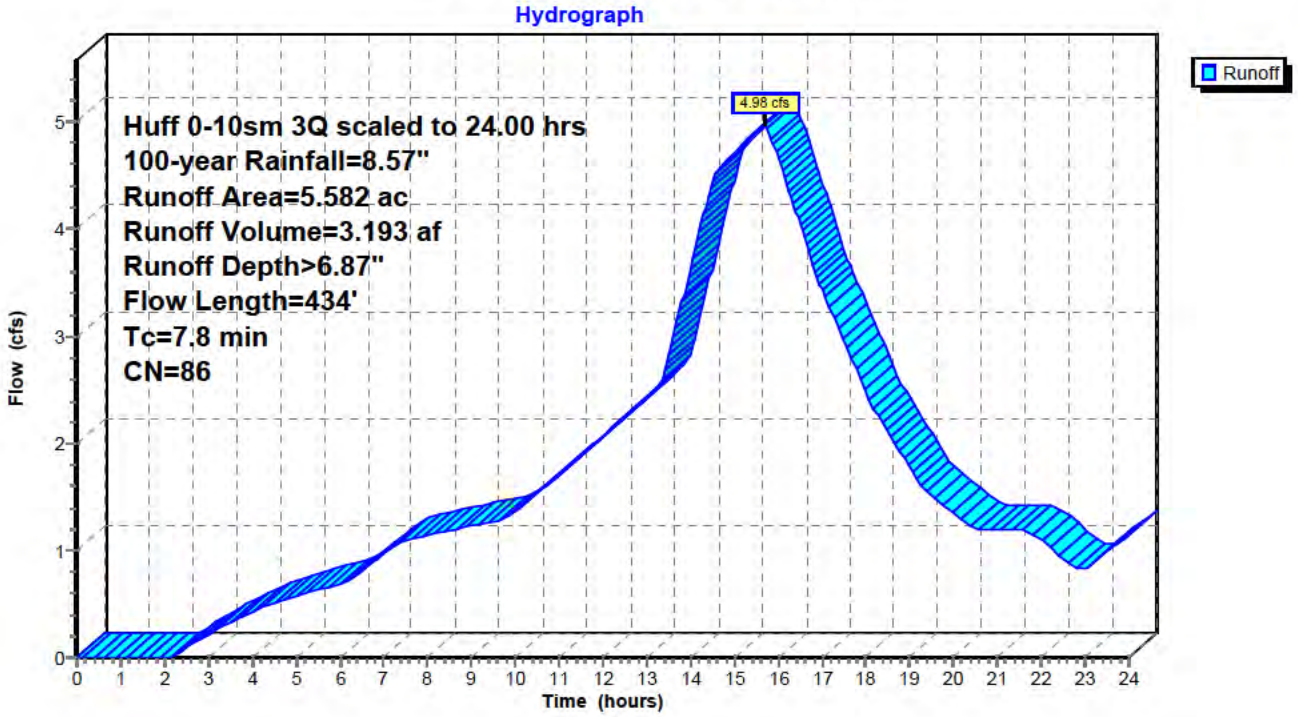
Runoff = 4.98 cfs @ 15.68 hrs, Volume= 3.193 af, Depth> 6.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 0.200 | 89 | Row crops, straight row, Good, HSG D |
| | 1.277 | 89 | Row crops, straight row, Good, HSG D |
| | 0.327 | 89 | Row crops, straight row, Good, HSG D |
| | 2.982 | 85 | Row crops, straight row, Good, HSG C |
| | 0.710 | 85 | Row crops, straight row, Good, HSG C |
| * | 0.086 | 98 | Impervious Area |
| | 5.582 | 86 | Weighted Average |
| | 5.496 | | 98.46% Pervious Area |
| | 0.086 | | 1.54% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.0 | 100 | 0.0282 | 0.42 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 3.8 | 334 | 0.0264 | 1.46 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 7.8 | 434 | Total | | | |

## Subcatchment 1-U: EX DA 1



## Hydrograph for Subcatchment 1-U: EX DA 1

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 3.51 | 2.11 | 2.43 |
| 0.25 | 0.01 | 0.00 | 0.00 | 13.25 | 3.64 | 2.22 | 2.52 |
| 0.50 | 0.02 | 0.00 | 0.00 | 13.50 | 3.78 | 2.34 | 2.83 |
| 0.75 | 0.05 | 0.00 | 0.00 | 13.75 | 3.94 | 2.49 | 3.23 |
| 1.00 | 0.09 | 0.00 | 0.00 | 14.00 | 4.11 | 2.65 | 3.64 |
| 1.25 | 0.14 | 0.00 | 0.00 | 14.25 | 4.31 | 2.83 | 4.05 |
| 1.50 | 0.20 | 0.00 | 0.00 | 14.50 | 4.52 | 3.03 | 4.45 |
| 1.75 | 0.25 | 0.00 | 0.00 | 14.75 | 4.75 | 3.23 | 4.60 |
| 2.00 | 0.30 | 0.00 | 0.00 | 15.00 | 4.97 | 3.44 | 4.71 |
| 2.25 | 0.36 | 0.00 | 0.01 | 15.25 | 5.20 | 3.65 | 4.81 |
| 2.50 | 0.41 | 0.00 | 0.09 | 15.50 | 5.43 | 3.87 | **4.91** |
| 2.75 | 0.47 | 0.01 | 0.16 | 15.75 | 5.66 | 4.09 | **4.95** |
| 3.00 | 0.52 | 0.02 | 0.22 | 16.00 | 5.88 | 4.30 | 4.66 |
| 3.25 | 0.58 | 0.03 | 0.28 | 16.25 | 6.09 | 4.49 | 4.36 |
| 3.50 | 0.63 | 0.05 | 0.33 | 16.50 | 6.28 | 4.67 | 4.04 |
| 3.75 | 0.69 | 0.07 | 0.38 | 16.75 | 6.45 | 4.84 | 3.73 |
| 4.00 | 0.74 | 0.08 | 0.43 | 17.00 | 6.61 | 4.99 | 3.44 |
| 4.25 | 0.79 | 0.10 | 0.47 | 17.25 | 6.76 | 5.13 | 3.20 |
| 4.50 | 0.85 | 0.13 | 0.51 | 17.50 | 6.89 | 5.26 | 2.96 |
| 4.75 | 0.90 | 0.15 | 0.54 | 17.75 | 7.02 | 5.38 | 2.72 |
| 5.00 | 0.96 | 0.18 | 0.57 | 18.00 | 7.13 | 5.50 | 2.47 |
| 5.25 | 1.01 | 0.20 | 0.60 | 18.25 | 7.24 | 5.60 | 2.27 |
| 5.50 | 1.07 | 0.23 | 0.63 | 18.50 | 7.34 | 5.69 | 2.11 |
| 5.75 | 1.12 | 0.26 | 0.66 | 18.75 | 7.43 | 5.78 | 1.95 |
| 6.00 | 1.17 | 0.29 | 0.68 | 19.00 | 7.51 | 5.86 | 1.79 |
| 6.25 | 1.23 | 0.32 | 0.73 | 19.25 | 7.58 | 5.93 | 1.62 |
| 6.50 | 1.29 | 0.36 | 0.81 | 19.50 | 7.65 | 6.00 | 1.52 |
| 6.75 | 1.35 | 0.40 | 0.89 | 19.75 | 7.72 | 6.06 | 1.44 |
| 7.00 | 1.42 | 0.44 | 0.97 | 20.00 | 7.78 | 6.12 | 1.36 |
| 7.25 | 1.49 | 0.49 | 1.05 | 20.25 | 7.84 | 6.18 | 1.27 |
| 7.50 | 1.57 | 0.54 | 1.09 | 20.50 | 7.90 | 6.23 | 1.20 |
| 7.75 | 1.64 | 0.59 | 1.12 | 20.75 | 7.95 | 6.28 | 1.19 |
| 8.00 | 1.71 | 0.64 | 1.14 | 21.00 | 8.00 | 6.34 | 1.19 |
| 8.25 | 1.78 | 0.69 | 1.17 | 21.25 | 8.06 | 6.39 | 1.19 |
| 8.50 | 1.86 | 0.74 | 1.19 | 21.50 | 8.11 | 6.44 | 1.19 |
| 8.75 | 1.93 | 0.80 | 1.21 | 21.75 | 8.17 | 6.49 | 1.17 |
| 9.00 | 2.00 | 0.85 | 1.23 | 22.00 | 8.22 | 6.54 | 1.10 |
| 9.25 | 2.07 | 0.91 | 1.24 | 22.25 | 8.26 | 6.59 | 1.01 |
| 9.50 | 2.15 | 0.96 | 1.26 | 22.50 | 8.31 | 6.63 | 0.93 |
| 9.75 | 2.22 | 1.02 | 1.29 | 22.75 | 8.35 | 6.67 | 0.85 |
| 10.00 | 2.30 | 1.08 | 1.37 | 23.00 | 8.38 | 6.70 | 0.82 |
| 10.25 | 2.38 | 1.14 | 1.45 | 23.25 | 8.42 | 6.74 | 0.90 |
| 10.50 | 2.46 | 1.21 | 1.53 | 23.50 | 8.47 | 6.79 | 0.98 |
| 10.75 | 2.55 | 1.28 | 1.62 | 23.75 | 8.52 | 6.83 | 1.07 |
| 11.00 | 2.64 | 1.36 | 1.71 | 24.00 | **8.57** | **6.88** | 1.15 |
| 11.25 | 2.74 | 1.44 | 1.79 | | | | |
| 11.50 | 2.84 | 1.52 | 1.88 | | | | |
| 11.75 | 2.94 | 1.61 | 1.97 | | | | |
| 12.00 | 3.05 | 1.70 | 2.06 | | | | |
| 12.25 | 3.16 | 1.80 | 2.15 | | | | |
| 12.50 | 3.27 | 1.90 | 2.24 | | | | |
| 12.75 | 3.39 | 2.00 | 2.33 | | | | |

## Summary for Subcatchment 2-U: EX DA 2

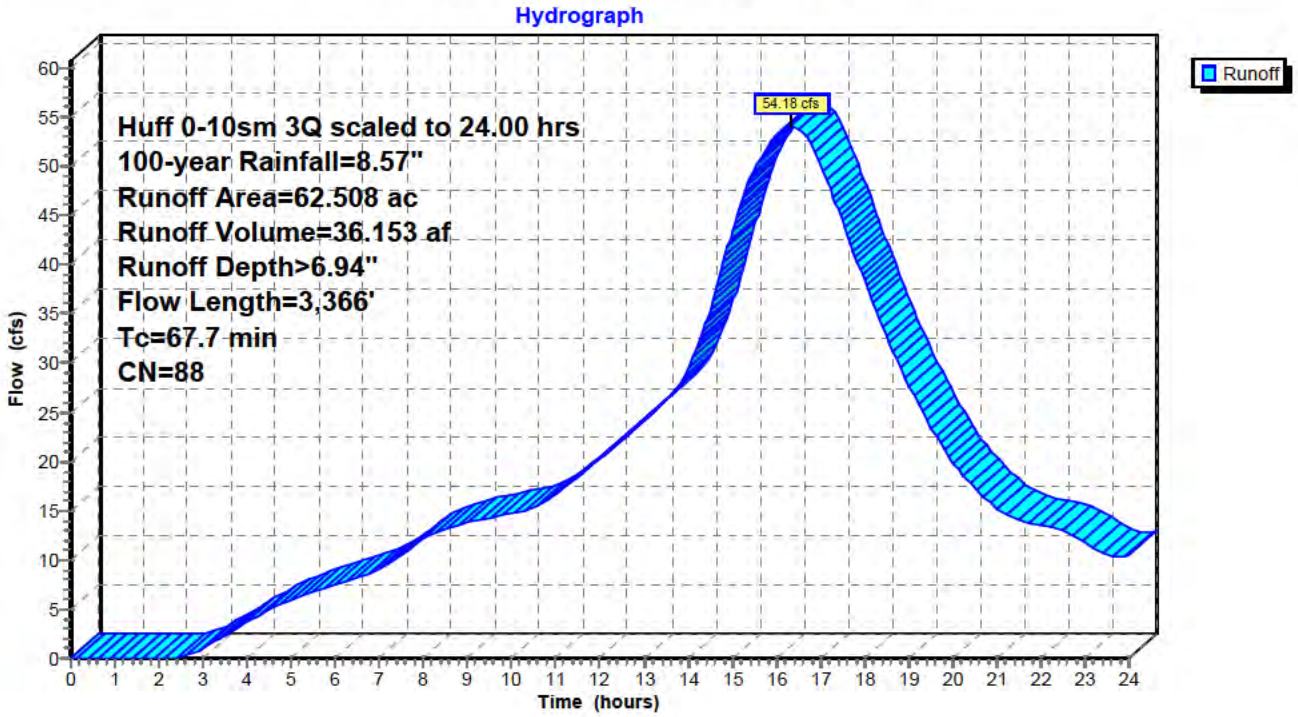
Runoff = 54.18 cfs @ 16.33 hrs, Volume= 36.153 af, Depth> 6.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 11.150 | 89 | Row crops, straight row, Good, HSG D |
| | 2.052 | 89 | Row crops, straight row, Good, HSG D |
| | 0.061 | 89 | Row crops, straight row, Good, HSG D |
| | 11.220 | 89 | Row crops, straight row, Good, HSG D |
| | 8.588 | 89 | Row crops, straight row, Good, HSG D |
| | 10.020 | 89 | Row crops, straight row, Good, HSG D |
| | 14.950 | 85 | Row crops, straight row, Good, HSG C |
| | 2.184 | 85 | Row crops, straight row, Good, HSG C |
| | 0.951 | 85 | Row crops, straight row, Good, HSG C |
| | 1.019 | 85 | Row crops, straight row, Good, HSG C |
| * | 0.313 | 98 | Impervious Area |
| | 62.508 | 88 | Weighted Average |
| | 62.195 | | 99.50% Pervious Area |
| | 0.313 | | 0.50% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.4 | 100 | 0.0421 | 0.49 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 1.5 | 141 | 0.0306 | 1.57 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 62.8 | 3,125 | 0.0085 | 0.83 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 67.7 | 3,366 | Total | | | |

## Subcatchment 2-U: EX DA 2



## Hydrograph for Subcatchment 2-U: EX DA 2

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 0.25 | 0.01 | 0.00 | 0.00 |
| 0.50 | 0.02 | 0.00 | 0.00 |
| 0.75 | 0.05 | 0.00 | 0.00 |
| 1.00 | 0.09 | 0.00 | 0.00 |
| 1.25 | 0.14 | 0.00 | 0.00 |
| 1.50 | 0.20 | 0.00 | 0.00 |
| 1.75 | 0.25 | 0.00 | 0.00 |
| 2.00 | 0.30 | 0.00 | 0.00 |
| 2.25 | 0.36 | 0.01 | 0.02 |
| 2.50 | 0.41 | 0.01 | 0.13 |
| 2.75 | 0.47 | 0.02 | 0.45 |
| 3.00 | 0.52 | 0.04 | 0.98 |
| 3.25 | 0.58 | 0.06 | 1.64 |
| 3.50 | 0.63 | 0.07 | 2.34 |
| 3.75 | 0.69 | 0.10 | 3.04 |
| 4.00 | 0.74 | 0.12 | 3.71 |
| 4.25 | 0.79 | 0.14 | 4.33 |
| 4.50 | 0.85 | 0.17 | 4.90 |
| 4.75 | 0.90 | 0.20 | 5.44 |
| 5.00 | 0.96 | 0.23 | 5.92 |
| 5.25 | 1.01 | 0.26 | 6.37 |
| 5.50 | 1.07 | 0.29 | 6.79 |
| 5.75 | 1.12 | 0.32 | 7.16 |
| 6.00 | 1.17 | 0.36 | 7.51 |
| 6.25 | 1.23 | 0.40 | 7.84 |
| 6.50 | 1.29 | 0.44 | 8.16 |
| 6.75 | 1.35 | 0.48 | 8.55 |
| 7.00 | 1.42 | 0.53 | 9.09 |
| 7.25 | 1.49 | 0.58 | 9.75 |
| 7.50 | 1.57 | 0.63 | 10.52 |
| 7.75 | 1.64 | 0.68 | 11.34 |
| 8.00 | 1.71 | 0.74 | 12.07 |
| 8.25 | 1.78 | 0.79 | 12.66 |
| 8.50 | 1.86 | 0.85 | 13.13 |
| 8.75 | 1.93 | 0.91 | 13.48 |
| 9.00 | 2.00 | 0.97 | 13.78 |
| 9.25 | 2.07 | 1.02 | 14.05 |
| 9.50 | 2.15 | 1.08 | 14.27 |
| 9.75 | 2.22 | 1.14 | 14.47 |
| 10.00 | 2.30 | 1.21 | 14.68 |
| 10.25 | 2.38 | 1.28 | 14.93 |
| 10.50 | 2.46 | 1.35 | 15.35 |
| 10.75 | 2.55 | 1.42 | 15.96 |
| 11.00 | 2.64 | 1.50 | 16.69 |
| 11.25 | 2.74 | 1.59 | 17.53 |
| 11.50 | 2.84 | 1.67 | 18.44 |
| 11.75 | 2.94 | 1.76 | 19.35 |
| 12.00 | 3.05 | 1.86 | 20.32 |
| 12.25 | 3.16 | 1.96 | 21.30 |
| 12.50 | 3.27 | 2.06 | 22.26 |
| 12.75 | 3.39 | 2.17 | 23.26 |
| 13.00 | 3.51 | 2.28 | 24.27 |
| 13.25 | 3.64 | 2.39 | 25.26 |
| 13.50 | 3.78 | 2.52 | 26.29 |
| 13.75 | 3.94 | 2.67 | 27.53 |
| 14.00 | 4.11 | 2.83 | 29.33 |
| 14.25 | 4.31 | 3.02 | 32.03 |
| 14.50 | 4.52 | 3.22 | 35.48 |
| 14.75 | 4.75 | 3.43 | 39.37 |
| 15.00 | 4.97 | 3.64 | 43.35 |
| 15.25 | 5.20 | 3.86 | 46.83 |
| 15.50 | 5.43 | 4.08 | 49.50 |
| 15.75 | 5.66 | 4.30 | 51.61 |
| 16.00 | 5.88 | 4.51 | 53.21 |
| 16.25 | 6.09 | 4.71 | **54.07** |
| 16.50 | 6.28 | 4.89 | **53.91** |
| 16.75 | 6.45 | 5.06 | 52.53 |
| 17.00 | 6.61 | 5.21 | 50.21 |
| 17.25 | 6.76 | 5.36 | 47.44 |
| 17.50 | 6.89 | 5.49 | 44.40 |
| 17.75 | 7.02 | 5.61 | 41.35 |
| 18.00 | 7.13 | 5.72 | 38.45 |
| 18.25 | 7.24 | 5.83 | 35.59 |
| 18.50 | 7.34 | 5.92 | 32.80 |
| 18.75 | 7.43 | 6.01 | 30.21 |
| 19.00 | 7.51 | 6.09 | 27.81 |
| 19.25 | 7.58 | 6.16 | 25.61 |
| 19.50 | 7.65 | 6.23 | 23.61 |
| 19.75 | 7.72 | 6.29 | 21.70 |
| 20.00 | 7.78 | 6.36 | 19.99 |
| 20.25 | 7.84 | 6.41 | 18.56 |
| 20.50 | 7.90 | 6.47 | 17.31 |
| 20.75 | 7.95 | 6.52 | 16.20 |
| 21.00 | 8.00 | 6.57 | 15.27 |
| 21.25 | 8.06 | 6.63 | 14.54 |
| 21.50 | 8.11 | 6.68 | 14.05 |
| 21.75 | 8.17 | 6.73 | 13.78 |
| 22.00 | 8.22 | 6.78 | 13.60 |
| 22.25 | 8.26 | 6.83 | 13.39 |
| 22.50 | 8.31 | 6.87 | 13.06 |
| 22.75 | 8.35 | 6.91 | 12.50 |
| 23.00 | 8.38 | 6.94 | 11.79 |
| 23.25 | 8.42 | 6.98 | 11.05 |
| 23.50 | 8.47 | 7.03 | 10.47 |
| 23.75 | 8.52 | 7.07 | 10.27 |
| 24.00 | **8.57** | **7.13** | 10.50 |

## Summary for Subcatchment 3-U: EX DA 3

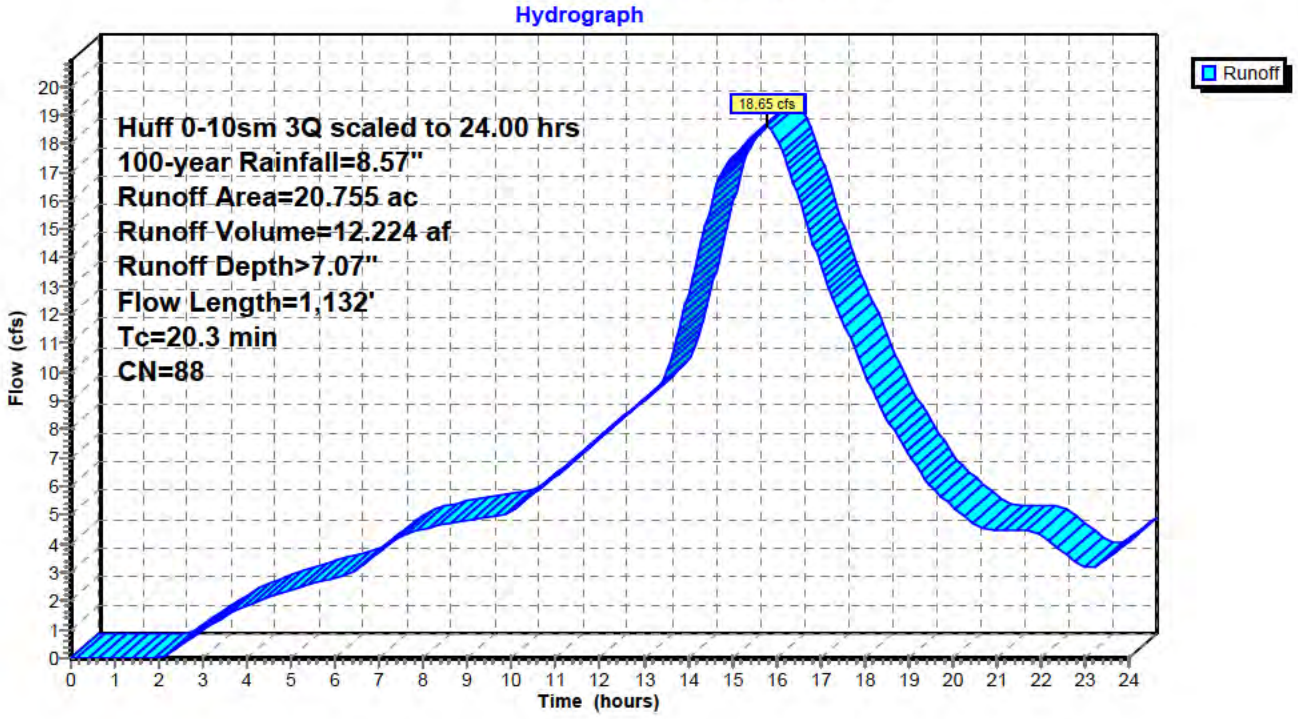
Runoff = 18.65 cfs @ 15.80 hrs, Volume= 12.224 af, Depth> 7.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

| Area (ac) | CN | Description |
|---|---|---|
| 3.643 | 89 | Row crops, straight row, Good, HSG D |
| 4.215 | 89 | Row crops, straight row, Good, HSG D |
| 1.296 | 89 | Row crops, straight row, Good, HSG D |
| 5.307 | 89 | Row crops, straight row, Good, HSG D |
| 3.064 | 85 | Row crops, straight row, Good, HSG C |
| 3.230 | 85 | Row crops, straight row, Good, HSG C |
| 20.755 | 88 | Weighted Average |
| 20.755 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.6 | 100 | 0.0203 | 0.36 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 15.7 | 1,032 | 0.0149 | 1.10 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 20.3 | 1,132 | Total | | | |

## Subcatchment 3-U: EX DA 3



## Hydrograph for Subcatchment 3-U: EX DA 3

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 0.25 | 0.01 | 0.00 | 0.00 |
| 0.50 | 0.02 | 0.00 | 0.00 |
| 0.75 | 0.05 | 0.00 | 0.00 |
| 1.00 | 0.09 | 0.00 | 0.00 |
| 1.25 | 0.14 | 0.00 | 0.00 |
| 1.50 | 0.20 | 0.00 | 0.00 |
| 1.75 | 0.25 | 0.00 | 0.00 |
| 2.00 | 0.30 | 0.00 | 0.00 |
| 2.25 | 0.36 | 0.01 | 0.16 |
| 2.50 | 0.41 | 0.01 | 0.45 |
| 2.75 | 0.47 | 0.02 | 0.74 |
| 3.00 | 0.52 | 0.04 | 1.00 |
| 3.25 | 0.58 | 0.06 | 1.24 |
| 3.50 | 0.63 | 0.07 | 1.45 |
| 3.75 | 0.69 | 0.10 | 1.65 |
| 4.00 | 0.74 | 0.12 | 1.82 |
| 4.25 | 0.79 | 0.14 | 1.98 |
| 4.50 | 0.85 | 0.17 | 2.13 |
| 4.75 | 0.90 | 0.20 | 2.27 |
| 5.00 | 0.96 | 0.23 | 2.39 |
| 5.25 | 1.01 | 0.26 | 2.50 |
| 5.50 | 1.07 | 0.29 | 2.61 |
| 5.75 | 1.12 | 0.32 | 2.71 |
| 6.00 | 1.17 | 0.36 | 2.80 |
| 6.25 | 1.23 | 0.40 | 2.90 |
| 6.50 | 1.29 | 0.44 | 3.13 |
| 6.75 | 1.35 | 0.48 | 3.41 |
| 7.00 | 1.42 | 0.53 | 3.71 |
| 7.25 | 1.49 | 0.58 | 4.02 |
| 7.50 | 1.57 | 0.63 | 4.30 |
| 7.75 | 1.64 | 0.68 | 4.44 |
| 8.00 | 1.71 | 0.74 | 4.53 |
| 8.25 | 1.78 | 0.79 | 4.61 |
| 8.50 | 1.86 | 0.85 | 4.68 |
| 8.75 | 1.93 | 0.91 | 4.75 |
| 9.00 | 2.00 | 0.97 | 4.82 |
| 9.25 | 2.07 | 1.02 | 4.87 |
| 9.50 | 2.15 | 1.08 | 4.93 |
| 9.75 | 2.22 | 1.14 | 4.98 |
| 10.00 | 2.30 | 1.21 | 5.15 |
| 10.25 | 2.38 | 1.28 | 5.43 |
| 10.50 | 2.46 | 1.35 | 5.75 |
| 10.75 | 2.55 | 1.42 | 6.06 |
| 11.00 | 2.64 | 1.50 | 6.39 |
| 11.25 | 2.74 | 1.59 | 6.71 |
| 11.50 | 2.84 | 1.67 | 7.04 |
| 11.75 | 2.94 | 1.76 | 7.37 |
| 12.00 | 3.05 | 1.86 | 7.70 |
| 12.25 | 3.16 | 1.96 | 8.03 |
| 12.50 | 3.27 | 2.06 | 8.36 |
| 12.75 | 3.39 | 2.17 | 8.70 |
| 13.00 | 3.51 | 2.28 | 9.04 |
| 13.25 | 3.64 | 2.39 | 9.37 |
| 13.50 | 3.78 | 2.52 | 9.94 |
| 13.75 | 3.94 | 2.67 | 11.20 |
| 14.00 | 4.11 | 2.83 | 12.68 |
| 14.25 | 4.31 | 3.02 | 14.21 |
| 14.50 | 4.52 | 3.22 | 15.76 |
| 14.75 | 4.75 | 3.43 | 16.95 |
| 15.00 | 4.97 | 3.64 | 17.50 |
| 15.25 | 5.20 | 3.86 | 17.91 |
| 15.50 | 5.43 | 4.08 | 18.28 |
| 15.75 | 5.66 | 4.30 | **18.63** |
| 16.00 | 5.88 | 4.51 | **18.30** |
| 16.25 | 6.09 | 4.71 | 17.30 |
| 16.50 | 6.28 | 4.89 | 16.14 |
| 16.75 | 6.45 | 5.06 | 14.96 |
| 17.00 | 6.61 | 5.21 | 13.77 |
| 17.25 | 6.76 | 5.36 | 12.75 |
| 17.50 | 6.89 | 5.49 | 11.82 |
| 17.75 | 7.02 | 5.61 | 10.91 |
| 18.00 | 7.13 | 5.72 | 10.00 |
| 18.25 | 7.24 | 5.83 | 9.12 |
| 18.50 | 7.34 | 5.92 | 8.42 |
| 18.75 | 7.43 | 6.01 | 7.79 |
| 19.00 | 7.51 | 6.09 | 7.18 |
| 19.25 | 7.58 | 6.16 | 6.57 |
| 19.50 | 7.65 | 6.23 | 6.01 |
| 19.75 | 7.72 | 6.29 | 5.64 |
| 20.00 | 7.78 | 6.36 | 5.32 |
| 20.25 | 7.84 | 6.41 | 5.02 |
| 20.50 | 7.90 | 6.47 | 4.71 |
| 20.75 | 7.95 | 6.52 | 4.50 |
| 21.00 | 8.00 | 6.57 | 4.46 |
| 21.25 | 8.06 | 6.63 | 4.45 |
| 21.50 | 8.11 | 6.68 | 4.45 |
| 21.75 | 8.17 | 6.73 | 4.45 |
| 22.00 | 8.22 | 6.78 | 4.31 |
| 22.25 | 8.26 | 6.83 | 4.03 |
| 22.50 | 8.31 | 6.87 | 3.73 |
| 22.75 | 8.35 | 6.91 | 3.42 |
| 23.00 | 8.38 | 6.94 | 3.14 |
| 23.25 | 8.42 | 6.98 | 3.19 |
| 23.50 | 8.47 | 7.03 | 3.46 |
| 23.75 | 8.52 | 7.07 | 3.76 |
| 24.00 | **8.57** | **7.13** | 4.07 |

## Summary for Subcatchment 4-U: EX DA 4

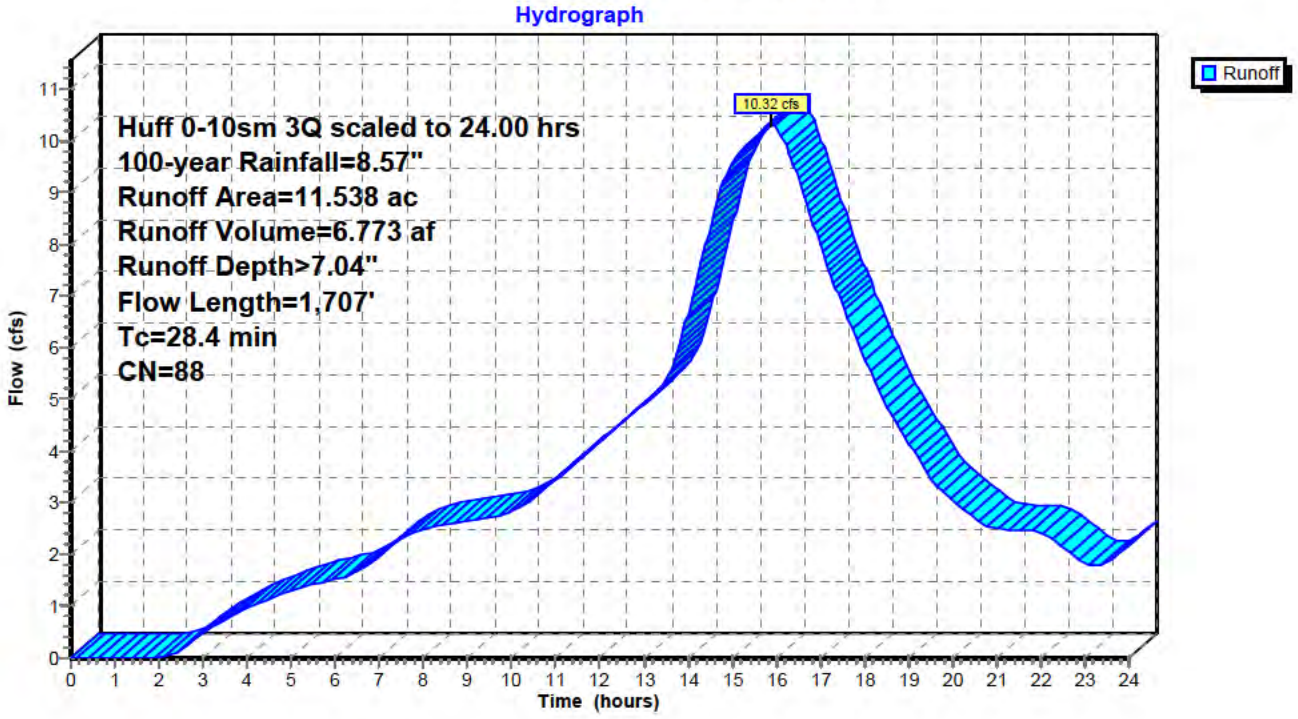
Runoff = 10.32 cfs @ 15.89 hrs, Volume= 6.773 af, Depth> 7.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

| Area (ac) | CN | Description |
|---|---|---|
| 0.430 | 89 | Row crops, straight row, Good, HSG D |
| 4.644 | 89 | Row crops, straight row, Good, HSG D |
| 0.045 | 89 | Row crops, straight row, Good, HSG D |
| 3.216 | 89 | Row crops, straight row, Good, HSG D |
| 0.697 | 85 | Row crops, straight row, Good, HSG C |
| 2.506 | 85 | Row crops, straight row, Good, HSG C |
| 11.538 | 88 | Weighted Average |
| 11.538 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0080 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 21.8 | 1,607 | 0.0187 | 1.23 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 28.4 | 1,707 | Total | | | |

## Subcatchment 4-U: EX DA 4



## Hydrograph for Subcatchment 4-U: EX DA 4

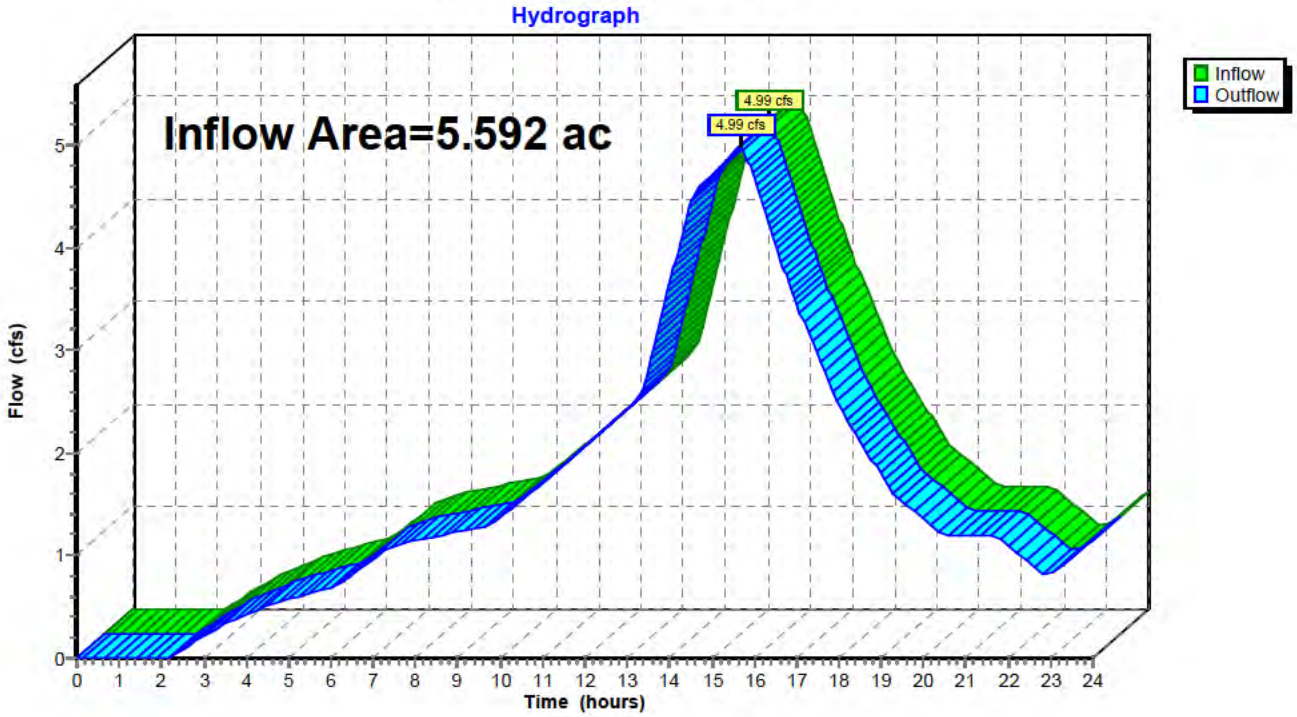
| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 0.25 | 0.01 | 0.00 | 0.00 |
| 0.50 | 0.02 | 0.00 | 0.00 |
| 0.75 | 0.05 | 0.00 | 0.00 |
| 1.00 | 0.09 | 0.00 | 0.00 |
| 1.25 | 0.14 | 0.00 | 0.00 |
| 1.50 | 0.20 | 0.00 | 0.00 |
| 1.75 | 0.25 | 0.00 | 0.00 |
| 2.00 | 0.30 | 0.00 | 0.00 |
| 2.25 | 0.36 | 0.01 | 0.04 |
| 2.50 | 0.41 | 0.01 | 0.17 |
| 2.75 | 0.47 | 0.02 | 0.33 |
| 3.00 | 0.52 | 0.04 | 0.48 |
| 3.25 | 0.58 | 0.06 | 0.62 |
| 3.50 | 0.63 | 0.07 | 0.75 |
| 3.75 | 0.69 | 0.10 | 0.86 |
| 4.00 | 0.74 | 0.12 | 0.96 |
| 4.25 | 0.79 | 0.14 | 1.06 |
| 4.50 | 0.85 | 0.17 | 1.14 |
| 4.75 | 0.90 | 0.20 | 1.22 |
| 5.00 | 0.96 | 0.23 | 1.29 |
| 5.25 | 1.01 | 0.26 | 1.36 |
| 5.50 | 1.07 | 0.29 | 1.42 |
| 5.75 | 1.12 | 0.32 | 1.48 |
| 6.00 | 1.17 | 0.36 | 1.53 |
| 6.25 | 1.23 | 0.40 | 1.58 |
| 6.50 | 1.29 | 0.44 | 1.68 |
| 6.75 | 1.35 | 0.48 | 1.82 |
| 7.00 | 1.42 | 0.53 | 1.98 |
| 7.25 | 1.49 | 0.58 | 2.15 |
| 7.50 | 1.57 | 0.63 | 2.32 |
| 7.75 | 1.64 | 0.68 | 2.42 |
| 8.00 | 1.71 | 0.74 | 2.49 |
| 8.25 | 1.78 | 0.79 | 2.54 |
| 8.50 | 1.86 | 0.85 | 2.58 |
| 8.75 | 1.93 | 0.91 | 2.62 |
| 9.00 | 2.00 | 0.97 | 2.66 |
| 9.25 | 2.07 | 1.02 | 2.69 |
| 9.50 | 2.15 | 1.08 | 2.72 |
| 9.75 | 2.22 | 1.14 | 2.75 |
| 10.00 | 2.30 | 1.21 | 2.82 |
| 10.25 | 2.38 | 1.28 | 2.95 |
| 10.50 | 2.46 | 1.35 | 3.11 |
| 10.75 | 2.55 | 1.42 | 3.28 |
| 11.00 | 2.64 | 1.50 | 3.46 |
| 11.25 | 2.74 | 1.59 | 3.64 |
| 11.50 | 2.84 | 1.67 | 3.82 |
| 11.75 | 2.94 | 1.76 | 4.00 |
| 12.00 | 3.05 | 1.86 | 4.19 |
| 12.25 | 3.16 | 1.96 | 4.37 |
| 12.50 | 3.27 | 2.06 | 4.56 |
| 12.75 | 3.39 | 2.17 | 4.74 |
| 13.00 | 3.51 | 2.28 | 4.93 |
| 13.25 | 3.64 | 2.39 | 5.12 |
| 13.50 | 3.78 | 2.52 | 5.36 |
| 13.75 | 3.94 | 2.67 | 5.89 |
| 14.00 | 4.11 | 2.83 | 6.65 |
| 14.25 | 4.31 | 3.02 | 7.48 |
| 14.50 | 4.52 | 3.22 | 8.33 |
| 14.75 | 4.75 | 3.43 | 9.10 |
| 15.00 | 4.97 | 3.64 | 9.55 |
| 15.25 | 5.20 | 3.86 | 9.83 |
| 15.50 | 5.43 | 4.08 | 10.06 |
| 15.75 | 5.66 | 4.30 | **10.26** |
| 16.00 | 5.88 | 4.51 | **10.27** |
| 16.25 | 6.09 | 4.71 | 9.87 |
| 16.50 | 6.28 | 4.89 | 9.28 |
| 16.75 | 6.45 | 5.06 | 8.64 |
| 17.00 | 6.61 | 5.21 | 7.99 |
| 17.25 | 6.76 | 5.36 | 7.37 |
| 17.50 | 6.89 | 5.49 | 6.84 |
| 17.75 | 7.02 | 5.61 | 6.32 |
| 18.00 | 7.13 | 5.72 | 5.81 |
| 18.25 | 7.24 | 5.83 | 5.31 |
| 18.50 | 7.34 | 5.92 | 4.88 |
| 18.75 | 7.43 | 6.01 | 4.51 |
| 19.00 | 7.51 | 6.09 | 4.16 |
| 19.25 | 7.58 | 6.16 | 3.82 |
| 19.50 | 7.65 | 6.23 | 3.49 |
| 19.75 | 7.72 | 6.29 | 3.24 |
| 20.00 | 7.78 | 6.36 | 3.05 |
| 20.25 | 7.84 | 6.41 | 2.88 |
| 20.50 | 7.90 | 6.47 | 2.70 |
| 20.75 | 7.95 | 6.52 | 2.56 |
| 21.00 | 8.00 | 6.57 | 2.50 |
| 21.25 | 8.06 | 6.63 | 2.48 |
| 21.50 | 8.11 | 6.68 | 2.48 |
| 21.75 | 8.17 | 6.73 | 2.47 |
| 22.00 | 8.22 | 6.78 | 2.44 |
| 22.25 | 8.26 | 6.83 | 2.31 |
| 22.50 | 8.31 | 6.87 | 2.16 |
| 22.75 | 8.35 | 6.91 | 1.99 |
| 23.00 | 8.38 | 6.94 | 1.82 |
| 23.25 | 8.42 | 6.98 | 1.76 |
| 23.50 | 8.47 | 7.03 | 1.86 |
| 23.75 | 8.52 | 7.07 | 2.01 |
| 24.00 | **8.57** | **7.13** | 2.18 |

## Summary for Reach 1-T: EX DA 1 TOTAL

Inflow Area = 5.592 ac, 1.72% Impervious, Inflow Depth > 6.87" for 100-year event
Inflow = 4.99 cfs @ 15.68 hrs, Volume= 3.200 af
Outflow = 4.99 cfs @ 15.68 hrs, Volume= 3.200 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## Reach 1-T: EX DA 1 TOTAL



## Hydrograph for Reach 1-T: EX DA 1 TOTAL

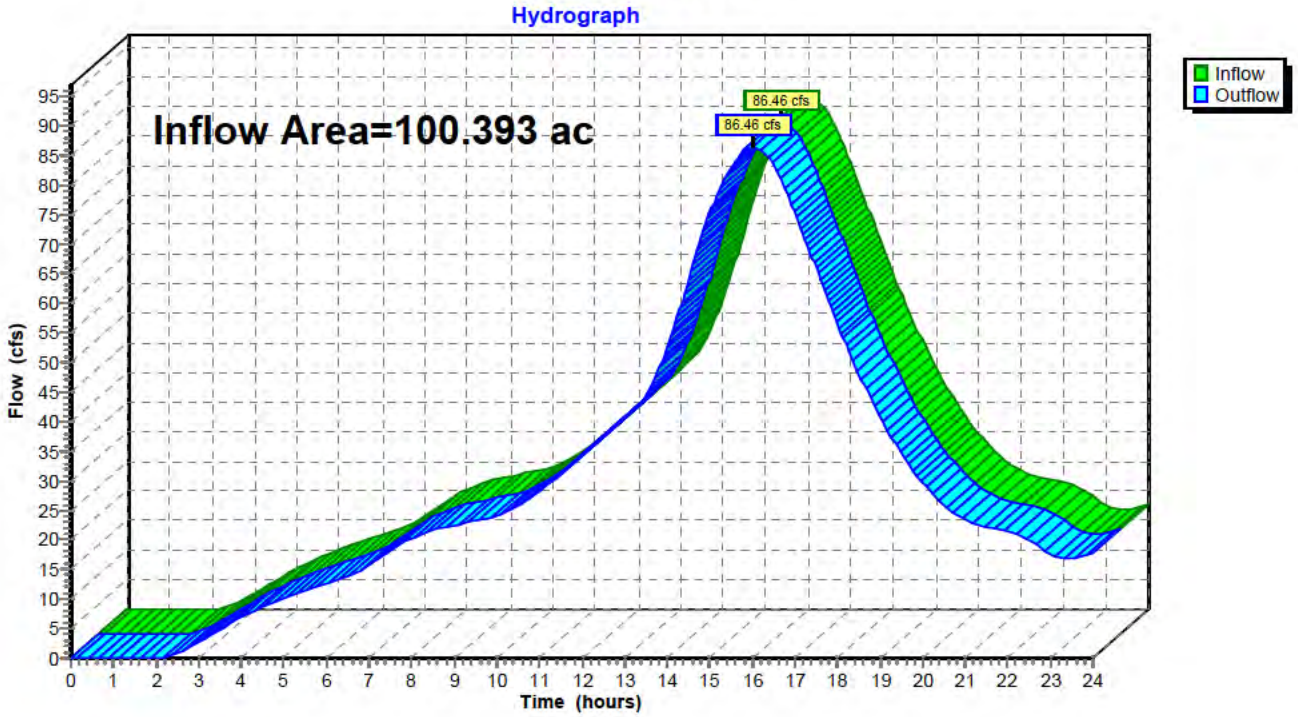
| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 2.43 | | 2.43 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 2.52 | | 2.52 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 2.83 | | 2.83 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 3.24 | | 3.24 |
| 1.00 | 0.00 | | 0.00 | 14.00 | 3.64 | | 3.64 |
| 1.25 | 0.00 | | 0.00 | 14.25 | 4.06 | | 4.06 |
| 1.50 | 0.00 | | 0.00 | 14.50 | 4.46 | | 4.46 |
| 1.75 | 0.00 | | 0.00 | 14.75 | 4.61 | | 4.61 |
| 2.00 | 0.00 | | 0.00 | 15.00 | 4.72 | | 4.72 |
| 2.25 | 0.02 | | 0.02 | 15.25 | 4.82 | | 4.82 |
| 2.50 | 0.09 | | 0.09 | 15.50 | **4.92** | | **4.92** |
| 2.75 | 0.16 | | 0.16 | 15.75 | **4.96** | | **4.96** |
| 3.00 | 0.22 | | 0.22 | 16.00 | 4.67 | | 4.67 |
| 3.25 | 0.28 | | 0.28 | 16.25 | 4.36 | | 4.36 |
| 3.50 | 0.33 | | 0.33 | 16.50 | 4.05 | | 4.05 |
| 3.75 | 0.38 | | 0.38 | 16.75 | 3.74 | | 3.74 |
| 4.00 | 0.43 | | 0.43 | 17.00 | 3.44 | | 3.44 |
| 4.25 | 0.47 | | 0.47 | 17.25 | 3.20 | | 3.20 |
| 4.50 | 0.51 | | 0.51 | 17.50 | 2.96 | | 2.96 |
| 4.75 | 0.54 | | 0.54 | 17.75 | 2.72 | | 2.72 |
| 5.00 | 0.58 | | 0.58 | 18.00 | 2.48 | | 2.48 |
| 5.25 | 0.61 | | 0.61 | 18.25 | 2.28 | | 2.28 |
| 5.50 | 0.63 | | 0.63 | 18.50 | 2.12 | | 2.12 |
| 5.75 | 0.66 | | 0.66 | 18.75 | 1.95 | | 1.95 |
| 6.00 | 0.69 | | 0.69 | 19.00 | 1.79 | | 1.79 |
| 6.25 | 0.74 | | 0.74 | 19.25 | 1.63 | | 1.63 |
| 6.50 | 0.81 | | 0.81 | 19.50 | 1.52 | | 1.52 |
| 6.75 | 0.89 | | 0.89 | 19.75 | 1.44 | | 1.44 |
| 7.00 | 0.97 | | 0.97 | 20.00 | 1.36 | | 1.36 |
| 7.25 | 1.05 | | 1.05 | 20.25 | 1.28 | | 1.28 |
| 7.50 | 1.10 | | 1.10 | 20.50 | 1.20 | | 1.20 |
| 7.75 | 1.12 | | 1.12 | 20.75 | 1.19 | | 1.19 |
| 8.00 | 1.15 | | 1.15 | 21.00 | 1.19 | | 1.19 |
| 8.25 | 1.17 | | 1.17 | 21.25 | 1.19 | | 1.19 |
| 8.50 | 1.19 | | 1.19 | 21.50 | 1.19 | | 1.19 |
| 8.75 | 1.21 | | 1.21 | 21.75 | 1.18 | | 1.18 |
| 9.00 | 1.23 | | 1.23 | 22.00 | 1.10 | | 1.10 |
| 9.25 | 1.25 | | 1.25 | 22.25 | 1.02 | | 1.02 |
| 9.50 | 1.26 | | 1.26 | 22.50 | 0.93 | | 0.93 |
| 9.75 | 1.29 | | 1.29 | 22.75 | 0.85 | | 0.85 |
| 10.00 | 1.37 | | 1.37 | 23.00 | 0.82 | | 0.82 |
| 10.25 | 1.45 | | 1.45 | 23.25 | 0.90 | | 0.90 |
| 10.50 | 1.54 | | 1.54 | 23.50 | 0.99 | | 0.99 |
| 10.75 | 1.62 | | 1.62 | 23.75 | 1.07 | | 1.07 |
| 11.00 | 1.71 | | 1.71 | 24.00 | 1.15 | | 1.15 |
| 11.25 | 1.80 | | 1.80 | | | | |
| 11.50 | 1.89 | | 1.89 | | | | |
| 11.75 | 1.98 | | 1.98 | | | | |
| 12.00 | 2.07 | | 2.07 | | | | |
| 12.25 | 2.16 | | 2.16 | | | | |
| 12.50 | 2.25 | | 2.25 | | | | |
| 12.75 | 2.34 | | 2.34 | | | | |

## Summary for Reach T: Total

Inflow Area = 100.393 ac, 0.41% Impervious, Inflow Depth > 6.97" for 100-year event
Inflow = 86.46 cfs @ 16.01 hrs, Volume= 58.350 af
Outflow = 86.46 cfs @ 16.01 hrs, Volume= 58.350 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## Reach T: Total



## Hydrograph for Reach T: Total

| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 40.67 | | 40.67 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 42.27 | | 42.27 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 44.42 | | 44.42 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 47.86 | | 47.86 |
| 1.00 | 0.00 | | 0.00 | 14.00 | 52.30 | | 52.30 |
| 1.25 | 0.00 | | 0.00 | 14.25 | 57.78 | | 57.78 |
| 1.50 | 0.00 | | 0.00 | 14.50 | 64.03 | | 64.03 |
| 1.75 | 0.00 | | 0.00 | 14.75 | 70.03 | | 70.03 |
| 2.00 | 0.01 | | 0.01 | 15.00 | 75.12 | | 75.12 |
| 2.25 | 0.23 | | 0.23 | 15.25 | 79.39 | | 79.39 |
| 2.50 | 0.84 | | 0.84 | 15.50 | 82.76 | | 82.76 |
| 2.75 | 1.68 | | 1.68 | 15.75 | 85.46 | | 85.46 |
| 3.00 | 2.68 | | 2.68 | 16.00 | **86.46** | | **86.46** |
| 3.25 | 3.78 | | 3.78 | 16.25 | 85.60 | | 85.60 |
| 3.50 | 4.88 | | 4.88 | 16.50 | 83.39 | | 83.39 |
| 3.75 | 5.93 | | 5.93 | 16.75 | 79.87 | | 79.87 |
| 4.00 | 6.92 | | 6.92 | 17.00 | 75.41 | | 75.41 |
| 4.25 | 7.84 | | 7.84 | 17.25 | 70.76 | | 70.76 |
| 4.50 | 8.69 | | 8.69 | 17.50 | 66.02 | | 66.02 |
| 4.75 | 9.47 | | 9.47 | 17.75 | 61.30 | | 61.30 |
| 5.00 | 10.19 | | 10.19 | 18.00 | 56.75 | | 56.75 |
| 5.25 | 10.84 | | 10.84 | 18.25 | 52.30 | | 52.30 |
| 5.50 | 11.45 | | 11.45 | 18.50 | 48.21 | | 48.21 |
| 5.75 | 12.01 | | 12.01 | 18.75 | 44.47 | | 44.47 |
| 6.00 | 12.52 | | 12.52 | 19.00 | 40.95 | | 40.95 |
| 6.25 | 13.06 | | 13.06 | 19.25 | 37.63 | | 37.63 |
| 6.50 | 13.77 | | 13.77 | 19.50 | 34.64 | | 34.64 |
| 6.75 | 14.67 | | 14.67 | 19.75 | 32.02 | | 32.02 |
| 7.00 | 15.75 | | 15.75 | 20.00 | 29.72 | | 29.72 |
| 7.25 | 16.98 | | 16.98 | 20.25 | 27.73 | | 27.73 |
| 7.50 | 18.23 | | 18.23 | 20.50 | 25.92 | | 25.92 |
| 7.75 | 19.33 | | 19.33 | 20.75 | 24.45 | | 24.45 |
| 8.00 | 20.24 | | 20.24 | 21.00 | 23.41 | | 23.41 |
| 8.25 | 20.98 | | 20.98 | 21.25 | 22.65 | | 22.65 |
| 8.50 | 21.59 | | 21.59 | 21.50 | 22.16 | | 22.16 |
| 8.75 | 22.07 | | 22.07 | 21.75 | 21.88 | | 21.88 |
| 9.00 | 22.49 | | 22.49 | 22.00 | 21.44 | | 21.44 |
| 9.25 | 22.87 | | 22.87 | 22.25 | 20.76 | | 20.76 |
| 9.50 | 23.18 | | 23.18 | 22.50 | 19.87 | | 19.87 |
| 9.75 | 23.50 | | 23.50 | 22.75 | 18.76 | | 18.76 |
| 10.00 | 24.02 | | 24.02 | 23.00 | 17.57 | | 17.57 |
| 10.25 | 24.76 | | 24.76 | 23.25 | 16.91 | | 16.91 |
| 10.50 | 25.74 | | 25.74 | 23.50 | 16.77 | | 16.77 |
| 10.75 | 26.93 | | 26.93 | 23.75 | 17.11 | | 17.11 |
| 11.00 | 28.25 | | 28.25 | 24.00 | 17.90 | | 17.90 |
| 11.25 | 29.68 | | 29.68 | | | | |
| 11.50 | 31.18 | | 31.18 | | | | |
| 11.75 | 32.70 | | 32.70 | | | | |
| 12.00 | 34.27 | | 34.27 | | | | |
| 12.25 | 35.85 | | 35.85 | | | | |
| 12.50 | 37.43 | | 37.43 | | | | |
| 12.75 | 39.04 | | 39.04 | | | | |

# APPENDIX D-2

## HYDROCAD REPORT FOR 2-YEAR & 100-YEARSTORM EVENT

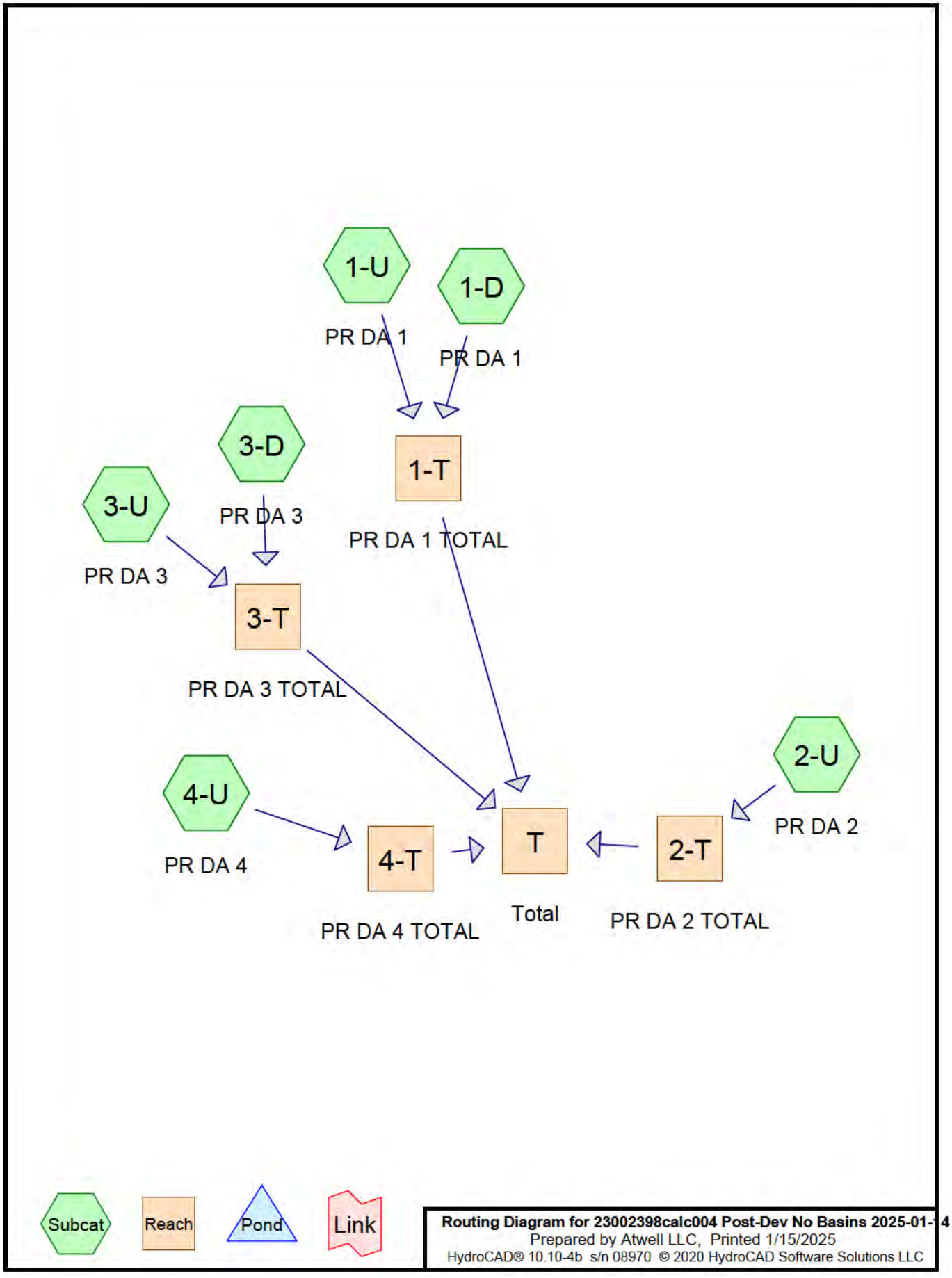
## POST-DEVELOPMENT CONDITION WITHOUT STORMWATER BASINS

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54 Reach T: Total


1-U
1-D
PR DA 1
PR DA 1
3-D
1-T
3-U
PR DA 3
PR DA 1 TOTAL
PR DA 3
3-T
PR DA 3 TOTAL
2-U
4-U
PR DA 2
PR DA 4
4-T
T
2-T
Total
PR DA 4 TOTAL
PR DA 2 TOTAL
Subcat
Reach
Pond
Link
Routing Diagram for 23002398calc004 Post-Dev No Basins 2025-01-14
Prepared by Atwell LLC, Printed 1/15/2025
HydroCAD® 10.10-4b s/n 08970 © 2020 HydroCAD Software Solutions LLC

## Rainfall Events Listing

| Event# | Event Name | Storm Type | Curve | Mode | Duration (hours) | B/B | Depth (inches) | AMC |
|---|---|---|---|---|---|---|---|---|
| 1 | 2-year | Huff 0-10sm | 3Q | Scale | 24.00 | 1 | 3.34 | 2 |
| 2 | 100-year | Huff 0-10sm | 3Q | Scale | 24.00 | 1 | 8.57 | 2 |

## Area Listing (all nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 1.373 | 98 | Impervious Area (1-D, 1-U, 2-U, 3-D) |
| 11.437 | 74 | Pasture/grassland/range, Good, HSG C (1-U, 2-U, 3-U, 4-U) |
| 29.040 | 80 | Pasture/grassland/range, Good, HSG D (1-U, 2-U, 3-U, 4-U) |
| 20.897 | 85 | Row crops, straight row, Good, HSG C (1-U, 2-U, 3-U, 4-U) |
| 37.458 | 89 | Row crops, straight row, Good, HSG D (1-U, 2-U, 3-U, 4-U) |
| **100.205** | **84** | **TOTAL AREA** |

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment1-D: PR DA 1** Runoff Area=0.323 ac 100.00% Impervious Runoff Depth>3.10"
Flow Length=459' Tc=9.8 min CN=98 Runoff=0.12 cfs 0.083 af

**Subcatchment1-U: PR DA 1** Runoff Area=3.806 ac 2.26% Impervious Runoff Depth>1.72"
Flow Length=459' Tc=9.8 min CN=83 Runoff=0.99 cfs 0.544 af

**Subcatchment2-U: PR DA 2** Runoff Area=62.154 ac 0.50% Impervious Runoff Depth>1.88"
Flow Length=3,331' Tc=78.0 min CN=86 Runoff=16.64 cfs 9.755 af

**Subcatchment3-D: PR DA 3** Runoff Area=0.651 ac 100.00% Impervious Runoff Depth>3.09"
Flow Length=1,305' Tc=17.6 min CN=98 Runoff=0.24 cfs 0.167 af

**Subcatchment3-U: PR DA 3** Runoff Area=21.569 ac 0.00% Impervious Runoff Depth>1.56"
Flow Length=1,305' Tc=17.6 min CN=81 Runoff=5.20 cfs 2.811 af

**Subcatchment4-U: PR DA 4** Runoff Area=11.702 ac 0.00% Impervious Runoff Depth>1.41"
Flow Length=1,661' Tc=33.8 min CN=79 Runoff=2.58 cfs 1.378 af

**Reach 1-T: PR DA 1 TOTAL** Inflow=1.11 cfs 0.628 af
Outflow=1.11 cfs 0.628 af

**Reach 2-T: PR DA 2 TOTAL** Inflow=16.64 cfs 9.755 af
Outflow=16.64 cfs 9.755 af

**Reach 3-T: PR DA 3 TOTAL** Inflow=5.44 cfs 2.979 af
Outflow=5.44 cfs 2.979 af

**Reach 4-T: PR DA 4 TOTAL** Inflow=2.58 cfs 1.378 af
Outflow=2.58 cfs 1.378 af

**Reach T: Total** Inflow=24.99 cfs 14.740 af
Outflow=24.99 cfs 14.740 af

**Total Runoff Area = 100.205 ac Runoff Volume = 14.740 af Average Runoff Depth = 1.77"**
**98.63% Pervious = 98.832 ac 1.37% Impervious = 1.373 ac**

## Summary for Subcatchment 1-D: PR DA 1

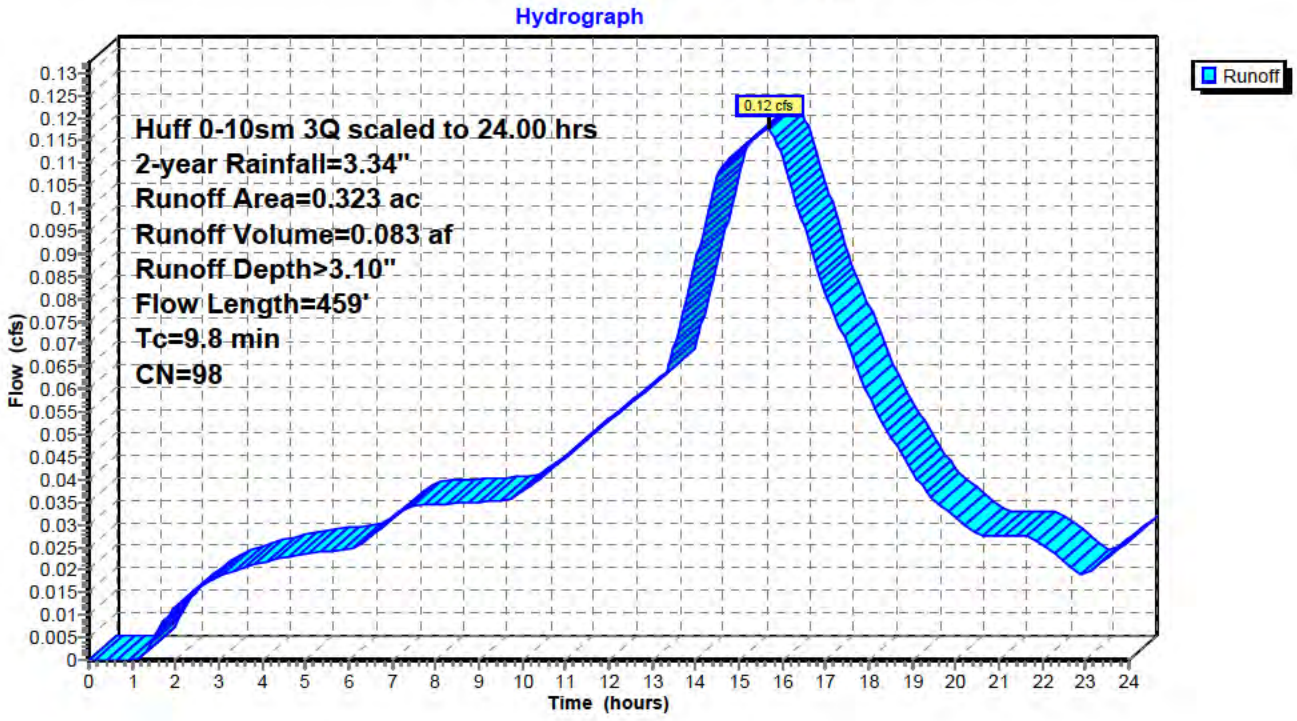
Runoff = 0.12 cfs @ 15.69 hrs, Volume= 0.083 af, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.323 | 98 | Impervious Area |
| | 0.323 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.0 | 100 | 0.0282 | 0.42 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 1.9 | 171 | 0.0290 | 1.53 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 0.2 | 16 | 0.0380 | 1.36 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 3.7 | 172 | 0.0122 | 0.77 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 9.8 | 459 | Total | | | |

## Subcatchment 1-D: PR DA 1



## Hydrograph for Subcatchment 1-D: PR DA 1

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 1.37 | 1.15 | 0.06 |
| 0.25 | 0.00 | 0.00 | 0.00 | 13.25 | 1.42 | 1.20 | 0.06 |
| 0.50 | 0.01 | 0.00 | 0.00 | 13.50 | 1.47 | 1.25 | 0.07 |
| 0.75 | 0.02 | 0.00 | 0.00 | 13.75 | 1.53 | 1.31 | 0.08 |
| 1.00 | 0.04 | 0.00 | 0.00 | 14.00 | 1.60 | 1.38 | 0.09 |
| 1.25 | 0.06 | 0.00 | 0.00 | 14.25 | 1.68 | 1.46 | 0.10 |
| 1.50 | 0.08 | 0.01 | 0.01 | 14.50 | 1.76 | 1.54 | 0.11 |
| 1.75 | 0.10 | 0.01 | 0.01 | 14.75 | 1.85 | 1.63 | 0.11 |
| 2.00 | 0.12 | 0.02 | 0.01 | 15.00 | 1.94 | 1.71 | 0.11 |
| 2.25 | 0.14 | 0.03 | 0.01 | 15.25 | 2.03 | 1.80 | 0.11 |
| 2.50 | 0.16 | 0.04 | 0.02 | 15.50 | 2.12 | 1.89 | **0.12** |
| 2.75 | 0.18 | 0.06 | 0.02 | 15.75 | 2.21 | 1.98 | **0.12** |
| 3.00 | 0.20 | 0.07 | 0.02 | 16.00 | 2.29 | 2.06 | 0.11 |
| 3.25 | 0.22 | 0.09 | 0.02 | 16.25 | 2.37 | 2.14 | 0.10 |
| 3.50 | 0.25 | 0.10 | 0.02 | 16.50 | 2.45 | 2.22 | 0.10 |
| 3.75 | 0.27 | 0.12 | 0.02 | 16.75 | 2.51 | 2.28 | 0.09 |
| 4.00 | 0.29 | 0.14 | 0.02 | 17.00 | 2.58 | 2.35 | 0.08 |
| 4.25 | 0.31 | 0.15 | 0.02 | 17.25 | 2.63 | 2.40 | 0.08 |
| 4.50 | 0.33 | 0.17 | 0.02 | 17.50 | 2.69 | 2.46 | 0.07 |
| 4.75 | 0.35 | 0.19 | 0.02 | 17.75 | 2.74 | 2.51 | 0.06 |
| 5.00 | 0.37 | 0.21 | 0.02 | 18.00 | 2.78 | 2.55 | 0.06 |
| 5.25 | 0.39 | 0.22 | 0.02 | 18.25 | 2.82 | 2.59 | 0.05 |
| 5.50 | 0.42 | 0.24 | 0.02 | 18.50 | 2.86 | 2.63 | 0.05 |
| 5.75 | 0.44 | 0.26 | 0.02 | 18.75 | 2.89 | 2.66 | 0.05 |
| 6.00 | 0.46 | 0.28 | 0.02 | 19.00 | 2.93 | 2.70 | 0.04 |
| 6.25 | 0.48 | 0.30 | 0.03 | 19.25 | 2.96 | 2.72 | 0.04 |
| 6.50 | 0.50 | 0.32 | 0.03 | 19.50 | 2.98 | 2.75 | 0.04 |
| 6.75 | 0.53 | 0.34 | 0.03 | 19.75 | 3.01 | 2.78 | 0.03 |
| 7.00 | 0.55 | 0.37 | 0.03 | 20.00 | 3.03 | 2.80 | 0.03 |
| 7.25 | 0.58 | 0.39 | 0.03 | 20.25 | 3.06 | 2.82 | 0.03 |
| 7.50 | 0.61 | 0.42 | 0.03 | 20.50 | 3.08 | 2.85 | 0.03 |
| 7.75 | 0.64 | 0.45 | 0.03 | 20.75 | 3.10 | 2.87 | 0.03 |
| 8.00 | 0.67 | 0.47 | 0.03 | 21.00 | 3.12 | 2.89 | 0.03 |
| 8.25 | 0.70 | 0.50 | 0.03 | 21.25 | 3.14 | 2.91 | 0.03 |
| 8.50 | 0.72 | 0.53 | 0.03 | 21.50 | 3.16 | 2.93 | 0.03 |
| 8.75 | 0.75 | 0.55 | 0.03 | 21.75 | 3.18 | 2.95 | 0.03 |
| 9.00 | 0.78 | 0.58 | 0.04 | 22.00 | 3.20 | 2.97 | 0.03 |
| 9.25 | 0.81 | 0.61 | 0.04 | 22.25 | 3.22 | 2.99 | 0.02 |
| 9.50 | 0.84 | 0.63 | 0.04 | 22.50 | 3.24 | 3.00 | 0.02 |
| 9.75 | 0.86 | 0.66 | 0.04 | 22.75 | 3.25 | 3.02 | 0.02 |
| 10.00 | 0.89 | 0.69 | 0.04 | 23.00 | 3.27 | 3.03 | 0.02 |
| 10.25 | 0.93 | 0.72 | 0.04 | 23.25 | 3.28 | 3.05 | 0.02 |
| 10.50 | 0.96 | 0.75 | 0.04 | 23.50 | 3.30 | 3.07 | 0.02 |
| 10.75 | 0.99 | 0.78 | 0.04 | 23.75 | 3.32 | 3.09 | 0.02 |
| 11.00 | 1.03 | 0.82 | 0.04 | 24.00 | **3.34** | **3.11** | 0.03 |
| 11.25 | 1.07 | 0.86 | 0.05 | | | | |
| 11.50 | 1.10 | 0.89 | 0.05 | | | | |
| 11.75 | 1.15 | 0.93 | 0.05 | | | | |
| 12.00 | 1.19 | 0.97 | 0.05 | | | | |
| 12.25 | 1.23 | 1.01 | 0.05 | | | | |
| 12.50 | 1.27 | 1.06 | 0.06 | | | | |
| 12.75 | 1.32 | 1.10 | 0.06 | | | | |

## Summary for Subcatchment 1-U: PR DA 1

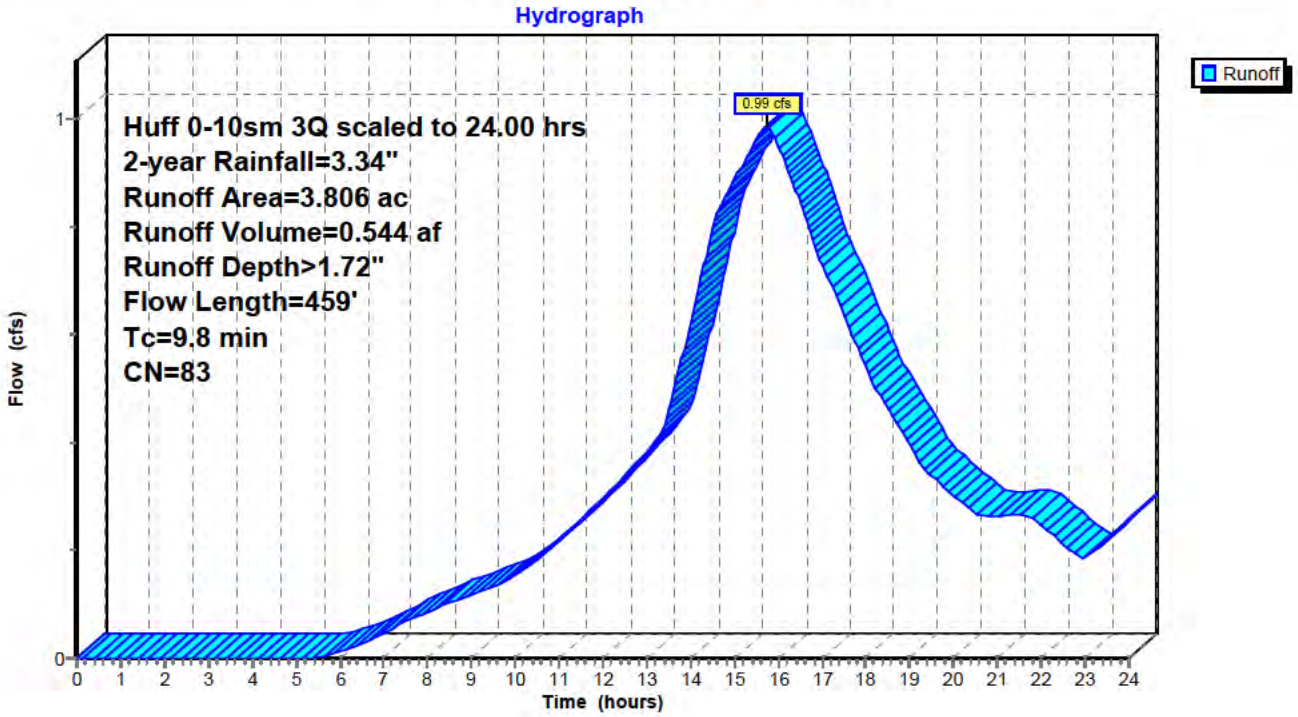
Runoff = 0.99 cfs @ 15.73 hrs, Volume= 0.544 af, Depth> 1.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 0.000 | 89 | Row crops, straight row, Good, HSG D |
| | 0.753 | 89 | Row crops, straight row, Good, HSG D |
| | 0.711 | 80 | Pasture/grassland/range, Good, HSG D |
| | 1.342 | 85 | Row crops, straight row, Good, HSG C |
| | 0.914 | 74 | Pasture/grassland/range, Good, HSG C |
| * | 0.086 | 98 | Impervious Area |
| | 3.806 | 83 | Weighted Average |
| | 3.720 | | 97.74% Pervious Area |
| | 0.086 | | 2.26% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.0 | 100 | 0.0282 | 0.42 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 1.9 | 171 | 0.0290 | 1.53 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 0.2 | 16 | 0.0380 | 1.36 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 3.7 | 172 | 0.0122 | 0.77 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 9.8 | 459 | Total | | | |

## Subcatchment 1-U: PR DA 1



## Hydrograph for Subcatchment 1-U: PR DA 1

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 1.37 | 0.31 | 0.38 |
| 0.25 | 0.00 | 0.00 | 0.00 | 13.25 | 1.42 | 0.33 | 0.41 |
| 0.50 | 0.01 | 0.00 | 0.00 | 13.50 | 1.47 | 0.36 | 0.46 |
| 0.75 | 0.02 | 0.00 | 0.00 | 13.75 | 1.53 | 0.40 | 0.54 |
| 1.00 | 0.04 | 0.00 | 0.00 | 14.00 | 1.60 | 0.44 | 0.62 |
| 1.25 | 0.06 | 0.00 | 0.00 | 14.25 | 1.68 | 0.49 | 0.71 |
| 1.50 | 0.08 | 0.00 | 0.00 | 14.50 | 1.76 | 0.54 | 0.80 |
| 1.75 | 0.10 | 0.00 | 0.00 | 14.75 | 1.85 | 0.59 | 0.85 |
| 2.00 | 0.12 | 0.00 | 0.00 | 15.00 | 1.94 | 0.65 | 0.89 |
| 2.25 | 0.14 | 0.00 | 0.00 | 15.25 | 2.03 | 0.71 | 0.93 |
| 2.50 | 0.16 | 0.00 | 0.00 | 15.50 | 2.12 | 0.78 | 0.96 |
| 2.75 | 0.18 | 0.00 | 0.00 | 15.75 | 2.21 | 0.84 | **0.99** |
| 3.00 | 0.20 | 0.00 | 0.00 | 16.00 | 2.29 | 0.90 | 0.95 |
| 3.25 | 0.22 | 0.00 | 0.00 | 16.25 | 2.37 | 0.96 | 0.90 |
| 3.50 | 0.25 | 0.00 | 0.00 | 16.50 | 2.45 | 1.01 | 0.85 |
| 3.75 | 0.27 | 0.00 | 0.00 | 16.75 | 2.51 | 1.07 | 0.79 |
| 4.00 | 0.29 | 0.00 | 0.00 | 17.00 | 2.58 | 1.11 | 0.73 |
| 4.25 | 0.31 | 0.00 | 0.00 | 17.25 | 2.63 | 1.16 | 0.69 |
| 4.50 | 0.33 | 0.00 | 0.00 | 17.50 | 2.69 | 1.20 | 0.64 |
| 4.75 | 0.35 | 0.00 | 0.00 | 17.75 | 2.74 | 1.24 | 0.59 |
| 5.00 | 0.37 | 0.00 | 0.00 | 18.00 | 2.78 | 1.27 | 0.54 |
| 5.25 | 0.39 | 0.00 | 0.00 | 18.25 | 2.82 | 1.30 | 0.50 |
| 5.50 | 0.42 | 0.00 | 0.00 | 18.50 | 2.86 | 1.33 | 0.46 |
| 5.75 | 0.44 | 0.00 | 0.00 | 18.75 | 2.89 | 1.36 | 0.43 |
| 6.00 | 0.46 | 0.00 | 0.01 | 19.00 | 2.93 | 1.39 | 0.40 |
| 6.25 | 0.48 | 0.00 | 0.02 | 19.25 | 2.96 | 1.41 | 0.36 |
| 6.50 | 0.50 | 0.00 | 0.03 | 19.50 | 2.98 | 1.43 | 0.34 |
| 6.75 | 0.53 | 0.01 | 0.04 | 19.75 | 3.01 | 1.45 | 0.32 |
| 7.00 | 0.55 | 0.01 | 0.05 | 20.00 | 3.03 | 1.47 | 0.30 |
| 7.25 | 0.58 | 0.01 | 0.06 | 20.25 | 3.06 | 1.49 | 0.29 |
| 7.50 | 0.61 | 0.02 | 0.07 | 20.50 | 3.08 | 1.51 | 0.27 |
| 7.75 | 0.64 | 0.02 | 0.08 | 20.75 | 3.10 | 1.53 | 0.26 |
| 8.00 | 0.67 | 0.03 | 0.09 | 21.00 | 3.12 | 1.54 | 0.26 |
| 8.25 | 0.70 | 0.03 | 0.09 | 21.25 | 3.14 | 1.56 | 0.27 |
| 8.50 | 0.72 | 0.04 | 0.10 | 21.50 | 3.16 | 1.58 | 0.27 |
| 8.75 | 0.75 | 0.05 | 0.11 | 21.75 | 3.18 | 1.60 | 0.26 |
| 9.00 | 0.78 | 0.06 | 0.12 | 22.00 | 3.20 | 1.61 | 0.25 |
| 9.25 | 0.81 | 0.06 | 0.13 | 22.25 | 3.22 | 1.63 | 0.23 |
| 9.50 | 0.84 | 0.07 | 0.13 | 22.50 | 3.24 | 1.64 | 0.21 |
| 9.75 | 0.86 | 0.08 | 0.14 | 22.75 | 3.25 | 1.65 | 0.19 |
| 10.00 | 0.89 | 0.09 | 0.15 | 23.00 | 3.27 | 1.66 | 0.18 |
| 10.25 | 0.93 | 0.10 | 0.17 | 23.25 | 3.28 | 1.68 | 0.20 |
| 10.50 | 0.96 | 0.12 | 0.18 | 23.50 | 3.30 | 1.69 | 0.22 |
| 10.75 | 0.99 | 0.13 | 0.20 | 23.75 | 3.32 | 1.71 | 0.24 |
| 11.00 | 1.03 | 0.14 | 0.22 | 24.00 | **3.34** | **1.72** | 0.26 |
| 11.25 | 1.07 | 0.16 | 0.24 | | | | |
| 11.50 | 1.10 | 0.18 | 0.26 | | | | |
| 11.75 | 1.15 | 0.19 | 0.28 | | | | |
| 12.00 | 1.19 | 0.21 | 0.30 | | | | |
| 12.25 | 1.23 | 0.23 | 0.32 | | | | |
| 12.50 | 1.27 | 0.26 | 0.34 | | | | |
| 12.75 | 1.32 | 0.28 | 0.36 | | | | |

## Summary for Subcatchment 2-U: PR DA 2

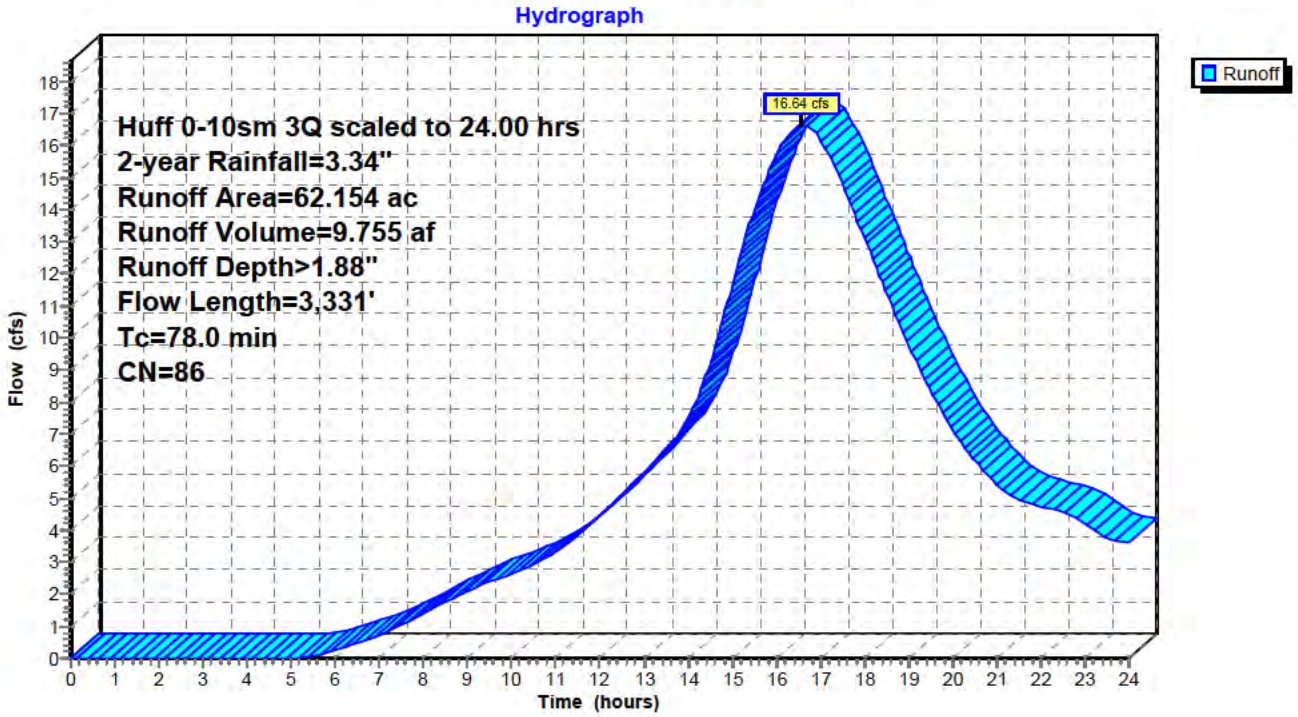
Runoff = 16.64 cfs @ 16.57 hrs, Volume= 9.755 af, Depth> 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 11.052 | 89 | Row crops, straight row, Good, HSG D |
| | 2.151 | 80 | Pasture/grassland/range, Good, HSG D |
| | 0.061 | 89 | Row crops, straight row, Good, HSG D |
| | 10.906 | 89 | Row crops, straight row, Good, HSG D |
| | 8.457 | 80 | Pasture/grassland/range, Good, HSG D |
| | 9.982 | 89 | Row crops, straight row, Good, HSG D |
| | 0.038 | 80 | Pasture/grassland/range, Good, HSG D |
| | 14.843 | 85 | Row crops, straight row, Good, HSG C |
| | 2.519 | 74 | Pasture/grassland/range, Good, HSG C |
| | 0.830 | 85 | Row crops, straight row, Good, HSG C |
| | 1.002 | 74 | Pasture/grassland/range, Good, HSG C |
| * | 0.313 | 98 | Impervious Area |
| | 62.154 | 86 | Weighted Average |
| | 61.841 | | 99.50% Pervious Area |
| | 0.313 | | 0.50% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.4 | 100 | 0.0421 | 0.49 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 1.5 | 141 | 0.0306 | 1.57 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 42.0 | 1,988 | 0.0077 | 0.79 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 31.1 | 1,102 | 0.0071 | 0.59 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 78.0 | 3,331 | Total | | | |

## Subcatchment 2-U: PR DA 2



## Hydrograph for Subcatchment 2-U: PR DA 2

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 1.37 | 0.41 | 5.80 |
| 0.25 | 0.00 | 0.00 | 0.00 | 13.25 | 1.42 | 0.44 | 6.17 |
| 0.50 | 0.01 | 0.00 | 0.00 | 13.50 | 1.47 | 0.47 | 6.54 |
| 0.75 | 0.02 | 0.00 | 0.00 | 13.75 | 1.53 | 0.51 | 6.96 |
| 1.00 | 0.04 | 0.00 | 0.00 | 14.00 | 1.60 | 0.56 | 7.49 |
| 1.25 | 0.06 | 0.00 | 0.00 | 14.25 | 1.68 | 0.61 | 8.24 |
| 1.50 | 0.08 | 0.00 | 0.00 | 14.50 | 1.76 | 0.67 | 9.21 |
| 1.75 | 0.10 | 0.00 | 0.00 | 14.75 | 1.85 | 0.74 | 10.37 |
| 2.00 | 0.12 | 0.00 | 0.00 | 15.00 | 1.94 | 0.80 | 11.64 |
| 2.25 | 0.14 | 0.00 | 0.00 | 15.25 | 2.03 | 0.87 | 12.86 |
| 2.50 | 0.16 | 0.00 | 0.00 | 15.50 | 2.12 | 0.94 | 13.97 |
| 2.75 | 0.18 | 0.00 | 0.00 | 15.75 | 2.21 | 1.01 | 14.89 |
| 3.00 | 0.20 | 0.00 | 0.00 | 16.00 | 2.29 | 1.08 | 15.69 |
| 3.25 | 0.22 | 0.00 | 0.00 | 16.25 | 2.37 | 1.14 | 16.29 |
| 3.50 | 0.25 | 0.00 | 0.00 | 16.50 | 2.45 | 1.20 | **16.60** |
| 3.75 | 0.27 | 0.00 | 0.00 | 16.75 | 2.51 | 1.25 | **16.58** |
| 4.00 | 0.29 | 0.00 | 0.00 | 17.00 | 2.58 | 1.31 | 16.19 |
| 4.25 | 0.31 | 0.00 | 0.00 | 17.25 | 2.63 | 1.35 | 15.59 |
| 4.50 | 0.33 | 0.00 | 0.00 | 17.50 | 2.69 | 1.40 | 14.81 |
| 4.75 | 0.35 | 0.00 | 0.00 | 17.75 | 2.74 | 1.44 | 13.99 |
| 5.00 | 0.37 | 0.00 | 0.01 | 18.00 | 2.78 | 1.48 | 13.13 |
| 5.25 | 0.39 | 0.00 | 0.03 | 18.25 | 2.82 | 1.51 | 12.27 |
| 5.50 | 0.42 | 0.00 | 0.08 | 18.50 | 2.86 | 1.54 | 11.42 |
| 5.75 | 0.44 | 0.01 | 0.15 | 18.75 | 2.89 | 1.57 | 10.58 |
| 6.00 | 0.46 | 0.01 | 0.24 | 19.00 | 2.93 | 1.60 | 9.80 |
| 6.25 | 0.48 | 0.01 | 0.35 | 19.25 | 2.96 | 1.62 | 9.06 |
| 6.50 | 0.50 | 0.02 | 0.46 | 19.50 | 2.98 | 1.65 | 8.38 |
| 6.75 | 0.53 | 0.02 | 0.57 | 19.75 | 3.01 | 1.67 | 7.73 |
| 7.00 | 0.55 | 0.03 | 0.71 | 20.00 | 3.03 | 1.69 | 7.15 |
| 7.25 | 0.58 | 0.03 | 0.86 | 20.25 | 3.06 | 1.71 | 6.62 |
| 7.50 | 0.61 | 0.04 | 1.03 | 20.50 | 3.08 | 1.73 | 6.17 |
| 7.75 | 0.64 | 0.05 | 1.22 | 20.75 | 3.10 | 1.75 | 5.78 |
| 8.00 | 0.67 | 0.06 | 1.41 | 21.00 | 3.12 | 1.77 | 5.43 |
| 8.25 | 0.70 | 0.07 | 1.60 | 21.25 | 3.14 | 1.78 | 5.15 |
| 8.50 | 0.72 | 0.08 | 1.78 | 21.50 | 3.16 | 1.80 | 4.94 |
| 8.75 | 0.75 | 0.09 | 1.94 | 21.75 | 3.18 | 1.82 | 4.81 |
| 9.00 | 0.78 | 0.10 | 2.10 | 22.00 | 3.20 | 1.84 | 4.72 |
| 9.25 | 0.81 | 0.11 | 2.24 | 22.25 | 3.22 | 1.85 | 4.65 |
| 9.50 | 0.84 | 0.12 | 2.38 | 22.50 | 3.24 | 1.87 | 4.55 |
| 9.75 | 0.86 | 0.13 | 2.51 | 22.75 | 3.25 | 1.88 | 4.40 |
| 10.00 | 0.89 | 0.15 | 2.64 | 23.00 | 3.27 | 1.89 | 4.19 |
| 10.25 | 0.93 | 0.16 | 2.77 | 23.25 | 3.28 | 1.91 | 3.95 |
| 10.50 | 0.96 | 0.18 | 2.93 | 23.50 | 3.30 | 1.92 | 3.74 |
| 10.75 | 0.99 | 0.19 | 3.11 | 23.75 | 3.32 | 1.94 | 3.62 |
| 11.00 | 1.03 | 0.21 | 3.34 | 24.00 | **3.34** | **1.96** | 3.63 |
| 11.25 | 1.07 | 0.23 | 3.59 | | | | |
| 11.50 | 1.10 | 0.25 | 3.86 | | | | |
| 11.75 | 1.15 | 0.27 | 4.15 | | | | |
| 12.00 | 1.19 | 0.30 | 4.46 | | | | |
| 12.25 | 1.23 | 0.32 | 4.78 | | | | |
| 12.50 | 1.27 | 0.35 | 5.11 | | | | |
| 12.75 | 1.32 | 0.38 | 5.46 | | | | |

## Summary for Subcatchment 3-D: PR DA 3

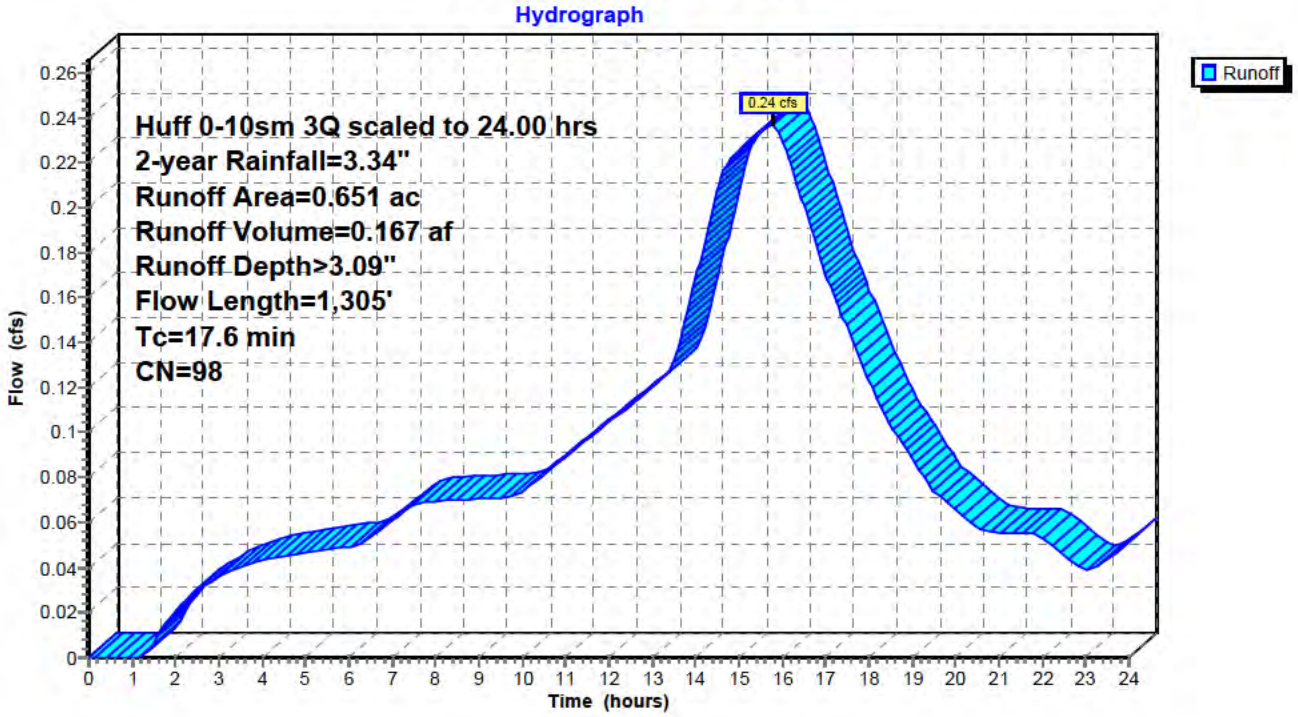
Runoff = 0.24 cfs @ 15.77 hrs, Volume= 0.167 af, Depth> 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.651 | 98 | Impervious Area |
| | 0.651 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0081 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 0.6 | 37 | 0.0151 | 1.11 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 1.8 | 758 | 0.0141 | 7.10 | 71.03 | **Channel Flow,** Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight |
| 0.3 | 38 | 0.0146 | 2.45 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 8.3 | 372 | 0.0113 | 0.74 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 17.6 | 1,305 | Total | | | |

## Subcatchment 3-D: PR DA 3



## Hydrograph for Subcatchment 3-D: PR DA 3

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 1.37 | 1.15 | 0.12 |
| 0.25 | 0.00 | 0.00 | 0.00 | 13.25 | 1.42 | 1.20 | 0.12 |
| 0.50 | 0.01 | 0.00 | 0.00 | 13.50 | 1.47 | 1.25 | 0.13 |
| 0.75 | 0.02 | 0.00 | 0.00 | 13.75 | 1.53 | 1.31 | 0.15 |
| 1.00 | 0.04 | 0.00 | 0.00 | 14.00 | 1.60 | 1.38 | 0.17 |
| 1.25 | 0.06 | 0.00 | 0.00 | 14.25 | 1.68 | 1.46 | 0.19 |
| 1.50 | 0.08 | 0.01 | 0.01 | 14.50 | 1.76 | 1.54 | 0.21 |
| 1.75 | 0.10 | 0.01 | 0.01 | 14.75 | 1.85 | 1.63 | 0.22 |
| 2.00 | 0.12 | 0.02 | 0.02 | 15.00 | 1.94 | 1.71 | 0.23 |
| 2.25 | 0.14 | 0.03 | 0.03 | 15.25 | 2.03 | 1.80 | 0.23 |
| 2.50 | 0.16 | 0.04 | 0.03 | 15.50 | 2.12 | 1.89 | 0.23 |
| 2.75 | 0.18 | 0.06 | 0.03 | 15.75 | 2.21 | 1.98 | **0.24** |
| 3.00 | 0.20 | 0.07 | 0.04 | 16.00 | 2.29 | 2.06 | 0.23 |
| 3.25 | 0.22 | 0.09 | 0.04 | 16.25 | 2.37 | 2.14 | 0.22 |
| 3.50 | 0.25 | 0.10 | 0.04 | 16.50 | 2.45 | 2.22 | 0.20 |
| 3.75 | 0.27 | 0.12 | 0.04 | 16.75 | 2.51 | 2.28 | 0.19 |
| 4.00 | 0.29 | 0.14 | 0.04 | 17.00 | 2.58 | 2.35 | 0.17 |
| 4.25 | 0.31 | 0.15 | 0.04 | 17.25 | 2.63 | 2.40 | 0.16 |
| 4.50 | 0.33 | 0.17 | 0.05 | 17.50 | 2.69 | 2.46 | 0.15 |
| 4.75 | 0.35 | 0.19 | 0.05 | 17.75 | 2.74 | 2.51 | 0.13 |
| 5.00 | 0.37 | 0.21 | 0.05 | 18.00 | 2.78 | 2.55 | 0.12 |
| 5.25 | 0.39 | 0.22 | 0.05 | 18.25 | 2.82 | 2.59 | 0.11 |
| 5.50 | 0.42 | 0.24 | 0.05 | 18.50 | 2.86 | 2.63 | 0.10 |
| 5.75 | 0.44 | 0.26 | 0.05 | 18.75 | 2.89 | 2.66 | 0.10 |
| 6.00 | 0.46 | 0.28 | 0.05 | 19.00 | 2.93 | 2.70 | 0.09 |
| 6.25 | 0.48 | 0.30 | 0.05 | 19.25 | 2.96 | 2.72 | 0.08 |
| 6.50 | 0.50 | 0.32 | 0.05 | 19.50 | 2.98 | 2.75 | 0.07 |
| 6.75 | 0.53 | 0.34 | 0.06 | 19.75 | 3.01 | 2.78 | 0.07 |
| 7.00 | 0.55 | 0.37 | 0.06 | 20.00 | 3.03 | 2.80 | 0.07 |
| 7.25 | 0.58 | 0.39 | 0.06 | 20.25 | 3.06 | 2.82 | 0.06 |
| 7.50 | 0.61 | 0.42 | 0.07 | 20.50 | 3.08 | 2.85 | 0.06 |
| 7.75 | 0.64 | 0.45 | 0.07 | 20.75 | 3.10 | 2.87 | 0.06 |
| 8.00 | 0.67 | 0.47 | 0.07 | 21.00 | 3.12 | 2.89 | 0.06 |
| 8.25 | 0.70 | 0.50 | 0.07 | 21.25 | 3.14 | 2.91 | 0.06 |
| 8.50 | 0.72 | 0.53 | 0.07 | 21.50 | 3.16 | 2.93 | 0.06 |
| 8.75 | 0.75 | 0.55 | 0.07 | 21.75 | 3.18 | 2.95 | 0.06 |
| 9.00 | 0.78 | 0.58 | 0.07 | 22.00 | 3.20 | 2.97 | 0.05 |
| 9.25 | 0.81 | 0.61 | 0.07 | 22.25 | 3.22 | 2.99 | 0.05 |
| 9.50 | 0.84 | 0.63 | 0.07 | 22.50 | 3.24 | 3.00 | 0.05 |
| 9.75 | 0.86 | 0.66 | 0.07 | 22.75 | 3.25 | 3.02 | 0.04 |
| 10.00 | 0.89 | 0.69 | 0.07 | 23.00 | 3.27 | 3.03 | 0.04 |
| 10.25 | 0.93 | 0.72 | 0.08 | 23.25 | 3.28 | 3.05 | 0.04 |
| 10.50 | 0.96 | 0.75 | 0.08 | 23.50 | 3.30 | 3.07 | 0.04 |
| 10.75 | 0.99 | 0.78 | 0.08 | 23.75 | 3.32 | 3.09 | 0.05 |
| 11.00 | 1.03 | 0.82 | 0.09 | 24.00 | **3.34** | **3.11** | 0.05 |
| 11.25 | 1.07 | 0.86 | 0.09 | | | | |
| 11.50 | 1.10 | 0.89 | 0.10 | | | | |
| 11.75 | 1.15 | 0.93 | 0.10 | | | | |
| 12.00 | 1.19 | 0.97 | 0.10 | | | | |
| 12.25 | 1.23 | 1.01 | 0.11 | | | | |
| 12.50 | 1.27 | 1.06 | 0.11 | | | | |
| 12.75 | 1.32 | 1.10 | 0.12 | | | | |

## Summary for Subcatchment 3-U: PR DA 3

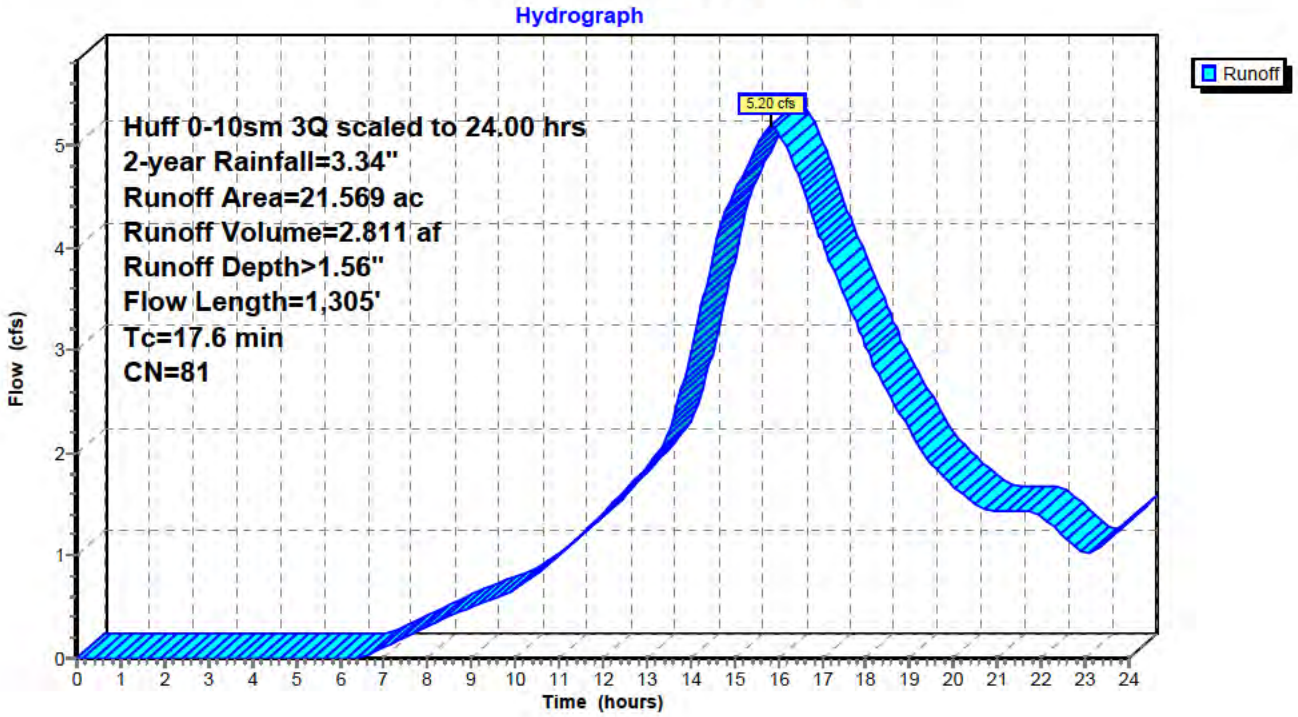
Runoff = 5.20 cfs @ 15.84 hrs, Volume= 2.811 af, Depth> 1.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

| Area (ac) | CN | Description |
|---|---|---|
| 3.171 | 89 | Row crops, straight row, Good, HSG D |
| 4.736 | 80 | Pasture/grassland/range, Good, HSG D |
| 1.134 | 89 | Row crops, straight row, Good, HSG D |
| 5.352 | 80 | Pasture/grassland/range, Good, HSG D |
| 3.187 | 85 | Row crops, straight row, Good, HSG C |
| 3.989 | 74 | Pasture/grassland/range, Good, HSG C |
| 21.569 | 81 | Weighted Average |
| 21.569 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0081 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 0.6 | 37 | 0.0151 | 1.11 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 1.8 | 758 | 0.0141 | 7.10 | 71.03 | **Channel Flow,** Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight |
| 0.3 | 38 | 0.0146 | 2.45 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 8.3 | 372 | 0.0113 | 0.74 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 17.6 | 1,305 | Total | | | |

## Subcatchment 3-U: PR DA 3



## Hydrograph for Subcatchment 3-U: PR DA 3

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 1.37 | 0.25 | 1.87 |
| 0.25 | 0.00 | 0.00 | 0.00 | 13.25 | 1.42 | 0.27 | 1.99 |
| 0.50 | 0.01 | 0.00 | 0.00 | 13.50 | 1.47 | 0.30 | 2.19 |
| 0.75 | 0.02 | 0.00 | 0.00 | 13.75 | 1.53 | 0.33 | 2.55 |
| 1.00 | 0.04 | 0.00 | 0.00 | 14.00 | 1.60 | 0.37 | 2.97 |
| 1.25 | 0.06 | 0.00 | 0.00 | 14.25 | 1.68 | 0.41 | 3.43 |
| 1.50 | 0.08 | 0.00 | 0.00 | 14.50 | 1.76 | 0.46 | 3.91 |
| 1.75 | 0.10 | 0.00 | 0.00 | 14.75 | 1.85 | 0.51 | 4.29 |
| 2.00 | 0.12 | 0.00 | 0.00 | 15.00 | 1.94 | 0.57 | 4.54 |
| 2.25 | 0.14 | 0.00 | 0.00 | 15.25 | 2.03 | 0.62 | 4.76 |
| 2.50 | 0.16 | 0.00 | 0.00 | 15.50 | 2.12 | 0.68 | 4.97 |
| 2.75 | 0.18 | 0.00 | 0.00 | 15.75 | 2.21 | 0.74 | **5.17** |
| 3.00 | 0.20 | 0.00 | 0.00 | 16.00 | 2.29 | 0.80 | **5.14** |
| 3.25 | 0.22 | 0.00 | 0.00 | 16.25 | 2.37 | 0.85 | 4.92 |
| 3.50 | 0.25 | 0.00 | 0.00 | 16.50 | 2.45 | 0.90 | 4.65 |
| 3.75 | 0.27 | 0.00 | 0.00 | 16.75 | 2.51 | 0.95 | 4.36 |
| 4.00 | 0.29 | 0.00 | 0.00 | 17.00 | 2.58 | 1.00 | 4.06 |
| 4.25 | 0.31 | 0.00 | 0.00 | 17.25 | 2.63 | 1.04 | 3.80 |
| 4.50 | 0.33 | 0.00 | 0.00 | 17.50 | 2.69 | 1.08 | 3.55 |
| 4.75 | 0.35 | 0.00 | 0.00 | 17.75 | 2.74 | 1.11 | 3.30 |
| 5.00 | 0.37 | 0.00 | 0.00 | 18.00 | 2.78 | 1.15 | 3.04 |
| 5.25 | 0.39 | 0.00 | 0.00 | 18.25 | 2.82 | 1.18 | 2.79 |
| 5.50 | 0.42 | 0.00 | 0.00 | 18.50 | 2.86 | 1.21 | 2.59 |
| 5.75 | 0.44 | 0.00 | 0.00 | 18.75 | 2.89 | 1.23 | 2.41 |
| 6.00 | 0.46 | 0.00 | 0.00 | 19.00 | 2.93 | 1.26 | 2.23 |
| 6.25 | 0.48 | 0.00 | 0.00 | 19.25 | 2.96 | 1.28 | 2.04 |
| 6.50 | 0.50 | 0.00 | 0.02 | 19.50 | 2.98 | 1.30 | 1.88 |
| 6.75 | 0.53 | 0.00 | 0.06 | 19.75 | 3.01 | 1.32 | 1.78 |
| 7.00 | 0.55 | 0.00 | 0.10 | 20.00 | 3.03 | 1.34 | 1.68 |
| 7.25 | 0.58 | 0.01 | 0.16 | 20.25 | 3.06 | 1.36 | 1.59 |
| 7.50 | 0.61 | 0.01 | 0.21 | 20.50 | 3.08 | 1.37 | 1.49 |
| 7.75 | 0.64 | 0.01 | 0.27 | 20.75 | 3.10 | 1.39 | 1.44 |
| 8.00 | 0.67 | 0.02 | 0.32 | 21.00 | 3.12 | 1.41 | 1.43 |
| 8.25 | 0.70 | 0.02 | 0.36 | 21.25 | 3.14 | 1.42 | 1.44 |
| 8.50 | 0.72 | 0.02 | 0.41 | 21.50 | 3.16 | 1.44 | 1.44 |
| 8.75 | 0.75 | 0.03 | 0.45 | 21.75 | 3.18 | 1.46 | 1.44 |
| 9.00 | 0.78 | 0.04 | 0.50 | 22.00 | 3.20 | 1.47 | 1.39 |
| 9.25 | 0.81 | 0.04 | 0.54 | 22.25 | 3.22 | 1.49 | 1.30 |
| 9.50 | 0.84 | 0.05 | 0.58 | 22.50 | 3.24 | 1.50 | 1.20 |
| 9.75 | 0.86 | 0.06 | 0.62 | 22.75 | 3.25 | 1.51 | 1.10 |
| 10.00 | 0.89 | 0.07 | 0.68 | 23.00 | 3.27 | 1.52 | 1.01 |
| 10.25 | 0.93 | 0.07 | 0.75 | 23.25 | 3.28 | 1.53 | 1.05 |
| 10.50 | 0.96 | 0.08 | 0.83 | 23.50 | 3.30 | 1.55 | 1.15 |
| 10.75 | 0.99 | 0.10 | 0.91 | 23.75 | 3.32 | 1.56 | 1.25 |
| 11.00 | 1.03 | 0.11 | 1.00 | 24.00 | **3.34** | **1.58** | 1.36 |
| 11.25 | 1.07 | 0.12 | 1.10 | | | | |
| 11.50 | 1.10 | 0.14 | 1.20 | | | | |
| 11.75 | 1.15 | 0.15 | 1.30 | | | | |
| 12.00 | 1.19 | 0.17 | 1.41 | | | | |
| 12.25 | 1.23 | 0.19 | 1.52 | | | | |
| 12.50 | 1.27 | 0.21 | 1.63 | | | | |
| 12.75 | 1.32 | 0.23 | 1.75 | | | | |

## Summary for Subcatchment 4-U: PR DA 4

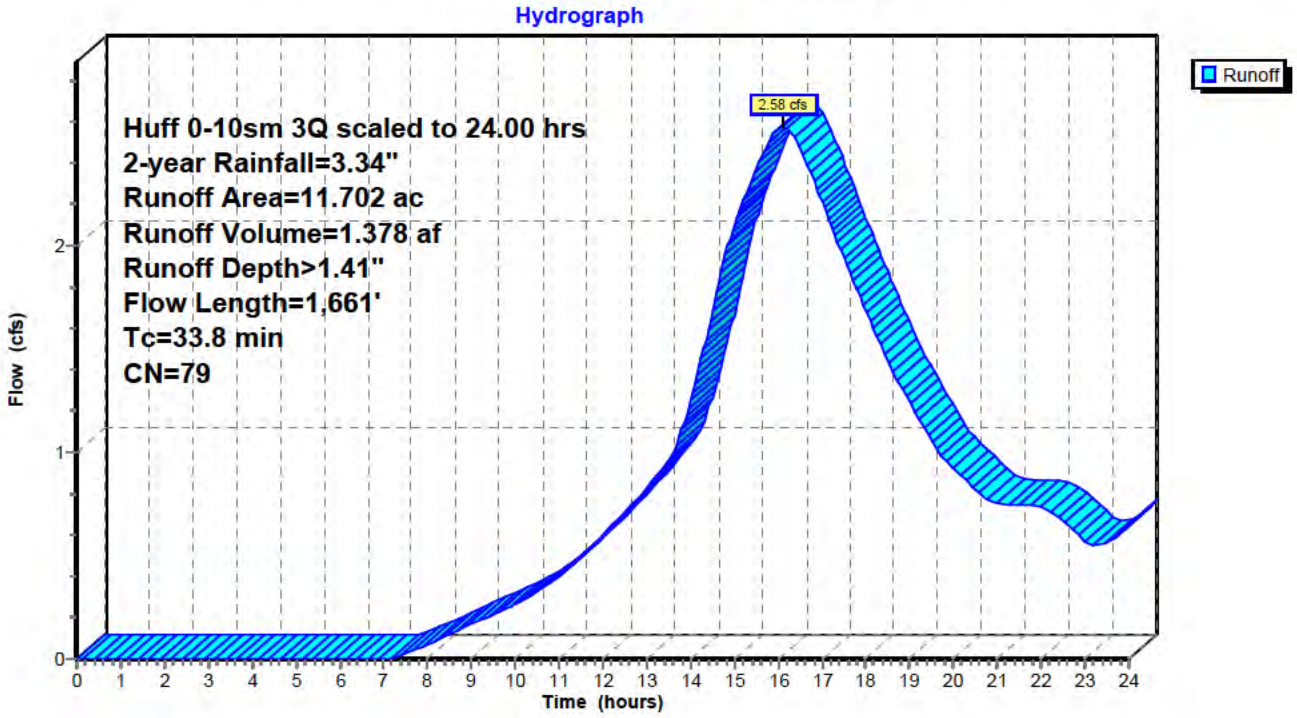
Runoff = 2.58 cfs @ 16.08 hrs, Volume= 1.378 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

| Area (ac) | CN | Description |
|---|---|---|
| 0.399 | 89 | Row crops, straight row, Good, HSG D |
| 4.560 | 80 | Pasture/grassland/range, Good, HSG D |
| 0.000 | 89 | Row crops, straight row, Good, HSG D |
| 3.035 | 80 | Pasture/grassland/range, Good, HSG D |
| 0.695 | 85 | Row crops, straight row, Good, HSG C |
| 3.013 | 74 | Pasture/grassland/range, Good, HSG C |
| 11.702 | 79 | Weighted Average |
| 11.702 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0080 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 2.7 | 198 | 0.0180 | 1.21 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 24.5 | 1,363 | 0.0175 | 0.93 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 33.8 | 1,661 | Total | | | |

## Subcatchment 4-U: PR DA 4



## Hydrograph for Subcatchment 4-U: PR DA 4

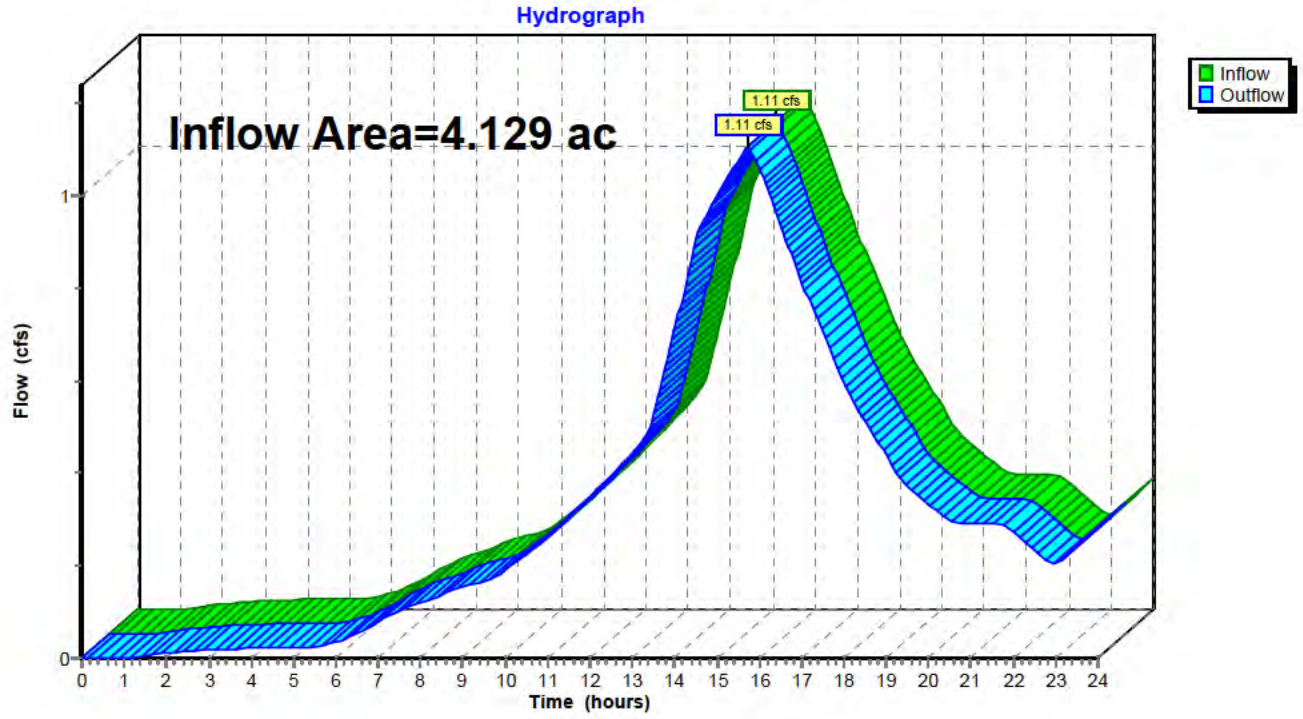
| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 1.37 | 0.20 | 0.83 |
| 0.25 | 0.00 | 0.00 | 0.00 | 13.25 | 1.42 | 0.22 | 0.89 |
| 0.50 | 0.01 | 0.00 | 0.00 | 13.50 | 1.47 | 0.25 | 0.96 |
| 0.75 | 0.02 | 0.00 | 0.00 | 13.75 | 1.53 | 0.27 | 1.08 |
| 1.00 | 0.04 | 0.00 | 0.00 | 14.00 | 1.60 | 0.31 | 1.25 |
| 1.25 | 0.06 | 0.00 | 0.00 | 14.25 | 1.68 | 0.35 | 1.46 |
| 1.50 | 0.08 | 0.00 | 0.00 | 14.50 | 1.76 | 0.39 | 1.68 |
| 1.75 | 0.10 | 0.00 | 0.00 | 14.75 | 1.85 | 0.44 | 1.92 |
| 2.00 | 0.12 | 0.00 | 0.00 | 15.00 | 1.94 | 0.49 | 2.10 |
| 2.25 | 0.14 | 0.00 | 0.00 | 15.25 | 2.03 | 0.54 | 2.24 |
| 2.50 | 0.16 | 0.00 | 0.00 | 15.50 | 2.12 | 0.59 | 2.37 |
| 2.75 | 0.18 | 0.00 | 0.00 | 15.75 | 2.21 | 0.65 | 2.49 |
| 3.00 | 0.20 | 0.00 | 0.00 | 16.00 | 2.29 | 0.70 | **2.57** |
| 3.25 | 0.22 | 0.00 | 0.00 | 16.25 | 2.37 | 0.75 | **2.56** |
| 3.50 | 0.25 | 0.00 | 0.00 | 16.50 | 2.45 | 0.80 | 2.47 |
| 3.75 | 0.27 | 0.00 | 0.00 | 16.75 | 2.51 | 0.85 | 2.35 |
| 4.00 | 0.29 | 0.00 | 0.00 | 17.00 | 2.58 | 0.89 | 2.21 |
| 4.25 | 0.31 | 0.00 | 0.00 | 17.25 | 2.63 | 0.93 | 2.07 |
| 4.50 | 0.33 | 0.00 | 0.00 | 17.50 | 2.69 | 0.97 | 1.94 |
| 4.75 | 0.35 | 0.00 | 0.00 | 17.75 | 2.74 | 1.00 | 1.82 |
| 5.00 | 0.37 | 0.00 | 0.00 | 18.00 | 2.78 | 1.03 | 1.69 |
| 5.25 | 0.39 | 0.00 | 0.00 | 18.25 | 2.82 | 1.06 | 1.56 |
| 5.50 | 0.42 | 0.00 | 0.00 | 18.50 | 2.86 | 1.09 | 1.44 |
| 5.75 | 0.44 | 0.00 | 0.00 | 18.75 | 2.89 | 1.11 | 1.34 |
| 6.00 | 0.46 | 0.00 | 0.00 | 19.00 | 2.93 | 1.14 | 1.24 |
| 6.25 | 0.48 | 0.00 | 0.00 | 19.25 | 2.96 | 1.16 | 1.15 |
| 6.50 | 0.50 | 0.00 | 0.00 | 19.50 | 2.98 | 1.18 | 1.06 |
| 6.75 | 0.53 | 0.00 | 0.00 | 19.75 | 3.01 | 1.19 | 0.98 |
| 7.00 | 0.55 | 0.00 | 0.00 | 20.00 | 3.03 | 1.21 | 0.92 |
| 7.25 | 0.58 | 0.00 | 0.01 | 20.25 | 3.06 | 1.23 | 0.87 |
| 7.50 | 0.61 | 0.00 | 0.02 | 20.50 | 3.08 | 1.25 | 0.82 |
| 7.75 | 0.64 | 0.00 | 0.05 | 20.75 | 3.10 | 1.26 | 0.78 |
| 8.00 | 0.67 | 0.01 | 0.07 | 21.00 | 3.12 | 1.28 | 0.75 |
| 8.25 | 0.70 | 0.01 | 0.10 | 21.25 | 3.14 | 1.29 | 0.75 |
| 8.50 | 0.72 | 0.01 | 0.12 | 21.50 | 3.16 | 1.31 | 0.74 |
| 8.75 | 0.75 | 0.02 | 0.15 | 21.75 | 3.18 | 1.32 | 0.75 |
| 9.00 | 0.78 | 0.02 | 0.17 | 22.00 | 3.20 | 1.34 | 0.74 |
| 9.25 | 0.81 | 0.03 | 0.19 | 22.25 | 3.22 | 1.35 | 0.71 |
| 9.50 | 0.84 | 0.03 | 0.22 | 22.50 | 3.24 | 1.36 | 0.67 |
| 9.75 | 0.86 | 0.04 | 0.24 | 22.75 | 3.25 | 1.38 | 0.62 |
| 10.00 | 0.89 | 0.04 | 0.26 | 23.00 | 3.27 | 1.39 | 0.57 |
| 10.25 | 0.93 | 0.05 | 0.29 | 23.25 | 3.28 | 1.40 | 0.54 |
| 10.50 | 0.96 | 0.06 | 0.33 | 23.50 | 3.30 | 1.41 | 0.56 |
| 10.75 | 0.99 | 0.07 | 0.36 | 23.75 | 3.32 | 1.43 | 0.60 |
| 11.00 | 1.03 | 0.08 | 0.41 | 24.00 | **3.34** | **1.44** | 0.65 |
| 11.25 | 1.07 | 0.09 | 0.45 | | | | |
| 11.50 | 1.10 | 0.10 | 0.50 | | | | |
| 11.75 | 1.15 | 0.12 | 0.55 | | | | |
| 12.00 | 1.19 | 0.13 | 0.60 | | | | |
| 12.25 | 1.23 | 0.15 | 0.65 | | | | |
| 12.50 | 1.27 | 0.16 | 0.71 | | | | |
| 12.75 | 1.32 | 0.18 | 0.77 | | | | |

## Summary for Reach 1-T: PR DA 1 TOTAL

Inflow Area = 4.129 ac, 9.91% Impervious, Inflow Depth > 1.82" for 2-year event
Inflow = 1.11 cfs @ 15.73 hrs, Volume= 0.628 af
Outflow = 1.11 cfs @ 15.73 hrs, Volume= 0.628 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

### Reach 1-T: PR DA 1 TOTAL



## Hydrograph for Reach 1-T: PR DA 1 TOTAL

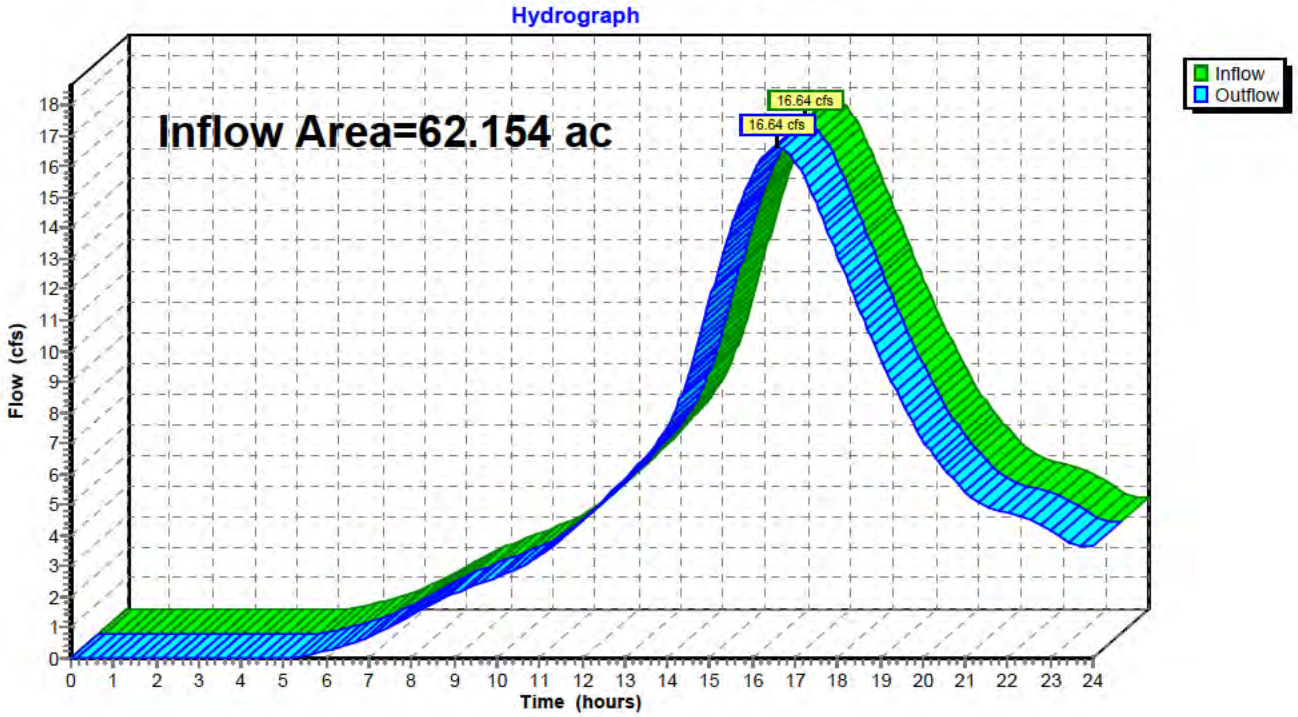
| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 0.44 | | 0.44 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 0.47 | | 0.47 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 0.53 | | 0.53 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 0.62 | | 0.62 |
| 1.00 | 0.00 | | 0.00 | 14.00 | 0.71 | | 0.71 |
| 1.25 | 0.00 | | 0.00 | 14.25 | 0.81 | | 0.81 |
| 1.50 | 0.01 | | 0.01 | 14.50 | 0.91 | | 0.91 |
| 1.75 | 0.01 | | 0.01 | 14.75 | 0.96 | | 0.96 |
| 2.00 | 0.01 | | 0.01 | 15.00 | 1.00 | | 1.00 |
| 2.25 | 0.01 | | 0.01 | 15.25 | 1.04 | | 1.04 |
| 2.50 | 0.02 | | 0.02 | 15.50 | 1.08 | | 1.08 |
| 2.75 | 0.02 | | 0.02 | 15.75 | **1.11** | | **1.11** |
| 3.00 | 0.02 | | 0.02 | 16.00 | 1.06 | | 1.06 |
| 3.25 | 0.02 | | 0.02 | 16.25 | 1.00 | | 1.00 |
| 3.50 | 0.02 | | 0.02 | 16.50 | 0.94 | | 0.94 |
| 3.75 | 0.02 | | 0.02 | 16.75 | 0.88 | | 0.88 |
| 4.00 | 0.02 | | 0.02 | 17.00 | 0.81 | | 0.81 |
| 4.25 | 0.02 | | 0.02 | 17.25 | 0.76 | | 0.76 |
| 4.50 | 0.02 | | 0.02 | 17.50 | 0.71 | | 0.71 |
| 4.75 | 0.02 | | 0.02 | 17.75 | 0.65 | | 0.65 |
| 5.00 | 0.02 | | 0.02 | 18.00 | 0.60 | | 0.60 |
| 5.25 | 0.02 | | 0.02 | 18.25 | 0.55 | | 0.55 |
| 5.50 | 0.02 | | 0.02 | 18.50 | 0.51 | | 0.51 |
| 5.75 | 0.03 | | 0.03 | 18.75 | 0.48 | | 0.48 |
| 6.00 | 0.04 | | 0.04 | 19.00 | 0.44 | | 0.44 |
| 6.25 | 0.04 | | 0.04 | 19.25 | 0.40 | | 0.40 |
| 6.50 | 0.05 | | 0.05 | 19.50 | 0.37 | | 0.37 |
| 6.75 | 0.06 | | 0.06 | 19.75 | 0.35 | | 0.35 |
| 7.00 | 0.08 | | 0.08 | 20.00 | 0.33 | | 0.33 |
| 7.25 | 0.09 | | 0.09 | 20.25 | 0.31 | | 0.31 |
| 7.50 | 0.10 | | 0.10 | 20.50 | 0.30 | | 0.30 |
| 7.75 | 0.11 | | 0.11 | 20.75 | 0.29 | | 0.29 |
| 8.00 | 0.12 | | 0.12 | 21.00 | 0.29 | | 0.29 |
| 8.25 | 0.13 | | 0.13 | 21.25 | 0.29 | | 0.29 |
| 8.50 | 0.14 | | 0.14 | 21.50 | 0.29 | | 0.29 |
| 8.75 | 0.15 | | 0.15 | 21.75 | 0.29 | | 0.29 |
| 9.00 | 0.15 | | 0.15 | 22.00 | 0.27 | | 0.27 |
| 9.25 | 0.16 | | 0.16 | 22.25 | 0.25 | | 0.25 |
| 9.50 | 0.17 | | 0.17 | 22.50 | 0.23 | | 0.23 |
| 9.75 | 0.18 | | 0.18 | 22.75 | 0.21 | | 0.21 |
| 10.00 | 0.19 | | 0.19 | 23.00 | 0.20 | | 0.20 |
| 10.25 | 0.21 | | 0.21 | 23.25 | 0.22 | | 0.22 |
| 10.50 | 0.23 | | 0.23 | 23.50 | 0.24 | | 0.24 |
| 10.75 | 0.24 | | 0.24 | 23.75 | 0.26 | | 0.26 |
| 11.00 | 0.26 | | 0.26 | 24.00 | 0.28 | | 0.28 |
| 11.25 | 0.28 | | 0.28 | | | | |
| 11.50 | 0.31 | | 0.31 | | | | |
| 11.75 | 0.33 | | 0.33 | | | | |
| 12.00 | 0.35 | | 0.35 | | | | |
| 12.25 | 0.37 | | 0.37 | | | | |
| 12.50 | 0.40 | | 0.40 | | | | |
| 12.75 | 0.42 | | 0.42 | | | | |

## Summary for Reach 2-T: PR DA 2 TOTAL

Inflow Area = 62.154 ac, 0.50% Impervious, Inflow Depth > 1.88" for 2-year event
Inflow = 16.64 cfs @ 16.57 hrs, Volume= 9.755 af
Outflow = 16.64 cfs @ 16.57 hrs, Volume= 9.755 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## Reach 2-T: PR DA 2 TOTAL



## Hydrograph for Reach 2-T: PR DA 2 TOTAL

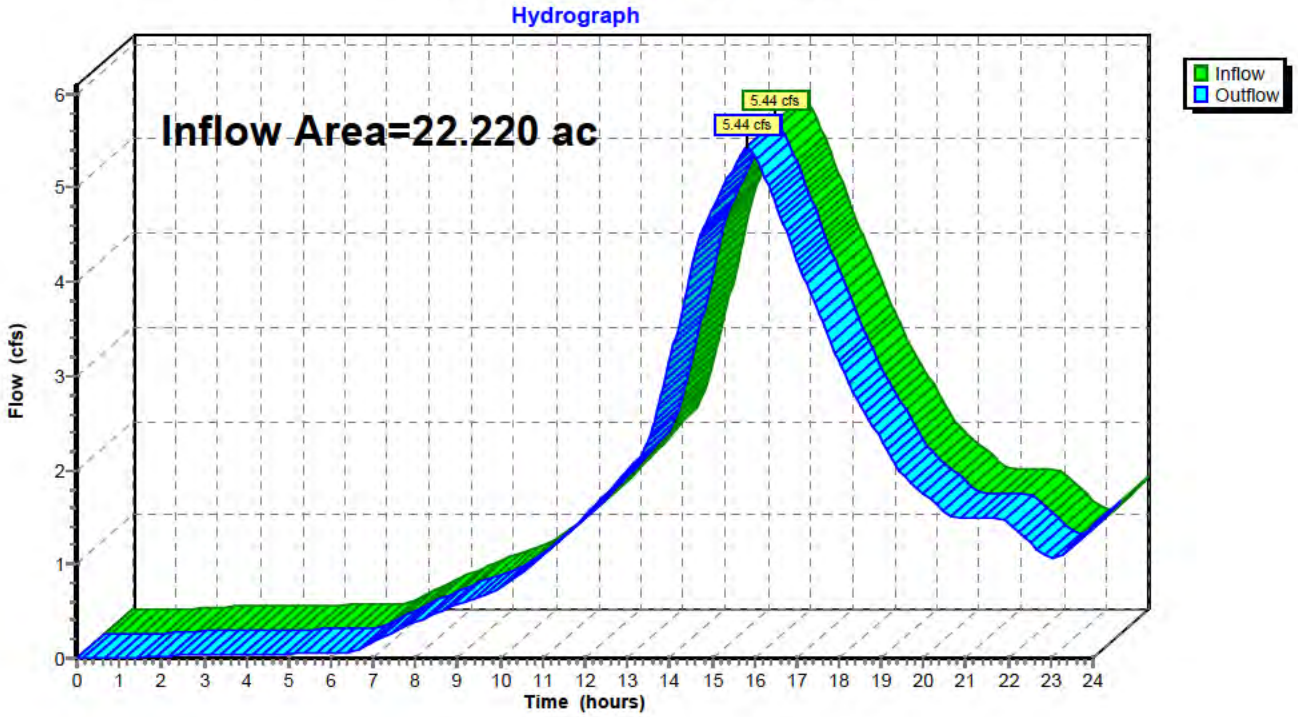
| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 5.80 | | 5.80 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 6.17 | | 6.17 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 6.54 | | 6.54 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 6.96 | | 6.96 |
| 1.00 | 0.00 | | 0.00 | 14.00 | 7.49 | | 7.49 |
| 1.25 | 0.00 | | 0.00 | 14.25 | 8.24 | | 8.24 |
| 1.50 | 0.00 | | 0.00 | 14.50 | 9.21 | | 9.21 |
| 1.75 | 0.00 | | 0.00 | 14.75 | 10.37 | | 10.37 |
| 2.00 | 0.00 | | 0.00 | 15.00 | 11.64 | | 11.64 |
| 2.25 | 0.00 | | 0.00 | 15.25 | 12.86 | | 12.86 |
| 2.50 | 0.00 | | 0.00 | 15.50 | 13.97 | | 13.97 |
| 2.75 | 0.00 | | 0.00 | 15.75 | 14.89 | | 14.89 |
| 3.00 | 0.00 | | 0.00 | 16.00 | 15.69 | | 15.69 |
| 3.25 | 0.00 | | 0.00 | 16.25 | 16.29 | | 16.29 |
| 3.50 | 0.00 | | 0.00 | 16.50 | **16.60** | | **16.60** |
| 3.75 | 0.00 | | 0.00 | 16.75 | **16.58** | | **16.58** |
| 4.00 | 0.00 | | 0.00 | 17.00 | 16.19 | | 16.19 |
| 4.25 | 0.00 | | 0.00 | 17.25 | 15.59 | | 15.59 |
| 4.50 | 0.00 | | 0.00 | 17.50 | 14.81 | | 14.81 |
| 4.75 | 0.00 | | 0.00 | 17.75 | 13.99 | | 13.99 |
| 5.00 | 0.01 | | 0.01 | 18.00 | 13.13 | | 13.13 |
| 5.25 | 0.03 | | 0.03 | 18.25 | 12.27 | | 12.27 |
| 5.50 | 0.08 | | 0.08 | 18.50 | 11.42 | | 11.42 |
| 5.75 | 0.15 | | 0.15 | 18.75 | 10.58 | | 10.58 |
| 6.00 | 0.24 | | 0.24 | 19.00 | 9.80 | | 9.80 |
| 6.25 | 0.35 | | 0.35 | 19.25 | 9.06 | | 9.06 |
| 6.50 | 0.46 | | 0.46 | 19.50 | 8.38 | | 8.38 |
| 6.75 | 0.57 | | 0.57 | 19.75 | 7.73 | | 7.73 |
| 7.00 | 0.71 | | 0.71 | 20.00 | 7.15 | | 7.15 |
| 7.25 | 0.86 | | 0.86 | 20.25 | 6.62 | | 6.62 |
| 7.50 | 1.03 | | 1.03 | 20.50 | 6.17 | | 6.17 |
| 7.75 | 1.22 | | 1.22 | 20.75 | 5.78 | | 5.78 |
| 8.00 | 1.41 | | 1.41 | 21.00 | 5.43 | | 5.43 |
| 8.25 | 1.60 | | 1.60 | 21.25 | 5.15 | | 5.15 |
| 8.50 | 1.78 | | 1.78 | 21.50 | 4.94 | | 4.94 |
| 8.75 | 1.94 | | 1.94 | 21.75 | 4.81 | | 4.81 |
| 9.00 | 2.10 | | 2.10 | 22.00 | 4.72 | | 4.72 |
| 9.25 | 2.24 | | 2.24 | 22.25 | 4.65 | | 4.65 |
| 9.50 | 2.38 | | 2.38 | 22.50 | 4.55 | | 4.55 |
| 9.75 | 2.51 | | 2.51 | 22.75 | 4.40 | | 4.40 |
| 10.00 | 2.64 | | 2.64 | 23.00 | 4.19 | | 4.19 |
| 10.25 | 2.77 | | 2.77 | 23.25 | 3.95 | | 3.95 |
| 10.50 | 2.93 | | 2.93 | 23.50 | 3.74 | | 3.74 |
| 10.75 | 3.11 | | 3.11 | 23.75 | 3.62 | | 3.62 |
| 11.00 | 3.34 | | 3.34 | 24.00 | 3.63 | | 3.63 |
| 11.25 | 3.59 | | 3.59 | | | | |
| 11.50 | 3.86 | | 3.86 | | | | |
| 11.75 | 4.15 | | 4.15 | | | | |
| 12.00 | 4.46 | | 4.46 | | | | |
| 12.25 | 4.78 | | 4.78 | | | | |
| 12.50 | 5.11 | | 5.11 | | | | |
| 12.75 | 5.46 | | 5.46 | | | | |

## Summary for Reach 3-T: PR DA 3 TOTAL

Inflow Area = 22.220 ac, 2.93% Impervious, Inflow Depth > 1.61" for 2-year event
Inflow = 5.44 cfs @ 15.84 hrs, Volume= 2.979 af
Outflow = 5.44 cfs @ 15.84 hrs, Volume= 2.979 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

### Reach 3-T: PR DA 3 TOTAL



## Hydrograph for Reach 3-T: PR DA 3 TOTAL

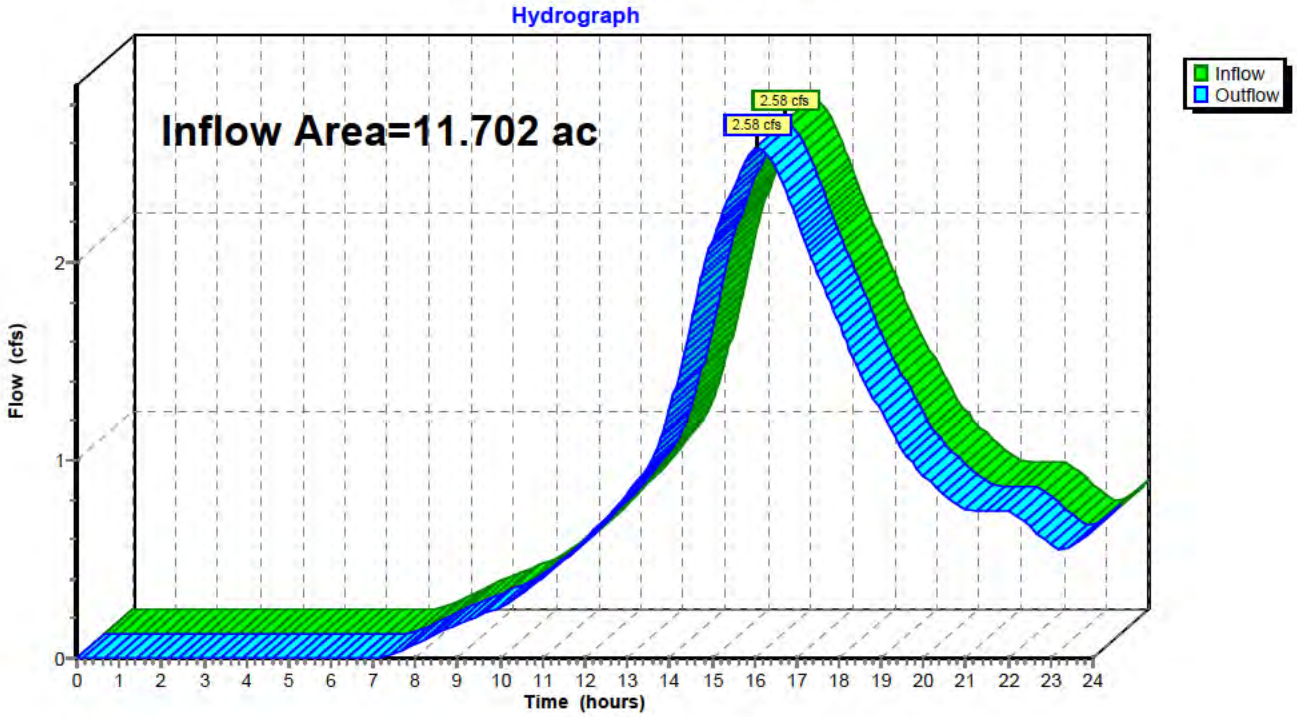
| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 1.99 | | 1.99 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 2.12 | | 2.12 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 2.32 | | 2.32 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 2.70 | | 2.70 |
| 1.00 | 0.00 | | 0.00 | 14.00 | 3.14 | | 3.14 |
| 1.25 | 0.00 | | 0.00 | 14.25 | 3.61 | | 3.61 |
| 1.50 | 0.01 | | 0.01 | 14.50 | 4.11 | | 4.11 |
| 1.75 | 0.01 | | 0.01 | 14.75 | 4.51 | | 4.51 |
| 2.00 | 0.02 | | 0.02 | 15.00 | 4.76 | | 4.76 |
| 2.25 | 0.03 | | 0.03 | 15.25 | 4.99 | | 4.99 |
| 2.50 | 0.03 | | 0.03 | 15.50 | 5.20 | | 5.20 |
| 2.75 | 0.03 | | 0.03 | 15.75 | **5.41** | | **5.41** |
| 3.00 | 0.04 | | 0.04 | 16.00 | **5.37** | | **5.37** |
| 3.25 | 0.04 | | 0.04 | 16.25 | 5.13 | | 5.13 |
| 3.50 | 0.04 | | 0.04 | 16.50 | 4.85 | | 4.85 |
| 3.75 | 0.04 | | 0.04 | 16.75 | 4.55 | | 4.55 |
| 4.00 | 0.04 | | 0.04 | 17.00 | 4.23 | | 4.23 |
| 4.25 | 0.04 | | 0.04 | 17.25 | 3.96 | | 3.96 |
| 4.50 | 0.05 | | 0.05 | 17.50 | 3.70 | | 3.70 |
| 4.75 | 0.05 | | 0.05 | 17.75 | 3.43 | | 3.43 |
| 5.00 | 0.05 | | 0.05 | 18.00 | 3.16 | | 3.16 |
| 5.25 | 0.05 | | 0.05 | 18.25 | 2.90 | | 2.90 |
| 5.50 | 0.05 | | 0.05 | 18.50 | 2.70 | | 2.70 |
| 5.75 | 0.05 | | 0.05 | 18.75 | 2.51 | | 2.51 |
| 6.00 | 0.05 | | 0.05 | 19.00 | 2.32 | | 2.32 |
| 6.25 | 0.05 | | 0.05 | 19.25 | 2.12 | | 2.12 |
| 6.50 | 0.07 | | 0.07 | 19.50 | 1.96 | | 1.96 |
| 6.75 | 0.11 | | 0.11 | 19.75 | 1.85 | | 1.85 |
| 7.00 | 0.17 | | 0.17 | 20.00 | 1.75 | | 1.75 |
| 7.25 | 0.22 | | 0.22 | 20.25 | 1.65 | | 1.65 |
| 7.50 | 0.28 | | 0.28 | 20.50 | 1.55 | | 1.55 |
| 7.75 | 0.34 | | 0.34 | 20.75 | 1.50 | | 1.50 |
| 8.00 | 0.38 | | 0.38 | 21.00 | 1.49 | | 1.49 |
| 8.25 | 0.43 | | 0.43 | 21.25 | 1.49 | | 1.49 |
| 8.50 | 0.48 | | 0.48 | 21.50 | 1.50 | | 1.50 |
| 8.75 | 0.52 | | 0.52 | 21.75 | 1.50 | | 1.50 |
| 9.00 | 0.57 | | 0.57 | 22.00 | 1.44 | | 1.44 |
| 9.25 | 0.61 | | 0.61 | 22.25 | 1.35 | | 1.35 |
| 9.50 | 0.65 | | 0.65 | 22.50 | 1.25 | | 1.25 |
| 9.75 | 0.69 | | 0.69 | 22.75 | 1.14 | | 1.14 |
| 10.00 | 0.75 | | 0.75 | 23.00 | 1.05 | | 1.05 |
| 10.25 | 0.83 | | 0.83 | 23.25 | 1.09 | | 1.09 |
| 10.50 | 0.91 | | 0.91 | 23.50 | 1.19 | | 1.19 |
| 10.75 | 1.00 | | 1.00 | 23.75 | 1.30 | | 1.30 |
| 11.00 | 1.09 | | 1.09 | 24.00 | 1.41 | | 1.41 |
| 11.25 | 1.19 | | 1.19 | | | | |
| 11.50 | 1.29 | | 1.29 | | | | |
| 11.75 | 1.40 | | 1.40 | | | | |
| 12.00 | 1.51 | | 1.51 | | | | |
| 12.25 | 1.62 | | 1.62 | | | | |
| 12.50 | 1.74 | | 1.74 | | | | |
| 12.75 | 1.86 | | 1.86 | | | | |

## Summary for Reach 4-T: PR DA 4 TOTAL

Inflow Area = 11.702 ac, 0.00% Impervious, Inflow Depth > 1.41" for 2-year event
Inflow = 2.58 cfs @ 16.08 hrs, Volume= 1.378 af
Outflow = 2.58 cfs @ 16.08 hrs, Volume= 1.378 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## Reach 4-T: PR DA 4 TOTAL



## Hydrograph for Reach 4-T: PR DA 4 TOTAL

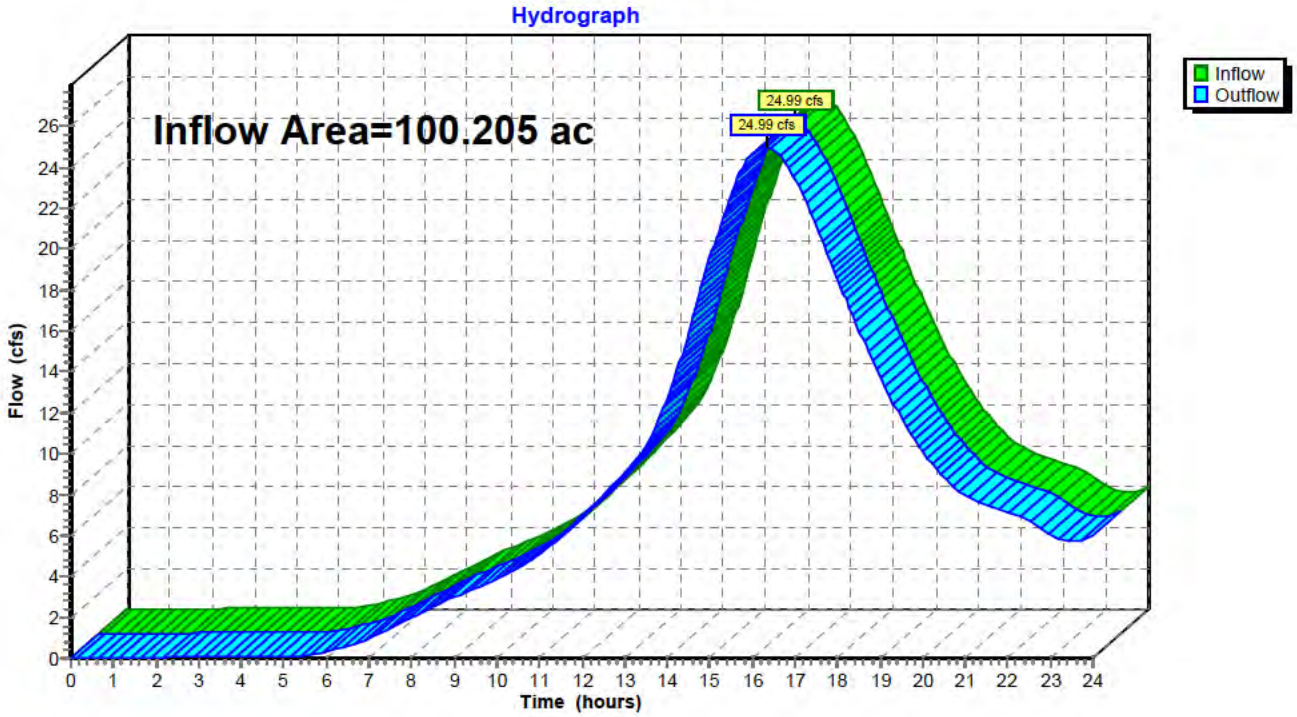
| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 0.83 | | 0.83 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 0.89 | | 0.89 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 0.96 | | 0.96 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 1.08 | | 1.08 |
| 1.00 | 0.00 | | 0.00 | 14.00 | 1.25 | | 1.25 |
| 1.25 | 0.00 | | 0.00 | 14.25 | 1.46 | | 1.46 |
| 1.50 | 0.00 | | 0.00 | 14.50 | 1.68 | | 1.68 |
| 1.75 | 0.00 | | 0.00 | 14.75 | 1.92 | | 1.92 |
| 2.00 | 0.00 | | 0.00 | 15.00 | 2.10 | | 2.10 |
| 2.25 | 0.00 | | 0.00 | 15.25 | 2.24 | | 2.24 |
| 2.50 | 0.00 | | 0.00 | 15.50 | 2.37 | | 2.37 |
| 2.75 | 0.00 | | 0.00 | 15.75 | 2.49 | | 2.49 |
| 3.00 | 0.00 | | 0.00 | 16.00 | **2.57** | | **2.57** |
| 3.25 | 0.00 | | 0.00 | 16.25 | **2.56** | | **2.56** |
| 3.50 | 0.00 | | 0.00 | 16.50 | 2.47 | | 2.47 |
| 3.75 | 0.00 | | 0.00 | 16.75 | 2.35 | | 2.35 |
| 4.00 | 0.00 | | 0.00 | 17.00 | 2.21 | | 2.21 |
| 4.25 | 0.00 | | 0.00 | 17.25 | 2.07 | | 2.07 |
| 4.50 | 0.00 | | 0.00 | 17.50 | 1.94 | | 1.94 |
| 4.75 | 0.00 | | 0.00 | 17.75 | 1.82 | | 1.82 |
| 5.00 | 0.00 | | 0.00 | 18.00 | 1.69 | | 1.69 |
| 5.25 | 0.00 | | 0.00 | 18.25 | 1.56 | | 1.56 |
| 5.50 | 0.00 | | 0.00 | 18.50 | 1.44 | | 1.44 |
| 5.75 | 0.00 | | 0.00 | 18.75 | 1.34 | | 1.34 |
| 6.00 | 0.00 | | 0.00 | 19.00 | 1.24 | | 1.24 |
| 6.25 | 0.00 | | 0.00 | 19.25 | 1.15 | | 1.15 |
| 6.50 | 0.00 | | 0.00 | 19.50 | 1.06 | | 1.06 |
| 6.75 | 0.00 | | 0.00 | 19.75 | 0.98 | | 0.98 |
| 7.00 | 0.00 | | 0.00 | 20.00 | 0.92 | | 0.92 |
| 7.25 | 0.01 | | 0.01 | 20.25 | 0.87 | | 0.87 |
| 7.50 | 0.02 | | 0.02 | 20.50 | 0.82 | | 0.82 |
| 7.75 | 0.05 | | 0.05 | 20.75 | 0.78 | | 0.78 |
| 8.00 | 0.07 | | 0.07 | 21.00 | 0.75 | | 0.75 |
| 8.25 | 0.10 | | 0.10 | 21.25 | 0.75 | | 0.75 |
| 8.50 | 0.12 | | 0.12 | 21.50 | 0.74 | | 0.74 |
| 8.75 | 0.15 | | 0.15 | 21.75 | 0.75 | | 0.75 |
| 9.00 | 0.17 | | 0.17 | 22.00 | 0.74 | | 0.74 |
| 9.25 | 0.19 | | 0.19 | 22.25 | 0.71 | | 0.71 |
| 9.50 | 0.22 | | 0.22 | 22.50 | 0.67 | | 0.67 |
| 9.75 | 0.24 | | 0.24 | 22.75 | 0.62 | | 0.62 |
| 10.00 | 0.26 | | 0.26 | 23.00 | 0.57 | | 0.57 |
| 10.25 | 0.29 | | 0.29 | 23.25 | 0.54 | | 0.54 |
| 10.50 | 0.33 | | 0.33 | 23.50 | 0.56 | | 0.56 |
| 10.75 | 0.36 | | 0.36 | 23.75 | 0.60 | | 0.60 |
| 11.00 | 0.41 | | 0.41 | 24.00 | 0.65 | | 0.65 |
| 11.25 | 0.45 | | 0.45 | | | | |
| 11.50 | 0.50 | | 0.50 | | | | |
| 11.75 | 0.55 | | 0.55 | | | | |
| 12.00 | 0.60 | | 0.60 | | | | |
| 12.25 | 0.65 | | 0.65 | | | | |
| 12.50 | 0.71 | | 0.71 | | | | |
| 12.75 | 0.77 | | 0.77 | | | | |

## Summary for Reach T: Total

Inflow Area = 100.205 ac, 1.37% Impervious, Inflow Depth > 1.77" for 2-year event
Inflow = 24.99 cfs @ 16.34 hrs, Volume= 14.740 af
Outflow = 24.99 cfs @ 16.34 hrs, Volume= 14.740 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## Reach T: Total



## Hydrograph for Reach T: Total

| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 9.07 | | 9.07 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 9.65 | | 9.65 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 10.35 | | 10.35 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 11.36 | | 11.36 |
| 1.00 | 0.00 | | 0.00 | 14.00 | 12.60 | | 12.60 |
| 1.25 | 0.00 | | 0.00 | 14.25 | 14.11 | | 14.11 |
| 1.50 | 0.01 | | 0.01 | 14.50 | 15.91 | | 15.91 |
| 1.75 | 0.02 | | 0.02 | 14.75 | 17.76 | | 17.76 |
| 2.00 | 0.03 | | 0.03 | 15.00 | 19.51 | | 19.51 |
| 2.25 | 0.04 | | 0.04 | 15.25 | 21.13 | | 21.13 |
| 2.50 | 0.05 | | 0.05 | 15.50 | 22.63 | | 22.63 |
| 2.75 | 0.05 | | 0.05 | 15.75 | 23.90 | | 23.90 |
| 3.00 | 0.05 | | 0.05 | 16.00 | 24.69 | | 24.69 |
| 3.25 | 0.06 | | 0.06 | 16.25 | **24.98** | | **24.98** |
| 3.50 | 0.06 | | 0.06 | 16.50 | **24.87** | | **24.87** |
| 3.75 | 0.06 | | 0.06 | 16.75 | 24.35 | | 24.35 |
| 4.00 | 0.06 | | 0.06 | 17.00 | 23.45 | | 23.45 |
| 4.25 | 0.07 | | 0.07 | 17.25 | 22.38 | | 22.38 |
| 4.50 | 0.07 | | 0.07 | 17.50 | 21.16 | | 21.16 |
| 4.75 | 0.07 | | 0.07 | 17.75 | 19.90 | | 19.90 |
| 5.00 | 0.08 | | 0.08 | 18.00 | 18.58 | | 18.58 |
| 5.25 | 0.10 | | 0.10 | 18.25 | 17.29 | | 17.29 |
| 5.50 | 0.15 | | 0.15 | 18.50 | 16.07 | | 16.07 |
| 5.75 | 0.23 | | 0.23 | 18.75 | 14.90 | | 14.90 |
| 6.00 | 0.33 | | 0.33 | 19.00 | 13.80 | | 13.80 |
| 6.25 | 0.44 | | 0.44 | 19.25 | 12.73 | | 12.73 |
| 6.50 | 0.58 | | 0.58 | 19.50 | 11.77 | | 11.77 |
| 6.75 | 0.75 | | 0.75 | 19.75 | 10.91 | | 10.91 |
| 7.00 | 0.95 | | 0.95 | 20.00 | 10.15 | | 10.15 |
| 7.25 | 1.18 | | 1.18 | 20.25 | 9.46 | | 9.46 |
| 7.50 | 1.44 | | 1.44 | 20.50 | 8.84 | | 8.84 |
| 7.75 | 1.71 | | 1.71 | 20.75 | 8.34 | | 8.34 |
| 8.00 | 1.99 | | 1.99 | 21.00 | 7.96 | | 7.96 |
| 8.25 | 2.26 | | 2.26 | 21.25 | 7.68 | | 7.68 |
| 8.50 | 2.52 | | 2.52 | 21.50 | 7.47 | | 7.47 |
| 8.75 | 2.76 | | 2.76 | 21.75 | 7.34 | | 7.34 |
| 9.00 | 2.99 | | 2.99 | 22.00 | 7.17 | | 7.17 |
| 9.25 | 3.21 | | 3.21 | 22.25 | 6.97 | | 6.97 |
| 9.50 | 3.41 | | 3.41 | 22.50 | 6.70 | | 6.70 |
| 9.75 | 3.62 | | 3.62 | 22.75 | 6.37 | | 6.37 |
| 10.00 | 3.84 | | 3.84 | 23.00 | 6.02 | | 6.02 |
| 10.25 | 4.10 | | 4.10 | 23.25 | 5.81 | | 5.81 |
| 10.50 | 4.39 | | 4.39 | 23.50 | 5.74 | | 5.74 |
| 10.75 | 4.72 | | 4.72 | 23.75 | 5.78 | | 5.78 |
| 11.00 | 5.10 | | 5.10 | 24.00 | 5.97 | | 5.97 |
| 11.25 | 5.51 | | 5.51 | | | | |
| 11.50 | 5.96 | | 5.96 | | | | |
| 11.75 | 6.43 | | 6.43 | | | | |
| 12.00 | 6.92 | | 6.92 | | | | |
| 12.25 | 7.43 | | 7.43 | | | | |
| 12.50 | 7.96 | | 7.96 | | | | |
| 12.75 | 8.51 | | 8.51 | | | | |

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment1-D: PR DA 1** Runoff Area=0.323 ac 100.00% Impervious Runoff Depth>8.30"
Flow Length=459' Tc=9.8 min CN=98 Runoff=0.30 cfs 0.223 af

**Subcatchment1-U: PR DA 1** Runoff Area=3.806 ac 2.26% Impervious Runoff Depth>6.50"
Flow Length=459' Tc=9.8 min CN=83 Runoff=3.30 cfs 2.061 af

**Subcatchment2-U: PR DA 2** Runoff Area=62.154 ac 0.50% Impervious Runoff Depth>6.67"
Flow Length=3,331' Tc=78.0 min CN=86 Runoff=52.41 cfs 34.569 af

**Subcatchment3-D: PR DA 3** Runoff Area=0.651 ac 100.00% Impervious Runoff Depth>8.28"
Flow Length=1,305' Tc=17.6 min CN=98 Runoff=0.61 cfs 0.449 af

**Subcatchment3-U: PR DA 3** Runoff Area=21.569 ac 0.00% Impervious Runoff Depth>6.23"
Flow Length=1,305' Tc=17.6 min CN=81 Runoff=18.22 cfs 11.204 af

**Subcatchment4-U: PR DA 4** Runoff Area=11.702 ac 0.00% Impervious Runoff Depth>5.95"
Flow Length=1,661' Tc=33.8 min CN=79 Runoff=9.54 cfs 5.800 af

**Reach 1-T: PR DA 1 TOTAL** Inflow=3.60 cfs 2.284 af
Outflow=3.60 cfs 2.284 af

**Reach 2-T: PR DA 2 TOTAL** Inflow=52.41 cfs 34.569 af
Outflow=52.41 cfs 34.569 af

**Reach 3-T: PR DA 3 TOTAL** Inflow=18.83 cfs 11.653 af
Outflow=18.83 cfs 11.653 af

**Reach 4-T: PR DA 4 TOTAL** Inflow=9.54 cfs 5.800 af
Outflow=9.54 cfs 5.800 af

**Reach T: Total** Inflow=82.12 cfs 54.306 af
Outflow=82.12 cfs 54.306 af

**Total Runoff Area = 100.205 ac Runoff Volume = 54.306 af Average Runoff Depth = 6.50"**
**98.63% Pervious = 98.832 ac 1.37% Impervious = 1.373 ac**

## Summary for Subcatchment 1-D: PR DA 1

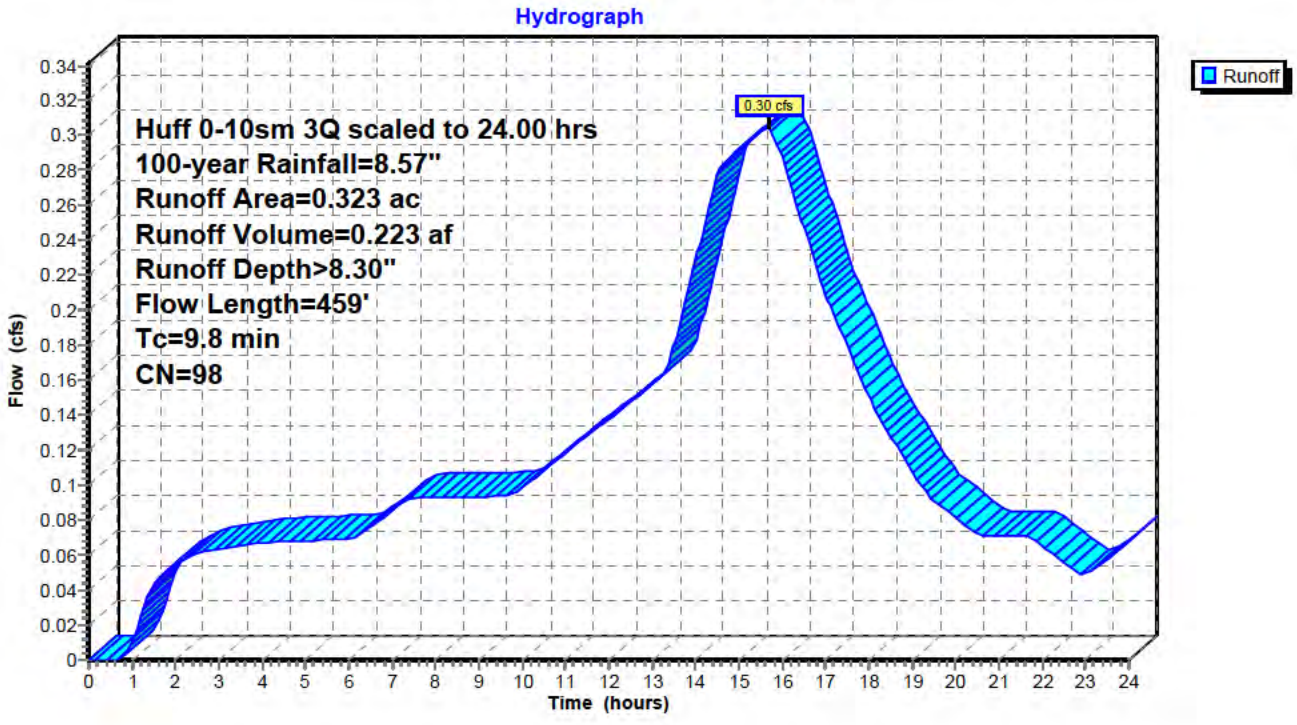
Runoff = 0.30 cfs @ 15.69 hrs, Volume= 0.223 af, Depth> 8.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.323 | 98 | Impervious Area |
| | 0.323 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.0 | 100 | 0.0282 | 0.42 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 1.9 | 171 | 0.0290 | 1.53 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 0.2 | 16 | 0.0380 | 1.36 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 3.7 | 172 | 0.0122 | 0.77 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 9.8 | 459 | Total | | | |

## Subcatchment 1-D: PR DA 1



## Hydrograph for Subcatchment 1-D: PR DA 1

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 3.51 | 3.28 | 0.16 |
| 0.25 | 0.01 | 0.00 | 0.00 | 13.25 | 3.64 | 3.40 | 0.16 |
| 0.50 | 0.02 | 0.00 | 0.00 | 13.50 | 3.78 | 3.54 | 0.18 |
| 0.75 | 0.05 | 0.00 | 0.00 | 13.75 | 3.94 | 3.70 | 0.20 |
| 1.00 | 0.09 | 0.01 | 0.01 | 14.00 | 4.11 | 3.88 | 0.23 |
| 1.25 | 0.14 | 0.03 | 0.03 | 14.25 | 4.31 | 4.07 | 0.25 |
| 1.50 | 0.20 | 0.07 | 0.04 | 14.50 | 4.52 | 4.29 | 0.28 |
| 1.75 | 0.25 | 0.11 | 0.05 | 14.75 | 4.75 | 4.51 | 0.29 |
| 2.00 | 0.30 | 0.15 | 0.06 | 15.00 | 4.97 | 4.73 | 0.29 |
| 2.25 | 0.36 | 0.19 | 0.06 | 15.25 | 5.20 | 4.96 | 0.30 |
| 2.50 | 0.41 | 0.24 | 0.06 | 15.50 | 5.43 | 5.19 | **0.30** |
| 2.75 | 0.47 | 0.29 | 0.06 | 15.75 | 5.66 | 5.43 | **0.30** |
| 3.00 | 0.52 | 0.34 | 0.06 | 16.00 | 5.88 | 5.64 | 0.29 |
| 3.25 | 0.58 | 0.39 | 0.06 | 16.25 | 6.09 | 5.85 | 0.27 |
| 3.50 | 0.63 | 0.44 | 0.07 | 16.50 | 6.28 | 6.04 | 0.25 |
| 3.75 | 0.69 | 0.49 | 0.07 | 16.75 | 6.45 | 6.21 | 0.23 |
| 4.00 | 0.74 | 0.54 | 0.07 | 17.00 | 6.61 | 6.37 | 0.21 |
| 4.25 | 0.79 | 0.59 | 0.07 | 17.25 | 6.76 | 6.52 | 0.19 |
| 4.50 | 0.85 | 0.64 | 0.07 | 17.50 | 6.89 | 6.66 | 0.18 |
| 4.75 | 0.90 | 0.70 | 0.07 | 17.75 | 7.02 | 6.78 | 0.17 |
| 5.00 | 0.96 | 0.75 | 0.07 | 18.00 | 7.13 | 6.90 | 0.15 |
| 5.25 | 1.01 | 0.80 | 0.07 | 18.25 | 7.24 | 7.00 | 0.14 |
| 5.50 | 1.07 | 0.85 | 0.07 | 18.50 | 7.34 | 7.10 | 0.13 |
| 5.75 | 1.12 | 0.91 | 0.07 | 18.75 | 7.43 | 7.19 | 0.12 |
| 6.00 | 1.17 | 0.96 | 0.07 | 19.00 | 7.51 | 7.27 | 0.11 |
| 6.25 | 1.23 | 1.02 | 0.07 | 19.25 | 7.58 | 7.34 | 0.10 |
| 6.50 | 1.29 | 1.07 | 0.08 | 19.50 | 7.65 | 7.41 | 0.09 |
| 6.75 | 1.35 | 1.14 | 0.08 | 19.75 | 7.72 | 7.48 | 0.09 |
| 7.00 | 1.42 | 1.20 | 0.09 | 20.00 | 7.78 | 7.54 | 0.08 |
| 7.25 | 1.49 | 1.27 | 0.09 | 20.25 | 7.84 | 7.60 | 0.08 |
| 7.50 | 1.57 | 1.35 | 0.09 | 20.50 | 7.90 | 7.66 | 0.07 |
| 7.75 | 1.64 | 1.42 | 0.09 | 20.75 | 7.95 | 7.71 | 0.07 |
| 8.00 | 1.71 | 1.49 | 0.09 | 21.00 | 8.00 | 7.76 | 0.07 |
| 8.25 | 1.78 | 1.56 | 0.09 | 21.25 | 8.06 | 7.82 | 0.07 |
| 8.50 | 1.86 | 1.63 | 0.09 | 21.50 | 8.11 | 7.87 | 0.07 |
| 8.75 | 1.93 | 1.70 | 0.09 | 21.75 | 8.17 | 7.93 | 0.07 |
| 9.00 | 2.00 | 1.78 | 0.09 | 22.00 | 8.22 | 7.98 | 0.07 |
| 9.25 | 2.07 | 1.85 | 0.09 | 22.25 | 8.26 | 8.02 | 0.06 |
| 9.50 | 2.15 | 1.92 | 0.09 | 22.50 | 8.31 | 8.07 | 0.06 |
| 9.75 | 2.22 | 1.99 | 0.09 | 22.75 | 8.35 | 8.11 | 0.05 |
| 10.00 | 2.30 | 2.07 | 0.10 | 23.00 | 8.38 | 8.14 | 0.05 |
| 10.25 | 2.38 | 2.15 | 0.10 | 23.25 | 8.42 | 8.18 | 0.05 |
| 10.50 | 2.46 | 2.23 | 0.11 | 23.50 | 8.47 | 8.23 | 0.06 |
| 10.75 | 2.55 | 2.32 | 0.11 | 23.75 | 8.52 | 8.28 | 0.06 |
| 11.00 | 2.64 | 2.41 | 0.12 | 24.00 | **8.57** | **8.33** | 0.07 |
| 11.25 | 2.74 | 2.51 | 0.12 | | | | |
| 11.50 | 2.84 | 2.60 | 0.13 | | | | |
| 11.75 | 2.94 | 2.71 | 0.13 | | | | |
| 12.00 | 3.05 | 2.81 | 0.14 | | | | |
| 12.25 | 3.16 | 2.92 | 0.14 | | | | |
| 12.50 | 3.27 | 3.04 | 0.15 | | | | |
| 12.75 | 3.39 | 3.16 | 0.15 | | | | |

## Summary for Subcatchment 1-U: PR DA 1

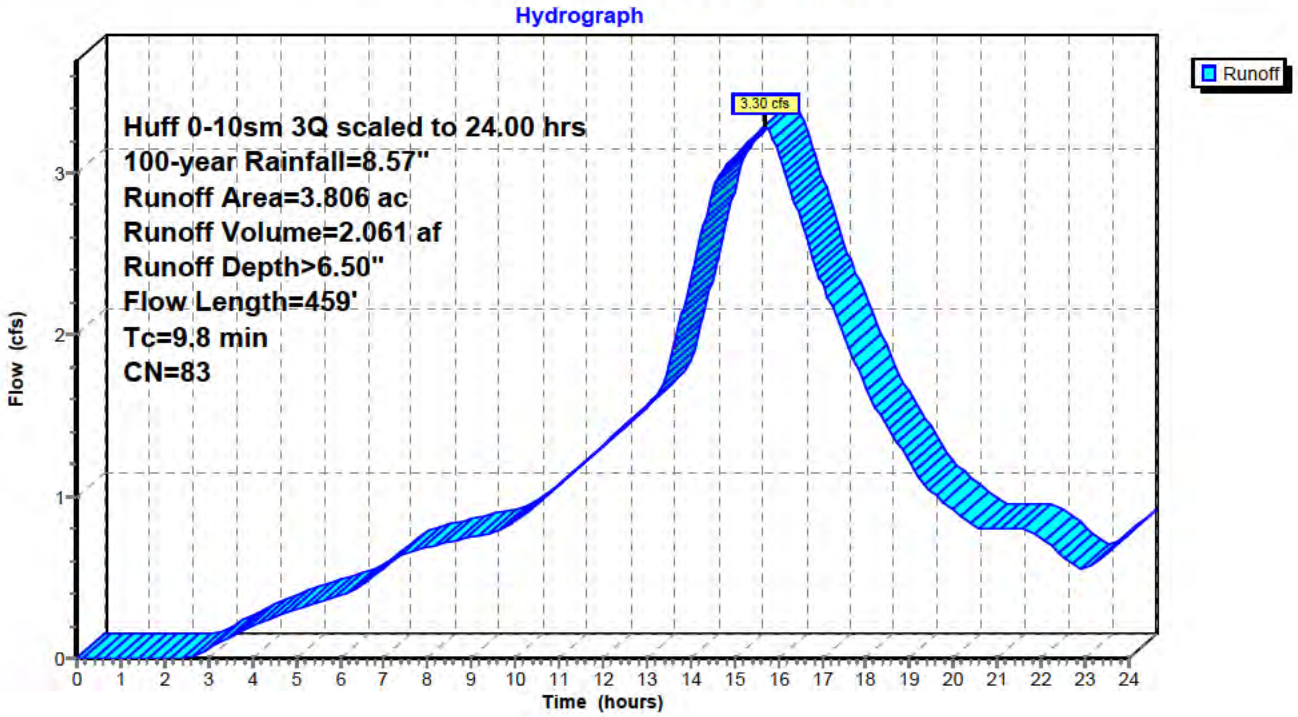
Runoff = 3.30 cfs @ 15.70 hrs, Volume= 2.061 af, Depth> 6.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 0.000 | 89 | Row crops, straight row, Good, HSG D |
| | 0.753 | 89 | Row crops, straight row, Good, HSG D |
| | 0.711 | 80 | Pasture/grassland/range, Good, HSG D |
| | 1.342 | 85 | Row crops, straight row, Good, HSG C |
| | 0.914 | 74 | Pasture/grassland/range, Good, HSG C |
| * | 0.086 | 98 | Impervious Area |
| | 3.806 | 83 | Weighted Average |
| | 3.720 | | 97.74% Pervious Area |
| | 0.086 | | 2.26% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.0 | 100 | 0.0282 | 0.42 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 1.9 | 171 | 0.0290 | 1.53 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 0.2 | 16 | 0.0380 | 1.36 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 3.7 | 172 | 0.0122 | 0.77 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 9.8 | 459 | Total | | | |

## Subcatchment 1-U: PR DA 1



## Hydrograph for Subcatchment 1-U: PR DA 1

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 3.51 | 1.87 | 1.56 |
| 0.25 | 0.01 | 0.00 | 0.00 | 13.25 | 3.64 | 1.97 | 1.63 |
| 0.50 | 0.02 | 0.00 | 0.00 | 13.50 | 3.78 | 2.09 | 1.81 |
| 0.75 | 0.05 | 0.00 | 0.00 | 13.75 | 3.94 | 2.23 | 2.07 |
| 1.00 | 0.09 | 0.00 | 0.00 | 14.00 | 4.11 | 2.38 | 2.34 |
| 1.25 | 0.14 | 0.00 | 0.00 | 14.25 | 4.31 | 2.56 | 2.62 |
| 1.50 | 0.20 | 0.00 | 0.00 | 14.50 | 4.52 | 2.75 | 2.90 |
| 1.75 | 0.25 | 0.00 | 0.00 | 14.75 | 4.75 | 2.94 | 3.02 |
| 2.00 | 0.30 | 0.00 | 0.00 | 15.00 | 4.97 | 3.15 | 3.10 |
| 2.25 | 0.36 | 0.00 | 0.00 | 15.25 | 5.20 | 3.35 | 3.17 |
| 2.50 | 0.41 | 0.00 | 0.00 | 15.50 | 5.43 | 3.57 | **3.25** |
| 2.75 | 0.47 | 0.00 | 0.02 | 15.75 | 5.66 | 3.78 | **3.29** |
| 3.00 | 0.52 | 0.01 | 0.06 | 16.00 | 5.88 | 3.98 | 3.13 |
| 3.25 | 0.58 | 0.01 | 0.10 | 16.25 | 6.09 | 4.17 | 2.93 |
| 3.50 | 0.63 | 0.02 | 0.13 | 16.50 | 6.28 | 4.35 | 2.72 |
| 3.75 | 0.69 | 0.03 | 0.17 | 16.75 | 6.45 | 4.51 | 2.51 |
| 4.00 | 0.74 | 0.05 | 0.20 | 17.00 | 6.61 | 4.66 | 2.32 |
| 4.25 | 0.79 | 0.06 | 0.23 | 17.25 | 6.76 | 4.80 | 2.16 |
| 4.50 | 0.85 | 0.08 | 0.25 | 17.50 | 6.89 | 4.93 | 2.00 |
| 4.75 | 0.90 | 0.10 | 0.28 | 17.75 | 7.02 | 5.05 | 1.84 |
| 5.00 | 0.96 | 0.12 | 0.30 | 18.00 | 7.13 | 5.15 | 1.68 |
| 5.25 | 1.01 | 0.14 | 0.32 | 18.25 | 7.24 | 5.25 | 1.54 |
| 5.50 | 1.07 | 0.16 | 0.34 | 18.50 | 7.34 | 5.35 | 1.43 |
| 5.75 | 1.12 | 0.18 | 0.36 | 18.75 | 7.43 | 5.43 | 1.32 |
| 6.00 | 1.17 | 0.21 | 0.38 | 19.00 | 7.51 | 5.51 | 1.21 |
| 6.25 | 1.23 | 0.24 | 0.41 | 19.25 | 7.58 | 5.58 | 1.10 |
| 6.50 | 1.29 | 0.27 | 0.46 | 19.50 | 7.65 | 5.65 | 1.03 |
| 6.75 | 1.35 | 0.30 | 0.51 | 19.75 | 7.72 | 5.71 | 0.97 |
| 7.00 | 1.42 | 0.34 | 0.56 | 20.00 | 7.78 | 5.77 | 0.92 |
| 7.25 | 1.49 | 0.38 | 0.61 | 20.25 | 7.84 | 5.83 | 0.86 |
| 7.50 | 1.57 | 0.42 | 0.65 | 20.50 | 7.90 | 5.88 | 0.81 |
| 7.75 | 1.64 | 0.46 | 0.67 | 20.75 | 7.95 | 5.93 | 0.80 |
| 8.00 | 1.71 | 0.51 | 0.69 | 21.00 | 8.00 | 5.98 | 0.80 |
| 8.25 | 1.78 | 0.55 | 0.70 | 21.25 | 8.06 | 6.03 | 0.80 |
| 8.50 | 1.86 | 0.60 | 0.72 | 21.50 | 8.11 | 6.09 | 0.80 |
| 8.75 | 1.93 | 0.65 | 0.74 | 21.75 | 8.17 | 6.14 | 0.79 |
| 9.00 | 2.00 | 0.70 | 0.75 | 22.00 | 8.22 | 6.18 | 0.74 |
| 9.25 | 2.07 | 0.75 | 0.77 | 22.25 | 8.26 | 6.23 | 0.69 |
| 9.50 | 2.15 | 0.80 | 0.78 | 22.50 | 8.31 | 6.27 | 0.63 |
| 9.75 | 2.22 | 0.85 | 0.80 | 22.75 | 8.35 | 6.31 | 0.58 |
| 10.00 | 2.30 | 0.90 | 0.85 | 23.00 | 8.38 | 6.34 | 0.55 |
| 10.25 | 2.38 | 0.96 | 0.90 | 23.25 | 8.42 | 6.38 | 0.60 |
| 10.50 | 2.46 | 1.03 | 0.96 | 23.50 | 8.47 | 6.43 | 0.66 |
| 10.75 | 2.55 | 1.09 | 1.01 | 23.75 | 8.52 | 6.47 | 0.71 |
| 11.00 | 2.64 | 1.16 | 1.07 | 24.00 | **8.57** | **6.52** | 0.77 |
| 11.25 | 2.74 | 1.24 | 1.13 | | | | |
| 11.50 | 2.84 | 1.32 | 1.19 | | | | |
| 11.75 | 2.94 | 1.40 | 1.25 | | | | |
| 12.00 | 3.05 | 1.48 | 1.31 | | | | |
| 12.25 | 3.16 | 1.57 | 1.37 | | | | |
| 12.50 | 3.27 | 1.67 | 1.44 | | | | |
| 12.75 | 3.39 | 1.77 | 1.50 | | | | |

## Summary for Subcatchment 2-U: PR DA 2

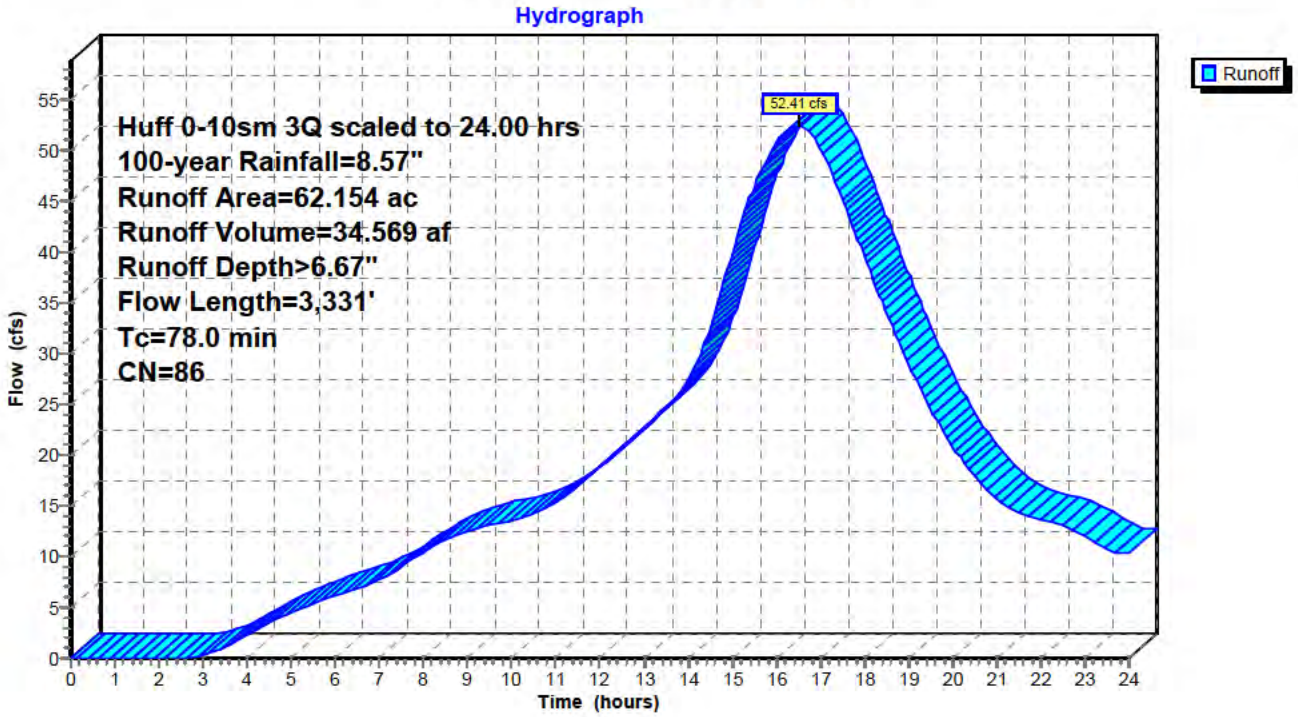
Runoff = 52.41 cfs @ 16.53 hrs, Volume= 34.569 af, Depth> 6.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 11.052 | 89 | Row crops, straight row, Good, HSG D |
| | 2.151 | 80 | Pasture/grassland/range, Good, HSG D |
| | 0.061 | 89 | Row crops, straight row, Good, HSG D |
| | 10.906 | 89 | Row crops, straight row, Good, HSG D |
| | 8.457 | 80 | Pasture/grassland/range, Good, HSG D |
| | 9.982 | 89 | Row crops, straight row, Good, HSG D |
| | 0.038 | 80 | Pasture/grassland/range, Good, HSG D |
| | 14.843 | 85 | Row crops, straight row, Good, HSG C |
| | 2.519 | 74 | Pasture/grassland/range, Good, HSG C |
| | 0.830 | 85 | Row crops, straight row, Good, HSG C |
| | 1.002 | 74 | Pasture/grassland/range, Good, HSG C |
| * | 0.313 | 98 | Impervious Area |
| | 62.154 | 86 | Weighted Average |
| | 61.841 | | 99.50% Pervious Area |
| | 0.313 | | 0.50% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.4 | 100 | 0.0421 | 0.49 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 1.5 | 141 | 0.0306 | 1.57 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 42.0 | 1,988 | 0.0077 | 0.79 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 31.1 | 1,102 | 0.0071 | 0.59 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 78.0 | 3,331 | Total | | | |

## Subcatchment 2-U: PR DA 2



## Hydrograph for Subcatchment 2-U: PR DA 2

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 3.51 | 2.11 | 22.63 |
| 0.25 | 0.01 | 0.00 | 0.00 | 13.25 | 3.64 | 2.22 | 23.65 |
| 0.50 | 0.02 | 0.00 | 0.00 | 13.50 | 3.78 | 2.34 | 24.64 |
| 0.75 | 0.05 | 0.00 | 0.00 | 13.75 | 3.94 | 2.49 | 25.81 |
| 1.00 | 0.09 | 0.00 | 0.00 | 14.00 | 4.11 | 2.65 | 27.34 |
| 1.25 | 0.14 | 0.00 | 0.00 | 14.25 | 4.31 | 2.83 | 29.57 |
| 1.50 | 0.20 | 0.00 | 0.00 | 14.50 | 4.52 | 3.03 | 32.52 |
| 1.75 | 0.25 | 0.00 | 0.00 | 14.75 | 4.75 | 3.23 | 36.02 |
| 2.00 | 0.30 | 0.00 | 0.00 | 15.00 | 4.97 | 3.44 | 39.82 |
| 2.25 | 0.36 | 0.00 | 0.00 | 15.25 | 5.20 | 3.65 | 43.33 |
| 2.50 | 0.41 | 0.00 | 0.01 | 15.50 | 5.43 | 3.87 | 46.39 |
| 2.75 | 0.47 | 0.01 | 0.08 | 15.75 | 5.66 | 4.09 | 48.76 |
| 3.00 | 0.52 | 0.02 | 0.27 | 16.00 | 5.88 | 4.30 | 50.68 |
| 3.25 | 0.58 | 0.03 | 0.63 | 16.25 | 6.09 | 4.49 | 51.98 |
| 3.50 | 0.63 | 0.05 | 1.12 | 16.50 | 6.28 | 4.67 | **52.39** |
| 3.75 | 0.69 | 0.07 | 1.69 | 16.75 | 6.45 | 4.84 | **51.78** |
| 4.00 | 0.74 | 0.08 | 2.28 | 17.00 | 6.61 | 4.99 | 50.13 |
| 4.25 | 0.79 | 0.10 | 2.87 | 17.25 | 6.76 | 5.13 | 47.87 |
| 4.50 | 0.85 | 0.13 | 3.43 | 17.50 | 6.89 | 5.26 | 45.13 |
| 4.75 | 0.90 | 0.15 | 3.97 | 17.75 | 7.02 | 5.38 | 42.35 |
| 5.00 | 0.96 | 0.18 | 4.48 | 18.00 | 7.13 | 5.50 | 39.50 |
| 5.25 | 1.01 | 0.20 | 4.95 | 18.25 | 7.24 | 5.60 | 36.73 |
| 5.50 | 1.07 | 0.23 | 5.39 | 18.50 | 7.34 | 5.69 | 34.01 |
| 5.75 | 1.12 | 0.26 | 5.80 | 18.75 | 7.43 | 5.78 | 31.37 |
| 6.00 | 1.17 | 0.29 | 6.19 | 19.00 | 7.51 | 5.86 | 28.95 |
| 6.25 | 1.23 | 0.32 | 6.54 | 19.25 | 7.58 | 5.93 | 26.67 |
| 6.50 | 1.29 | 0.36 | 6.89 | 19.50 | 7.65 | 6.00 | 24.61 |
| 6.75 | 1.35 | 0.40 | 7.26 | 19.75 | 7.72 | 6.06 | 22.63 |
| 7.00 | 1.42 | 0.44 | 7.74 | 20.00 | 7.78 | 6.12 | 20.87 |
| 7.25 | 1.49 | 0.49 | 8.32 | 20.25 | 7.84 | 6.18 | 19.29 |
| 7.50 | 1.57 | 0.54 | 9.01 | 20.50 | 7.90 | 6.23 | 17.94 |
| 7.75 | 1.64 | 0.59 | 9.75 | 20.75 | 7.95 | 6.28 | 16.76 |
| 8.00 | 1.71 | 0.64 | 10.48 | 21.00 | 8.00 | 6.34 | 15.72 |
| 8.25 | 1.78 | 0.69 | 11.13 | 21.25 | 8.06 | 6.39 | 14.89 |
| 8.50 | 1.86 | 0.74 | 11.66 | 21.50 | 8.11 | 6.44 | 14.26 |
| 8.75 | 1.93 | 0.80 | 12.11 | 21.75 | 8.17 | 6.49 | 13.87 |
| 9.00 | 2.00 | 0.85 | 12.46 | 22.00 | 8.22 | 6.54 | 13.60 |
| 9.25 | 2.07 | 0.91 | 12.79 | 22.25 | 8.26 | 6.59 | 13.39 |
| 9.50 | 2.15 | 0.96 | 13.06 | 22.50 | 8.31 | 6.63 | 13.08 |
| 9.75 | 2.22 | 1.02 | 13.31 | 22.75 | 8.35 | 6.67 | 12.62 |
| 10.00 | 2.30 | 1.08 | 13.55 | 23.00 | 8.38 | 6.70 | 12.02 |
| 10.25 | 2.38 | 1.14 | 13.81 | 23.25 | 8.42 | 6.74 | 11.32 |
| 10.50 | 2.46 | 1.21 | 14.19 | 23.50 | 8.47 | 6.79 | 10.71 |
| 10.75 | 2.55 | 1.28 | 14.68 | 23.75 | 8.52 | 6.83 | 10.34 |
| 11.00 | 2.64 | 1.36 | 15.36 | 24.00 | **8.57** | **6.88** | 10.36 |
| 11.25 | 2.74 | 1.44 | 16.11 | | | | |
| 11.50 | 2.84 | 1.52 | 16.96 | | | | |
| 11.75 | 2.94 | 1.61 | 17.84 | | | | |
| 12.00 | 3.05 | 1.70 | 18.76 | | | | |
| 12.25 | 3.16 | 1.80 | 19.71 | | | | |
| 12.50 | 3.27 | 1.90 | 20.67 | | | | |
| 12.75 | 3.39 | 2.00 | 21.66 | | | | |

## Summary for Subcatchment 3-D: PR DA 3

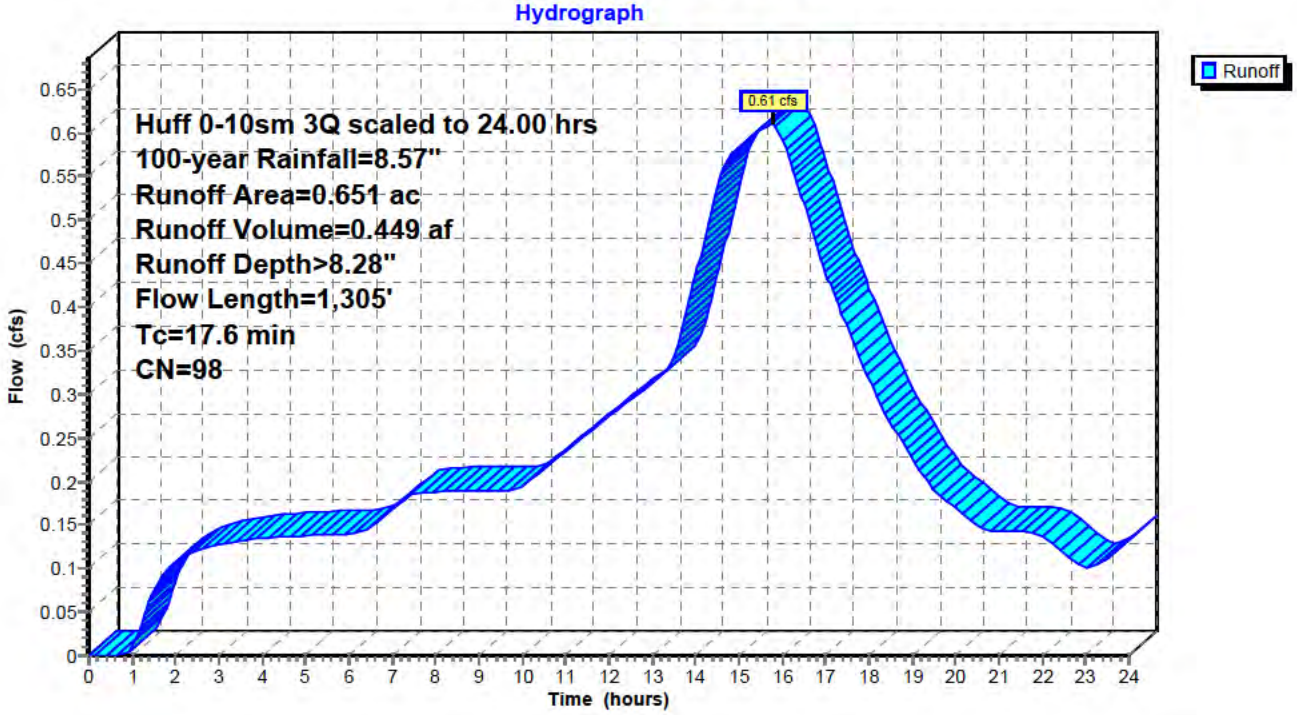
Runoff = 0.61 cfs @ 15.77 hrs, Volume= 0.449 af, Depth> 8.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.651 | 98 | Impervious Area |
| | 0.651 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0081 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 0.6 | 37 | 0.0151 | 1.11 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 1.8 | 758 | 0.0141 | 7.10 | 71.03 | **Channel Flow,** Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight |
| 0.3 | 38 | 0.0146 | 2.45 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 8.3 | 372 | 0.0113 | 0.74 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 17.6 | 1,305 | Total | | | |

## Subcatchment 3-D: PR DA 3



## Hydrograph for Subcatchment 3-D: PR DA 3

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 3.51 | 3.28 | 0.31 |
| 0.25 | 0.01 | 0.00 | 0.00 | 13.25 | 3.64 | 3.40 | 0.32 |
| 0.50 | 0.02 | 0.00 | 0.00 | 13.50 | 3.78 | 3.54 | 0.34 |
| 0.75 | 0.05 | 0.00 | 0.00 | 13.75 | 3.94 | 3.70 | 0.39 |
| 1.00 | 0.09 | 0.01 | 0.01 | 14.00 | 4.11 | 3.88 | 0.44 |
| 1.25 | 0.14 | 0.03 | 0.04 | 14.25 | 4.31 | 4.07 | 0.49 |
| 1.50 | 0.20 | 0.07 | 0.07 | 14.50 | 4.52 | 4.29 | 0.54 |
| 1.75 | 0.25 | 0.11 | 0.09 | 14.75 | 4.75 | 4.51 | 0.57 |
| 2.00 | 0.30 | 0.15 | 0.11 | 15.00 | 4.97 | 4.73 | 0.58 |
| 2.25 | 0.36 | 0.19 | 0.11 | 15.25 | 5.20 | 4.96 | 0.59 |
| 2.50 | 0.41 | 0.24 | 0.12 | 15.50 | 5.43 | 5.19 | 0.60 |
| 2.75 | 0.47 | 0.29 | 0.12 | 15.75 | 5.66 | 5.43 | **0.61** |
| 3.00 | 0.52 | 0.34 | 0.13 | 16.00 | 5.88 | 5.64 | 0.59 |
| 3.25 | 0.58 | 0.39 | 0.13 | 16.25 | 6.09 | 5.85 | 0.56 |
| 3.50 | 0.63 | 0.44 | 0.13 | 16.50 | 6.28 | 6.04 | 0.52 |
| 3.75 | 0.69 | 0.49 | 0.13 | 16.75 | 6.45 | 6.21 | 0.48 |
| 4.00 | 0.74 | 0.54 | 0.13 | 17.00 | 6.61 | 6.37 | 0.44 |
| 4.25 | 0.79 | 0.59 | 0.14 | 17.25 | 6.76 | 6.52 | 0.41 |
| 4.50 | 0.85 | 0.64 | 0.14 | 17.50 | 6.89 | 6.66 | 0.38 |
| 4.75 | 0.90 | 0.70 | 0.14 | 17.75 | 7.02 | 6.78 | 0.35 |
| 5.00 | 0.96 | 0.75 | 0.14 | 18.00 | 7.13 | 6.90 | 0.32 |
| 5.25 | 1.01 | 0.80 | 0.14 | 18.25 | 7.24 | 7.00 | 0.29 |
| 5.50 | 1.07 | 0.85 | 0.14 | 18.50 | 7.34 | 7.10 | 0.27 |
| 5.75 | 1.12 | 0.91 | 0.14 | 18.75 | 7.43 | 7.19 | 0.25 |
| 6.00 | 1.17 | 0.96 | 0.14 | 19.00 | 7.51 | 7.27 | 0.23 |
| 6.25 | 1.23 | 1.02 | 0.14 | 19.25 | 7.58 | 7.34 | 0.21 |
| 6.50 | 1.29 | 1.07 | 0.15 | 19.50 | 7.65 | 7.41 | 0.19 |
| 6.75 | 1.35 | 1.14 | 0.16 | 19.75 | 7.72 | 7.48 | 0.18 |
| 7.00 | 1.42 | 1.20 | 0.17 | 20.00 | 7.78 | 7.54 | 0.17 |
| 7.25 | 1.49 | 1.27 | 0.18 | 20.25 | 7.84 | 7.60 | 0.16 |
| 7.50 | 1.57 | 1.35 | 0.19 | 20.50 | 7.90 | 7.66 | 0.15 |
| 7.75 | 1.64 | 1.42 | 0.19 | 20.75 | 7.95 | 7.71 | 0.14 |
| 8.00 | 1.71 | 1.49 | 0.19 | 21.00 | 8.00 | 7.76 | 0.14 |
| 8.25 | 1.78 | 1.56 | 0.19 | 21.25 | 8.06 | 7.82 | 0.14 |
| 8.50 | 1.86 | 1.63 | 0.19 | 21.50 | 8.11 | 7.87 | 0.14 |
| 8.75 | 1.93 | 1.70 | 0.19 | 21.75 | 8.17 | 7.93 | 0.14 |
| 9.00 | 2.00 | 1.78 | 0.19 | 22.00 | 8.22 | 7.98 | 0.14 |
| 9.25 | 2.07 | 1.85 | 0.19 | 22.25 | 8.26 | 8.02 | 0.13 |
| 9.50 | 2.15 | 1.92 | 0.19 | 22.50 | 8.31 | 8.07 | 0.12 |
| 9.75 | 2.22 | 1.99 | 0.19 | 22.75 | 8.35 | 8.11 | 0.11 |
| 10.00 | 2.30 | 2.07 | 0.19 | 23.00 | 8.38 | 8.14 | 0.10 |
| 10.25 | 2.38 | 2.15 | 0.20 | 23.25 | 8.42 | 8.18 | 0.10 |
| 10.50 | 2.46 | 2.23 | 0.21 | 23.50 | 8.47 | 8.23 | 0.11 |
| 10.75 | 2.55 | 2.32 | 0.22 | 23.75 | 8.52 | 8.28 | 0.12 |
| 11.00 | 2.64 | 2.41 | 0.23 | 24.00 | **8.57** | **8.33** | 0.13 |
| 11.25 | 2.74 | 2.51 | 0.24 | | | | |
| 11.50 | 2.84 | 2.60 | 0.25 | | | | |
| 11.75 | 2.94 | 2.71 | 0.26 | | | | |
| 12.00 | 3.05 | 2.81 | 0.27 | | | | |
| 12.25 | 3.16 | 2.92 | 0.28 | | | | |
| 12.50 | 3.27 | 3.04 | 0.29 | | | | |
| 12.75 | 3.39 | 3.16 | 0.30 | | | | |

## Summary for Subcatchment 3-U: PR DA 3

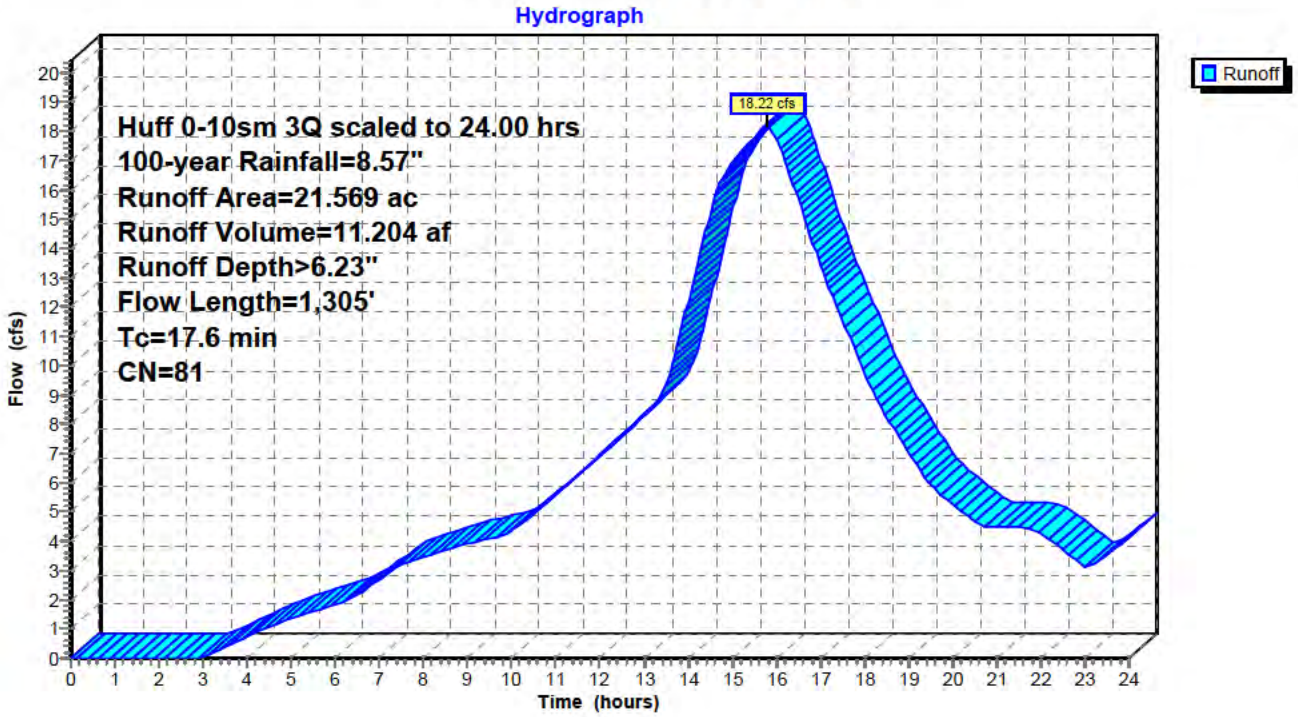
Runoff = 18.22 cfs @ 15.79 hrs, Volume= 11.204 af, Depth> 6.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

| Area (ac) | CN | Description |
|---|---|---|
| 3.171 | 89 | Row crops, straight row, Good, HSG D |
| 4.736 | 80 | Pasture/grassland/range, Good, HSG D |
| 1.134 | 89 | Row crops, straight row, Good, HSG D |
| 5.352 | 80 | Pasture/grassland/range, Good, HSG D |
| 3.187 | 85 | Row crops, straight row, Good, HSG C |
| 3.989 | 74 | Pasture/grassland/range, Good, HSG C |
| 21.569 | 81 | Weighted Average |
| 21.569 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0081 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 0.6 | 37 | 0.0151 | 1.11 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 1.8 | 758 | 0.0141 | 7.10 | 71.03 | **Channel Flow,** Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight |
| 0.3 | 38 | 0.0146 | 2.45 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 8.3 | 372 | 0.0113 | 0.74 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 17.6 | 1,305 | Total | | | |

## Subcatchment 3-U: PR DA 3



## Hydrograph for Subcatchment 3-U: PR DA 3

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 3.51 | 1.72 | 8.34 |
| 0.25 | 0.01 | 0.00 | 0.00 | 13.25 | 3.64 | 1.82 | 8.70 |
| 0.50 | 0.02 | 0.00 | 0.00 | 13.50 | 3.78 | 1.94 | 9.35 |
| 0.75 | 0.05 | 0.00 | 0.00 | 13.75 | 3.94 | 2.07 | 10.66 |
| 1.00 | 0.09 | 0.00 | 0.00 | 14.00 | 4.11 | 2.22 | 12.14 |
| 1.25 | 0.14 | 0.00 | 0.00 | 14.25 | 4.31 | 2.38 | 13.66 |
| 1.50 | 0.20 | 0.00 | 0.00 | 14.50 | 4.52 | 2.57 | 15.22 |
| 1.75 | 0.25 | 0.00 | 0.00 | 14.75 | 4.75 | 2.76 | 16.34 |
| 2.00 | 0.30 | 0.00 | 0.00 | 15.00 | 4.97 | 2.96 | 16.90 |
| 2.25 | 0.36 | 0.00 | 0.00 | 15.25 | 5.20 | 3.16 | 17.36 |
| 2.50 | 0.41 | 0.00 | 0.00 | 15.50 | 5.43 | 3.37 | 17.80 |
| 2.75 | 0.47 | 0.00 | 0.00 | 15.75 | 5.66 | 3.58 | **18.20** |
| 3.00 | 0.52 | 0.00 | 0.03 | 16.00 | 5.88 | 3.78 | **17.80** |
| 3.25 | 0.58 | 0.00 | 0.19 | 16.25 | 6.09 | 3.96 | 16.80 |
| 3.50 | 0.63 | 0.01 | 0.39 | 16.50 | 6.28 | 4.14 | 15.70 |
| 3.75 | 0.69 | 0.02 | 0.57 | 16.75 | 6.45 | 4.30 | 14.56 |
| 4.00 | 0.74 | 0.03 | 0.75 | 17.00 | 6.61 | 4.44 | 13.43 |
| 4.25 | 0.79 | 0.04 | 0.91 | 17.25 | 6.76 | 4.58 | 12.47 |
| 4.50 | 0.85 | 0.05 | 1.07 | 17.50 | 6.89 | 4.71 | 11.58 |
| 4.75 | 0.90 | 0.07 | 1.21 | 17.75 | 7.02 | 4.82 | 10.69 |
| 5.00 | 0.96 | 0.08 | 1.35 | 18.00 | 7.13 | 4.93 | 9.80 |
| 5.25 | 1.01 | 0.10 | 1.48 | 18.25 | 7.24 | 5.03 | 8.94 |
| 5.50 | 1.07 | 0.12 | 1.60 | 18.50 | 7.34 | 5.12 | 8.28 |
| 5.75 | 1.12 | 0.14 | 1.71 | 18.75 | 7.43 | 5.20 | 7.67 |
| 6.00 | 1.17 | 0.16 | 1.82 | 19.00 | 7.51 | 5.28 | 7.07 |
| 6.25 | 1.23 | 0.19 | 1.95 | 19.25 | 7.58 | 5.35 | 6.46 |
| 6.50 | 1.29 | 0.21 | 2.16 | 19.50 | 7.65 | 5.42 | 5.93 |
| 6.75 | 1.35 | 0.24 | 2.41 | 19.75 | 7.72 | 5.48 | 5.59 |
| 7.00 | 1.42 | 0.28 | 2.68 | 20.00 | 7.78 | 5.54 | 5.28 |
| 7.25 | 1.49 | 0.31 | 2.96 | 20.25 | 7.84 | 5.59 | 4.97 |
| 7.50 | 1.57 | 0.35 | 3.21 | 20.50 | 7.90 | 5.64 | 4.67 |
| 7.75 | 1.64 | 0.39 | 3.36 | 20.75 | 7.95 | 5.70 | 4.49 |
| 8.00 | 1.71 | 0.43 | 3.49 | 21.00 | 8.00 | 5.75 | 4.46 |
| 8.25 | 1.78 | 0.47 | 3.60 | 21.25 | 8.06 | 5.80 | 4.46 |
| 8.50 | 1.86 | 0.52 | 3.71 | 21.50 | 8.11 | 5.85 | 4.47 |
| 8.75 | 1.93 | 0.56 | 3.81 | 21.75 | 8.17 | 5.90 | 4.46 |
| 9.00 | 2.00 | 0.61 | 3.90 | 22.00 | 8.22 | 5.95 | 4.29 |
| 9.25 | 2.07 | 0.65 | 3.99 | 22.25 | 8.26 | 5.99 | 4.00 |
| 9.50 | 2.15 | 0.70 | 4.08 | 22.50 | 8.31 | 6.03 | 3.70 |
| 9.75 | 2.22 | 0.75 | 4.16 | 22.75 | 8.35 | 6.07 | 3.39 |
| 10.00 | 2.30 | 0.80 | 4.36 | 23.00 | 8.38 | 6.10 | 3.12 |
| 10.25 | 2.38 | 0.86 | 4.65 | 23.25 | 8.42 | 6.14 | 3.24 |
| 10.50 | 2.46 | 0.91 | 4.96 | 23.50 | 8.47 | 6.19 | 3.53 |
| 10.75 | 2.55 | 0.98 | 5.27 | 23.75 | 8.52 | 6.23 | 3.84 |
| 11.00 | 2.64 | 1.04 | 5.59 | 24.00 | **8.57** | **6.28** | 4.15 |
| 11.25 | 2.74 | 1.11 | 5.92 | | | | |
| 11.50 | 2.84 | 1.19 | 6.26 | | | | |
| 11.75 | 2.94 | 1.27 | 6.59 | | | | |
| 12.00 | 3.05 | 1.35 | 6.94 | | | | |
| 12.25 | 3.16 | 1.43 | 7.28 | | | | |
| 12.50 | 3.27 | 1.52 | 7.63 | | | | |
| 12.75 | 3.39 | 1.62 | 7.99 | | | | |

## Summary for Subcatchment 4-U: PR DA 4

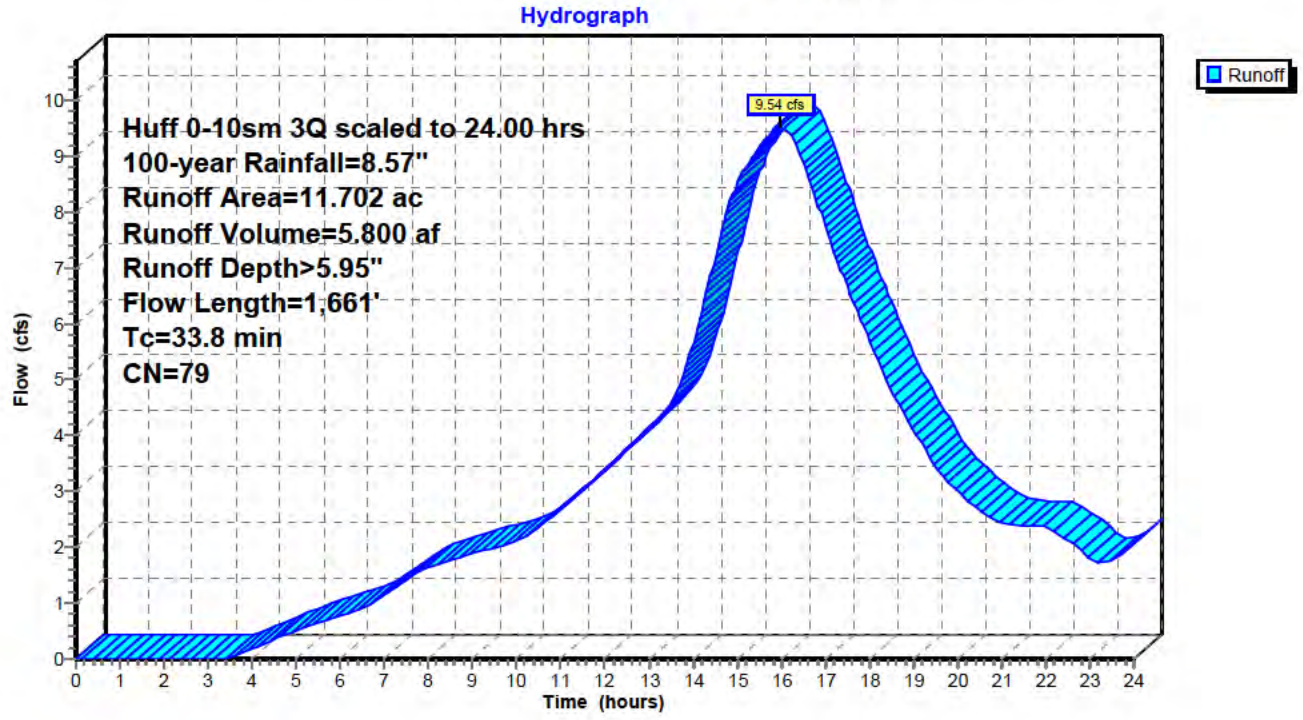
Runoff = 9.54 cfs @ 15.97 hrs, Volume= 5.800 af, Depth> 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

| Area (ac) | CN | Description |
|---|---|---|
| 0.399 | 89 | Row crops, straight row, Good, HSG D |
| 4.560 | 80 | Pasture/grassland/range, Good, HSG D |
| 0.000 | 89 | Row crops, straight row, Good, HSG D |
| 3.035 | 80 | Pasture/grassland/range, Good, HSG D |
| 0.695 | 85 | Row crops, straight row, Good, HSG C |
| 3.013 | 74 | Pasture/grassland/range, Good, HSG C |
| 11.702 | 79 | Weighted Average |
| 11.702 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0080 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 2.7 | 198 | 0.0180 | 1.21 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 24.5 | 1,363 | 0.0175 | 0.93 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 33.8 | 1,661 | Total | | | |

## Subcatchment 4-U: PR DA 4



## Hydrograph for Subcatchment 4-U: PR DA 4

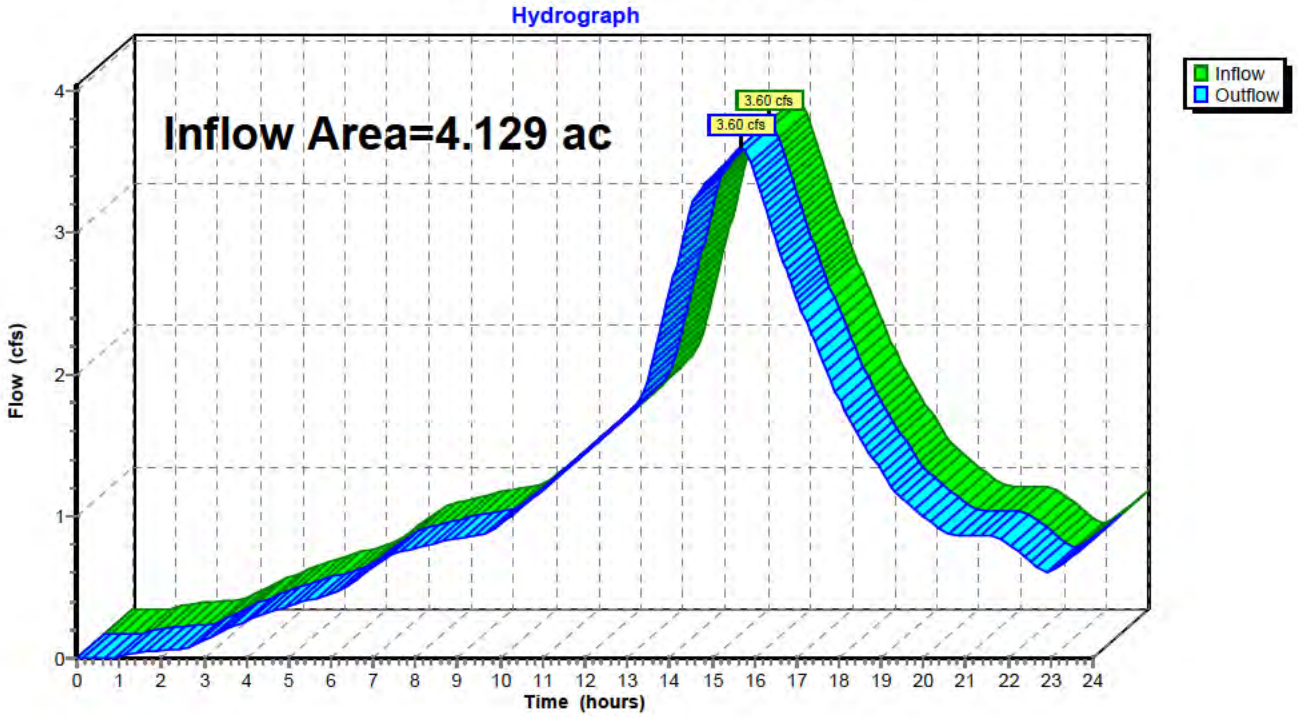
| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 3.51 | 1.57 | 4.14 |
| 0.25 | 0.01 | 0.00 | 0.00 | 13.25 | 3.64 | 1.67 | 4.34 |
| 0.50 | 0.02 | 0.00 | 0.00 | 13.50 | 3.78 | 1.78 | 4.56 |
| 0.75 | 0.05 | 0.00 | 0.00 | 13.75 | 3.94 | 1.91 | 4.98 |
| 1.00 | 0.09 | 0.00 | 0.00 | 14.00 | 4.11 | 2.06 | 5.63 |
| 1.25 | 0.14 | 0.00 | 0.00 | 14.25 | 4.31 | 2.22 | 6.38 |
| 1.50 | 0.20 | 0.00 | 0.00 | 14.50 | 4.52 | 2.40 | 7.18 |
| 1.75 | 0.25 | 0.00 | 0.00 | 14.75 | 4.75 | 2.58 | 7.95 |
| 2.00 | 0.30 | 0.00 | 0.00 | 15.00 | 4.97 | 2.78 | 8.51 |
| 2.25 | 0.36 | 0.00 | 0.00 | 15.25 | 5.20 | 2.97 | 8.86 |
| 2.50 | 0.41 | 0.00 | 0.00 | 15.50 | 5.43 | 3.18 | 9.16 |
| 2.75 | 0.47 | 0.00 | 0.00 | 15.75 | 5.66 | 3.38 | **9.41** |
| 3.00 | 0.52 | 0.00 | 0.00 | 16.00 | 5.88 | 3.57 | **9.54** |
| 3.25 | 0.58 | 0.00 | 0.00 | 16.25 | 6.09 | 3.76 | 9.32 |
| 3.50 | 0.63 | 0.00 | 0.02 | 16.50 | 6.28 | 3.93 | 8.87 |
| 3.75 | 0.69 | 0.01 | 0.09 | 16.75 | 6.45 | 4.08 | 8.32 |
| 4.00 | 0.74 | 0.02 | 0.18 | 17.00 | 6.61 | 4.23 | 7.74 |
| 4.25 | 0.79 | 0.02 | 0.26 | 17.25 | 6.76 | 4.36 | 7.18 |
| 4.50 | 0.85 | 0.03 | 0.35 | 17.50 | 6.89 | 4.49 | 6.66 |
| 4.75 | 0.90 | 0.05 | 0.43 | 17.75 | 7.02 | 4.60 | 6.18 |
| 5.00 | 0.96 | 0.06 | 0.51 | 18.00 | 7.13 | 4.71 | 5.71 |
| 5.25 | 1.01 | 0.07 | 0.58 | 18.25 | 7.24 | 4.80 | 5.23 |
| 5.50 | 1.07 | 0.09 | 0.65 | 18.50 | 7.34 | 4.89 | 4.81 |
| 5.75 | 1.12 | 0.11 | 0.72 | 18.75 | 7.43 | 4.98 | 4.44 |
| 6.00 | 1.17 | 0.13 | 0.78 | 19.00 | 7.51 | 5.05 | 4.11 |
| 6.25 | 1.23 | 0.15 | 0.84 | 19.25 | 7.58 | 5.12 | 3.78 |
| 6.50 | 1.29 | 0.17 | 0.92 | 19.50 | 7.65 | 5.19 | 3.46 |
| 6.75 | 1.35 | 0.19 | 1.02 | 19.75 | 7.72 | 5.25 | 3.20 |
| 7.00 | 1.42 | 0.22 | 1.15 | 20.00 | 7.78 | 5.31 | 3.00 |
| 7.25 | 1.49 | 0.26 | 1.29 | 20.25 | 7.84 | 5.36 | 2.83 |
| 7.50 | 1.57 | 0.29 | 1.43 | 20.50 | 7.90 | 5.41 | 2.66 |
| 7.75 | 1.64 | 0.33 | 1.54 | 20.75 | 7.95 | 5.46 | 2.51 |
| 8.00 | 1.71 | 0.36 | 1.63 | 21.00 | 8.00 | 5.51 | 2.43 |
| 8.25 | 1.78 | 0.40 | 1.71 | 21.25 | 8.06 | 5.56 | 2.40 |
| 8.50 | 1.86 | 0.44 | 1.77 | 21.50 | 8.11 | 5.61 | 2.39 |
| 8.75 | 1.93 | 0.48 | 1.83 | 21.75 | 8.17 | 5.66 | 2.39 |
| 9.00 | 2.00 | 0.52 | 1.89 | 22.00 | 8.22 | 5.71 | 2.37 |
| 9.25 | 2.07 | 0.57 | 1.95 | 22.25 | 8.26 | 5.75 | 2.27 |
| 9.50 | 2.15 | 0.61 | 2.00 | 22.50 | 8.31 | 5.79 | 2.13 |
| 9.75 | 2.22 | 0.66 | 2.05 | 22.75 | 8.35 | 5.83 | 1.98 |
| 10.00 | 2.30 | 0.70 | 2.11 | 23.00 | 8.38 | 5.87 | 1.82 |
| 10.25 | 2.38 | 0.76 | 2.22 | 23.25 | 8.42 | 5.90 | 1.73 |
| 10.50 | 2.46 | 0.81 | 2.36 | 23.50 | 8.47 | 5.95 | 1.78 |
| 10.75 | 2.55 | 0.87 | 2.52 | 23.75 | 8.52 | 5.99 | 1.91 |
| 11.00 | 2.64 | 0.93 | 2.69 | 24.00 | **8.57** | **6.04** | 2.06 |
| 11.25 | 2.74 | 1.00 | 2.86 | | | | |
| 11.50 | 2.84 | 1.07 | 3.03 | | | | |
| 11.75 | 2.94 | 1.14 | 3.21 | | | | |
| 12.00 | 3.05 | 1.22 | 3.39 | | | | |
| 12.25 | 3.16 | 1.30 | 3.57 | | | | |
| 12.50 | 3.27 | 1.39 | 3.76 | | | | |
| 12.75 | 3.39 | 1.48 | 3.95 | | | | |

## Summary for Reach 1-T: PR DA 1 TOTAL

Inflow Area = 4.129 ac, 9.91% Impervious, Inflow Depth > 6.64" for 100-year event
Inflow = 3.60 cfs @ 15.70 hrs, Volume= 2.284 af
Outflow = 3.60 cfs @ 15.70 hrs, Volume= 2.284 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

### Reach 1-T: PR DA 1 TOTAL



## Hydrograph for Reach 1-T: PR DA 1 TOTAL

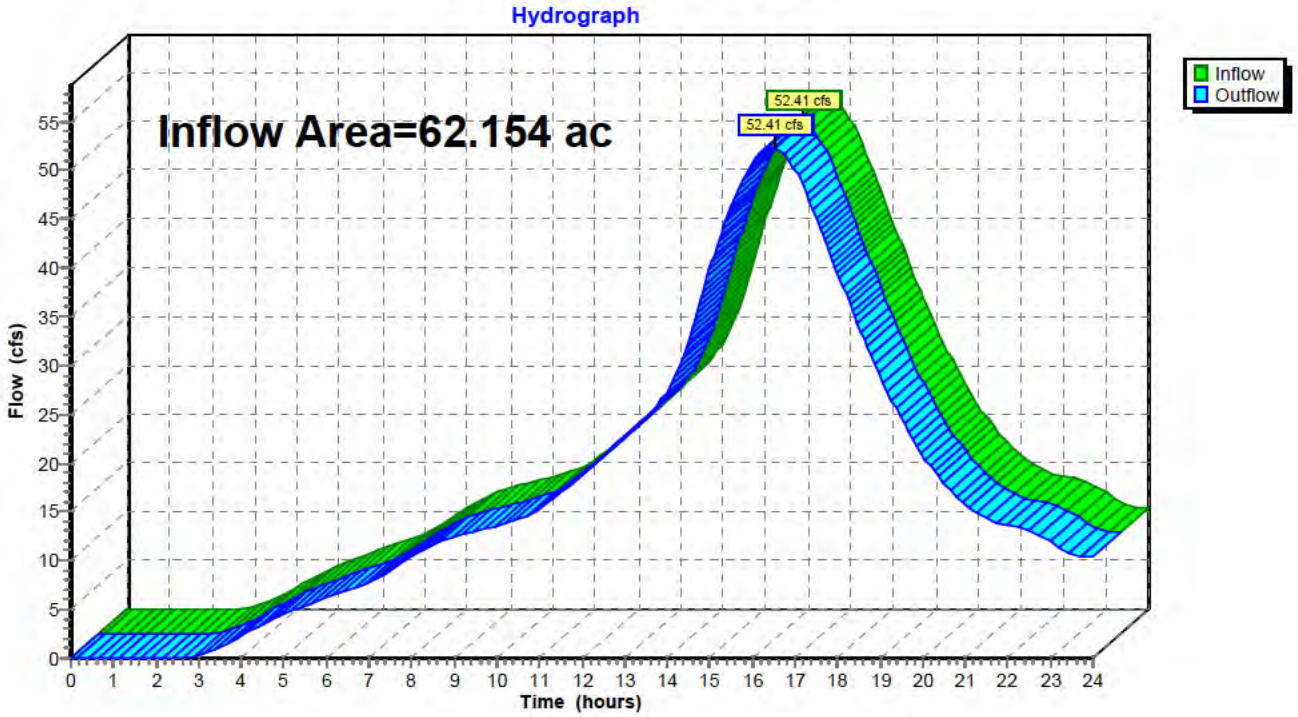
| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 1.72 | | 1.72 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 1.79 | | 1.79 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 1.99 | | 1.99 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 2.28 | | 2.28 |
| 1.00 | 0.01 | | 0.01 | 14.00 | 2.57 | | 2.57 |
| 1.25 | 0.03 | | 0.03 | 14.25 | 2.87 | | 2.87 |
| 1.50 | 0.04 | | 0.04 | 14.50 | 3.17 | | 3.17 |
| 1.75 | 0.05 | | 0.05 | 14.75 | 3.31 | | 3.31 |
| 2.00 | 0.06 | | 0.06 | 15.00 | 3.39 | | 3.39 |
| 2.25 | 0.06 | | 0.06 | 15.25 | 3.47 | | 3.47 |
| 2.50 | 0.06 | | 0.06 | 15.50 | **3.55** | | **3.55** |
| 2.75 | 0.08 | | 0.08 | 15.75 | **3.60** | | **3.60** |
| 3.00 | 0.12 | | 0.12 | 16.00 | 3.41 | | 3.41 |
| 3.25 | 0.16 | | 0.16 | 16.25 | 3.19 | | 3.19 |
| 3.50 | 0.20 | | 0.20 | 16.50 | 2.97 | | 2.97 |
| 3.75 | 0.23 | | 0.23 | 16.75 | 2.74 | | 2.74 |
| 4.00 | 0.26 | | 0.26 | 17.00 | 2.53 | | 2.53 |
| 4.25 | 0.29 | | 0.29 | 17.25 | 2.35 | | 2.35 |
| 4.50 | 0.32 | | 0.32 | 17.50 | 2.18 | | 2.18 |
| 4.75 | 0.35 | | 0.35 | 17.75 | 2.00 | | 2.00 |
| 5.00 | 0.37 | | 0.37 | 18.00 | 1.83 | | 1.83 |
| 5.25 | 0.39 | | 0.39 | 18.25 | 1.68 | | 1.68 |
| 5.50 | 0.41 | | 0.41 | 18.50 | 1.56 | | 1.56 |
| 5.75 | 0.43 | | 0.43 | 18.75 | 1.44 | | 1.44 |
| 6.00 | 0.45 | | 0.45 | 19.00 | 1.32 | | 1.32 |
| 6.25 | 0.48 | | 0.48 | 19.25 | 1.20 | | 1.20 |
| 6.50 | 0.53 | | 0.53 | 19.50 | 1.12 | | 1.12 |
| 6.75 | 0.59 | | 0.59 | 19.75 | 1.06 | | 1.06 |
| 7.00 | 0.64 | | 0.64 | 20.00 | 1.00 | | 1.00 |
| 7.25 | 0.70 | | 0.70 | 20.25 | 0.94 | | 0.94 |
| 7.50 | 0.74 | | 0.74 | 20.50 | 0.88 | | 0.88 |
| 7.75 | 0.76 | | 0.76 | 20.75 | 0.87 | | 0.87 |
| 8.00 | 0.78 | | 0.78 | 21.00 | 0.87 | | 0.87 |
| 8.25 | 0.80 | | 0.80 | 21.25 | 0.87 | | 0.87 |
| 8.50 | 0.81 | | 0.81 | 21.50 | 0.87 | | 0.87 |
| 8.75 | 0.83 | | 0.83 | 21.75 | 0.86 | | 0.86 |
| 9.00 | 0.85 | | 0.85 | 22.00 | 0.81 | | 0.81 |
| 9.25 | 0.86 | | 0.86 | 22.25 | 0.75 | | 0.75 |
| 9.50 | 0.87 | | 0.87 | 22.50 | 0.69 | | 0.69 |
| 9.75 | 0.89 | | 0.89 | 22.75 | 0.63 | | 0.63 |
| 10.00 | 0.94 | | 0.94 | 23.00 | 0.60 | | 0.60 |
| 10.25 | 1.00 | | 1.00 | 23.25 | 0.65 | | 0.65 |
| 10.50 | 1.07 | | 1.07 | 23.50 | 0.71 | | 0.71 |
| 10.75 | 1.13 | | 1.13 | 23.75 | 0.77 | | 0.77 |
| 11.00 | 1.19 | | 1.19 | 24.00 | 0.83 | | 0.83 |
| 11.25 | 1.26 | | 1.26 | | | | |
| 11.50 | 1.32 | | 1.32 | | | | |
| 11.75 | 1.39 | | 1.39 | | | | |
| 12.00 | 1.45 | | 1.45 | | | | |
| 12.25 | 1.52 | | 1.52 | | | | |
| 12.50 | 1.58 | | 1.58 | | | | |
| 12.75 | 1.65 | | 1.65 | | | | |

## Summary for Reach 2-T: PR DA 2 TOTAL

Inflow Area = 62.154 ac, 0.50% Impervious, Inflow Depth > 6.67" for 100-year event
Inflow = 52.41 cfs @ 16.53 hrs, Volume= 34.569 af
Outflow = 52.41 cfs @ 16.53 hrs, Volume= 34.569 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## Reach 2-T: PR DA 2 TOTAL



## Hydrograph for Reach 2-T: PR DA 2 TOTAL

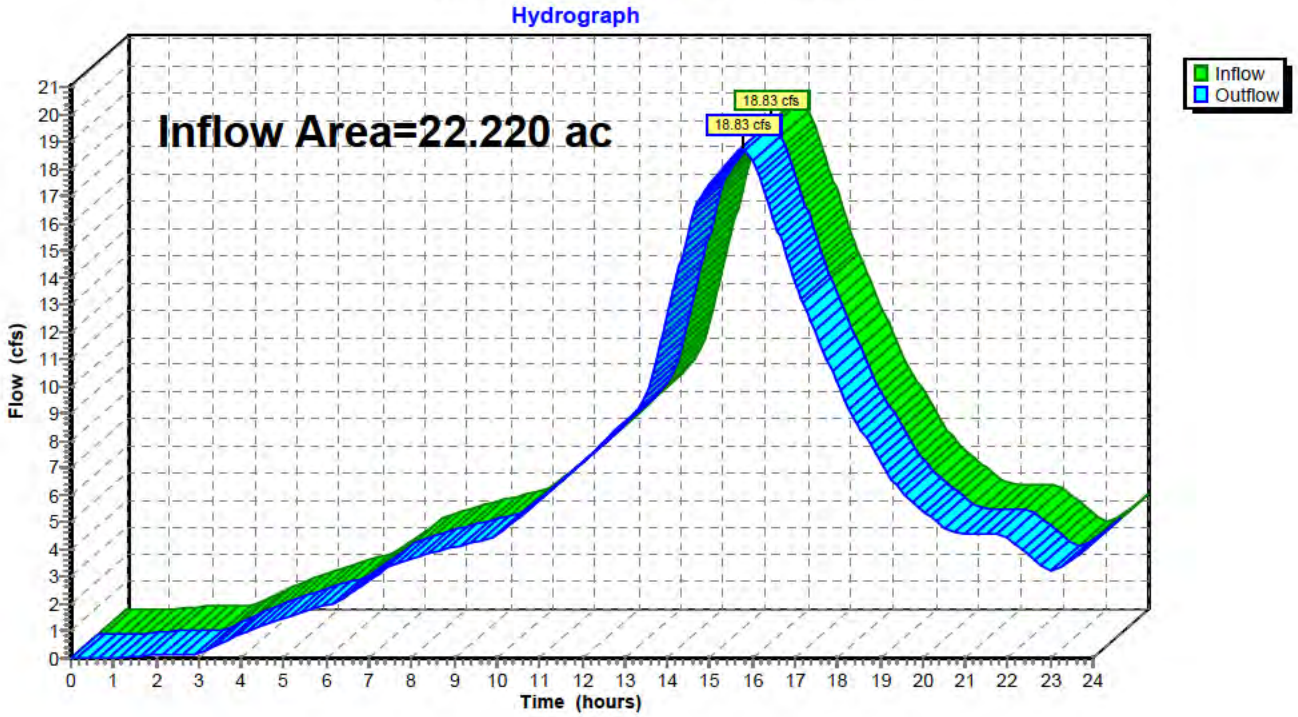
| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 22.63 | | 22.63 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 23.65 | | 23.65 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 24.64 | | 24.64 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 25.81 | | 25.81 |
| 1.00 | 0.00 | | 0.00 | 14.00 | 27.34 | | 27.34 |
| 1.25 | 0.00 | | 0.00 | 14.25 | 29.57 | | 29.57 |
| 1.50 | 0.00 | | 0.00 | 14.50 | 32.52 | | 32.52 |
| 1.75 | 0.00 | | 0.00 | 14.75 | 36.02 | | 36.02 |
| 2.00 | 0.00 | | 0.00 | 15.00 | 39.82 | | 39.82 |
| 2.25 | 0.00 | | 0.00 | 15.25 | 43.33 | | 43.33 |
| 2.50 | 0.01 | | 0.01 | 15.50 | 46.39 | | 46.39 |
| 2.75 | 0.08 | | 0.08 | 15.75 | 48.76 | | 48.76 |
| 3.00 | 0.27 | | 0.27 | 16.00 | 50.68 | | 50.68 |
| 3.25 | 0.63 | | 0.63 | 16.25 | 51.98 | | 51.98 |
| 3.50 | 1.12 | | 1.12 | 16.50 | **52.39** | | **52.39** |
| 3.75 | 1.69 | | 1.69 | 16.75 | **51.78** | | **51.78** |
| 4.00 | 2.28 | | 2.28 | 17.00 | 50.13 | | 50.13 |
| 4.25 | 2.87 | | 2.87 | 17.25 | 47.87 | | 47.87 |
| 4.50 | 3.43 | | 3.43 | 17.50 | 45.13 | | 45.13 |
| 4.75 | 3.97 | | 3.97 | 17.75 | 42.35 | | 42.35 |
| 5.00 | 4.48 | | 4.48 | 18.00 | 39.50 | | 39.50 |
| 5.25 | 4.95 | | 4.95 | 18.25 | 36.73 | | 36.73 |
| 5.50 | 5.39 | | 5.39 | 18.50 | 34.01 | | 34.01 |
| 5.75 | 5.80 | | 5.80 | 18.75 | 31.37 | | 31.37 |
| 6.00 | 6.19 | | 6.19 | 19.00 | 28.95 | | 28.95 |
| 6.25 | 6.54 | | 6.54 | 19.25 | 26.67 | | 26.67 |
| 6.50 | 6.89 | | 6.89 | 19.50 | 24.61 | | 24.61 |
| 6.75 | 7.26 | | 7.26 | 19.75 | 22.63 | | 22.63 |
| 7.00 | 7.74 | | 7.74 | 20.00 | 20.87 | | 20.87 |
| 7.25 | 8.32 | | 8.32 | 20.25 | 19.29 | | 19.29 |
| 7.50 | 9.01 | | 9.01 | 20.50 | 17.94 | | 17.94 |
| 7.75 | 9.75 | | 9.75 | 20.75 | 16.76 | | 16.76 |
| 8.00 | 10.48 | | 10.48 | 21.00 | 15.72 | | 15.72 |
| 8.25 | 11.13 | | 11.13 | 21.25 | 14.89 | | 14.89 |
| 8.50 | 11.66 | | 11.66 | 21.50 | 14.26 | | 14.26 |
| 8.75 | 12.11 | | 12.11 | 21.75 | 13.87 | | 13.87 |
| 9.00 | 12.46 | | 12.46 | 22.00 | 13.60 | | 13.60 |
| 9.25 | 12.79 | | 12.79 | 22.25 | 13.39 | | 13.39 |
| 9.50 | 13.06 | | 13.06 | 22.50 | 13.08 | | 13.08 |
| 9.75 | 13.31 | | 13.31 | 22.75 | 12.62 | | 12.62 |
| 10.00 | 13.55 | | 13.55 | 23.00 | 12.02 | | 12.02 |
| 10.25 | 13.81 | | 13.81 | 23.25 | 11.32 | | 11.32 |
| 10.50 | 14.19 | | 14.19 | 23.50 | 10.71 | | 10.71 |
| 10.75 | 14.68 | | 14.68 | 23.75 | 10.34 | | 10.34 |
| 11.00 | 15.36 | | 15.36 | 24.00 | 10.36 | | 10.36 |
| 11.25 | 16.11 | | 16.11 | | | | |
| 11.50 | 16.96 | | 16.96 | | | | |
| 11.75 | 17.84 | | 17.84 | | | | |
| 12.00 | 18.76 | | 18.76 | | | | |
| 12.25 | 19.71 | | 19.71 | | | | |
| 12.50 | 20.67 | | 20.67 | | | | |
| 12.75 | 21.66 | | 21.66 | | | | |

## Summary for Reach 3-T: PR DA 3 TOTAL

Inflow Area = 22.220 ac, 2.93% Impervious, Inflow Depth > 6.29" for 100-year event
Inflow = 18.83 cfs @ 15.79 hrs, Volume= 11.653 af
Outflow = 18.83 cfs @ 15.79 hrs, Volume= 11.653 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## Reach 3-T: PR DA 3 TOTAL



## Hydrograph for Reach 3-T: PR DA 3 TOTAL

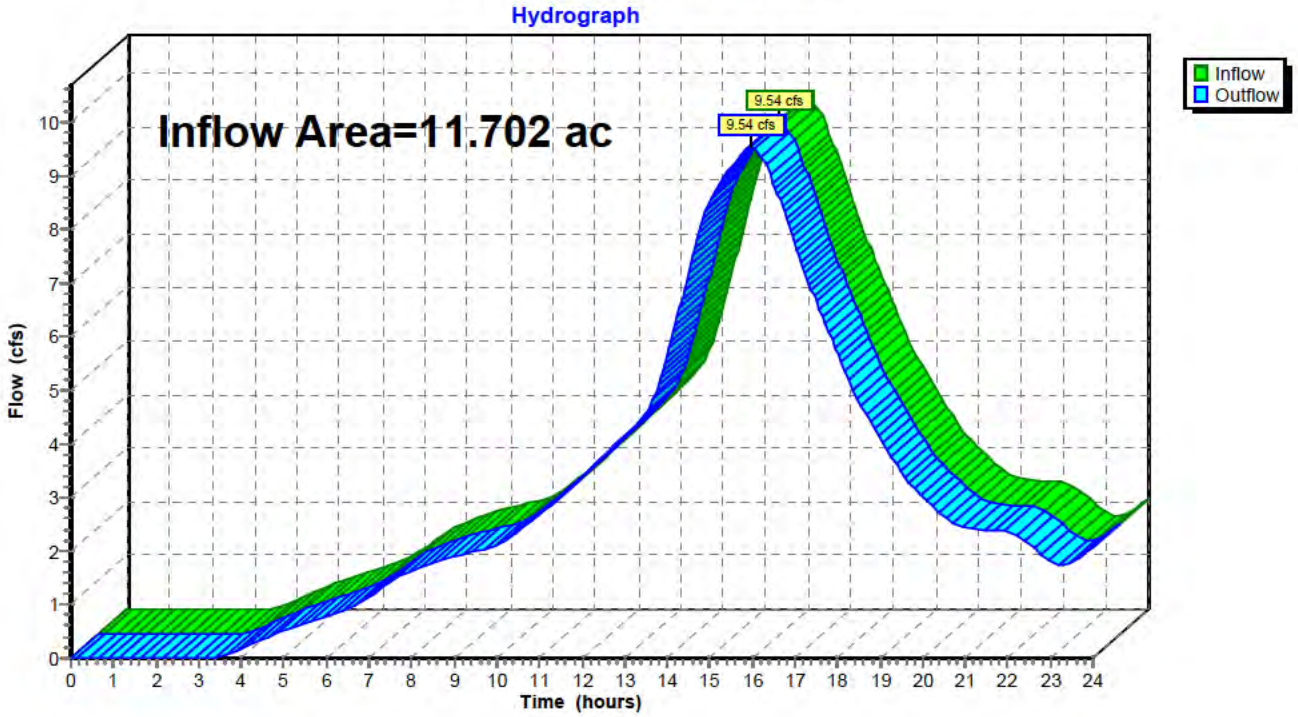
| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | | 0.00 |
| 0.25 | 0.00 | | 0.00 |
| 0.50 | 0.00 | | 0.00 |
| 0.75 | 0.00 | | 0.00 |
| 1.00 | 0.01 | | 0.01 |
| 1.25 | 0.04 | | 0.04 |
| 1.50 | 0.07 | | 0.07 |
| 1.75 | 0.09 | | 0.09 |
| 2.00 | 0.11 | | 0.11 |
| 2.25 | 0.11 | | 0.11 |
| 2.50 | 0.12 | | 0.12 |
| 2.75 | 0.12 | | 0.12 |
| 3.00 | 0.16 | | 0.16 |
| 3.25 | 0.32 | | 0.32 |
| 3.50 | 0.52 | | 0.52 |
| 3.75 | 0.71 | | 0.71 |
| 4.00 | 0.88 | | 0.88 |
| 4.25 | 1.05 | | 1.05 |
| 4.50 | 1.20 | | 1.20 |
| 4.75 | 1.35 | | 1.35 |
| 5.00 | 1.49 | | 1.49 |
| 5.25 | 1.61 | | 1.61 |
| 5.50 | 1.74 | | 1.74 |
| 5.75 | 1.85 | | 1.85 |
| 6.00 | 1.96 | | 1.96 |
| 6.25 | 2.09 | | 2.09 |
| 6.50 | 2.31 | | 2.31 |
| 6.75 | 2.57 | | 2.57 |
| 7.00 | 2.85 | | 2.85 |
| 7.25 | 3.14 | | 3.14 |
| 7.50 | 3.40 | | 3.40 |
| 7.75 | 3.55 | | 3.55 |
| 8.00 | 3.67 | | 3.67 |
| 8.25 | 3.79 | | 3.79 |
| 8.50 | 3.90 | | 3.90 |
| 8.75 | 4.00 | | 4.00 |
| 9.00 | 4.09 | | 4.09 |
| 9.25 | 4.18 | | 4.18 |
| 9.50 | 4.26 | | 4.26 |
| 9.75 | 4.35 | | 4.35 |
| 10.00 | 4.55 | | 4.55 |
| 10.25 | 4.85 | | 4.85 |
| 10.50 | 5.17 | | 5.17 |
| 10.75 | 5.50 | | 5.50 |
| 11.00 | 5.83 | | 5.83 |
| 11.25 | 6.16 | | 6.16 |
| 11.50 | 6.51 | | 6.51 |
| 11.75 | 6.86 | | 6.86 |
| 12.00 | 7.21 | | 7.21 |
| 12.25 | 7.57 | | 7.57 |
| 12.50 | 7.92 | | 7.92 |
| 12.75 | 8.29 | | 8.29 |
| 13.00 | 8.65 | | 8.65 |
| 13.25 | 9.02 | | 9.02 |
| 13.50 | 9.70 | | 9.70 |
| 13.75 | 11.05 | | 11.05 |
| 14.00 | 12.58 | | 12.58 |
| 14.25 | 14.15 | | 14.15 |
| 14.50 | 15.75 | | 15.75 |
| 14.75 | 16.91 | | 16.91 |
| 15.00 | 17.48 | | 17.48 |
| 15.25 | 17.95 | | 17.95 |
| 15.50 | 18.40 | | 18.40 |
| 15.75 | **18.81** | | **18.81** |
| 16.00 | **18.39** | | **18.39** |
| 16.25 | 17.35 | | 17.35 |
| 16.50 | 16.22 | | 16.22 |
| 16.75 | 15.04 | | 15.04 |
| 17.00 | 13.87 | | 13.87 |
| 17.25 | 12.88 | | 12.88 |
| 17.50 | 11.95 | | 11.95 |
| 17.75 | 11.04 | | 11.04 |
| 18.00 | 10.12 | | 10.12 |
| 18.25 | 9.23 | | 9.23 |
| 18.50 | 8.55 | | 8.55 |
| 18.75 | 7.92 | | 7.92 |
| 19.00 | 7.29 | | 7.29 |
| 19.25 | 6.67 | | 6.67 |
| 19.50 | 6.12 | | 6.12 |
| 19.75 | 5.77 | | 5.77 |
| 20.00 | 5.45 | | 5.45 |
| 20.25 | 5.13 | | 5.13 |
| 20.50 | 4.82 | | 4.82 |
| 20.75 | 4.63 | | 4.63 |
| 21.00 | 4.61 | | 4.61 |
| 21.25 | 4.61 | | 4.61 |
| 21.50 | 4.61 | | 4.61 |
| 21.75 | 4.61 | | 4.61 |
| 22.00 | 4.43 | | 4.43 |
| 22.25 | 4.13 | | 4.13 |
| 22.50 | 3.81 | | 3.81 |
| 22.75 | 3.49 | | 3.49 |
| 23.00 | 3.22 | | 3.22 |
| 23.25 | 3.34 | | 3.34 |
| 23.50 | 3.64 | | 3.64 |
| 23.75 | 3.96 | | 3.96 |
| 24.00 | 4.28 | | 4.28 |

## Summary for Reach 4-T: PR DA 4 TOTAL

Inflow Area = 11.702 ac, 0.00% Impervious, Inflow Depth > 5.95" for 100-year event
Inflow = 9.54 cfs @ 15.97 hrs, Volume= 5.800 af
Outflow = 9.54 cfs @ 15.97 hrs, Volume= 5.800 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## Reach 4-T: PR DA 4 TOTAL



## Hydrograph for Reach 4-T: PR DA 4 TOTAL

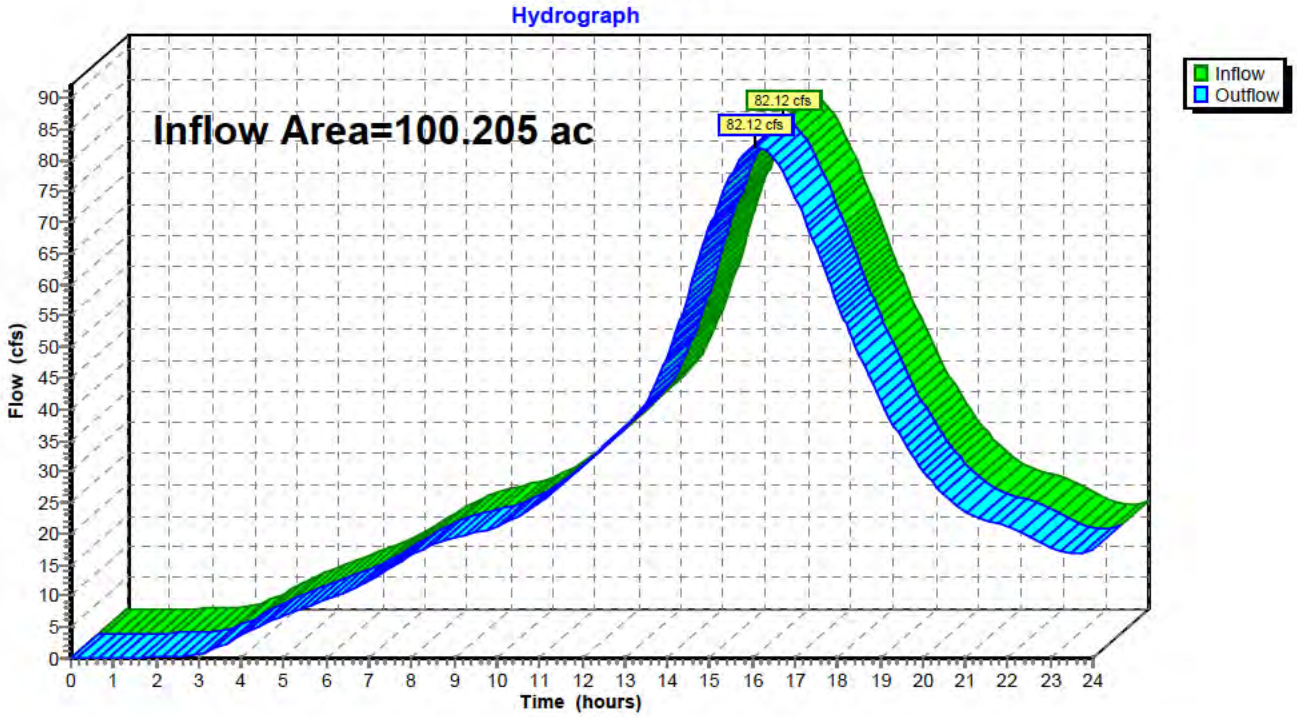
| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 4.14 | | 4.14 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 4.34 | | 4.34 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 4.56 | | 4.56 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 4.98 | | 4.98 |
| 1.00 | 0.00 | | 0.00 | 14.00 | 5.63 | | 5.63 |
| 1.25 | 0.00 | | 0.00 | 14.25 | 6.38 | | 6.38 |
| 1.50 | 0.00 | | 0.00 | 14.50 | 7.18 | | 7.18 |
| 1.75 | 0.00 | | 0.00 | 14.75 | 7.95 | | 7.95 |
| 2.00 | 0.00 | | 0.00 | 15.00 | 8.51 | | 8.51 |
| 2.25 | 0.00 | | 0.00 | 15.25 | 8.86 | | 8.86 |
| 2.50 | 0.00 | | 0.00 | 15.50 | 9.16 | | 9.16 |
| 2.75 | 0.00 | | 0.00 | 15.75 | **9.41** | | **9.41** |
| 3.00 | 0.00 | | 0.00 | 16.00 | **9.54** | | **9.54** |
| 3.25 | 0.00 | | 0.00 | 16.25 | 9.32 | | 9.32 |
| 3.50 | 0.02 | | 0.02 | 16.50 | 8.87 | | 8.87 |
| 3.75 | 0.09 | | 0.09 | 16.75 | 8.32 | | 8.32 |
| 4.00 | 0.18 | | 0.18 | 17.00 | 7.74 | | 7.74 |
| 4.25 | 0.26 | | 0.26 | 17.25 | 7.18 | | 7.18 |
| 4.50 | 0.35 | | 0.35 | 17.50 | 6.66 | | 6.66 |
| 4.75 | 0.43 | | 0.43 | 17.75 | 6.18 | | 6.18 |
| 5.00 | 0.51 | | 0.51 | 18.00 | 5.71 | | 5.71 |
| 5.25 | 0.58 | | 0.58 | 18.25 | 5.23 | | 5.23 |
| 5.50 | 0.65 | | 0.65 | 18.50 | 4.81 | | 4.81 |
| 5.75 | 0.72 | | 0.72 | 18.75 | 4.44 | | 4.44 |
| 6.00 | 0.78 | | 0.78 | 19.00 | 4.11 | | 4.11 |
| 6.25 | 0.84 | | 0.84 | 19.25 | 3.78 | | 3.78 |
| 6.50 | 0.92 | | 0.92 | 19.50 | 3.46 | | 3.46 |
| 6.75 | 1.02 | | 1.02 | 19.75 | 3.20 | | 3.20 |
| 7.00 | 1.15 | | 1.15 | 20.00 | 3.00 | | 3.00 |
| 7.25 | 1.29 | | 1.29 | 20.25 | 2.83 | | 2.83 |
| 7.50 | 1.43 | | 1.43 | 20.50 | 2.66 | | 2.66 |
| 7.75 | 1.54 | | 1.54 | 20.75 | 2.51 | | 2.51 |
| 8.00 | 1.63 | | 1.63 | 21.00 | 2.43 | | 2.43 |
| 8.25 | 1.71 | | 1.71 | 21.25 | 2.40 | | 2.40 |
| 8.50 | 1.77 | | 1.77 | 21.50 | 2.39 | | 2.39 |
| 8.75 | 1.83 | | 1.83 | 21.75 | 2.39 | | 2.39 |
| 9.00 | 1.89 | | 1.89 | 22.00 | 2.37 | | 2.37 |
| 9.25 | 1.95 | | 1.95 | 22.25 | 2.27 | | 2.27 |
| 9.50 | 2.00 | | 2.00 | 22.50 | 2.13 | | 2.13 |
| 9.75 | 2.05 | | 2.05 | 22.75 | 1.98 | | 1.98 |
| 10.00 | 2.11 | | 2.11 | 23.00 | 1.82 | | 1.82 |
| 10.25 | 2.22 | | 2.22 | 23.25 | 1.73 | | 1.73 |
| 10.50 | 2.36 | | 2.36 | 23.50 | 1.78 | | 1.78 |
| 10.75 | 2.52 | | 2.52 | 23.75 | 1.91 | | 1.91 |
| 11.00 | 2.69 | | 2.69 | 24.00 | 2.06 | | 2.06 |
| 11.25 | 2.86 | | 2.86 | | | | |
| 11.50 | 3.03 | | 3.03 | | | | |
| 11.75 | 3.21 | | 3.21 | | | | |
| 12.00 | 3.39 | | 3.39 | | | | |
| 12.25 | 3.57 | | 3.57 | | | | |
| 12.50 | 3.76 | | 3.76 | | | | |
| 12.75 | 3.95 | | 3.95 | | | | |

## Summary for Reach T: Total

Inflow Area = 100.205 ac, 1.37% Impervious, Inflow Depth > 6.50" for 100-year event
Inflow = 82.12 cfs @ 16.06 hrs, Volume= 54.306 af
Outflow = 82.12 cfs @ 16.06 hrs, Volume= 54.306 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## Reach T: Total



## Hydrograph for Reach T: Total

| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 37.14 | | 37.14 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 38.80 | | 38.80 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 40.89 | | 40.89 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 44.11 | | 44.11 |
| 1.00 | 0.02 | | 0.02 | 14.00 | 48.12 | | 48.12 |
| 1.25 | 0.07 | | 0.07 | 14.25 | 52.97 | | 52.97 |
| 1.50 | 0.12 | | 0.12 | 14.50 | 58.63 | | 58.63 |
| 1.75 | 0.14 | | 0.14 | 14.75 | 64.20 | | 64.20 |
| 2.00 | 0.16 | | 0.16 | 15.00 | 69.20 | | 69.20 |
| 2.25 | 0.17 | | 0.17 | 15.25 | 73.62 | | 73.62 |
| 2.50 | 0.19 | | 0.19 | 15.50 | 77.49 | | 77.49 |
| 2.75 | 0.28 | | 0.28 | 15.75 | 80.58 | | 80.58 |
| 3.00 | 0.55 | | 0.55 | 16.00 | **82.03** | | **82.03** |
| 3.25 | 1.11 | | 1.11 | 16.25 | **81.85** | | **81.85** |
| 3.50 | 1.86 | | 1.86 | 16.50 | 80.45 | | 80.45 |
| 3.75 | 2.72 | | 2.72 | 16.75 | 77.89 | | 77.89 |
| 4.00 | 3.60 | | 3.60 | 17.00 | 74.27 | | 74.27 |
| 4.25 | 4.47 | | 4.47 | 17.25 | 70.28 | | 70.28 |
| 4.50 | 5.31 | | 5.31 | 17.50 | 65.92 | | 65.92 |
| 4.75 | 6.10 | | 6.10 | 17.75 | 61.58 | | 61.58 |
| 5.00 | 6.84 | | 6.84 | 18.00 | 57.15 | | 57.15 |
| 5.25 | 7.54 | | 7.54 | 18.25 | 52.87 | | 52.87 |
| 5.50 | 8.20 | | 8.20 | 18.50 | 48.92 | | 48.92 |
| 5.75 | 8.81 | | 8.81 | 18.75 | 45.17 | | 45.17 |
| 6.00 | 9.38 | | 9.38 | 19.00 | 41.67 | | 41.67 |
| 6.25 | 9.95 | | 9.95 | 19.25 | 38.32 | | 38.32 |
| 6.50 | 10.65 | | 10.65 | 19.50 | 35.31 | | 35.31 |
| 6.75 | 11.45 | | 11.45 | 19.75 | 32.65 | | 32.65 |
| 7.00 | 12.38 | | 12.38 | 20.00 | 30.32 | | 30.32 |
| 7.25 | 13.45 | | 13.45 | 20.25 | 28.19 | | 28.19 |
| 7.50 | 14.57 | | 14.57 | 20.50 | 26.30 | | 26.30 |
| 7.75 | 15.61 | | 15.61 | 20.75 | 24.78 | | 24.78 |
| 8.00 | 16.57 | | 16.57 | 21.00 | 23.63 | | 23.63 |
| 8.25 | 17.43 | | 17.43 | 21.25 | 22.77 | | 22.77 |
| 8.50 | 18.14 | | 18.14 | 21.50 | 22.13 | | 22.13 |
| 8.75 | 18.77 | | 18.77 | 21.75 | 21.73 | | 21.73 |
| 9.00 | 19.29 | | 19.29 | 22.00 | 21.20 | | 21.20 |
| 9.25 | 19.77 | | 19.77 | 22.25 | 20.54 | | 20.54 |
| 9.50 | 20.19 | | 20.19 | 22.50 | 19.72 | | 19.72 |
| 9.75 | 20.60 | | 20.60 | 22.75 | 18.72 | | 18.72 |
| 10.00 | 21.16 | | 21.16 | 23.00 | 17.65 | | 17.65 |
| 10.25 | 21.89 | | 21.89 | 23.25 | 17.03 | | 17.03 |
| 10.50 | 22.78 | | 22.78 | 23.50 | 16.83 | | 16.83 |
| 10.75 | 23.83 | | 23.83 | 23.75 | 16.98 | | 16.98 |
| 11.00 | 25.06 | | 25.06 | 24.00 | 17.54 | | 17.54 |
| 11.25 | 26.39 | | 26.39 | | | | |
| 11.50 | 27.82 | | 27.82 | | | | |
| 11.75 | 29.29 | | 29.29 | | | | |
| 12.00 | 30.81 | | 30.81 | | | | |
| 12.25 | 32.37 | | 32.37 | | | | |
| 12.50 | 33.94 | | 33.94 | | | | |
| 12.75 | 35.56 | | 35.56 | | | | |

# APPENDIX D-3

## HYDROCAD REPORT FOR 2-YEAR & 100-YEARSTORM EVENT

## POST-DEVELOPMENT CONDITION WITH STORMWATER BASINS

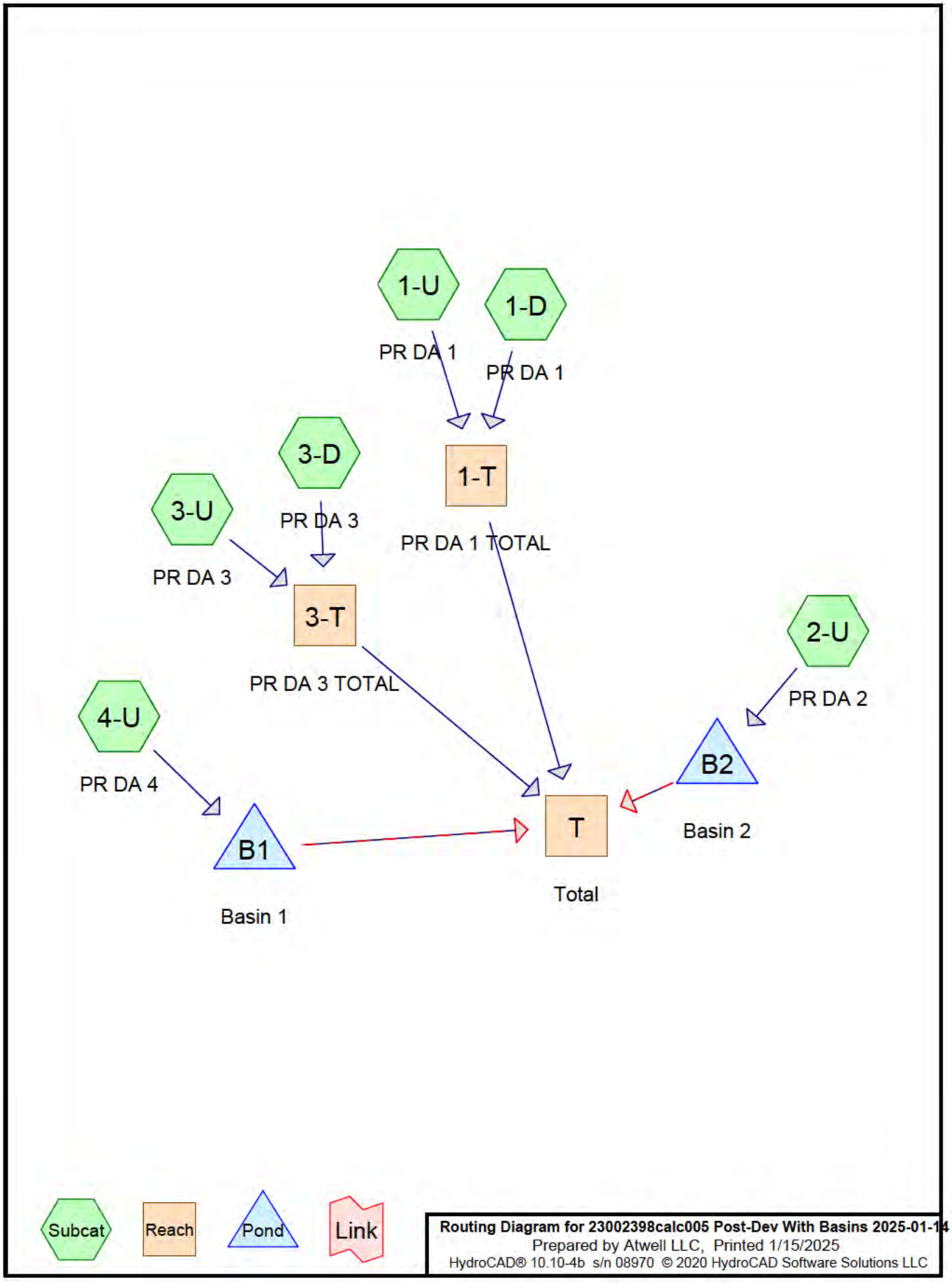
**23002398calc005 Post-Dev With Basins 2025-01-14** *Table of Contents*
Prepared by Atwell LLC Printed 1/15/2025
HydroCAD® 10.10-4b s/n 08970 © 2020 HydroCAD Software Solutions LLC

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1-U
1-D
PR DA 1
PR DA 1
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PR DA 1 TOTAL
PR DA 3
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2-U
PR DA 3 TOTAL
PR DA 2
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PR DA 4
T
B1
Basin 2
Total
Basin 1
Subcat
Reach
Pond
Link
Routing Diagram for 23002398calc005 Post-Dev With Basins 2025-01-14
Prepared by Atwell LLC, Printed 1/15/2025
HydroCAD® 10.10-4b s/n 08970 © 2020 HydroCAD Software Solutions LLC

## Rainfall Events Listing

| Event# | Event Name | Storm Type | Curve | Mode | Duration (hours) | B/B | Depth (inches) | AMC |
|---|---|---|---|---|---|---|---|---|
| 1 | 2-year | Huff 0-10sm | 3Q | Scale | 24.00 | 1 | 3.34 | 2 |
| 2 | 100-year | Huff 0-10sm | 3Q | Scale | 24.00 | 1 | 8.57 | 2 |

## Area Listing (all nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 1.373 | 98 | Impervious Area (1-D, 1-U, 2-U, 3-D) |
| 11.437 | 74 | Pasture/grassland/range, Good, HSG C (1-U, 2-U, 3-U, 4-U) |
| 29.040 | 80 | Pasture/grassland/range, Good, HSG D (1-U, 2-U, 3-U, 4-U) |
| 20.897 | 85 | Row crops, straight row, Good, HSG C (1-U, 2-U, 3-U, 4-U) |
| 37.458 | 89 | Row crops, straight row, Good, HSG D (1-U, 2-U, 3-U, 4-U) |
| **100.205** | **84** | **TOTAL AREA** |

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment1-D: PR DA 1** Runoff Area=0.323 ac 100.00% Impervious Runoff Depth>3.10"
Flow Length=459' Tc=9.8 min CN=98 Runoff=0.12 cfs 0.083 af

**Subcatchment1-U: PR DA 1** Runoff Area=3.806 ac 2.26% Impervious Runoff Depth>1.72"
Flow Length=459' Tc=9.8 min CN=83 Runoff=0.99 cfs 0.544 af

**Subcatchment2-U: PR DA 2** Runoff Area=62.154 ac 0.50% Impervious Runoff Depth>1.88"
Flow Length=3,331' Tc=78.0 min CN=86 Runoff=16.64 cfs 9.755 af

**Subcatchment3-D: PR DA 3** Runoff Area=0.651 ac 100.00% Impervious Runoff Depth>3.09"
Flow Length=1,305' Tc=17.6 min CN=98 Runoff=0.24 cfs 0.167 af

**Subcatchment3-U: PR DA 3** Runoff Area=21.569 ac 0.00% Impervious Runoff Depth>1.56"
Flow Length=1,305' Tc=17.6 min CN=81 Runoff=5.20 cfs 2.811 af

**Subcatchment4-U: PR DA 4** Runoff Area=11.702 ac 0.00% Impervious Runoff Depth>1.41"
Flow Length=1,661' Tc=33.8 min CN=79 Runoff=2.58 cfs 1.378 af

**Reach 1-T: PR DA 1 TOTAL** Inflow=1.11 cfs 0.628 af
Outflow=1.11 cfs 0.628 af

**Reach 3-T: PR DA 3 TOTAL** Inflow=5.44 cfs 2.979 af
Outflow=5.44 cfs 2.979 af

**Reach T: Total** Inflow=23.95 cfs 14.287 af
Outflow=23.95 cfs 14.287 af

**Pond B1: Basin 1** Peak Elev=689.13' Storage=17,821 cf Inflow=2.58 cfs 1.378 af
Primary=0.84 cfs 0.786 af Secondary=1.25 cfs 0.277 af Outflow=2.10 cfs 1.063 af

**Pond B2: Basin 2** Peak Elev=689.48' Storage=12,232 cf Inflow=16.64 cfs 9.755 af
Primary=0.70 cfs 0.840 af Secondary=15.90 cfs 8.778 af Outflow=16.59 cfs 9.618 af

**Total Runoff Area = 100.205 ac Runoff Volume = 14.740 af Average Runoff Depth = 1.77"**
**98.63% Pervious = 98.832 ac 1.37% Impervious = 1.373 ac**

## Summary for Subcatchment 1-D: PR DA 1

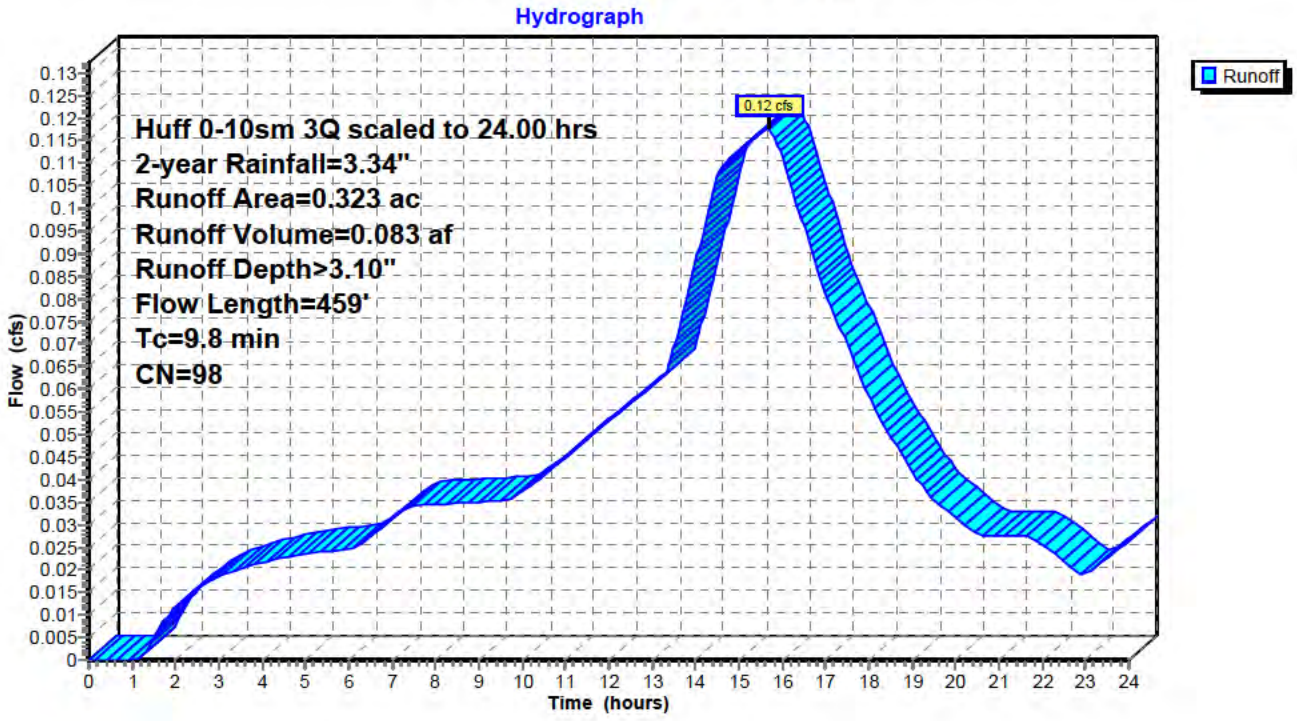
Runoff = 0.12 cfs @ 15.69 hrs, Volume= 0.083 af, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.323 | 98 | Impervious Area |
| | 0.323 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.0 | 100 | 0.0282 | 0.42 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 1.9 | 171 | 0.0290 | 1.53 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 0.2 | 16 | 0.0380 | 1.36 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 3.7 | 172 | 0.0122 | 0.77 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 9.8 | 459 | Total | | | |

## Subcatchment 1-D: PR DA 1



## Hydrograph for Subcatchment 1-D: PR DA 1

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 1.37 | 1.15 | 0.06 |
| 0.25 | 0.00 | 0.00 | 0.00 | 13.25 | 1.42 | 1.20 | 0.06 |
| 0.50 | 0.01 | 0.00 | 0.00 | 13.50 | 1.47 | 1.25 | 0.07 |
| 0.75 | 0.02 | 0.00 | 0.00 | 13.75 | 1.53 | 1.31 | 0.08 |
| 1.00 | 0.04 | 0.00 | 0.00 | 14.00 | 1.60 | 1.38 | 0.09 |
| 1.25 | 0.06 | 0.00 | 0.00 | 14.25 | 1.68 | 1.46 | 0.10 |
| 1.50 | 0.08 | 0.01 | 0.01 | 14.50 | 1.76 | 1.54 | 0.11 |
| 1.75 | 0.10 | 0.01 | 0.01 | 14.75 | 1.85 | 1.63 | 0.11 |
| 2.00 | 0.12 | 0.02 | 0.01 | 15.00 | 1.94 | 1.71 | 0.11 |
| 2.25 | 0.14 | 0.03 | 0.01 | 15.25 | 2.03 | 1.80 | 0.11 |
| 2.50 | 0.16 | 0.04 | 0.02 | 15.50 | 2.12 | 1.89 | **0.12** |
| 2.75 | 0.18 | 0.06 | 0.02 | 15.75 | 2.21 | 1.98 | **0.12** |
| 3.00 | 0.20 | 0.07 | 0.02 | 16.00 | 2.29 | 2.06 | 0.11 |
| 3.25 | 0.22 | 0.09 | 0.02 | 16.25 | 2.37 | 2.14 | 0.10 |
| 3.50 | 0.25 | 0.10 | 0.02 | 16.50 | 2.45 | 2.22 | 0.10 |
| 3.75 | 0.27 | 0.12 | 0.02 | 16.75 | 2.51 | 2.28 | 0.09 |
| 4.00 | 0.29 | 0.14 | 0.02 | 17.00 | 2.58 | 2.35 | 0.08 |
| 4.25 | 0.31 | 0.15 | 0.02 | 17.25 | 2.63 | 2.40 | 0.08 |
| 4.50 | 0.33 | 0.17 | 0.02 | 17.50 | 2.69 | 2.46 | 0.07 |
| 4.75 | 0.35 | 0.19 | 0.02 | 17.75 | 2.74 | 2.51 | 0.06 |
| 5.00 | 0.37 | 0.21 | 0.02 | 18.00 | 2.78 | 2.55 | 0.06 |
| 5.25 | 0.39 | 0.22 | 0.02 | 18.25 | 2.82 | 2.59 | 0.05 |
| 5.50 | 0.42 | 0.24 | 0.02 | 18.50 | 2.86 | 2.63 | 0.05 |
| 5.75 | 0.44 | 0.26 | 0.02 | 18.75 | 2.89 | 2.66 | 0.05 |
| 6.00 | 0.46 | 0.28 | 0.02 | 19.00 | 2.93 | 2.70 | 0.04 |
| 6.25 | 0.48 | 0.30 | 0.03 | 19.25 | 2.96 | 2.72 | 0.04 |
| 6.50 | 0.50 | 0.32 | 0.03 | 19.50 | 2.98 | 2.75 | 0.04 |
| 6.75 | 0.53 | 0.34 | 0.03 | 19.75 | 3.01 | 2.78 | 0.03 |
| 7.00 | 0.55 | 0.37 | 0.03 | 20.00 | 3.03 | 2.80 | 0.03 |
| 7.25 | 0.58 | 0.39 | 0.03 | 20.25 | 3.06 | 2.82 | 0.03 |
| 7.50 | 0.61 | 0.42 | 0.03 | 20.50 | 3.08 | 2.85 | 0.03 |
| 7.75 | 0.64 | 0.45 | 0.03 | 20.75 | 3.10 | 2.87 | 0.03 |
| 8.00 | 0.67 | 0.47 | 0.03 | 21.00 | 3.12 | 2.89 | 0.03 |
| 8.25 | 0.70 | 0.50 | 0.03 | 21.25 | 3.14 | 2.91 | 0.03 |
| 8.50 | 0.72 | 0.53 | 0.03 | 21.50 | 3.16 | 2.93 | 0.03 |
| 8.75 | 0.75 | 0.55 | 0.03 | 21.75 | 3.18 | 2.95 | 0.03 |
| 9.00 | 0.78 | 0.58 | 0.04 | 22.00 | 3.20 | 2.97 | 0.03 |
| 9.25 | 0.81 | 0.61 | 0.04 | 22.25 | 3.22 | 2.99 | 0.02 |
| 9.50 | 0.84 | 0.63 | 0.04 | 22.50 | 3.24 | 3.00 | 0.02 |
| 9.75 | 0.86 | 0.66 | 0.04 | 22.75 | 3.25 | 3.02 | 0.02 |
| 10.00 | 0.89 | 0.69 | 0.04 | 23.00 | 3.27 | 3.03 | 0.02 |
| 10.25 | 0.93 | 0.72 | 0.04 | 23.25 | 3.28 | 3.05 | 0.02 |
| 10.50 | 0.96 | 0.75 | 0.04 | 23.50 | 3.30 | 3.07 | 0.02 |
| 10.75 | 0.99 | 0.78 | 0.04 | 23.75 | 3.32 | 3.09 | 0.02 |
| 11.00 | 1.03 | 0.82 | 0.04 | 24.00 | **3.34** | **3.11** | 0.03 |
| 11.25 | 1.07 | 0.86 | 0.05 | | | | |
| 11.50 | 1.10 | 0.89 | 0.05 | | | | |
| 11.75 | 1.15 | 0.93 | 0.05 | | | | |
| 12.00 | 1.19 | 0.97 | 0.05 | | | | |
| 12.25 | 1.23 | 1.01 | 0.05 | | | | |
| 12.50 | 1.27 | 1.06 | 0.06 | | | | |
| 12.75 | 1.32 | 1.10 | 0.06 | | | | |

## Summary for Subcatchment 1-U: PR DA 1

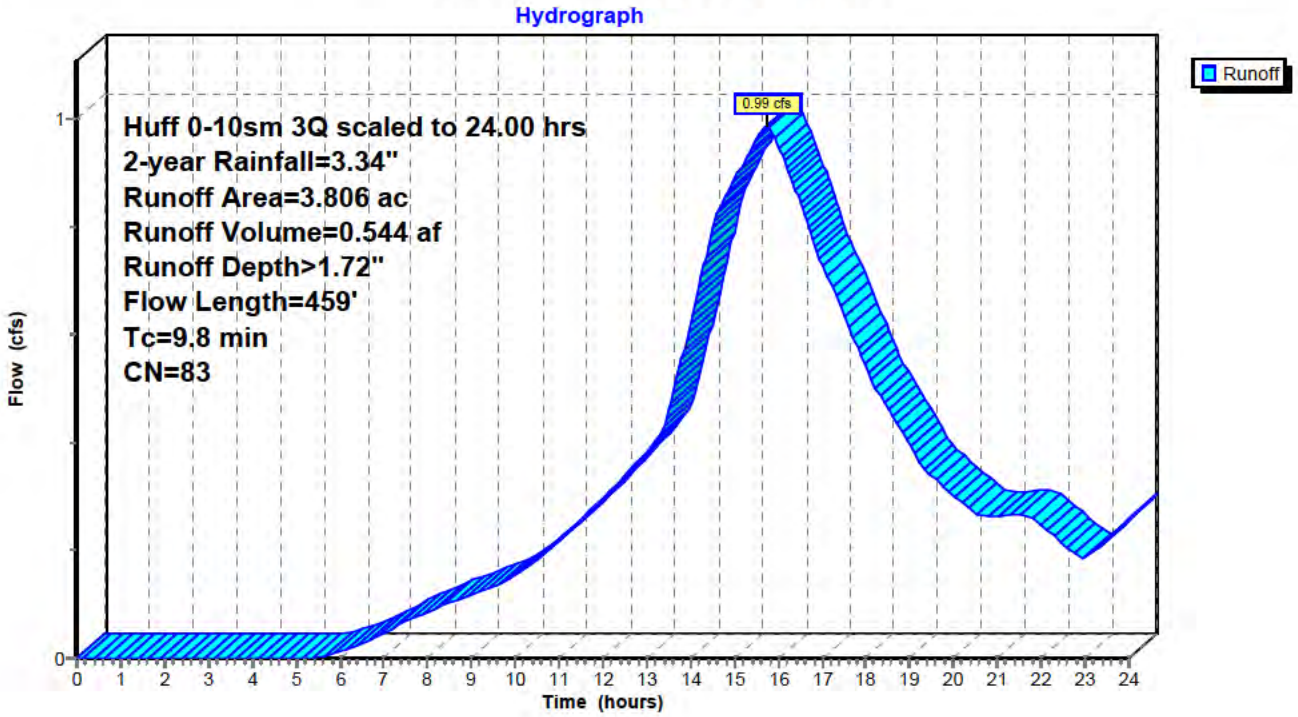
Runoff = 0.99 cfs @ 15.73 hrs, Volume= 0.544 af, Depth> 1.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 0.000 | 89 | Row crops, straight row, Good, HSG D |
| | 0.753 | 89 | Row crops, straight row, Good, HSG D |
| | 0.711 | 80 | Pasture/grassland/range, Good, HSG D |
| | 1.342 | 85 | Row crops, straight row, Good, HSG C |
| | 0.914 | 74 | Pasture/grassland/range, Good, HSG C |
| * | 0.086 | 98 | Impervious Area |
| | 3.806 | 83 | Weighted Average |
| | 3.720 | | 97.74% Pervious Area |
| | 0.086 | | 2.26% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.0 | 100 | 0.0282 | 0.42 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 1.9 | 171 | 0.0290 | 1.53 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 0.2 | 16 | 0.0380 | 1.36 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 3.7 | 172 | 0.0122 | 0.77 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 9.8 | 459 | Total | | | |

## Subcatchment 1-U: PR DA 1



## Hydrograph for Subcatchment 1-U: PR DA 1

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 1.37 | 0.31 | 0.38 |
| 0.25 | 0.00 | 0.00 | 0.00 | 13.25 | 1.42 | 0.33 | 0.41 |
| 0.50 | 0.01 | 0.00 | 0.00 | 13.50 | 1.47 | 0.36 | 0.46 |
| 0.75 | 0.02 | 0.00 | 0.00 | 13.75 | 1.53 | 0.40 | 0.54 |
| 1.00 | 0.04 | 0.00 | 0.00 | 14.00 | 1.60 | 0.44 | 0.62 |
| 1.25 | 0.06 | 0.00 | 0.00 | 14.25 | 1.68 | 0.49 | 0.71 |
| 1.50 | 0.08 | 0.00 | 0.00 | 14.50 | 1.76 | 0.54 | 0.80 |
| 1.75 | 0.10 | 0.00 | 0.00 | 14.75 | 1.85 | 0.59 | 0.85 |
| 2.00 | 0.12 | 0.00 | 0.00 | 15.00 | 1.94 | 0.65 | 0.89 |
| 2.25 | 0.14 | 0.00 | 0.00 | 15.25 | 2.03 | 0.71 | 0.93 |
| 2.50 | 0.16 | 0.00 | 0.00 | 15.50 | 2.12 | 0.78 | 0.96 |
| 2.75 | 0.18 | 0.00 | 0.00 | 15.75 | 2.21 | 0.84 | **0.99** |
| 3.00 | 0.20 | 0.00 | 0.00 | 16.00 | 2.29 | 0.90 | 0.95 |
| 3.25 | 0.22 | 0.00 | 0.00 | 16.25 | 2.37 | 0.96 | 0.90 |
| 3.50 | 0.25 | 0.00 | 0.00 | 16.50 | 2.45 | 1.01 | 0.85 |
| 3.75 | 0.27 | 0.00 | 0.00 | 16.75 | 2.51 | 1.07 | 0.79 |
| 4.00 | 0.29 | 0.00 | 0.00 | 17.00 | 2.58 | 1.11 | 0.73 |
| 4.25 | 0.31 | 0.00 | 0.00 | 17.25 | 2.63 | 1.16 | 0.69 |
| 4.50 | 0.33 | 0.00 | 0.00 | 17.50 | 2.69 | 1.20 | 0.64 |
| 4.75 | 0.35 | 0.00 | 0.00 | 17.75 | 2.74 | 1.24 | 0.59 |
| 5.00 | 0.37 | 0.00 | 0.00 | 18.00 | 2.78 | 1.27 | 0.54 |
| 5.25 | 0.39 | 0.00 | 0.00 | 18.25 | 2.82 | 1.30 | 0.50 |
| 5.50 | 0.42 | 0.00 | 0.00 | 18.50 | 2.86 | 1.33 | 0.46 |
| 5.75 | 0.44 | 0.00 | 0.00 | 18.75 | 2.89 | 1.36 | 0.43 |
| 6.00 | 0.46 | 0.00 | 0.01 | 19.00 | 2.93 | 1.39 | 0.40 |
| 6.25 | 0.48 | 0.00 | 0.02 | 19.25 | 2.96 | 1.41 | 0.36 |
| 6.50 | 0.50 | 0.00 | 0.03 | 19.50 | 2.98 | 1.43 | 0.34 |
| 6.75 | 0.53 | 0.01 | 0.04 | 19.75 | 3.01 | 1.45 | 0.32 |
| 7.00 | 0.55 | 0.01 | 0.05 | 20.00 | 3.03 | 1.47 | 0.30 |
| 7.25 | 0.58 | 0.01 | 0.06 | 20.25 | 3.06 | 1.49 | 0.29 |
| 7.50 | 0.61 | 0.02 | 0.07 | 20.50 | 3.08 | 1.51 | 0.27 |
| 7.75 | 0.64 | 0.02 | 0.08 | 20.75 | 3.10 | 1.53 | 0.26 |
| 8.00 | 0.67 | 0.03 | 0.09 | 21.00 | 3.12 | 1.54 | 0.26 |
| 8.25 | 0.70 | 0.03 | 0.09 | 21.25 | 3.14 | 1.56 | 0.27 |
| 8.50 | 0.72 | 0.04 | 0.10 | 21.50 | 3.16 | 1.58 | 0.27 |
| 8.75 | 0.75 | 0.05 | 0.11 | 21.75 | 3.18 | 1.60 | 0.26 |
| 9.00 | 0.78 | 0.06 | 0.12 | 22.00 | 3.20 | 1.61 | 0.25 |
| 9.25 | 0.81 | 0.06 | 0.13 | 22.25 | 3.22 | 1.63 | 0.23 |
| 9.50 | 0.84 | 0.07 | 0.13 | 22.50 | 3.24 | 1.64 | 0.21 |
| 9.75 | 0.86 | 0.08 | 0.14 | 22.75 | 3.25 | 1.65 | 0.19 |
| 10.00 | 0.89 | 0.09 | 0.15 | 23.00 | 3.27 | 1.66 | 0.18 |
| 10.25 | 0.93 | 0.10 | 0.17 | 23.25 | 3.28 | 1.68 | 0.20 |
| 10.50 | 0.96 | 0.12 | 0.18 | 23.50 | 3.30 | 1.69 | 0.22 |
| 10.75 | 0.99 | 0.13 | 0.20 | 23.75 | 3.32 | 1.71 | 0.24 |
| 11.00 | 1.03 | 0.14 | 0.22 | 24.00 | **3.34** | **1.72** | 0.26 |
| 11.25 | 1.07 | 0.16 | 0.24 | | | | |
| 11.50 | 1.10 | 0.18 | 0.26 | | | | |
| 11.75 | 1.15 | 0.19 | 0.28 | | | | |
| 12.00 | 1.19 | 0.21 | 0.30 | | | | |
| 12.25 | 1.23 | 0.23 | 0.32 | | | | |
| 12.50 | 1.27 | 0.26 | 0.34 | | | | |
| 12.75 | 1.32 | 0.28 | 0.36 | | | | |

## Summary for Subcatchment 2-U: PR DA 2

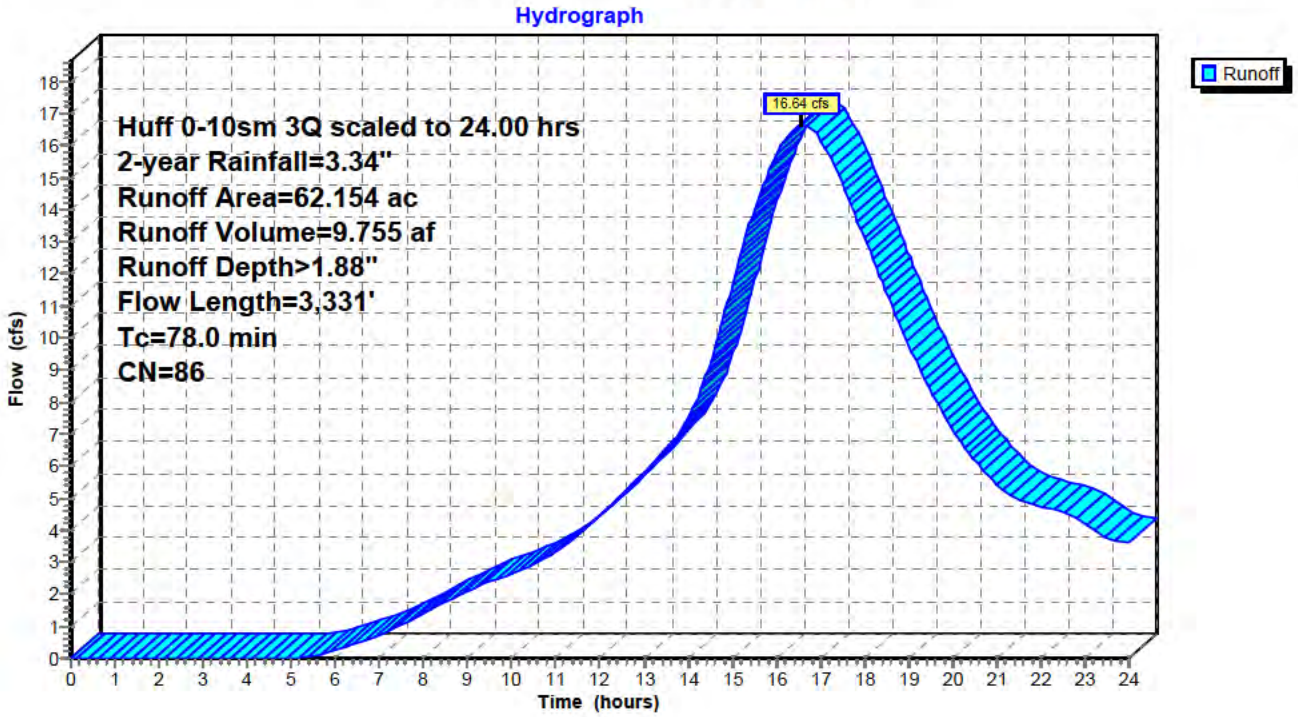
Runoff = 16.64 cfs @ 16.57 hrs, Volume= 9.755 af, Depth> 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 11.052 | 89 | Row crops, straight row, Good, HSG D |
| | 2.151 | 80 | Pasture/grassland/range, Good, HSG D |
| | 0.061 | 89 | Row crops, straight row, Good, HSG D |
| | 10.906 | 89 | Row crops, straight row, Good, HSG D |
| | 8.457 | 80 | Pasture/grassland/range, Good, HSG D |
| | 9.982 | 89 | Row crops, straight row, Good, HSG D |
| | 0.038 | 80 | Pasture/grassland/range, Good, HSG D |
| | 14.843 | 85 | Row crops, straight row, Good, HSG C |
| | 2.519 | 74 | Pasture/grassland/range, Good, HSG C |
| | 0.830 | 85 | Row crops, straight row, Good, HSG C |
| | 1.002 | 74 | Pasture/grassland/range, Good, HSG C |
| * | 0.313 | 98 | Impervious Area |
| | 62.154 | 86 | Weighted Average |
| | 61.841 | | 99.50% Pervious Area |
| | 0.313 | | 0.50% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.4 | 100 | 0.0421 | 0.49 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 1.5 | 141 | 0.0306 | 1.57 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 42.0 | 1,988 | 0.0077 | 0.79 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 31.1 | 1,102 | 0.0071 | 0.59 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 78.0 | 3,331 | Total | | | |

## Subcatchment 2-U: PR DA 2



## Hydrograph for Subcatchment 2-U: PR DA 2

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 1.37 | 0.41 | 5.80 |
| 0.25 | 0.00 | 0.00 | 0.00 | 13.25 | 1.42 | 0.44 | 6.17 |
| 0.50 | 0.01 | 0.00 | 0.00 | 13.50 | 1.47 | 0.47 | 6.54 |
| 0.75 | 0.02 | 0.00 | 0.00 | 13.75 | 1.53 | 0.51 | 6.96 |
| 1.00 | 0.04 | 0.00 | 0.00 | 14.00 | 1.60 | 0.56 | 7.49 |
| 1.25 | 0.06 | 0.00 | 0.00 | 14.25 | 1.68 | 0.61 | 8.24 |
| 1.50 | 0.08 | 0.00 | 0.00 | 14.50 | 1.76 | 0.67 | 9.21 |
| 1.75 | 0.10 | 0.00 | 0.00 | 14.75 | 1.85 | 0.74 | 10.37 |
| 2.00 | 0.12 | 0.00 | 0.00 | 15.00 | 1.94 | 0.80 | 11.64 |
| 2.25 | 0.14 | 0.00 | 0.00 | 15.25 | 2.03 | 0.87 | 12.86 |
| 2.50 | 0.16 | 0.00 | 0.00 | 15.50 | 2.12 | 0.94 | 13.97 |
| 2.75 | 0.18 | 0.00 | 0.00 | 15.75 | 2.21 | 1.01 | 14.89 |
| 3.00 | 0.20 | 0.00 | 0.00 | 16.00 | 2.29 | 1.08 | 15.69 |
| 3.25 | 0.22 | 0.00 | 0.00 | 16.25 | 2.37 | 1.14 | 16.29 |
| 3.50 | 0.25 | 0.00 | 0.00 | 16.50 | 2.45 | 1.20 | **16.60** |
| 3.75 | 0.27 | 0.00 | 0.00 | 16.75 | 2.51 | 1.25 | **16.58** |
| 4.00 | 0.29 | 0.00 | 0.00 | 17.00 | 2.58 | 1.31 | 16.19 |
| 4.25 | 0.31 | 0.00 | 0.00 | 17.25 | 2.63 | 1.35 | 15.59 |
| 4.50 | 0.33 | 0.00 | 0.00 | 17.50 | 2.69 | 1.40 | 14.81 |
| 4.75 | 0.35 | 0.00 | 0.00 | 17.75 | 2.74 | 1.44 | 13.99 |
| 5.00 | 0.37 | 0.00 | 0.01 | 18.00 | 2.78 | 1.48 | 13.13 |
| 5.25 | 0.39 | 0.00 | 0.03 | 18.25 | 2.82 | 1.51 | 12.27 |
| 5.50 | 0.42 | 0.00 | 0.08 | 18.50 | 2.86 | 1.54 | 11.42 |
| 5.75 | 0.44 | 0.01 | 0.15 | 18.75 | 2.89 | 1.57 | 10.58 |
| 6.00 | 0.46 | 0.01 | 0.24 | 19.00 | 2.93 | 1.60 | 9.80 |
| 6.25 | 0.48 | 0.01 | 0.35 | 19.25 | 2.96 | 1.62 | 9.06 |
| 6.50 | 0.50 | 0.02 | 0.46 | 19.50 | 2.98 | 1.65 | 8.38 |
| 6.75 | 0.53 | 0.02 | 0.57 | 19.75 | 3.01 | 1.67 | 7.73 |
| 7.00 | 0.55 | 0.03 | 0.71 | 20.00 | 3.03 | 1.69 | 7.15 |
| 7.25 | 0.58 | 0.03 | 0.86 | 20.25 | 3.06 | 1.71 | 6.62 |
| 7.50 | 0.61 | 0.04 | 1.03 | 20.50 | 3.08 | 1.73 | 6.17 |
| 7.75 | 0.64 | 0.05 | 1.22 | 20.75 | 3.10 | 1.75 | 5.78 |
| 8.00 | 0.67 | 0.06 | 1.41 | 21.00 | 3.12 | 1.77 | 5.43 |
| 8.25 | 0.70 | 0.07 | 1.60 | 21.25 | 3.14 | 1.78 | 5.15 |
| 8.50 | 0.72 | 0.08 | 1.78 | 21.50 | 3.16 | 1.80 | 4.94 |
| 8.75 | 0.75 | 0.09 | 1.94 | 21.75 | 3.18 | 1.82 | 4.81 |
| 9.00 | 0.78 | 0.10 | 2.10 | 22.00 | 3.20 | 1.84 | 4.72 |
| 9.25 | 0.81 | 0.11 | 2.24 | 22.25 | 3.22 | 1.85 | 4.65 |
| 9.50 | 0.84 | 0.12 | 2.38 | 22.50 | 3.24 | 1.87 | 4.55 |
| 9.75 | 0.86 | 0.13 | 2.51 | 22.75 | 3.25 | 1.88 | 4.40 |
| 10.00 | 0.89 | 0.15 | 2.64 | 23.00 | 3.27 | 1.89 | 4.19 |
| 10.25 | 0.93 | 0.16 | 2.77 | 23.25 | 3.28 | 1.91 | 3.95 |
| 10.50 | 0.96 | 0.18 | 2.93 | 23.50 | 3.30 | 1.92 | 3.74 |
| 10.75 | 0.99 | 0.19 | 3.11 | 23.75 | 3.32 | 1.94 | 3.62 |
| 11.00 | 1.03 | 0.21 | 3.34 | 24.00 | **3.34** | **1.96** | 3.63 |
| 11.25 | 1.07 | 0.23 | 3.59 | | | | |
| 11.50 | 1.10 | 0.25 | 3.86 | | | | |
| 11.75 | 1.15 | 0.27 | 4.15 | | | | |
| 12.00 | 1.19 | 0.30 | 4.46 | | | | |
| 12.25 | 1.23 | 0.32 | 4.78 | | | | |
| 12.50 | 1.27 | 0.35 | 5.11 | | | | |
| 12.75 | 1.32 | 0.38 | 5.46 | | | | |

## Summary for Subcatchment 3-D: PR DA 3

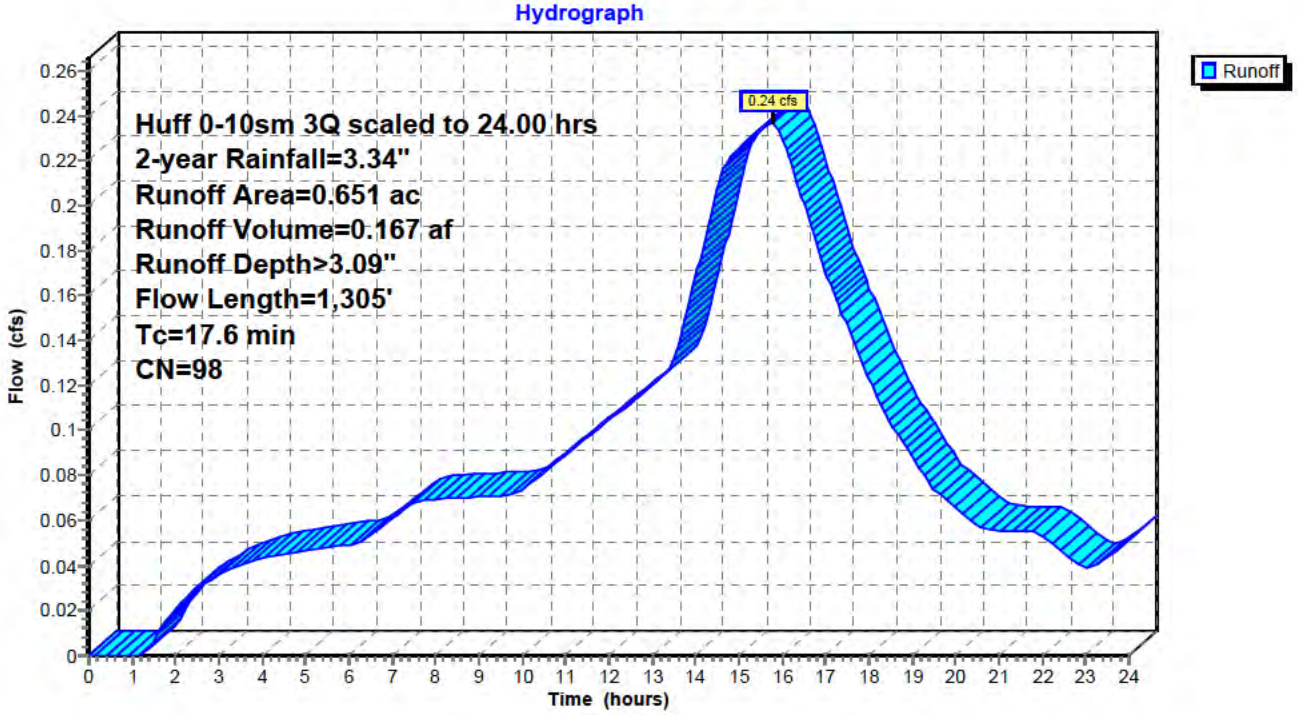
Runoff = 0.24 cfs @ 15.77 hrs, Volume= 0.167 af, Depth> 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.651 | 98 | Impervious Area |
| | 0.651 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0081 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 0.6 | 37 | 0.0151 | 1.11 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 1.8 | 758 | 0.0141 | 7.10 | 71.03 | **Channel Flow,** Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight |
| 0.3 | 38 | 0.0146 | 2.45 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 8.3 | 372 | 0.0113 | 0.74 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 17.6 | 1,305 | Total | | | |

## Subcatchment 3-D: PR DA 3



## Hydrograph for Subcatchment 3-D: PR DA 3

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 1.37 | 1.15 | 0.12 |
| 0.25 | 0.00 | 0.00 | 0.00 | 13.25 | 1.42 | 1.20 | 0.12 |
| 0.50 | 0.01 | 0.00 | 0.00 | 13.50 | 1.47 | 1.25 | 0.13 |
| 0.75 | 0.02 | 0.00 | 0.00 | 13.75 | 1.53 | 1.31 | 0.15 |
| 1.00 | 0.04 | 0.00 | 0.00 | 14.00 | 1.60 | 1.38 | 0.17 |
| 1.25 | 0.06 | 0.00 | 0.00 | 14.25 | 1.68 | 1.46 | 0.19 |
| 1.50 | 0.08 | 0.01 | 0.01 | 14.50 | 1.76 | 1.54 | 0.21 |
| 1.75 | 0.10 | 0.01 | 0.01 | 14.75 | 1.85 | 1.63 | 0.22 |
| 2.00 | 0.12 | 0.02 | 0.02 | 15.00 | 1.94 | 1.71 | 0.23 |
| 2.25 | 0.14 | 0.03 | 0.03 | 15.25 | 2.03 | 1.80 | 0.23 |
| 2.50 | 0.16 | 0.04 | 0.03 | 15.50 | 2.12 | 1.89 | 0.23 |
| 2.75 | 0.18 | 0.06 | 0.03 | 15.75 | 2.21 | 1.98 | **0.24** |
| 3.00 | 0.20 | 0.07 | 0.04 | 16.00 | 2.29 | 2.06 | 0.23 |
| 3.25 | 0.22 | 0.09 | 0.04 | 16.25 | 2.37 | 2.14 | 0.22 |
| 3.50 | 0.25 | 0.10 | 0.04 | 16.50 | 2.45 | 2.22 | 0.20 |
| 3.75 | 0.27 | 0.12 | 0.04 | 16.75 | 2.51 | 2.28 | 0.19 |
| 4.00 | 0.29 | 0.14 | 0.04 | 17.00 | 2.58 | 2.35 | 0.17 |
| 4.25 | 0.31 | 0.15 | 0.04 | 17.25 | 2.63 | 2.40 | 0.16 |
| 4.50 | 0.33 | 0.17 | 0.05 | 17.50 | 2.69 | 2.46 | 0.15 |
| 4.75 | 0.35 | 0.19 | 0.05 | 17.75 | 2.74 | 2.51 | 0.13 |
| 5.00 | 0.37 | 0.21 | 0.05 | 18.00 | 2.78 | 2.55 | 0.12 |
| 5.25 | 0.39 | 0.22 | 0.05 | 18.25 | 2.82 | 2.59 | 0.11 |
| 5.50 | 0.42 | 0.24 | 0.05 | 18.50 | 2.86 | 2.63 | 0.10 |
| 5.75 | 0.44 | 0.26 | 0.05 | 18.75 | 2.89 | 2.66 | 0.10 |
| 6.00 | 0.46 | 0.28 | 0.05 | 19.00 | 2.93 | 2.70 | 0.09 |
| 6.25 | 0.48 | 0.30 | 0.05 | 19.25 | 2.96 | 2.72 | 0.08 |
| 6.50 | 0.50 | 0.32 | 0.05 | 19.50 | 2.98 | 2.75 | 0.07 |
| 6.75 | 0.53 | 0.34 | 0.06 | 19.75 | 3.01 | 2.78 | 0.07 |
| 7.00 | 0.55 | 0.37 | 0.06 | 20.00 | 3.03 | 2.80 | 0.07 |
| 7.25 | 0.58 | 0.39 | 0.06 | 20.25 | 3.06 | 2.82 | 0.06 |
| 7.50 | 0.61 | 0.42 | 0.07 | 20.50 | 3.08 | 2.85 | 0.06 |
| 7.75 | 0.64 | 0.45 | 0.07 | 20.75 | 3.10 | 2.87 | 0.06 |
| 8.00 | 0.67 | 0.47 | 0.07 | 21.00 | 3.12 | 2.89 | 0.06 |
| 8.25 | 0.70 | 0.50 | 0.07 | 21.25 | 3.14 | 2.91 | 0.06 |
| 8.50 | 0.72 | 0.53 | 0.07 | 21.50 | 3.16 | 2.93 | 0.06 |
| 8.75 | 0.75 | 0.55 | 0.07 | 21.75 | 3.18 | 2.95 | 0.06 |
| 9.00 | 0.78 | 0.58 | 0.07 | 22.00 | 3.20 | 2.97 | 0.05 |
| 9.25 | 0.81 | 0.61 | 0.07 | 22.25 | 3.22 | 2.99 | 0.05 |
| 9.50 | 0.84 | 0.63 | 0.07 | 22.50 | 3.24 | 3.00 | 0.05 |
| 9.75 | 0.86 | 0.66 | 0.07 | 22.75 | 3.25 | 3.02 | 0.04 |
| 10.00 | 0.89 | 0.69 | 0.07 | 23.00 | 3.27 | 3.03 | 0.04 |
| 10.25 | 0.93 | 0.72 | 0.08 | 23.25 | 3.28 | 3.05 | 0.04 |
| 10.50 | 0.96 | 0.75 | 0.08 | 23.50 | 3.30 | 3.07 | 0.04 |
| 10.75 | 0.99 | 0.78 | 0.08 | 23.75 | 3.32 | 3.09 | 0.05 |
| 11.00 | 1.03 | 0.82 | 0.09 | 24.00 | **3.34** | **3.11** | 0.05 |
| 11.25 | 1.07 | 0.86 | 0.09 | | | | |
| 11.50 | 1.10 | 0.89 | 0.10 | | | | |
| 11.75 | 1.15 | 0.93 | 0.10 | | | | |
| 12.00 | 1.19 | 0.97 | 0.10 | | | | |
| 12.25 | 1.23 | 1.01 | 0.11 | | | | |
| 12.50 | 1.27 | 1.06 | 0.11 | | | | |
| 12.75 | 1.32 | 1.10 | 0.12 | | | | |

## Summary for Subcatchment 3-U: PR DA 3

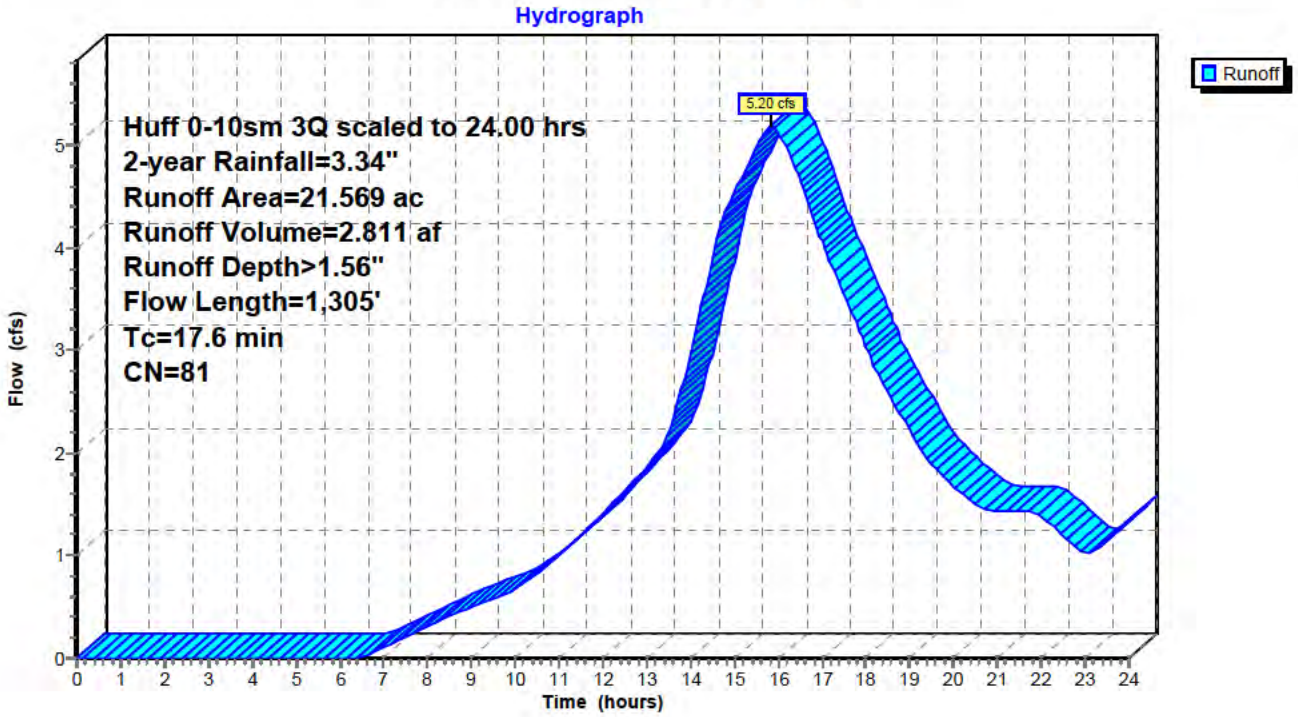
Runoff = 5.20 cfs @ 15.84 hrs, Volume= 2.811 af, Depth> 1.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

| Area (ac) | CN | Description |
|---|---|---|
| 3.171 | 89 | Row crops, straight row, Good, HSG D |
| 4.736 | 80 | Pasture/grassland/range, Good, HSG D |
| 1.134 | 89 | Row crops, straight row, Good, HSG D |
| 5.352 | 80 | Pasture/grassland/range, Good, HSG D |
| 3.187 | 85 | Row crops, straight row, Good, HSG C |
| 3.989 | 74 | Pasture/grassland/range, Good, HSG C |
| 21.569 | 81 | Weighted Average |
| 21.569 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0081 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 0.6 | 37 | 0.0151 | 1.11 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 1.8 | 758 | 0.0141 | 7.10 | 71.03 | **Channel Flow,** Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight |
| 0.3 | 38 | 0.0146 | 2.45 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 8.3 | 372 | 0.0113 | 0.74 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 17.6 | 1,305 | Total | | | |

## Subcatchment 3-U: PR DA 3



## Hydrograph for Subcatchment 3-U: PR DA 3

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 1.37 | 0.25 | 1.87 |
| 0.25 | 0.00 | 0.00 | 0.00 | 13.25 | 1.42 | 0.27 | 1.99 |
| 0.50 | 0.01 | 0.00 | 0.00 | 13.50 | 1.47 | 0.30 | 2.19 |
| 0.75 | 0.02 | 0.00 | 0.00 | 13.75 | 1.53 | 0.33 | 2.55 |
| 1.00 | 0.04 | 0.00 | 0.00 | 14.00 | 1.60 | 0.37 | 2.97 |
| 1.25 | 0.06 | 0.00 | 0.00 | 14.25 | 1.68 | 0.41 | 3.43 |
| 1.50 | 0.08 | 0.00 | 0.00 | 14.50 | 1.76 | 0.46 | 3.91 |
| 1.75 | 0.10 | 0.00 | 0.00 | 14.75 | 1.85 | 0.51 | 4.29 |
| 2.00 | 0.12 | 0.00 | 0.00 | 15.00 | 1.94 | 0.57 | 4.54 |
| 2.25 | 0.14 | 0.00 | 0.00 | 15.25 | 2.03 | 0.62 | 4.76 |
| 2.50 | 0.16 | 0.00 | 0.00 | 15.50 | 2.12 | 0.68 | 4.97 |
| 2.75 | 0.18 | 0.00 | 0.00 | 15.75 | 2.21 | 0.74 | **5.17** |
| 3.00 | 0.20 | 0.00 | 0.00 | 16.00 | 2.29 | 0.80 | **5.14** |
| 3.25 | 0.22 | 0.00 | 0.00 | 16.25 | 2.37 | 0.85 | 4.92 |
| 3.50 | 0.25 | 0.00 | 0.00 | 16.50 | 2.45 | 0.90 | 4.65 |
| 3.75 | 0.27 | 0.00 | 0.00 | 16.75 | 2.51 | 0.95 | 4.36 |
| 4.00 | 0.29 | 0.00 | 0.00 | 17.00 | 2.58 | 1.00 | 4.06 |
| 4.25 | 0.31 | 0.00 | 0.00 | 17.25 | 2.63 | 1.04 | 3.80 |
| 4.50 | 0.33 | 0.00 | 0.00 | 17.50 | 2.69 | 1.08 | 3.55 |
| 4.75 | 0.35 | 0.00 | 0.00 | 17.75 | 2.74 | 1.11 | 3.30 |
| 5.00 | 0.37 | 0.00 | 0.00 | 18.00 | 2.78 | 1.15 | 3.04 |
| 5.25 | 0.39 | 0.00 | 0.00 | 18.25 | 2.82 | 1.18 | 2.79 |
| 5.50 | 0.42 | 0.00 | 0.00 | 18.50 | 2.86 | 1.21 | 2.59 |
| 5.75 | 0.44 | 0.00 | 0.00 | 18.75 | 2.89 | 1.23 | 2.41 |
| 6.00 | 0.46 | 0.00 | 0.00 | 19.00 | 2.93 | 1.26 | 2.23 |
| 6.25 | 0.48 | 0.00 | 0.00 | 19.25 | 2.96 | 1.28 | 2.04 |
| 6.50 | 0.50 | 0.00 | 0.02 | 19.50 | 2.98 | 1.30 | 1.88 |
| 6.75 | 0.53 | 0.00 | 0.06 | 19.75 | 3.01 | 1.32 | 1.78 |
| 7.00 | 0.55 | 0.00 | 0.10 | 20.00 | 3.03 | 1.34 | 1.68 |
| 7.25 | 0.58 | 0.01 | 0.16 | 20.25 | 3.06 | 1.36 | 1.59 |
| 7.50 | 0.61 | 0.01 | 0.21 | 20.50 | 3.08 | 1.37 | 1.49 |
| 7.75 | 0.64 | 0.01 | 0.27 | 20.75 | 3.10 | 1.39 | 1.44 |
| 8.00 | 0.67 | 0.02 | 0.32 | 21.00 | 3.12 | 1.41 | 1.43 |
| 8.25 | 0.70 | 0.02 | 0.36 | 21.25 | 3.14 | 1.42 | 1.44 |
| 8.50 | 0.72 | 0.02 | 0.41 | 21.50 | 3.16 | 1.44 | 1.44 |
| 8.75 | 0.75 | 0.03 | 0.45 | 21.75 | 3.18 | 1.46 | 1.44 |
| 9.00 | 0.78 | 0.04 | 0.50 | 22.00 | 3.20 | 1.47 | 1.39 |
| 9.25 | 0.81 | 0.04 | 0.54 | 22.25 | 3.22 | 1.49 | 1.30 |
| 9.50 | 0.84 | 0.05 | 0.58 | 22.50 | 3.24 | 1.50 | 1.20 |
| 9.75 | 0.86 | 0.06 | 0.62 | 22.75 | 3.25 | 1.51 | 1.10 |
| 10.00 | 0.89 | 0.07 | 0.68 | 23.00 | 3.27 | 1.52 | 1.01 |
| 10.25 | 0.93 | 0.07 | 0.75 | 23.25 | 3.28 | 1.53 | 1.05 |
| 10.50 | 0.96 | 0.08 | 0.83 | 23.50 | 3.30 | 1.55 | 1.15 |
| 10.75 | 0.99 | 0.10 | 0.91 | 23.75 | 3.32 | 1.56 | 1.25 |
| 11.00 | 1.03 | 0.11 | 1.00 | 24.00 | **3.34** | **1.58** | 1.36 |
| 11.25 | 1.07 | 0.12 | 1.10 | | | | |
| 11.50 | 1.10 | 0.14 | 1.20 | | | | |
| 11.75 | 1.15 | 0.15 | 1.30 | | | | |
| 12.00 | 1.19 | 0.17 | 1.41 | | | | |
| 12.25 | 1.23 | 0.19 | 1.52 | | | | |
| 12.50 | 1.27 | 0.21 | 1.63 | | | | |
| 12.75 | 1.32 | 0.23 | 1.75 | | | | |

## Summary for Subcatchment 4-U: PR DA 4

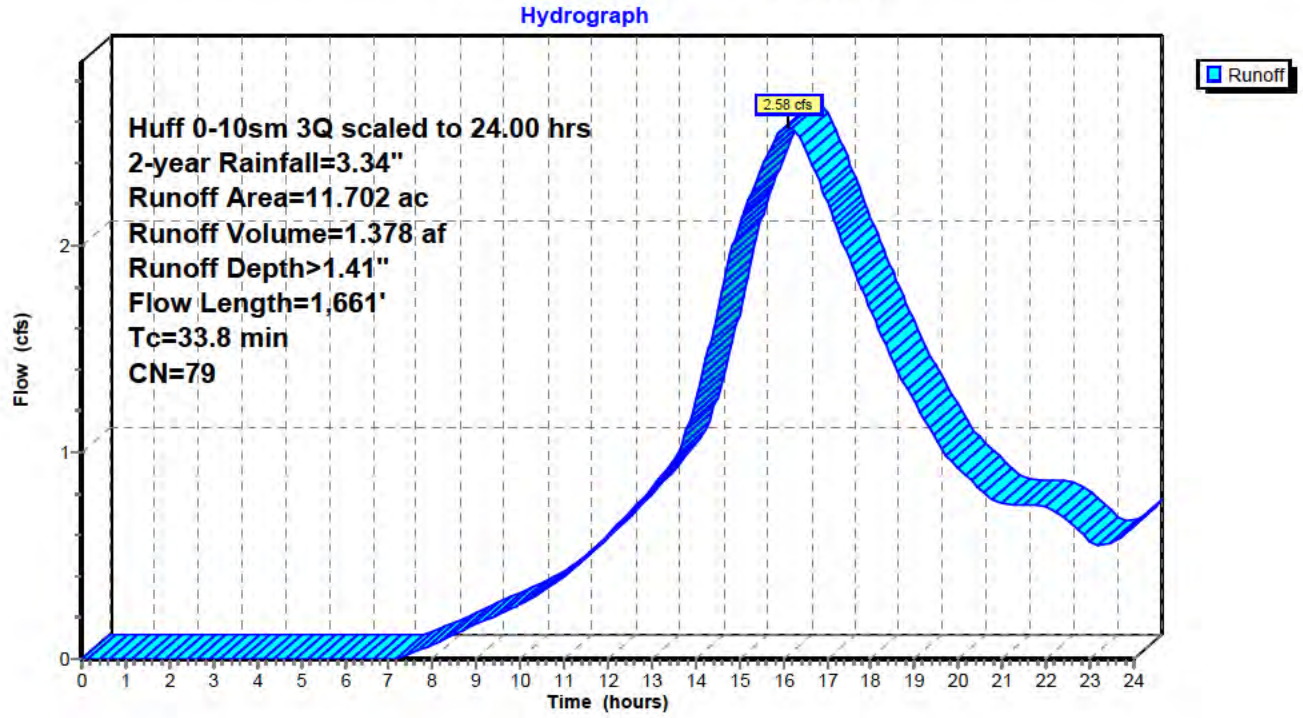
Runoff = 2.58 cfs @ 16.08 hrs, Volume= 1.378 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 2-year Rainfall=3.34"

| Area (ac) | CN | Description |
|---|---|---|
| 0.399 | 89 | Row crops, straight row, Good, HSG D |
| 4.560 | 80 | Pasture/grassland/range, Good, HSG D |
| 0.000 | 89 | Row crops, straight row, Good, HSG D |
| 3.035 | 80 | Pasture/grassland/range, Good, HSG D |
| 0.695 | 85 | Row crops, straight row, Good, HSG C |
| 3.013 | 74 | Pasture/grassland/range, Good, HSG C |
| 11.702 | 79 | Weighted Average |
| 11.702 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0080 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 2.7 | 198 | 0.0180 | 1.21 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 24.5 | 1,363 | 0.0175 | 0.93 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 33.8 | 1,661 | Total | | | |

## Subcatchment 4-U: PR DA 4



## Hydrograph for Subcatchment 4-U: PR DA 4

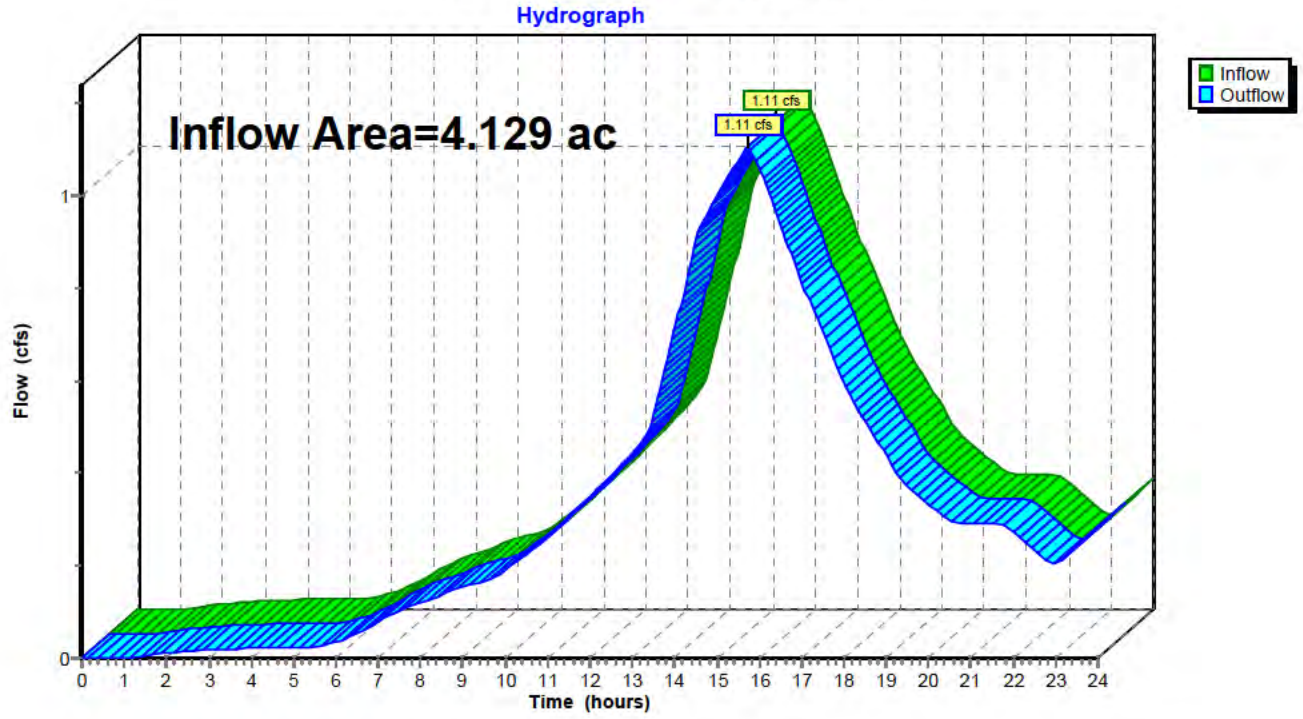
| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 1.37 | 0.20 | 0.83 |
| 0.25 | 0.00 | 0.00 | 0.00 | 13.25 | 1.42 | 0.22 | 0.89 |
| 0.50 | 0.01 | 0.00 | 0.00 | 13.50 | 1.47 | 0.25 | 0.96 |
| 0.75 | 0.02 | 0.00 | 0.00 | 13.75 | 1.53 | 0.27 | 1.08 |
| 1.00 | 0.04 | 0.00 | 0.00 | 14.00 | 1.60 | 0.31 | 1.25 |
| 1.25 | 0.06 | 0.00 | 0.00 | 14.25 | 1.68 | 0.35 | 1.46 |
| 1.50 | 0.08 | 0.00 | 0.00 | 14.50 | 1.76 | 0.39 | 1.68 |
| 1.75 | 0.10 | 0.00 | 0.00 | 14.75 | 1.85 | 0.44 | 1.92 |
| 2.00 | 0.12 | 0.00 | 0.00 | 15.00 | 1.94 | 0.49 | 2.10 |
| 2.25 | 0.14 | 0.00 | 0.00 | 15.25 | 2.03 | 0.54 | 2.24 |
| 2.50 | 0.16 | 0.00 | 0.00 | 15.50 | 2.12 | 0.59 | 2.37 |
| 2.75 | 0.18 | 0.00 | 0.00 | 15.75 | 2.21 | 0.65 | 2.49 |
| 3.00 | 0.20 | 0.00 | 0.00 | 16.00 | 2.29 | 0.70 | **2.57** |
| 3.25 | 0.22 | 0.00 | 0.00 | 16.25 | 2.37 | 0.75 | **2.56** |
| 3.50 | 0.25 | 0.00 | 0.00 | 16.50 | 2.45 | 0.80 | 2.47 |
| 3.75 | 0.27 | 0.00 | 0.00 | 16.75 | 2.51 | 0.85 | 2.35 |
| 4.00 | 0.29 | 0.00 | 0.00 | 17.00 | 2.58 | 0.89 | 2.21 |
| 4.25 | 0.31 | 0.00 | 0.00 | 17.25 | 2.63 | 0.93 | 2.07 |
| 4.50 | 0.33 | 0.00 | 0.00 | 17.50 | 2.69 | 0.97 | 1.94 |
| 4.75 | 0.35 | 0.00 | 0.00 | 17.75 | 2.74 | 1.00 | 1.82 |
| 5.00 | 0.37 | 0.00 | 0.00 | 18.00 | 2.78 | 1.03 | 1.69 |
| 5.25 | 0.39 | 0.00 | 0.00 | 18.25 | 2.82 | 1.06 | 1.56 |
| 5.50 | 0.42 | 0.00 | 0.00 | 18.50 | 2.86 | 1.09 | 1.44 |
| 5.75 | 0.44 | 0.00 | 0.00 | 18.75 | 2.89 | 1.11 | 1.34 |
| 6.00 | 0.46 | 0.00 | 0.00 | 19.00 | 2.93 | 1.14 | 1.24 |
| 6.25 | 0.48 | 0.00 | 0.00 | 19.25 | 2.96 | 1.16 | 1.15 |
| 6.50 | 0.50 | 0.00 | 0.00 | 19.50 | 2.98 | 1.18 | 1.06 |
| 6.75 | 0.53 | 0.00 | 0.00 | 19.75 | 3.01 | 1.19 | 0.98 |
| 7.00 | 0.55 | 0.00 | 0.00 | 20.00 | 3.03 | 1.21 | 0.92 |
| 7.25 | 0.58 | 0.00 | 0.01 | 20.25 | 3.06 | 1.23 | 0.87 |
| 7.50 | 0.61 | 0.00 | 0.02 | 20.50 | 3.08 | 1.25 | 0.82 |
| 7.75 | 0.64 | 0.00 | 0.05 | 20.75 | 3.10 | 1.26 | 0.78 |
| 8.00 | 0.67 | 0.01 | 0.07 | 21.00 | 3.12 | 1.28 | 0.75 |
| 8.25 | 0.70 | 0.01 | 0.10 | 21.25 | 3.14 | 1.29 | 0.75 |
| 8.50 | 0.72 | 0.01 | 0.12 | 21.50 | 3.16 | 1.31 | 0.74 |
| 8.75 | 0.75 | 0.02 | 0.15 | 21.75 | 3.18 | 1.32 | 0.75 |
| 9.00 | 0.78 | 0.02 | 0.17 | 22.00 | 3.20 | 1.34 | 0.74 |
| 9.25 | 0.81 | 0.03 | 0.19 | 22.25 | 3.22 | 1.35 | 0.71 |
| 9.50 | 0.84 | 0.03 | 0.22 | 22.50 | 3.24 | 1.36 | 0.67 |
| 9.75 | 0.86 | 0.04 | 0.24 | 22.75 | 3.25 | 1.38 | 0.62 |
| 10.00 | 0.89 | 0.04 | 0.26 | 23.00 | 3.27 | 1.39 | 0.57 |
| 10.25 | 0.93 | 0.05 | 0.29 | 23.25 | 3.28 | 1.40 | 0.54 |
| 10.50 | 0.96 | 0.06 | 0.33 | 23.50 | 3.30 | 1.41 | 0.56 |
| 10.75 | 0.99 | 0.07 | 0.36 | 23.75 | 3.32 | 1.43 | 0.60 |
| 11.00 | 1.03 | 0.08 | 0.41 | 24.00 | **3.34** | **1.44** | 0.65 |
| 11.25 | 1.07 | 0.09 | 0.45 | | | | |
| 11.50 | 1.10 | 0.10 | 0.50 | | | | |
| 11.75 | 1.15 | 0.12 | 0.55 | | | | |
| 12.00 | 1.19 | 0.13 | 0.60 | | | | |
| 12.25 | 1.23 | 0.15 | 0.65 | | | | |
| 12.50 | 1.27 | 0.16 | 0.71 | | | | |
| 12.75 | 1.32 | 0.18 | 0.77 | | | | |

## Summary for Reach 1-T: PR DA 1 TOTAL

Inflow Area = 4.129 ac, 9.91% Impervious, Inflow Depth > 1.82" for 2-year event
Inflow = 1.11 cfs @ 15.73 hrs, Volume= 0.628 af
Outflow = 1.11 cfs @ 15.73 hrs, Volume= 0.628 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

### Reach 1-T: PR DA 1 TOTAL



## Hydrograph for Reach 1-T: PR DA 1 TOTAL

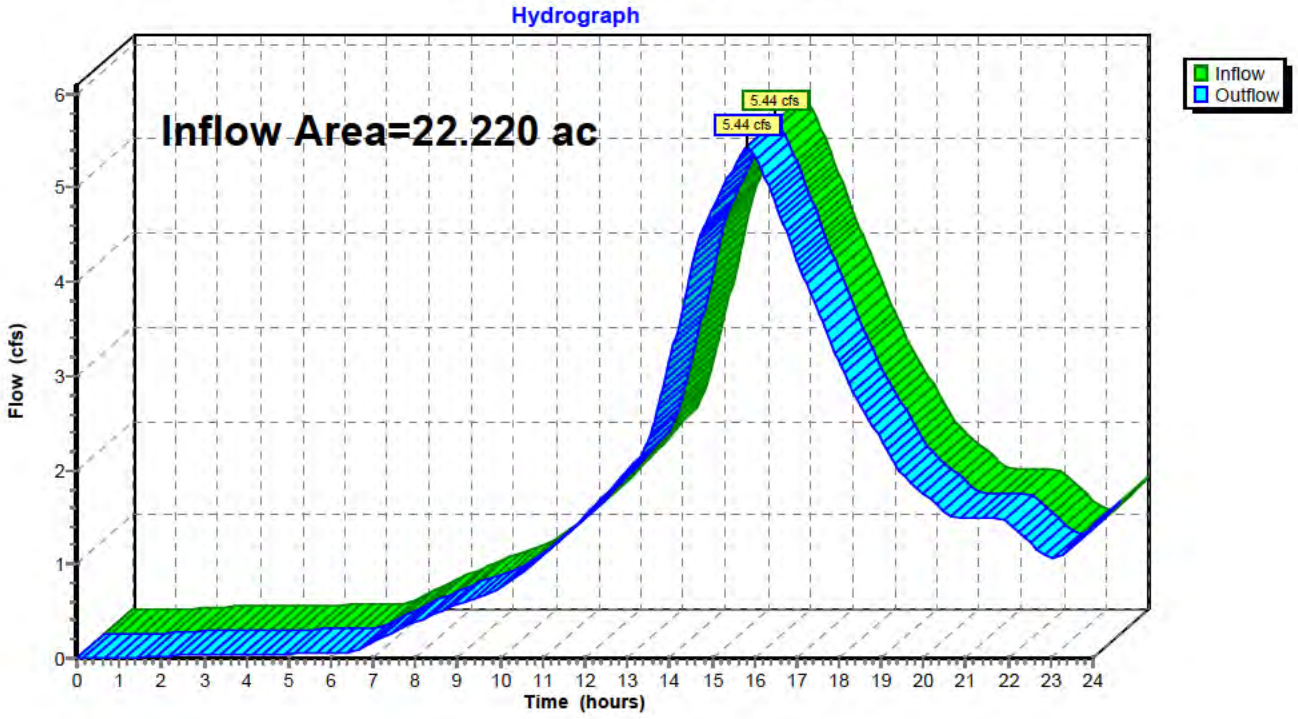
| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 0.44 | | 0.44 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 0.47 | | 0.47 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 0.53 | | 0.53 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 0.62 | | 0.62 |
| 1.00 | 0.00 | | 0.00 | 14.00 | 0.71 | | 0.71 |
| 1.25 | 0.00 | | 0.00 | 14.25 | 0.81 | | 0.81 |
| 1.50 | 0.01 | | 0.01 | 14.50 | 0.91 | | 0.91 |
| 1.75 | 0.01 | | 0.01 | 14.75 | 0.96 | | 0.96 |
| 2.00 | 0.01 | | 0.01 | 15.00 | 1.00 | | 1.00 |
| 2.25 | 0.01 | | 0.01 | 15.25 | 1.04 | | 1.04 |
| 2.50 | 0.02 | | 0.02 | 15.50 | 1.08 | | 1.08 |
| 2.75 | 0.02 | | 0.02 | 15.75 | **1.11** | | **1.11** |
| 3.00 | 0.02 | | 0.02 | 16.00 | 1.06 | | 1.06 |
| 3.25 | 0.02 | | 0.02 | 16.25 | 1.00 | | 1.00 |
| 3.50 | 0.02 | | 0.02 | 16.50 | 0.94 | | 0.94 |
| 3.75 | 0.02 | | 0.02 | 16.75 | 0.88 | | 0.88 |
| 4.00 | 0.02 | | 0.02 | 17.00 | 0.81 | | 0.81 |
| 4.25 | 0.02 | | 0.02 | 17.25 | 0.76 | | 0.76 |
| 4.50 | 0.02 | | 0.02 | 17.50 | 0.71 | | 0.71 |
| 4.75 | 0.02 | | 0.02 | 17.75 | 0.65 | | 0.65 |
| 5.00 | 0.02 | | 0.02 | 18.00 | 0.60 | | 0.60 |
| 5.25 | 0.02 | | 0.02 | 18.25 | 0.55 | | 0.55 |
| 5.50 | 0.02 | | 0.02 | 18.50 | 0.51 | | 0.51 |
| 5.75 | 0.03 | | 0.03 | 18.75 | 0.48 | | 0.48 |
| 6.00 | 0.04 | | 0.04 | 19.00 | 0.44 | | 0.44 |
| 6.25 | 0.04 | | 0.04 | 19.25 | 0.40 | | 0.40 |
| 6.50 | 0.05 | | 0.05 | 19.50 | 0.37 | | 0.37 |
| 6.75 | 0.06 | | 0.06 | 19.75 | 0.35 | | 0.35 |
| 7.00 | 0.08 | | 0.08 | 20.00 | 0.33 | | 0.33 |
| 7.25 | 0.09 | | 0.09 | 20.25 | 0.31 | | 0.31 |
| 7.50 | 0.10 | | 0.10 | 20.50 | 0.30 | | 0.30 |
| 7.75 | 0.11 | | 0.11 | 20.75 | 0.29 | | 0.29 |
| 8.00 | 0.12 | | 0.12 | 21.00 | 0.29 | | 0.29 |
| 8.25 | 0.13 | | 0.13 | 21.25 | 0.29 | | 0.29 |
| 8.50 | 0.14 | | 0.14 | 21.50 | 0.29 | | 0.29 |
| 8.75 | 0.15 | | 0.15 | 21.75 | 0.29 | | 0.29 |
| 9.00 | 0.15 | | 0.15 | 22.00 | 0.27 | | 0.27 |
| 9.25 | 0.16 | | 0.16 | 22.25 | 0.25 | | 0.25 |
| 9.50 | 0.17 | | 0.17 | 22.50 | 0.23 | | 0.23 |
| 9.75 | 0.18 | | 0.18 | 22.75 | 0.21 | | 0.21 |
| 10.00 | 0.19 | | 0.19 | 23.00 | 0.20 | | 0.20 |
| 10.25 | 0.21 | | 0.21 | 23.25 | 0.22 | | 0.22 |
| 10.50 | 0.23 | | 0.23 | 23.50 | 0.24 | | 0.24 |
| 10.75 | 0.24 | | 0.24 | 23.75 | 0.26 | | 0.26 |
| 11.00 | 0.26 | | 0.26 | 24.00 | 0.28 | | 0.28 |
| 11.25 | 0.28 | | 0.28 | | | | |
| 11.50 | 0.31 | | 0.31 | | | | |
| 11.75 | 0.33 | | 0.33 | | | | |
| 12.00 | 0.35 | | 0.35 | | | | |
| 12.25 | 0.37 | | 0.37 | | | | |
| 12.50 | 0.40 | | 0.40 | | | | |
| 12.75 | 0.42 | | 0.42 | | | | |

## Summary for Reach 3-T: PR DA 3 TOTAL

Inflow Area = 22.220 ac, 2.93% Impervious, Inflow Depth > 1.61" for 2-year event
Inflow = 5.44 cfs @ 15.84 hrs, Volume= 2.979 af
Outflow = 5.44 cfs @ 15.84 hrs, Volume= 2.979 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

### Reach 3-T: PR DA 3 TOTAL



## Hydrograph for Reach 3-T: PR DA 3 TOTAL

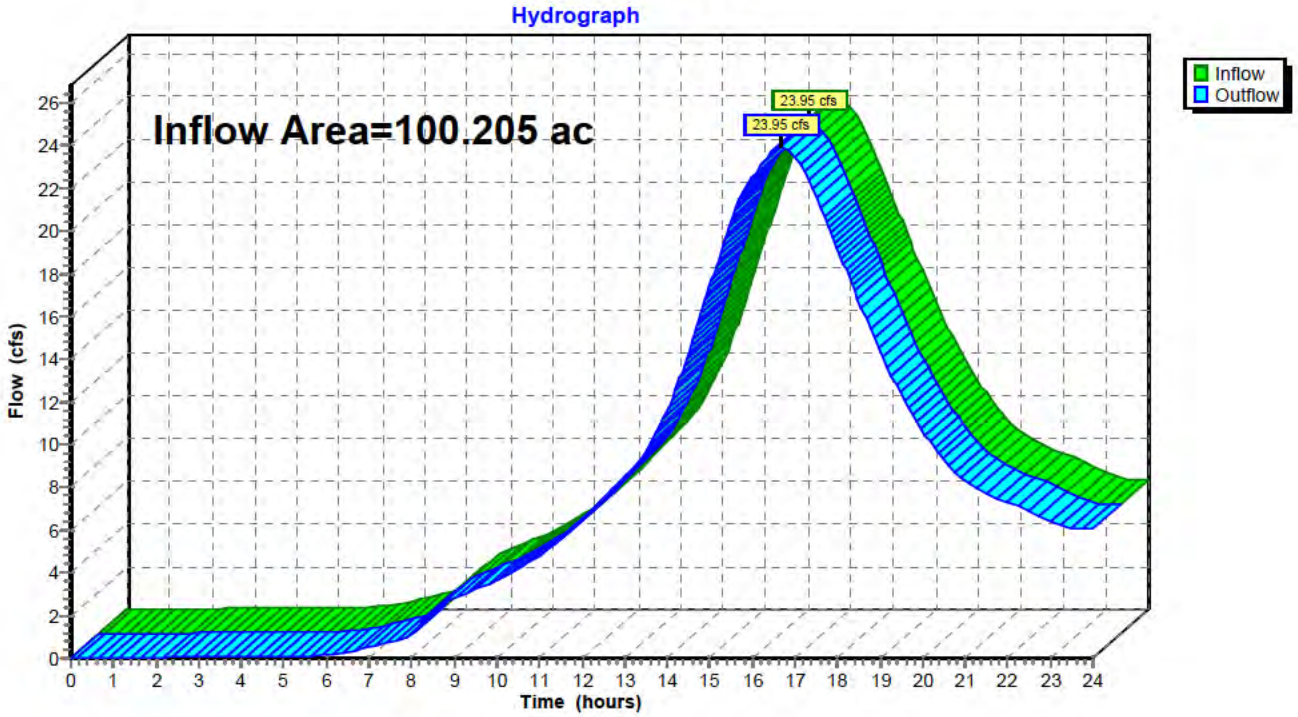
| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 1.99 | | 1.99 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 2.12 | | 2.12 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 2.32 | | 2.32 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 2.70 | | 2.70 |
| 1.00 | 0.00 | | 0.00 | 14.00 | 3.14 | | 3.14 |
| 1.25 | 0.00 | | 0.00 | 14.25 | 3.61 | | 3.61 |
| 1.50 | 0.01 | | 0.01 | 14.50 | 4.11 | | 4.11 |
| 1.75 | 0.01 | | 0.01 | 14.75 | 4.51 | | 4.51 |
| 2.00 | 0.02 | | 0.02 | 15.00 | 4.76 | | 4.76 |
| 2.25 | 0.03 | | 0.03 | 15.25 | 4.99 | | 4.99 |
| 2.50 | 0.03 | | 0.03 | 15.50 | 5.20 | | 5.20 |
| 2.75 | 0.03 | | 0.03 | 15.75 | **5.41** | | **5.41** |
| 3.00 | 0.04 | | 0.04 | 16.00 | **5.37** | | **5.37** |
| 3.25 | 0.04 | | 0.04 | 16.25 | 5.13 | | 5.13 |
| 3.50 | 0.04 | | 0.04 | 16.50 | 4.85 | | 4.85 |
| 3.75 | 0.04 | | 0.04 | 16.75 | 4.55 | | 4.55 |
| 4.00 | 0.04 | | 0.04 | 17.00 | 4.23 | | 4.23 |
| 4.25 | 0.04 | | 0.04 | 17.25 | 3.96 | | 3.96 |
| 4.50 | 0.05 | | 0.05 | 17.50 | 3.70 | | 3.70 |
| 4.75 | 0.05 | | 0.05 | 17.75 | 3.43 | | 3.43 |
| 5.00 | 0.05 | | 0.05 | 18.00 | 3.16 | | 3.16 |
| 5.25 | 0.05 | | 0.05 | 18.25 | 2.90 | | 2.90 |
| 5.50 | 0.05 | | 0.05 | 18.50 | 2.70 | | 2.70 |
| 5.75 | 0.05 | | 0.05 | 18.75 | 2.51 | | 2.51 |
| 6.00 | 0.05 | | 0.05 | 19.00 | 2.32 | | 2.32 |
| 6.25 | 0.05 | | 0.05 | 19.25 | 2.12 | | 2.12 |
| 6.50 | 0.07 | | 0.07 | 19.50 | 1.96 | | 1.96 |
| 6.75 | 0.11 | | 0.11 | 19.75 | 1.85 | | 1.85 |
| 7.00 | 0.17 | | 0.17 | 20.00 | 1.75 | | 1.75 |
| 7.25 | 0.22 | | 0.22 | 20.25 | 1.65 | | 1.65 |
| 7.50 | 0.28 | | 0.28 | 20.50 | 1.55 | | 1.55 |
| 7.75 | 0.34 | | 0.34 | 20.75 | 1.50 | | 1.50 |
| 8.00 | 0.38 | | 0.38 | 21.00 | 1.49 | | 1.49 |
| 8.25 | 0.43 | | 0.43 | 21.25 | 1.49 | | 1.49 |
| 8.50 | 0.48 | | 0.48 | 21.50 | 1.50 | | 1.50 |
| 8.75 | 0.52 | | 0.52 | 21.75 | 1.50 | | 1.50 |
| 9.00 | 0.57 | | 0.57 | 22.00 | 1.44 | | 1.44 |
| 9.25 | 0.61 | | 0.61 | 22.25 | 1.35 | | 1.35 |
| 9.50 | 0.65 | | 0.65 | 22.50 | 1.25 | | 1.25 |
| 9.75 | 0.69 | | 0.69 | 22.75 | 1.14 | | 1.14 |
| 10.00 | 0.75 | | 0.75 | 23.00 | 1.05 | | 1.05 |
| 10.25 | 0.83 | | 0.83 | 23.25 | 1.09 | | 1.09 |
| 10.50 | 0.91 | | 0.91 | 23.50 | 1.19 | | 1.19 |
| 10.75 | 1.00 | | 1.00 | 23.75 | 1.30 | | 1.30 |
| 11.00 | 1.09 | | 1.09 | 24.00 | 1.41 | | 1.41 |
| 11.25 | 1.19 | | 1.19 | | | | |
| 11.50 | 1.29 | | 1.29 | | | | |
| 11.75 | 1.40 | | 1.40 | | | | |
| 12.00 | 1.51 | | 1.51 | | | | |
| 12.25 | 1.62 | | 1.62 | | | | |
| 12.50 | 1.74 | | 1.74 | | | | |
| 12.75 | 1.86 | | 1.86 | | | | |

## Summary for Reach T: Total

Inflow Area = 100.205 ac, 1.37% Impervious, Inflow Depth > 1.71" for 2-year event
Inflow = 23.95 cfs @ 16.67 hrs, Volume= 14.287 af
Outflow = 23.95 cfs @ 16.67 hrs, Volume= 14.287 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## Reach T: Total



## Hydrograph for Reach T: Total

| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 8.49 | | 8.49 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 9.03 | | 9.03 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 9.68 | | 9.68 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 10.56 | | 10.56 |
| 1.00 | 0.00 | | 0.00 | 14.00 | 11.59 | | 11.59 |
| 1.25 | 0.00 | | 0.00 | 14.25 | 12.83 | | 12.83 |
| 1.50 | 0.01 | | 0.01 | 14.50 | 14.31 | | 14.31 |
| 1.75 | 0.02 | | 0.02 | 14.75 | 15.86 | | 15.86 |
| 2.00 | 0.03 | | 0.03 | 15.00 | 17.41 | | 17.41 |
| 2.25 | 0.04 | | 0.04 | 15.25 | 18.96 | | 18.96 |
| 2.50 | 0.05 | | 0.05 | 15.50 | 20.43 | | 20.43 |
| 2.75 | 0.05 | | 0.05 | 15.75 | 21.71 | | 21.71 |
| 3.00 | 0.05 | | 0.05 | 16.00 | 22.52 | | 22.52 |
| 3.25 | 0.06 | | 0.06 | 16.25 | 23.18 | | 23.18 |
| 3.50 | 0.06 | | 0.06 | 16.50 | **23.81** | | **23.81** |
| 3.75 | 0.06 | | 0.06 | 16.75 | **23.92** | | **23.92** |
| 4.00 | 0.06 | | 0.06 | 17.00 | 23.49 | | 23.49 |
| 4.25 | 0.07 | | 0.07 | 17.25 | 22.70 | | 22.70 |
| 4.50 | 0.07 | | 0.07 | 17.50 | 21.65 | | 21.65 |
| 4.75 | 0.07 | | 0.07 | 17.75 | 20.46 | | 20.46 |
| 5.00 | 0.07 | | 0.07 | 18.00 | 19.20 | | 19.20 |
| 5.25 | 0.07 | | 0.07 | 18.25 | 17.93 | | 17.93 |
| 5.50 | 0.09 | | 0.09 | 18.50 | 16.73 | | 16.73 |
| 5.75 | 0.11 | | 0.11 | 18.75 | 15.55 | | 15.55 |
| 6.00 | 0.15 | | 0.15 | 19.00 | 14.42 | | 14.42 |
| 6.25 | 0.20 | | 0.20 | 19.25 | 13.34 | | 13.34 |
| 6.50 | 0.28 | | 0.28 | 19.50 | 12.34 | | 12.34 |
| 6.75 | 0.39 | | 0.39 | 19.75 | 11.47 | | 11.47 |
| 7.00 | 0.51 | | 0.51 | 20.00 | 10.66 | | 10.66 |
| 7.25 | 0.64 | | 0.64 | 20.25 | 9.92 | | 9.92 |
| 7.50 | 0.77 | | 0.77 | 20.50 | 9.26 | | 9.26 |
| 7.75 | 0.88 | | 0.88 | 20.75 | 8.73 | | 8.73 |
| 8.00 | 1.02 | | 1.02 | 21.00 | 8.30 | | 8.30 |
| 8.25 | 1.71 | | 1.71 | 21.25 | 7.96 | | 7.96 |
| 8.50 | 2.21 | | 2.21 | 21.50 | 7.69 | | 7.69 |
| 8.75 | 2.53 | | 2.53 | 21.75 | 7.50 | | 7.50 |
| 9.00 | 2.79 | | 2.79 | 22.00 | 7.31 | | 7.31 |
| 9.25 | 3.02 | | 3.02 | 22.25 | 7.10 | | 7.10 |
| 9.50 | 3.23 | | 3.23 | 22.50 | 6.89 | | 6.89 |
| 9.75 | 3.44 | | 3.44 | 22.75 | 6.64 | | 6.64 |
| 10.00 | 3.66 | | 3.66 | 23.00 | 6.36 | | 6.36 |
| 10.25 | 3.91 | | 3.91 | 23.25 | 6.20 | | 6.20 |
| 10.50 | 4.18 | | 4.18 | 23.50 | 6.09 | | 6.09 |
| 10.75 | 4.48 | | 4.48 | 23.75 | 6.04 | | 6.04 |
| 11.00 | 4.81 | | 4.81 | 24.00 | 6.10 | | 6.10 |
| 11.25 | 5.20 | | 5.20 | | | | |
| 11.50 | 5.61 | | 5.61 | | | | |
| 11.75 | 6.04 | | 6.04 | | | | |
| 12.00 | 6.50 | | 6.50 | | | | |
| 12.25 | 6.97 | | 6.97 | | | | |
| 12.50 | 7.46 | | 7.46 | | | | |
| 12.75 | 7.97 | | 7.97 | | | | |

## Summary for Pond B1: Basin 1

Inflow Area = 11.702 ac, 0.00% Impervious, Inflow Depth > 1.41" for 2-year event
Inflow = 2.58 cfs @ 16.08 hrs, Volume= 1.378 af
Outflow = 2.10 cfs @ 17.21 hrs, Volume= 1.063 af, Atten= 19%, Lag= 67.4 min
Primary = 0.84 cfs @ 17.21 hrs, Volume= 0.786 af
Secondary = 1.25 cfs @ 17.21 hrs, Volume= 0.277 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 689.13' @ 17.21 hrs Surf.Area= 24,369 sf Storage= 17,821 cf

Plug-Flow detention time= 149.7 min calculated for 1.060 af (77% of inflow)
Center-of-Mass det. time= 70.3 min ( 1,076.6 - 1,006.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 687.60' | 47,069 cf | **Storage (Prismatic)**Listed below (Recalc) |

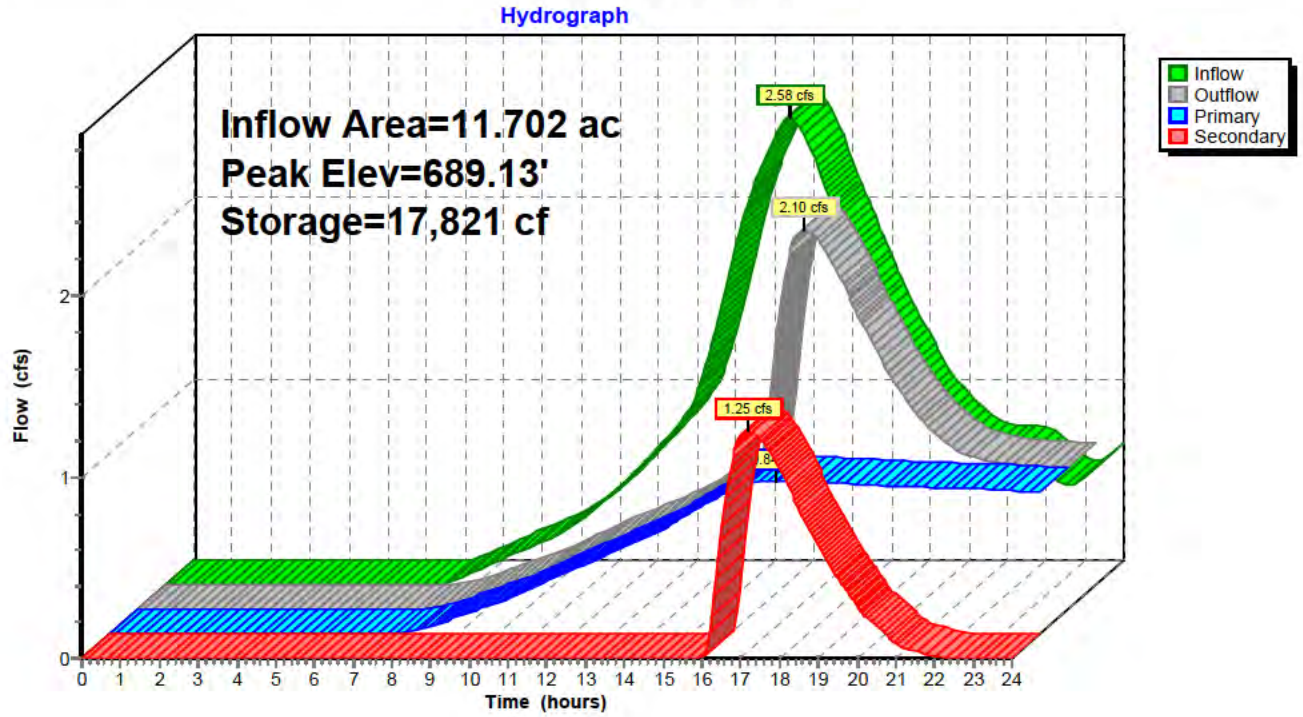
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 687.60 | 29 | 0 | 0 |
| 688.00 | 5,769 | 1,160 | 1,160 |
| 689.00 | 21,757 | 13,763 | 14,923 |
| 690.00 | 42,536 | 32,147 | 47,069 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 687.60' | **6.0" Round 6" PVC Pipe**<br>L= 60.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 687.60' / 685.09' S= 0.0418 '/' Cc= 0.900<br>n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf |
| #2 | Secondary | 689.00' | **11.0' long x 11.5' breadth Emergency Overflow**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.55 2.60 2.70 2.67 2.67 2.67 2.66 2.64 |

**Primary OutFlow** Max=0.84 cfs @ 17.21 hrs HW=689.13' (Free Discharge)
↑—**1=6" PVC Pipe** (Inlet Controls 0.84 cfs @ 4.29 fps)

**Secondary OutFlow** Max=1.25 cfs @ 17.21 hrs HW=689.13' (Free Discharge)
↑—**2=Emergency Overflow** (Weir Controls 1.25 cfs @ 0.90 fps)

## Pond B1: Basin 1



## Hydrograph for Pond B1: Basin 1

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Outflow (cfs) | Primary (cfs) | Secondary (cfs) |
|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 0.50 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 1.00 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 1.50 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 2.00 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 2.50 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 3.00 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 3.50 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 4.00 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 4.50 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 5.50 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 6.00 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 6.50 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 7.00 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 7.50 | 0.02 | 13 | 687.64 | 0.00 | 0.00 | 0.00 |
| 8.00 | 0.07 | 77 | 687.70 | 0.02 | 0.02 | 0.00 |
| 8.50 | 0.12 | 182 | 687.76 | 0.06 | 0.06 | 0.00 |
| 9.00 | 0.17 | 313 | 687.81 | 0.09 | 0.09 | 0.00 |
| 9.50 | 0.22 | 458 | 687.85 | 0.13 | 0.13 | 0.00 |
| 10.00 | 0.26 | 612 | 687.89 | 0.17 | 0.17 | 0.00 |
| 10.50 | 0.33 | 792 | 687.93 | 0.21 | 0.21 | 0.00 |
| 11.00 | 0.41 | 1,023 | 687.98 | 0.26 | 0.26 | 0.00 |
| 11.50 | 0.50 | 1,318 | 688.03 | 0.31 | 0.31 | 0.00 |
| 12.00 | 0.60 | 1,694 | 688.08 | 0.36 | 0.36 | 0.00 |
| 12.50 | 0.71 | 2,178 | 688.15 | 0.41 | 0.41 | 0.00 |
| 13.00 | 0.83 | 2,787 | 688.22 | 0.45 | 0.45 | 0.00 |
| 13.50 | 0.96 | 3,538 | 688.29 | 0.50 | 0.50 | 0.00 |
| 14.00 | 1.25 | 4,560 | 688.38 | 0.55 | 0.55 | 0.00 |
| 14.50 | 1.68 | 6,153 | 688.51 | 0.61 | 0.61 | 0.00 |
| 15.00 | 2.10 | 8,436 | 688.66 | 0.67 | 0.67 | 0.00 |
| 15.50 | 2.37 | 11,205 | 688.82 | 0.73 | 0.73 | 0.00 |
| 16.00 | **2.57** | 14,302 | 688.97 | 0.79 | 0.79 | 0.00 |
| 16.50 | **2.47** | 16,919 | 689.09 | 1.56 | 0.83 | 0.73 |
| 17.00 | 2.21 | **17,771** | **689.12** | **2.07** | **0.84** | **1.22** |
| 17.50 | 1.94 | **17,756** | **689.12** | **2.06** | **0.84** | **1.21** |
| 18.00 | 1.69 | 17,473 | 689.11 | 1.88 | 0.84 | 1.04 |
| 18.50 | 1.44 | 17,091 | 689.10 | 1.66 | 0.83 | 0.83 |
| 19.00 | 1.24 | 16,704 | 689.08 | 1.45 | 0.83 | 0.63 |
| 19.50 | 1.06 | 16,328 | 689.06 | 1.26 | 0.82 | 0.44 |
| 20.00 | 0.92 | 15,966 | 689.05 | 1.11 | 0.82 | 0.29 |
| 20.50 | 0.82 | 15,656 | 689.03 | 0.99 | 0.81 | 0.18 |
| 21.00 | 0.75 | 15,369 | 689.02 | 0.89 | 0.81 | 0.09 |
| 21.50 | 0.74 | 15,160 | 689.01 | 0.84 | 0.80 | 0.04 |
| 22.00 | 0.74 | 15,008 | 689.00 | 0.82 | 0.80 | 0.01 |
| 22.50 | 0.67 | 14,836 | 689.00 | 0.80 | 0.80 | 0.00 |
| 23.00 | 0.57 | 14,519 | 688.98 | 0.79 | 0.79 | 0.00 |
| 23.50 | 0.56 | 14,088 | 688.96 | 0.79 | 0.79 | 0.00 |
| 24.00 | 0.65 | 13,763 | 688.95 | 0.78 | 0.78 | 0.00 |

## Summary for Pond B2: Basin 2

Inflow Area = 62.154 ac, 0.50% Impervious, Inflow Depth > 1.88" for 2-year event
Inflow = 16.64 cfs @ 16.57 hrs, Volume= 9.755 af
Outflow = 16.59 cfs @ 16.73 hrs, Volume= 9.618 af, Atten= 0%, Lag= 9.6 min
Primary = 0.70 cfs @ 16.73 hrs, Volume= 0.840 af
Secondary = 15.90 cfs @ 16.73 hrs, Volume= 8.778 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 689.48' @ 16.73 hrs Surf.Area= 23,712 sf Storage= 12,232 cf

Plug-Flow detention time= 18.0 min calculated for 9.598 af (98% of inflow)
Center-of-Mass det. time= 11.9 min ( 1,007.8 - 995.9 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 688.36' | 77,771 cf | **Storage (Prismatic)**Listed below (Recalc) |

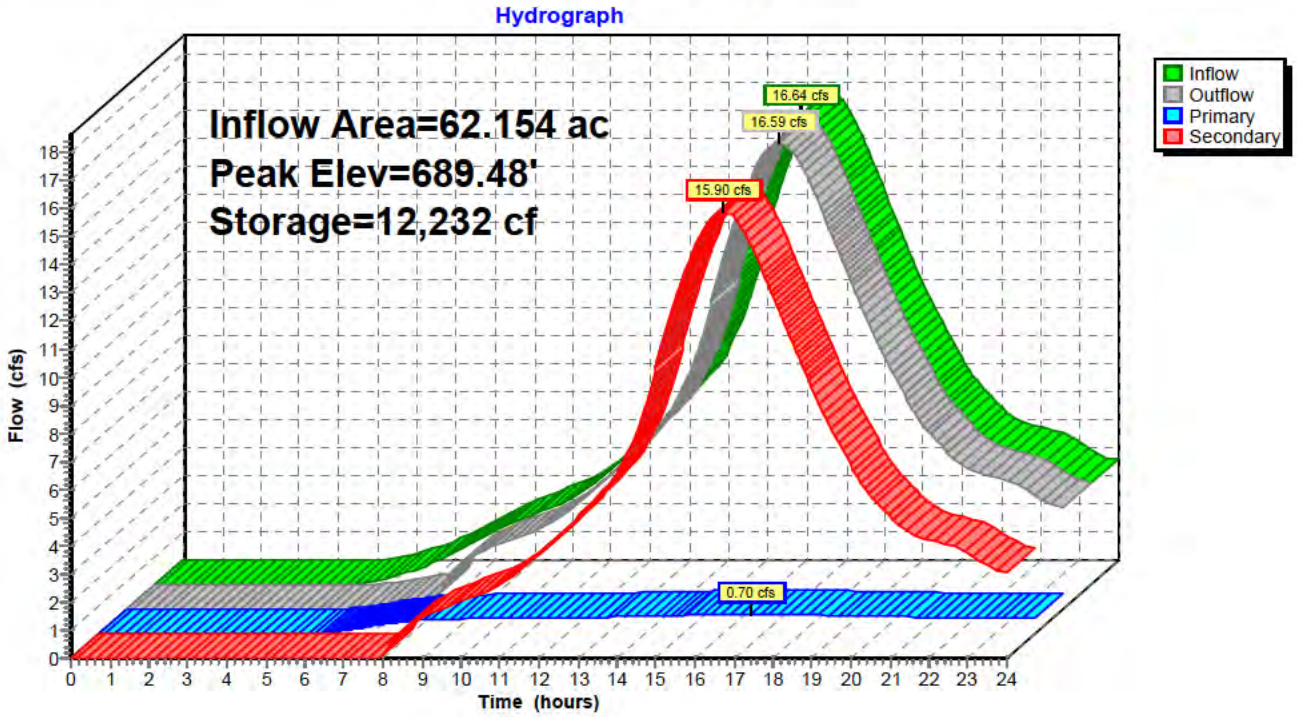
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 688.36 | 42 | 0 | 0 |
| 689.00 | 11,522 | 3,700 | 3,700 |
| 690.00 | 36,691 | 24,107 | 27,807 |
| 691.00 | 63,237 | 49,964 | 77,771 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 688.36' | **6.0" Round 6" PVC Pipe**<br>L= 50.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 688.36' / 685.05' S= 0.0662 '/' Cc= 0.900<br>n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.20 sf |
| #2 | Secondary | 689.00' | **18.0' long x 10.0' breadth Emergency Spillway**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=0.70 cfs @ 16.73 hrs HW=689.48' (Free Discharge)
↑—**1=6" PVC Pipe** (Inlet Controls 0.70 cfs @ 3.55 fps)

**Secondary OutFlow** Max=15.89 cfs @ 16.73 hrs HW=689.48' (Free Discharge)
↑—**2=Emergency Spillway** (Weir Controls 15.89 cfs @ 1.82 fps)

## Pond B2: Basin 2



## Hydrograph for Pond B2: Basin 2

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Outflow (cfs) | Primary (cfs) | Secondary (cfs) |
|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0 | 688.36 | 0.00 | 0.00 | 0.00 |
| 0.50 | 0.00 | 0 | 688.36 | 0.00 | 0.00 | 0.00 |
| 1.00 | 0.00 | 0 | 688.36 | 0.00 | 0.00 | 0.00 |
| 1.50 | 0.00 | 0 | 688.36 | 0.00 | 0.00 | 0.00 |
| 2.00 | 0.00 | 0 | 688.36 | 0.00 | 0.00 | 0.00 |
| 2.50 | 0.00 | 0 | 688.36 | 0.00 | 0.00 | 0.00 |
| 3.00 | 0.00 | 0 | 688.36 | 0.00 | 0.00 | 0.00 |
| 3.50 | 0.00 | 0 | 688.36 | 0.00 | 0.00 | 0.00 |
| 4.00 | 0.00 | 0 | 688.36 | 0.00 | 0.00 | 0.00 |
| 4.50 | 0.00 | 0 | 688.36 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.01 | 2 | 688.37 | 0.00 | 0.00 | 0.00 |
| 5.50 | 0.08 | 52 | 688.43 | 0.01 | 0.01 | 0.00 |
| 6.00 | 0.24 | 264 | 688.53 | 0.06 | 0.06 | 0.00 |
| 6.50 | 0.46 | 694 | 688.64 | 0.16 | 0.16 | 0.00 |
| 7.00 | 0.71 | 1,349 | 688.75 | 0.27 | 0.27 | 0.00 |
| 7.50 | 1.03 | 2,311 | 688.87 | 0.38 | 0.38 | 0.00 |
| 8.00 | 1.41 | 3,740 | 689.00 | 0.49 | 0.47 | 0.02 |
| 8.50 | 1.78 | 4,705 | 689.08 | 1.53 | 0.51 | 1.02 |
| 9.00 | 2.10 | 5,000 | 689.10 | 1.98 | 0.52 | 1.45 |
| 9.50 | 2.38 | 5,193 | 689.11 | 2.28 | 0.53 | 1.75 |
| 10.00 | 2.64 | 5,359 | 689.13 | 2.55 | 0.54 | 2.02 |
| 10.50 | 2.93 | 5,521 | 689.14 | 2.83 | 0.54 | 2.29 |
| 11.00 | 3.34 | 5,737 | 689.15 | 3.20 | 0.55 | 2.65 |
| 11.50 | 3.86 | 6,018 | 689.17 | 3.69 | 0.56 | 3.14 |
| 12.00 | 4.46 | 6,340 | 689.19 | 4.28 | 0.57 | 3.71 |
| 12.50 | 5.11 | 6,685 | 689.21 | 4.92 | 0.58 | 4.34 |
| 13.00 | 5.80 | 7,043 | 689.23 | 5.60 | 0.59 | 5.02 |
| 13.50 | 6.54 | 7,413 | 689.25 | 6.33 | 0.60 | 5.73 |
| 14.00 | 7.49 | 7,848 | 689.28 | 7.20 | 0.61 | 6.59 |
| 14.50 | 9.21 | 8,582 | 689.32 | 8.69 | 0.63 | 8.06 |
| 15.00 | 11.64 | 9,683 | 689.37 | 10.97 | 0.65 | 10.32 |
| 15.50 | 13.97 | 10,817 | 689.42 | 13.41 | 0.67 | 12.74 |
| 16.00 | 15.69 | 11,660 | 689.46 | 15.29 | 0.69 | 14.61 |
| 16.50 | **16.60** | **12,173** | **689.48** | **16.45** | **0.70** | **15.76** |
| 17.00 | **16.19** | **12,141** | **689.48** | **16.38** | **0.70** | **15.68** |
| 17.50 | 14.81 | 11,615 | 689.46 | 15.19 | 0.69 | 14.51 |
| 18.00 | 13.13 | 10,882 | 689.43 | 13.56 | 0.67 | 12.88 |
| 18.50 | 11.42 | 10,102 | 689.39 | 11.85 | 0.66 | 11.20 |
| 19.00 | 9.80 | 9,319 | 689.35 | 10.21 | 0.64 | 9.57 |
| 19.50 | 8.38 | 8,612 | 689.32 | 8.75 | 0.63 | 8.12 |
| 20.00 | 7.15 | 7,983 | 689.28 | 7.47 | 0.61 | 6.85 |
| 20.50 | 6.17 | 7,461 | 689.26 | 6.42 | 0.60 | 5.82 |
| 21.00 | 5.43 | 7,054 | 689.23 | 5.63 | 0.59 | 5.04 |
| 21.50 | 4.94 | 6,760 | 689.21 | 5.06 | 0.58 | 4.48 |
| 22.00 | 4.72 | 6,610 | 689.21 | 4.77 | 0.58 | 4.20 |
| 22.50 | 4.55 | 6,522 | 689.20 | 4.61 | 0.57 | 4.04 |
| 23.00 | 4.19 | 6,359 | 689.19 | 4.31 | 0.57 | 3.74 |
| 23.50 | 3.74 | 6,115 | 689.18 | 3.87 | 0.56 | 3.31 |
| 24.00 | 3.63 | 5,981 | 689.17 | 3.63 | 0.56 | 3.07 |

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment1-D: PR DA 1** Runoff Area=0.323 ac 100.00% Impervious Runoff Depth>8.30"
Flow Length=459' Tc=9.8 min CN=98 Runoff=0.30 cfs 0.223 af

**Subcatchment1-U: PR DA 1** Runoff Area=3.806 ac 2.26% Impervious Runoff Depth>6.50"
Flow Length=459' Tc=9.8 min CN=83 Runoff=3.30 cfs 2.061 af

**Subcatchment2-U: PR DA 2** Runoff Area=62.154 ac 0.50% Impervious Runoff Depth>6.67"
Flow Length=3,331' Tc=78.0 min CN=86 Runoff=52.41 cfs 34.569 af

**Subcatchment3-D: PR DA 3** Runoff Area=0.651 ac 100.00% Impervious Runoff Depth>8.28"
Flow Length=1,305' Tc=17.6 min CN=98 Runoff=0.61 cfs 0.449 af

**Subcatchment3-U: PR DA 3** Runoff Area=21.569 ac 0.00% Impervious Runoff Depth>6.23"
Flow Length=1,305' Tc=17.6 min CN=81 Runoff=18.22 cfs 11.204 af

**Subcatchment4-U: PR DA 4** Runoff Area=11.702 ac 0.00% Impervious Runoff Depth>5.95"
Flow Length=1,661' Tc=33.8 min CN=79 Runoff=9.54 cfs 5.800 af

**Reach 1-T: PR DA 1 TOTAL** Inflow=3.60 cfs 2.284 af
Outflow=3.60 cfs 2.284 af

**Reach 3-T: PR DA 3 TOTAL** Inflow=18.83 cfs 11.653 af
Outflow=18.83 cfs 11.653 af

**Reach T: Total** Inflow=81.19 cfs 53.688 af
Outflow=81.19 cfs 53.688 af

**Pond B1: Basin 1** Peak Elev=689.44' Storage=26,555 cf Inflow=9.54 cfs 5.800 af
Primary=0.94 cfs 1.261 af Secondary=8.46 cfs 4.137 af Outflow=9.40 cfs 5.398 af

**Pond B2: Basin 2** Peak Elev=690.04' Storage=29,378 cf Inflow=52.41 cfs 34.569 af
Primary=0.89 cfs 1.196 af Secondary=51.37 cfs 33.157 af Outflow=52.26 cfs 34.353 af

**Total Runoff Area = 100.205 ac Runoff Volume = 54.306 af Average Runoff Depth = 6.50"**
**98.63% Pervious = 98.832 ac 1.37% Impervious = 1.373 ac**

## Summary for Subcatchment 1-D: PR DA 1

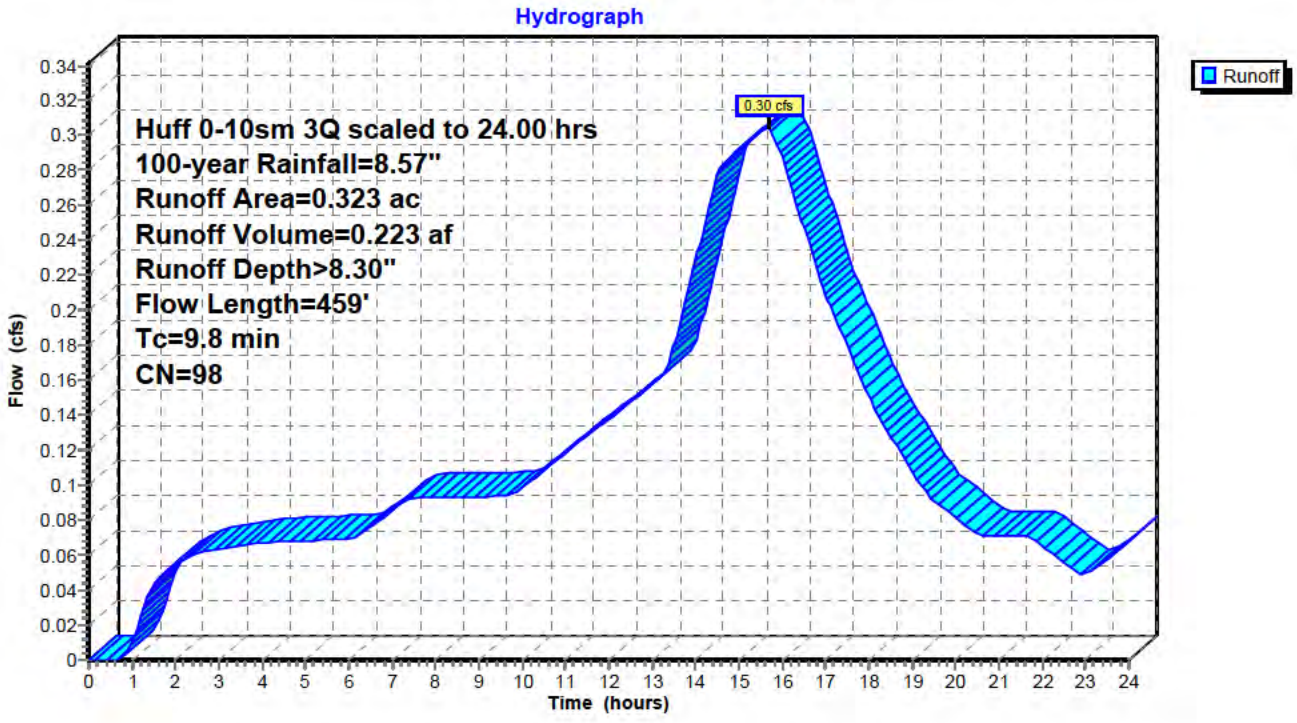
Runoff = 0.30 cfs @ 15.69 hrs, Volume= 0.223 af, Depth> 8.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.323 | 98 | Impervious Area |
| | 0.323 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.0 | 100 | 0.0282 | 0.42 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 1.9 | 171 | 0.0290 | 1.53 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 0.2 | 16 | 0.0380 | 1.36 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 3.7 | 172 | 0.0122 | 0.77 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 9.8 | 459 | Total | | | |

## Subcatchment 1-D: PR DA 1



## Hydrograph for Subcatchment 1-D: PR DA 1

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 3.51 | 3.28 | 0.16 |
| 0.25 | 0.01 | 0.00 | 0.00 | 13.25 | 3.64 | 3.40 | 0.16 |
| 0.50 | 0.02 | 0.00 | 0.00 | 13.50 | 3.78 | 3.54 | 0.18 |
| 0.75 | 0.05 | 0.00 | 0.00 | 13.75 | 3.94 | 3.70 | 0.20 |
| 1.00 | 0.09 | 0.01 | 0.01 | 14.00 | 4.11 | 3.88 | 0.23 |
| 1.25 | 0.14 | 0.03 | 0.03 | 14.25 | 4.31 | 4.07 | 0.25 |
| 1.50 | 0.20 | 0.07 | 0.04 | 14.50 | 4.52 | 4.29 | 0.28 |
| 1.75 | 0.25 | 0.11 | 0.05 | 14.75 | 4.75 | 4.51 | 0.29 |
| 2.00 | 0.30 | 0.15 | 0.06 | 15.00 | 4.97 | 4.73 | 0.29 |
| 2.25 | 0.36 | 0.19 | 0.06 | 15.25 | 5.20 | 4.96 | 0.30 |
| 2.50 | 0.41 | 0.24 | 0.06 | 15.50 | 5.43 | 5.19 | **0.30** |
| 2.75 | 0.47 | 0.29 | 0.06 | 15.75 | 5.66 | 5.43 | **0.30** |
| 3.00 | 0.52 | 0.34 | 0.06 | 16.00 | 5.88 | 5.64 | 0.29 |
| 3.25 | 0.58 | 0.39 | 0.06 | 16.25 | 6.09 | 5.85 | 0.27 |
| 3.50 | 0.63 | 0.44 | 0.07 | 16.50 | 6.28 | 6.04 | 0.25 |
| 3.75 | 0.69 | 0.49 | 0.07 | 16.75 | 6.45 | 6.21 | 0.23 |
| 4.00 | 0.74 | 0.54 | 0.07 | 17.00 | 6.61 | 6.37 | 0.21 |
| 4.25 | 0.79 | 0.59 | 0.07 | 17.25 | 6.76 | 6.52 | 0.19 |
| 4.50 | 0.85 | 0.64 | 0.07 | 17.50 | 6.89 | 6.66 | 0.18 |
| 4.75 | 0.90 | 0.70 | 0.07 | 17.75 | 7.02 | 6.78 | 0.17 |
| 5.00 | 0.96 | 0.75 | 0.07 | 18.00 | 7.13 | 6.90 | 0.15 |
| 5.25 | 1.01 | 0.80 | 0.07 | 18.25 | 7.24 | 7.00 | 0.14 |
| 5.50 | 1.07 | 0.85 | 0.07 | 18.50 | 7.34 | 7.10 | 0.13 |
| 5.75 | 1.12 | 0.91 | 0.07 | 18.75 | 7.43 | 7.19 | 0.12 |
| 6.00 | 1.17 | 0.96 | 0.07 | 19.00 | 7.51 | 7.27 | 0.11 |
| 6.25 | 1.23 | 1.02 | 0.07 | 19.25 | 7.58 | 7.34 | 0.10 |
| 6.50 | 1.29 | 1.07 | 0.08 | 19.50 | 7.65 | 7.41 | 0.09 |
| 6.75 | 1.35 | 1.14 | 0.08 | 19.75 | 7.72 | 7.48 | 0.09 |
| 7.00 | 1.42 | 1.20 | 0.09 | 20.00 | 7.78 | 7.54 | 0.08 |
| 7.25 | 1.49 | 1.27 | 0.09 | 20.25 | 7.84 | 7.60 | 0.08 |
| 7.50 | 1.57 | 1.35 | 0.09 | 20.50 | 7.90 | 7.66 | 0.07 |
| 7.75 | 1.64 | 1.42 | 0.09 | 20.75 | 7.95 | 7.71 | 0.07 |
| 8.00 | 1.71 | 1.49 | 0.09 | 21.00 | 8.00 | 7.76 | 0.07 |
| 8.25 | 1.78 | 1.56 | 0.09 | 21.25 | 8.06 | 7.82 | 0.07 |
| 8.50 | 1.86 | 1.63 | 0.09 | 21.50 | 8.11 | 7.87 | 0.07 |
| 8.75 | 1.93 | 1.70 | 0.09 | 21.75 | 8.17 | 7.93 | 0.07 |
| 9.00 | 2.00 | 1.78 | 0.09 | 22.00 | 8.22 | 7.98 | 0.07 |
| 9.25 | 2.07 | 1.85 | 0.09 | 22.25 | 8.26 | 8.02 | 0.06 |
| 9.50 | 2.15 | 1.92 | 0.09 | 22.50 | 8.31 | 8.07 | 0.06 |
| 9.75 | 2.22 | 1.99 | 0.09 | 22.75 | 8.35 | 8.11 | 0.05 |
| 10.00 | 2.30 | 2.07 | 0.10 | 23.00 | 8.38 | 8.14 | 0.05 |
| 10.25 | 2.38 | 2.15 | 0.10 | 23.25 | 8.42 | 8.18 | 0.05 |
| 10.50 | 2.46 | 2.23 | 0.11 | 23.50 | 8.47 | 8.23 | 0.06 |
| 10.75 | 2.55 | 2.32 | 0.11 | 23.75 | 8.52 | 8.28 | 0.06 |
| 11.00 | 2.64 | 2.41 | 0.12 | 24.00 | **8.57** | **8.33** | 0.07 |
| 11.25 | 2.74 | 2.51 | 0.12 | | | | |
| 11.50 | 2.84 | 2.60 | 0.13 | | | | |
| 11.75 | 2.94 | 2.71 | 0.13 | | | | |
| 12.00 | 3.05 | 2.81 | 0.14 | | | | |
| 12.25 | 3.16 | 2.92 | 0.14 | | | | |
| 12.50 | 3.27 | 3.04 | 0.15 | | | | |
| 12.75 | 3.39 | 3.16 | 0.15 | | | | |

## Summary for Subcatchment 1-U: PR DA 1

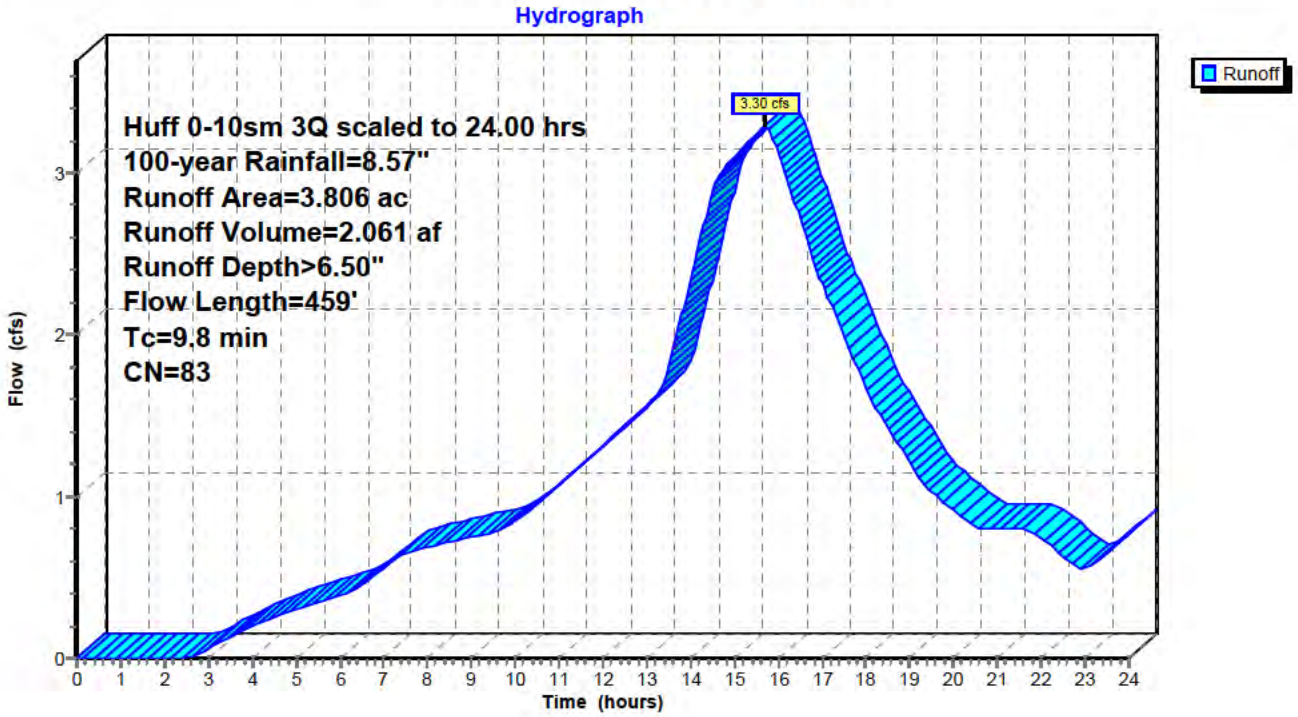
Runoff = 3.30 cfs @ 15.70 hrs, Volume= 2.061 af, Depth> 6.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 0.000 | 89 | Row crops, straight row, Good, HSG D |
| | 0.753 | 89 | Row crops, straight row, Good, HSG D |
| | 0.711 | 80 | Pasture/grassland/range, Good, HSG D |
| | 1.342 | 85 | Row crops, straight row, Good, HSG C |
| | 0.914 | 74 | Pasture/grassland/range, Good, HSG C |
| * | 0.086 | 98 | Impervious Area |
| | 3.806 | 83 | Weighted Average |
| | 3.720 | | 97.74% Pervious Area |
| | 0.086 | | 2.26% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.0 | 100 | 0.0282 | 0.42 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 1.9 | 171 | 0.0290 | 1.53 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 0.2 | 16 | 0.0380 | 1.36 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 3.7 | 172 | 0.0122 | 0.77 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 9.8 | 459 | Total | | | |

## Subcatchment 1-U: PR DA 1



## Hydrograph for Subcatchment 1-U: PR DA 1

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 3.51 | 1.87 | 1.56 |
| 0.25 | 0.01 | 0.00 | 0.00 | 13.25 | 3.64 | 1.97 | 1.63 |
| 0.50 | 0.02 | 0.00 | 0.00 | 13.50 | 3.78 | 2.09 | 1.81 |
| 0.75 | 0.05 | 0.00 | 0.00 | 13.75 | 3.94 | 2.23 | 2.07 |
| 1.00 | 0.09 | 0.00 | 0.00 | 14.00 | 4.11 | 2.38 | 2.34 |
| 1.25 | 0.14 | 0.00 | 0.00 | 14.25 | 4.31 | 2.56 | 2.62 |
| 1.50 | 0.20 | 0.00 | 0.00 | 14.50 | 4.52 | 2.75 | 2.90 |
| 1.75 | 0.25 | 0.00 | 0.00 | 14.75 | 4.75 | 2.94 | 3.02 |
| 2.00 | 0.30 | 0.00 | 0.00 | 15.00 | 4.97 | 3.15 | 3.10 |
| 2.25 | 0.36 | 0.00 | 0.00 | 15.25 | 5.20 | 3.35 | 3.17 |
| 2.50 | 0.41 | 0.00 | 0.00 | 15.50 | 5.43 | 3.57 | **3.25** |
| 2.75 | 0.47 | 0.00 | 0.02 | 15.75 | 5.66 | 3.78 | **3.29** |
| 3.00 | 0.52 | 0.01 | 0.06 | 16.00 | 5.88 | 3.98 | 3.13 |
| 3.25 | 0.58 | 0.01 | 0.10 | 16.25 | 6.09 | 4.17 | 2.93 |
| 3.50 | 0.63 | 0.02 | 0.13 | 16.50 | 6.28 | 4.35 | 2.72 |
| 3.75 | 0.69 | 0.03 | 0.17 | 16.75 | 6.45 | 4.51 | 2.51 |
| 4.00 | 0.74 | 0.05 | 0.20 | 17.00 | 6.61 | 4.66 | 2.32 |
| 4.25 | 0.79 | 0.06 | 0.23 | 17.25 | 6.76 | 4.80 | 2.16 |
| 4.50 | 0.85 | 0.08 | 0.25 | 17.50 | 6.89 | 4.93 | 2.00 |
| 4.75 | 0.90 | 0.10 | 0.28 | 17.75 | 7.02 | 5.05 | 1.84 |
| 5.00 | 0.96 | 0.12 | 0.30 | 18.00 | 7.13 | 5.15 | 1.68 |
| 5.25 | 1.01 | 0.14 | 0.32 | 18.25 | 7.24 | 5.25 | 1.54 |
| 5.50 | 1.07 | 0.16 | 0.34 | 18.50 | 7.34 | 5.35 | 1.43 |
| 5.75 | 1.12 | 0.18 | 0.36 | 18.75 | 7.43 | 5.43 | 1.32 |
| 6.00 | 1.17 | 0.21 | 0.38 | 19.00 | 7.51 | 5.51 | 1.21 |
| 6.25 | 1.23 | 0.24 | 0.41 | 19.25 | 7.58 | 5.58 | 1.10 |
| 6.50 | 1.29 | 0.27 | 0.46 | 19.50 | 7.65 | 5.65 | 1.03 |
| 6.75 | 1.35 | 0.30 | 0.51 | 19.75 | 7.72 | 5.71 | 0.97 |
| 7.00 | 1.42 | 0.34 | 0.56 | 20.00 | 7.78 | 5.77 | 0.92 |
| 7.25 | 1.49 | 0.38 | 0.61 | 20.25 | 7.84 | 5.83 | 0.86 |
| 7.50 | 1.57 | 0.42 | 0.65 | 20.50 | 7.90 | 5.88 | 0.81 |
| 7.75 | 1.64 | 0.46 | 0.67 | 20.75 | 7.95 | 5.93 | 0.80 |
| 8.00 | 1.71 | 0.51 | 0.69 | 21.00 | 8.00 | 5.98 | 0.80 |
| 8.25 | 1.78 | 0.55 | 0.70 | 21.25 | 8.06 | 6.03 | 0.80 |
| 8.50 | 1.86 | 0.60 | 0.72 | 21.50 | 8.11 | 6.09 | 0.80 |
| 8.75 | 1.93 | 0.65 | 0.74 | 21.75 | 8.17 | 6.14 | 0.79 |
| 9.00 | 2.00 | 0.70 | 0.75 | 22.00 | 8.22 | 6.18 | 0.74 |
| 9.25 | 2.07 | 0.75 | 0.77 | 22.25 | 8.26 | 6.23 | 0.69 |
| 9.50 | 2.15 | 0.80 | 0.78 | 22.50 | 8.31 | 6.27 | 0.63 |
| 9.75 | 2.22 | 0.85 | 0.80 | 22.75 | 8.35 | 6.31 | 0.58 |
| 10.00 | 2.30 | 0.90 | 0.85 | 23.00 | 8.38 | 6.34 | 0.55 |
| 10.25 | 2.38 | 0.96 | 0.90 | 23.25 | 8.42 | 6.38 | 0.60 |
| 10.50 | 2.46 | 1.03 | 0.96 | 23.50 | 8.47 | 6.43 | 0.66 |
| 10.75 | 2.55 | 1.09 | 1.01 | 23.75 | 8.52 | 6.47 | 0.71 |
| 11.00 | 2.64 | 1.16 | 1.07 | 24.00 | **8.57** | **6.52** | 0.77 |
| 11.25 | 2.74 | 1.24 | 1.13 | | | | |
| 11.50 | 2.84 | 1.32 | 1.19 | | | | |
| 11.75 | 2.94 | 1.40 | 1.25 | | | | |
| 12.00 | 3.05 | 1.48 | 1.31 | | | | |
| 12.25 | 3.16 | 1.57 | 1.37 | | | | |
| 12.50 | 3.27 | 1.67 | 1.44 | | | | |
| 12.75 | 3.39 | 1.77 | 1.50 | | | | |

## Summary for Subcatchment 2-U: PR DA 2

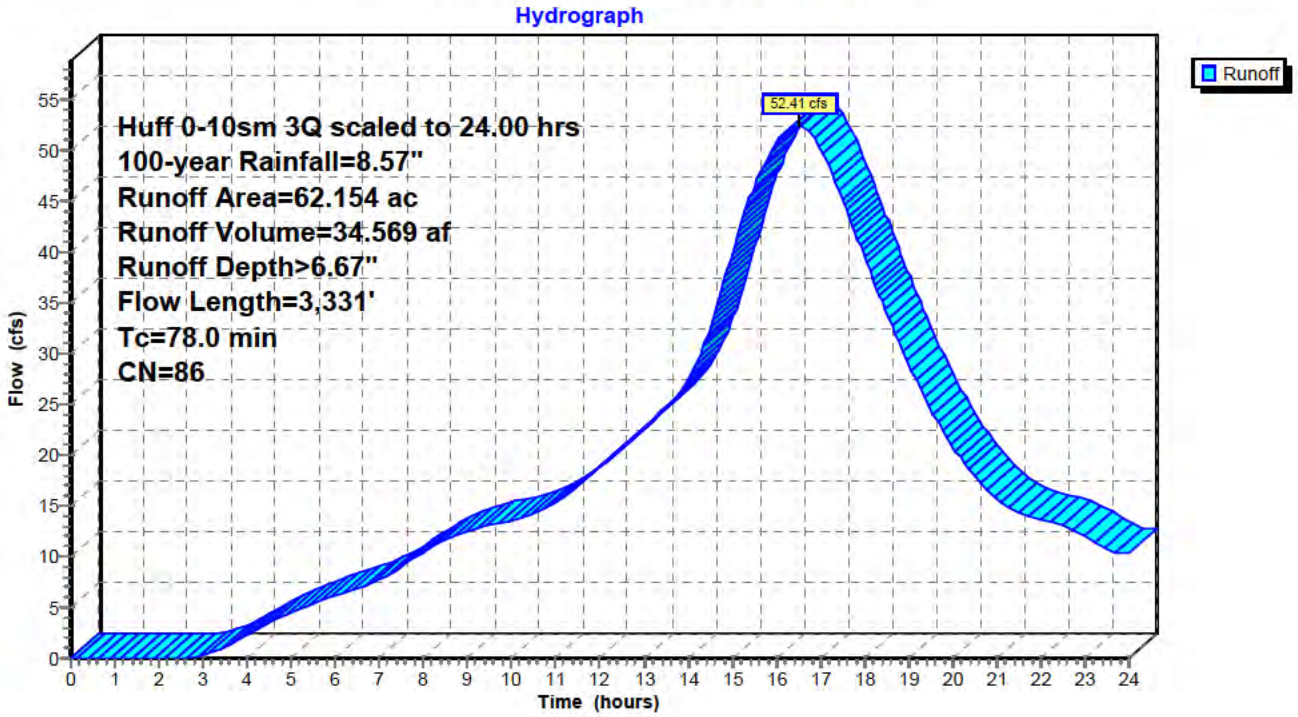
Runoff = 52.41 cfs @ 16.53 hrs, Volume= 34.569 af, Depth> 6.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 11.052 | 89 | Row crops, straight row, Good, HSG D |
| | 2.151 | 80 | Pasture/grassland/range, Good, HSG D |
| | 0.061 | 89 | Row crops, straight row, Good, HSG D |
| | 10.906 | 89 | Row crops, straight row, Good, HSG D |
| | 8.457 | 80 | Pasture/grassland/range, Good, HSG D |
| | 9.982 | 89 | Row crops, straight row, Good, HSG D |
| | 0.038 | 80 | Pasture/grassland/range, Good, HSG D |
| | 14.843 | 85 | Row crops, straight row, Good, HSG C |
| | 2.519 | 74 | Pasture/grassland/range, Good, HSG C |
| | 0.830 | 85 | Row crops, straight row, Good, HSG C |
| | 1.002 | 74 | Pasture/grassland/range, Good, HSG C |
| * | 0.313 | 98 | Impervious Area |
| | 62.154 | 86 | Weighted Average |
| | 61.841 | | 99.50% Pervious Area |
| | 0.313 | | 0.50% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.4 | 100 | 0.0421 | 0.49 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 1.5 | 141 | 0.0306 | 1.57 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 42.0 | 1,988 | 0.0077 | 0.79 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 31.1 | 1,102 | 0.0071 | 0.59 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 78.0 | 3,331 | Total | | | |

## Subcatchment 2-U: PR DA 2



## Hydrograph for Subcatchment 2-U: PR DA 2

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 0.25 | 0.01 | 0.00 | 0.00 |
| 0.50 | 0.02 | 0.00 | 0.00 |
| 0.75 | 0.05 | 0.00 | 0.00 |
| 1.00 | 0.09 | 0.00 | 0.00 |
| 1.25 | 0.14 | 0.00 | 0.00 |
| 1.50 | 0.20 | 0.00 | 0.00 |
| 1.75 | 0.25 | 0.00 | 0.00 |
| 2.00 | 0.30 | 0.00 | 0.00 |
| 2.25 | 0.36 | 0.00 | 0.00 |
| 2.50 | 0.41 | 0.00 | 0.01 |
| 2.75 | 0.47 | 0.01 | 0.08 |
| 3.00 | 0.52 | 0.02 | 0.27 |
| 3.25 | 0.58 | 0.03 | 0.63 |
| 3.50 | 0.63 | 0.05 | 1.12 |
| 3.75 | 0.69 | 0.07 | 1.69 |
| 4.00 | 0.74 | 0.08 | 2.28 |
| 4.25 | 0.79 | 0.10 | 2.87 |
| 4.50 | 0.85 | 0.13 | 3.43 |
| 4.75 | 0.90 | 0.15 | 3.97 |
| 5.00 | 0.96 | 0.18 | 4.48 |
| 5.25 | 1.01 | 0.20 | 4.95 |
| 5.50 | 1.07 | 0.23 | 5.39 |
| 5.75 | 1.12 | 0.26 | 5.80 |
| 6.00 | 1.17 | 0.29 | 6.19 |
| 6.25 | 1.23 | 0.32 | 6.54 |
| 6.50 | 1.29 | 0.36 | 6.89 |
| 6.75 | 1.35 | 0.40 | 7.26 |
| 7.00 | 1.42 | 0.44 | 7.74 |
| 7.25 | 1.49 | 0.49 | 8.32 |
| 7.50 | 1.57 | 0.54 | 9.01 |
| 7.75 | 1.64 | 0.59 | 9.75 |
| 8.00 | 1.71 | 0.64 | 10.48 |
| 8.25 | 1.78 | 0.69 | 11.13 |
| 8.50 | 1.86 | 0.74 | 11.66 |
| 8.75 | 1.93 | 0.80 | 12.11 |
| 9.00 | 2.00 | 0.85 | 12.46 |
| 9.25 | 2.07 | 0.91 | 12.79 |
| 9.50 | 2.15 | 0.96 | 13.06 |
| 9.75 | 2.22 | 1.02 | 13.31 |
| 10.00 | 2.30 | 1.08 | 13.55 |
| 10.25 | 2.38 | 1.14 | 13.81 |
| 10.50 | 2.46 | 1.21 | 14.19 |
| 10.75 | 2.55 | 1.28 | 14.68 |
| 11.00 | 2.64 | 1.36 | 15.36 |
| 11.25 | 2.74 | 1.44 | 16.11 |
| 11.50 | 2.84 | 1.52 | 16.96 |
| 11.75 | 2.94 | 1.61 | 17.84 |
| 12.00 | 3.05 | 1.70 | 18.76 |
| 12.25 | 3.16 | 1.80 | 19.71 |
| 12.50 | 3.27 | 1.90 | 20.67 |
| 12.75 | 3.39 | 2.00 | 21.66 |
| 13.00 | 3.51 | 2.11 | 22.63 |
| 13.25 | 3.64 | 2.22 | 23.65 |
| 13.50 | 3.78 | 2.34 | 24.64 |
| 13.75 | 3.94 | 2.49 | 25.81 |
| 14.00 | 4.11 | 2.65 | 27.34 |
| 14.25 | 4.31 | 2.83 | 29.57 |
| 14.50 | 4.52 | 3.03 | 32.52 |
| 14.75 | 4.75 | 3.23 | 36.02 |
| 15.00 | 4.97 | 3.44 | 39.82 |
| 15.25 | 5.20 | 3.65 | 43.33 |
| 15.50 | 5.43 | 3.87 | 46.39 |
| 15.75 | 5.66 | 4.09 | 48.76 |
| 16.00 | 5.88 | 4.30 | 50.68 |
| 16.25 | 6.09 | 4.49 | 51.98 |
| 16.50 | 6.28 | 4.67 | **52.39** |
| 16.75 | 6.45 | 4.84 | **51.78** |
| 17.00 | 6.61 | 4.99 | 50.13 |
| 17.25 | 6.76 | 5.13 | 47.87 |
| 17.50 | 6.89 | 5.26 | 45.13 |
| 17.75 | 7.02 | 5.38 | 42.35 |
| 18.00 | 7.13 | 5.50 | 39.50 |
| 18.25 | 7.24 | 5.60 | 36.73 |
| 18.50 | 7.34 | 5.69 | 34.01 |
| 18.75 | 7.43 | 5.78 | 31.37 |
| 19.00 | 7.51 | 5.86 | 28.95 |
| 19.25 | 7.58 | 5.93 | 26.67 |
| 19.50 | 7.65 | 6.00 | 24.61 |
| 19.75 | 7.72 | 6.06 | 22.63 |
| 20.00 | 7.78 | 6.12 | 20.87 |
| 20.25 | 7.84 | 6.18 | 19.29 |
| 20.50 | 7.90 | 6.23 | 17.94 |
| 20.75 | 7.95 | 6.28 | 16.76 |
| 21.00 | 8.00 | 6.34 | 15.72 |
| 21.25 | 8.06 | 6.39 | 14.89 |
| 21.50 | 8.11 | 6.44 | 14.26 |
| 21.75 | 8.17 | 6.49 | 13.87 |
| 22.00 | 8.22 | 6.54 | 13.60 |
| 22.25 | 8.26 | 6.59 | 13.39 |
| 22.50 | 8.31 | 6.63 | 13.08 |
| 22.75 | 8.35 | 6.67 | 12.62 |
| 23.00 | 8.38 | 6.70 | 12.02 |
| 23.25 | 8.42 | 6.74 | 11.32 |
| 23.50 | 8.47 | 6.79 | 10.71 |
| 23.75 | 8.52 | 6.83 | 10.34 |
| 24.00 | **8.57** | **6.88** | 10.36 |

## Summary for Subcatchment 3-D: PR DA 3

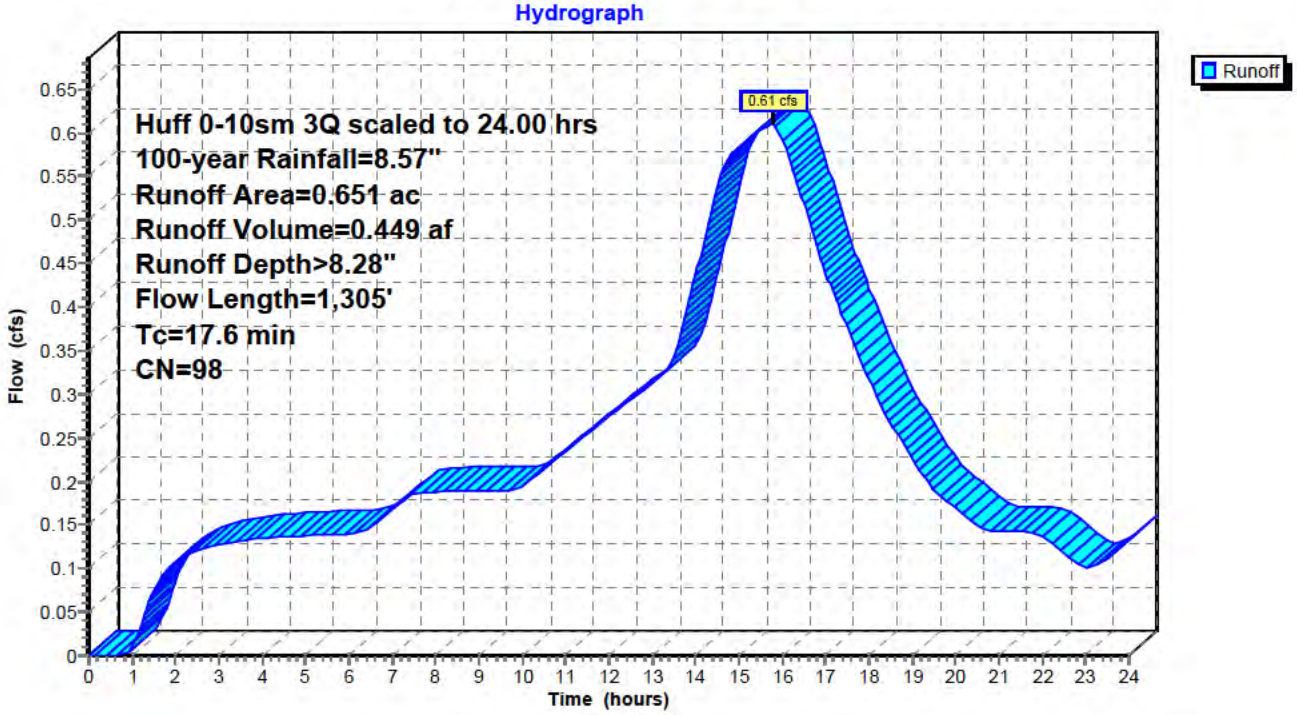
Runoff = 0.61 cfs @ 15.77 hrs, Volume= 0.449 af, Depth> 8.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.651 | 98 | Impervious Area |
| | 0.651 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0081 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 0.6 | 37 | 0.0151 | 1.11 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 1.8 | 758 | 0.0141 | 7.10 | 71.03 | **Channel Flow,** Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight |
| 0.3 | 38 | 0.0146 | 2.45 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 8.3 | 372 | 0.0113 | 0.74 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 17.6 | 1,305 | Total | | | |

## Subcatchment 3-D: PR DA 3



## Hydrograph for Subcatchment 3-D: PR DA 3

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 3.51 | 3.28 | 0.31 |
| 0.25 | 0.01 | 0.00 | 0.00 | 13.25 | 3.64 | 3.40 | 0.32 |
| 0.50 | 0.02 | 0.00 | 0.00 | 13.50 | 3.78 | 3.54 | 0.34 |
| 0.75 | 0.05 | 0.00 | 0.00 | 13.75 | 3.94 | 3.70 | 0.39 |
| 1.00 | 0.09 | 0.01 | 0.01 | 14.00 | 4.11 | 3.88 | 0.44 |
| 1.25 | 0.14 | 0.03 | 0.04 | 14.25 | 4.31 | 4.07 | 0.49 |
| 1.50 | 0.20 | 0.07 | 0.07 | 14.50 | 4.52 | 4.29 | 0.54 |
| 1.75 | 0.25 | 0.11 | 0.09 | 14.75 | 4.75 | 4.51 | 0.57 |
| 2.00 | 0.30 | 0.15 | 0.11 | 15.00 | 4.97 | 4.73 | 0.58 |
| 2.25 | 0.36 | 0.19 | 0.11 | 15.25 | 5.20 | 4.96 | 0.59 |
| 2.50 | 0.41 | 0.24 | 0.12 | 15.50 | 5.43 | 5.19 | 0.60 |
| 2.75 | 0.47 | 0.29 | 0.12 | 15.75 | 5.66 | 5.43 | **0.61** |
| 3.00 | 0.52 | 0.34 | 0.13 | 16.00 | 5.88 | 5.64 | 0.59 |
| 3.25 | 0.58 | 0.39 | 0.13 | 16.25 | 6.09 | 5.85 | 0.56 |
| 3.50 | 0.63 | 0.44 | 0.13 | 16.50 | 6.28 | 6.04 | 0.52 |
| 3.75 | 0.69 | 0.49 | 0.13 | 16.75 | 6.45 | 6.21 | 0.48 |
| 4.00 | 0.74 | 0.54 | 0.13 | 17.00 | 6.61 | 6.37 | 0.44 |
| 4.25 | 0.79 | 0.59 | 0.14 | 17.25 | 6.76 | 6.52 | 0.41 |
| 4.50 | 0.85 | 0.64 | 0.14 | 17.50 | 6.89 | 6.66 | 0.38 |
| 4.75 | 0.90 | 0.70 | 0.14 | 17.75 | 7.02 | 6.78 | 0.35 |
| 5.00 | 0.96 | 0.75 | 0.14 | 18.00 | 7.13 | 6.90 | 0.32 |
| 5.25 | 1.01 | 0.80 | 0.14 | 18.25 | 7.24 | 7.00 | 0.29 |
| 5.50 | 1.07 | 0.85 | 0.14 | 18.50 | 7.34 | 7.10 | 0.27 |
| 5.75 | 1.12 | 0.91 | 0.14 | 18.75 | 7.43 | 7.19 | 0.25 |
| 6.00 | 1.17 | 0.96 | 0.14 | 19.00 | 7.51 | 7.27 | 0.23 |
| 6.25 | 1.23 | 1.02 | 0.14 | 19.25 | 7.58 | 7.34 | 0.21 |
| 6.50 | 1.29 | 1.07 | 0.15 | 19.50 | 7.65 | 7.41 | 0.19 |
| 6.75 | 1.35 | 1.14 | 0.16 | 19.75 | 7.72 | 7.48 | 0.18 |
| 7.00 | 1.42 | 1.20 | 0.17 | 20.00 | 7.78 | 7.54 | 0.17 |
| 7.25 | 1.49 | 1.27 | 0.18 | 20.25 | 7.84 | 7.60 | 0.16 |
| 7.50 | 1.57 | 1.35 | 0.19 | 20.50 | 7.90 | 7.66 | 0.15 |
| 7.75 | 1.64 | 1.42 | 0.19 | 20.75 | 7.95 | 7.71 | 0.14 |
| 8.00 | 1.71 | 1.49 | 0.19 | 21.00 | 8.00 | 7.76 | 0.14 |
| 8.25 | 1.78 | 1.56 | 0.19 | 21.25 | 8.06 | 7.82 | 0.14 |
| 8.50 | 1.86 | 1.63 | 0.19 | 21.50 | 8.11 | 7.87 | 0.14 |
| 8.75 | 1.93 | 1.70 | 0.19 | 21.75 | 8.17 | 7.93 | 0.14 |
| 9.00 | 2.00 | 1.78 | 0.19 | 22.00 | 8.22 | 7.98 | 0.14 |
| 9.25 | 2.07 | 1.85 | 0.19 | 22.25 | 8.26 | 8.02 | 0.13 |
| 9.50 | 2.15 | 1.92 | 0.19 | 22.50 | 8.31 | 8.07 | 0.12 |
| 9.75 | 2.22 | 1.99 | 0.19 | 22.75 | 8.35 | 8.11 | 0.11 |
| 10.00 | 2.30 | 2.07 | 0.19 | 23.00 | 8.38 | 8.14 | 0.10 |
| 10.25 | 2.38 | 2.15 | 0.20 | 23.25 | 8.42 | 8.18 | 0.10 |
| 10.50 | 2.46 | 2.23 | 0.21 | 23.50 | 8.47 | 8.23 | 0.11 |
| 10.75 | 2.55 | 2.32 | 0.22 | 23.75 | 8.52 | 8.28 | 0.12 |
| 11.00 | 2.64 | 2.41 | 0.23 | 24.00 | **8.57** | **8.33** | 0.13 |
| 11.25 | 2.74 | 2.51 | 0.24 | | | | |
| 11.50 | 2.84 | 2.60 | 0.25 | | | | |
| 11.75 | 2.94 | 2.71 | 0.26 | | | | |
| 12.00 | 3.05 | 2.81 | 0.27 | | | | |
| 12.25 | 3.16 | 2.92 | 0.28 | | | | |
| 12.50 | 3.27 | 3.04 | 0.29 | | | | |
| 12.75 | 3.39 | 3.16 | 0.30 | | | | |

## Summary for Subcatchment 3-U: PR DA 3

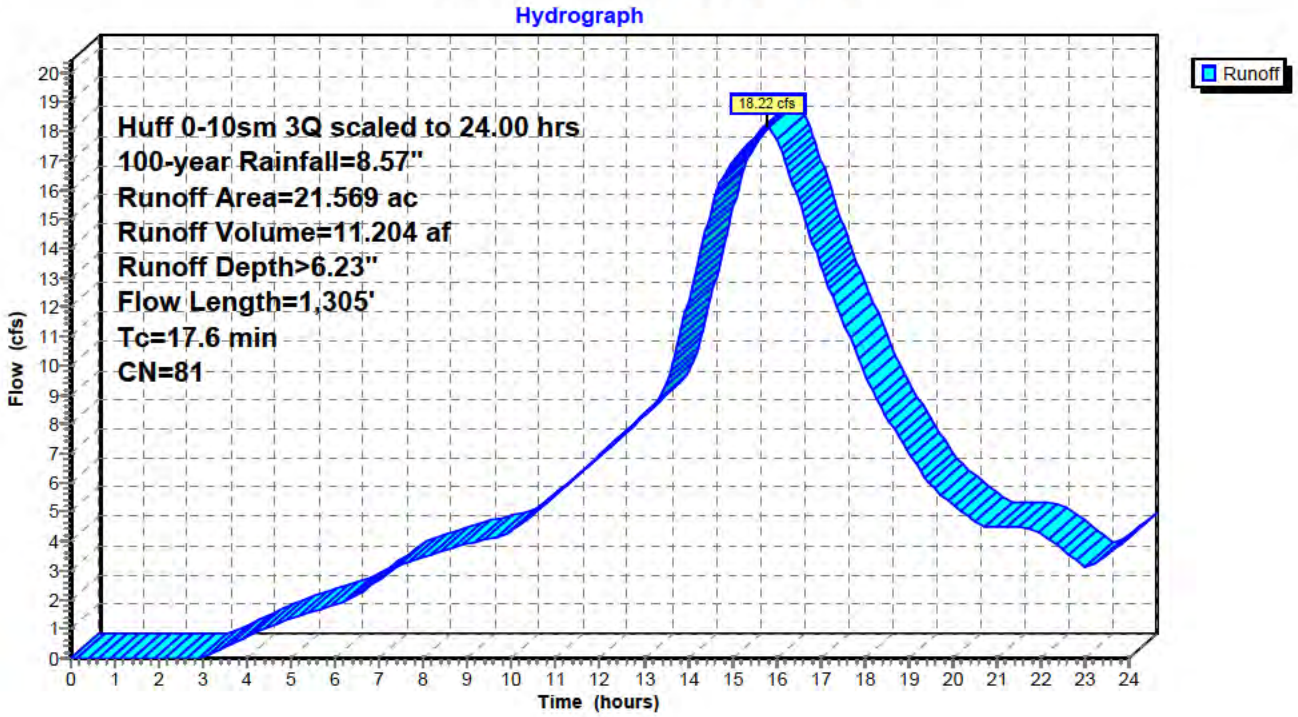
Runoff = 18.22 cfs @ 15.79 hrs, Volume= 11.204 af, Depth> 6.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

| Area (ac) | CN | Description |
|---|---|---|
| 3.171 | 89 | Row crops, straight row, Good, HSG D |
| 4.736 | 80 | Pasture/grassland/range, Good, HSG D |
| 1.134 | 89 | Row crops, straight row, Good, HSG D |
| 5.352 | 80 | Pasture/grassland/range, Good, HSG D |
| 3.187 | 85 | Row crops, straight row, Good, HSG C |
| 3.989 | 74 | Pasture/grassland/range, Good, HSG C |
| 21.569 | 81 | Weighted Average |
| 21.569 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0081 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 0.6 | 37 | 0.0151 | 1.11 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 1.8 | 758 | 0.0141 | 7.10 | 71.03 | **Channel Flow,** Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight |
| 0.3 | 38 | 0.0146 | 2.45 | | **Shallow Concentrated Flow,** Paved Kv= 20.3 fps |
| 8.3 | 372 | 0.0113 | 0.74 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 17.6 | 1,305 | Total | | | |

## Subcatchment 3-U: PR DA 3



## Hydrograph for Subcatchment 3-U: PR DA 3

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 3.51 | 1.72 | 8.34 |
| 0.25 | 0.01 | 0.00 | 0.00 | 13.25 | 3.64 | 1.82 | 8.70 |
| 0.50 | 0.02 | 0.00 | 0.00 | 13.50 | 3.78 | 1.94 | 9.35 |
| 0.75 | 0.05 | 0.00 | 0.00 | 13.75 | 3.94 | 2.07 | 10.66 |
| 1.00 | 0.09 | 0.00 | 0.00 | 14.00 | 4.11 | 2.22 | 12.14 |
| 1.25 | 0.14 | 0.00 | 0.00 | 14.25 | 4.31 | 2.38 | 13.66 |
| 1.50 | 0.20 | 0.00 | 0.00 | 14.50 | 4.52 | 2.57 | 15.22 |
| 1.75 | 0.25 | 0.00 | 0.00 | 14.75 | 4.75 | 2.76 | 16.34 |
| 2.00 | 0.30 | 0.00 | 0.00 | 15.00 | 4.97 | 2.96 | 16.90 |
| 2.25 | 0.36 | 0.00 | 0.00 | 15.25 | 5.20 | 3.16 | 17.36 |
| 2.50 | 0.41 | 0.00 | 0.00 | 15.50 | 5.43 | 3.37 | 17.80 |
| 2.75 | 0.47 | 0.00 | 0.00 | 15.75 | 5.66 | 3.58 | **18.20** |
| 3.00 | 0.52 | 0.00 | 0.03 | 16.00 | 5.88 | 3.78 | **17.80** |
| 3.25 | 0.58 | 0.00 | 0.19 | 16.25 | 6.09 | 3.96 | 16.80 |
| 3.50 | 0.63 | 0.01 | 0.39 | 16.50 | 6.28 | 4.14 | 15.70 |
| 3.75 | 0.69 | 0.02 | 0.57 | 16.75 | 6.45 | 4.30 | 14.56 |
| 4.00 | 0.74 | 0.03 | 0.75 | 17.00 | 6.61 | 4.44 | 13.43 |
| 4.25 | 0.79 | 0.04 | 0.91 | 17.25 | 6.76 | 4.58 | 12.47 |
| 4.50 | 0.85 | 0.05 | 1.07 | 17.50 | 6.89 | 4.71 | 11.58 |
| 4.75 | 0.90 | 0.07 | 1.21 | 17.75 | 7.02 | 4.82 | 10.69 |
| 5.00 | 0.96 | 0.08 | 1.35 | 18.00 | 7.13 | 4.93 | 9.80 |
| 5.25 | 1.01 | 0.10 | 1.48 | 18.25 | 7.24 | 5.03 | 8.94 |
| 5.50 | 1.07 | 0.12 | 1.60 | 18.50 | 7.34 | 5.12 | 8.28 |
| 5.75 | 1.12 | 0.14 | 1.71 | 18.75 | 7.43 | 5.20 | 7.67 |
| 6.00 | 1.17 | 0.16 | 1.82 | 19.00 | 7.51 | 5.28 | 7.07 |
| 6.25 | 1.23 | 0.19 | 1.95 | 19.25 | 7.58 | 5.35 | 6.46 |
| 6.50 | 1.29 | 0.21 | 2.16 | 19.50 | 7.65 | 5.42 | 5.93 |
| 6.75 | 1.35 | 0.24 | 2.41 | 19.75 | 7.72 | 5.48 | 5.59 |
| 7.00 | 1.42 | 0.28 | 2.68 | 20.00 | 7.78 | 5.54 | 5.28 |
| 7.25 | 1.49 | 0.31 | 2.96 | 20.25 | 7.84 | 5.59 | 4.97 |
| 7.50 | 1.57 | 0.35 | 3.21 | 20.50 | 7.90 | 5.64 | 4.67 |
| 7.75 | 1.64 | 0.39 | 3.36 | 20.75 | 7.95 | 5.70 | 4.49 |
| 8.00 | 1.71 | 0.43 | 3.49 | 21.00 | 8.00 | 5.75 | 4.46 |
| 8.25 | 1.78 | 0.47 | 3.60 | 21.25 | 8.06 | 5.80 | 4.46 |
| 8.50 | 1.86 | 0.52 | 3.71 | 21.50 | 8.11 | 5.85 | 4.47 |
| 8.75 | 1.93 | 0.56 | 3.81 | 21.75 | 8.17 | 5.90 | 4.46 |
| 9.00 | 2.00 | 0.61 | 3.90 | 22.00 | 8.22 | 5.95 | 4.29 |
| 9.25 | 2.07 | 0.65 | 3.99 | 22.25 | 8.26 | 5.99 | 4.00 |
| 9.50 | 2.15 | 0.70 | 4.08 | 22.50 | 8.31 | 6.03 | 3.70 |
| 9.75 | 2.22 | 0.75 | 4.16 | 22.75 | 8.35 | 6.07 | 3.39 |
| 10.00 | 2.30 | 0.80 | 4.36 | 23.00 | 8.38 | 6.10 | 3.12 |
| 10.25 | 2.38 | 0.86 | 4.65 | 23.25 | 8.42 | 6.14 | 3.24 |
| 10.50 | 2.46 | 0.91 | 4.96 | 23.50 | 8.47 | 6.19 | 3.53 |
| 10.75 | 2.55 | 0.98 | 5.27 | 23.75 | 8.52 | 6.23 | 3.84 |
| 11.00 | 2.64 | 1.04 | 5.59 | 24.00 | **8.57** | **6.28** | 4.15 |
| 11.25 | 2.74 | 1.11 | 5.92 | | | | |
| 11.50 | 2.84 | 1.19 | 6.26 | | | | |
| 11.75 | 2.94 | 1.27 | 6.59 | | | | |
| 12.00 | 3.05 | 1.35 | 6.94 | | | | |
| 12.25 | 3.16 | 1.43 | 7.28 | | | | |
| 12.50 | 3.27 | 1.52 | 7.63 | | | | |
| 12.75 | 3.39 | 1.62 | 7.99 | | | | |

## Summary for Subcatchment 4-U: PR DA 4

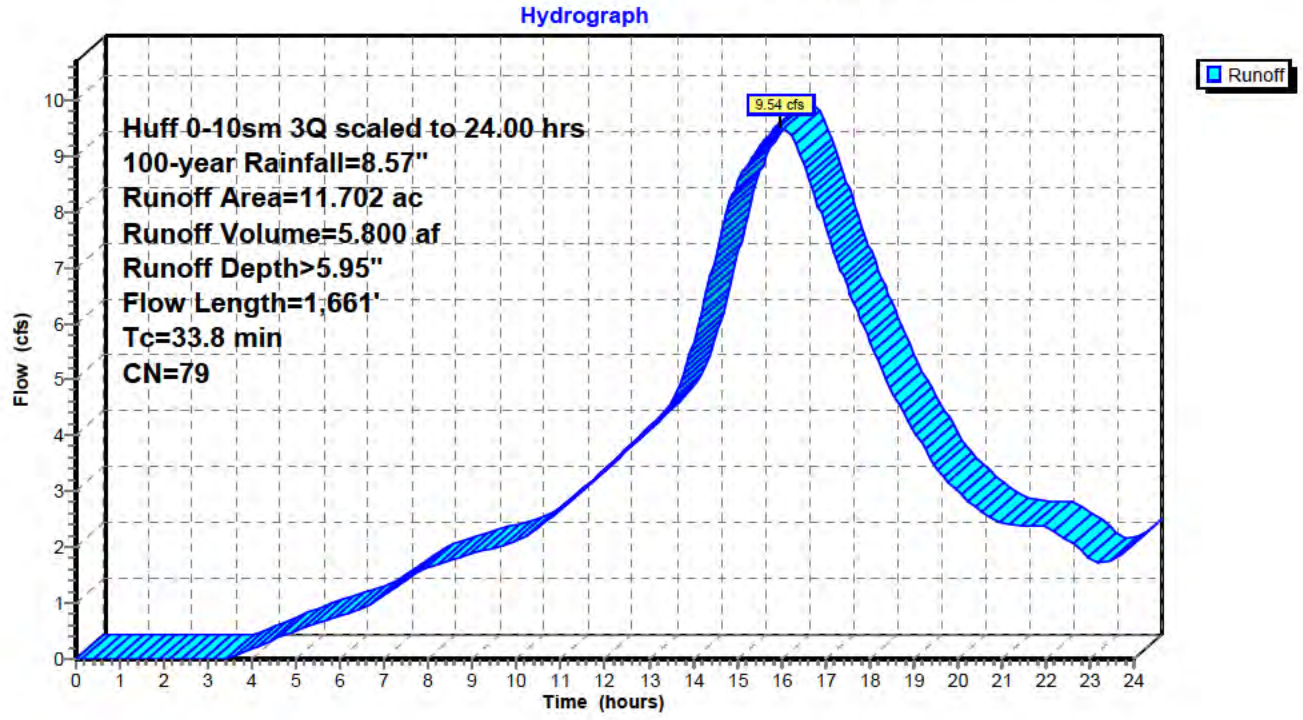
Runoff = 9.54 cfs @ 15.97 hrs, Volume= 5.800 af, Depth> 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Huff 0-10sm 3Q scaled to 24.00 hrs 100-year Rainfall=8.57"

| Area (ac) | CN | Description |
|---|---|---|
| 0.399 | 89 | Row crops, straight row, Good, HSG D |
| 4.560 | 80 | Pasture/grassland/range, Good, HSG D |
| 0.000 | 89 | Row crops, straight row, Good, HSG D |
| 3.035 | 80 | Pasture/grassland/range, Good, HSG D |
| 0.695 | 85 | Row crops, straight row, Good, HSG C |
| 3.013 | 74 | Pasture/grassland/range, Good, HSG C |
| 11.702 | 79 | Weighted Average |
| 11.702 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0080 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.34" |
| 2.7 | 198 | 0.0180 | 1.21 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 24.5 | 1,363 | 0.0175 | 0.93 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 33.8 | 1,661 | Total | | | |

## Subcatchment 4-U: PR DA 4



## Hydrograph for Subcatchment 4-U: PR DA 4

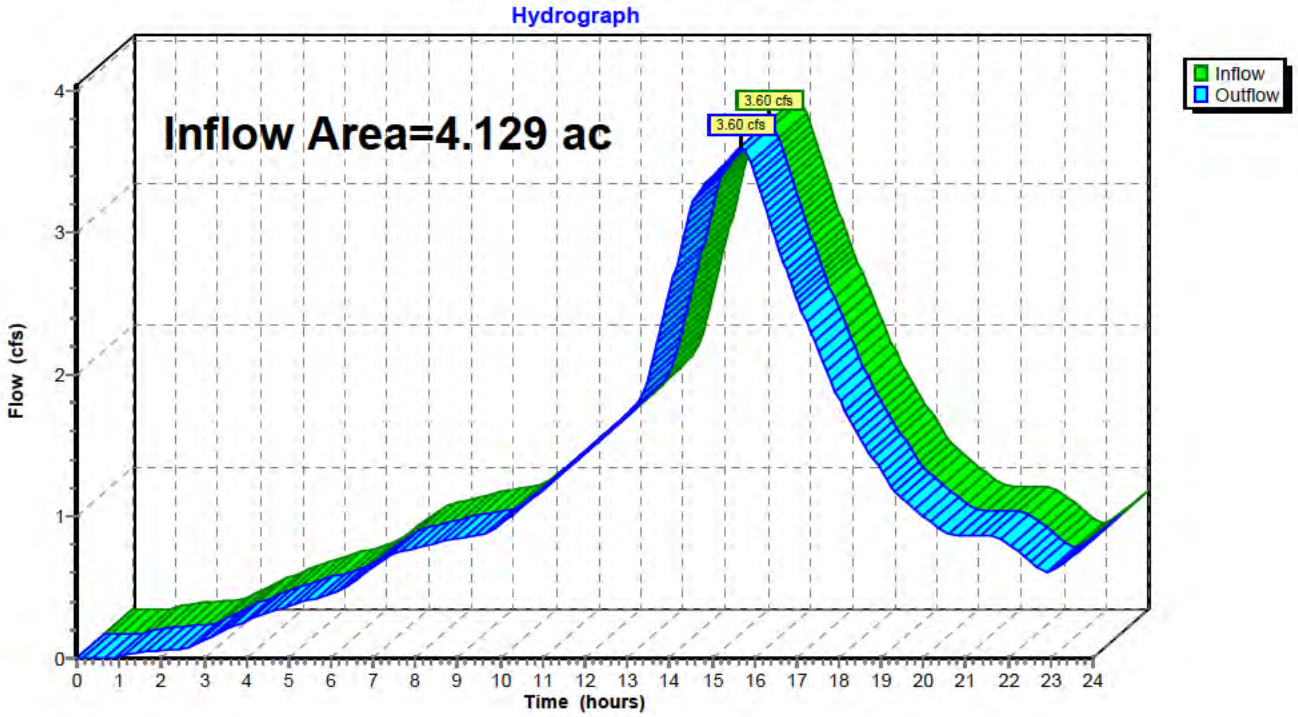
| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) | Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 13.00 | 3.51 | 1.57 | 4.14 |
| 0.25 | 0.01 | 0.00 | 0.00 | 13.25 | 3.64 | 1.67 | 4.34 |
| 0.50 | 0.02 | 0.00 | 0.00 | 13.50 | 3.78 | 1.78 | 4.56 |
| 0.75 | 0.05 | 0.00 | 0.00 | 13.75 | 3.94 | 1.91 | 4.98 |
| 1.00 | 0.09 | 0.00 | 0.00 | 14.00 | 4.11 | 2.06 | 5.63 |
| 1.25 | 0.14 | 0.00 | 0.00 | 14.25 | 4.31 | 2.22 | 6.38 |
| 1.50 | 0.20 | 0.00 | 0.00 | 14.50 | 4.52 | 2.40 | 7.18 |
| 1.75 | 0.25 | 0.00 | 0.00 | 14.75 | 4.75 | 2.58 | 7.95 |
| 2.00 | 0.30 | 0.00 | 0.00 | 15.00 | 4.97 | 2.78 | 8.51 |
| 2.25 | 0.36 | 0.00 | 0.00 | 15.25 | 5.20 | 2.97 | 8.86 |
| 2.50 | 0.41 | 0.00 | 0.00 | 15.50 | 5.43 | 3.18 | 9.16 |
| 2.75 | 0.47 | 0.00 | 0.00 | 15.75 | 5.66 | 3.38 | **9.41** |
| 3.00 | 0.52 | 0.00 | 0.00 | 16.00 | 5.88 | 3.57 | **9.54** |
| 3.25 | 0.58 | 0.00 | 0.00 | 16.25 | 6.09 | 3.76 | 9.32 |
| 3.50 | 0.63 | 0.00 | 0.02 | 16.50 | 6.28 | 3.93 | 8.87 |
| 3.75 | 0.69 | 0.01 | 0.09 | 16.75 | 6.45 | 4.08 | 8.32 |
| 4.00 | 0.74 | 0.02 | 0.18 | 17.00 | 6.61 | 4.23 | 7.74 |
| 4.25 | 0.79 | 0.02 | 0.26 | 17.25 | 6.76 | 4.36 | 7.18 |
| 4.50 | 0.85 | 0.03 | 0.35 | 17.50 | 6.89 | 4.49 | 6.66 |
| 4.75 | 0.90 | 0.05 | 0.43 | 17.75 | 7.02 | 4.60 | 6.18 |
| 5.00 | 0.96 | 0.06 | 0.51 | 18.00 | 7.13 | 4.71 | 5.71 |
| 5.25 | 1.01 | 0.07 | 0.58 | 18.25 | 7.24 | 4.80 | 5.23 |
| 5.50 | 1.07 | 0.09 | 0.65 | 18.50 | 7.34 | 4.89 | 4.81 |
| 5.75 | 1.12 | 0.11 | 0.72 | 18.75 | 7.43 | 4.98 | 4.44 |
| 6.00 | 1.17 | 0.13 | 0.78 | 19.00 | 7.51 | 5.05 | 4.11 |
| 6.25 | 1.23 | 0.15 | 0.84 | 19.25 | 7.58 | 5.12 | 3.78 |
| 6.50 | 1.29 | 0.17 | 0.92 | 19.50 | 7.65 | 5.19 | 3.46 |
| 6.75 | 1.35 | 0.19 | 1.02 | 19.75 | 7.72 | 5.25 | 3.20 |
| 7.00 | 1.42 | 0.22 | 1.15 | 20.00 | 7.78 | 5.31 | 3.00 |
| 7.25 | 1.49 | 0.26 | 1.29 | 20.25 | 7.84 | 5.36 | 2.83 |
| 7.50 | 1.57 | 0.29 | 1.43 | 20.50 | 7.90 | 5.41 | 2.66 |
| 7.75 | 1.64 | 0.33 | 1.54 | 20.75 | 7.95 | 5.46 | 2.51 |
| 8.00 | 1.71 | 0.36 | 1.63 | 21.00 | 8.00 | 5.51 | 2.43 |
| 8.25 | 1.78 | 0.40 | 1.71 | 21.25 | 8.06 | 5.56 | 2.40 |
| 8.50 | 1.86 | 0.44 | 1.77 | 21.50 | 8.11 | 5.61 | 2.39 |
| 8.75 | 1.93 | 0.48 | 1.83 | 21.75 | 8.17 | 5.66 | 2.39 |
| 9.00 | 2.00 | 0.52 | 1.89 | 22.00 | 8.22 | 5.71 | 2.37 |
| 9.25 | 2.07 | 0.57 | 1.95 | 22.25 | 8.26 | 5.75 | 2.27 |
| 9.50 | 2.15 | 0.61 | 2.00 | 22.50 | 8.31 | 5.79 | 2.13 |
| 9.75 | 2.22 | 0.66 | 2.05 | 22.75 | 8.35 | 5.83 | 1.98 |
| 10.00 | 2.30 | 0.70 | 2.11 | 23.00 | 8.38 | 5.87 | 1.82 |
| 10.25 | 2.38 | 0.76 | 2.22 | 23.25 | 8.42 | 5.90 | 1.73 |
| 10.50 | 2.46 | 0.81 | 2.36 | 23.50 | 8.47 | 5.95 | 1.78 |
| 10.75 | 2.55 | 0.87 | 2.52 | 23.75 | 8.52 | 5.99 | 1.91 |
| 11.00 | 2.64 | 0.93 | 2.69 | 24.00 | **8.57** | **6.04** | 2.06 |
| 11.25 | 2.74 | 1.00 | 2.86 | | | | |
| 11.50 | 2.84 | 1.07 | 3.03 | | | | |
| 11.75 | 2.94 | 1.14 | 3.21 | | | | |
| 12.00 | 3.05 | 1.22 | 3.39 | | | | |
| 12.25 | 3.16 | 1.30 | 3.57 | | | | |
| 12.50 | 3.27 | 1.39 | 3.76 | | | | |
| 12.75 | 3.39 | 1.48 | 3.95 | | | | |

## Summary for Reach 1-T: PR DA 1 TOTAL

Inflow Area = 4.129 ac, 9.91% Impervious, Inflow Depth > 6.64" for 100-year event
Inflow = 3.60 cfs @ 15.70 hrs, Volume= 2.284 af
Outflow = 3.60 cfs @ 15.70 hrs, Volume= 2.284 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## Reach 1-T: PR DA 1 TOTAL



## Hydrograph for Reach 1-T: PR DA 1 TOTAL

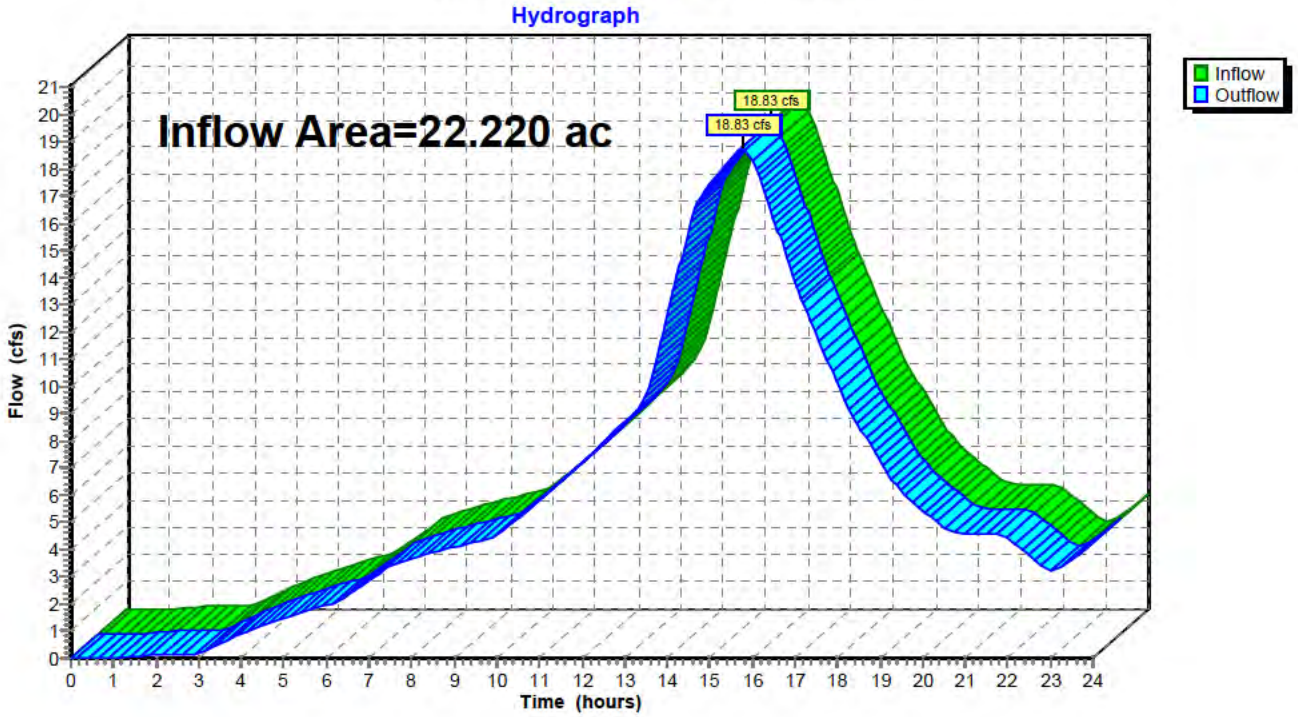
| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 1.72 | | 1.72 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 1.79 | | 1.79 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 1.99 | | 1.99 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 2.28 | | 2.28 |
| 1.00 | 0.01 | | 0.01 | 14.00 | 2.57 | | 2.57 |
| 1.25 | 0.03 | | 0.03 | 14.25 | 2.87 | | 2.87 |
| 1.50 | 0.04 | | 0.04 | 14.50 | 3.17 | | 3.17 |
| 1.75 | 0.05 | | 0.05 | 14.75 | 3.31 | | 3.31 |
| 2.00 | 0.06 | | 0.06 | 15.00 | 3.39 | | 3.39 |
| 2.25 | 0.06 | | 0.06 | 15.25 | 3.47 | | 3.47 |
| 2.50 | 0.06 | | 0.06 | 15.50 | **3.55** | | **3.55** |
| 2.75 | 0.08 | | 0.08 | 15.75 | **3.60** | | **3.60** |
| 3.00 | 0.12 | | 0.12 | 16.00 | 3.41 | | 3.41 |
| 3.25 | 0.16 | | 0.16 | 16.25 | 3.19 | | 3.19 |
| 3.50 | 0.20 | | 0.20 | 16.50 | 2.97 | | 2.97 |
| 3.75 | 0.23 | | 0.23 | 16.75 | 2.74 | | 2.74 |
| 4.00 | 0.26 | | 0.26 | 17.00 | 2.53 | | 2.53 |
| 4.25 | 0.29 | | 0.29 | 17.25 | 2.35 | | 2.35 |
| 4.50 | 0.32 | | 0.32 | 17.50 | 2.18 | | 2.18 |
| 4.75 | 0.35 | | 0.35 | 17.75 | 2.00 | | 2.00 |
| 5.00 | 0.37 | | 0.37 | 18.00 | 1.83 | | 1.83 |
| 5.25 | 0.39 | | 0.39 | 18.25 | 1.68 | | 1.68 |
| 5.50 | 0.41 | | 0.41 | 18.50 | 1.56 | | 1.56 |
| 5.75 | 0.43 | | 0.43 | 18.75 | 1.44 | | 1.44 |
| 6.00 | 0.45 | | 0.45 | 19.00 | 1.32 | | 1.32 |
| 6.25 | 0.48 | | 0.48 | 19.25 | 1.20 | | 1.20 |
| 6.50 | 0.53 | | 0.53 | 19.50 | 1.12 | | 1.12 |
| 6.75 | 0.59 | | 0.59 | 19.75 | 1.06 | | 1.06 |
| 7.00 | 0.64 | | 0.64 | 20.00 | 1.00 | | 1.00 |
| 7.25 | 0.70 | | 0.70 | 20.25 | 0.94 | | 0.94 |
| 7.50 | 0.74 | | 0.74 | 20.50 | 0.88 | | 0.88 |
| 7.75 | 0.76 | | 0.76 | 20.75 | 0.87 | | 0.87 |
| 8.00 | 0.78 | | 0.78 | 21.00 | 0.87 | | 0.87 |
| 8.25 | 0.80 | | 0.80 | 21.25 | 0.87 | | 0.87 |
| 8.50 | 0.81 | | 0.81 | 21.50 | 0.87 | | 0.87 |
| 8.75 | 0.83 | | 0.83 | 21.75 | 0.86 | | 0.86 |
| 9.00 | 0.85 | | 0.85 | 22.00 | 0.81 | | 0.81 |
| 9.25 | 0.86 | | 0.86 | 22.25 | 0.75 | | 0.75 |
| 9.50 | 0.87 | | 0.87 | 22.50 | 0.69 | | 0.69 |
| 9.75 | 0.89 | | 0.89 | 22.75 | 0.63 | | 0.63 |
| 10.00 | 0.94 | | 0.94 | 23.00 | 0.60 | | 0.60 |
| 10.25 | 1.00 | | 1.00 | 23.25 | 0.65 | | 0.65 |
| 10.50 | 1.07 | | 1.07 | 23.50 | 0.71 | | 0.71 |
| 10.75 | 1.13 | | 1.13 | 23.75 | 0.77 | | 0.77 |
| 11.00 | 1.19 | | 1.19 | 24.00 | 0.83 | | 0.83 |
| 11.25 | 1.26 | | 1.26 | | | | |
| 11.50 | 1.32 | | 1.32 | | | | |
| 11.75 | 1.39 | | 1.39 | | | | |
| 12.00 | 1.45 | | 1.45 | | | | |
| 12.25 | 1.52 | | 1.52 | | | | |
| 12.50 | 1.58 | | 1.58 | | | | |
| 12.75 | 1.65 | | 1.65 | | | | |

## Summary for Reach 3-T: PR DA 3 TOTAL

Inflow Area = 22.220 ac, 2.93% Impervious, Inflow Depth > 6.29" for 100-year event
Inflow = 18.83 cfs @ 15.79 hrs, Volume= 11.653 af
Outflow = 18.83 cfs @ 15.79 hrs, Volume= 11.653 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## Reach 3-T: PR DA 3 TOTAL



## Hydrograph for Reach 3-T: PR DA 3 TOTAL

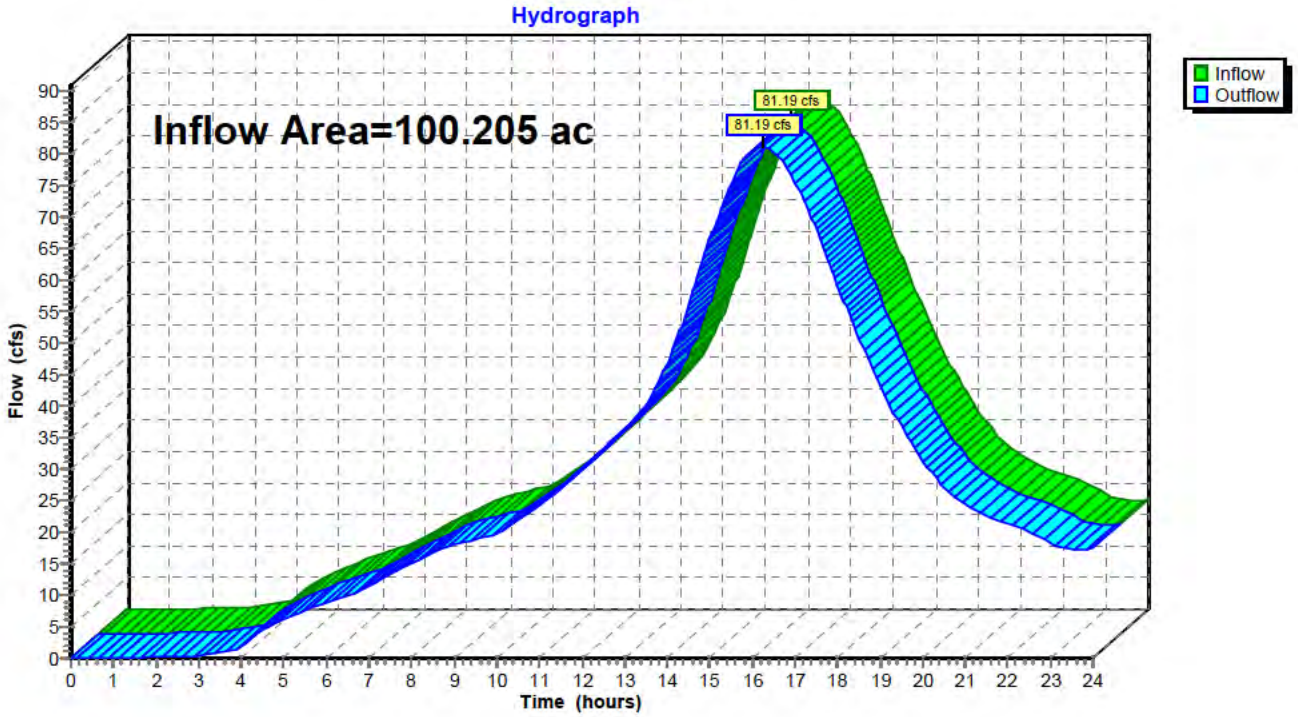
| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 8.65 | | 8.65 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 9.02 | | 9.02 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 9.70 | | 9.70 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 11.05 | | 11.05 |
| 1.00 | 0.01 | | 0.01 | 14.00 | 12.58 | | 12.58 |
| 1.25 | 0.04 | | 0.04 | 14.25 | 14.15 | | 14.15 |
| 1.50 | 0.07 | | 0.07 | 14.50 | 15.75 | | 15.75 |
| 1.75 | 0.09 | | 0.09 | 14.75 | 16.91 | | 16.91 |
| 2.00 | 0.11 | | 0.11 | 15.00 | 17.48 | | 17.48 |
| 2.25 | 0.11 | | 0.11 | 15.25 | 17.95 | | 17.95 |
| 2.50 | 0.12 | | 0.12 | 15.50 | 18.40 | | 18.40 |
| 2.75 | 0.12 | | 0.12 | 15.75 | **18.81** | | **18.81** |
| 3.00 | 0.16 | | 0.16 | 16.00 | **18.39** | | **18.39** |
| 3.25 | 0.32 | | 0.32 | 16.25 | 17.35 | | 17.35 |
| 3.50 | 0.52 | | 0.52 | 16.50 | 16.22 | | 16.22 |
| 3.75 | 0.71 | | 0.71 | 16.75 | 15.04 | | 15.04 |
| 4.00 | 0.88 | | 0.88 | 17.00 | 13.87 | | 13.87 |
| 4.25 | 1.05 | | 1.05 | 17.25 | 12.88 | | 12.88 |
| 4.50 | 1.20 | | 1.20 | 17.50 | 11.95 | | 11.95 |
| 4.75 | 1.35 | | 1.35 | 17.75 | 11.04 | | 11.04 |
| 5.00 | 1.49 | | 1.49 | 18.00 | 10.12 | | 10.12 |
| 5.25 | 1.61 | | 1.61 | 18.25 | 9.23 | | 9.23 |
| 5.50 | 1.74 | | 1.74 | 18.50 | 8.55 | | 8.55 |
| 5.75 | 1.85 | | 1.85 | 18.75 | 7.92 | | 7.92 |
| 6.00 | 1.96 | | 1.96 | 19.00 | 7.29 | | 7.29 |
| 6.25 | 2.09 | | 2.09 | 19.25 | 6.67 | | 6.67 |
| 6.50 | 2.31 | | 2.31 | 19.50 | 6.12 | | 6.12 |
| 6.75 | 2.57 | | 2.57 | 19.75 | 5.77 | | 5.77 |
| 7.00 | 2.85 | | 2.85 | 20.00 | 5.45 | | 5.45 |
| 7.25 | 3.14 | | 3.14 | 20.25 | 5.13 | | 5.13 |
| 7.50 | 3.40 | | 3.40 | 20.50 | 4.82 | | 4.82 |
| 7.75 | 3.55 | | 3.55 | 20.75 | 4.63 | | 4.63 |
| 8.00 | 3.67 | | 3.67 | 21.00 | 4.61 | | 4.61 |
| 8.25 | 3.79 | | 3.79 | 21.25 | 4.61 | | 4.61 |
| 8.50 | 3.90 | | 3.90 | 21.50 | 4.61 | | 4.61 |
| 8.75 | 4.00 | | 4.00 | 21.75 | 4.61 | | 4.61 |
| 9.00 | 4.09 | | 4.09 | 22.00 | 4.43 | | 4.43 |
| 9.25 | 4.18 | | 4.18 | 22.25 | 4.13 | | 4.13 |
| 9.50 | 4.26 | | 4.26 | 22.50 | 3.81 | | 3.81 |
| 9.75 | 4.35 | | 4.35 | 22.75 | 3.49 | | 3.49 |
| 10.00 | 4.55 | | 4.55 | 23.00 | 3.22 | | 3.22 |
| 10.25 | 4.85 | | 4.85 | 23.25 | 3.34 | | 3.34 |
| 10.50 | 5.17 | | 5.17 | 23.50 | 3.64 | | 3.64 |
| 10.75 | 5.50 | | 5.50 | 23.75 | 3.96 | | 3.96 |
| 11.00 | 5.83 | | 5.83 | 24.00 | 4.28 | | 4.28 |
| 11.25 | 6.16 | | 6.16 | | | | |
| 11.50 | 6.51 | | 6.51 | | | | |
| 11.75 | 6.86 | | 6.86 | | | | |
| 12.00 | 7.21 | | 7.21 | | | | |
| 12.25 | 7.57 | | 7.57 | | | | |
| 12.50 | 7.92 | | 7.92 | | | | |
| 12.75 | 8.29 | | 8.29 | | | | |

## Summary for Reach T: Total

Inflow Area = 100.205 ac, 1.37% Impervious, Inflow Depth > 6.43" for 100-year event
Inflow = 81.19 cfs @ 16.23 hrs, Volume= 53.688 af
Outflow = 81.19 cfs @ 16.23 hrs, Volume= 53.688 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## Reach T: Total



## Hydrograph for Reach T: Total

| Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) | Time (hours) | Inflow (cfs) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | | 0.00 | 13.00 | 36.41 | | 36.41 |
| 0.25 | 0.00 | | 0.00 | 13.25 | 38.04 | | 38.04 |
| 0.50 | 0.00 | | 0.00 | 13.50 | 40.08 | | 40.08 |
| 0.75 | 0.00 | | 0.00 | 13.75 | 43.04 | | 43.04 |
| 1.00 | 0.02 | | 0.02 | 14.00 | 46.62 | | 46.62 |
| 1.25 | 0.07 | | 0.07 | 14.25 | 50.94 | | 50.94 |
| 1.50 | 0.12 | | 0.12 | 14.50 | 56.12 | | 56.12 |
| 1.75 | 0.14 | | 0.14 | 14.75 | 61.38 | | 61.38 |
| 2.00 | 0.16 | | 0.16 | 15.00 | 66.37 | | 66.37 |
| 2.25 | 0.17 | | 0.17 | 15.25 | 71.13 | | 71.13 |
| 2.50 | 0.18 | | 0.18 | 15.50 | 75.35 | | 75.35 |
| 2.75 | 0.22 | | 0.22 | 15.75 | 78.87 | | 78.87 |
| 3.00 | 0.32 | | 0.32 | 16.00 | 80.72 | | 80.72 |
| 3.25 | 0.60 | | 0.60 | 16.25 | **81.19** | | **81.19** |
| 3.50 | 0.95 | | 0.95 | 16.50 | 80.54 | | 80.54 |
| 3.75 | 1.32 | | 1.32 | 16.75 | 78.71 | | 78.71 |
| 4.00 | 1.65 | | 1.65 | 17.00 | 75.75 | | 75.75 |
| 4.25 | 3.24 | | 3.24 | 17.25 | 72.13 | | 72.13 |
| 4.50 | 4.56 | | 4.56 | 17.50 | 68.07 | | 68.07 |
| 4.75 | 5.47 | | 5.47 | 17.75 | 63.73 | | 63.73 |
| 5.00 | 6.25 | | 6.25 | 18.00 | 59.33 | | 59.33 |
| 5.25 | 6.95 | | 6.95 | 18.25 | 55.00 | | 55.00 |
| 5.50 | 7.61 | | 7.61 | 18.50 | 50.98 | | 50.98 |
| 5.75 | 8.22 | | 8.22 | 18.75 | 47.12 | | 47.12 |
| 6.00 | 8.78 | | 8.78 | 19.00 | 43.46 | | 43.46 |
| 6.25 | 9.33 | | 9.33 | 19.25 | 40.00 | | 40.00 |
| 6.50 | 9.99 | | 9.99 | 19.50 | 36.86 | | 36.86 |
| 6.75 | 10.70 | | 10.70 | 19.75 | 34.11 | | 34.11 |
| 7.00 | 11.48 | | 11.48 | 20.00 | 31.52 | | 31.52 |
| 7.25 | 12.39 | | 12.39 | 20.25 | 29.25 | | 29.25 |
| 7.50 | 13.34 | | 13.34 | 20.50 | 27.24 | | 27.24 |
| 7.75 | 14.27 | | 14.27 | 20.75 | 25.61 | | 25.61 |
| 8.00 | 15.18 | | 15.18 | 21.00 | 24.33 | | 24.33 |
| 8.25 | 16.03 | | 16.03 | 21.25 | 23.31 | | 23.31 |
| 8.50 | 16.77 | | 16.77 | 21.50 | 22.52 | | 22.52 |
| 8.75 | 17.40 | | 17.40 | 21.75 | 21.97 | | 21.97 |
| 9.00 | 17.94 | | 17.94 | 22.00 | 21.39 | | 21.39 |
| 9.25 | 18.40 | | 18.40 | 22.25 | 20.75 | | 20.75 |
| 9.50 | 18.82 | | 18.82 | 22.50 | 20.03 | | 20.03 |
| 9.75 | 19.21 | | 19.21 | 22.75 | 19.17 | | 19.17 |
| 10.00 | 19.78 | | 19.78 | 23.00 | 18.20 | | 18.20 |
| 10.25 | 20.75 | | 20.75 | 23.25 | 17.60 | | 17.60 |
| 10.50 | 21.84 | | 21.84 | 23.50 | 17.22 | | 17.22 |
| 10.75 | 23.01 | | 23.01 | 23.75 | 17.12 | | 17.12 |
| 11.00 | 24.28 | | 24.28 | 24.00 | 17.38 | | 17.38 |
| 11.25 | 25.64 | | 25.64 | | | | |
| 11.50 | 27.07 | | 27.07 | | | | |
| 11.75 | 28.55 | | 28.55 | | | | |
| 12.00 | 30.07 | | 30.07 | | | | |
| 12.25 | 31.62 | | 31.62 | | | | |
| 12.50 | 33.19 | | 33.19 | | | | |
| 12.75 | 34.80 | | 34.80 | | | | |

## Summary for Pond B1: Basin 1

Inflow Area = 11.702 ac, 0.00% Impervious, Inflow Depth > 5.95" for 100-year event
Inflow = 9.54 cfs @ 15.97 hrs, Volume= 5.800 af
Outflow = 9.40 cfs @ 16.19 hrs, Volume= 5.398 af, Atten= 1%, Lag= 13.5 min
Primary = 0.94 cfs @ 16.19 hrs, Volume= 1.261 af
Secondary = 8.46 cfs @ 16.19 hrs, Volume= 4.137 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 689.44' @ 16.19 hrs Surf.Area= 30,932 sf Storage= 26,555 cf

Plug-Flow detention time= 76.8 min calculated for 5.387 af (93% of inflow)
Center-of-Mass det. time= 44.6 min ( 976.1 - 931.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 687.60' | 47,069 cf | **Storage (Prismatic)**Listed below (Recalc) |

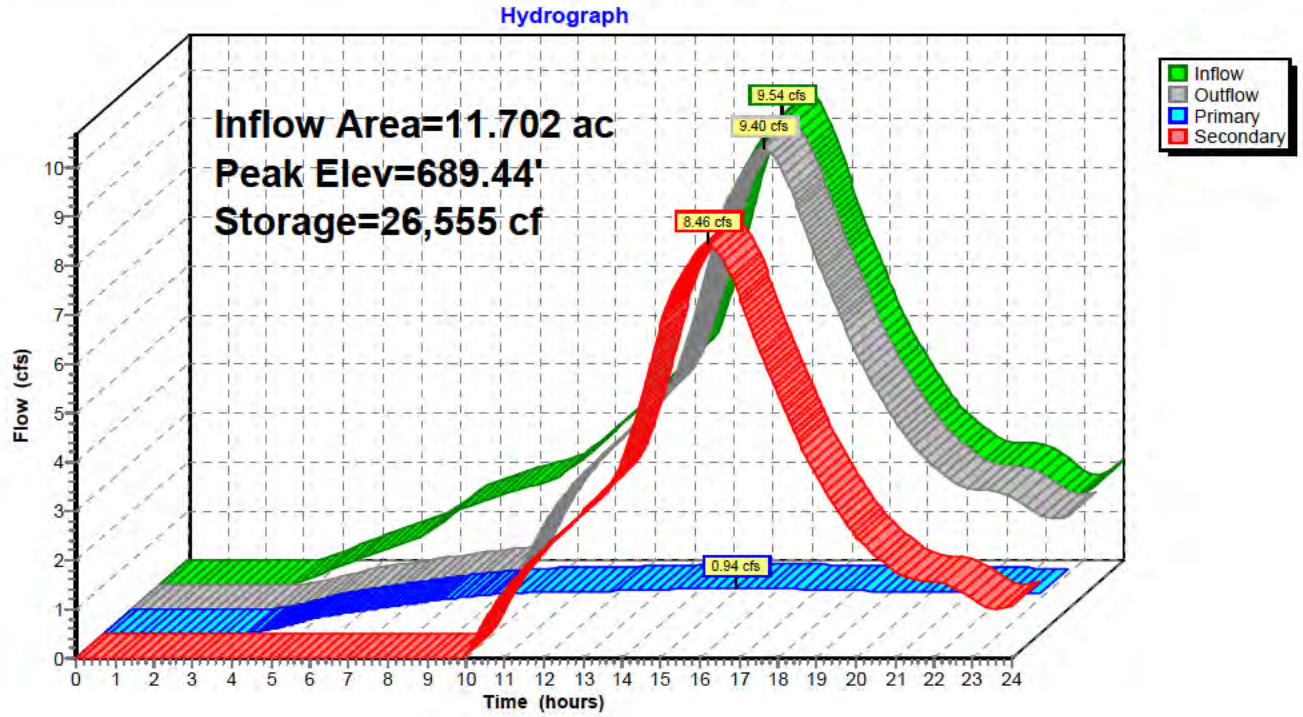
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 687.60 | 29 | 0 | 0 |
| 688.00 | 5,769 | 1,160 | 1,160 |
| 689.00 | 21,757 | 13,763 | 14,923 |
| 690.00 | 42,536 | 32,147 | 47,069 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 687.60' | **6.0" Round 6" PVC Pipe**<br>L= 60.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 687.60' / 685.09' S= 0.0418 '/' Cc= 0.900<br>n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf |
| #2 | Secondary | 689.00' | **11.0' long x 11.5' breadth Emergency Overflow**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.55 2.60 2.70 2.67 2.67 2.67 2.66 2.64 |

**Primary OutFlow** Max=0.94 cfs @ 16.19 hrs HW=689.44' (Free Discharge)
↑—**1=6" PVC Pipe** (Inlet Controls 0.94 cfs @ 4.80 fps)

**Secondary OutFlow** Max=8.46 cfs @ 16.19 hrs HW=689.44' (Free Discharge)
↑—**2=Emergency Overflow** (Weir Controls 8.46 cfs @ 1.74 fps)

## Pond B1: Basin 1



## Hydrograph for Pond B1: Basin 1

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Outflow (cfs) | Primary (cfs) | Secondary (cfs) |
|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 0.50 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 1.00 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 1.50 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 2.00 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 2.50 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 3.00 | 0.00 | 0 | 687.60 | 0.00 | 0.00 | 0.00 |
| 3.50 | 0.02 | 8 | 687.63 | 0.00 | 0.00 | 0.00 |
| 4.00 | 0.18 | 143 | 687.74 | 0.04 | 0.04 | 0.00 |
| 4.50 | 0.35 | 461 | 687.85 | 0.13 | 0.13 | 0.00 |
| 5.00 | 0.51 | 903 | 687.95 | 0.24 | 0.24 | 0.00 |
| 5.50 | 0.65 | 1,436 | 688.04 | 0.33 | 0.33 | 0.00 |
| 6.00 | 0.78 | 2,068 | 688.13 | 0.40 | 0.40 | 0.00 |
| 6.50 | 0.92 | 2,820 | 688.22 | 0.45 | 0.45 | 0.00 |
| 7.00 | 1.15 | 3,802 | 688.32 | 0.51 | 0.51 | 0.00 |
| 7.50 | 1.43 | 5,145 | 688.43 | 0.57 | 0.57 | 0.00 |
| 8.00 | 1.63 | 6,838 | 688.56 | 0.63 | 0.63 | 0.00 |
| 8.50 | 1.77 | 8,730 | 688.68 | 0.68 | 0.68 | 0.00 |
| 9.00 | 1.89 | 10,765 | 688.79 | 0.72 | 0.72 | 0.00 |
| 9.50 | 2.00 | 12,923 | 688.90 | 0.77 | 0.77 | 0.00 |
| 10.00 | 2.11 | 15,191 | 689.01 | 0.85 | 0.80 | 0.04 |
| 10.50 | 2.36 | 17,002 | 689.09 | 1.61 | 0.83 | 0.78 |
| 11.00 | 2.69 | 18,044 | 689.13 | 2.24 | 0.85 | 1.39 |
| 11.50 | 3.03 | 18,734 | 689.16 | 2.69 | 0.86 | 1.84 |
| 12.00 | 3.39 | 19,299 | 689.18 | 3.09 | 0.86 | 2.23 |
| 12.50 | 3.76 | 19,821 | 689.21 | 3.48 | 0.87 | 2.61 |
| 13.00 | 4.14 | 20,326 | 689.22 | 3.86 | 0.87 | 2.99 |
| 13.50 | 4.56 | 20,827 | 689.24 | 4.26 | 0.88 | 3.38 |
| 14.00 | 5.63 | 21,667 | 689.27 | 4.95 | 0.89 | 4.06 |
| 14.50 | 7.18 | 23,168 | 689.33 | 6.23 | 0.91 | 5.33 |
| 15.00 | 8.51 | 24,816 | 689.38 | 7.73 | 0.92 | 6.80 |
| 15.50 | **9.16** | 25,867 | 689.42 | 8.73 | 0.93 | 7.79 |
| 16.00 | **9.54** | **26,478** | **689.44** | **9.33** | **0.94** | **8.38** |
| 16.50 | 8.87 | **26,358** | **689.44** | **9.21** | **0.94** | **8.27** |
| 17.00 | 7.74 | 25,473 | 689.41 | 8.34 | 0.93 | 7.41 |
| 17.50 | 6.66 | 24,340 | 689.37 | 7.29 | 0.92 | 6.37 |
| 18.00 | 5.71 | 23,245 | 689.33 | 6.30 | 0.91 | 5.40 |
| 18.50 | 4.81 | 22,177 | 689.29 | 5.38 | 0.90 | 4.48 |
| 19.00 | 4.11 | 21,235 | 689.26 | 4.59 | 0.89 | 3.70 |
| 19.50 | 3.46 | 20,394 | 689.23 | 3.92 | 0.88 | 3.04 |
| 20.00 | 3.00 | 19,658 | 689.20 | 3.36 | 0.87 | 2.49 |
| 20.50 | 2.66 | 19,095 | 689.18 | 2.95 | 0.86 | 2.09 |
| 21.00 | 2.43 | 18,638 | 689.16 | 2.63 | 0.85 | 1.77 |
| 21.50 | 2.39 | 18,401 | 689.15 | 2.47 | 0.85 | 1.62 |
| 22.00 | 2.37 | 18,313 | 689.15 | 2.41 | 0.85 | 1.56 |
| 22.50 | 2.13 | 18,135 | 689.14 | 2.29 | 0.85 | 1.45 |
| 23.00 | 1.82 | 17,762 | 689.12 | 2.06 | 0.84 | 1.22 |
| 23.50 | 1.78 | 17,424 | 689.11 | 1.85 | 0.84 | 1.01 |
| 24.00 | 2.06 | 17,517 | 689.11 | 1.91 | 0.84 | 1.07 |

## Summary for Pond B2: Basin 2

Inflow Area = 62.154 ac, 0.50% Impervious, Inflow Depth > 6.67" for 100-year event
Inflow = 52.41 cfs @ 16.53 hrs, Volume= 34.569 af
Outflow = 52.26 cfs @ 16.61 hrs, Volume= 34.353 af, Atten= 0%, Lag= 4.8 min
Primary = 0.89 cfs @ 16.61 hrs, Volume= 1.196 af
Secondary = 51.37 cfs @ 16.61 hrs, Volume= 33.157 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 690.04' @ 16.61 hrs Surf.Area= 37,810 sf Storage= 29,378 cf

Plug-Flow detention time= 11.3 min calculated for 34.282 af (99% of inflow)
Center-of-Mass det. time= 8.2 min ( 940.6 - 932.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 688.36' | 77,771 cf | **Storage (Prismatic)**Listed below (Recalc) |

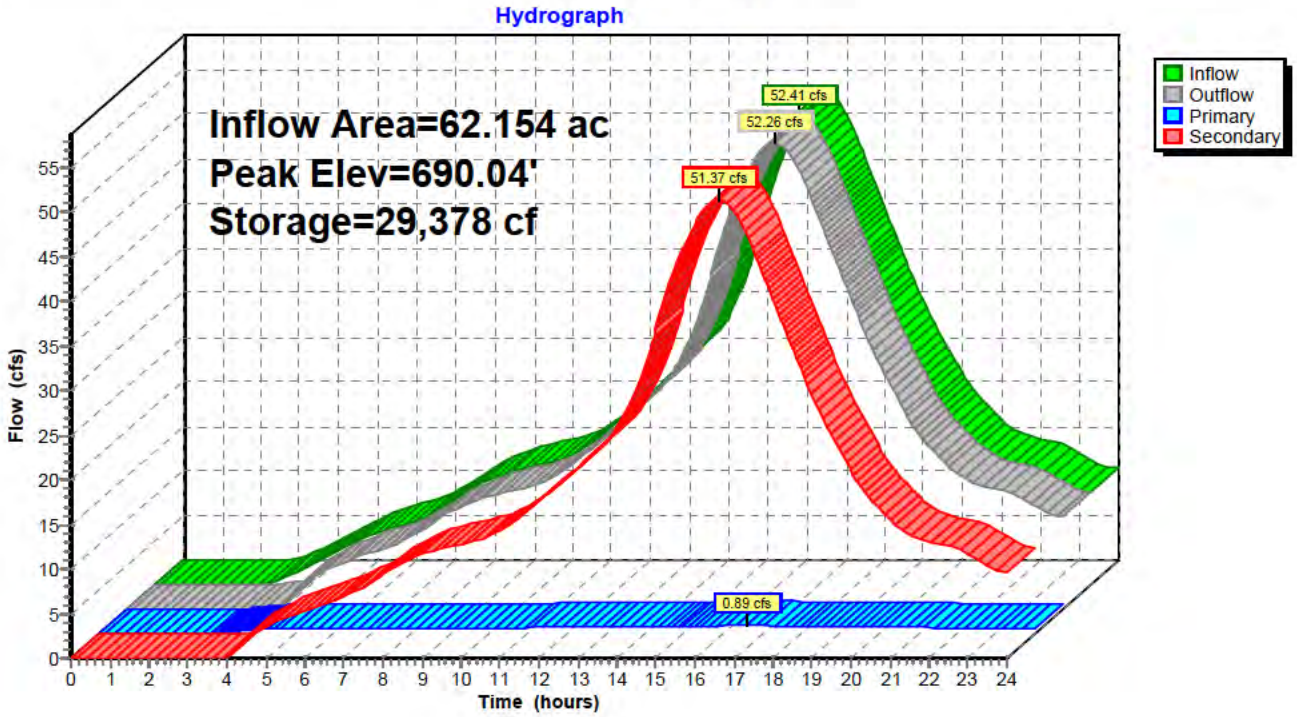
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 688.36 | 42 | 0 | 0 |
| 689.00 | 11,522 | 3,700 | 3,700 |
| 690.00 | 36,691 | 24,107 | 27,807 |
| 691.00 | 63,237 | 49,964 | 77,771 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 688.36' | **6.0" Round 6" PVC Pipe**<br>L= 50.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 688.36' / 685.05' S= 0.0662 '/' Cc= 0.900<br>n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.20 sf |
| #2 | Secondary | 689.00' | **18.0' long x 10.0' breadth Emergency Spillway**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=0.89 cfs @ 16.61 hrs HW=690.04' (Free Discharge)
↑**1=6" PVC Pipe** (Inlet Controls 0.89 cfs @ 4.55 fps)

**Secondary OutFlow** Max=51.36 cfs @ 16.61 hrs HW=690.04' (Free Discharge)
↑**2=Emergency Spillway** (Weir Controls 51.36 cfs @ 2.74 fps)

## Pond B2: Basin 2



## Hydrograph for Pond B2: Basin 2

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Outflow (cfs) | Primary (cfs) | Secondary (cfs) |
|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0 | 688.36 | 0.00 | 0.00 | 0.00 |
| 0.50 | 0.00 | 0 | 688.36 | 0.00 | 0.00 | 0.00 |
| 1.00 | 0.00 | 0 | 688.36 | 0.00 | 0.00 | 0.00 |
| 1.50 | 0.00 | 0 | 688.36 | 0.00 | 0.00 | 0.00 |
| 2.00 | 0.00 | 0 | 688.36 | 0.00 | 0.00 | 0.00 |
| 2.50 | 0.01 | 3 | 688.37 | 0.00 | 0.00 | 0.00 |
| 3.00 | 0.27 | 156 | 688.49 | 0.04 | 0.04 | 0.00 |
| 3.50 | 1.12 | 1,105 | 688.71 | 0.23 | 0.23 | 0.00 |
| 4.00 | 2.28 | 3,510 | 688.98 | 0.46 | 0.46 | 0.00 |
| 4.50 | 3.43 | 5,564 | 689.14 | 2.90 | 0.54 | 2.36 |
| 5.00 | 4.48 | 6,275 | 689.19 | 4.16 | 0.57 | 3.59 |
| 5.50 | 5.39 | 6,797 | 689.22 | 5.13 | 0.58 | 4.55 |
| 6.00 | 6.19 | 7,229 | 689.24 | 5.97 | 0.59 | 5.37 |
| 6.50 | 6.89 | 7,597 | 689.26 | 6.69 | 0.60 | 6.09 |
| 7.00 | 7.74 | 7,988 | 689.28 | 7.48 | 0.61 | 6.86 |
| 7.50 | 9.01 | 8,558 | 689.31 | 8.64 | 0.63 | 8.01 |
| 8.00 | 10.48 | 9,263 | 689.35 | 10.10 | 0.64 | 9.45 |
| 8.50 | 11.66 | 9,876 | 689.38 | 11.38 | 0.65 | 10.72 |
| 9.00 | 12.46 | 10,297 | 689.40 | 12.28 | 0.66 | 11.61 |
| 9.50 | 13.06 | 10,593 | 689.41 | 12.92 | 0.67 | 12.25 |
| 10.00 | 13.55 | 10,825 | 689.42 | 13.43 | 0.67 | 12.76 |
| 10.50 | 14.19 | 11,079 | 689.43 | 13.99 | 0.68 | 13.32 |
| 11.00 | 15.36 | 11,540 | 689.45 | 15.02 | 0.69 | 14.34 |
| 11.50 | 16.96 | 12,213 | 689.48 | 16.54 | 0.70 | 15.85 |
| 12.00 | 18.76 | 12,988 | 689.52 | 18.31 | 0.71 | 17.60 |
| 12.50 | 20.67 | 13,809 | 689.55 | 20.21 | 0.72 | 19.49 |
| 13.00 | 22.63 | 14,650 | 689.58 | 22.17 | 0.74 | 21.43 |
| 13.50 | 24.64 | 15,523 | 689.61 | 24.13 | 0.75 | 23.38 |
| 14.00 | 27.34 | 16,658 | 689.66 | 26.52 | 0.76 | 25.76 |
| 14.50 | 32.52 | 18,783 | 689.73 | 30.96 | 0.79 | 30.17 |
| 15.00 | 39.82 | 22,110 | 689.84 | 37.78 | 0.83 | 36.95 |
| 15.50 | 46.39 | 25,553 | 689.94 | 44.68 | 0.86 | 43.82 |
| 16.00 | 50.68 | 28,041 | 690.01 | 49.59 | 0.88 | 48.71 |
| 16.50 | **52.39** | **29,325** | **690.04** | **52.15** | **0.89** | **51.26** |
| 17.00 | **50.13** | **28,752** | **690.03** | **51.01** | **0.89** | **50.12** |
| 17.50 | 45.13 | 26,547 | 689.97 | 46.64 | 0.87 | 45.78 |
| 18.00 | 39.50 | 23,748 | 689.88 | 41.08 | 0.84 | 40.24 |
| 18.50 | 34.01 | 20,990 | 689.80 | 35.50 | 0.81 | 34.68 |
| 19.00 | 28.95 | 18,444 | 689.72 | 30.25 | 0.79 | 29.47 |
| 19.50 | 24.61 | 16,269 | 689.64 | 25.70 | 0.76 | 24.95 |
| 20.00 | 20.87 | 14,456 | 689.57 | 21.72 | 0.73 | 20.98 |
| 20.50 | 17.94 | 13,108 | 689.52 | 18.59 | 0.71 | 17.88 |
| 21.00 | 15.72 | 12,074 | 689.48 | 16.23 | 0.70 | 15.53 |
| 21.50 | 14.26 | 11,340 | 689.45 | 14.57 | 0.68 | 13.89 |
| 22.00 | 13.60 | 10,964 | 689.43 | 13.74 | 0.68 | 13.06 |
| 22.50 | 13.08 | 10,739 | 689.42 | 13.24 | 0.67 | 12.57 |
| 23.00 | 12.02 | 10,320 | 689.40 | 12.33 | 0.66 | 11.66 |
| 23.50 | 10.71 | 9,706 | 689.37 | 11.02 | 0.65 | 10.37 |
| 24.00 | 10.36 | 9,389 | 689.36 | 10.36 | 0.64 | 9.71 |

# APPENDIX E

## ASCE STUDY ON FLOWS FROM SOLAR FARMS

# Hydrologic Response of Solar Farms

Lauren M. Cook, S.M.ASCE[1]; and Richard H. McCuen, M.ASCE[2]

**Abstract:** Because of the benefits of solar energy, the number of solar farms is increasing; however, their hydrologic impacts have not been studied. The goal of this study was to determine the hydrologic effects of solar farms and examine whether or not storm-water management is needed to control runoff volumes and rates. A model of a solar farm was used to simulate runoff for two conditions: the pre- and postpaneled conditions. Using sensitivity analyses, modeling showed that the solar panels themselves did not have a significant effect on the runoff volumes, peaks, or times to peak. However, if the ground cover under the panels is gravel or bare ground, owing to design decisions or lack of maintenance, the peak discharge may increase significantly with storm-water management needed. In addition, the kinetic energy of the flow that drains from the panels was found to be greater than that of the rainfall, which could cause erosion at the base of the panels. Thus, it is recommended that the grass beneath the panels be well maintained or that a buffer strip be placed after the most downgradient row of panels. This study, along with design recommendations, can be used as a guide for the future design of solar farms. **DOI: 10.1061/(ASCE)HE.1943-5584.0000530.** *© 2013 American Society of Civil Engineers.*

**CE Database subject headings:** Hydrology; Land use; Solar power; Floods; Surface water; Runoff; Stormwater management.

**Author keywords:** Hydrology; Land use change; Solar energy; Flooding; Surface water runoff; Storm-water management.

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## Introduction

Storm-water management practices are generally implemented to reverse the effects of land-cover changes that cause increases in volumes and rates of runoff. This is a concern posed for new types of land-cover change such as the solar farm. Solar energy is a renewable energy source that is expected to increase in importance in the near future. Because solar farms require considerable land, it is necessary to understand the design of solar farms and their potential effect on erosion rates and storm runoff, especially the impact on offsite properties and receiving streams. These farms can vary in size from 8 ha (20 acres) in residential areas to 250 ha (600 acres) in areas where land is abundant.

The solar panels are impervious to rain water; however, they are mounted on metal rods and placed over pervious land. In some cases, the area below the panel is paved or covered with gravel. Service roads are generally located between rows of panels. Although some panels are stationary, others are designed to move so that the angle of the panel varies with the angle of the sun. The angle can range, depending on the latitude, from 22° during the summer months to 74° during the winter months. In addition, the angle and direction can also change throughout the day. The issue posed is whether or not these rows of impervious panels will change the runoff characteristics of the site, specifically increase runoff volumes or peak discharge rates. If the increases are hydrologically significant, storm-water management facilities may be needed. Additionally, it is possible that the velocity of water draining from the edge of the panels is sufficient to cause erosion of the soil below the panels, especially where the maintenance roadways are bare ground.

The outcome of this study provides guidance for assessing the hydrologic effects of solar farms, which is important to those who plan, design, and install arrays of solar panels. Those who design solar farms may need to provide for storm-water management. This study investigated the hydrologic effects of solar farms, assessed whether or not storm-water management might be needed, and if the velocity of the runoff from the panels could be sufficient to cause erosion of the soil below the panels.

## Model Development

Solar farms are generally designed to maximize the amount of energy produced per unit of land area, while still allowing space for maintenance. The hydrologic response of solar farms is not usually considered in design. Typically, the panels will be arrayed in long rows with separations between the rows to allow for maintenance vehicles. To model a typical layout, a unit width of one panel was assumed, with the length of the downgradient strip depending on the size of the farm. For example, a solar farm with 30 rows of 200 panels each could be modeled as a strip of 30 panels with space between the panels for maintenance vehicles. Rainwater that drains from the upper panel onto the ground will flow over the land under the 29 panels on the downgradient strip. Depending on the land cover, infiltration losses would be expected as the runoff flows to the bottom of the slope.

To determine the effects that the solar panels have on runoff characteristics, a model of a solar farm was developed. Runoff in the form of sheet flow without the addition of the solar panels served as the prepaneled condition. The paneled condition assumed a downgradient series of cells with one solar panel per ground cell. Each cell was separated into three sections: wet, dry, and spacer.

The dry section is that portion directly underneath the solar panel, unexposed directly to the rainfall. As the angle of the panel from the horizontal increases, more of the rain will fall directly onto

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the ground; this section of the cell is referred to as the wet section. The spacer section is the area between the rows of panels used by maintenance vehicles. Fig. 1 is an image of two solar panels and the spacer section allotted for maintenance vehicles. Fig. 2 is a schematic of the wet, dry, and spacer sections with their respective dimensions. In Fig. 1, tracks from the vehicles are visible on what is modeled within as the spacer section. When the solar panel is horizontal, then the length longitudinal to the direction that runoff will occur is the length of the dry and wet sections combined. Runoff from a dry section drains onto the downgradient spacer section. Runoff from the spacer section flows to the wet section of the next downgradient cell. Water that drains from a solar panel falls directly onto the spacer section of that cell.

The length of the spacer section is constant. During a storm event, the loss rate was assumed constant for the 24-h storm because a wet antecedent condition was assumed. The lengths of the wet and dry sections changed depending on the angle of the solar panel. The total length of the wet and dry sections was set equal to the length of one horizontal solar panel, which was assumed to be 3.5 m. When a solar panel is horizontal, the dry section length would equal 3.5 m and the wet section length would be zero. In the paneled condition, the dry section does not receive direct rainfall because the rain first falls onto the solar panel then drains onto the spacer section. However, the dry section does infiltrate some of the runoff that comes from the upgradient wet section. The wet section was modeled similar to the spacer section with rain falling directly onto the section and assuming a constant loss rate.

For the presolar panel condition, the spacer and wet sections are modeled the same as in the paneled condition; however, the cell does not include a dry section. In the prepaneled condition, rain falls directly onto the entire cell. When modeling the prepaneled condition, all cells receive rainfall at the same rate and are subject to losses. All other conditions were assumed to remain the same such that the prepaneled and paneled conditions can be compared.

Rainfall was modeled after an natural resources conservation service (NRCS) Type II Storm (McCuen 2005) because it is an accurate representation of actual storms of varying characteristics that are imbedded in intensity-duration-frequency (IDF) curves. For each duration of interest, a dimensionless hyetograph was developed using a time increment of 12 s over the duration of the storm (see Fig. 3). The depth of rainfall that corresponds to each storm magnitude was then multiplied by the dimensionless hyetograph. For a 2-h storm duration, depths of 40.6, 76.2, and 101.6 mm were used for the 2-, 25-, and 100-year events. The 2- and 6-h duration hyetographs were developed using the center portion of the 24-h storm, with the rainfall depths established with the Baltimore IDF curve. The corresponding depths for a 6-h duration were 53.3, 106.7, and 132.1 mm, respectively. These magnitudes were chosen to give a range of storm conditions.

During each time increment, the depth of rain is multiplied by the cell area to determine the volume of rain added to each section of each cell. This volume becomes the storage in each cell. Depending on the soil group, a constant volume of losses was subtracted from the storage. The runoff velocity from a solar panel was calculated using Manning's equation, with the hydraulic radius for sheet flow assumed to equal the depth of the storage on the panel (Bedient and Huber 2002). Similar assumptions were made to compute the velocities in each section of the surface sections.



**Fig. 1.** Maintenance or "spacer" section between two rows of solar panels (photo by John E. Showler, reprinted with permission)

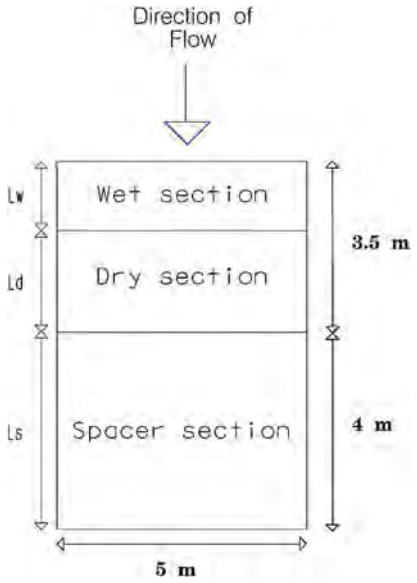



**Fig. 2.** Wet, dry, and spacer sections of a single cell with lengths *Lw*, *Ls*, and *Ld* with the solar panel covering the dry section

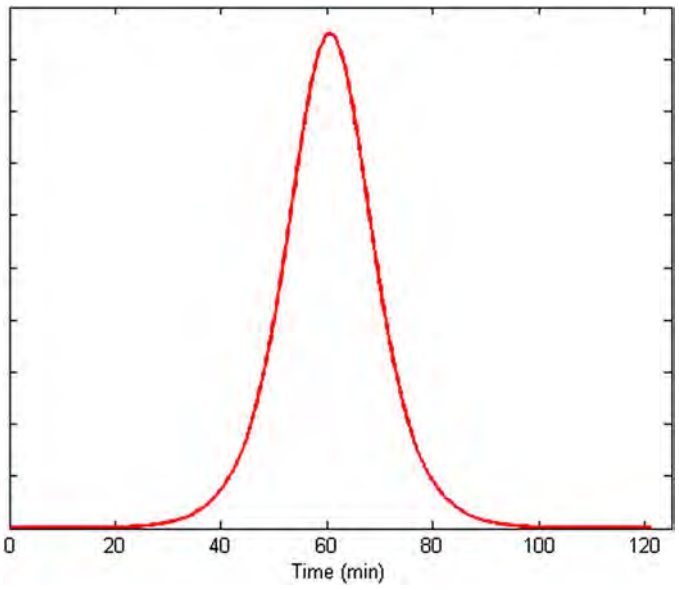



**Fig. 3.** Dimensionless hyetograph of 2-h Type II storm



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Runoff from one section to the next and then to the next downgradient cell was routed using the continuity of mass. The routing coefficient depended on the depth of flow in storage and the velocity of runoff. Flow was routed from the wet section to the dry section to the spacer section, with flow from the spacer section draining to the wet section of the next cell. Flow from the most downgradient cell was assumed to be the outflow. Discharge rates and volumes from the most downgradient cell were used for comparisons between the prepaneled and paneled conditions.

## Alternative Model Scenarios

To assess the effects of the different variables, a section of 30 cells, each with a solar panel, was assumed for the base model. Each cell was separated individually into wet, dry, and spacer sections. The area had a total ground length of 225 m with a ground slope of 1% and width of 5 m, which was the width of an average solar panel. The roughness coefficient (Engman 1986) for the silicon solar panel was assumed to be that of glass, 0.01. Roughness coefficients of 0.15 for grass and 0.02 for bare ground were also assumed. Loss rates of 0.5715 cm/h (0.225 in./h) and 0.254 cm/h (0.1 in./h) for B and C soils, respectively, were assumed.

The prepaneled condition using the 2-h, 25-year rainfall was assumed for the base condition, with each cell assumed to have a good grass cover condition. All other analyses were made assuming a paneled condition. For most scenarios, the runoff volumes and peak discharge rates from the paneled model were not significantly greater than those for the prepaneled condition. Over a total length of 225 m with 30 solar panels, the runoff increased by 0.26 $m^3$, which was a difference of only 0.35%. The slight increase in runoff volume reflects the slightly higher velocities for the paneled condition. The peak discharge increased by 0.0013 $m^3$, a change of only 0.31%. The time to peak was delayed by one time increment, i.e., 12 s. Inclusion of the panels did not have a significant hydrologic impact.

### Storm Magnitude

The effect of storm magnitude was investigated by changing the magnitude from a 25-year storm to a 2-year storm. For the 2-year storm, the rainfall and runoff volumes decreased by approximately 50%. However, the runoff from the paneled watershed condition increased compared to the prepaneled condition by approximately the same volume as for the 25-year analysis, 0.26 $m^3$. This increase represents only a 0.78% increase in volume. The peak discharge and the time to peak did not change significantly. These results reflect runoff from a good grass cover condition and indicated that the general conclusion of very minimal impacts was the same for different storm magnitudes.

### Ground Slope

The effect of the downgradient ground slope of the solar farm was also examined. The angle of the solar panels would influence the velocity of flows from the panels. As the ground slope was increased, the velocity of flow over the ground surface would be closer to that on the panels. This could cause an overall increase in discharge rates. The ground slope was changed from 1 to 5%, with all other conditions remaining the same as the base conditions.

With the steeper incline, the volume of losses decreased from that for the 1% slope, which is to be expected because the faster velocity of the runoff would provide less opportunity for infiltration. However, between the prepaneled and paneled conditions, the increase in runoff volume was less than 1%. The peak discharge and the time to peak did not change. Therefore, the greater ground slope did not significantly influence the response of the solar farm.

### Soil Type

The effect of soil type on the runoff was also examined. The soil group was changed from B soil to C soil by varying the loss rate. As expected, owing to the higher loss rate for the C soil, the depths of runoff increased by approximately 7.5% with the C soil when compared with the volume for B soils. However, the runoff volume for the C soil condition only increased by 0.17% from the prepaneled condition to the paneled condition. In comparison with the B soil, a difference of 0.35% in volume resulted between the two conditions. Therefore, the soil group influenced the actual volumes and rates, but not the relative effect of the paneled condition when compared to the prepaneled condition.

### Panel Angle

Because runoff velocities increase with slope, the effect of the angle of the solar panel on the hydrologic response was examined. Analyses were made for angles of 30° and 70° to test an average range from winter to summer. The hydrologic response for these angles was compared to that of the base condition angle of 45°. The other site conditions remained the same. The analyses showed that the angle of the panel had only a slight effect on runoff volumes and discharge rates. The lower angle of 30° was associated with an increased runoff volume, whereas the runoff volume decreased for the steeper angle of 70° when compared with the base condition of 45°. However, the differences (~0.5%) were very slight. Nevertheless, these results indicate that, when the solar panel was closer to horizontal, i.e., at a lower angle, a larger difference in runoff volume occurred between the prepaneled and paneled conditions. These differences in the response result are from differences in loss rates.

The peak discharge was also lower at the lower angle. At an angle of 30°, the peak discharge was slightly lower than at the higher angle of 70°. For the 2-h storm duration, the time to peak of the 30° angle was 2 min delayed from the time to peak of when the panel was positioned at a 70° angle, which reflects the longer travel times across the solar panels.

### Storm Duration

To assess the effect of storm duration, analyses were made for 6-h storms, testing magnitudes for 2-, 25-, and 100-year return periods, with the results compared with those for the 2-h rainfall events. The longer storm duration was tested to determine whether a longer duration storm would produce a different ratio of increase in runoff between the prepaneled and paneled conditions. When compared to runoff volumes from the 2-h storm, those for the 6-h storm were 34% greater in both the paneled and prepaneled cases. However, when comparing the prepaneled to the paneled condition, the increase in the runoff volume with the 6-h storm was less than 1% regardless of the return period. The peak discharge and the time-to-peak did not differ significantly between the two conditions. The trends in the hydrologic response of the solar farm did not vary with storm duration.

### Ground Cover

The ground cover under the panels was assumed to be a native grass that received little maintenance. For some solar farms, the area beneath the panel is covered in gravel or partially paved because the panels prevent the grass from receiving sunlight. Depending on the

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volume of traffic, the spacer cell could be grass, patches of grass, or bare ground. Thus, it was necessary to determine whether or not these alternative ground-cover conditions would affect the runoff characteristics. This was accomplished by changing the Manning's $n$ for the ground beneath the panels. The value of $n$ under the panels, i.e., the dry section, was set to 0.015 for gravel, with the value for the spacer or maintenance section set to 0.02, i.e., bare ground. These can be compared to the base condition of a native grass ($n = 0.15$). A good cover should promote losses and delay the runoff.

For the smoother surfaces, the velocity of the runoff increased and the losses decreased, which resulted in increasing runoff volumes. This occurred both when the ground cover under the panels was changed to gravel and when the cover in the spacer section was changed to bare ground. Owing to the higher velocities of the flow, runoff rates from the cells increased significantly such that it was necessary to reduce the computational time increment. Fig. 4(a) shows the hydrograph from a 30-panel area with a time increment of 12 s. With a time increment of 12 s, the water in each cell is discharged at the end of every time increment, which results in no attenuation of the flow; thus, the undulations shown in Fig. 4(a) result. The time increment was reduced to 3 s for the 2-h storm, which resulted in watershed smoothing and a rational hydrograph shape [Fig. 4(b)]. The results showed that the storm runoff

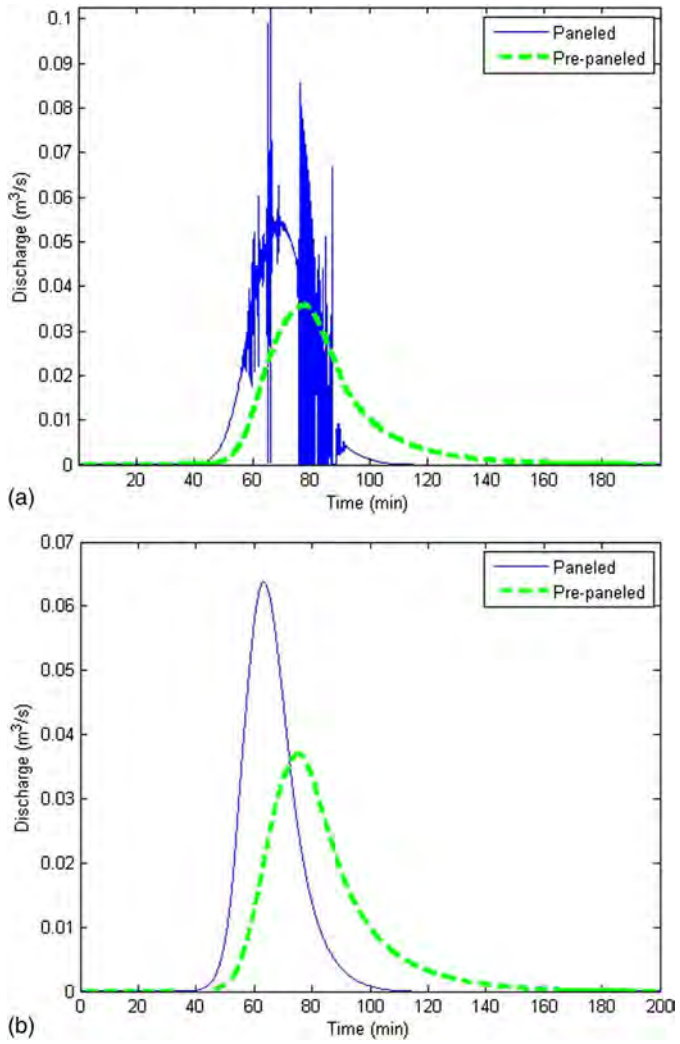



**Fig. 4.** Hydrograph with time increment of (a) 12 s; (b) 3 s with Manning's $n$ for bare ground

increased by 7% from the grass-covered scenario to the scenario with gravel under the panel. The peak discharge increased by 73% for the gravel ground cover when compared with the grass cover without the panels. The time to peak was 10 min less with the gravel than with the grass, which reflects the effect of differences in surface roughness and the resulting velocities.

If maintenance vehicles used the spacer section regularly and the grass cover was not adequately maintained, the soil in the spacer section would be compacted and potentially the runoff volumes and rates would increase. Grass that is not maintained has the potential to become patchy and turn to bare ground. The grass under the panel may not get enough sunlight and die. Fig. 1 shows the result of the maintenance trucks frequently driving in the spacer section, which diminished the grass cover.

The effect of the lack of solar farm maintenance on runoff characteristics was modeled by changing the Manning's $n$ to a value of 0.02 for bare ground. In this scenario, the roughness coefficient for the ground under the panels, i.e., the dry section, as well as in the spacer cell was changed from grass covered to bare ground ($n = 0.02$).The effects were nearly identical to that of the gravel. The runoff volume increased by 7% from the grass-covered to the bare-ground condition. The peak discharge increased by 72% when compared with the grass-covered condition. The runoff for the bare-ground condition also resulted in an earlier time to peak by approximately 10 min. Two other conditions were also modeled, showing similar results. In the first scenario, gravel was placed directly under the panel, and healthy grass was placed in the spacer section, which mimics a possible design decision. Under these conditions, the peak discharge increased by 42%, and the volume of runoff increased by 4%, which suggests that storm-water management would be necessary if gravel is placed anywhere.

Fig. 5 shows two solar panels from a solar farm in New Jersey. The bare ground between the panels can cause increased runoff rates and reductions in time of concentration, both of which could necessitate storm-water management. The final condition modeled involved the assumption of healthy grass beneath the panels and bare ground in the spacer section, which would simulate the condition of unmaintained grass resulting from vehicles that drive over the spacer section. Because the spacer section is 53% of the cell, the change in land cover to bare ground would reduce losses and decrease runoff travel times, which would cause runoff to amass as it

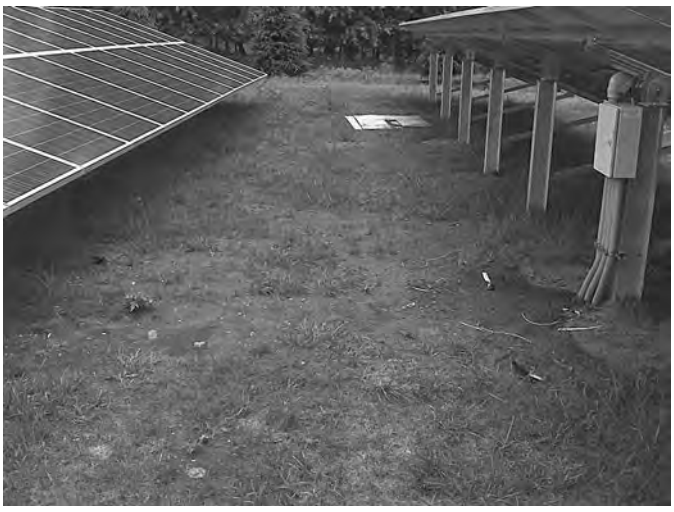


**Fig. 5.** Site showing the initiation of bare ground below the panels, which increases the potential for erosion (photo by John Showler, reprinted with permission)





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moves downgradient. With the spacer section as bare ground, the peak discharge increased by 100%, which reflected the increases in volume and decrease in timing. These results illustrate the need for maintenance of the grass below and between the panels.

## Design Suggestions

With well-maintained grass underneath the panels, the solar panels themselves do not have much effect on total volumes of the runoff or peak discharge rates. Although the panels are impervious, the rainwater that drains from the panels appears as runoff over the downgradient cells. Some of the runoff infiltrates. If the grass cover of a solar farm is not maintained, it can deteriorate either because of a lack of sunlight or maintenance vehicle traffic. In this case, the runoff characteristics can change significantly with both runoff rates and volumes increasing by significant amounts. In addition, if gravel or pavement is placed underneath the panels, this can also contribute to a significant increase in the hydrologic response.

If bare ground is foreseen to be a problem or gravel is to be placed under the panels to prevent erosion, it is necessary to counteract the excess runoff using some form of storm-water management. A simple practice that can be implemented is a buffer strip (Dabney et al. 2006) at the downgradient end of the solar farm. The buffer strip length must be sufficient to return the runoff characteristics with the panels to those of runoff experienced before the gravel and panels were installed. Alternatively, a detention basin can be installed.

A buffer strip was modeled along with the panels. For approximately every 200 m of panels, or 29 cells, the buffer must be 5 cells long (or 35 m) to reduce the runoff volume to that which occurred before the panels were added. Even if a gravel base is not placed under the panels, the inclusion of a buffer strip may be a good practice when grass maintenance is not a top funding priority. Fig. 6 shows the peak discharge from the graveled surface versus the length of the buffer needed to keep the discharge to prepaneled peak rate.

Water draining from a solar panel can increase the potential for erosion of the spacer section. If the spacer section is bare ground, the high kinetic energy of water draining from the panel can cause soil detachment and transport (Garde and Raju 1977; Beuselinck et al. 2002). The amount and risk of erosion was modeled using the velocity of water coming off a solar panel compared with the velocity and intensity of the rainwater. The velocity of panel runoff was calculated using Manning's equation, and the velocity of falling rainwater was calculated using the following:

$$V_t = 120\, d_r^{0.35} \tag{1}$$

where $d_r$ = diameter of a raindrop, assumed to be 1 mm. The relationship between kinetic energy and rainfall intensity is

$$K_e = 916 + 330 \log_{10} i \tag{2}$$

where $i$ = rainfall intensity (in./h) and $K_e$ = kinetic energy (ft-tons per ac-in. of rain) of rain falling onto the wet section and the panel, as well as the water flowing off of the end of the panel (Wischmeier and Smith 1978). The kinetic energy (Salles et al. 2002) of the rainfall was greater than that coming off the panel, but the area under the panel (i.e., the product of the length, width, and cosine of the panel angle) is greater than the area under the edge of the panel where the water drains from the panel onto the ground. Thus, dividing the kinetic energy by the respective areas gives a more accurate representation of the kinetic energy experienced by the soil. The energy of the water draining from the panel onto the ground can be nearly 10 times greater than the rain itself falling onto the ground area. If the solar panel runoff falls onto an unsealed soil, considerable detachment can result (Motha et al. 2004). Thus, because of the increased kinetic energy, it is possible that the soil is much more prone to erosion with the panels than without. Where panels are installed, methods of erosion control should be included in the design.

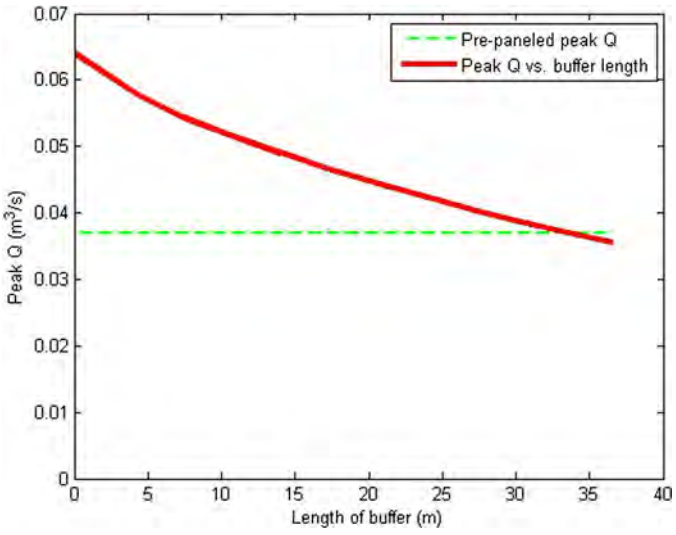



**Fig. 6.** Peak discharge over gravel compared with buffer length

## Conclusions

Solar farms are the energy generators of the future; thus, it is important to determine the environmental and hydrologic effects of these farms, both existing and proposed. A model was created to simulate storm-water runoff over a land surface without panels and then with solar panels added. Various sensitivity analyses were conducted including changing the storm duration and volume, soil type, ground slope, panel angle, and ground cover to determine the effect that each of these factors would have on the volumes and peak discharge rates of the runoff.

The addition of solar panels over a grassy field does not have much of an effect on the volume of runoff, the peak discharge, nor the time to peak. With each analysis, the runoff volume increased slightly but not enough to require storm-water management facilities. However, when the land-cover type was changed under the panels, the hydrologic response changed significantly. When gravel or pavement was placed under the panels, with the spacer section left as patchy grass or bare ground, the volume of the runoff increased significantly and the peak discharge increased by approximately 100%. This was also the result when the entire cell was assumed to be bare ground.

The potential for erosion of the soil at the base of the solar panels was also studied. It was determined that the kinetic energy of the water draining from the solar panel could be as much as 10 times greater than that of rainfall. Thus, because the energy of the water draining from the panels is much higher, it is very possible that soil below the base of the solar panel could erode owing to the concentrated flow of water off the panel, especially if there is bare ground in the spacer section of the cell. If necessary, erosion control methods should be used.

Bare ground beneath the panels and in the spacer section is a realistic possibility (see Figs. 1 and 5). Thus, a good, well-maintained grass cover beneath the panels and in the spacer section is highly recommended. If gravel, pavement, or bare ground is



J. Hydrol. Eng., 2013, 18(5): 536-541

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deemed unavoidable below the panels or in the spacer section, it may necessary to add a buffer section to control the excess runoff volume and ensure adequate losses. If these simple measures are taken, solar farms will not have an adverse hydrologic impact from excess runoff or contribute eroded soil particles to receiving streams and waterways.

## Acknowledgments

The authors appreciate the photographs (Figs. 1 and 5) of Ortho Clinical Diagnostics, 1001 Route 202, North Raritan, New Jersey, 08869, provided by John E. Showler, Environmental Scientist, New Jersey Department of Agriculture. The extensive comments of reviewers resulted in an improved paper.

## References

Bedient, P. B., and Huber, W. C. (2002). *Hydrology and floodplain analysis*, Prentice-Hall, Upper Saddle River, NJ.

Beuselinck, L., Govers, G., Hairsince, P. B., Sander, G. C., and Breynaert, M. (2002). "The influence of rainfall on sediment transport by overland flow over areas of net deposition." *J. Hydrol.*, 257(1–4), 145–163.

Dabney, S. M., Moore, M. T., and Locke, M. A. (2006). "Integrated management of in-field, edge-of-field, and after-field buffers." *J. Amer. Water Resour. Assoc.*, 42(1), 15–24.

Engman, E. T. (1986). "Roughness coefficients for routing surface runoff." *J. Irrig. Drain. Eng.*, 112(1), 39–53.

Garde, R. J., and Raju, K. G. (1977). *Mechanics of sediment transportation and alluvial stream problems*, Wiley, New York.

McCuen, R. H. (2005). *Hydrologic analysis and design*, 3rd Ed., Pearson/Prentice-Hall, Upper Saddle River, NJ.

Motha, J. A., Wallbrink, P. J., Hairsine, P. B., and Grayson, R. B. (2004). "Unsealed roads as suspended sediment sources in agricultural catchment in south-eastern Australia." *J. Hydrol.*, 286(1–4), 1–18.

Salles, C., Poesen, J., and Sempere-Torres, D. (2002). "Kinetic energy of rain and its functional relationship with intensity." *J. Hydrol.*, 257(1–4), 256–270.

Wischmeier, W. H., and Smith, D. D. (1978). *Predicting rainfall erosion losses: A guide to conservation planning, USDA Handbook 537*, U.S. Government Printing Office, Washington, DC.

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# EXISTING AGRICULTURAL DRAIN TILE
# PROBABILITY MAPPING

# YORKVILLE AMENT Rd SOLAR

**PREPARED FOR** New Leaf Energy

**Section no. 16, Kendall Twp., Kendall Co., IL**

## EXISTING SUBSURFACE AGRICULTURAL DRAIN TILE INVESTIGATION REPORT

**YORKVILLE AMENT Rd SOLAR**

**New Leaf Energy**

*YORKVILLE AMENT Rd SOLAR / New Leaf Energy , FIELD FILE NO. 8-4-16 , DATE: 7/20/2024 ,*
*IN ACCORDANCE WITH LOCAL STORMWATER ORDINANCE STANDARDS FOR PROBABLY DRAIN TILE MAPPING*
*COPYRIGHT © 2024, BY HUDDLESTON MCBRIDE LAND DRAINAGE COMPANY*

*DESCRIPTION CHART NO. 1A :* *INVESTIGATION SLIT TRENCH LOCATIONS*

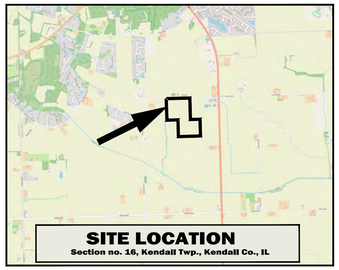
| ID NO. | SZ. | TYPE / QUALITY | FLOW % | SILT % | DEPTH GRD./INV. | FIELD NOTES: |
|---|---|---|---|---|---|---|

NOTE: THIS DESCRIPTION CHART IS RESERVED FOR SITE INTENSIVE DRAIN TILE INVESTIGATION LOCATION, STAKING, GPS MAPPING AND EVALUATION IN ACCORDANCE WITH LOCAL STORMWATER ORDINANCE SPECIFICATIONS.

*DESCRIPTION CHART NO. 1B :* *SURVEY DATA POINT LOCATIONS*

| DATA POINT | SZ. | TYPE / QUALITY | FLOW % | SILT % | DEPTH HUB/INV. | FIELD NOTES: |
|---|---|---|---|---|---|---|

NOTE: THIS DESCRIPTION CHART IS RESERVED FOR SITE INTENSIVE DRAIN TILE INVESTIGATION LOCATION, STAKING, GPS MAPPING AND EVALUATION IN ACCORDANCE WITH LOCAL STORMWATER ORDINANCE SPECIFICATIONS.



**SITE LOCATION**
**Section no. 16, Kendall Twp., Kendall Co., IL**

*MAP LEGEND :*

- *<<<FLOW<<<* — *EXISTING DRAIN TILE FLOW DIRECTION*
- *EX. POLYETHYLENE MAINLINE OR SYSTEM PART*
- *EX. CLAY DRAIN TILE MAINLINE OR SYSTEM PARTS*
- *EX. CONCRETE DRAIN TILE MAINLINE OR SYSTEM PART*
- *EXISTING DRAIN TILE CONTINUES TO UPLAND WATERSHED*
- *EXISTING DRAIN TILE OUTLETS TO SURFACE*
- *EXIST. DRAIN TILE (1) INSPECTION STRUCTURE , / (2) CATCH BASIN*
- *EXIST. DRAIN TILE (1) LOCATED END / (2) ASSUMED END*
- *EXISTING DRAIN TILE CONTINUES TO OFF-SITE OUTLET SYSTEM*
- *EXISTING DRAIN TILE FAILURE , / FLOW SURCHARGE TO SURFACE*
- *EXISTING DRAIN TILE MAPPED BY SPECULATION AND ASSUMPTION*
- *EXISTING DRAIN TILE ABANDONED (NOT FUNCTIONAL)*
- *EXISTING DRAIN TILE "BLOWOUT" OR FAILURE*
- *HAND PROBE OR ELECTRONIC SCAN FOR DRAIN TILE LOCATION*
- *INVESTIGATION SLIT TRENCH FOR INVESTIGATION*
- *SPECIFIC PIT EXCAVATION FOR INVESTIGATION*
- *SURVEY DATA POINTS*
- *REPORT IDENTIFICATION NUMBER*

*REPORT LEGEND :*

| | |
|---|---|
| *ID NO.* | *POINT OF EXCAVATION FOR SPECIFIC DRAIN TILE INVESTIGATION.* |
| *SZ. (SIZE)* | *DRAIN TILE INTERNAL DIAMETER IN INCHES.* |
| *MATERIAL / QUALITY* | *TYPE OF TILE MATERIALS, PIPE QUALITY - GOOD, FAIR & POOR.* |
| *FLOW %* | *PERCENTAGE OF TILE DIAMETER OCCUPIED BY ACTIVE FLOW.* |
| (R) | *RESTRICTED OR BACHED UP FLOW, SURCHARGED CONDITION* |
| *SILT %* | *PERCENTAGE OF TILE DIAMETER OCCUPIED BY RESTRICTIVE SILT.* |
| (A) | *ABANDONED, FILLED WITH SILT BLOCKAGE, NO FLOW POTENTIAL* |
| *DEPTH* | *MEASUREMENT FROM EXISTING GROUND LEVEL TO PIPE INVERT.* |

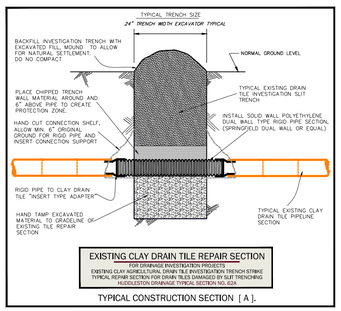
*(GENERAL NOTES)*

| | |
|---|---|
| *MAINLINE TILE* | *TRUNK LINE OR MUTUAL DRAIN, COLLECTOR OF SUB-SYSTEMS.* |
| *SUB-MAIN TILE* | *SECONDARY TRUNK LINE OR RANDOM SYSTEM COLLECTOR.* |
| *LATERAL TILE* | *FEEDER LINE, SERVICE TILE OR SYSTEM SPUR.* |
| *"BLOWOUT"* | *EXISTING SYSTEM PIPE FAILURE OR RESTRICTION.* |
| *DRAIN TILE ENDS* | *MAINLINE, SUB-MAIN OR LATERAL PLANNED TERMINATION.* |
| *SLIT TRENCH* | *INVESTIGATION TRENCH, TYPICAL 2'- 0" WIDE x 6'- 0" DEPTH.* |

*SPECIAL NOTES :*

- *ALL EXISTING AGRICULTURAL DRAIN TILES LOCATED DURING THIS INVESTIGATION SURVEY HAVE BEEN IDENTIFIED ON THIS PLAN AND FIELD STAKED AT < 50' INTERVALS, IN SOME OCCASIONS CERTAIN EXISTING LOCAL DRAIN TILE SECTIONS MAY BE SPECULATED AND CONSIDERED AS AN ASSUMED ROUTE WHICH SHALL BE DELINEATED ON THIS PLAN.*
- *ALL EXISTING DRAIN TILES DAMAGED DURING THE INVESTIGATION PROCESS SHALL BE REPAIRED TO THEIR ORIGINAL STATE IN ACCORDANCE WITH NATURAL RESOURCE CONSERVATION SERVICE STANDARDS FOR DRAIN TILE INSTALLATION AND REPAIR. (HUDDLESTON DRAINAGE (624) TYPICAL STANDARD "A")*
- *ALL EXISTING DRAIN TILE LOCATION DIMENSIONS HAVE BEEN SURVEYED BY AGRICULTURAL GRADE GPS SURVEY SYSTEMS AND INCLUDE SUB METER ACCURACY, ALL LOCATIONS PERTINENT TO FINAL DESIGN SHALL BE VERIFIED BY THE PROJECT SURVEYOR.*
- *THIS DRAIN TILE INVESTIGATION REPORT IS INTENDED TO IDENTIFY EXISTING DRAIN TILE MAINLINE SYSTEMS ONLY WITH ADDITIONAL PRIORITY ON DRAIN TILES WHICH MAY SERVICE THE UPLAND PROPERTY OF OTHERS OR WITH MUTUAL DRAINAGE STATUS.*
- *THIS DRAIN TILE INVESTIGATION REPORT SHALL BE FILED WITH HUDDLESTON DRAINAGE LAND DRAINAGE CO., AND WILL BE REPRODUCED AND DISBURSED ONLY BY PERMISSION OF THE CONTRACT PRINCIPALS.*

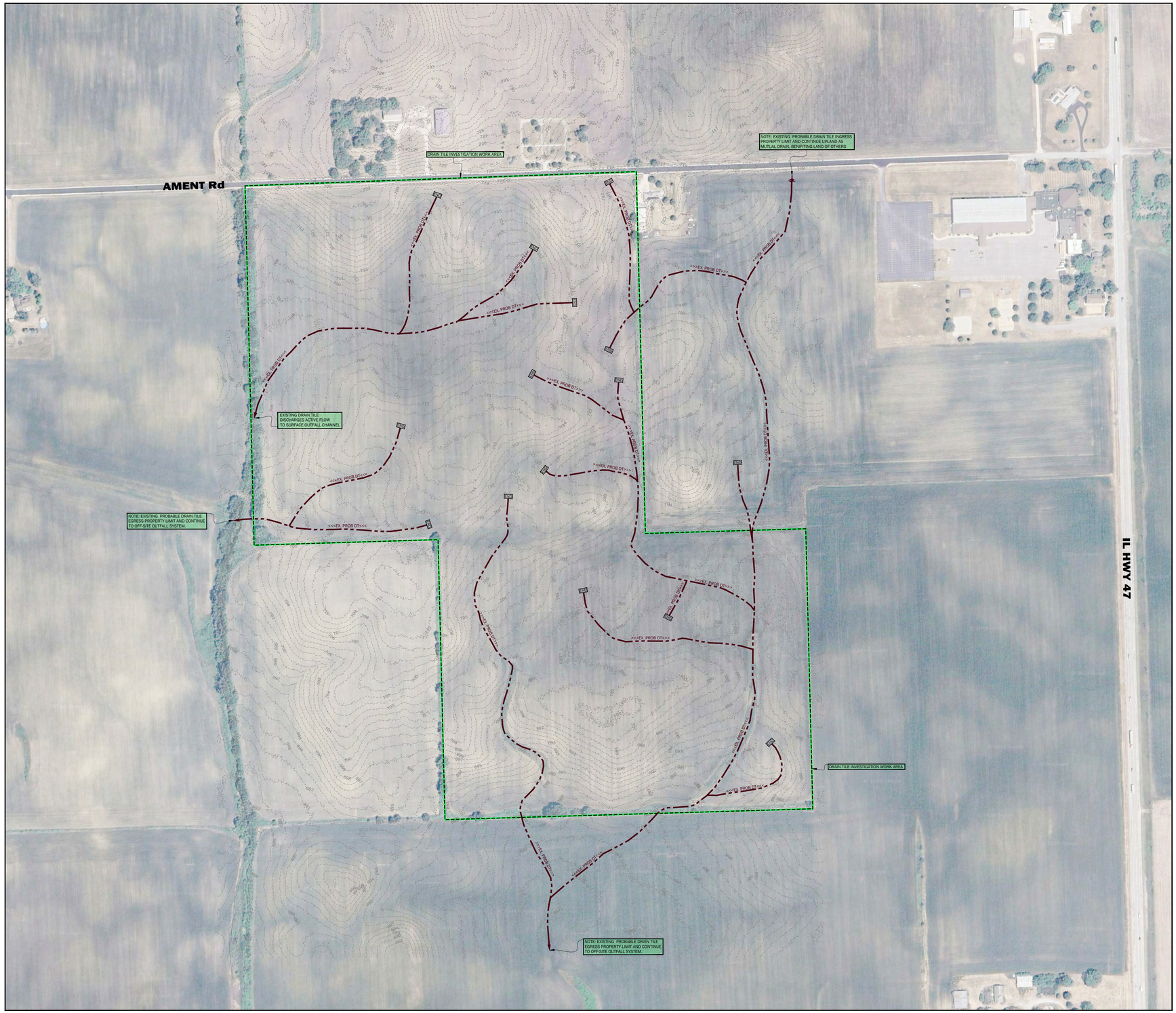
*TOM HUDDLESTON, HUDDLESTON McBRIDE DRAINAGE CO.*




**EXISTING CLAY DRAIN TILE REPAIR SECTION**
FOR DRAINAGE INVESTIGATION PROJECTS ONLY
EXISTING CLAY AGRICULTURAL DRAIN TILE PROVIDES TRENCH STRIKE
TYPICAL REPAIR SECTION FOR DRAIN TILES DAMAGED BY SLIT TRENCHING
HUDDLESTON DRAINAGE TYPICAL SECTION NO. 624

TYPICAL CONSTRUCTION SECTION [ A ].

THESE SYMBOLS REPRESENT SURVEY DATA POINTS WHICH HAVE BEEN STAKED IN THE FIELD FOR THE SPECIFIC PURPOSE OF ELECTRONIC LOCATION AND ELEVATION DETERMINATION BY THE PROJECT SURVEYOR.
THESE DATA POINTS CONSIST OF A 2" X 2" GROUND HUB AND A 3'-0" ON-LINE LOCATION STAKE WHICH INCLUDES DATA POINT IDENTIFICATION NUMBER, SEPARATION MEASUREMENT FROM HUB TO PIPE INVERT, AND PIPE SIZE.
ALL EXISTING DRAIN TILE ROUTES HAVE BEEN FIELD STAKED WITH "EXISTING DRAIN TILE" PIN FLAGS AT 50' INTERVALS AND DOUBLE FLAGS AT INTERSECTIONS.




PROJECT CLIENT:

**New Leaf Energy**

**Tom Ryan , Project Manager**
**55 Technology Drive, Suite 102, Lowell, MA 01851**

| | |
|---|---|
| APPROVED BY AND DATE: *RUDY P. DIXON, P.E., 10/17/24* | PROJECT DATE: *10/17/24* |
| ACKNOWLEDGMENTS: *HUDDLESTON DRAINAGE MAP and ARCHIVE SYSTEMS* | FIELD FILE NO.: *8-4-16* |
| DRAWN BY AND DATE: *TOM HUDDLESTON 10/17/24* | DRAWING NO. *8-4-16_P1* |

REVISIONS

| DATE: | BY: | DESCRIPTION: |
|---|---|---|
| | | |
| | | |
| | | |

| WEATHER CONDITIONS: | DRAWING SCALE: | SHEET NO. |
|---|---|---|
| *SUNNY/ WARM - 45o* | *1" TO 200'* | *ONE OF ONE* |

RUDY P. DIXON 062.065333 — REGISTERED PROFESSIONAL ENGINEER — STATE OF ILLINOIS

HUDDLESTON-McBRIDE 1976 48 Anniversary 2024 DRAINAGE HISTORY

ILLINOIS FARM BUREAU MEMBER

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NORTH

**YORKVILLE AMENT Rd SOLAR**

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**PROFESSIONAL LAND DRAINAGE SERVICES**
Women-Owned Small Business (WOSB)
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COORDINATE SYSTEM: ILLINOIS STATE PLANE EAST NAD 83

# FORGESOLAR GLARE ANALYSIS

Project: **Ament Road - Kendal County**
5MW Solar Site

Site configuration: **Ament Road - Kendal County**

**Created** 09 Jul, 2024
**Updated** 09 Jul, 2024
**Time-step** 1 minute
**Timezone offset** UTC-6
**Minimum sun altitude** 0.0 deg
**DNI** peaks at 1,034.0 W/m$^2$
**Category** 1 MW to 5 MW
**Site ID** 123723.21235

**Ocular transmission coefficient** 0.5
**Pupil diameter** 0.002 m
**Eye focal length** 0.017 m
**Sun subtended angle** 9.3 mrad
**PV analysis methodology** V2




## Summary of Results No glare predicted

| PV Array | Tilt | Orient | Annual Green Glare | | Annual Yellow Glare | | Energy |
|---|---|---|---|---|---|---|---|
| | ° | ° | min | hr | min | hr | kWh |
| PV array 1 | SA tracking | SA tracking | 0 | 0.0 | 0 | 0.0 | - |

*Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.*

| Receptor | Annual Green Glare | | Annual Yellow Glare | |
|---|---|---|---|---|
| | min | hr | min | hr |
| Ament Road | 0 | 0.0 | 0 | 0.0 |
| Illinois Route 47 | 0 | 0.0 | 0 | 0.0 |
| Immanuel Road | 0 | 0.0 | 0 | 0.0 |
| OP 1 | 0 | 0.0 | 0 | 0.0 |
| OP 2 | 0 | 0.0 | 0 | 0.0 |
| OP 3 | 0 | 0.0 | 0 | 0.0 |
| OP 4 | 0 | 0.0 | 0 | 0.0 |
| OP 5 | 0 | 0.0 | 0 | 0.0 |
| OP 6 | 0 | 0.0 | 0 | 0.0 |
| OP 7 | 0 | 0.0 | 0 | 0.0 |
| OP 8 | 0 | 0.0 | 0 | 0.0 |
| OP 9 | 0 | 0.0 | 0 | 0.0 |
| OP 10 | 0 | 0.0 | 0 | 0.0 |
| OP 11 | 0 | 0.0 | 0 | 0.0 |

| Receptor | Annual Green Glare | | Annual Yellow Glare | |
|---|---|---|---|---|
| | min | hr | min | hr |
| OP 12 | 0 | 0.0 | 0 | 0.0 |
| OP 13 | 0 | 0.0 | 0 | 0.0 |
| OP 14 | 0 | 0.0 | 0 | 0.0 |

# Component Data

## PV Arrays

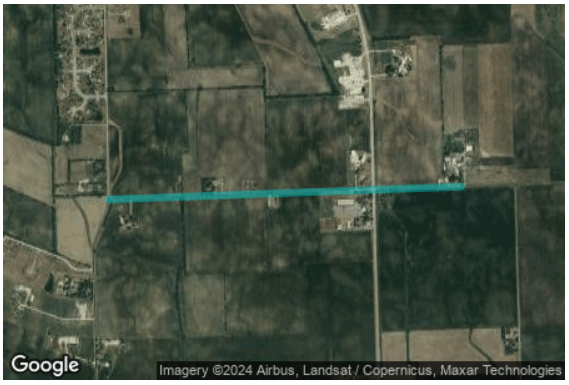
**Name**: PV array 1
**Axis tracking**: Single-axis rotation
**Backtracking**: Shade-slope
**Tracking axis orientation**: 180.0°
**Max tracking angle**: 52.0°
**Resting angle**: 52.0°
**Ground Coverage Ratio**: 0.5
**Rated power**: -
**Panel material**: Smooth glass without AR coating
**Reflectivity**: Vary with sun
**Slope error**: correlate with material




| Vertex | Latitude (°) | Longitude (°) | Ground elevation (ft) | Height above ground (ft) | Total elevation (ft) |
|---|---|---|---|---|---|
| 1 | 41.592943 | -88.440589 | 699.77 | 20.00 | 719.77 |
| 2 | 41.589733 | -88.440375 | 696.92 | 20.00 | 716.92 |
| 3 | 41.589653 | -88.446018 | 693.17 | 20.00 | 713.17 |
| 4 | 41.592862 | -88.446104 | 712.38 | 20.00 | 732.38 |

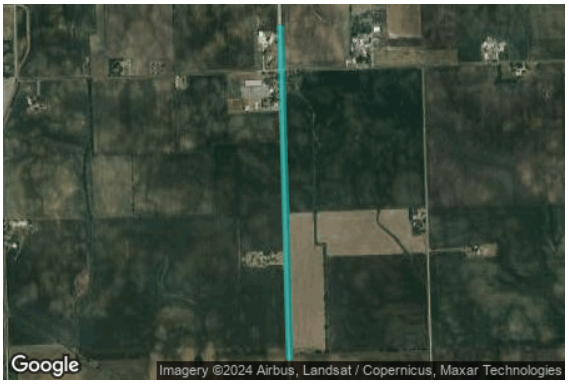
## Route Receptors

**Name**: Ament Road
**Path type**: Two-way
**Observer view angle**: 50.0°




| Vertex | Latitude (°) | Longitude (°) | Ground elevation (ft) | Height above ground (ft) | Total elevation (ft) |
|---|---|---|---|---|---|
| 1 | 41.596670 | -88.454069 | 725.54 | 5.00 | 730.54 |
| 2 | 41.597328 | -88.429864 | 700.23 | 5.00 | 705.23 |

**Name**: Illinois Route 47
**Path type**: Two-way
**Observer view angle**: 50.0°




| Vertex | Latitude (°) | Longitude (°) | Ground elevation (ft) | Height above ground (ft) | Total elevation (ft) |
|---|---|---|---|---|---|
| 1 | 41.599350 | -88.435937 | 716.32 | 5.00 | 721.32 |
| 2 | 41.582499 | -88.435315 | 668.79 | 5.00 | 673.79 |

**Name**: Immanuel Road
**Path type**: Two-way
**Observer view angle**: 50.0°



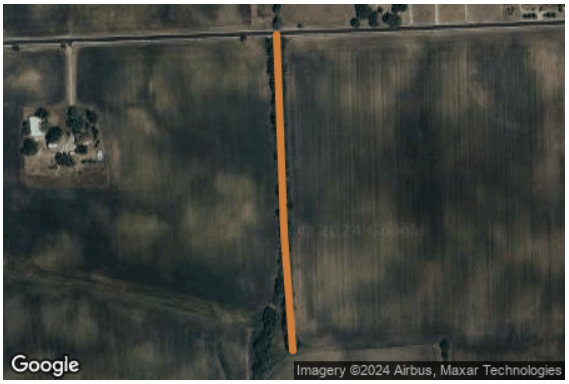

| Vertex | Latitude (°) | Longitude (°) | Ground elevation (ft) | Height above ground (ft) | Total elevation (ft) |
|---|---|---|---|---|---|
| 1 | 41.598883 | -88.454116 | 737.83 | 5.00 | 742.83 |
| 2 | 41.596460 | -88.454095 | 724.20 | 5.00 | 729.20 |
| 3 | 41.595208 | -88.454588 | 719.17 | 5.00 | 724.17 |
| 4 | 41.594213 | -88.455125 | 718.71 | 5.00 | 723.71 |
| 5 | 41.593764 | -88.455125 | 718.19 | 5.00 | 723.19 |
| 6 | 41.590270 | -88.454996 | 707.54 | 5.00 | 712.54 |
| 7 | 41.585776 | -88.454803 | 680.48 | 5.00 | 685.48 |

## Discrete Observation Point Receptors

| Name | ID | Latitude (°) | Longitude (°) | Elevation (ft) | Height (ft) |
|---|---|---|---|---|---|
| OP 1 | 1 | 41.596629 | -88.442893 | 717.46 | 5.50 |
| OP 2 | 2 | 41.596247 | -88.438321 | 705.82 | 5.50 |
| OP 3 | 3 | 41.595481 | -88.436320 | 702.68 | 5.00 |
| OP 4 | 4 | 41.587506 | -88.436939 | 688.28 | 5.50 |
| OP 5 | 5 | 41.580453 | -88.450356 | 696.79 | 5.00 |
| OP 6 | 6 | 41.588179 | -88.454638 | 692.17 | 5.00 |
| OP 7 | 7 | 41.589250 | -88.454386 | 706.23 | 5.00 |
| OP 8 | 8 | 41.589182 | -88.457272 | 703.80 | 5.00 |
| OP 9 | 9 | 41.591232 | -88.455743 | 713.27 | 5.00 |
| OP 10 | 10 | 41.592024 | -88.456231 | 722.74 | 5.50 |
| OP 11 | 11 | 41.595420 | -88.452272 | 721.49 | 5.00 |
| OP 12 | 12 | 41.597066 | -88.454673 | 729.19 | 5.50 |
| OP 13 | 13 | 41.597293 | -88.446986 | 734.84 | 5.50 |
| OP 14 | 14 | 41.597695 | -88.436659 | 710.56 | 5.50 |

## Obstruction Components

**Name**: Tree Line 1
**Top height**: 25.0 ft




| Vertex | Latitude (°) | Longitude (°) | Ground elevation (ft) |
|---|---|---|---|
| 1 | 41.596783 | -88.449005 | 719.57 |
| 2 | 41.594231 | -88.448876 | 702.47 |
| 3 | 41.592739 | -88.448726 | 703.41 |

**Name**: Tree Line 2
**Top height**: 25.0 ft




| Vertex | Latitude (°) | Longitude (°) | Ground elevation (ft) |
|---|---|---|---|
| 1 | 41.589481 | -88.448919 | 686.05 |
| 2 | 41.591038 | -88.449305 | 692.86 |
| 3 | 41.592209 | -88.449412 | 698.37 |
| 4 | 41.593156 | -88.449176 | 702.37 |
| 5 | 41.593685 | -88.448962 | 704.66 |

# Glare Analysis Results

## Summary of Results No glare predicted

| PV Array | Tilt | Orient | Annual Green Glare | | Annual Yellow Glare | | Energy |
|---|---|---|---|---|---|---|---|
| | ° | ° | min | hr | min | hr | kWh |
| PV array 1 | SA tracking | SA tracking | 0 | 0.0 | 0 | 0.0 | - |

*Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.*

| Receptor | Annual Green Glare | | Annual Yellow Glare | |
|---|---|---|---|---|
| | min | hr | min | hr |
| Ament Road | 0 | 0.0 | 0 | 0.0 |
| Illinois Route 47 | 0 | 0.0 | 0 | 0.0 |
| Immanuel Road | 0 | 0.0 | 0 | 0.0 |
| OP 1 | 0 | 0.0 | 0 | 0.0 |
| OP 2 | 0 | 0.0 | 0 | 0.0 |
| OP 3 | 0 | 0.0 | 0 | 0.0 |
| OP 4 | 0 | 0.0 | 0 | 0.0 |
| OP 5 | 0 | 0.0 | 0 | 0.0 |
| OP 6 | 0 | 0.0 | 0 | 0.0 |
| OP 7 | 0 | 0.0 | 0 | 0.0 |
| OP 8 | 0 | 0.0 | 0 | 0.0 |
| OP 9 | 0 | 0.0 | 0 | 0.0 |
| OP 10 | 0 | 0.0 | 0 | 0.0 |
| OP 11 | 0 | 0.0 | 0 | 0.0 |
| OP 12 | 0 | 0.0 | 0 | 0.0 |
| OP 13 | 0 | 0.0 | 0 | 0.0 |
| OP 14 | 0 | 0.0 | 0 | 0.0 |

## PV: PV array 1 no glare found

*Receptor results ordered by category of glare*

| Receptor | Annual Green Glare | | Annual Yellow Glare | |
|---|---|---|---|---|
| | min | hr | min | hr |
| Ament Road | 0 | 0.0 | 0 | 0.0 |
| Illinois Route 47 | 0 | 0.0 | 0 | 0.0 |
| Immanuel Road | 0 | 0.0 | 0 | 0.0 |
| OP 1 | 0 | 0.0 | 0 | 0.0 |
| OP 2 | 0 | 0.0 | 0 | 0.0 |
| OP 3 | 0 | 0.0 | 0 | 0.0 |
| OP 4 | 0 | 0.0 | 0 | 0.0 |
| OP 5 | 0 | 0.0 | 0 | 0.0 |
| OP 6 | 0 | 0.0 | 0 | 0.0 |
| OP 7 | 0 | 0.0 | 0 | 0.0 |
| OP 8 | 0 | 0.0 | 0 | 0.0 |
| OP 9 | 0 | 0.0 | 0 | 0.0 |
| OP 10 | 0 | 0.0 | 0 | 0.0 |
| OP 11 | 0 | 0.0 | 0 | 0.0 |
| OP 12 | 0 | 0.0 | 0 | 0.0 |
| OP 13 | 0 | 0.0 | 0 | 0.0 |
| OP 14 | 0 | 0.0 | 0 | 0.0 |

### PV array 1 and Route: Ament Road

No glare found

### PV array 1 and Route: Illinois Route 47

No glare found

### PV array 1 and Route: Immanuel Road

No glare found

### PV array 1 and OP 1

No glare found

### PV array 1 and OP 2

No glare found

### PV array 1 and OP 3

No glare found

### PV array 1 and OP 4

No glare found

### PV array 1 and OP 5

No glare found

### PV array 1 and OP 6

No glare found

### PV array 1 and OP 7

No glare found

### PV array 1 and OP 8

No glare found

### PV array 1 and OP 9

No glare found

### PV array 1 and OP 10

No glare found

### PV array 1 and OP 11

No glare found

### PV array 1 and OP 12

No glare found

### PV array 1 and OP 13

No glare found

### PV array 1 and OP 14

No glare found

# Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, we have validated our models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque, and the tool accurately predicted the occurrence and intensity of glare at different times and days of the year.
Several V1 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare. This primarily affects V1 analyses of path receptors.
Random number computations are utilized by various steps of the annual hazard analysis algorithm. Predicted minutes of glare can vary between runs as a result. This limitation primarily affects analyses of Observation Point receptors, including ATCTs. Note that the SGHAT/ ForgeSolar methodology has always relied on an analytical, qualitative approach to accurately determine the overall hazard (i.e. green vs. yellow) of expected glare on an annual basis.
The analysis does not automatically consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
The variable direct normal irradiance (DNI) feature (if selected) scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.
The ocular hazard predicted by the tool depends on a number of environmental, optical, and human factors, which can be uncertain. We provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results. The speed of SGHAT allows expedited sensitivity and parametric analyses.
The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

Default glare analysis parameters and observer eye characteristics (for reference only):

- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

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# REAL ESTATE ADJACENT PROPERTY VALUE IMPACT REPORT:

## Academic and Peer Authored Property Value Impact Studies, Research and Analysis of Existing Solar Facilities, and Market Participant and Assessor Interviews

**Prepared For:**

New Leaf Energy, Inc.

**Submitted By:**

CohnReznick LLP
*Valuation Advisory Services*
1 S. Wacker Drive, Suite 3550
Chicago, Illinois 60606
(312) 508-5900

Patricia L. McGarr, MAI, CRE, FRICS
Andrew R. Lines, MAI
Erin C. Bowen, MAI

**March 21, 2023**



## LETTER OF TRANSMITTAL

March 21, 2023

Mr. Ben Sych
Project Developer
New Leaf Energy, Inc.
[redacted]

SUBJECT: Property Value Impact Report
An Analysis of Existing Solar Farms

To Whom it May Concern:

CohnReznick is pleased to submit the accompanying property values impact report for proposed solar energy uses in Illinois. Per the client's request, CohnReznick researched property transactions adjacent to existing solar farms, researched and analyzed articles and other published studies, and interviewed real estate professionals and Township/County Assessors active in the market where solar farms are located, to gain an understanding of actual market transactions in the presence of solar energy uses.

The purpose of this consulting assignment is to determine whether proximity to a renewable energy use (solar farm) has an impact adjacent property values. The intended use of our opinions and conclusions is to assist the client in addressing local concerns and to provide information that local bodies are required to consider in their evaluation of solar project use applications. We have not been asked to value any specific property, and we have not done so.

The client and intended user for the assignment is New Leaf Energy, Inc. The report may be used only for the aforementioned purpose and may not be distributed without the written consent of CohnReznick LLP ("CohnReznick").

This consulting assignment is intended to conform to the Uniform Standards of Professional Appraisal Practice (USPAP), the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute, as well as applicable state appraisal regulations.

Based on the analysis in the accompanying report, and subject to the definitions, assumptions, and limiting conditions expressed in the report, our findings are:

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## FINDINGS

I. Academic Studies *(pages 18-20):* CohnReznick reviewed and analyzed published academic studies that specifically analyzed the impact of solar facilities on nearby property values. These studies include multiple regression analyses of hundreds and thousands of sales transactions, and opinion surveys, for both residential homes and farmland properties in rural communities, which concluded existing solar facilities have had no negative impact on adjacent property values.

Peer Authored Studies: CohnReznick also reviewed studies prepared by other real estate valuation experts that specifically analyzed the impact of solar facilities on nearby property values. These studies found little to no measurable or consistent difference in value between the Test Area Sales and the Control Area Sales attributed to the proximity to existing solar farms and noted that solar energy uses are generally considered a compatible use.

II. CohnReznick Studies *(pages 21-91)*: Further, CohnReznick has performed 30 studies in over 15 states, of both residential and agricultural properties, in which we have determined that the existing solar facilities have not caused any consistent and measurable negative impact on property values.

For this Project, we have included 10 of these studies which are most similar to the subject in terms of general location and size, summarized as follows:

**CohnReznick - Existing Solar Farms Studied**

| Solar Farm # | Solar Farm | County | State | Power Output (MW AC) | Site Area (Acres) | Date Project Completed | Impact on Surrounding Property Values |
|---|---|---|---|---|---|---|---|
| 1 | DTE Lapeer | LaPeer | MI | 48.28 | ±365 | May-17 | No Impact |
| 2 | Grand Ridge Solar | LaSalle | IL | 20.00 | 158 | Jul-12 | No Impact |
| 3 | Woodland Solar | Isle of Wight | VA | 19.00 | 211 | Dec-16 | No Impact |
| 4 | Dominion Indy Solar III | Marion | IN | 8.60 | 129 | Dec-13 | No Impact |
| 5 | Sunfish Farm | Wake | NC | 5.00 | 50 | Dec-15 | No Impact |
| 6 | 2662 Freeport Solar CSG | Stephenson | IL | 2.00 | 18 | Dec-20 | No Impact |
| 7 | Portage Solar | Porter | IN | 2.00 | 56 | Sep-12 | No Impact |
| 8 | IMPA Frankton Solar | Madison | IN | 1.40 | 13 | Jun-14 | No Impact |
| 9 | Jefferson County Community | Jefferson | CO | 1.20 | 14 | May-16 | No Impact |
| 10 | Valparaiso Solar | Porter | IN | 1.00 | 28 | Dec-12 | No Impact |

It is noted that proximity to the solar farms has not deterred sales of nearby agricultural land and residential single-family homes nor has it deterred the development of new single-family homes on adjacent land.

This report also includes two "Before and After" analysis, in which sales that occurred prior to the announcement and construction of the solar farm project were compared with sales that occurred after completion of the solar farm project, for both adjoining and non-adjoining properties. No measurable impact on property values was demonstrated.

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III. Market Participant Interviews *(pages 92-94)*: Our conclusions also consider interviews with over 45 County and Township Assessors, who have at least one solar farm in their jurisdiction, and in which they have determined that solar farms have not negatively affected adjacent property values.

With regards to the Project, we specifically interviewed Assessors in Illinois:

- In Otter Creek Township, in LaSalle County, Illinois, we spoke with Viki Crouch, the Township Assessor, who she said that *there has been no impact on property values due to their proximity to the **Grand Ridge Solar Farm***.
- We spoke with Ken Crowley, Rockford Township Assessor in Winnebago County, Illinois, who stated that he has seen *no impact on property values in his township as an effect of proximity to the **Rockford Solar Farm***.
- We spoke with James Weisiger, the Champaign Township Assessor in Champaign County, where the **University of Illinois Solar Farm** is located, and he noted *there appears to have been no impact on property values as a result of proximity to the solar farm*.
- Cindi Lotz of Fayette County, Illinois did indicate that the **Dressor Plains Solar** project *has not had any impact whatsoever on adjacent property values.*

To give us additional insight as to how the market evaluates farmland and single-family homes with views of solar farms, we interviewed numerous real estate brokers and other market participants who were party to actual sales of property adjacent to solar; these professionals also confirmed that solar farms did not diminish property values or marketability in the areas they conducted their business.

IV. Solar Farm Factors on Harmony of Use *(pages 95-101)*: In the course of our research and studies, we have recorded information regarding the compatibility of these existing solar facilities and their adjoining uses, including the continuing development of land adjoining these facilities.

## CONCLUSION

**Considering all of the preceding, the data indicates that solar facilities do not have a negative impact on adjacent property values.**

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If you have any questions or comments, please contact the undersigned. Thank you for the opportunity to be of service.

Very truly yours,

**CohnReznick LLP**



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# SCOPE OF WORK

## CLIENT AND INTENDED USERS

The client and intended user of this report is New Leaf Energy, Inc.; other intended users may include the client's legal and site development professionals. Additional intended users of our findings include all relevant permitting authorities for New Leaf Energy's proposed solar projects in Illinois.

## INTENDED USE

The intended use of our findings and conclusions is to assist the client in addressing local concerns and to provide information that permitting bodies consider in their evaluation of solar project use applications. We have not been asked to value any specific property, and we have not done so. The report may be used only for the aforementioned purpose and may not be distributed without the written consent of CohnReznick LLP ("CohnReznick").

## PURPOSE

The purpose of this consulting assignment is to determine whether proximity to the proposed solar facility will result in an impact on adjacent property values.

## DEFINITION OF VALUE

This report utilizes Market Value as the appropriate premise of value. Market value is defined as:

"The most probable price which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus. Implicit in this definition are the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:

1. Buyer and seller are typically motivated;
2. Both parties are well informed or well advised, and acting in what they consider their own best interests;
3. A reasonable time is allowed for exposure in the open market.
4. Payment is made in terms of cash in U.S. dollars or in terms of financial arrangements comparable thereto; and
5. The price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale."[1]

[1] Code of Federal Regulations, Title 12, Chapter I, Part 34.42[h]

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## EFFECTIVE DATE & DATE OF REPORT

March 21, 2023 (Paired sale analyses contained within each study are periodically updated.)

## PRIOR SERVICES

USPAP requires appraisers to disclose to the client any services they have provided in connection with the subject property in the prior three years, including valuation, consulting, property management, brokerage, or any other services.

This report is a compilation of the Existing Solar Farms which we have studied over the past year, and is not evaluating a specific subject site. In this instance, there is no "subject property" to disclose.

## INSPECTION

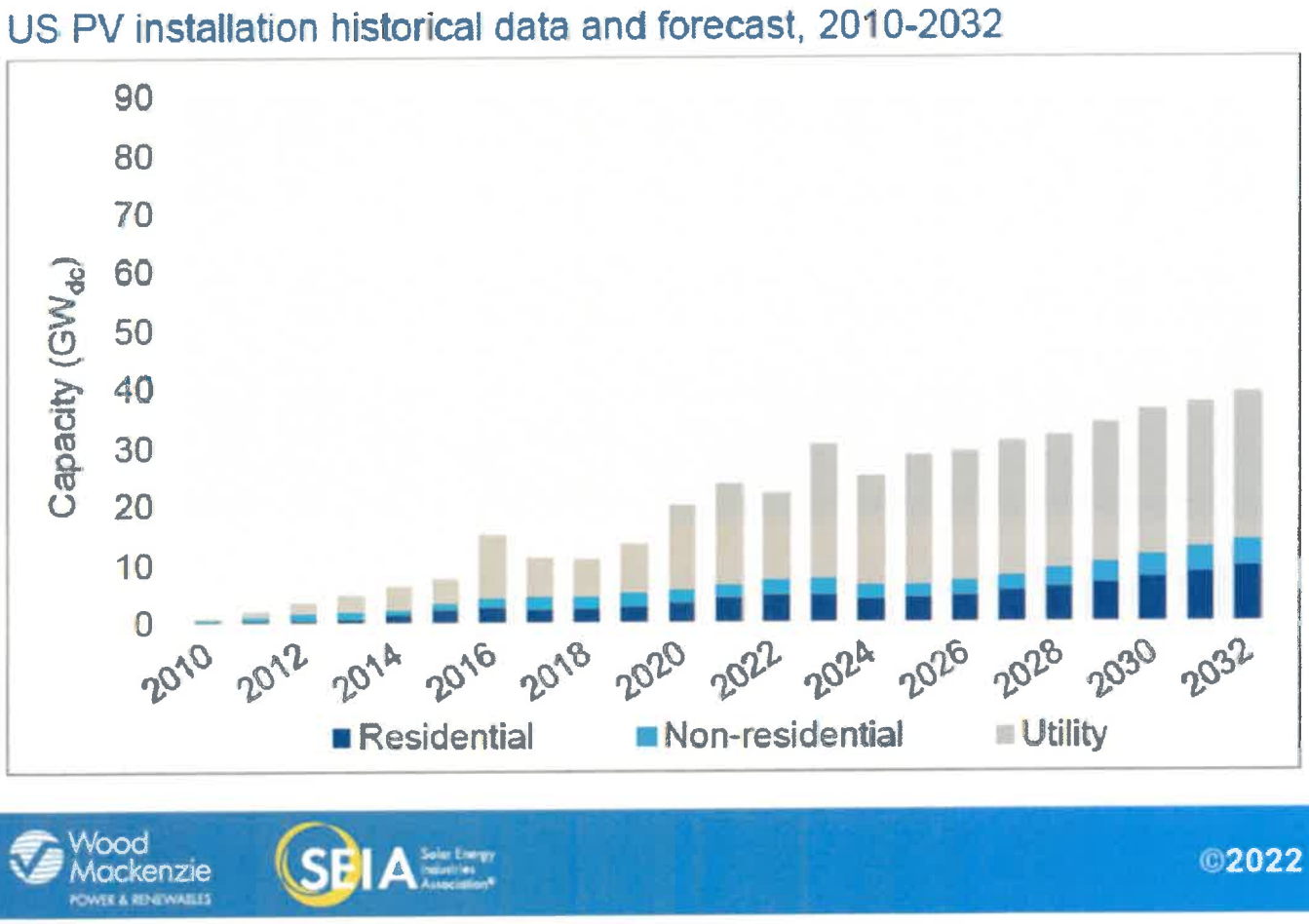
Patricia L. McGarr, MAI, CRE, FRICS, Andrew R. Lines, MAI, and Erin C. Bowen, MAI have viewed the exterior of all comparable data referenced in this report in person, via photographs, or aerial imagery.

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## OVERVIEW OF SOLAR DEVELOPMENT IN THE UNITED STATES

Solar development increased almost exponentially over the past ten years in the United States as technology and the economic incentives (Solar Investment Tax Credits or ITC) made the installation of solar farms economically reasonable. The cost to install solar panels has dropped nationally by 70 percent since 2010, which has been one cause that led to the increase in installations. A majority of these solar farm installations are attributed to larger-scale solar farm developments for utility purposes. The chart below portrays the historical increase on an annual basis of solar installations in the US as a whole, courtesy of research by Solar Energy Industries Association (SEIA) and Wood Mackenzie, and projects solar photovoltaic (PV) deployment for the next ten years through 2032, with the largest percentage of installations attributed to utility-scale projects.




The United States installed 4.6 Gigawatts (GW) DC of solar photovoltaic capacity for all the sectors, residential, commercial, community solar and utility-scale solar projects in Q3 2022, a 17 percent decrease from Q3 2021 and a 2 percent increase from Q2 2022, which could have been higher without supply chain constraints. Due to the anti-circumvention investigation instigated by Auxin Solar's petition to the Department of Commerce, most manufacturers have simply stopped shipping equipment to the United States to avoid tariff risk. Additionally, the

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Uyghur Forced Labor Prevention Act (UFLPA) went into effect on June 21, 2022 which has resulted in a reduction in expectations of utility-scale projects in the pipeline, reduced down 10 GWdc from Q1 2022. Most of the reduction comes from the utility-scale solar segment while expectations for distributed solar have increased, effectively balancing each other out.

The beginning dates for operation of multiple gigawatts of projects have been pushed from 2022 into 2023 or later. The projects likely to come online in 2022 already have secured equipment, as of the end of 2021.

However, solar power generation still accounted for 45 percent of all new electricity-generating capacity additions in Q3 2022 and continues to make up the largest share of new generating capacity in the U.S.

As of August 12, 2022, the Inflation Reduction Act was passed in the Senate and The House of Representatives, which includes long-term solar incentives and investment in domestic solar manufacturing. Included in the bill, a 10-year extension and expansion of the Investment Tax Credit (ITC) and Production Tax Credit (PTC) will provide tax credits for solar manufacturing and direct payment options for tax credits. While the uncertainty of the anti-circumvention investigation remains present, the passage of the Inflation Reduction Act gives the solar industry long-term market certainty.

Recent articles show that over the past decade, the solar industry has experienced unprecedented growth. Among the factors contributing to its growth were government incentives, significant capacity additions from existing and new entrants and continual innovation. Solar farms offer a wide array of economic and environmental benefits to surrounding properties. Unlike other energy sources, solar energy does not produce emissions that may cause negative health effects or environmental damage. Solar farms produce a lower electromagnetic field exposure than most household appliances, such as TV and refrigerators, and studies have confirmed there are no health issues related to solar farms.[2]

Solar farm construction in rural areas has also dramatically increased the tax value of the land on which they are built, which has provided a financial boost to some counties. CohnReznick has studied real estate tax increases due to the installation of solar, which can range up to 10-12 times the rate for farmland. A majority of tax revenue is funneled back into the local area, and as much as 50 percent of increased tax revenue can typically be allocated to the local school district. By converting farmland to a passive solar use for the duration of the system's life, the solar energy use does not burden school systems, utilities, traffic, nor infrastructure as it is a passive use that does not increase population as say a residential subdivision would.

Beyond creating jobs, solar farms are also benefiting the overall long-term agricultural health of the community. The unused land, and also all the land beneath the solar panels, will be left to rejuvenate naturally. In the long run this is a better use of land since the soil is allowed to recuperate instead of being ploughed and fertilized year after year. A solar farm can offer some financial security for the property owner over 20 to 25 years. Once solar panel racking systems are removed, the land can revert to its original use.[3]

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[2] "Electromagnetic Field and Public Health." Media Centre (2013): 1-4. World Health Organization.
[3] NC State Extension. (May 2016). Landowner Solar Leasing: Contract Terms Explained. Retrieved from: https://content.ces.ncsu.edu/landowner-solar-leasing-contract-terms-explained

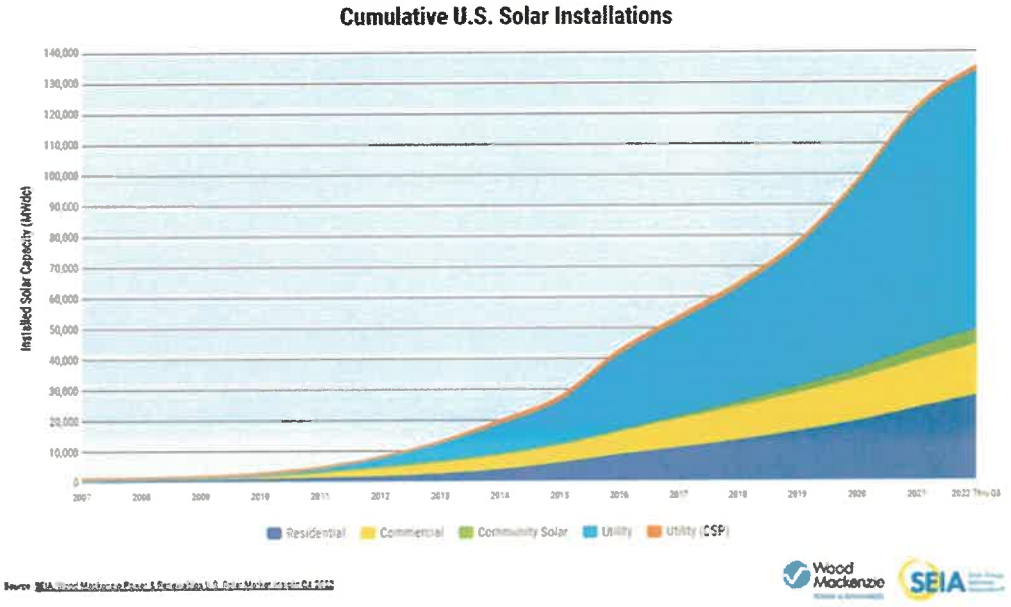
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## NATIONAL COMMUNITY SOLAR ENERGY PRODUCTION

Community solar projects (facilities that generate 5 MW AC or less of power) account for 9,600 MW of installed power in the U.S. as of the fourth quarter 2022, according to SEIA data. The community solar industry had a robust year in 2022 with 416 MW installed, according to SEIA data. According to the U.S. Energy Information Administration (EIA) through December 2022, there are over 4,258 community solar facilities in operation across the country.

Community solar installations declined 17 percent year-over-year as of third quarter 2022, and installations are down 17 percent from the second quarter 2022. Due to uncertainty around the anti-circumvention investigation, supply chain issues, and long timelines for new community solar policies, community solar installations are expected to contract in 2023. The growth of community solar installations from 2014 to 2022 is presented in the following chart.



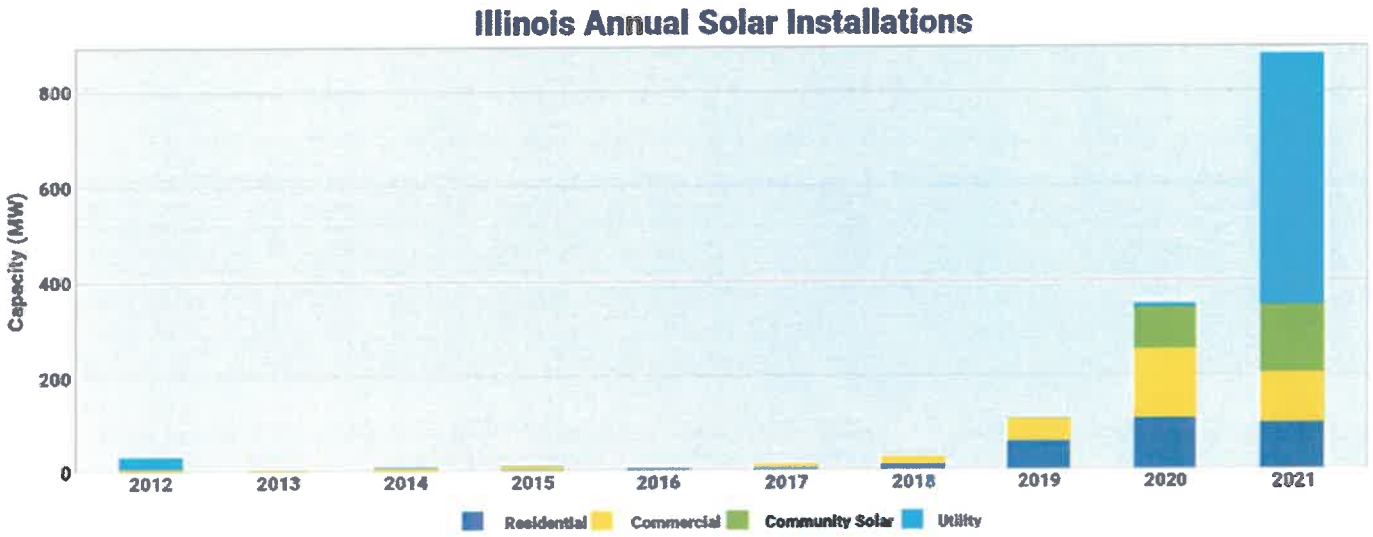

While early growth for community solar installations was led primarily by three key markets - New York, Minnesota, and Massachusetts - a growing list of states with community solar programs have helped diversify the market, creating large pipelines set to come to fruition over the next several years.

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## SOLAR ENERGY PRODUCTION IN ILLINOIS

As of the end of Q3 2022, Illinois has 1,909 MW of solar installed, ranking 15th in the US for the capacity of solar installed according to the Solar Energy Industries Association (SEIA). There have been significantly more utility investments in clean energy with continued growth on the horizon, with 4,943 MW of solar proposed to be installed over the next five years.




Illinois has 1,446.1 MW AC of solar power planned for installation through December 2022 in 15 facilities across the state. Seven of the planned solar installations in Illinois are utility scale and total 1,430.8 MW AC, or 99 percent of all planned installations. The largest new solar facility in Illinois will be a 600 MW AC utility scale installation projected to become operational in December 2024 in Lee County, that is being developed by Steward Creek Solar. The total planned solar facilities will increase solar power generation in the state by approximately 176 percent.

There are 9 community solar projects planned for the state of Illinois before the end of 2023, generating a total of 24.1 MW AC of power.

Additionally, on January 27, 2023, Illinois Governor, JB Pritzker, signed into law House Bill 4412 which protects clean energy projects in Illinois from the increasing number of local bans. House Bill 4412 establishes statewide wind and solar project siting regulations, prioritizes protection for endangered species and natural areas, and limits the restrictions allowed in local ordinances that have previously hindered wind and solar clean energy projects. A rapid development in clean energy across the state can be expected as House Bill 4412 prevents future bans of clean energy projects on a local level and takes precedence over current bans.

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## APPRAISAL THEORY – ADJACENT PROPERTY'S IMPACT ON VALUE

According to Randall Bell, PhD, MAI, author of text *Real Estate Damages,* published by the Appraisal Institute in 2016, understanding the market's perceptions on all factors that may have an influence on a property's desirability (and therefore its value) is essential in determining if a diminution or enhancement of value has occurred.[4] According to Dr. Bell:

> *"There is often a predisposition to believe that detrimental conditions automatically have a negative impact on property values. However, it is important to keep in mind that if a property's value is to be affected by a negative condition, whether internal or external to the property, that condition must be given enough weight in the decision-making process of buyers and sellers to have a material effect on pricing relative to all the other positive and negative attributes that influence the value of that particular property."*[5]

Market data and empirical research through the application of the three traditional approaches to value should be utilized to estimate the market value to determine if there is a material effect on pricing due, to the influence of a particular characteristic of or on a property.

A credible impact analysis is one that is logical, innate, testable and repeatable, prepared in conformity with approved valuation techniques. In order to produce credible assignment results, more than one valuation technique should be utilized for support for the primary method, or a check of reasonableness, such as utilization of more than one approach to value, conducting a literature review, or having discussions (testimony) with market participants.[6] CohnReznick implemented the scientific method[7] to determine if a detrimental condition of proximity to a solar farm exists, further described in the next section.

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[4] Bell, Randall, PhD, MAI. *Real Estate Damages. Third ed.* Chicago, IL: Appraisal Institute, 2016. (Pages 1-2)
[5] Ibid, Page 314
[6] Ibid, Pages 7-8
[7] The scientific method is a process that involves observation, development of a theory, establishment of a hypothesis, and testing. The valuation process applies principles of the scientific method as a model, based upon economic principles (primarily substitution) as the hypothesis. The steps for the scientific method are outlined as follows:

1. Identify the problem.
2. Collect relevant data.
3. Propose a hypothesis.
4. Test the hypothesis.
5. Assess the validity of the hypothesis.

Bell, Randall, PhD, MAI. *Real Estate Damages. Third ed.* Chicago, IL: Appraisal Institute, 2016. (Pages 314-316)

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## METHODOLOGY

The purpose of this report is to determine whether proximity to the solar facility resulted in any measurable and consistent impact on adjacent property values. To test this hypothesis, CohnReznick identified three relevant techniques to test if a detrimental condition exists.

(1) A review of published studies;
(2) Paired sale analysis of properties adjacent to existing solar generating facilities, which may include repeat sale analyses or "Before and After" analyses; and,
(3) Interviews with real estate professionals and local real estate assessors.

The paired sales analysis is an effective method of determining if there is a detrimental impact on surrounding properties.

> *"One of the most useful applications of the sales comparison approach is paired sale analysis. This type of analysis may compare the subject property or similarly impacted properties called* ***Test Areas*** *(at Points B, C, D, E, or F) with unimpaired properties called* ***Control Areas*** *(Point A). A comparison may also be made between the unimpaired value of the subject property before and after the discovery of a detrimental condition. If a legitimate detrimental condition exists, there will likely be a* ***measurable and consistent difference*** *between the two sets of market data; if not, there will likely be no significant difference between the two sets of data. This process involves the study of a group of sales with a detrimental condition, which are then compared to a group of otherwise similar sales without the detrimental condition."*[8]

As an approved method, paired sales analysis can be utilized to extract the effect of a single characteristic on value. By definition, paired data analysis is "a quantitative technique used to identify and measure adjustments to the sale prices or rents of comparable properties; to apply this technique, sales or rental data on nearly identical properties is analyzed to isolate a single characteristic's effect on value or rent."[9] The text further describes that this method is theoretically sound when an abundance of market data, or sale transactions, is available for analysis.

Where data is available, CohnReznick has also prepared "Before and After" analyses or a Repeat Sale Analysis,[10] to determine if a detrimental impact has occurred.

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[8] Bell, Randall, PhD, MAI. *Real Estate Damages. Third ed.* Chicago, IL: Appraisal Institute, 2016. (Page 33)
[9] *The Appraisal of Real Estate 14th Edition.* Chicago, IL: Appraisal Institute, 2013.
[10] Another type of paired sales analysis involves studying the sale and subsequent resale of the same property. This method is used to determine the influence of time on market values or to determine the impact of a detrimental condition by comparing values before and after the discovery of the condition.
Bell, Randall, PhD, MAI. *Real Estate Damages. Third ed.* Chicago, IL: Appraisal Institute, 2016. (Page 35)

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## SCOPE OF WORK

The scope of work utilized to test the hypothesis stated on the prior page is as follows:

1. Review published studies, assess credibility, and validity of conclusions;
2. Prepare paired sale analyses for existing solar farms as follows:
    2.1. Identify existing solar farms comparable to the proposed project to analyze;
    2.2. Define Test Area Sales and Control Areas Sales;
    2.3. Collect market data (sale transactions) for both Test Area and Control Area Sales;
    2.4. Analyze and confirm sales, including omission of sales that are not reflective of market value;
    2.5. Prepare comparative analysis of Test Area and Control Area sales, adjusting for market conditions;
    2.6. Interpret calculations; and
3. Conduct interviews with real estate professionals and local real estate assessors who have evaluated real property adjacent to existing solar farms.

It should be noted that our impact report data and methodology have been previously reviewed by our peer in the field – Kirkland Appraisals, LLC – as well as by the Solar Energy Industries Association (SEIA).

The following bullet points summarize important elements to consider in our scope of work:

- Due to the limited number of community solar projects that qualified for study in the state of Illinois, we have incorporated some regional utility scale projects and community solar projects in other states.

- Test Area Sales consists of sales that are adjacent to an existing solar facility. Ownership and sales history for each adjoining property to an existing solar farm through the effective date of this report is maintained within our workfile. Adjoining properties with no sales data or that sold prior to the announcement of the solar farm were excluded from further analysis.

- Control Area Sales are generally located in the same market area, although varies based on the general location of the existing solar farm under analysis. In rural areas, sales are identified first within the township, and expands radially outward through the county until a reliable set of data points is obtained.

- Control Area Sales are generally between 12 and 18 months before or after the date of the Test Area Sale(s), and are comparable in physical characteristics such as age, condition, style, and size.

- Sales of properties that sold in a non-arm's length transaction (such as a transaction between related parties, bank-owned transaction, or between adjacent owners) were excluded from analysis as these are not considered to be reflective of market value, as defined earlier in this report. The sales that remained after exclusions were considered for a paired sale analysis.

- The methodology employed in this report for paired sale analysis does not rely on multiple subjective adjustments that are typical in many appraisals and single-paired sales analyses. Rather, the

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methodology remains objective, and the only adjustment required is for market conditions;[11] the analysis relies upon market conditions trends tracked by credible agencies such as the Federal Housing Finance Agency ("FHFA"), who maintains a House Price Index ("HPI")[12] for macro and micro regions in the United States. A market conditions adjustment is a variable that affects all properties similarly and can be adjusted for in an objective manner.

- To make direct comparisons, the sale price of the Control Area Sales was adjusted for market conditions to a common date. In this analysis, the common date is the date of the Test Area Sale(s). After adjustment, any measurable difference between the sale prices would be indicative of a possible price impact by the solar facility.

- If there is more than one Test Area Sale to evaluate, the sales are grouped if they exhibit similar transactional and physical characteristics; otherwise, they are evaluated separately with their own respective Control Area Sale groups.

[11] Adjusting for market conditions is necessary as described in The Appraisal of Real Estate 14th Edition as follows: "Comparable sales that occurred under market conditions different from those applicable to the subject on the effective date of appraisal require adjustment for any differences that affect their values. An adjustment for market conditions is made if general property values have increased or decreased since the transaction dates."

[12] The FHFA HPI is a weighted, repeat-sales index, meaning that it measures average price changes in repeat sales or refinancings on the same properties. This information is obtained by reviewing repeat mortgage transactions on single-family properties whose mortgages have been purchased or securitized by Fannie Mae or Freddie Mac since January 1975. The FHFA HPI serves as a timely, accurate indicator of house price trends at various geographic levels. Because of the breadth of the sample, it provides more information than is available in other house price indexes.

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## TECHNIQUE 1: REVIEW OF PUBLISHED STUDIES

The following is a discussion of various studies that consider the impact of solar farms on surrounding property values. The studies range from quantitative analysis to survey-based formal research to less formal analyses.

### ACADEMIC REPORTS

There have been three academic reports that attempt to quantify the effect on property values due to proximity to solar.

i. The first report is a study completed by **The University of Texas at Austin**, published in May 2018.[13] The portion of the study focusing on property impact was an Opinion Survey of Assessors with no sales data or evidence included in the survey. The opinion survey was sent to 400 accessors nationwide and received only 37 responses. Of those 37 assessors, only 18 had assessed a home near a utility-scale solar installation, the remainder had not. Of the 18 assessors with experience in valuing homes near solar farms, 17 had not found any impact on home values near solar. Those are the actual facts in the study. A small number of those assessor respondents hypothetically surmised an impact, but none had evidence to support such statements.

   The paper admits that there is no actual sales data analyzed, and further denotes its own areas of weakness, including "This study did not differentiate between ground-mounted and rooftop installations." The author states on the last line of page 22: ***"Finally, to shift from perceived to actual property value impacts, future research can conduct analyses on home sales data to collect empirical evidence of actual property value impacts."***

   The paper concludes with a suggestion that a statistic hedonic regression model may better identify impacts. It should be noted that the type of statistical analysis that the author states is required to determine "*actual property value impacts*' was completed two years later by the following Academic Studies.

ii. The second report is a study prepared by a team at the **University of Rhode Island**, published in September 2020, "*Property Value Impacts of Commercial-Scale Solar Energy in Massachusetts and Rhode Island.*"[14] The study utilized a hedonic pricing model, or multiple regression analysis, to quantify the effect of proximity on property values due to solar by studying existing solar installations in Massachusetts and Rhode Island. The study evaluated 208 solar facilities, 71,373 housing sales occurring within one-mile of the solar facilities (Test Group), and 343,921 sales between one-to-three miles (Control Group). Because it is a hedonic regression model, it allowed them to isolate specific

[13] Al-Hamoodah, Leila, et al. An Exploration of Property-Value Impacts Near Utility-Scale Solar Installations. Policy Research Project (PRP), LBJ School of Public Affairs, The University of Texas at Austin, May 2018, emp.lbl.gov/sites/default/files/property-value_impacts_near_utility-scale_solar_installations.pdf.

[14] Gaur, V. and C. Lang. (2020). Property Value Impacts of Commercial-Scale Solar Energy in Massachusetts and Rhode Island. Submitted to University of Rhode Island Cooperative Extension on September 29, 2020. Accessed at https://web.uri.edu/coopext/valuing-sitingoptions-for-commercial-scale-solar-energy-in-rhode-island/.

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variables that could impact value, including isolating rural and non-rural locations. The study defines "**Rural**," as an area having a "population density of 850 people per square mile or fewer."

The study provides data which found no negative impact to residential homes near solar arrays in rural areas: "these results suggest that [the Test Area] in rural areas ***is effectively zero*** (a statistically insignificant 0.1%), and that the negative externalities of solar arrays are only occurring in non-rural areas."[15] Further, the study tested to determine if the size of the installation impacted values, and found no evidence of differential property values impacts by the solar installation's size.

Thus, not only are there no impacts to homes in similar areas as the proposed Project, but any differences in the size of a solar farm are similarly not demonstrating an impact.

iii. The third report is a published study prepared by Dr. Nino Abashidze, School of Economics, Georgia Institute of Technology, dated October 20, 2020, entitled "*Utility Scale Solar Farms and Agricultural Land Values*." Abashidze examined 451 solar farms in North Carolina. "Across many samples and specifications, we find ***no direct negative or positive spillover effect of a solar farm construction on nearby agricultural land values.*** Although there are no direct effects of solar farms on nearby agricultural land values, we do find evidence that suggests construction of a solar farm may create a small, positive, option-value for land owners that is capitalized into land prices. Specifically, after construction of a nearby solar farm, we find that agricultural land that is also located near transmission infrastructure may increase modestly in value."

iv. On March 1, 2023, an article was prepared by the Energy Analysis and Environmental Impacts Division, Lawrence Berkeley National Lab, Berkeley, CA, which measured 1.8 million residential transactions around solar facilities greater than 1 MW in the states of CA, CT, MA, MN, NC and NJ. We are still reviewing this article although it does note that for the overwhelming majority of the transactions (in the states of CA, CT and MA), no impact was measured near large-scale photo-voltaic facilities or LSPVs. We expect to have additional opinions regarding the merits and conclusions of this study in the coming weeks after the date of this report.

## VALUATION EXPERT REPORTS

We have similarly considered property value impact studies prepared by other experts, which have also noted that the installation of utility-scale solar on a property has no measurable or consistent impact on adjoining property value. According to a report titled "Mapleton Solar Impact Study" from Kirkland Appraisals, LLC, conducted in Murfreesboro, North Carolina in September 2017, which studied 13 existing solar farms in the state, found that the solar farms had no impact on adjacent vacant residential, agricultural land, or residential homes. The paired sales data analysis in the report primarily consisted of low density residential and agricultural land uses and included one case where the solar farm adjoined to two dense subdivisions of homes.

[15] The University of Rhode Island study's conclusion that there may be an impact to non-rural communities is surmised is that "land is abundant in rural areas, so the development of some land into solar does little to impact scarcity, whereas in non-rural areas it makes a noticeable impact.

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Donald Fisher, ARA who has served six years as Chair of the American Society of Farm Managers and Rural Appraisers, and has prepared several market studies examining the impact of solar on residential values was quoted in a press release dated February 15, 2021 stating, "Most of the locations were in either suburban or rural areas, and all of these studies found either a neutral impact or, ironically, a positive impact, where values on properties after the installation of solar farms went up higher than time trends."

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## REAL ESTATE ASSESSOR SOLAR IMPACT REPORTS

The Chisago County (Minnesota) Assessor's Office conducted their own study on property prices adjacent to and in the close vicinity of the North Star solar farm in Chisago County, Minnesota. At the November 2017 Chisago County Board meeting, John Keefe, the Chisago County Assessor, presented data from his study. He concluded that the North Star solar farm had, "no adverse impact" on property values. His study encompassed 15 parcels that sold and were adjacent or in the close vicinity to the solar farm between January 2016 and October 2017; the control group used for comparison comprised of over 700 sales within the county. Almost all of the [Test Area] properties sold were at a price above the assessed value. He further stated that, "It seems conclusive that valuation has not suffered."[16]

Furthermore, Grant County, Kentucky Property Value Administrator, Elliott Anderson, stated that Duke Energy built a solar farm near Crittenden, adjacent to existing homes on Claiborne Drive in December 2017. At the time of the interview, there have been nine arm's length homes sales on that street since the solar farm commenced operations. Each of those nine homes sold higher than its assessed value, and one over 32 percent higher. At the time, Anderson noted that several more lots were for sale by the developer and four more homes were currently under construction. Anderson said that *the solar farm had no impact either on adjoining home values or on marketability or desirability of those homes adjacent to the solar farm.*

## CONCLUSION

These published studies and other valuation expert opinions conclude that there is no impact to property adjacent to established solar farms. These conclusions have been confirmed by academic studies utilizing large sales databases and regression analysis investigating this uses' potential impact on property values. Further, the conclusion has been confirmed by county assessors who have also investigated this adjacent land use' potential impact on property values.

[16] Chisago County Press: County Board Real Estate Update Shows No "Solar Effects" (11/03/2017)

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## TECHNIQUE 2: PAIRED SALE ANALYSIS

### SOLAR FARM 1: DTE LAPEER SOLAR PROJECT, LAPEER, MICHIGAN

**Coordinates:** Latitude 43.0368219316, Longitude -83.3369986251

**PINs:** L20-95-705-050-00, L20-98-008-003-00

**Total Land Size:** ±365 Acres

**Date Project Announced:** 2016

**Date Project Completed:** May 2017

**Output:** 48.28 MW AC



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**The Surrounding Area:** The DTE Lapeer solar farm is located just south of the City of Lapeer, in Lapeer County, Michigan and is a joint project between the City of Lapeer and DTE Electric Company. The solar farm was developed with Inovateus Solar MI, LLC to meet Michigan renewable energy standards. The solar farm features over 200,000 panels, a power output of 48.28 MW AC, and produces enough energy to power 14,000 homes. The Lapeer solar project was developed in two phases: the Demille Solar installation and the Turrill Solar installation. For purposes of our study, taken together, both installations are considered one solar farm.




*DTE's Lapeer Solar Projects Demille and Turrill Solar installations*

Lapeer is considered to be in the Tri-Cities area of central Michigan and is approximately 21 miles east of the City of Flint. Interstate-69 serves Lapeer and runs east-west just south of the solar farm. The two phases of the solar installation are on the east and west sides of Michigan State Route 24 from each other.

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**The Immediate Area:** Land uses surrounding the Demille installation include a correctional facility and industrial uses to the west, buffered by a mature stand of trees, a retail center to the northeast, other commercial uses to the east along MI-24/South Lapeer Road, and residential homes to the southeast. Interstate-69 runs south of the Demille solar installation.

The Turrill installation is surrounded to the north by a residential subdivision, to the north and east by industrial uses, to the south by vacant land and residential homes, and to the west by light commercial and professional uses along MI-24/South Lapeer Road. Hunter's Creek divides two sets of solar arrays in the Turrill installation.

The Demille installation adjoins Interstate-69 to the South; while a residential subdivision adjoins the solar farm to the east. To the northeast corner of the solar panels is a senior living facility, Stonegate Health Campus, developed before the solar facility.

**Real Estate Tax Information:**

Prior to the development of the solar farm, the land under the Demille and Turrill solar installations were municipal-owned and were not subject to property tax. After development, in 2017, the land became taxable and taxes were $82,889 total, as shown below.

| PIN | Acres | 2016 Taxes Paid | 2017 Taxes Paid | Tax Increase | 2016 Assessed Value | 2017 Assessed Value | Value Increase |
|---|---|---|---|---|---|---|---|
| **Lapeer County, MI** | | | | | | | |
| L20-98-008-003-00* | 110.84 | $ - | $ 34,294 | N/A | $ - | $ 726,700 | N/A |
| L20-95-705-050-00* | 254.84 | $ - | $ 48,595 | N/A | $ - | $ 1,029,750 | N/A |
| **TOTAL** | **365.68** | **$ -** | **$ 82,889** | **N/A** | **$ -** | **$ 1,756,450** | **N/A** |

* Prior to development as a solar farm, the parcels were municpal property without a taxable value.

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## PAIRED SALE ANALYSIS

The maps, below, and on the following pages display properties adjoining the solar sites that are numbered in red for subsequent analysis.

### Demille Solar Farm




*DTE Lapeer Solar Projects - Demille Adjoining Properties*

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*DTE Lapeer Solar Projects - Demille Adjoining Properties*

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## Turrill Solar Farm




*DTE Lapeer Solar Projects - Turrill Adjoining Properties*

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*DTE Lapeer Solar Projects - Turrill Adjoining Properties*

In reviewing Adjoining Properties to study in a Paired Sale Analysis, several properties and sales were considered but eliminated from further consideration as discussed below.

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We identified eight Adjoining Properties that sold since the solar farm started operations in May of 2017: Adjoining Properties 3, 4, 7, 9, 10, and 16 for the Demille Solar Farm, and Adjoining Properties 3 and 4 for the Turrill Solar Farm. Of these properties, three were considered atypical for the area.

Adjoining Property 7 adjacent to the Demille Solar farm is a split-level home with a finished walk out basement with a pool. The typical home in the area has a traditional basement and pools are atypical. The unusual nature of this sale was confirmed with the selling broker, Renee Voss (see comments below). We note that this home sold twice after the construction of the solar farm, once in September 2018 and again in August 2019. The appreciate rate between the two sale dates are analyzed further later in this section.

Adjoining Property 16 just south of the Demille Solar Farm is a 10.1-acre lot that is buffered by trees. The home is atypical for the area, as most homes are situated on lots between 1-acre and 1.5-acres in size and were built before 1980; this home was built in 2008. We interviewed the broker Josh Holbrook (see comments below) who confirmed the atypical nature of this property.

Adjoining Property 3, just west of the Turrill Solar Farm, was a ranch home with 1,348 square feet on a lot that was just over one acre. Comparables for homes of this size, type, and lot size were not available in the immediate market area. It should be noted that the price per square foot for this home ($108.01) is significantly higher than median price per square foot of either data set we studied.

As a part of our research, we interviewed three local real estate brokers that sold homes adjacent to the Lapeer Solar farm. According to the brokers, there was no impact on the home prices or marketability due to the homes' proximity to the solar arrays.

*Renee Voss of Coldwell Banker*, selling broker of the raised ranch at 1138 Don Wayne Drive (Adjoining Property 7), which is adjacent to the Demille solar farm at the southeast corner, noted that there was no impact on this sale from the solar farm located to the rear. The home, which has a pool in the backyard, sold quickly with multiple offers, Voss stated.

*Josh Holbrook*, the selling broker of 1408 Turrill Road (known as Adjoining Property 16), located just south of the Demille Solar Farm, said the solar farm had no impact on the sale and that the community takes pride in the solar farm.

*Anne Pence of National Realty Centers*, the selling broker for 1126 Don Wayne Drive, a single-family home adjacent to the Demille solar farm (known as Test Area Sale 9), reported that "the solar farm did not have any effect on the sale of this home. The buyers did not care one bit about the solar field in the back yard. The fact is that you know no one is going to be behind you when they develop a solar farm in your back yard. And [sometimes the developer] put up trees to block the view. My in-laws also actually live at end of that street, even though they haven't sold or put their house on market, they don't mind the solar panels either. It's not an eyesore. And another house sold on that block, a raised ranch home, and it sold with no problems."



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Adjoining Properties 3, 4, and 9 to the Demille Solar Farm were considered for a paired sales analysis, and we analyzed these properties as single-family home uses in Group 1. The improvements on these properties are located between 275 to 305 feet to the nearest solar panel.

| Test Area Sales<br>Group 1 - Demille Solar | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Adj. Property # | Address | Median Sale Price | Median Site Size (AC) | Median Beds | Median Baths | Median Year Built | Median Square Feet | Median Sale Date | Median Price PSF |
| 3, 4, 9 | 1174 Alice Dr, 1168 Alice Dr, 1126 Don Wayne Drive | $165,000 | 0.50 | 3 | 2.0 | 1973 | 1,672 | Jan-19 | $105.26 |

We analyzed six Control Area Sales of single-family homes with similar construction and use that were not located in close proximity to the solar farm, that sold within a reasonable time frame from the median sale date of the Test Area Sales in Group 1. The Control Area Sales for Group 1 are ranch homes with three bedrooms and one and a half to two bathrooms. We excluded sales that were bank-owned, and those between related parties.



Lapeer Solar-Demille - Group 1: Test Area Sales Map

Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeat-sales index measuring average price changes in repeat sales or

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refinancing of the same properties. The result of our analysis for DTE Lapeer Solar Project - Group 1-Demille is presented on the below.

| CohnReznick Paired Sale Analysis<br>DTE Lapeer Solar<br>Group 1 - Demille Solar | | |
|---|---|---|
| No. of Sales | Potentially Impacted by Solar Farm | Adjusted Median Price Per SF |
| Test Area Sales (3) | Adjoining solar farm | $105.26 |
| Control Area Sales (6) | No: Not adjoining solar farm | $99.64 |
| Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales | | 5.65% |

The days on market for the three Test Area Sales had a median of 29 days on market (ranging from 5 to 48 days), while the median days on market for the Control Area Sales was 21 days (ranging from 5 to 224 days), ***and we note no significant marketing time differential.***

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## GROUP 2 – DEMILLE

Adjoining Property 10 to the Demille Solar Farm was considered for a paired sales analysis, and we analyzed this property as a single-family home use in Group 2. The improvements on this property are located approximately 315 to the nearest solar panel.

| Test Area Sale<br>Group 2 - Demille Solar | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Adj. Property # | Address | Sale Price | Median Site Size (AC) | Bedrooms | Bathrooms | Year Built/Renovated | Square Feet | Other Features | Sale Date | Price PSF |
| 10 | 1120 Don Wayne Drive, Lapeer | $194,000 | 0.47 | 3 | 2.5 | 1976/2006 | 1,700 | Above Ground Pool, Two Car Garage | Nov-19 | $114.12 |

We analyzed five Control Area Sales of single-family homes with similar construction and use that were not located in close proximity to the solar farm, that sold within a reasonable time frame from the sale date of the Test Area Sale in Group 2. The Control Area Sales for Group 2 are similarly sized homes in Lapeer County with three to four bedrooms and one and half to three bathrooms, with an above-ground pool, and an attached garage. We excluded sales that were bank-owned, and those between related parties.



DTE Lapeer Solar-Demille - Group 2: Test Area Sales Map

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Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeat-sales index measuring average price changes in repeat sales or refinancing of the same properties. The result of our analysis for DTE Lapeer Solar Project - Group 2 is presented below.

| CohnReznick Paired Sale Analysis<br>DTE Lapeer Solar<br>Group 2 - Demille Solar | | |
|---|---|---|
| **No. of Sales** | **Potentially Impacted by Solar Farm** | **Adjusted Median Price Per SF** |
| Test Area Sales (1) | Adjoining solar farm | $114.12 |
| Control Area Sales (5) | No: Not adjoining solar farm | $113.01 |
| **Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales** | | **0.98%** |

The marketing time for the Test Area Sales was 90 days on market, while the median marketing time for the Control Area Sales was 34 days (ranging from 3 to 73 days). We note the Test Area Sale was initially listed above its market value, as there was a listing price decline after a month on the market. We also note that after the final decrease of the list price, the Test Area Sale home was only on the market 51 more days, which is within the range exhibited by the Control Area Sales.

## GROUP 3 – TURRILL

Adjoining Property 4 to the Turrill Solar Farm was analyzed separately since it is a two-story home on a larger lot than the Test Area Sale in Group 2. The home on Adjoining Property 4 is 290 feet from the property line to the nearest solar panel.

| Test Area Sale<br>Group 3 - Turrill Solar | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Adj. Property #** | **Address** | **Median Sale Price** | **Median Site Size (AC)** | **Median Beds** | **Median Baths** | **Median Year Built** | **Median Square Feet** | **Median Sale Date** | **Median Price PSF** |
| 4 | 1060 Cliff Drive | $200,500 | 1.30 | 4 | 2.5 | 1970 | 2,114 | Sep-18 | $94.84 |

We analyzed four single-family homes as Control Area Sales with similar construction that were not located in close proximity to the solar farm, that sold within a reasonable time frame from the sale date of Adjoining Property 4.

The Control Area Sales for Group 3 are two-story homes with two to four bedrooms and 2.5 to 3 bathrooms. We excluded sales that were bank-owned, and those between related parties.

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DTE Lapeer Solar-Turrill - Group 3: Test Area Sales Map

Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeat-sales index measuring average price changes in repeat sales or refinancing of the same properties. The result of our analysis for DTE Lapeer Solar Project-Turrill – Group 3 is presented on the following page.

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| CohnReznick Paired Sale Analysis<br>DTE Lapeer Solar<br>Group 3 - Turrill Solar | | |
|---|---|---|
| No. of Sales | Potentially Impacted by Solar Farm | Adjusted Median Price Per SF |
| Test Area Sale (1) | Adjoining solar farm | $94.84 |
| Control Area Sales (4) | No: Not adjoining solar farm | $96.32 |
| Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales | | -1.53% |

The marketing time for the Test Area Sale was two days on market, while the median days on market for the Control Area Sales was 35 days (ranging from 11 to 177 days), ***and we note no negative marketing time differential.***

***Noting no significant price differential in any of the three groups***, it does not appear that the DTE Lapeer Solar Farm had any negative impact on adjacent property values.

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## BEFORE & AFTER ANALYSIS – DEMILLE SOLAR PROJECT

We note two of the Test Area Sales in Group 1 of the Demille Solar project (Adjoining Properties 4 and 9), one sale in Group 2 of the Demille Solar farm (Adjoining Property 10), as well as Adjoining Property 7 have sold at least twice over the past 15 years. To determine if any of the rates of appreciation for these identified home sales were affected by the proximity to the Demille Solar farm, we prepared a Repeat-Sales Analysis on each identified adjoining property. First, we calculated the total appreciation between each sale of the same property, the number of months that elapsed between each sale, and determined the monthly appreciation rate. Then, we compared extracted appreciation rates reflected in the Federal Housing Finance Agency (FHFA) Home Price Index for Michigan's 48446 zip code (where the identified homes are located) over the same period. The index for zip codes is measured on a yearly basis and is presented below.

| 48446 Zip Code - Housing Price Index Change (Year over Year) Not Seasonally Adjusted | | | | | |
|---|---|---|---|---|---|
| Five-Digit ZIP Code | Year | Annual Change (%) | HPI | HPI with 1990 base | HPI with 2000 base |
| 48446 | 2004 | 2.02 | 438.38 | 206.29 | 111.35 |
| 48446 | 2005 | 3.68 | 454.53 | 213.89 | 115.45 |
| 48446 | 2006 | -1.76 | 446.53 | 210.12 | 113.42 |
| 48446 | 2007 | -6.35 | 418.17 | 196.78 | 106.22 |
| 48446 | 2008 | -8.37 | 383.17 | 180.31 | 97.33 |
| 48446 | 2009 | -10.62 | 342.49 | 161.16 | 86.99 |
| 48446 | 2010 | -8.94 | 311.86 | 146.75 | 79.21 |
| 48446 | 2011 | -6.89 | 290.37 | 136.64 | 73.75 |
| 48446 | 2012 | 0.29 | 291.22 | 137.04 | 73.97 |
| 48446 | 2013 | 7.27 | 312.39 | 147.00 | 79.35 |
| 48446 | 2014 | 7.10 | 334.56 | 157.43 | 84.98 |
| 48446 | 2015 | 5.10 | 351.63 | 165.47 | 89.32 |
| 48446 | 2016 | 6.10 | 373.08 | 175.56 | 94.76 |
| 48446 | 2017 | 6.74 | 398.23 | 187.39 | 101.15 |
| 48446 | 2018 | 5.96 | 421.96 | 198.56 | 107.18 |
| 48446 | 2019 | 5.74 | 446.17 | 209.95 | 113.33 |
| 48446 | 2020 | 4.99 | 468.43 | 220.43 | 118.98 |

We have presented the full repeat sales analysis on the following page.

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| Repeat Sales Analysis | | | | | | | | | | | 48446 Zip Code - FHFA House Price Index Change | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Property ID | Address | Land Area (Acres) | Total Finished Living Area (SF) | Most Recent Sale Date | Most Recent Sale Price | Prior Sale Date | Prior Sale Price | Total Appreciation | Months Elapsed Between Sales | Monthly Appreciation Rate | Index Level During Year of Most Recent Sale | Prior Sale Year Index Level | Total Appreciation | Monthly Appreciation Rate |
| 4 | 1168 Alice Drive | 0.46 | 1,672 | 10/9/2019 | $176,000 | 12/8/2017 | $144,000 | 22.22% | 22 | 0.92% | 446.17 | 398.23 | 12.04% | 0.52% |
| 4 | 1168 Alice Drive | 0.46 | 1,672 | 12/8/2017 | $144,000 | 10/1/1993 | $100,000 | 44.00% | 290 | 0.13% | 398.23 | 238.05 | 67.29% | 0.18% |
| 9 | 1126 Don Wayne Drive | 0.50 | 1,900 | 5/21/2018 | $160,000 | 12/21/2007 | $119,000 | 34.45% | 125 | 0.24% | 446.17 | 418.17 | 6.70% | 0.05% |
| 10 | 1120 Don Wayne Drive | 0.47 | 1,700 | 11/8/2019 | $194,000 | 10/15/2014 | $173,200 | 12.01% | 61 | 0.19% | 446.17 | 334.56 | 33.36% | 0.47% |
| 7 | 1138 Don Wayne Drive | 0.47 | 2,128 | 9/7/2018 | $179,900 | 8/22/2014 | $148,500 | 21.14% | 49 | 0.40% | 446.17 | 334.56 | 33.36% | 0.60% |
| 7 | 1138 Don Wayne Drive | 0.47 | 2,128 | 8/28/2019 | $191,000 | 9/7/2018 | $179,900 | 6.17% | 12 | 0.51% | 446.17 | 446.17 | 0.00% | 0.00% |
| | *Median - Test Area Sales* | *0.47* | *1,800* | | | | | | | *0.32%* | | | | *0.33%* |
| | *Median - Before/After* | *0.49* | *2,019* | | | | | | | *0.21%* | | | | *0.11%* |

## Conclusion

When compared to the FHFA home price index for the local zip code, the median monthly appreciation rate of the sales of properties adjoining the Demille Solar Farm that sold before construction of the solar farm and again after construction of the solar farm outperformed the median for the zip code, as depicted in the far-right column in the table above (and highlighted in orange). Additionally, the extracted appreciation rate for the resales of Adjoining Properties 4 and 7, that sold twice after the solar farm was constructed, exhibited higher rates of appreciation than the Home Price Index for the zip code (highlighted in white). As such, *we have concluded that there does not appear to be a consistent detrimental impact on the value of properties adjacent to the DTE Lapeer-Demille Solar Farm.*

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## SOLAR FARM 2: GRAND RIDGE SOLAR FARM, LASALLE COUNTY, ILLINOIS

**Coordinates:** Latitude 41.143421, Longitude -88.758340

**PINs:** 34-22-100-000, 34-22-101-000

**Total Land Size:** 158 acres

**Date Project Announced:** December 31, 2010

**Date Project Completed:** July 2012

**Output:** 20 MW AC

This solar farm is located in the southeast quadrant of the intersection of E. 21st and N. 15th Roads, near Streator, in LaSalle County, Illinois. The solar farm was developed by Invenergy and is part of a renewable energy center known as Grand Ridge. The Energy Center includes the 20 MW AC solar facility, a 210 MW wind farm, and a 36 MW advanced-energy storage facility, all in one local vicinity. The solar site is located adjacent to the south and west of Invenergy's wind farm.

The solar facility consists of 20 individual 1-MW solar inverters and over 155,000 photovoltaic solar panels manufactured by General Electric.

**The Surrounding Area:** The Grand Ridge Solar Farm is situated just outside of the City of Streator, in Otter Creek Township, in LaSalle County, Illinois. The solar farm is located in a primarily rural part of Illinois, with the nearest interstate, Interstate-55, located approximately 14 miles southeast of the site.

**The Immediate Area:** Within a one-mile radius of the solar farm, surrounding uses mainly consist of agricultural land, with some single-family homes to the west. All of the adjacent land parcels to the solar farm are used for agricultural and/or residential purposes.

The solar site is surrounded by row crops to the north adjoining N. 15th Road. Row crops also adjoin the solar arrays to the east. Scrub shrubbery exists on the western border of the solar site, along E. 21st Road. On the west side of E. 21st Road is the 28-acre private Sandy Ford Sportsmans Club that includes a 12-acre fishing lake. The private Lazy Acres Fishing Club adjoins the solar site to the south and is surrounded by mature trees.

**Real Estate Tax Information:** Prior to development of the solar farm, in 2011, the owner of this 158-acre site paid real estate taxes of $3,000 annually. In the year following the solar farm development, 2012, real estate taxes increased to approximately $240,000, a 7,791 percent increase in tax revenue for the site.

| PIN | Acres | 2011 Taxes Paid | 2012 Taxes Paid | Tax Increase | 2011 Assessed Value | 2012 Assessed Value | Value Increase |
|---|---|---|---|---|---|---|---|
| **LaSalle County, IL** | | | | | | | |
| 34-22-100-000 | 78.99 | $ 1,580 | $ 120,064 | 7501% | $ 23,830 | $ 1,812,357 | 7505% |
| 34-22-101-000 | 78.80 | $ 1,457 | $ 119,539 | 8106% | $ 21,975 | $ 1,804,433 | 8111% |
| **TOTAL** | **157.79** | **$ 3,036** | **$ 239,602** | **7791%** | **$ 45,805** | **$ 3,616,790** | **7796%** |

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The map below displays the parcels in the solar farm site (outlined in red). Properties adjoining the solar parcels are numbered for subsequent analysis.




Grand Ridge Solar - Adjoining Properties

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The surrounding area is primarily populated with agricultural uses. Some of these agricultural parcels contain homesteads on the site and others are fully unimproved.

Adjoining Properties 1, 3, 5, 6, 7, 13, and 14 have no sales data, therefore, those properties djoining Properties have been excluded from further analysis.

Recall, the solar farm was announced on December 31, 2010 and began operations in July 2012. Adjoining Properties 8 and 9 were sold in 1997 and 1996, respectively. These sales did not occur within a reasonable time period prior to announcement/completion. Therefore, Adjoining Properties 8 and 9 were excluded from further analysis.

Adjoining Property 4 sold in March 2011 while construction was ongoing. However, we have not considered this property for a paired sales analysis because the impact of being proximate to the solar farm could not be differentiated from the impact of the construction. Therefore, Adjoining Property 4 was excluded from further analysis.

Adjoining Property 2 transferred in September of 2018 with no consideration amount on a Trustee's deed from Gemini Farms LLC to the Bedeker Family Gift Trust. John and Susan Bedeker are owners of the Adjoining Property 1. This is not considered an arm's length transaction, therefore, Adjoining Property 2 was excluded from further analysis.

Adjoining Properties 11 and 12 were initially one parcel of 37.07 acres. Adjoining Property 12 sold in October 2016, which is a reasonable time period after completion of the solar farm. When Adjoining Property 12 was sold, the parcel was split into the two-acre homesite now known as Adjoining Propeprty 12, and the 35.07 acre farm, that was retained by the seller. Therefore, we have excluded Adjoining Property 11 and only considered Adjoining Property 12 (Test Area Sale) for paired sales analysis.

## PAIRED SALES ANALYSIS

We have considered only one type of paired sales analysis, we have compared sales of similar properties not proximate to the solar farm (Control Area Sales) to the sales of the adjoining property (Test Area Sale), after the completion of the solar farm project.

Adjoining Property 12 (Test Area Sale) was considered for a paired sales analysis, and we analyzed this property as a single-family home use, a 2,328 square foot home located on a 2.0- acre parcel that sold in October 2016. This parcel is approximately 366 feet from the closest solar panel, and the improvements are approximately 479 feet from the closest solar panel. The table on the following page outlines the other important characteristics of Adjoining Property 12.

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| Grand Ridge Solar Farm<br>Test Area Sale - Adjoining Property 12 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Property # | Address | Sale Price | Beds | Baths | Year Built | Home Size (SF) | Improvements | Site Size (AC) | Sale Price/SF | Sale Date |
| Adjoining Property 12 | 2098 N 15th Rd, Streator, IL | $186,000 | 3 | 4.0 | 1997 | 2,328 | Single Family Home and Garage and Farm Acreage | 2.0 | $79.90 | Oct-16 |

We have found five Control Area Sales using data from the Northern Illinois Multiple Listing Service (MLS) and verified these sales through county records, conversations with brokers, and the County Assessor's office. We excluded sales that were not arm's length, such as REO sales or those between related parties. We have excluded any home sites under one acre and included only sales with a similar quantity of bedrooms, bathrooms, and living area. The Control Area Sales are comparable in most physical characteristics and bracket Adjoining Property 12 reasonably.




*Grand Ridge Solar: Test Area Sale Map*

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It is important to note that the Control Area Sales are not adjoining to any solar farm, nor do they have a view of one from the property. Therefore, neither the announcement nor the completion of the solar farm use could have impacted the sales price of these properties. It is informative to note that the average marketing time (from list date to closing date) for Control Area Sales of 171 days is consistent with the marketing time for the Test Area Sale which was on the market for 169 days. This is an indication that the marketability of the Test Area Sale was not negatively influenced by proximity to the solar farm.

We analyzed the five Control Area Sales and adjusted for market conditions using a regression analysis to identity the appropriate monthly market conditions adjustment. The results of the paired sales analysis for the Grand Ridge Solar Farm are presented below.

| CohnReznick Paired Sales Anaysis<br>Grand Ridge Solar Farm<br>Adjoining Property 12 | | |
|---|---|---|
| **No. of Sales** | **Potentially Impacted by Solar Farm** | **Adjusted Median Price Per SF** |
| Test Area Sale (1) | Yes: Adjoining solar farm | $79.90 |
| Control Area Sales (5) | No: Not adjoining solar farm | $74.35 |
| **Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales** | | 7.46% |

The unit sale price of the Test Area Sale was somewhat higher than the median adjusted unit sale price of the Control Area Sales.

We contacted the selling broker of the Test Area Sale home, Tina Sergenti with Coldwell Banker, who said that the proximity of the solar farm had no impact on the marketing time or selling price of the home. The Test Area Sale sold with 169 days on market (5 – 6 months) compared to the Control Area Sales, which sold between 10 471 days on market (0 and 16 months).

***Noting no negative price differential***, it does not appear that the Grand Ridge Solar Farm impacted the sales price of the Test Area Sale, Adjoining Property 12. This was confirmed by the real estate agent who marketed and sold this home.

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## SOLAR FARM 3: WOODLAND SOLAR FARM, ISLE OF WIGHT COUNTY, VIRGINIA

**Coordinates:** Latitude 36.890000, Longitude -76.611000

**PINs:** 41-02-004, 41-02-001, 41-02-001A, 41-02-005

**Total Land Size:** 211.12 acres

**Date Project Announced:** August 4, 2015

**Date Project Completed:** December 2016

**Output:** 19.0 MW AC




*Aerial imagery retrieved from Google Earth*

The Woodland Solar Farm is located in unincorporated Isle of Wight County, Virginia, and was developed by Dominion Virginia Power in 2016. This solar farm has a capacity of 19.0 Megawatts (MW) AC of power, which is enough to power 4,700 homes. The solar farm sits on 204 acres, part of Oliver Farms, a 1,000-acre site that was chosen for its flat land and proximity to power lines. The land under the solar arrays was previously farmed and

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used to grow broccoli, collards, peas, strawberries, and butter beans. The solar installation includes 79,648 solar panels and was one of the largest of its kind at the time of construction.

**The Surrounding Area:** Isle of Wight County is in the southeast part of Virginia and has shoreline along the James River on its eastern border. The county is predominantly rural and has two incorporated towns, Smithfield and Windsor. The Woodland Solar facility is approximately 27 miles northwest of Norfolk, Virginia, across the Elizabeth River and the Nansemond River. The solar site is also approximately 21 miles southwest of Newport News, Virginia. The town of Smithfield is approximately nine miles northeast of the solar facility and the town of Windsor is approximately 12 miles southwest. The solar facility is near the intersection of State Route 600 (Oliver Drive) and State Route 602 (Longview Drive).

**The Immediate Area:** Land uses surrounding the Woodland Solar facility include forests and agricultural land to the north, west, and south, and residential and farmland to the east.

Landscaping around the solar site consists of the naturally occurring vegetation and forests. It should be noted that the landowner that leases the land to the solar owner has agricultural buildings and other structures along Longview Drive and the nearest solar panels are approximately 220 feet from the property line.

**Real Estate Tax Information:** In 2015, prior to the property being assessed as a solar farm, the assessed value of the property was approximately $542,200 and ownership paid $4,609 in real estate taxes (see below). In 2016, the assessed value increased to $3,021,600 and the real estate tax increased to $27,844.

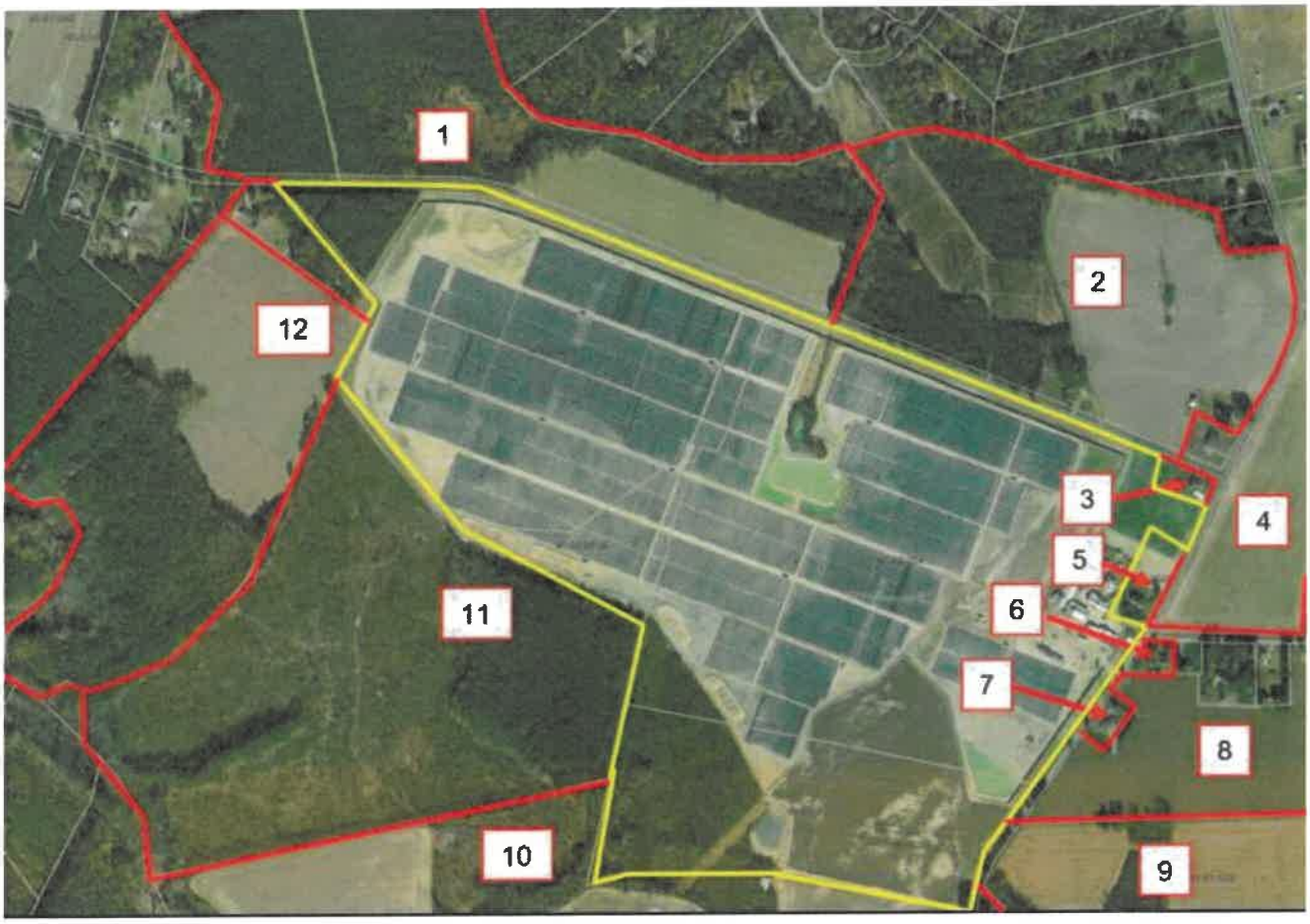
| PIN | Acres | 2015 Taxes Paid | 2016 Taxes Paid | Tax Increase | 2015 Assessed Value | 2016 Assessed Value | Value Increase |
|---|---|---|---|---|---|---|---|
| **Isle of Wight County, VA** | | | | | | | |
| 41-02-004 | 107.32 | $ 2,250 | $ 15,985 | 610% | $ 264,700 | $ 1,728,100 | 553% |
| 41-02-001 | 62.66 | $ 1,369 | $ 8,601 | 529% | $ 161,000 | $ 939,900 | 484% |
| 41-02-001A | 8.08 | $ 230 | $ 1,193 | 420% | $ 27,000 | $ 110,700 | 310% |
| 41-02-005 | 33.06 | $ 761 | $ 2,065 | 171% | $ 89,500 | $ 242,900 | 171% |
| **TOTAL** | **211.12** | **$ 4,609** | **$ 27,844** | **504%** | **$ 542,200** | **$ 3,021,600** | **457%** |

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## PAIRED SALE ANALYSIS:

The map below displays the Adjoining Properties to the solar farm (outlined in red). Properties adjoining the solar farm parcels are numbered for subsequent analysis.




*Woodland Solar - Adjoining Properties*

In reviewing Adjoining Properties to study in a Paired Sale Analysis, several properties and sales were considered but eliminated from further consideration as discussed below.

We identified three Adjoining Properties that sold since the solar farm started operations in December 2016: Adjoining Property 3, and two parcels included in Adjoining Property 5. The two properties that were considered part of Adjoining Property 5, sold between related parties, and were sales between family members of the land lessor for the solar site. These two sales were excluded from further analysis as they were not arms' length transactions.

Adjoining Property 3 was considered for a paired sales analysis and we analyzed this property as single-family home use. The improvements on this property are located approximately 600 feet from the nearest solar panel.

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| Woodland Solar Farm<br>Test Area Sale - Adjoining Property 3 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Adj. Property # | Address | Sale Price | Site Size (AC) | Beds | Baths | Year Built | Home Size GLA (SF) | Sale Date | Price PSF |
| 3 | 18146 Longview Drive | $175,000 | 1.00 | 3 | 1 | 1978 | 1,210 | Jun-16 | $144.63 |

We analyzed five Control Area Sales of single-family homes with similar construction and use that were not located in close proximity to the solar farm, that sold within a reasonable time frame from the sale date of the Test Area Sale. The Control Area Sales are one-story homes with three bedrooms and either one or two bathrooms. We excluded sales that were bank-owned, REO sales, and those between related parties.



*Woodland Solar – Test Area Sale Map*

The Control Area Sales were adjusted for market conditions using a regression analysis to identify the appropriate monthly market conditions adjustment. The result of our analysis for Woodland Solar Farm is presented on the following page.

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| CohnReznick Paired Sales Anaysis<br>Woodland Solar Farm<br>Adjoining Property 3 | | |
|---|---|---|
| No. of Sales | Potentially Impacted by Solar Farm | Adjusted Median Price Per SF |
| Test Area Sale (1) | Yes: Adjoining solar farm | $144.63 |
| Control Area Sales (5) | No: Not adjoining solar farm | $137.76 |
| Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales | | 4.99% |

The difference between the unit price of the Test Area Sale and the Adjusted Median Unit Price of the Control Area Sales is considered within the range for a typical market area.

***Noting no negative marketing time differential***, the Test Area Sale sold in 33 days (1-2 months), while the Control Area Sales sold between 17 and 37 days (0-2 months), with a median time on market of 28 days.

***Noting no negative price differential***, with the Test Area Sale having a higher unit sale price than the Control Area Sales, it does not appear that the Woodland Solar Farm had any negative impact on adjacent property values.

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## SOLAR FARM 4: DOMINION INDY SOLAR III, MARION COUNTY, INDIANA

**Coordinates:** Latitude 39°39'14.16"N, Longitude 86°15'35.06"W

**PIN:** 49-13-13-113-001.000-200

**Total Land Size:** 129 acres

**Date Project Announced:** August 2012

**Date Project Completed:** December 2013

**Output:** 8.6 MW AC (11.9 MW DC)

The Dominion Indy III solar farm was developed by Dominion Renewable Energy and became operable in December 2013. This solar farm has ground-mounted solar panels and has the capacity for 8.6 Megawatts (MW) AC of power. The panels are mounted in a fixed tilt fashion with 12 inverters.

**The Surrounding Area:** The Dominion Indy III solar farm is located in Decatur Township, in the southwest portion of Marion County, Indiana. The solar farm is approximately 10 miles southeast of the Indianapolis International Airport and approximately eight and a half miles from the center of Indianapolis.

**The Immediate Area:** The solar installation is on the southern side of West Southport Road. Adjoining parcels to the west, south, and east are agricultural in nature, actively farmed primarily with row crops and large areas of mature trees. There is one single family home on 4.78 acres of land at the northwest corner of the solar site, with frontage on West Southport Road, identified in our analysis as Adjoining Property 9.

To the north, across West Southport Road from the solar site, is the single-family residential subdivision known as Crossfield. Originally developed with over 81 acres of land by the Key Life Insurance Company, the one- and two-story homes in the subdivision were built between approximately 1998 and 2011.

All of the adjacent land parcels to the solar farm are used for agricultural or residential purposes.

The solar farm is surrounded by a chain link fence around all of the solar panels. Additionally, there are some natural shrubs and trees on all sides of the property; this vegetation was in place before the solar farm was developed.

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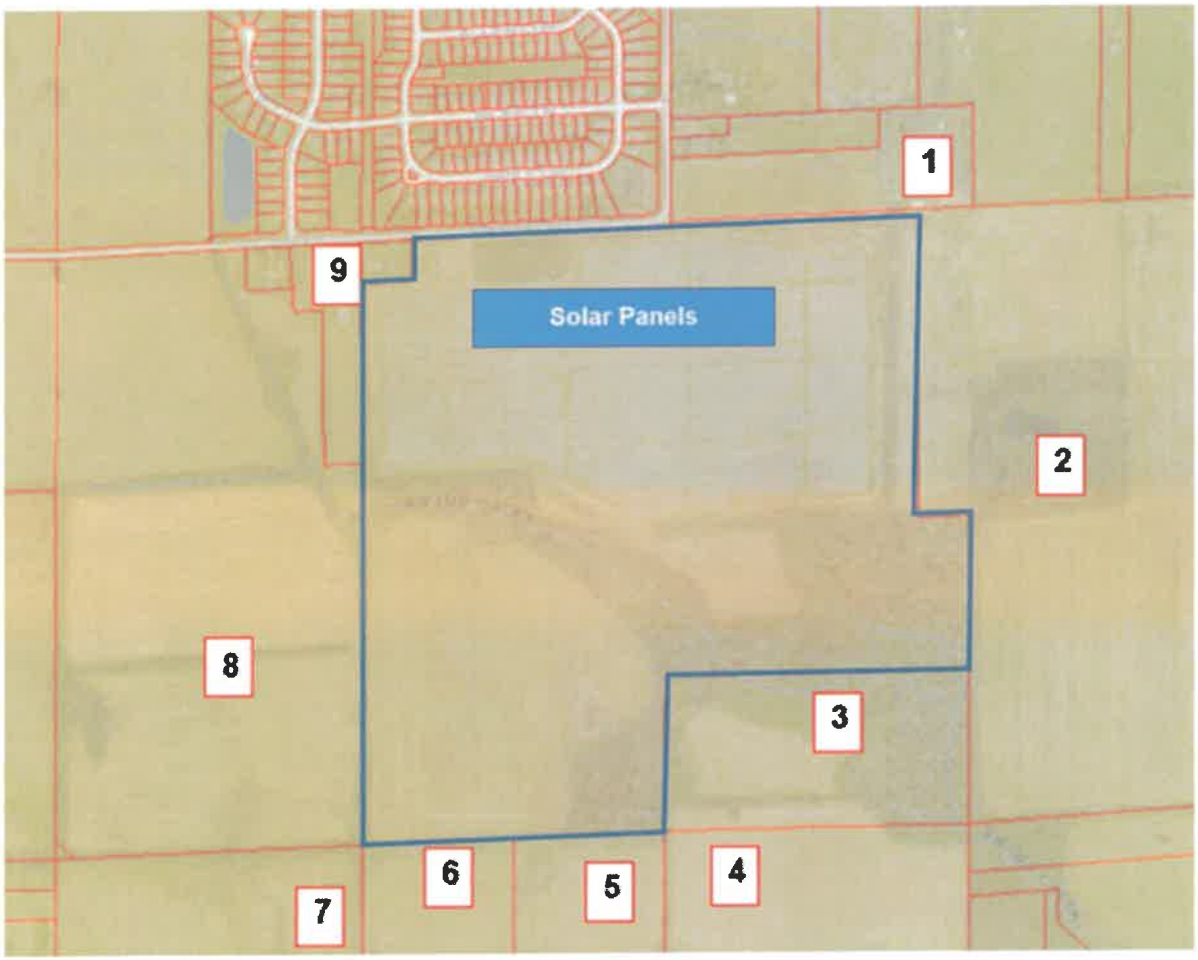
**Real Estate Tax Information:** Prior to development of the solar farm, in 2013, the owner of this 129-acre site paid real estate taxes of $1,788 annually. After development of the solar farm development, in 2015, real estate taxes increased to approximately $16,405, an 818 percent increase in tax revenue for the site.

| PIN | Acres |
|---|---|
| **Marion County, IN**<br>49-13-13-113-001.000-200 | 129.04 |
| **TOTAL** | **129.04** |

| 2013 Taxes Paid | 2015 Taxes Paid | Tax Increase |
|---|---|---|
| $ 1,788 | $ 16,405 | 818% |
| **$ 1,788** | **$ 16,405** | **818%** |

| 2013 Assessed Value | 2015 Assessed Value | Value Increase |
|---|---|---|
| $ 89,400 | $ 109,900 | 23% |
| **$ 89,400** | **$ 109,900** | **23%** |

The map below, and the maps on the following pages, display the parcels within the solar farm is located (outlined in blue). Properties adjoining this site are numbered for subsequent analysis.




Dominion Indy III - Adjoining Properties

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## PAIRED SALES ANALYSIS

We have considered two types of paired sales analysis with regards to the Dominion Indy III solar farm. The first compares sales of Adjoining Properties (Test Area Sales) to the solar farm after the completion of the solar farm site to similar properties not proximate to the solar farm (Control Area Sales). We utilized this type of paired sale analysis for all three groups of Adjoining Properties under study.

The second type of paired sale analysis is known as a Before and After analysis which compares sales of Adjoining Properties that occurred prior to the announcement of the solar farm with the sales of the same Adjoining Properties after the completion of the solar farm development. We were able to use home sale data from the Crossfield subdivision that is located to the north of the solar site, across West Southport Road, for this analysis.

### GROUP 1

Adjoining Property 2 is a vacant 86.96-acre agricultural parcel located to the east of the solar site. Adjoining Property 2 sold in October 2017 and was considered for a paired sale analysis, known as a Test Area Sale, in Group 1.

The property line of this unimproved parcel is approximately 166 feet from the closest solar panel. The following table outlines the other important characteristics of Adjoining Property 12.

| Test Area Sale<br>Group 1 - Agricultural Land | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Adjoining Property # | Address | Sale Price | Site Size (AC) | NCCPI Index | Wetlands | Floodplain | Sale Price/AC | Sale Date |
| Adjoining Property 2 | 5755 W Southport Rd, Indianapolis, IN | $738,584 | 89.96 | 63.4 | 1% | Zone X | $8,210 | Oct-17 |

**Soil Productivity and Land Value Trends and the NCCPI Productivity Index**

Crop yields have been the basis for establishing a soil productivity index, and are used by county assessors, farmers, and market participants in assessing agricultural land. While crop yields are an integral part in assessing soil qualities, it is not an appropriate metric to rely on because "yields fluctuate from year to year, and absolute yields mean little when comparing different crops. Productivity indices provide a single scale on which soils may be rated according to their suitability for several major crops under specified levels of management such as an average level."[1] The productivity index, therefore, not crop yields, is best suited for applications in land appraisal and land-use planning.

The United States Department of Agriculture's (USDA) National Resources Conservation Services (NRCS) developed and utilizes the National Commodity Crop Productivity Index (NCCPI) as a national soil interpreter and is used in the National Soil Information System (NASIS), but it is not intended to replace other crop

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production models developed by individual states.[17] The focus of the model is on identifying the best soils for the growth of commodity crops, as the best soils for the growth of these crops are generally the best soils for the growth of other crops.[18] The NCCPI model describes relative productivity ranking over a period of years and not for a single year where external influences such as extreme weather or change in management practices may have affected production. At the moment, the index only describes non-irrigated crops, and will later be expanded to include irrigated crops, rangeland, and forestland productivity.[19]

Yields are influenced by a variety of different factors including environmental traits and management inputs. Tracked climate and soil qualities have been proven by researchers to directly explain fluctuations in crop yields, especially those qualities that relate to moisture-holding capacity. Some states such as Illinois have developed a soil productivity model that considers these factors to describe "optimal" productivity of farmed land. Except for these factors, "inherent soil quality or inherent soil productivity varies little over time or from place to place for a specific soil (map unit component) identified by the National Cooperative Soil Survey (NCSS)."[20] The NRCS Web Soil Survey website has additional information on how the ratings are determined. The **State of Indiana** does not have its own crop production model and utilizes the NCCPI.

In analyzing agricultural land sales for Control Area Sales with similar characteristics to Adjoining Property 2, we have excluded any parcels with NCCPI soil indices less than 50.0 and greater than 85.0.

We identified and analyzed four Control Area Sales that were comparable in location, size, and use that were not located in close proximity to the solar farm. The Control Area Sales for Adjoining Property 2 are land tracts that were larger than 20 acres and utilized specifically as farmland. We excluded sales that were bank-owned, those between related parties, split transactions, and land with significant improvements.

The Control Area Sales that are included in this analysis sold within a reasonable time frame from the sale date of the Test Area Sale and are similar to the Test Area Sale in physical characteristics.

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[17] Agricultural land rental payments are typically tied to crop production of the leased agricultural land and is one of the primary reasons the NCCPI was developed, especially since the model needed to be consistent across political boundaries.
[18] Per the User Guide for the National Commodity Crop Productivity Index, the NCCPI uses natural relationships of soil, landscape and climate factors to model the response of commodity crops in soil map units. The present use of the land is not considered in the ratings.
[19] AgriData Inc. Docs: http://support.agridatainc.com/NationalCommodityCropProductivityIndex(NCCPI).ashx
[20] USDA NRCS's User Guide National Commodity Crop Productivity Index (NCCPI)

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Dominion Indy III - Group 1: Test Area Sale Map

The Control Area Sales were adjusted for market conditions using a regression and trend analysis to identify the appropriate monthly market condition adjustment. Using the agricultural land sale data published in the *Land Sales Bulletin,*[21] from January 2016 through December 2017, which includes reliable and credible data for analysis, we extracted a monthly rate of change of 0.50 percent.

The results of our analysis for Adjoining Property 2, in Group 1 are presented on the following page.

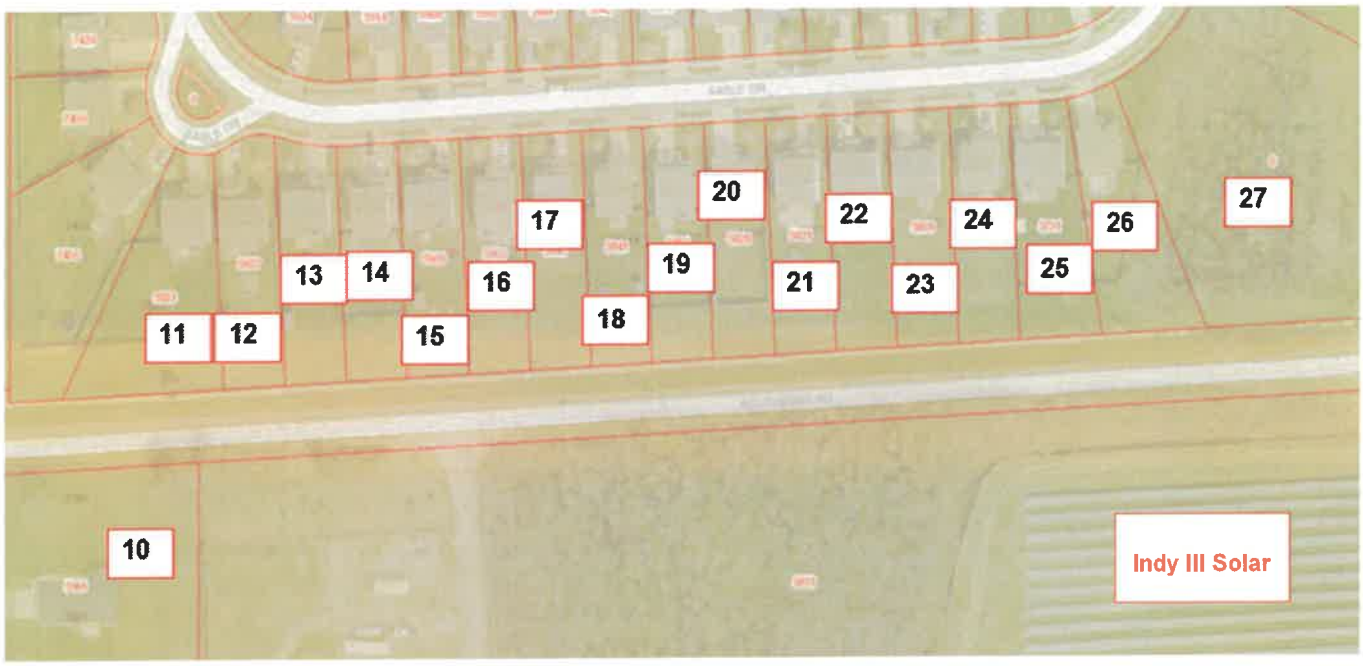
[21] https://www.landsalesbulletin.com/

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| CohnReznick Paired Sale Analysis<br>Dominion Indy III Solar<br>Group 1 - Agricultural Land | | |
|---|---|---|
| No. of Sales | Potentially Impacted by Solar Farm | Adjusted Median Price Per Acre |
| Test Area Sale (Adjoining Property 2) | Yes: Solar Farm was completed by the sale date | $8,210 |
| Control Area Sales (4) | No: Not adjoining solar farm | $8,091 |
| Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales | | 1.47% |

***Noting the relatively low price differential,*** in which the Test Area Sale was higher than the median for the Control Areas Sales, it does not appear that the Dominion Indy III solar farm had any negative impact on the adjoining agricultural property value.




Dominion Indy III Solar - Adjoining Properties

We idenitified a total of nine Adjoining Properties that sold after the develoment of the solar farm as single-family home uses. Adjoining Properties 11, 13, 14, 15, 18, 20, 22, 24 and 26 were analyzed in two paired sales analyses (Group 2 and Group 3). These nine properties were analyzed as single-family homes and they are located in the Crossfield subdivision, across West Southport Road from the solar site, as seen in the map above.

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It should be noted that Adjoining Properties 11 and 24 have sold more than once since the solar farm was constructed, and each sale is included in the analysis. Adjoining Property 11 sold first in December 2015 and later in July 2018, approximately two and a half years later. Adjoining Property 24 sold first in February 2014 and later in April 2019, approximately five years later. Our research indicated that these were arm's-length sales.

The nine Adjoining Properties that were included in our paired sales analysis were divided into two groups, based on the sale dates of the Test Area Sales.

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## GROUP 2

For Group 2 (sales in 2014 – 2016), we analyzed four Control Area Sales with similar location, square footages, lot sizes, and ages that sold within a reasonable time frame from the median sale date of the Group 2 Test Area Sales.

| Test Area Sales Group 2 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Adj. Property # | Address | Median Sale Price | Median Site Size (AC) | Median Beds | Median Baths | Median Year Built | Median Square Feet | Median Sale Date | Median Price PSF |
| 11, 20, 22, 24 | 5933 Sable Dr, 5829 Sable Dr, 5813 Sable Dr, 5737 Sable Dr | $129,375 | 0.23 | 4 | 2.0 | 2008 | 2,163 | Jul-15 | $60.61 |

The Test Area Sales in Group 2 are located between 230 feet and 404 feet from the house to the solar panels. The Control Area Sales for Group 2 are located beyond this area in other areas of the Crossfield Division and in other nearby subdivisions.




Dominion Indy III – Group 2: Test Area Sales

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## GROUP 3

For Group 3 (sales occurring in 2017 - 2019), we analyzed a set of seven Control Area Sales with similar locations, square footages, lot sizes, and ages that sold within a reasonable time frame from the median sale date of the Group 3 Test Area Sales.

| Dominion Indy III Solar Test Area Sales Group 3 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Adj. Property # | Address | Median Sale Price | Median Site Size (AC) | Median Beds | Median Baths | Median Year Built | Median Square Feet | Median Sale Date | Median Price PSF |
| 11, 13, 14, 15, 18, 24, 26 | 5933 Sable Dr, 5921 Sable Dr, 5915 Sable Dr, 5909 Sable Dr, 5841 Sable Dr, 5737 Sable Dr, 5731 Sable Dr | $169,900 | 0.23 | 3 | 2.5 | 2006 | 2,412 | Jul-18 | $72.15 |

The Test Area Sales in Group 3 are located between 227 feet and 419 feet from the house to the solar panels. The Control Area Sales are located beyond this area, in other areas of the Crossfield Division, and in other nearby subdivisions.



Dominion Indy III – Group 3: Test Area Sales

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Control Area Sales in Groups 2 and 3 were adjusted for market conditions using a regression analysis to identify the appropriate monthly market condition adjustment. The results of our study are presented below.

| CohnReznick Paired Sale Analysis<br>Dominion Indy III Solar<br>Group 2 | | |
|---|---|---|
| **No. of Sales** | **Potentially Impacted by Solar Farm** | **Adjusted Median Price Per SF** |
| Test Area Sales (4) | Adjoining solar farm | $60.61 |
| Control Area Sales (8) | No: Not adjoining solar farm | $57.84 |
| **Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales** | | **4.78%** |

| CohnReznick Paired Sale Analysis<br>Dominion Indy III Solar<br>Group 3 | | |
|---|---|---|
| **No. of Sales** | **Potentially Impacted by Solar Farm** | **Adjusted Median Price Per SF** |
| Test Area Sales (7) | Adjoining solar farm | $72.15 |
| Control Area Sales (11) | No: Not adjoining solar farm | $71.69 |
| **Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales** | | **0.65%** |

The Test Area Sales in Group 2 sold between 18 and 75 days on market (0-3 months), while the Control Area Sales in Group 2 sold between 2 and 649 days on market (0-23 months). The Test Area Sales in Group 3 sold between 3 and 75 days on market (0-3 months), while the Control Area Sales in Group 3 sold between 2 and 89 days on market (0-3 months).

***Noting the relatively low price differentials,*** it does not appear that the Dominion Indy III solar farm had any negative impact on adjoining residential property values.

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## BEFORE ANNOUNCEMENT AND AFTER CONSTRUCTION OF THE SOLAR FARM ANALYSIS

Due to the number of sales over time in the Crossfield subdivision, we were able to conduct an analysis on the prices of single-family homes before the solar farm announcement date in comparison to the prices of single-family homes after the construction of the Dominion Indy III solar farm. This analysis shows the appreciation rates of homes in the subdivision over the period before the solar farm was announced to after construction was complete. If there were a difference in the appreciation rates of homes within the Test Area (homes adjoining the solar farm) from the homes within the Control Areas (homes not adjoining the solar farm), we would expect to see it in the results of this analysis. We have provided our conclusions from the analysis below, and the following page displays an explanatory chart.

- The Before the Announcement of the solar farm period is from 2006 to July 2012. The After Construction of the solar farm period is from December 2013 to 2019.
- 25 Test Area Sales were sold from 2006 to 2019 and 46 Control Area Sales sold from 2008 to 2019.
    - The Test Area Sales are homes located adjoining the Dominion Indy III Solar Farm in the Crossfield subdivision.
    - The Control Area Sales are homes located in the remainder of the Crossfield subdivision, not adjoining the solar farm.
- In both the Test Area Sales (ORANGE) and Control Area Sales (BLUE) plotted on the chart on the following page, new construction homes sold through 2011, prior to announcement of the solar farm.
- The dotted lines are polynomial trend lines plotted by Microsoft Excel in order to illustrate and approximate the "average" trend of each set of data.
- After construction of the solar farm, in parallel with the improving economic climate (as depicted by the Red lines representing the Federal Housing Finance Agency's House Price Index for the East North Central region that includes Indiana), it appears that unit prices for both the Test Area Sales and the Control Area Sales appreciated at a similar rate over the period from 2013 to 2019.
- The economic climate improved in the period from 2013 to 2019, as shown by the Red line representing the Federal Housing Finance Agency's House Price Index for the East North Central region that includes Indiana. After construction of the solar farm, in parallel with the improving economic climate, it appears that unit prices for both the Test Area Sales and the Control Area Sales appreciated at a similar rate over the period from 2013 to 2019.

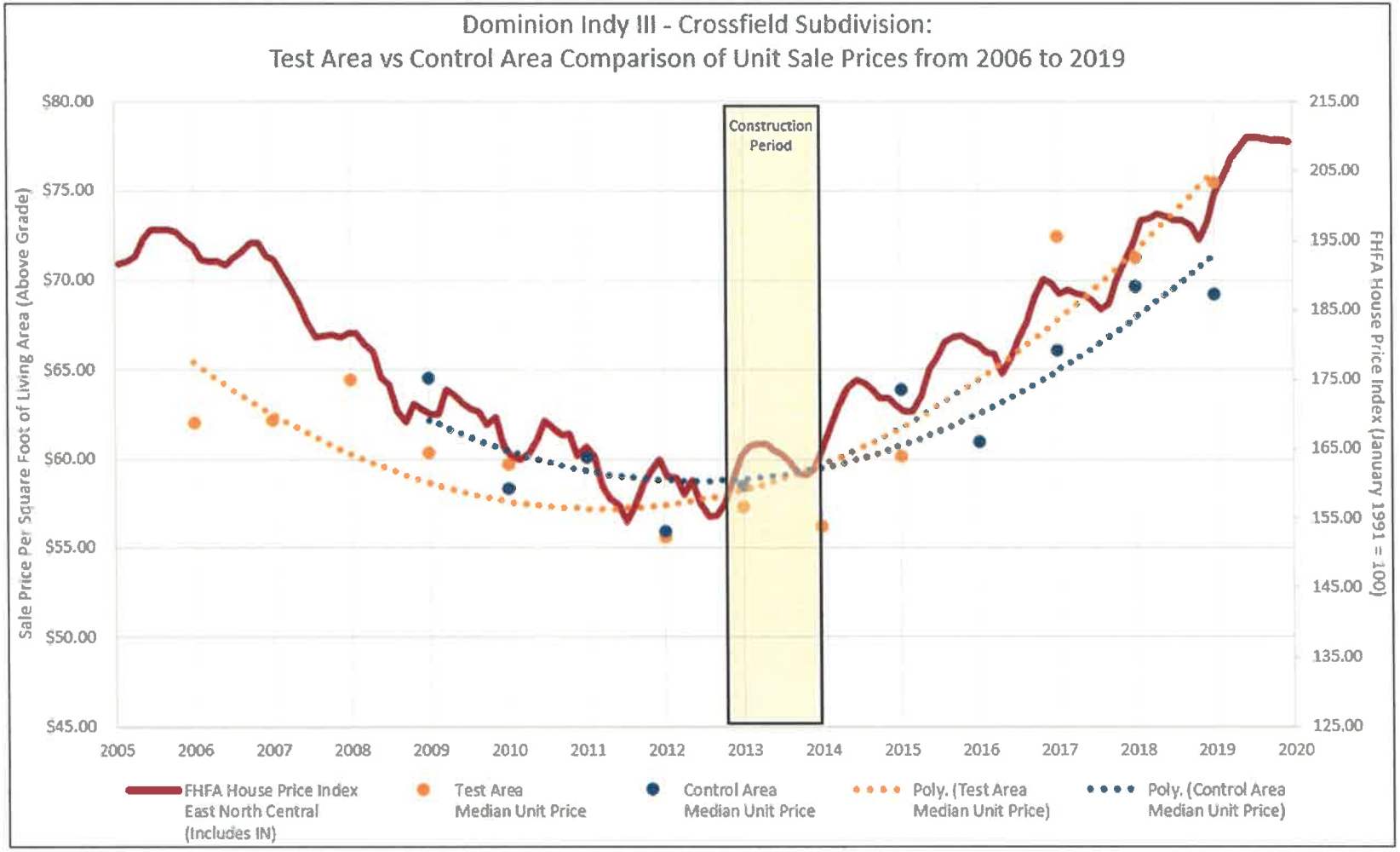
A difference in appreciation rates does not appear to exist between Test Area Sale homes versus the Control Area Sale homes.

Sale prices of single-family homes after the construction of the solar farm exhibit a similar appreciation trend as sales prior to the solar farm announcement. Overall, our findings indicate that there *is not a consistent and measurable difference* in prices that exists in association with homes proximate to the Dominion Indy III solar farm

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## ANALYSIS OF BEFORE ANNOUNCEMENT AND AFTER CONSTRUCTION OF THE DOMINION INDY III SOLAR FAR






Attachment 11, Page 59

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## SOLAR FARM 5: SUNFISH FARM SOLAR, WAKE COUNTY, NORTH CAROLINA

**Coordinates:** Latitude 35 33.457, Longitude 78 44.190

**PIN:** 675874971

**Total Land Size:** Approximately 49.6 acres

**Date Project Completed:** December 2015

**Output:** 5 MW AC




This Sunfish Farm solar facility is located in the southern portion of Wake County, North Carolina, approximately 16 miles south of Raleigh. The solar facility was placed into service in December 2015 and has a power generating capacity of 5 MW AC. The solar facility was developed by Cypress Creek Renewables, which has built several community-scale solar farms in North Carolina.

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**The Surrounding Area:** The Sunfish Farm solar facility is surrounding by single family homes, some of which are in subdivisions, as well as agricultural and forest land. The local area is accessible from Raleigh via Fayetteville Road (US Hwy 401) and Interstate 40. The Sunfish Farm solar farm is located southwest of the town of Fuquay-Varina, which has experienced considerable population growth over the past 10 years due to the area's proximity to Research Triangle Park (Raleigh, Durham, Chapel Hill).

**The Immediate Area:** The solar farm is buffered from residences and road frontages by trees and is surrounded by fencing. The solar farm is clearly visible from the roadways. Immediate land uses surrounding the solar farm include residential homes to the north, some residential homes (some that also contain commercial uses) to the west, agricultural land to the south, and agricultural land and residential homes to the east.

There is an 11.25-acre carve-out of land in the original, larger farmland parcel that was split from the parent parcel in 2014, as pictured below. Both the carved out parcel and the solar farm parcel are owned by an individual who leases the land for the solar farm use.



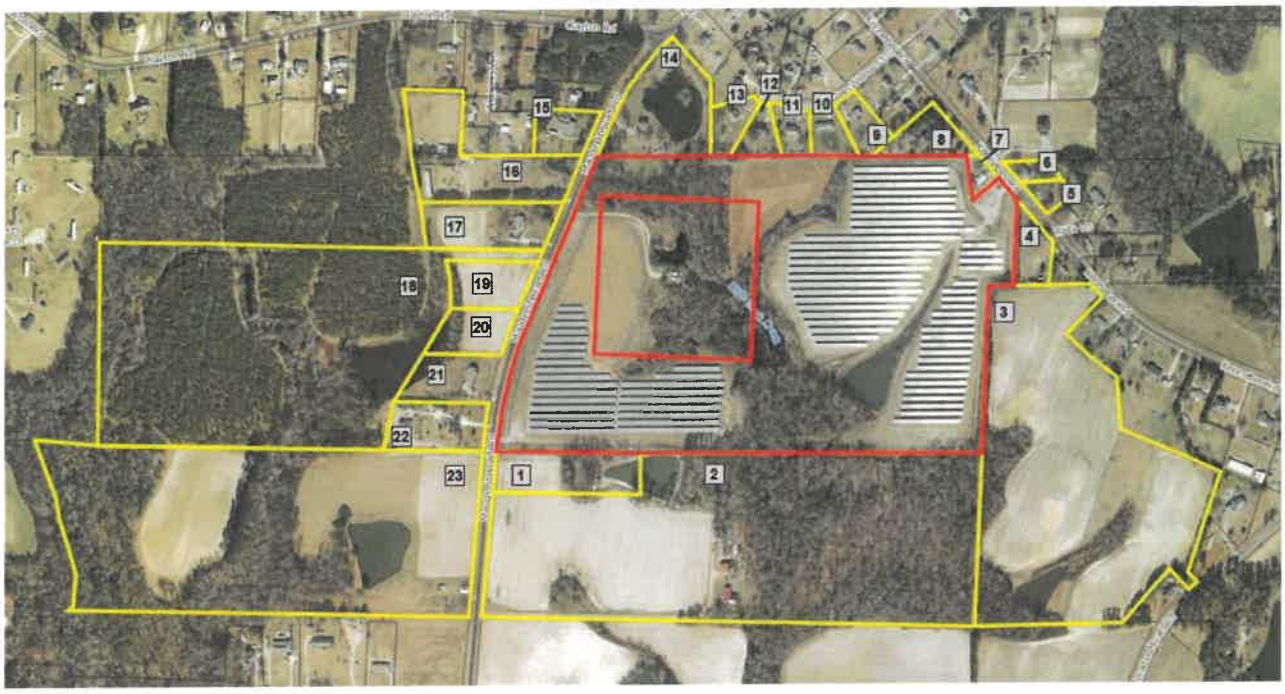
**Real Estate Tax Information:** Solar farms in North Carolina are assessed as personal property, separate from the land assessment. After the solar farm was placed into service, there was an increase of 180 percent in total assessed value, and 203 percent increase in total taxes paid.

| PIN | Acres | 2013 Taxes Paid (Per Acre) | 2016 Taxes Paid (Per Acre) | Tax Increase | 2013 Assessed Value (Per Acre) | 2016 Assessed Value (Per Acre) | Value Increase |
|---|---|---|---|---|---|---|---|
| **Wake County, NC** | | | | | | | |
| 675874971 (Post 2015 Split) | 49.60 | $ 119.52 | $ 105.33 | | $ 18,589 | $ 15,123 | |
| Personal Property Tax | | $ - | $ 256.81 | | $ - | $ 36,871 | |
| **TOTAL** | **49.60** | **$ 119.52** | **$ 362.14** | **203%** | **$ 18,588.83** | **$ 51,994.82** | **180%** |

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The map below displays the properties adjoining the solar arrays and are numbered for subsequent analysis (outlined in yellow).




Sunfish Farm Solar - Adjoining Properties

## PAIRED SALES ANALYSIS

We have considered only one type of paired sales analysis, comparing sales of properties not proximate to the solar farm (Control Area Sales) to the sales of adjoining properties (Test Area Sales) after the completion of the solar farm project. We were able to identify two Adjoining Properties to the Sunfish Farm solar facility that sold after the solar installation was placed into service (Adjoining Properties 10 and 15). These sales were analyzed in separate Test Area Sale groups based on home type (conventional single-family home and manufactured single-family home) and sale dates.

We collected Control Area Sale data from the Wake County Real Estate database which summarizes data directly from the Real Estate Assessor website for the county. We have also reviewed other public records and verified marketing information through online sources such as Zillow.com, Redfin.com, Realtor.com and Estately.com. We have verified these sales through county records, conversations with brokers, and the County Assessor's Office. We excluded sales that were not arm's length, such as REO sales or bank-owned properties, or those between related parties.

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## GROUP 1

Adjoining Property 10 (Test Area Sale 1) was considered for a paired sales analysis, and we analyzed this property as a single-family home use. The property is a single-story 1,470 square foot home located on a 0.79-acre lot that sold in September 2017. This property line is approximately 50 feet from the closest solar panel, and the improvements are approximately 200 feet from the closest solar panel. The following table outlines the other important characteristics of Adjoining Property 10.

| SUNFISH FARM SOLAR TEST AREA SALE GROUP 1 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Property # | Address | Sale Price | Site Size (AC) | Beds | Baths | Year Built | Home Size (SF) | Improvements | Sale Price/SF | Sale Date |
| Test Sale 1 Adjoining Property 10 | 7513 Glen Willow Court | $188,000 | 0.79 | 3 | 2 | 1989 | 1,470 | One-Story, No Basement | $127.89 | Sep-17 |

We have identified 14 single-family home sales in the Control Area Sale group that are located within Wake County, either in Middle Creek Township or Panther Branch Township. They were built generally from 1989 to 1999 and are each similar in square footage and layout, as well as quality of construction, to the Test Area Sale and they sold within a reasonable time frame from the sale date of the Test Area Sale.



*Sunfish Farm Solar - Group 1: Test Area Sale Map*

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It is informative to note that the marketing time (from list date to closing date) for Control Area Sales ranged from 30 to 127 days on market, and the marketing time for Adjoining Property 10 was 98 days, which is within the range of the Control Area Sales. This is an indication that the marketability of the Test Area Sale was not negatively influenced by proximity to the solar farm.

We adjusted the Control Area Sales for market conditions using the compounded monthly growth rate exhibited in the FHFA House Price Index, for the period from December 2015 to the end of December 2018 (36 months).

When adjusting sales prices for market conditions (time between date of Test Area Sale and Control Area Sales date) throughout this analysis we have used regression analysis to identify the appropriate monthly market conditions adjustment. We utilized the Federal Housing Finance Agency House Price Index (FHFA HPI) for the 27592 zip code to determine the average monthly rate of appreciation. The FHFA HPI is a broad measure of the movement of single-family house prices. The FHFA HPI is a weighted, repeat-sales index, meaning that it measures average price changes in repeat sales or re-financings on the same properties. The FHFA HPI serves as a timely, accurate indicator of house price trends at various geographic levels.[22]

The results of the paired sales analysis for Adjoining Property 10 are presented below.

| CohnReznick Paired Sales Analysis<br>Sunfish Farm Solar<br>GROUP 1 - Adjoining Property 10 | | |
|---|---|---|
| **No. of Sales** | **Potentially Impacted by Solar Farm** | **Adjusted Median Price Per SF** |
| Test Area Sale (1) | Yes: Adjoining solar farm | $127.89 |
| Control Area Sales (14) | No: Not adjoining solar farm | $124.86 |
| **Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales** | | **2.43%** |

The difference between the unit price of the Test Area Sale and the Adjusted Median Unit Price of the Control Area Sales is considered within the range for a typical market area.

***Noting no negative price differential***, it does not appear that the Sunfish Farm solar installation impacted the sale price of the Test Area Sale, Adjoining Property 10.

[22] https://www.fhfa.gov/DataTools/Downloads/Pages/House-Price-Index.aspx

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## GROUP 2

Adjoining Property 15 (Test Area Sale) was considered for a paired sales analysis, and we analyzed this property as a manufactuerd single-family home use, with 1,860 square feet of improvements, on a parcel of 1.24-acres, that sold in October 2019. The property line for this property is approximately 665 feet from the closest solar panel, and the improvements are approximately 760 feet from the closest solar panel. The following table outlines the other important characteristics of Adjoining Property 15.

| SUNFISH FARM SOLAR<br>TEST AREA SALE<br>GROUP 2 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Property # | Address | Sale Price | Site Size (AC) | Beds | Baths | Year Built | Home Size (SF) | Improvements | Sale Price/SF | Sale Date |
| Test Sale 1 Adjoining Property 15 | 7608 Maude Stewart Road | $125,000 | 1.24 | 2 | 2 | 1990 | 1,860 | One-Story, Manufactured, No Basement | $67.20 | Oct-19 |

In Group 2, we have studied only homes on lots between 0.50 and 1.60 acres and homes that are greater than 1,750 square feet, built between 1990 and 2003, so as to be comparable to the Test Area Sale home. The Control Area Sales sold within a reasonable time frame from the sale date of the Test Area Sale and are similar to the Test Area Sale in physical characteristics, that is they are one-story manufactured homes with no basements, that are located in Wake County, either in Middle Creek Township or Panther Branch Township.



*Sunfish Farm Solar - Group 2: Test Area Sale Map*

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We analyzed the eight Control Area Sales and adjusted the Control Area Sales for market conditions using the compounded monthly growth rate exhibited in the FHFA House Price Index, for the period from December 2018 to December 2020 (24 months).

The results of the paired sales analysis for Adjoining Property 15 are presented below.

| CohnReznick Paired Sales Analysis<br>Sunfish Farm Solar<br>GROUP 2 - Adjoining Property 15 | | |
|---|---|---|
| **No. of Sales** | **Potentially Impacted by Solar Farm** | **Adjusted Median Price Per SF** |
| Test Area Sale (1) | Yes: Adjoining solar farm | $67.20 |
| Control Area Sales (8) | No: Not adjoining solar farm | $66.23 |
| **Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales** | | **1.47%** |

The unit sale price of the Test Area Sale was slightly higher than the median adjusted unit sale price of the Control Area Sales and is considered within the range for a typical market area.

***Noting no negative price differential***, it does not appear that the Sunfish Farm solar installation impacted the sale price of the Test Area Sale, Adjoining Property 15.

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## SOLAR FARM 6: 2662 FREEPORT SOLAR CSG, STEPHENSON COUNTY, IL

**Coordinates:** Latitude 42.33941447101255, Longitude -89.6394781667045

**PIN:** 08-00-13-800-001

**Total Land Size:** 17.84 acres

**Date Project Announced:** N/A

**Date Project Completed:** December 2020

**Output:** 2.0 MW AC



*Approximate 2662 Freeport Solar CSG boundaries outlined in yellow, aerial imagery provided by Google Earth*

2662 Freeport Solar CSG is located in Stephenson County, Illinois and is accessible via Illinois Route 26 N. The solar farm was developed by Borrego Solar Systems, Inc. and RECON Corporation and the improvements are owned by 2662 Freeport Solar I LLC. The solar farm went into operation in December 2020 with a total of 140,438 square feet of solar panels. The 17.84-acre solar farm was located on a larger 45-acre parcel that was replatted in January 2021. The underlying land of the solar farm sold in May 2022 for $200,000, with a 20-year ground

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lease for the solar panels. The remaining portion of the parcel – 27.16 acres – includes a single-family home, farm buildings, and farmland and has an easement for access to the solar site.

**The Surrounding Area:** The 2662 Freeport Solar CSG installation is located in Stephenson County, directly north of the City of Freeport. Stephenson County is located on the northern border of the state of Illinois, along the border with Wisconsin. The solar site is approximately 3 miles north of downtown Freeport and 100 miles northwest of the City of Chicago.

The 2662 Freeport Solar CSG project is one of 134 solar farms in Illinois and one of nine solar farms located within Stephenson County. The 2662 Freeport Solar CSG project is a similar size to all of the existing solar farms in Illinois with the exception of seven that are significantly larger and have output ranging from 10 to 200 MW. All of the solar farms in Stephenson County have capacity of 2.0 MW, similar to 2662 Freeport Solar CSG.

**The Immediate Area:** The solar farm is located in between W. Winneshiek Road to the north, Jay Street to the south, Blumenthal Road to the west, and Route 26 N to the east. The solar site is surrounded by farmland to the north and west, farmland and farmhouse buildings to the east, and single-family homes in a community surrounding Willow Lake to the south. The parcel lines of the single-family homes to the south are lined with mature trees. The single-family home located adjacent to the east of the solar site is surrounded by mature trees while the farm buildings have direct views of the solar site.

**Real Estate Tax Info:** In 2021 (payable 2022), the assessed value of the improvements was $145,333 and the owner paid $16,038 in real estate taxes. The 2021 assessed value of the underlying land was $2,404 and the participating the landowner paid $265 in real estate taxes. Prior assessment and tax information was unavailable given the split of the parcels, and the previous assessment and taxes included the larger 45-acre site and structures.

**Adjoining Parcels:** The following map displays the parcel in the solar farm site (outlined in red). Properties adjoining the solar parcels are numbered for subsequent analysis.

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*2662 Freeport Solar CSG - Adjoining Properties*

The surrounding area is primarily populated with agricultural uses to the north, east, and west, and a single-family home residential community to the south. Some of the agricultural parcels contain homesteads on the site and others are fully unimproved.

Adjoining Properties 4, 6, 8, and 9 have no sales data. Therefore, Adjoining Properties 4, 6, 8, and 9 are excluded from further analysis.

Recall, the solar farm under analysis began operations in December 2020. Adjoining Properties 1, 3, 5, 7, and 12 were sold in 2003, 2019, 2002, 2012, and 2008, respectively. These sales did not occur within a reasonable time period prior to /completion. Therefore, Adjoining Properties 1, 3, 5, 7, and 12 were excluded from further analysis.

Adjoining Property 11 sold in December 2021 and is comprised of 27 acres. Adjoining Property 11 consists of the remaining portion of the solar farm's parcel that was subdivided in 2020. Adjoining Property 11 includes a farmhouse, farm buildings, farmland, and an easement for access to the solar farm. We searched Stephenson County for sales of similar properties to Sale 3 with large areas of farmland and farm buildings and only found two comparables sales more than 15 acres. We excluded Adjoining Property 11 as a Test Area Sale given the easement and limited comparable Control Area Sales.

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Therefore, we have only considered Adjoining Properties 2 and 10 for paired sales analysis (identified as Test Area Sales 1 and 2 going forward).

## PAIRED SALES ANALYSIS

We considered only one type of paired sales anaylsis, which was comparing sales of properties not proximate to the solar farm (Control Area Sales) to the sales of adjoining properties after the completion of the solar farm project (Test Area Sales). Test Area Sales 1 and 2 are located in the single-family residential subdivision ajdacent to the south of the solar farm and have been utilized as a group of test sales.

We identified Control Area Sale data through the RealQuest database which aggregates real estate sales from public record. We verified these sales through county records and conversations with brokers and sellers. We excluded sales that were not arm's length, such as REO sales or bank-owned properties, or those between related parties.

It is important to note the these Control Area Sales are not adjoining to any solar farm, nor do they have a view of one from the property. Therefore, the announcement nor the completion of the solar farm use could not have impacted the sales price of these properties. Additionally, these Control Area Sales are all located within a one mile radius of the 2662 Freeport Solar CSG project.

Test Area Sale 1 sold in November 2020 for $140,000 after being on the market for 40 days. The property is a single-story 1,750 square foot home with a 2-car attached garage, located on a 0.5-acre lot. The improvements on this property are located approximately 230 feet to the nearest solar panel while the property line is approximately 100 feet to the nearest solar panel. Test Area Sale 2 sold in January 2021 for $150,000 after being on the market for 51 days. The property is a one- to two-story 2,009 square foot home with a 2-car attached garage and 2.5-stall detached garage, located on a 0.5-acre lot. The improvements on this property are located approximately 330 feet to the nearest solar panel while the property line is approximately 280 feet to the nearest solar panel.

The table on the following page outlines the characteristics of the Test Area Sales.



*Test Area Sale 1*



*Test Area Sale 2*

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| 2662 Freeport Solar 1 CSG Test Area Sales | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sale # | Address | Sale Price | Beds | Baths | Year Built | Home Size (SF) | Improvements | Site Size (AC) | Sale Price/ SF | Sale Date |
| 1 | 1424 Jay St. Freeport, IL 61032 | $140,000 | 3 | 2.0 (1 full, 2 half) | 1979 | 1,750 | 1-story SFH with 2-car attached garage | 0.5 | $80.00 | Nov-20 |
| 2 | 1226 Jay St. Freeport, IL 61032 | $150,000 | 3 | 2.5 | 1977 | 2,009 | 1-2 story SFH with 2-car attached garage and detached 2.5 stall garage | 0.5 | $74.66 | Jan-21 |

We analyzed 14 Control Area Sales of single-family homes with similar construction and use that were not located in close proximity to the solar farm, that sold within 12 months from the median sale date of the Test Area Sales. The Control Area Sales are single-family homes with three to four bedrooms and 2 to 2.5 baths, consist of between 1,200 square feet and 2,300 square feet of gross living area, and built between 1957 and 1993. The Control Area Sales have a partial unfinished basement or finished basement, and are located on lots between 0.3 and 0.6 acres in size.

The Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeated-sales index measuring the average price changes in repeat sales or refinancing of the same properties. The result of our analysis for the 2662 Freeport Solar CSG project is presented below.

| CohnReznick Paired Sales Anaysis 2662 Freeport Solar 1 CSG | | |
|---|---|---|
| No. of Sales | Potentially Impacted by Solar Farm | Adjusted Median Price Per SF |
| Test Area Sales (2) | Yes: Adjoining solar farm | $77.33 |
| Control Area Sales (14) | No: Not adjoining solar farm | $76.08 |
| Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales | | 1.65% |

The marketing time (from list date to closing date) for Control Area Sales ranged from 16 to 87 days on market with a median of 61 days. The marketing time for to Test Area Sales ranged from 40 to 51 days, which is within the range of the Control Area Sales and below the median, ***and we note no significant marketing time differential.***

***The small differential between the Test Area Sale and the Control Area Sales is within the range of normal market variance,*** and therefore it does not appear that the 2662 Freeport Solar CSG installation impacted the sale price of the Test Area Sales.

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We contacted the selling broker of Test Area Sale 2, Julie Wenzel of RE/MAX Town Lake & Country, who indicated that proximity to the solar farm did not impact the sale of the property.

Additionally, we spoke with Cami Grossenbacher, Stephenson County Deputy Assessor, who stated that there has been *no impact on property values due to their proximity to the **2662 Freeport Solar CSG** project.*

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## SOLAR FARM 7: PORTAGE SOLAR FARM, PORTAGE, PORTER COUNTY, INDIANA

**Coordinates:** Latitude 41.333263, Longitude -87.093015

**PIN:** 64-06-19-176-001.000-015

**Total Land Size:** 56 AC

**Date Project Announced:** February 2012

**Date Project Completed:** September 2012

**Output:** 1.96 MW AC (1.5 MW DC)

The solar farm was developed by Ecos Energy, a subsidiary of Allco Renewable Energy Limited, and is currently owned by PLH, Inc. This solar panels are ground-mounted the facility has the capacity for 1.96 Megawatts (MW) AC of power, which is enough to power 300 homes. This solar farm consists of 7,128 solar modules which are of a fixed tilt installation and it contains three inverters.

**The Surrounding Area:** The Portage Solar Farm is located outside the City of Portage, in Portage Township, approximately 2.5 miles to the southeast of the city center. The solar farm is also approximately two miles northwest of South Haven, a neighboring residential community. Portage Township is in the northern portion of Porter County, which is in the northwestern corner of the state of Indiana. The solar farm is approximately 45 miles southeast of downtown Chicago.

**The Immediate Area:** This solar farm is located on the south side of Robbins Road, and is surrounded to the west, south, and east by agricultural land. Just beyond the agricultural land buffer, uses to the west and east area single family homes, and to the south is an apartment complex and a commercial development with an IMAX movie theater and restaurants. To the north of the solar farm, across Robbins Road uses consist of a residential subdivision and vacant land. The solar farm and surrounding properties have a Valparaiso mailing address.

The solar farm is fenced from adjacent properties by a fence that surrounds all of the solar panels. Natural vegetation borders the northern, and eastern sides of the larger agricultural parcel the solar farm is nestled within.

**Real Estate Tax Information:** The taxes on the 56 acres of farmland were $1,400 per year prior to the solar farm development. After the solar farm was developed, only 13 acres (23 percent of the site) were re-assessed and the remaining 43 acres continued to be farmed. The total real estate tax bill increased to $16,350 after the solar farm was built, including both uses on the site. This indicates that the real estate taxes for the solar farm increased from $25 per acre to $1,175 per acre after the solar farm was developed.

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The map below displays the solar farm parcel shaded in blue, and the adjoining properties (outlined in red). Adjoining Properties to the solar farm are numbered for subsequent analysis.




*Portage Solar Farm - Adjoining Properties*

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*Portage Solar Farm - Adjoining Properties*

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## PAIRED SALES ANALYSIS

Adjoining Properties 1 and 7 (Test Area Sales) were each considered for a paired sales analysis. Adjoining Property 1 was analyzed as homestead-small farmland tract since at the time of purchase the site was used only as agricultural land. The buyer bought it as vacant land and subsequently built a home on the site. Adjoining Property 7 was analyzed as a single-family home use.

### GROUP 1

For Adjoining Property 1 (Group 1), the property line is approximtately 836 feet from the closest solar panel and the residential home that was eventually built is approximately 1,228 feet from the closest solar panel. The following table outlines the other important characteristics of Adjoining Property 10.

| Portage Solar Test Area Sale Group 1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Adj. Property # | Address | Sale Price | Site Size (AC) | PI Index (Corn) | Year Built | Vacant at the Time of Sale | Sale Price per Acre | Sale Date |
| 1 | 442 W 875 N, Valparaiso | $149,600 | 18.70 | 139.30 | 2017 (After Purchase) | Yes | $8,000 | Feb-14 |

In Group 1, we analyzed nine Control Area Sales of homesteads-small farmland tracts that sold within a reasonable time frame from the sale date of Adjoining Property 1. All Control Area Sales were adjusted for market conditions using regression analysis to identify the appropriate monthly market conditions adjustment.

The result of our analysis for Group 1 is presented below.

| CohnReznick Paired Sale Analysis Portage Solar Group 1 | | |
|---|---|---|
| No. of Sales | Potentially Impacted by Solar Farm | Adjusted Median Price Per Acre |
| Test Area Sales (1) | Adjoining solar farm | $8,000 |
| Control Area Sales (9) | No: Not adjoining solar farm | $7,674 |
| Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales | | 4.25% |

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## GROUP 2

For Adjoining Property 7 (Group 2), the residential home is approximately 1,227 feet from the closest solar panel. The following table outlines the other important characteristics of Adjoining Property 7.

| Portage Solar Test Area Sale Group 2 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Adj. Property # | Address | Sale Price | Site Size (AC) | Beds | Baths | Year Built | Square Feet | Sale Price per SF | Sale Date |
| 7 | 836 N 450 W Valparaiso | $149,800 | 1.00 | 3.0 | 1.5 | 1964 | 1,776 | $84.35 | Sep-13 |

For Adjoining Property 7, we analyzed seven Control Area Sales of similar single family homes that sold within a reasonable time frame from the sale date of Adjoining Property 7. All Control Area Sales were adjusted for market conditions using regression analysis to identify the appropriate monthly market conditions adjustment.



*Portage Solar - Group 2: Test Area Sale Map*

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The result of our analysis for Group 2 is presented below.

| CohnReznick Paired Sale Analysis<br>Portage Solar<br>Group 2 | | |
|---|---|---|
| **No. of Sales** | **Potentially Impacted by Solar Farm** | **Adjusted Median Price Per SF** |
| Test Area Sales (1) | Adjoining solar farm | $84.35 |
| Control Area Sales (7) | No: Not adjoining solar farm | $84.27 |
| **Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales** | | **0.10%** |

***Noting the relatively small price differentials*** between Test Area Sales and Control Area Sales, with both Test Area Sales (Adjoining Property 1 and 7) having higher unit sale prices than the respective Control Area Sales, it does not appear that the Portage Solar Farm had any negative impact on adjacent property values.

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## SOLAR FARM 8: IMPA FRANKTON SOLAR FARM, FRANKTON, INDIANA

**Location:** Frankton, Madison County, Indiana

**Coordinates:** Latitude 40.125701; Longitude -85.4626.88

**PIN:** 48-08-06-500-012.001-020

**Total Land Size:** 13 acres

**Date Project Announced:** November 2013

**Date Project Completed:** June 2014

**Output:** 1.0 MW AC (1.426 MW DC)

IMPA Frankton Solar Farm is located on the west side of South Lafayette Street, in the Town of Frankton. The solar farm was built in 2014 in joint effort by Inovateus Solar and Indiana Municipal Power Agency (IMPA). This solar farm has the capacity for 1 MW AC and its expected annual output is 1,426 MWh (megawatt hours). The solar farm is separated off from the adjacent properties by a 6 foot fence that surrounds the entirety of the solar panels. From our inspection of the site, we noted that the driveway to access the panels slopes downward and allows some views of the site.

**The Surrounding Area:** The IMPA Frankton solar farm is located in Lafayette Township, in the central portion of Madison County, Indiana. The solar farm is approximately 50 miles northeast of the center of Indianapolis and 65 miles northeast of the Indianapolis International Airport.

**The Immediate Area:** The solar installation is relatively centrally located in an undeveloped pocket of the town of Frankton, on the western side of South Lafayette Street. Adjoining parcels to the west include park land featuring baseball fields. Land further to the west is agricultural in nature, actively farmed primarily with row crops. Adjoining parcels to the north are residential with large estate homes. Adjoining the solar farm to the southeast is a single-family home identified in our analysis as Adjoining Property 7, and a baseball field. More farmland is directly south of the solar site. The solar site is adjoining a number of homes located east of the panels, along Lafayette Street. Mature trees at the rear of residential properties act as vegetative buffers.

Across Lafayette Street, to the east, are single-family residential homes forming the southeast quadrant of homes in Frankton.

All of the adjacent land parcels to the solar farm are used for agricultural, residential, or recreational purposes.

The solar farm is surrounded by a chain link fence that contains all the solar panels. Additionally, vegetative buffers along sides facing residential properties were planted as part of the solar farm development.

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**Real Estate Tax Information:** Prior to development of the solar farm in 2014, the original owner held one parcel of 15.667 acres with a home, pole barn and a utility shed, and no personal property was assessed on this parcel. In 2014 the parcel was split into two parcels and 13 acres was sold to IMPA for development of the solar farm. The owner of the parent parcel of 15.667 acres paid real estate taxes of $1,799 annually, prior to the split. After development of the solar farm, real estate taxes for both parcels, plus personal property tax revenue generated from the solar parcel, caused an increase $8,275, or a 360 percent increase in tax revenue for the entire site.

| PIN | Acres | 2013 Taxes Paid | 2017 Taxes Paid | Tax Increase | 2013 Assessed Value | 2017 Assessed Value | Value Increase |
|---|---|---|---|---|---|---|---|
| **Madison County, IN** | | | | | | | |
| 48-08-06-500-012.000-020 (parent) | 15.667 (2013) | $ 1,799 | $ 1,402 | | $ 138,700 | $ 127,000 | |
| Personal Property | | $ - | $ - | | $ - | $ - | |
| 48-08-06-500-012.001-020 (2014 solar parcel split) | 13.00 (2017) | $ - | $ 4,063 | | $ - | $ 137,400 | |
| Personal Property | | $ - | $ 2,810 | | $ - | $ 440,380 | |
| **TOTAL** | **0.00** | **$ 1,799** | **$ 8,275** | **360%** | **$ 138,700** | **$ 704,780** | **408%** |

The map below displays the solar farm parcel (outlined in red). Properties adjoining this parcel are numbered for subsequent analysis.




*IMPA Frankton Solar Farm - Adjoining Properties*

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## PAIRED SALES ANALYSIS

We have performed a paired sales analysis with regards to the IMPA Frankton solar farm. The analysis compares sales of Adjoining Properties to the solar farm after the completion of the solar farm site (Test Area Sales) to similar properties not proximate to the solar farm (Control Area Sales). We utilized this type of paired sale analysis for both groups of Adjoining Properties under study.

### GROUP 1

In Group 1, we identified and analyzed six Control Area Sales that were comparable to the Test Area Sale in location, size, and use that were not located in close proximity to the solar farm. We excluded sales that were bank-owned, or otherwise non arms'-length transactions. Adjoining Property 2 was manufactured single-family home use.

| IMPA Frankton Solar Farm<br>Test Area Sales<br>Group 1 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Adj. Property # | Address | Sale Price | Site Size (AC) | Beds | Baths | Year Built | Home Size (SF) | Sale Date | Price PSF |
| 2 | 607 S. Lafayette St<br>Frankton, IN | $41,900 | 0.37 | 2 | 2 | 1991 | 1,466 | Jun-15 | $28.58 |

We identified six Control Area Sales that are included in this analysis that sold within a reasonable time frame from the sale date of the Test Area Sale (Adjoining Property 2) and are similar to the Test Area Sale in physical characteristics.

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*IMPA Frankton Solar Farm – Group 1: Test Area Sale Map*

Control Area Sales in Group 1 were adjusted for market conditions using a regression analysis to identify the appropriate monthly market condition adjustment. The results of our study are presented below.

| CohnReznick Paired Sale Analysis<br>IMPA Frankton Solar Farm<br>Group 1 | | |
|---|---|---|
| **No. of Sales** | **Potentially Impacted by Solar Farm** | **Adjusted Median Price per SF** |
| Test Area Sale (1) | Adjoining Solar Farm | $28.58 |
| Control Area Sales (6) | No: Not adjoining solar farm | $28.42 |
| **Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales** | | **0.56%** |

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## GROUP 2

In Group 2, we identified and analyzed five Control Area Sales that were comparable to the Test Area Sale (Adjoining Property 7) in location, size, and use that were not located in close proximity to the solar farm. We excluded sales that were bank-owned, or otherwise non arms'-length transactions. Adjoining Property 7 was analyzed as a single-family home use.

| IMPA Frankton Solar Farm<br>Test Area Sales<br>Group 2 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Adj. Property # | Address | Sale Price | Site Size (AC) | Beds | Baths | Year Built | Home Size (SF) | Sale Date | Price PSF |
| 7 | 713 S. Lafeytte St<br>Frankton, IN | $131,000 | 3.04 | 4 | 2 | 2003 | 2,500 | Oct-16 | $52.40 |

We identified five Control Area Sales that are included in this analysis that sold within a reasonable time frame from the sale date of the Test Area Sale and are similar to the Test Area Sale in physical characteristics.



*IMPA Frankton Solar Farm – Group 2: Test Area Sale Map*

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Control Area Sales in Group 2 were adjusted for market conditions using a regression analysis to identify the appropriate monthly market condition adjustment. The results of our study are presented below.

| CohnReznick Paired Sale Analysis<br>IMPA Frankton Solar Farm<br>Group 2 | | |
|---|---|---|
| No. of Sales | Potentially Impacted by Solar Farm | Adjusted Median Price per SF |
| Test Area Sale (1) | Adjoining Solar Farm | $52.40 |
| Control Area Sales (5) | No: Not adjoining solar farm | $51.47 |
| Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales | | 1.81% |

***Noting the relatively small price differential,*** in which the Test Area Sales were higher than the median for the Control Areas Sales, in both Groups 1 and 2, it does not appear that the IMPA Frankton solar farm had any negative impact on adjoining property values.

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## SOLAR FARM 9: JEFFERSON COUNTY COMMUNITY SOLAR GARDEN, JEFFERSON COUNTY, COLORADO

**Coordinates:** Latitude 39.859564, Longitude -105.1497

**PIN:** 29-194-01-037

**Total Land Size**: 13.63 acres

**Date Project Announced:** November 2013

**Date Project Completed:** May 2016

**Output:** 1.2 MW AC

The Jefferson County Community Solar Garden is adjacent to the Whisper Creek residential subdivision, just outside the City of Arvada, and was developed by SunShare Management. This solar farm has the capacity for 1.2 Megawatts (AC) of power, which is enough to power 300 homes. After two months of operation, the solar farm was 100 percent subscribed and its three largest customers are the cities of Arvada and Northglenn, as well as the Green Mountain Water and Sanitation District.

**The Surrounding Area:** The Whisper Creek subdivision is located between the Welton Reservoir to the west and Standley Lake to the east. To the northwest of the subdivision lies the Colorado Hills Open Space and the Rocky Flats national Wildlife Refuge. The subdivision is primarily in the City of Arvada city limits, but the municipal boundary splits the street the Test Area Sales are located on, West 89$^{th}$ Loop, some are in Arvada and some are in unincorporated Jefferson County. Arvada is a northwestern suburb of the City of Denver and is accessible via Interstate-25 and Interstate-70 and Interstate-76.

**The Immediate Area:** The immediate area has uses that consist of vacant land to the north and east, a horse and alpaca farm to the south, known as Evening Star Farms, and single-family homes and a municipal police station and vacant land to the west.

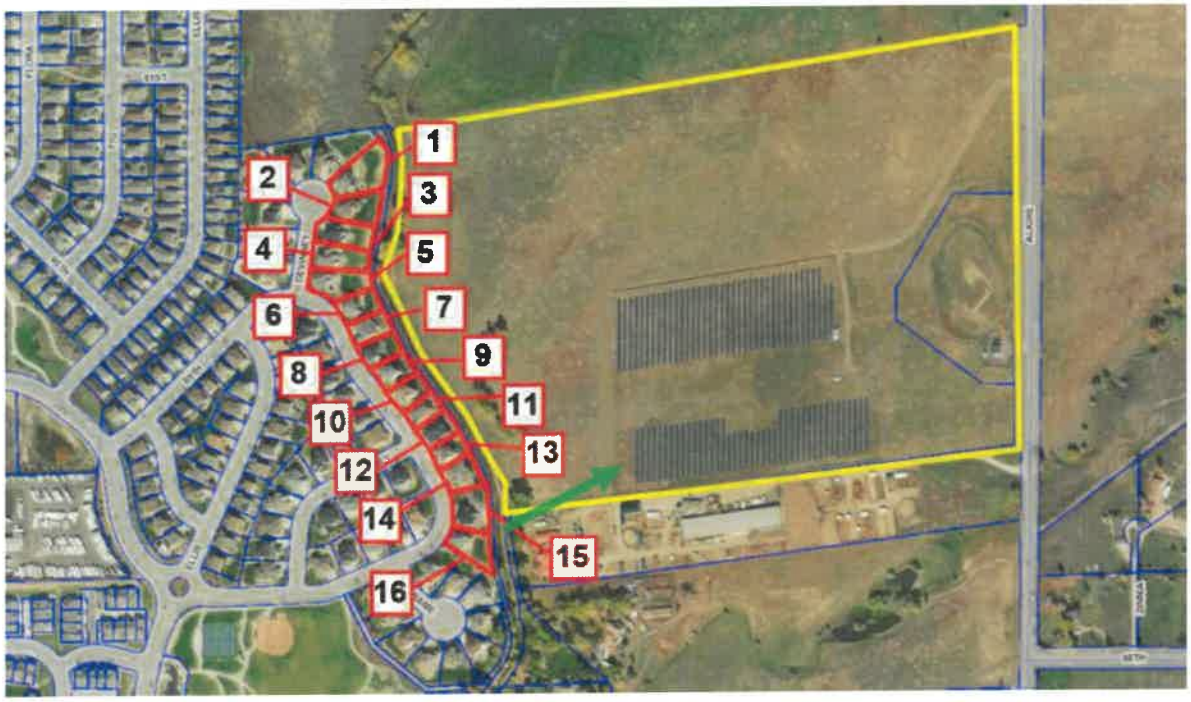
**Real Estate Tax Information:** In 2017, real estate taxes totaled $79.10 for the entire parcel for the year, which is slightly less than taxes billed in 2016 and 2015.

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## PAIRED SALES ANALYSIS

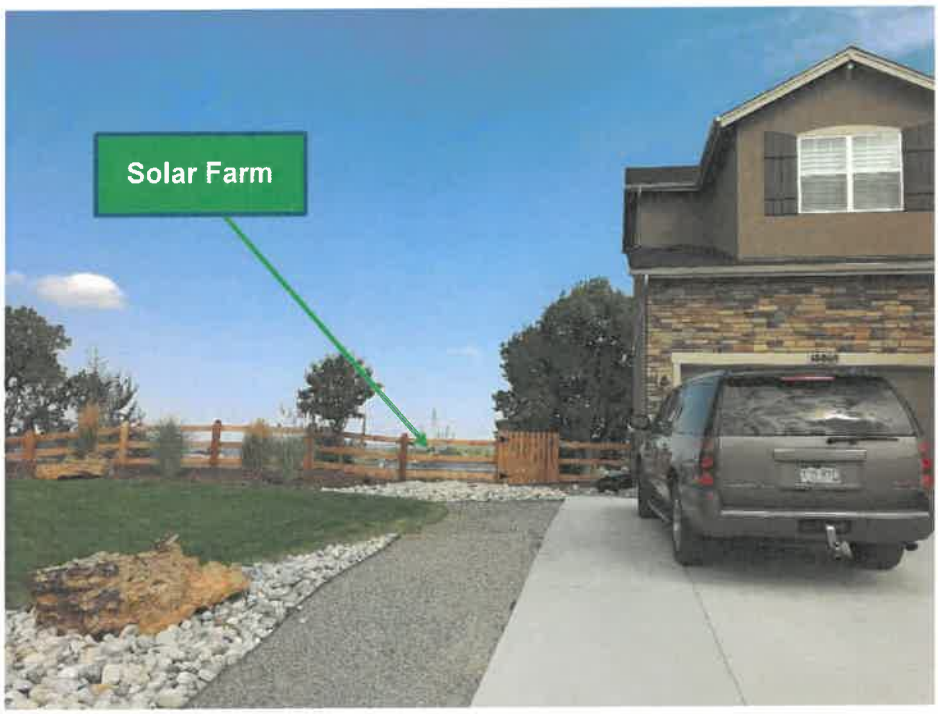
We found three Adjoining Properties that qualified for a paired sales analysis. The map below displays the solar farm parcel (outlined in yellow) and the Adjoining Properties (outlined in red) are numbered for subsequent analysis




Jefferson County Community Solar Garden - Adjoining Properties
(Q2 2016 imagery date)
*(Green Arrow – Direction of Photos on Following Page)*

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View from 89th Loop towards Solar Farm at rear of home




View from the rear of a Test Area Sale, towards Solar Farm

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Adjoining Properties 9, 10, and 13 (Test Area Sales 1, 2, and 3, respectively), were considered for a paired sales analysis. The Test Area Sales are two-story, single-family residential homes with four bedrooms and three and a half bathrooms, between 3,000 and 4,000 square feet of gross living area, on less than 0.30 acre of land, and each sold in 2016 as new construction homes.

| Jefferson County Community Solar Garden<br>Test Area Sales | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Adj. Property # | Address | Median Sale Price | Median Site Size (AC) | Median Beds | Median Baths | Median Year Built | Median Square Feet | Median Sale Date | Median Price PSF |
| 9, 10, 13 | 13929 W 89TH LOOP,<br>13919 W 89TH LOOP,<br>13889 W 89TH LOOP | $635,500 | 0.23 | 4 | 3.5 | 2016 | 3,848 | Jun-16 | $165.15 |

The Test Area Sales are located between 595 feet and 720 feet from the house to the solar panels. We analyzed six Control Area Sales of single-family homes that are included in this analysis that sold within a reasonable time frame from the median sale date of the Test Area Sales and are similar to the Test Area Sales in physical characteristics. The Control Area Sales are removed from the solar panels in other areas of the Whisper Creek subdivision.




*Jefferson County Community Solar Garden – Test Area Sales Map*

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All Control Area Sales were adjusted for market conditions using regression analysis to identify the appropriate monthly market conditions adjustment.

The results of our analyses for the Jefferson County Community Solar Garden are presented below.

| CohnReznick Paired Sale Analysis<br>Jefferson County Community Solar Garden | | |
|---|---|---|
| **No. of Sales** | **Potentially Impacted by Solar Farm** | **Adjusted Median Price Per SF** |
| Test Area Sales (3) | Adjoining solar farm | $165.15 |
| Control Area Sales (6) | No: Not Adjoining solar farm | $164.36 |
| **Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales** | | **0.48%** |

***Noting no negative price differential***, it does not appear that the Jefferson County Community Solar Garden had any negative impact on adjacent property values.

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## SOLAR FARM 10: VALPARAISO SOLAR, VALPARAISO, PORTER COUNTY, INDIANA

**Coordinates:** Latitude 41.301180, Longitude –87.094055

**PINs:** 64-09-07-152-001.000-019 and 64-09-07-152-002.000-019

**Total Land Size:** 27.9 Acres

**Date Project Announced:** March 2012

**Date Project Completed:** December 20, 2012

**Output:** 1 MW AC (1.3 MW DC)

The Valparaiso solar farm was developed by Sustainable Power Group, LLC and became operational in December 2012. The solar facility has ground mounted capacity for 1.0 Megawatts (MW) AC of power. The panels are mounted in a fixed tilt fashion and there are two inverters in this solar farm.

**The Surrounding Area:** The Valparaiso solar farm is located in Union Township, in the northwest portion of Porter County, Indiana. Porter County is located in the very northwest corner of the state of Indiana. The solar farm is approximately 10 miles northwest of the Porter County Regional Airport and approximately six and a half miles northwest of the center of the city of Valparaiso.

**The Immediate Area:** This solar farm is located on the southern side of Indiana Route 130 (Railroad Avenue) in Valparaiso, Porter County, Indiana and is located approximately 35 miles southwest of downtown Chicago.

Adjoining parcels to the solar farm to the east and south are residential homes and to the west and north are agricultural in nature.

The solar farm is lined by a chain link fence that surrounds all of the solar panels. Additionally, there are bushes and trees to the north and west of the solar panels; this vegetation has been in place since before development of the solar farm. Other small trees were planted and spaced out around the perimeter of the solar farm after development. From our inspection, the solar panels cannot be seen from Indiana State Route 130 from the north, nor on N 475 W Road to the east as this is a raised roadway. The adjacent properties to the east of the solar panels have full view of the panels from the backyards of the homes.

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**Real Estate Tax Information:** Prior to development of the solar farm, in 2011, the original parent parcel contained a home, a homesite, excess land, and agricultural land. In 2012, Valparaiso Solar, LLC bought the entire property to develop the solar farm on. Subsequently when Valparaiso Solar, LLC sold the project to PLH, LLC, they split the parcels so that the home and homesite were one parcel of 3.25 acres and the remaining 24.65 acres were the solar panel site. After development of the solar farm development, in 2015, total real estate taxes for both parcels had increased to approximately $2,587, a 25 percent increase in tax revenue for the site.

| PIN | Acres | 2011 Taxes Paid | 2015 Taxes Paid | Tax Increase | 2011 Assessed Value | 2015 Assessed Value | Value Increase |
|---|---|---|---|---|---|---|---|
| **Porter County, IN** | | | | | | | |
| 64-09-07-151-001.000-019 (parent parcel) | | $ 2,072 | | | $ 203,800 | | |
| 64-09-07-152-001.000-019 (split parcel) | 24.65 | | $ 2,587 | | | $ 156,800 | |
| 64-09-07-152-002.000-019 (split parcel) | 3.25 | | $ 1,741 | | | $ 187,900 | |
| **TOTAL** | **27.90** | **$ 2,072** | **$ 2,587** | **25%** | **$ 203,800** | **$ 344,700** | **69%** |

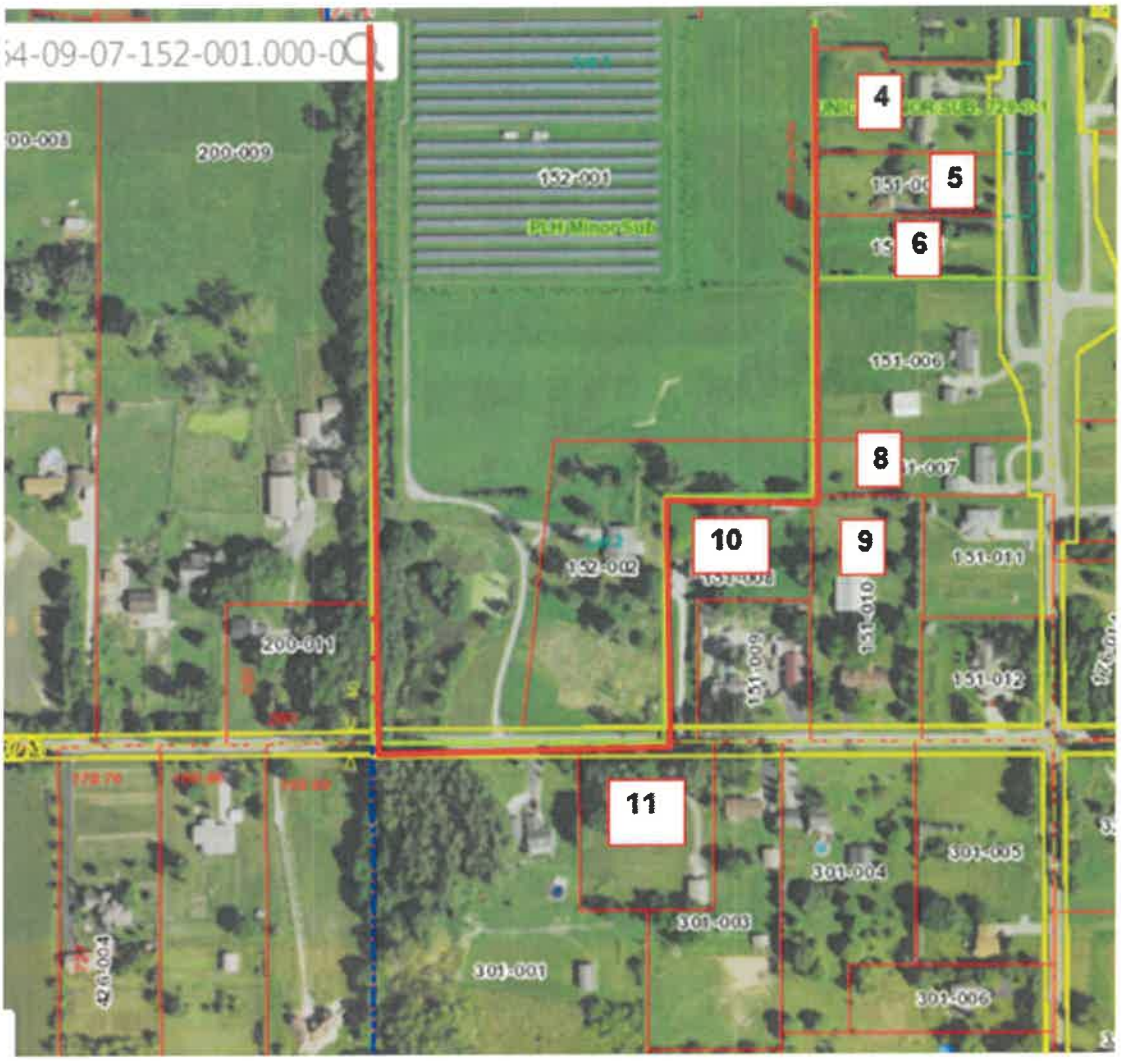
The maps below and on the following page display the solar farm parcels (outlined in red). Properties adjoining this parcel are numbered for subsequent analysis.




*Valparaiso Solar Farm - Adjoining Properties*

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*Valparaiso Solar Farm - Adjoining Properties*

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## PAIRED SALES ANALYSIS

Adjoining Properties 10 and 14 (Test Area Sales) were each considered for a paired sales analysis. Both were analyzed as single-family home uses.

### GROUP 1

For Adjoining Property 10 (Group 1), the residential home is approximately 514 feet from the closest solar panel. The following table outlines the other important characteristics of Adjoining Property 10.

| Valparaiso Solar Test Area Sale Group 1 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Adj. Property # | Address | Sale Price | Site Size (AC) | Beds | Baths | Year Built | Square Feet | Price PSF | Sale Date |
| 10 | 489 W 450 N, Valparaiso, IN | $105,000 | 1.45 | 3 | 2 | 1993 | 1,274 | $ 82.42 | Jul-15 |

We analyzed five Control Area Sales that sold within a reasonable time frame from the sale date of Adjoining Property 10. All Control Area Sales were adjusted for market conditions using regression analysis to identify the appropriate monthly market conditions adjustment.

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*Valparaiso Solar - Group 1: Test Area Sale Map*

The result of our analyses for Group 1 is presented below.

| CohnReznick Paired Sale Analysis<br>Valparaiso Solar<br>Group 1 | | |
|---|---|---|
| **No. of Sales** | **Potentially Impacted by Solar Farm** | **Adjusted Median Price Per SF** |
| Test Area Sales (1) | Adjoining solar farm | $82.42 |
| Control Area Sales (5) | No: Not adjoining solar farm | $79.95 |
| **Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales** | | **3.09%** |

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## TECHNIQUE 3: MARKET COMMENTARY

Additionally, we have contacted market participants such as appraisers, brokers, and developers familiar with property values around solar farms. Commentary from our conversations with these market participants is recorded below.

In Otter Creek Township, in LaSalle County, Illinois, we spoke with Viki Crouch, the Township Assessor, who she said that *there has been no impact on property values due to their proximity to the* ***Grand Ridge Solar Farm***.

We spoke with Ken Crowley, Rockford Township Assessor in Winnebago County, Illinois, who stated that he has seen *no impact on property values in his township as an effect of proximity to the* ***Rockford Solar Farm***.

We spoke with James Weisiger, the Champaign Township Assessor in Champaign County, where the **University of Illinois Solar Farm** is located, and he noted that no one has petitioned to have their property assessments lowered and *there appears to have been no impact on property values as a result of proximity to the solar farm*.

We spoke with Ken Surface, a Senior Vice President of Nexus Group. Nexus Group is a large valuation group in Indiana and has been hired by 20 counties in Indiana regarding property assessments. Mr. Surface is familiar with the solar farm sites in Harrison County (Lanesville Solar Farm) and Monroe County (Ellettsville Solar Farm) and stated he has noticed *no impact on property values from proximity to these sites*.

We interviewed Missy Tetrick, a Commercial Valuation Analyst for the Marion County Indiana Assessor. She mentioned the Indy Solar III sites and stated that she saw *no impact on land or property prices from proximity to this solar farm*.

We spoke with Dorene Greiwe, Decatur County Indiana Assessor, and she stated that solar farms have only been in the county a couple of years, but she has seen *no impact on land or property prices due to proximity to this solar farm*.

Connie Gardner, First Deputy Assessor for Madison County Indiana, stated that there are three solar farms in her county, and she has seen *no impact on land or property prices due to proximity to these solar farms*.

We spoke with Tara Shaver, Director of Administration for Marion County, Indiana Assessor/Certified Assessor, and she stated that she has seen *no impact on land or property prices due to proximity to solar farms*.

Candace Rindahl of ReMax Results, a real estate broker with 16 years of experience in the North Branch, Minnesota area, said that she has been in most of the homes surrounding the North Star Solar Farm and personally sold two of them. She reported that the neighboring homes sold at market rates comparable to other homes in the area not influenced by the solar farm, and they sold within 45 days of offering, at the end of 2017, *which was in line with the market.*

Dan Squires, Chisago County Tax Assessor (Minnesota), confirmed that the Chisago County Assessor's Office completed their own study on property values adjacent to and in close vicinity to the solar farm from January

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2016 to October 2017. From the study, the assessor determined the residential homes adjacent to the North Star Solar Farm (Minnesota) *were in-line with the market and were appreciating at the same rate as the market.*[23]

Renee Davis, Tax Administrator for Bladen County, North Carolina, stated that she *has not seen any effect on property values due to proximity to a solar farm.*

We spoke with Jim Brown, an appraiser for Scotland County, North Carolina, who stated that he *has seen no effect on property values due to proximity to a solar farm.*

We spoke with Gary Rose, a tax assessor for Duplin County, North Carolina, who stated that *he has seen no effect on property values in regards to proximity to a solar farm.*

Kathy Renn, a property Valuation Manager for Vance County, North Carolina, stated that she has *not noticed any effect on property values due to proximity to a solar farm.*

Larry Newton, a Tax Assessor for Anson County, North Carolina, stated that there are six solar farms in the county ranging from 20 to 40 acres and he *has not seen any evidence that solar farms have had any effect on property values due to proximity to a solar farm.*

We spoke with Patrice Stewart, a Tax Administrator for Pasquotank County, North Carolina, and she has seen *no effect on land or residential property values due to proximity to the solar farms in Pasquotank County.*

We spoke with the selling broker of the Adjoining Property for Elm City Solar, in North Carolina, Selby Brewer, who said the solar farm *did not impact the buyer's motivation.*

We spoke with Amy Carr, Commissioner of Revenue in Southampton County, Virginia, who stated that most of the solar farms are in rural areas, but she *has not seen any effect or made any adjustments on property values.* They have evaluated the solar farmland considering a more intense use, which increased the assessed value.

The Interim Assessor for the town of Whitestown in Oneida County, New York, Frank Donato, stated that he *has seen no impact on property values of properties nearby solar farms.*

Steve Lehr at the Department of Assessment for Tompkins County, New York, mentioned that the appraisal staff *has made no adjustments regarding assessed values of properties surrounding solar farms. Marketing times for properties have also stayed consistent.* Lehr noted that a few of the solar farms in Thompkins County are on land owned by colleges and universities and a few are in rural areas.

At this point in time, Al Fiorille, Senior Valuation Specialist in the Tompkins County Assessment department in New York, reported that he *cannot measure any negativity from the solar farms and arrays that have been installed within the county.*

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[23] Chisago County Press: County Board Real Estate Update Shows No "Solar Effects" (11/03/2017)

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In the Assessor's office in the town of Seneca, Ontario County, New York, Shana Jo Hamilton stated that she *has seen no impact on property values of properties adjacent to solar farms*.

Michael Zazzara, Assessor of the City of Rochester in Monroe County, New York commented that the City has a couple of solar farms, and they *have seen no impact on nearby property values and have received no complaints from property owners.*

While there are one or two homes nearby to existing solar farms in the town of Lisbon in St. Lawrence County, New York, Assessor Stephen Teele *has not seen any impact on property values in his town.* The solar farms in the area are in rural or agricultural areas in and around Lisbon.

The Assessor for the Village of Whitehall in Washington County, New York, Bruce Caza, noted that there are solar farms located in both rural and residential areas in the village and *he has seen no impact on adjacent properties, including any concerns related to glare form solar panels.*

Laurie Lambertson, the Town Assessor for Bethlehem, in Albany County, New York noted that the solar farms in her area are tucked away in rural or industrial areas. *Lambertson has seen no impact on property values in properties adjacent to solar farms.*

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## SOLAR FARM FACTORS ON HARMONY OF USE

**Zoning changes and conditional use permits often require that the proposed use is compatible with surrounding uses.**

The following section analyzes specific physical characteristics of solar farms and is based on research and CohnReznick's personal solar farm site visits and indicate that solar farms are generally harmonious with surrounding property and compliant with most zoning standards.

**Appearance:** Most solar panels have a similar appearance to a greenhouse or single-story residence can range from 8 to 20 feet but are usually not more than 15 feet high. As previously mentioned, developers generally surround a solar farm with a fence and often leave existing perimeter foliage, which minimizes the visibility of the solar farm. The physical characteristics of solar farms are compatible with adjoining agricultural and residential uses.

**Sound:** Solar panels in general are effectively silent and sound levels are minimal, like ambient sound. There are limited sound-emitting pieces of equipment on-site, which only produce a quiet hum (e.g., inverters). However, these sources are not typically heard outside the solar farm perimeter fence.

**Odor:** Solar panels do not produce any byproduct or odor.

**Greenhouse Gas (GHG) Emissions:** Much of the GHG produced in the United States is linked to the combustion of fossil fuels, such as coal, natural gas, and petroleum, for energy use. Generating renewable energy from operating solar panels for energy use does not have significant GHG emissions, promoting cleaner air and reducing carbon dioxide ($CO_2$) emissions to fight climate change.

**Traffic:** The solar farm requires minimal daily onsite monitoring by operational employees and thus minimal operational traffic.

**Hazardous Material:** Modern solar panel arrays are constructed to U.S. government standards. Testing shows that modern solar modules are both safe to dispose of in landfills and are also safe in worst case conditions of abandonment or damage in a disaster.[24] Reuse or recycling of materials would be prioritized over disposal. Recycling is an area of significant focus in the solar industry, and programs for both batteries and solar panels are advancing every year. While the exact method of recycling may not be known yet as it is dependent on specific design and manufacturer protocol, the equipment is designed with recyclability of its components in mind, and it is likely that solar panel and battery energy storage recycling and reuse programs will only improve in 25 years' time.

Examples of homes built adjoining to solar farms are presented on the following pages.

[24] Virginia Solar Initiative - Weldon Cooper Center for Public Service – University of Virginia (https://solar.coopercenter.org/taxonomy/term/5311)

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For the Dominion Indy III solar farm, the adjacent land to the west was acquired and subsequently developed with a large estate home – after the solar panels had been in operation for years.



*Dominion Indy III Solar Farm*
*September 2014*




*Dominion Indy III Solar Farm*
*October 2016*



*Estate home adjacent to Dominion Indy III Solar Farm*

*In ground pool and attached garage (home cost estimated at $450,000 - October 2015)*

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***Innovative Solar 42 (2017)***
*Cumberland County, NC*




***Innovative Solar 42 (2019)***
*Cumberland County, NC*

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***Developer Built Home***

*Sold 6/18/19 for $265,900 ($110.75/sf)*

*Cumberland County, NC (adjacent to Innovative 42 solar farm)*

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*Portage Solar Farm, IN*
*October 2015*




*Portage Solar Farm, IN*
*October 2016*



*4,255 square foot estate home under construction, adjacent to Portage Solar Farm located in Indiana*

*On-site pond and attached garage (cost estimated at $465,000) April 2018*

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The Brighton PV Solar farm became operational in December 2012. Located in Adams County, north of Denver, CO, this solar farm has a capacity of 1.8 MW AC and is located on a triangular parcel of land east of an area of existing custom-built estate homes. A photo of one home (15880 Jackson Street) located directly north of the circled area below, is presented to the right.



In December 2012, the 2.55-acre lot circled in red below (15840 Jackson Street) was purchased for future development of a single-family home. This home was built in 2017, and per the county assessor, the two-story home is 3,725 square feet above ground with 4 bedrooms and 3.5 bathrooms. According to the building permit issued in August 2016, the construction cost was budgeted at $410,000.



*Brighton PV Solar, Adams County, CO*
*June 2016*



*Brighton PV Solar, Adams County, CO*
*June 2017*

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## SUMMARY OF ADJOINING USES

The table below summarizes each Existing Solar Farm's adjoining uses.

| Composition of Surrounding Uses (% of Surrounding Acreage) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Solar Farm # | Solar Farm | Acreage % of Surrounding Agricultural Uses | Acreage % of Surrounding Residential Uses | Acreage % of Surrounding Industrial Uses | Acreage % of Surrounding Office Uses | Acreage % of Surrounding Other Uses | Avg. Distance from Panels to Improvements (Feet) |
| 1 | DTE Lapeer | 60.00% | 35.00% | 0.00% | 0.00% | 5.00% | 260 |
| 2 | Grand Ridge | 97.60% | 1.40% | 0.00% | 0.00% | 1.00% | 553 |
| 3 | Woodland Solar | 25.00% | 5.00% | 10.00% | 0.00% | 60.00% | 615 |
| 4 | Dominion Indy Solar III | 97.70% | 2.30% | 0.00% | 0.00% | 0.00% | 474 |
| 5 | Sunfish Farm | 81.70% | 18.30% | 0.00% | 0.00% | 0.00% | 380 |
| 6 | 2662 Freeport Solar | 96.30% | 3.50% | 0.00% | 0.00% | 0.00% | 243 |
| 7 | Portage Solar | 65.50% | 34.50% | 0.00% | 0.00% | 0.00% | 991 |
| 8 | IMPA Frankton | 76.30% | 5.70% | 0.00% | 0.00% | 18.00% | 236 |
| 9 | Jefferson County Solar Garden | 73.00% | 10.00% | 0.00% | 0.00% | 16.67% | 730 |
| 10 | Valparaiso Solar LLC | 81.60% | 18.40% | 0.00% | 0.00% | 0.00% | 659 |

Overall, the vast majority of the surrounding acreage for each comparable solar farm is made up of agricultural land, some of which have homesteads. There are also smaller single-family home sites that adjoin the solar farms analyzed in this report. Generally, these solar farms are sound comparables to New Leaf Energy's proposed solar project in terms of adjoining uses, location, and size.

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## SUMMARY AND FINAL CONCLUSIONS

The purpose of this property value impact report is to determine whether the presence of a solar farm has caused a measurable and consistent impact on adjacent property values. Under the identified methodology and scope of work, CohnReznick reviewed published methodology for measuring impact on property values as well as published reports that analyzed the impact of solar farms on property values. These studies found little to no measurable and consistent difference between Test Area Sales and Control Area Sales attributed to the solar farms.

A summary of the chosen CohnReznick impact studies prepared is presented below.

**CohnReznick Solar Analysis Conclusions**

| Solar Farm No. | Solar Farm | Number of Test Area Sales | Number of Control Area Sales | Median Adjoining Property Sale Price per Unit (Test Area Sales) | Median Control Area Sales Price per Unit | Difference (%) | Avg. Feet from Panel to Lot | Avg. Feet from Panel to House | Impact Found |
|---|---|---|---|---|---|---|---|---|---|
| **Single-Family Residential** | | | | | | | | | |
| 1 | DTE Lapeer Solar Group 1 | 3 | 6 | $105.26 | $99.64 | +5.64% | 205 | 285 | No Impact |
| | DTE Lapeer Solar Group 2 | 1 | 5 | $114.12 | $113.01 | +0.98% | 225 | 315 | No Impact |
| | DTE Lapeer Solar Group 3 | 1 | 4 | $94.84 | $91.80 | +3.31% | 165 | 250 | No Impact |
| 2 | Grand Ridge Solar | 1 | 5 | $79.90 | $74.35 | +7.46% | 366 | 479 | No Impact |
| 3 | Woodland Solar | 1 | 5 | $144.63 | $137.76 | +4.99% | 420 | 615 | No Impact |
| 4 | Dominion Indy Solar III Group 2 | 4 | 8 | $59.10 | $57.84 | +2.18% | 240 | 350 | No Impact |
| | Dominion Indy Solar III Group 3 | 7 | 11 | $72.15 | $72.69 | -0.74% | 165 | 300 | No Impact |
| 5 | Sunfish Farm Solar Group 1 | 1 | 14 | $127.89 | $124.86 | +2.43% | 50 | 200 | No Impact |
| | Sunfish Farm Solar Group 2 | 1 | 10 | $67.20 | $66.23 | +1.46% | 665 | 760 | No Impact |
| 6 | 2662 Freeport Solar | 2 | 14 | $77.33 | $76.08 | +1.64% | 114 | 243 | No Impact |
| 7 | Portage Solar Group 2 | 1 | 7 | $84.35 | $84.27 | +0.09% | 1070 | 1233 | No Impact |
| 8 | IMPA Frankton Solar Group 1 | 1 | 6 | $28.58 | $28.42 | +0.56% | 120 | 153 | No Impact |
| | IMPA Frankton Solar Group 2 | 1 | 5 | $52.40 | $51.47 | +1.81% | 163 | 415 | No Impact |
| 9 | Jefferson Community Solar Garden | 3 | 6 | $165.15 | $164.36 | +0.48% | 609 | 658 | No Impact |
| 10 | Valparaiso Solar Group 1 | 1 | 5 | $82.42 | $79.95 | +3.09% | 323 | 516 | No Impact |
| ***Median Variance in Sale Prices for Test Area Sales to Control Area Sales*** | | | | | | **+1.81%** | | | |

***29 Adjoining Test Area Sales studied and compared to 111 Control Area Sales***

** Note, the paired sale analysis for this group is an outlier as determined earlier in this report and was excluded from this summary table.*

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Land (Agricultural/Single Family Lots)** | | | | | | | | | |
| 4 | Dominion Indy Solar III Group 1 | 1 | 4 | $8,210 | $8,091 | +1.47% | 280 | - | No Impact |
| 7 | Portage Solar Group 1 | 1 | 9 | $8,000 | $7,674 | +4.25% | 845 | - | No Impact |
| ***Median Variance in Sale Prices for Test to Control Areas*** | | | | | | **+2.86%** | | | |

***2 Adjoining Test Area Sale studied and compared to 13 Control Area Sales***

As summarized above, we evaluated 31 property sales adjoining existing solar facilities (Test Area Sales) and 124 Control Area Sales. In addition, we studied a total of 37 Test Area Sales and 46 Control Area Sales in two Before and After analyses. In total, we have studied over 1,430 sale transactions across the United States.

The solar farms analyzed reflected sales of property adjoining an existing solar farm (Test Area Sales) in which the unit sale prices were effectively the same or higher than the comparable Control Area Sales that were not near a solar farm. The conclusions support that there is no negative impact for improved residential homes adjacent to solar, nor agricultural acreage. This was confirmed with market participants interviews, which provided additional insight as to how the market evaluates farmland and single-family homes with views of the solar farm.

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It can be concluded that since the Adjoining Property Sales (Test Area Sales) were not adversely affected by their proximity to the solar farm, that properties surrounding other proposed solar farms operating in compliance with all regulatory standards will similarly not be adversely affected, in either the short or long term periods.

Based upon the examination, research, and analyses of the existing solar farm uses, the surrounding areas, and an extensive market database, we have concluded that ***no consistent negative impact has occurred to adjacent property values that could be attributed to proximity to the adjacent solar farm***, with regard to unit sale prices or other influential market indicators. Additionally, in our workfile we have retained analyses of additional existing solar farms, each with their own set of matched control sales, which had consistent results, indicating no consistent and measurable impact on adjacent property values. This conclusion has been confirmed by numerous county assessors who have also investigated this use's potential impact on property values.

If you have any questions or comments, please contact the undersigned. Thank you for the opportunity to be of service.

Respectfully submitted,

**CohnReznick LLP**



Andrew R. Lines, MAI
Principal
Certified General Real Estate Appraiser
Illinois License No. [redacted]
Expires 9/30/2023
Indiana License No. [redacted]
Expires 6/30/2024



Patricia L. McGarr, MAI, CRE, FRICS
National Director - Valuation Advisory Services
Certified General Real Estate Appraiser
Illinois License No. [redacted]
Expires 9/30/2023
Indiana License No. [redacted]
Expires 6/30/2024
Michigan License No. [redacted]
Expires 7/31/2024



Erin C. Bowen, MAI
Senior Manager
Certified General Real Estate Appraiser
Arizona License No. [redacted]
Expires 12/31/2024

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## CERTIFICATION

We certify that, to the best of our knowledge and belief:

1. The statements of fact and data reported are true and correct.
2. The reported analyses, findings, and conclusions in this consulting report are limited only by the reported assumptions and limiting conditions, and are our personal, impartial, and unbiased professional analyses, findings, and conclusions.
3. We have no present or prospective interest in the property that is the subject of this report and no personal interest with respect to the parties involved.
4. We have performed no services, as an appraiser or in any other capacity, regarding the property that is the subject of this report within the three-year period immediately preceding acceptance of this assignment.
5. We have no bias with respect to the property that is the subject of this report or the parties involved with this assignment.
6. Our engagement in this assignment was not contingent upon developing or reporting predetermined results.
7. Our compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value finding, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this report.
8. Our analyses, findings, and conclusions were developed, and this report has been prepared, in conformity with the requirements of the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute, which includes the Uniform Standards of Professional Appraisal Practice (USPAP).
9. The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.
10. Patricia L. McGarr, MAI, CRE, FRICS, Andrew R. Lines, MAI, and Erin C. Bowen, MAI have viewed the exterior of all comparable data referenced in this report in person, via photographs, or aerial imagery.
11. We have not relied on unsupported conclusions relating to characteristics such as race, color, religion, national origin, gender, marital status, familial status, age, and receipt of public assistance income, handicap, or an unsupported conclusion that homogeneity of such characteristics is necessary to maximize value.
12. Joseph P. B. Ficenec provided significant appraisal consulting assistance to the persons signing this certification, including data verification, research, and administrative work all under the appropriate supervision.
13. We have experience in reviewing properties similar to the subject and are in compliance with the Competency Rule of USPAP.
14. As of the date of this report, Patricia L. McGarr, MAI, CRE, FRICS, Andrew R. Lines, MAI, and Erin C. Bowen, MAI have completed the continuing education program for Designated Members of the Appraisal Institute.

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If you have any questions or comments, please contact the undersigned. Thank you for the opportunity to be of service.

Respectfully submitted,

**CohnReznick LLP**

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## ASSUMPTIONS AND LIMITING CONDITIONS

*The fact witness services will be subject to the following assumptions and limiting conditions:*

1. No responsibility is assumed for the legal description provided or for matter pertaining to legal or title considerations. Title to the property is assumed to be good and marketable unless otherwise stated. The legal description used in this report is assumed to be correct.
2. The property is evaluated free and clear of any or all liens or encumbrances unless otherwise stated.
3. Responsible ownership and competent management are assumed.
4. Information furnished by others is believed to be true, correct and reliable, but no warranty is given for its accuracy.
5. All engineering studies are assumed to be correct. The plot plans and illustrative material in this report are included only to help the reader visualize the property.
6. It is assumed that there are no hidden or unapparent conditions of the property, subsoil, or structures that render it more or less valuable. No responsibility is assumed for such conditions or for obtaining the engineering studies that may be required to discover them.
7. It is assumed that the property is in full compliance with all applicable federal, state, and local and environmental regulations and laws unless the lack of compliance is stated, described, and considered in the evaluation report.
8. It is assumed that the property conforms to all applicable zoning and use regulations and restrictions unless nonconformity has been identified, described and considered in the evaluation report.
9. It is assumed that all required licenses, certificates of occupancy, consents, and other legislative or administrative authority from any local, state, or national government or private entity or organization have been or can be obtained or renewed for any use on which the value estimate contained in this report is based.
10. It is assumed that the use of the land and improvements is confined within the boundaries or property lines of the property described and that there is no encroachment or trespass unless noted in this report.
11. The date of value to which the findings are expressed in this report apply is set forth in the letter of transmittal. The appraisers assume no responsibility for economic or physical factors occurring at some later date which may affect the opinions herein stated.
12. Unless otherwise stated in this report, the existence of hazardous materials, which may or may not be present on the property, was not observed by the appraisers. The appraisers have no knowledge of the existence of such substances on or in the property. The appraisers, however, are not qualified to detect such substances. The presence of substances such as asbestos, urea-formaldehyde foam insulation, radon gas, lead or lead-based products, toxic waste contaminants, and other potentially hazardous materials may affect the value of the property. The value estimate is predicated on the assumption that there is no such material on or in the property that would cause a loss in value. No

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responsibility is assumed for such conditions or for any expertise or engineering knowledge required to discover them. The client is urged to retain an expert in this field, if desired.

13. The forecasts, projections, or operating estimates included in this report were utilized to assist in the evaluation process and are based on reasonable estimates of market conditions, anticipated supply and demand, and the state of the economy. Therefore, the projections are subject to changes in future conditions that cannot be accurately predicated by the appraisers and which could affect the future income or value projections.

14. Fundamental to the appraisal analysis is the assumption that no change in zoning is either proposed or imminent, unless otherwise stipulated. Should a change in zoning status occur from the property's present classification, the appraisers reserve the right to alter or amend the value accordingly.

15. It is assumed that the property does not contain within its confined any unmarked burial grounds which would prevent or hamper the development process.

16. The Americans with Disabilities Act (ADA) became effective on January 26, 1992. We have not made a specific compliance survey and analysis of the property to determine if it is in conformance with the various detailed requirements of the ADA. It is possible that a compliance survey of the property, together with a detailed analysis of the requirements of the ADA, could reveal that the property is not in compliance with one or more of the requirements of the Act. If so, this fact could have a negative effect on the value of the property. Unless otherwise noted in this report, we have not been provided with a compliance survey of the property. Any information regarding compliance surveys or estimates of costs to conform to the requirements of the ADA are provided for information purposes. No responsibility is assumed for the accuracy or completeness of the compliance survey cited in this report, or for the eventual cost to comply with the requirements of the ADA.

17. Any value estimates provided in this report apply to the entire property, and any proration or division of the total into fractional interests will invalidate the value estimate, unless such proration or division of interests has been set forth in this report.

18. Any proposed improvements are assumed to have been completed unless otherwise stipulated; any construction is assumed to conform with the building plans referenced in this report.

19. Unless otherwise noted in the body of this report, this evaluation assumes that the subject does not fall within the areas where mandatory flood insurance is effective.

20. Unless otherwise noted in the body of this report, we have not completed nor are we contracted to have completed an investigation to identify and/or quantify the presence of non-tidal wetland conditions on the subject property.

21. This report should not be used as a basis to determine the structural adequacy/inadequacy of the property described herein, but for evaluation purposes only.

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22. It is assumed that the subject structure meets the applicable building codes for its respective jurisdiction. We assume no responsibility/liability for the inclusion/exclusion of any structural component item which may have an impact on value. It is further assumed that the subject property will meet code requirements as they relate to proper soil compaction, grading, and drainage.

23. The appraisers are not engineers, and any references to physical property characteristics in terms of quality, condition, cost, suitability, soil conditions, flood risk, obsolescence, etc., are strictly related to their economic impact on the property. No liability is assumed for any engineering-related issues.

*The evaluation services will be subject to the following limiting conditions:*

1. The findings reported herein are only applicable to the properties studied in conjunction with the Purpose of the Evaluation and the Function of the Evaluation as herein set forth; the evaluation is not to be used for any other purposes or functions.

2. Any allocation of the total value estimated in this report between the land and the improvements applies only to the stated program of utilization. The separate values allocated to the land and buildings must not be used in conjunction with any other appraisal and are not valid if so used.

3. No opinion is expressed as to the value of subsurface oil, gas or mineral rights, if any, and we have assumed that the property is not subject to surface entry for the exploration or removal of such materials, unless otherwise noted in the evaluation.

4. This report has been prepared by CohnReznick under the terms and conditions outlined by the enclosed engagement letter. Therefore, the contents of this report and the use of this report are governed by the client confidentiality rules of the Appraisal Institute. Specifically, this report is not for use by a third party and CohnReznick is not responsible or liable, legally or otherwise, to other parties using this report unless agreed to in writing, in advance, by both CohnReznick and/or the client or third party.

5. Disclosure of the contents of this evaluation report is governed by the by-laws and Regulations of the Appraisal Institute has been prepared to conform with the reporting standards of any concerned government agencies.

6. The forecasts, projections, and/or operating estimates contained herein are based on current market conditions, anticipated short-term supply and demand factors, and a continued stable economy. These forecasts are, therefore, subject to changes with future conditions. This evaluation is based on the condition of local and national economies, purchasing power of money, and financing rates prevailing at the effective date of value.

7. This evaluation shall be considered only in its entirety, and no part of this evaluation shall be utilized separately or out of context. Any separation of the signature pages from the balance of the evaluation report invalidates the conclusions established herein.

8. **Possession of this report, or a copy thereof, does not carry with it the right of publication, nor may it be used for any purposes by anyone other than the client without the prior written consent of the appraisers, and in any event, only with property qualification.**

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9. The appraisers, by reason of this study, are not required to give further consultation or testimony or to be in attendance in court with reference to the property in question unless arrangements have been previously made.

10. Neither all nor any part of the contents of this report shall be conveyed to any person or entity, other than the appraiser's client, through advertising, solicitation materials, public relations, news, sales or other media, without the written consent and approval of the authors, particularly as to evaluation conclusions, the identity of the appraisers or CohnReznick, LLC, or any reference to the Appraisal Institute, or the MAI designation. Further, the appraisers and CohnReznick, LLC assume no obligation, liability, or accountability to any third party. If this report is placed in the hands of anyone but the client, client shall make such party aware of all the assumptions and limiting conditions of the assignment.

11. This evaluation is not intended to be used, and may not be used, on behalf of or in connection with a real estate syndicate or syndicates. A real estate syndicate means a general or limited partnership, joint venture, unincorporated association or similar organization formed for the purpose of, and engaged in, an investment or gain from an interest in real property, including, but not limited to a sale or exchange, trade or development of such real property, on behalf of others, or which is required to be registered with the United States Securities and Exchange commissions or any state regulatory agency which regulates investments made as a public offering. It is agreed that any user of this evaluation who uses it contrary to the prohibitions in this section indemnifies the appraisers and the appraisers' firm and holds them harmless from all claims, including attorney fees, arising from said use.

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# ADDENDUM A:
# APPRAISER QUALIFICATIONS

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# Patricia L. McGarr, MAI, CRE, FRICS, CRA

## Principal and CohnReznick Group – Valuation Advisory National Director

200 S. Wacker Drive, Suite 2600
Chicago, IL 60606
312-508-5802
patricia.mcgarr@cohnreznick.com

Patricia L. McGarr, MAI, CRE, FRICS, CRA, is a principal and National Director of CohnReznick Advisory Group's Valuation Advisory Services practice. Pat's experience includes market value appraisals of varied property types for acquisition, condemnation, mortgage, estate, ad valorem tax, litigation, zoning, and other purposes. Pat has been involved in the real estate business since 1980. From June 1980 to January 1984, she was involved with the sales and brokerage of residential and commercial properties. Her responsibilities during this time included the formation, management, and training of sales staff in addition to her sales, marketing, and analytical functions. Of special note was her development of a commercial division for a major Chicago-area brokerage firm.

Since January 1984, Pat has been exclusively involved in the valuation of real estate. Her experience includes the valuation of a wide variety of property types including residential (SF/MF/LIHTC), commercial, industrial, and special purpose properties including such diverse subjects as quarries, marinas, riverboat gaming sites, shopping centers, manufacturing plants, and office buildings. She is also experienced in the valuation of leasehold and leased fee interests. Pat has performed appraisal assignments throughout the country, including the Chicago Metropolitan area as well as New York, New Jersey, California, Nevada, Florida, Utah, Texas, Wisconsin, Indiana, Michigan, and Ohio. Pat has gained substantial experience in the study and analysis of the establishment and expansion of sanitary landfills in various metropolitan areas including the preparation of real estate impact studies to address criteria required by Senate Bill 172. She has also developed an accepted format for allocating value of a landfill operation between real property, landfill improvements, and franchise (permits) value.

Over the past several years, Pat has developed a valuation group that specializes in the establishment of new utility corridors for electric power transmission and pipelines. This includes determining acquisition budgets, easement acquisitions, corridor valuations, and litigation support. Pat has considerable experience in performing valuation impact studies on potential detrimental conditions and has studied properties adjoining solar farms, wind farms, landfills, waste transfer stations, stone quarries, cellular towers, schools, electrical power transmission lines, "Big Box" retail facilities, levies, properties with restrictive covenants, landmark districts, environmental contamination, airports, material defects in construction, stigma, and loss of view amenity for residential high rises. Most recently, the firm has studied property values adjacent to Solar Farms to address criteria required for special use permits across the Midwest.

Pat has qualified as an expert valuation witness in numerous local, state, and federal courts.

Pat has participated in specialized real estate appraisal education and has completed more than 50 courses and seminars offered by the Appraisal Institute totaling more than 600 classroom hours, including real estate transaction courses as a prerequisite to obtaining a State of Illinois Real Estate Salesman License.

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Pat has earned the professional designations of Counselors of Real Estate (CRE), Member of the Appraisal Institute (MAI), Fellow of Royal Institution of Chartered Surveyors (FRICS) and Certified Review Appraiser (CRA). She has also been a certified general real estate appraiser in 21 states (see below).

## Education

- North Park University: Bachelor of Science, General Studies

## Professional Affiliations

- National Association of Realtors
- CREW Commercial Real Estate Executive Women
- IRWA International Right Of Way Association

## Licenses and Accreditations

- Member of the Appraisal Institute (MAI)
- Counselors of Real Estate, designated CRE
- Fellow of Royal Institution of Chartered Surveyors (FRICS)
- Certified Review Appraiser (CRA)
- Alabama State Certified General Real Estate Appraiser
- California State Certified General Real Estate Appraiser
- Connecticut State Certified General Real Estate Appraiser
- Colorado State Certified General Real Estate Appraiser
- District of Columbia Certified General Real Estate Appraiser
- Illinois State Certified General Real Estate Appraiser
- Indiana State Certified General Real Estate Appraiser
- Louisiana State Certified General Real Estate Appraiser
- Maryland State Certified General Real Estate Appraiser
- Massachusetts Certified General Real Estate Appraiser
- Michigan State Certified General Real Estate Appraiser
- North Carolina State Certified General Real Estate Appraiser
- New Jersey State Certified General Real Estate Appraiser
- Nevada State Certified General Real Estate Appraiser
- New York State Certified General Real Estate Appraiser
- Pennsylvania State Certified General Real Estate Appraiser
- South Carolina State Certified General Real Estate Appraiser
- Tennessee State Certified General Real Estate Appraiser
- Texas State Certified General Real Estate Appraiser
- Virginia State Certified General Real Estate Appraiser
- Wisconsin State Certified General Real Estate Appraiser

## Appointments

- Appointed by two Governors of Illinois to the State Real Estate Appraisal Board (2017 & 2021)
- Chairperson of the State of Illinois Real Estate Appraisal Board (2021)

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# Andrew R. Lines, MAI

## Principal, CohnReznick Advisory

200 S. Wacker Drive, Suite 2600
Chicago, IL 60606
312-508-5892
andrew.lines@cohnreznick.com

Andrew R. Lines is a principal in CohnReznick's Valuation Advisory Services group where he specializes in Real Estate, Affordable Housing, Cannabis and Renewable Energy. Andrew leads a group of appraisers across the country performing valuations on a wide variety of real estate property types including residential, commercial, industrial, hospitality and special purpose properties: landfills, waste transfer stations, marinas, hospitals, universities, self-storage facilities, racetracks, CCRCs, and railroad corridors. Affordable Housing experience includes Market Studies, Rent Compatibility Studies and Feasibility Analysis for LIHTC and mixed-income developments. Cannabis assignments have covered cultivation, processing and dispensaries in over 10 states, including due diligence for mergers and acquisitions of multi-state operational and early stage companies. Renewable Energy assignments have included preparation of impact studies and testimony at local zoning hearings in eight states.

Andrew is experienced in the valuation of leasehold, leased fee, and partial interests and performs appraisals for all purposes including financial reporting, litigation, and gift/estate planning. Andrew is a State Certified General Real Estate Appraiser in the states of Illinois, Indiana, Maryland, Georgia, Florida, Ohio, New York, New Jersey, Arizona, Kentucky, and the District of Columbia.

Before joining CohnReznick, Andrew was with Integra Realty Resources, starting as analyst support in 2002 and leaving the firm as a director in late 2011 (including two years with the Phoenix branch). His real estate experience also includes one year as administrator for the residential multifamily REIT Equity Residential Properties Trust (ERP), in the transactions department, where he performed due diligence associated with the sale and acquisition of REIT properties and manufactured home communities.

### Education

- Syracuse University: Bachelor of Fine Arts
- MAI Designation (Member of the Appraisal Institute)

### Professional Affiliations

- Chicago Chapter of the Appraisal Institute
  - Alternate Regional Representative (2016 - 2018)
  - MAI Candidate Advisor (2014 - Present)
- International Real Estate Management (IREM)
- National Council of Real Estate Investment Fiduciaries (NCREIF)

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## Community Involvement

- Syracuse University Regional Council – Active Member
- Syracuse University Alumni Association of Chicago, Past Board member
- Chicago Friends School – Treasurer & Board Member

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# Erin Bowen, MAI

## Senior Manager, Valuation Advisory Services

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www.cohnreznick.com

Erin Bowen, MAI is a Senior Manager with CohnReznick in Valuation Advisory Services. Ms. Bowen is based in Phoenix, Arizona, with presence covering the west coast. Ms. Bowen's work in Commercial Real Estate valuation spans over 12 years.

Ms. Bowen specializes in lodging, cannabis, seniors housing, large scale retail and multifamily conversion properties. Lodging work includes all hotel property types and brand segments including limited, full service and resort properties; additionally, Ms. Bowen has appraised numerous hotel to multifamily conversion properties including market rate and affordable housing. Cannabis work includes dispensaries, cultivation facilities including specialized indoor facilities and greenhouse properties, processing and manufacturing facilities. Senior's housing assignments include assisted living, skilled nursing facilities and rehabilitation centers. Retail work spans power centers, lifestyle centers, outlet centers and malls. She has appraised numerous additional properties including multifamily, office, medical office, industrial, churches, and vacant land.

Ms. Bowen has expertise in appraising properties at all stages of development, including existing as is, proposed, under construction, renovations and conversion to alternate use. Valuations have been completed nationwide for a variety of assignments including mortgage financing, litigation, eminent domain, tax appeal, estate gifts, asset management, as well as valuation for financial reporting including purchase price allocations (ASC 805). Impact Study Reports have also been generated for zoning hearings related to the development of solar facilities and wind powered facilities. Ms. Bowen has qualified as an expert witness and provided testimony for zoning and county commission hearings.

### Education

- University of California, San Diego: Bachelor of Arts in Psychology and Theater; College Honors

### Professional Affiliations

- Appraisal Institute, Designated Member

### Licenses

- Certified General Real Estate Appraiser licensed in Oregon, Arizona, California, and Nevada

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## Matt Asselmeier

**From:** Doug Westphal <dwestphal@kendalltwp.com>
**Sent:** Wednesday, October 23, 2024 7:53 PM
**To:** Matt Asselmeier
**Subject:** [External]Re: Ament Road Solar Project Question

CAUTION - This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Yes I would like that
Sent from my iPhone

On Oct 23, 2024, at 12:03 PM, Matt Asselmeier <masselmeier@kendallcountyil.gov> wrote:

Doug:

I received an email from Yorkville requesting a ROW dedication 40' in depth for this project.

Since this project is unincorporated, the land would go to the Township.

Do you want the ROW dedication?

Thanks,

Matthew H. Asselmeier, AICP, CFM
Director
Kendall County Planning, Building & Zoning
111 West Fox Street
Yorkville, IL 60560-1498
PH: 630-553-4139
Fax: 630-553-4179

**From:** Matt Asselmeier
**Sent:** Tuesday, October 22, 2024 3:05 PM
**To:** Doug Westphal (dwestphal@kendalltwp.com) <dwestphal@kendalltwp.com>
**Cc:** Steve Gebner <sgrebner@kendalltwp.com>; Steve Gengler (sgengler@kendalltwp.com) <sgengler@kendalltwp.com>
**Subject:** Ament Road Solar Project Question

Doug:

For the solar project on Ament Road, does Kendall Township want any ROW dedication?

Thanks,

Matthew H. Asselmeier, AICP, CFM

## Matt Asselmeier

**From:** Krysti Barksdale-Noble <knoble@yorkville.il.us>
**Sent:** Wednesday, October 23, 2024 11:53 AM
**To:** Matt Asselmeier
**Subject:** RE: [External]RE: Ament Road Solar - Yorkville

That would be preferred. Thanks.

Best Regards,

***Krysti J. Barksdale-Noble, AICP***
*(she/her)*
Community Development Director
United City of Yorkville
651 Prairie Pointe Drive
Yorkville, Illinois 60560
(630) 553-8573
(630) 742-7808
www.yorkville.il.us

**From:** Matt Asselmeier <masselmeier@kendallcountyil.gov>
**Sent:** Wednesday, October 23, 2024 8:06 AM
**To:** Krysti Barksdale-Noble <knoble@yorkville.il.us>
**Subject:** RE: [External]RE: Ament Road Solar - Yorkville

It could be dedicated to the township.

Matthew H. Asselmeier, AICP, CFM
Director
Kendall County Planning, Building & Zoning
111 West Fox Street
Yorkville, IL 60560-1498
PH: 630-553-4139
Fax: 630-553-4179

**From:** Krysti Barksdale-Noble <knoble@yorkville.il.us>
**Sent:** Tuesday, October 22, 2024 6:40 PM
**To:** Matt Asselmeier <masselmeier@kendallcountyil.gov>
**Subject:** RE: [External]RE: Ament Road Solar - Yorkville

Matt,

Since the parcel is not contiguous, I don't think it can be dedicated to the city. Can the County dedicate it to the township for now? If so, the City would like 40' half right of way.

**ZONING, PLATTING & ADVISORY COMMITTEE (ZPAC)**
**November 5, 2024 – Unapproved Meeting Minutes**

PBZ Chairman Seth Wormley called the meeting to order at 9:01 a.m.

Present:
Matt Asselmeier – PBZ Department
Lauren Belville – Health Department
David Guritz – Forest Preserve
Brian Holdiman – PBZ Department
Commander Jason Langston – Sheriff's Department
Alyse Olson – Soil and Water Conservation District
Seth Wormley – PBZ Committee Chair

Absent:
Meagan Briganti – GIS Department
Greg Chismark – WBK Engineering, LLC
Fran Klaas – Highway Department

Audience:
James Kerrigan, Nicholas Bellone, and Nicholas Standiford

**PETITIONS**

**Petition 24-30 Nicholas S. Bellone on Behalf of Ament Solar 1, LLC (Tenant) and Janet M. Dhuse on Behalf of the Janet Dhuse Declaration of Family Trust Dated March 1, 2013 (Owner)**
Mr. Asselmeier summarized the request.

The Petitioner is seeking a special use permit for a commercial solar energy facility and a variance to Section 36-282(17)a of the Kendall County Code to allow a commercial solar energy facility on land within one point five (1.5) miles of municipality without an annexation agreement.

The application materials, wetland delineation reports (including EcoCat information), NRI Report, property survey, site plan, vegetative management plan, decommissioning information, stormwater information, drain tile information, glare study, and property value study were provided.

The property is located south of 9949 and 10021 Ament Road.

The total acreage of the two (2) parcels is approximately ninety-three point four (93.4) acres. The disturbed area is approximately thirty-nine point three (39.3) acres. The fenced area is approximately thirty-five point six (35.6) acres.

The existing land use is Agricultural.

The County's Future Land Use Map calls for the property to be Rural Residential. Yorkville's Plan calls for the property to be Agricultural.

Ament Road is a Local Road maintained by Kendall Township.

The United City of Yorkville has a trail planned along Ament Road.

There are no floodplains on the property. There are two (2) farmed wetlands in the vicinity of the proposed use.

The adjacent land uses are Agricultural, Farmstead, Public Institutional (Cemetery), and Single-Family Residential.

The adjacent properties are zoned A-1, A-1SU and R-3.

The County's Plan calls for the area to be Rural Residential and Transportation Corridor.

Yorkville Plan calls for the area to be Agricultural.

Properties within one half (1/2) mile are zoned A-1, A-1SU, R-1, R-1 PUD, R-3, RPD-2, and M-1.

The A-1 special use permit to the north is for a cemetery. The A-1 special use permits to the east are for a church and school and for agricultural implement sales and service.

The Deere Crossing subdivision is located near the subject property. Approximately fourteen (14) homes are located within a half mile (0.5) miles of the subject property.

EcoCAT Report was submitted on July 10, 2023, for the eastern parcel and November 16, 2023, for the western parcel and consultation was terminated for both parcels.

A LESA Score was not generated for the property. The land evaluation was 96 out of 100 indicating the soils were well suited for agricultural. The NRI Report was provided.

Petition information was sent to Kendall Township on October 25, 2024. No comments received.

Petition information was sent to the United City of Yorkville on October 25, 2024. Prior to formal application submittal, the United City of Yorkville submitted a letter stating they would not pursue annexation at this time; this was provided. Yorkville also submitted an email requesting a forty foot (40') right-of-way dedication; Kendall Township was agreeable to this request. The emails related to the right-of-way dedication were provided.

Petition information was sent to the Bristol-Kendall Fire Protection District on October 25, 2024. No comments received.

§ 36-282(17) of the Kendall County Zoning Ordinance, commercial solar energy facilities businesses can be special uses on A-1 zoned property subject to the following conditions:

a. All commercial solar energy facilities and test solar energy systems located within one point five (1.5) miles of a municipality shall either annex to the municipality or obtain an annexation agreement with the municipality requiring the municipality's regulations to flow through the property. Petitioner is requesting a variance.

b. The setbacks for commercial solar energy facilities shall be measured from the nearest edge of any component of the facility as follows:

   Occupied Community Buildings or Dwellings on Nonparticipating Properties-One hundred fifty feet (150') from the nearest point on the outside wall of the structure

   Boundary Lines of Participating Properties-None

   Boundary Lines of Nonparticipating Properties- Fifty feet (50') to the nearest point on the property line of the nonparticipating property

   Public Road Rights-Of-Way-Fifty feet (50') from the nearest edge

   The above setbacks do not exempt or excuse compliance with electric facility clearances approved or required by the National Electrical Code, the National Electrical Safety Code, Commerce Commission, Federal Energy Regulatory Commission, and their designees or successors. Per the site plan, the closet nonparticipating structure is approximately one thousand, thirty feet (1,030') to the southeast of the commercial solar energy facility. A church is located approximately one thousand, four hundred thirty-three feet (1,433') to the northeast of the commercial solar energy facility. The perimeter fence is setback fifty feet (50') from the adjoining property line. The commercial solar energy facility is approximately one thousand, four hundred forty-two feet (1,442') from the Ament Road. At their closest points, the panels are approximately forty-nine feet (49') south of the northern fence line, twenty-nine point five feet (29.5) west of the eastern fence line, just under nineteen feet (19') north of the southern fence line, and twenty-one point five feet (21.5') east of the western fence line.

c. A commercial solar energy facility's perimeter shall be enclosed by fencing having a height of at least six feet (6') and no more than twenty-five feet (25'). This is true. Per the site plan, the fence is proposed to be seven feet (7') in height and will be chain link.

d. No component of a solar panel as part of a commercial solar energy facility shall have a height of more than twenty feet (20') above ground when the solar energy facility's arrays are at full tilt. This is true. Per the site plan, the

maximum height will be nine feet (9'). The Petitioner does not want a restriction setting the maximum height at this level.

e. The above setback, fencing, and component height requirements may be waived subject to written consent of the owner of each affected nonparticipating property. This written consent shall be submitted at the time of application submittal. No such consent requested or needed.

f. Sound limitations for components in commercial solar energy facilities shall follow the sound limitations established by the Illinois Pollution Control Board. A noise study was provided.

g. The County shall not require standards for construction, decommissioning, or deconstruction of a commercial solar energy system or related financial assurances to be more restrictive than agricultural impact mitigation agreement set in State law. The amount of any decommissioning payment shall be limited to the cost identified in the decommissioning or deconstruction plan, as required by the agricultural impact mitigation agreement, minus the salvage value of the project. A copy of the agricultural impact mitigation agreement shall be submitted with the application materials. The decommissioning plan was provided and is outlined in the AIMA. As noted, the estimated cost of decommissioning is Four Hundred Twenty-Five Thousand, Eight Hundred Ninety-Seven Dollars and Thirty-Seven Cents ($425,897.37). This money will be provided to the County in the form of a bond as outlined in the AIMA.

h. A vegetative screening shall be placed around the commercial solar energy facility. The landscaping plan was provided with the site plan and more detailed landscaping information included in the vegetative management plan. The plan includes a cover crop seed mix, a native pollinator seed mix, and a native grazing seed mix. The performance standards and ground cover maintenance requirements were included in the vegetative management plan.

i. Commercial solar energy facility applicants shall provide the results and recommendations from consultations with the Illinois Department of Natural Resources obtained through the Ecological Compliance Assessment Tool (EcoCat) or a comparable successor tool. The commercial solar energy facility applicant shall adhere to the recommendations provided through this consultation. The EcoCat was submitted and consultation was terminated without any specific recommendations.

j. Commercial solar energy facility applicants shall provide the results of the United States Fish and Wildlife Service's Information for Planning and Consulting environmental review or a comparable successor toll that is consistent with the U.S. Fish and Wildlife Service's Land-Based Wind Energy Guidelines and any applicable United States Fish and Wildlife Service solar wildlife guidelines that have been subject to public review. This was provided in both wetland delineation reports. Six (6) threatened or endangered species were in the area, but no impacts were anticipated.

k. A facility owner shall demonstrate avoidance of protected lands as identified by the Illinois Department of Natural Resources and the Illinois Nature Preserve Commission or consider the recommendations of the Illinois Department of Natural Resources for setbacks from protected lands, including areas identified by the Illinois Nature Preserve Commission. This is true. The site is designed around the farmed wetlands.

l. A facility owner shall provide evidence at the time of application submittal of consultation with the Illinois State Historic Preservation Office to assess potential impacts on State-registered historic sites under applicable State law. No potential impacts to State-registered historic sites exist.

m. A commercial solar energy facility owner shall plant, establish, and maintain for the life of the facility vegetative ground cover consistent with State law and the guidelines of the Illinois Department of Natural Resources' vegetative management plans. The vegetation management plan shall be required at the time of application submittal. The vegetation management plan, including timelines for planting and maintenance of the vegetation was provided.

n. The facility owner shall enter into a road use agreement with the jurisdiction having control over the applicable roads. The road use agreement shall follow applicable law. The facility owner shall supply the Kendall County Planning, Building and Zoning Department with a copy of the road use agreement. This provision shall be waived if the jurisdiction having control over the applicable roads does not wish to enter into an agreement. To date, the road use agreement negotiations are ongoing. No transportation or access plan was provided. The site plan shows

one (1) twenty foot (20') wide gravel driveway approximately thirty feet (30') west of the eastern property line.

o. The facility owner shall repair or pay for the repair of all damage to the drainage system caused by the construction of the commercial solar energy system within a reasonable time after construction of the commercial solar energy facility is complete. The specific time shall be set in the special use permit. A tentative drain tile study was provided. The foundations for the racking will be placed in a manner that minimizes impacts on the drain tile.

No buildings are planned for the site. Any structures proposed for the site, including the solar arrays, shall obtain applicable permits.

The property is presently farmland. No wells, septic systems, or refuse collection points were identified.

The proposed area of disturbance is slightly less than one (1) acre. The County requested that the Petitioner submit an escrow payment so that WBK can evaluate the proposal; this was provided.

Per the site plan, the Petitioner propose one (1) twenty foot (20') wide access road.

There is one (1) forty foot (40') wide vehicular access gate and approximately ten (10) four foot (4') access gates proposed around the perimeter of the property. The locations of the smaller gates have not been determined. Knox box information will be provided to the County.

No permeant parking was proposed. There will be a staging area during construction; the specific location of the staging area was undetermined, but will likely be northwest of the vehicular access gate.

No lighting was proposed.

No specific signage was planned. The Petitioner was agreeable to installing one (1) sign at the vehicular access gate stating emergency contact information.

The Petitioner provided a glare study.

The Petitioner provided a general property values study. Mr. Asselmeier noted that the same company that provided the property value study for this project also prepared the property value study for the project on Simons Road. An email outlining the differences between the studies was available. The conclusion of both studies, that property values would not be negatively impacted, was the same.

No odors were foreseen.

If approved, this would be the second special use permit for a commercial solar energy facility in unincorporated Kendall County.

The proposed Findings of Fact for the special use permit were as follows:

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 Project will generate clean, renewable electricity while producing no air, noise, or water pollution, or ground contamination. The front portion of the parcel closest to Ament Road will be retained for agricultural use as well as the surrounding land of the other parcel, which will create a natural screening during the growing season. The Petitioner submitted a vegetative management plan outlining the types of vegetation that will be planted, the timing of planting, and a maintenance plan for the vegetation.

The special use will not be substantially injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, nor substantially diminish and impair property values within the neighborhood. The Zoning classification of property within the general area of the property in question shall be considered in determining consistency with this standard. The proposed use makes adequate provisions for appropriate buffers, landscaping, fencing, lighting, building materials, open space and other improvements necessary to insure that the proposed use does not adversely impact adjacent uses and is compatible with the surrounding area and/or the County as a whole. The proposal will not interfere with the use and enjoyment of nearby properties. The surrounding properties are zoned primarily A-1 and will not be prevented from continuing any existing use or from pursuing future uses. The proposal's operations would be quiet and

minimal traffic will occur after installation is completed. The solar panels are setback from Ament Road and neighboring houses to avoid negative visual impacts.

Adequate utilities, access roads and points of ingress and egress, drainage, and/or other necessary facilities have been or are being provided. The proposal will have adequate utility interconnections designed in collaboration with ComEd. The proposal does not require water, sewer, or any other public utility facilities to operate. The Petitioner will also build all roads and entrances at the facility and will enter into an agreement with Kendall Township regarding road use. After initial construction traffic, landscape maintenance and maintenance to the project components are anticipated to occur on an as-needed basis, consistent with the vegetative management plan. Existing traffic patterns will not be impacted in the post-construction operations phase. A drain tile survey will be completed prior to construction and foundation design will work around or reroute any identified drain tiles to ensure proper drainage.

The special use shall in all other respects conform to the applicable regulations of the district in which it is located, except as such regulations may in each instance be modified by the County Board pursuant to the recommendation of the Zoning Board of Appeals. If the requested variance is granted, the proposal meets all applicable regulations.

The special use is consistent with the purpose and objectives of the Land Resource Management Plan and other adopted County or municipal plans and policies. The proposal is also consistent with a goal and objective found on page 3-34 of the Land Resource Management Plan, “Support the public and private use of sustainable energy systems (examples include wind, solar, and geo-thermal).” However, the proposal is located on property classified as Rural Residential on the Future Land Use Map.

The proposed Findings of Fact for the variance:

The particular physical surroundings, shape, or topographical condition of the specific property involved would result in a particular hardship or practical difficulty upon the owner if the strict letter of the regulations were carried out. The subject property is located within one point five (1.5) miles of the United City of Yorkville. The Petitioner provided a letter from the United City of Yorkville stating that Yorkville did not wish to annex the property or enter into a pre-annexation agreement.

The conditions upon which the requested variation is based would not be applicable, generally, to other property within the same zoning classification. Other A-1 zoned properties within one point five (1.5) miles of a municipality could request a similar variance, if the municipality refuses to annex or enter into a pre-annexation agreement.

The alleged difficulty or hardship has not been created by any person presently having an interest in the property. The difficulty was created because the United City of Yorkville did not wish to enter into a pre-annexation agreement or annex the property.

The granting of the variation will not materially be detrimental to the public welfare or substantially injurious to other property or improvements in the neighborhood in which the property is located. Granting the variance would not be detrimental to the public or substantially injurious to other properties.

That the proposed variation will not impair an adequate supply of light and air to adjacent property, or substantially increase the congestion in the public streets or increase the danger of fire, or endanger the public safety or substantially diminish or impair property values within the neighborhood. The proposed variance would not impair light or air on adjacent property, cause congestion, increase the danger of fire, or negatively impact property values.

Staff will wait with issuing a recommendation on this proposal, pending comments from the Regional Planning Commission. The proposed conditions and restrictions are listed:

1. The site shall be developed substantially in accordance with the submitted site plan, vegetative management plan, decommissioning plan, road access plan, and Agricultural Impact Mitigation Agreement.
2. Within ninety (90) days of the approval of the special use permit, the owners of the subject property shall dedicate a strip of land forty feet (40’) in depth along the northern property line to Kendall Township. The Kendall County Planning, Building and Zoning Committee may grant an extension to this deadline.
3. None of the vehicles or equipment parked or stored on the subject property allowed by the special use permit shall be considered agricultural vehicles or agricultural equipment.
4. All of the vehicles and equipment stored on the subject property allowed by the special use permit shall be maintained in good condition with no deflated tires and shall be licensed if required by law.

5. Any structures, included solar arrays, constructed, installed, or used allowed by this special use permit shall not be considered for agricultural purposes and must secure applicable building permits.

6. One (1) warning sign shall be placed near or on the vehicular entrance gate. This sign shall include, at minimum, the address of the subject property and a twenty-four (24) hour emergency contact phone number. Additional signage may be installed, if required by applicable law.

7. KenCom and other applicable public safety agencies shall be supplied the access code to the Knox Box/security gate.

8. The operators of the use allowed by this special use permit acknowledge and agree to follow Kendall County's Right to Farm Clause.

9. The property owner and operator of the use allowed by this special use permit shall follow all applicable Federal, State, and Local laws related to the operation of this type of use.

10. Failure to comply with one or more of the above conditions or restrictions could result in the amendment or revocation of the special use permit.

11. If one or more of the above conditions is declared invalid by a court of competent jurisdiction, the remaining conditions shall remain valid.

12. This special use permit and variance shall be treated as a covenant running with the land and is binding on the successors, heirs, and assigns as to the same special use conducted on the property.

Commander Langston made a motion, seconded by Mr. Guritz, to forward the proposal to the Kendall County Regional Planning Commission.

The votes were follows:
Ayes (7): Asselmeier, Belville, Guritz, Holdiman, Langston, Olson, and Wormley
Nays (0): None
Abstain (0): None
Absent (3): Briganti, Chismark, and Klaas

The motion passed.

The proposal goes to the Kendall County Regional Planning Commission on December 11, 2024.

## PUBLIC COMMENT

None

## ADJOURNMENT

Mr. Guritz made a motion, seconded by Commander Langston, to adjourn.

With a voice vote of seven (7) ayes, the motion carried.

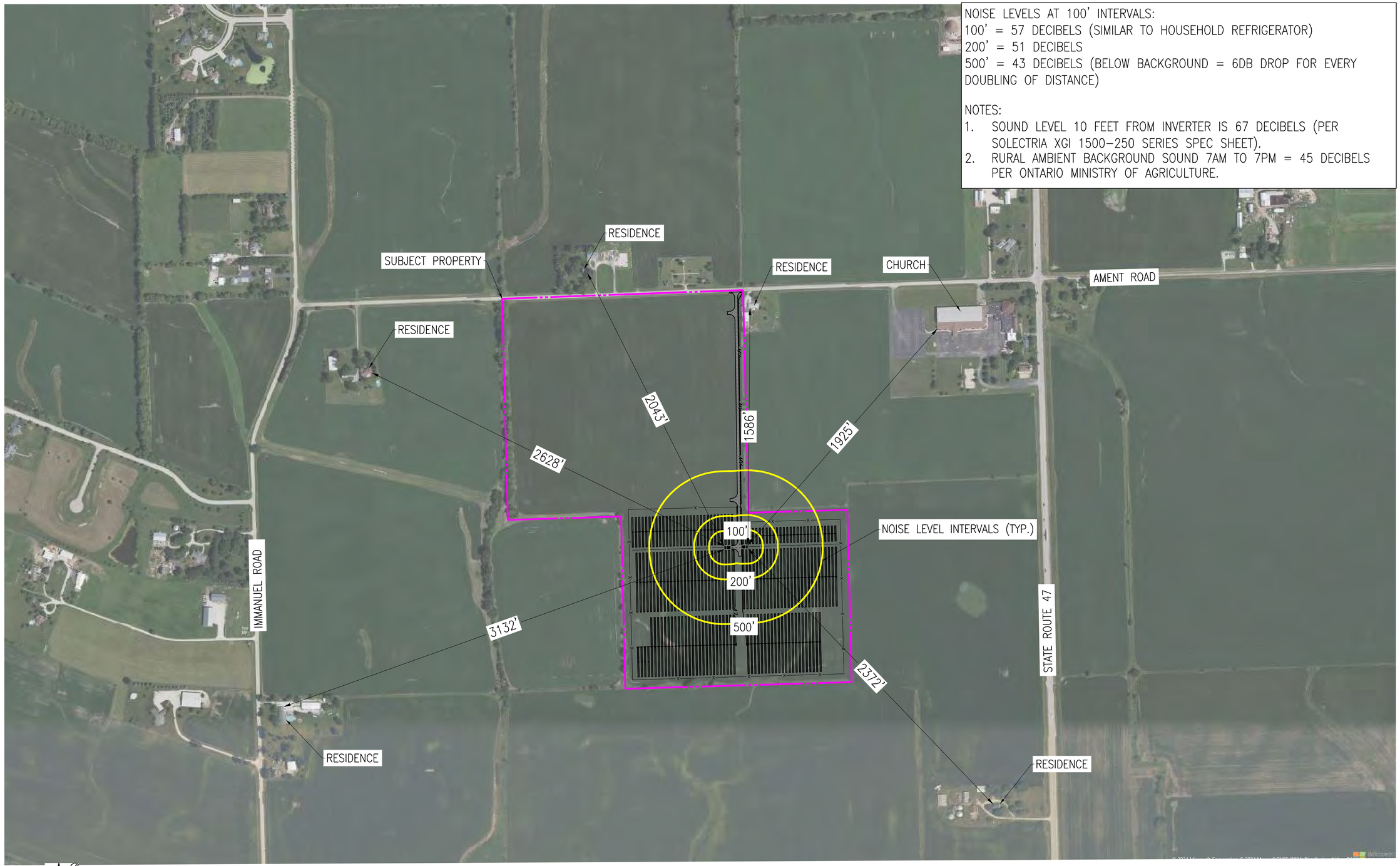
The ZPAC, at 9:31 a.m., adjourned.

Respectfully Submitted,
Matthew H. Asselmeier, AICP, CFM
Director

Enc.

NOISE LEVELS AT 100' INTERVALS:
100' = 57 DECIBELS (SIMILAR TO HOUSEHOLD REFRIGERATOR)
200' = 51 DECIBELS
500' = 43 DECIBELS (BELOW BACKGROUND = 6DB DROP FOR EVERY DOUBLING OF DISTANCE)

NOTES:
1. SOUND LEVEL 10 FEET FROM INVERTER IS 67 DECIBELS (PER SOLECTRIA XGI 1500-250 SERIES SPEC SHEET).
2. RURAL AMBIENT BACKGROUND SOUND 7AM TO 7PM = 45 DECIBELS PER ONTARIO MINISTRY OF AGRICULTURE.




# NOISE LEVEL EXHIBIT

SCALE: 1" = 300'

0 300' 600'

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ATWELL
866.850.4200 www.atwell-group.com
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NAPERVILLE, IL 60563
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NOT FOR CONSTRUCTION

IT IS A VIOLATION OF LAW FOR ANY PERSON TO ALTER ANY DOCUMENT WHICH BEARS THE SEAL OF A PROFESSIONAL ENGINEER, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

SPECIAL USE PERMIT SET
AMENT ROAD- KENDALL IL

PROJECT NUMBER:
22-4525

| REV | DATE | DRAWN | CHECKED | RELEASE LEVEL |
|---|---|---|---|---|
| | | | | |

SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTED ARCH D 24" X 36"

NOISE LEVEL EXHIBIT

C:\Users\vhelmine_newleafener\Box\Salesforce\Opportunities\Ament Road - Kendall IL\CAD_Ament Road\C-X.0 NOISE LEVEL EXHIBIT.dwg

## Matt Asselmeier

**From:** Erin Bowen <Erin.Bowen@CohnReznick.com>
**Sent:** Wednesday, October 23, 2024 2:35 PM
**To:** Matt Asselmeier
**Subject:** RE: [External]RE: Solar Property Value Studies Question

Matt,

Thanks. The two reports have the same conclusions that "the data indicates that solar facilities do not have a negative impact on adjacent property values". They include the same paired sales studies, although are in a slightly different order. The New Leaf report is dated March 2023, which mentions the recent publication of the academic study published by Lawrence Berkely National Lab which was published a couple of weeks before we submitted the report. The TPE report dated September, has a more in depth analysis of the study on pages 20-21. The TPE report also includes another example of new development adjacent solar facilities, a new 175-home subdivision next to the Portage Solar Farm in Indiana, presented on page 103 of the report.

I'd like to also bring to your attention a newer academic study not in either report, that was published last month that focusses on solar facilities in the Midwest:

> In September 2024 a study prepared by Simeng Hao and Gilbert Michaud of **Loyola University Chicago**'s School of Environmental Sustainability was published, "Assessing Property Value Impacts Near Utility-Scale Solar in the Midwestern United State". The study examined 70 utility-scale solar farms in the states of IL, IN, IA, KS, MI, MN, MO, NE, OH and WI, that were completed between 2009 and 2022 and measured over 20,800 average home values (AHV) from this time period. The study utilized difference-in-differences (DiD) models which compared the change in AHV for "treatment groups", zip codes which have a utility-scale solar projects, to the change in AHV for "control groups", zip codes that did not have a utility-scale solar project and were in the same state as the treatment groups. ***The results of the study indicate that utility-scale solar projects increase nearby property values by roughly 0.5-2.0 percent, with smaller projects (less than 20 MW) having more of a positive impact on nearby property values than project over 20 MW.***
>
> The study included models with unadjusted AHV (does not account for increase in value due to market conditions) and adjusted AHV (accounted for increase in value due to market conditions by utilizing the Case Schiller Index, which is measured using data on repeated sales of single-family homes over time). Both models indicated similar results, strengthening the finding of a positive correlation between utility-scale solar projects and nearby property values.
>
> The study further suggested, "the positive correlation between utility-scale solar projects and nearby property values could be due to the new tax revenues, which are often used to support local school and other public services, as well as the local employment opportunities that utility-cale solar projects can provide".

Let me know if you have any questions.

**Erin Bowen, MAI**
Director
Valuation Advisory
Value360

November 7, 2024

Kendall County Board
111 W. Fox Street
Yorkville, IL 60560

Dear Members of the Kendall County Board,

I am the landowner of the property on Ament Road where the solar farm is proposed. I am writing to express my support for the Ament Solar Farm's special use application. As a landowner and long-time resident of the area until recently, I have a deep connection to this community, and I believe that this project will be a positive and forward-thinking addition to our county.

I was born and raised in the house around corner of Ament Road and had lived here my entire life. My family and I have deep roots in this area, having been members of the nearby church for many generations. I personally attended the school associated with the church, and my parents were incredibly active in supporting both the church and its community.

When my parents passed away, they left a generous donation to the church, a testament to their lifelong commitment to this community. Additionally, my parents donated the land on which the cemetery sits today, and my father personally dug most of the graves there. His work and dedication to our community's spiritual and historical legacy are something I hold dear.

I share these details not to dwell on the past, but to highlight the enduring relationship my family has had with this land and this community. I believe the Ament Solar Farm aligns with the values of stewardship and long-term planning that my family has always embraced. The transition to renewable energy offers an opportunity to honor our land in a new way, while also providing sustainable benefits to the community.

The proposed solar farm will not only support environmental goals, but it will also provide clean, renewable energy for future generations. I believe this project represents a responsible, progressive use of the land that will have a minimal impact on the area while contributing to a greener future. The property will also continue to be farmed in front of the solar farm.

I strongly encourage the Board to approve the Ament Solar Farm's special use application and allow this important project to move forward. It is my hope that we can continue to preserve the legacy of our community while embracing opportunities for a brighter and more sustainable future.

Thank you for your time and consideration.

Sincerely,

[redacted]

**Matt Asselmeier**

**From:** Steve Grebner <sgrebner@kendalltwp.com>
**Sent:** Friday, November 22, 2024 1:01 PM
**To:** Nicholas Bellone; Matt Asselmeier; Tom Ryan
**Cc:** Steve Gengler; Cathy Scalise; Doug Westphal; jakecoopfarms[redacted] Don Hirsch; Carolyn Pottinger; Timothy Karales; Doug Thanepohn; bjandersonfarms[redacted] mikehomerding[redacted] mbsweeney919[redacted]
**Subject:** [External]Position of Kendall Township on the proposed Ament Road Solar Farm 1 LLC Special Use Permit Request 24-30

CAUTION - This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

ATTN: Kendall County Zoning Board et. al

Please note that on Monday November 18th the Kendall Township Planning Commission entertained New Leaf Energy Representatives to present the *AMENT ROAD SOLAR FARM 1 LLC* Project. While the individuals were forthcoming and answered the questions to the best of their ability, there were some major concerns. These concerns are addressed in the recommendations below:

The below was approved to be passed on to the full Kendall Township Board for review and vote.

*Motion by the Planning Commission regarding the Ament Solar 1 LLC.*

*The Planning Commission recommends approval of Petition 24-30 with these recommendations:*

*The entity will maintain and repair the subsurface drainage throughout the entirety of the lease to be repaired within the timeframe indicated in the special use permit (sup). The entity will commit to, as part of their maintenance schedule, perform a physical inspection of the property to include drain tile observation for damage and necessary repair. The surrounding property owners shall be provided a copy of the existing drain tile survey of subject property as well as any changes made as part of this project.*

*We would request that there be a subsurface drainage repair bond to ensure there are sufficient funds available for any required repair of materials and labor at the time of agreement. All replacement tile shall equal to or greater than its current flow.*

*The planning and zoning committee also recommends as part of the comprehensive MONITORING AND MANAGEMENT PLAN AMENT ROAD SOLAR FARM – KENDALL COUNTY (section 1-6) specific attention to the noxious weeds including but not limited to water hemp, and Giant Ragweed.*

However, the Full Township Board is concerned these recommendations may or may not be considered and may not have the ability to be applied to ANY AND ALL future owners of the subject property. That being said, the Township board is informing both the county Zoning Board and any decision-making bodies, that Kendall Township will table any decision until the following questions/issues/requests are resolved.

- That it appears specifically and in writing that any fiduciary instrument (i.e. Bond) be attached to the Title and or abstract of the Subject Property presently identified as *AMENT ROAD SOLAR FARM*. In so much as that responsibility will pass to any and all owners until the end of the deconstruction phase of the project.
- That the concerns expressed above regarding the subsoil drainage issues be specifically addressed in any SUP, and failure to do so will result in a violation of the terms of the agreement and a monetary penalty will be applied.
- That the concerns regarding the noxious weeds shall be specifically spelled out in the SUP and future agreements.

It is therefore the position of the Kendall Township Board that no action to approve this Project should go forward until the local body of government in which the project resides has these questions answered to their satisfaction.

In addition there was a request to the NewLeaf Representatives for contact information for non participating property owners for other completed projects that is as of yet outstanding.

The Next Kendall Township Planning Commission Meeting is presently scheduled for December 16th 2024 at 7:00 PM and the next full board meeting will be Tuesday December 17th at 7:30 PM

Steve Grebner, Clerk Kendall Township
Check out our New Township website by clicking the QR code

## Matt Asselmeier

**From:** Nicholas Bellone <nbellone@newleafenergy.com>
**Sent:** Tuesday, December 3, 2024 2:38 PM
**To:** Steve Grebner
**Cc:** Matt Asselmeier; Tom Ryan; Steve Gengler; Cathy Scalise; Doug Westphal; jakecoopfarms@gmail.com; Don Hirsch; Carolyn Pottinger; Timothy Karales; Doug Thanepohn; bjandersonfarms[redacted] mikehomerding@[redacted]; mbsweeney919[redacted] Nick Standiford
**Subject:** [External]Re: Position of Kendall Township on the proposed Ament Road Solar Farm 1 LLC Special Use Permit Request 24-30
**Attachments:** NLE Response Letter to Kendall Twp_241203.pdf

CAUTION - This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Afternoon,

In response to the email sent by the Kendall Township Board, New Leaf has put together the attached memo to help address the concerns. We are happy to be put on the next township agenda for December 16th and 17th to go over these concerns and our solutions. In the meantime feel free to reach out with any additional questions or comments.

It is important to us that the Township's concerns are addressed prior to attending the hearings at the county level. With that said, we would like to request a continuance on our Kendall County hearing dates (RPC: Dec. 11th & ZBA: Dec. 16th) to the following month (RPC: Jan. 22nd & ZBA : Jan. 27th) in hopes that these have been resolved.

Thank you,
Nick

**Nicholas Bellone**
Civil Project Engineer I

nbellone@newleafenergy.com Cell: 401.644.6824

On Fri, Nov 22, 2024 at 2:01 PM Steve Grebner <sgrebner@kendalltwp.com> wrote:

ATTN: Kendall County Zoning Board et. al

Please note that on Monday November 18th the Kendall Township Planning Commission entertained New Leaf Energy Representatives to present the *AMENT ROAD SOLAR FARM 1 LLC* Project. While the

**Ament Solar 1, LLC (Kendall County Petition 24-30)**

December 3, 2024

**VIA EMAIL**
Kendall Township
c/o Steve Grebner, Clerk
sgrebner@kendalltwp.com

**RE: Ament Solar 1, LLC's Response to Kendall Township**

Dear Members of the Kendall Township Board,

New Leaf Energy / Ament Solar 1, LLC (the Applicant) is in receipt of the Township's emailed plan review comments from November 22, 2024. In its correspondence, the Township listed three (3) proposed conditions that the Township's Planning Commission recommended after New Leaf representatives presented about the proposed 5-megawatt commercial solar energy facility to be located on Ament Road (Kendall County Petition 24-30). The Township's correspondence also included certain questions, issues, and requests from the Township Board. In the Township's correspondence, it requested that the County table any decision on Petition 24-30 until the Township's comments are resolved.

In the hopes of receiving a positive recommendation from the Township, the Applicant hereby requests that the County continue its upcoming public hearings to January 22, 2025 (for the Regional Planning Commission) and January 27, 2025 (for the County's Zoning Board of Appeals). As for the Township Planning Commission's proposed conditions and the Township Board's questions, issues, and requests, the Applicant responds as follows:

**Township Planning Commission's Proposed Conditions**

1. The entity will maintain and repair the subsurface drainage throughout the entirety of the lease to be repaired within the timeframe indicated in the special use permit (sup). The entity will commit to, as part of their maintenance schedule, perform a physical inspection of the property to include drain tile observation for damage and necessary repair. The surrounding property owners shall be provided a copy of the existing drain tile survey of subject property as well as any changes made as part of this project.
   **The Applicant agrees to comply with Section 36-282(17)(o) of the Kendall County Zoning Ordinance, which requires the Applicant to repair or pay for repairs to damages to the drainage system within a reasonable time after construction. A**

**copy of Kendall County's Solar and Wind Ordinance is enclosed herewith for the Township's reference. *See* Zoning Ord., §36-282(17)(o) ("[t]he facility owner shall repair or pay for the repair of all damage to the drainage system caused by the construction of the commercial solar energy system within a reasonable time after construction of the commercial solar energy facility is complete. The specific time shall be set in the special use permit.").**

**The Applicant will repair any damaged drain tiles in the project limits prior to commercial operation of the solar farm. The Applicant will also repair any damaged drain tile in the project limits that occurs after decommissioning. There is not anticipated to be any damaged drain tile while the project is operating, as there will be no site activities other than power generation and maintenance. However, the applicant agrees to repair any drain tile malfunctions that occur within the project limits during the project's operational lifespan. As for a drain tile study, the Applicant provided a preliminary drain tile study to the County. A copy is enclosed for the Township's reference. The Applicant agrees to provide a copy of the final drain tile study to the adjacent property owners after the study is completed. The Applicant also agrees to provide a copy of the final drain tile study to the Township.**

2. We would request that there be a subsurface drainage repair bond to ensure there are sufficient funds available for any required repair of materials and labor at the time of agreement. All replacement tile shall equal to or greater than its current flow.
**As set forth above, the Applicant agrees to comply with Section 36-282(17)(o) of the County's Zoning Ordinance, which requires that damaged drain tile be repaired within a reasonable time after the construction of the solar farm.**

**Additionally, County staff has recommended several conditions for the special use (the Conditions). A copy of the County's Staff Report for Petition 24-30 is enclosed herewith. The Applicant agrees to comply with the Conditions, including but not limited to Condition #10, which requires that all conditions and restrictions be followed or the special use permit could be amended or revoked. *See* Staff Report, p. 8, Condition #10 ("Failure to comply with one or more of the above conditions or restrictions could result in the amendment or revocation of the special use permit.")**

3. The planning and zoning committee also recommends as part of the comprehensive MONITORING AND MANAGEMENT PLAN AMENT ROAD SOLAR FARM – KENDALL COUNTY (section 1-6) specific attention to the noxious weeds including but not limited to water hemp, and Giant Ragweed.

**The Applicant agrees to comply with Section 36-282(17)(m) of the County's Zoning Ordinance, which requires the Applicant to install vegetative groundcover consistent with state law and IDNR guidelines. *See* Zoning Ord., §36-282(17)(m) ("A commercial solar energy facility owner shall plant, establish, and maintain for the life of the facility vegetative ground cover consistent with State law and the guidelines of the Illinois Department of Natural Resources' vegetative management plans. The vegetation management plan shall be required at the time of application submittal.")**

**The Applicant also agrees to comply with the County's proposed Condition #1, which requires that the site be developed in accordance with the submitted site plan and vegetative management plan. *See* County's Staff Report, p. 7, Condition #1. In this case, the Applicant's Management and Monitoring (M&M) plan (enclosed for the Township's reference) states that:**

- **"Mow[ing] (including weed whipping) the planted areas to a height of 8-12 inches, 3 times during the early growing season or as needed to control non-native and invasive annual species." *See* M&M Plan, p. 6.**
- **"As the planted areas mature… the plant communities will stabilize and be effectively managed through a reduced schedule of spot mowing, selective herbicide application, and hand pulling as necessary." *See* M&M Plan, p. 7.**

**To further satisfy the concerns of the Township in regards to the noxious weeds of water hemp and giant ragweed, the Applicant modified Section 2.4 of its Monitoring and Management Plan to state:**

- **"At the end of each growing season, none of the three most dominant species within the planted areas shall be non-native, invasive, or noxious weed species, including but not limited to: Giant and Common Ragweed (Ambrosia trifida & artemisiifolia), Wild Carrot (Daucus carota), Purple Loosestrife (Lythrum salicaria), Teasel (Dipsacus spp.), Reed Canary Grass (Phalaris arundinacea), Sweet Clover (Melilotus spp.), Common Buckthorn (Rhamnus cathartica), Kentucky Blue Grass (Poa pratensis), Thistle (Cirsium spp.), Honeysuckle (Lonicera sp.), Common Reed (Phragmites australis), Sandbar Willow (Salix interior), and Water Hemp (Amaranthus tuberculatus)." *See* M&M Plan, pp. 5-6.**

**The Applicant also agrees to comply with the County's proposed Condition #9, which requires all laws to be follows, including noxious weed laws. *See* County's Staff Report, p. 8, Condition #9 ("The property owner and operator of the use allowed by this special use permit shall follow all applicable Federal, State, and**

**Local laws related to the operation of this type of use." Noxious weed laws are currently in effect that would require the removal of water hemp and giant ragweed.**

**The Applicant also agrees to comply with the County's proposed Condition #10, which conditions the special use permit on compliance with its terms and conditions. *See* County's Staff Report, p. 8, Condition #10 ("Failure to comply with one or more of the above conditions or restrictions could result in the amendment or revocation of the special use permit.").**

**Township Board's Questions, Issues, and Requests**

4. The Township Board voiced concerns as to whether the Recommendations would apply to "ANY AND ALL future owners of the subject property."
   **The Applicant agrees to comply with the County's proposed Condition #12, which treats the approval as a covenant running with the land and binding on successors, heirs and assigns. *See* County's Staff Report, p. 10, Condition #12. ("This special use permit and variance shall be treated as a covenant running with the land and is binding on the successors, heirs, and assigns as to the same special use conducted on the property.")**

5. That it appears specifically and in writing that any fiduciary instrument (i.e. Bond) be attached to the Title and or abstract of the Subject Property presently identified as AMENT ROAD SOLAR FARM. In so much as that responsibility will pass to any and all owners until the end of the deconstruction phase of the project.
   **The Applicant agrees to comply with Section 36-282(17)(g) of the County's Zoning Ordinance, which requires the Applicant to comply with its decommissioning obligations under its Agricultural Impact Mitigation Agreement. *See* Zoning Ord., §36-282(17)(g) ("The County shall not require standards for construction, decommissioning, or deconstruction of a commercial solar energy system or related financial assurances to be more restrictive than agricultural impact mitigation agreement set in State law. The amount of any decommissioning payment shall be limited to the cost identified in the decommissioning or deconstruction plan, as required by the agricultural impact mitigation agreement, minus the salvage value of the project. A copy of the agricultural impact mitigation agreement shall be submitted with the application materials.").**

   **A copy of the AIMA that the Applicant submitted to the County is enclosed for the Township's reference. As set forth in the AIMA, if the Applicant does not decommission the site, then the County may draw on the decommissioning**

**bond, which is $425,897.37. *See* Decommissioning Estimate, p. 6; *see also* AIMA p. 12, §17(F) ("Upon Abandonment, the County may take all appropriate actions for Deconstruction including drawing upon the Financial Assurance."). There would be no need to record the bond on the subject property, as it will be provided to the County.**

6. That the concerns expressed above regarding the subsoil drainage issues be specifically addressed in any SUP, and failure to do so will result in a violation of the terms of the agreement and a monetary penalty will be applied.
   **The Applicant agrees to comply with Section 36-282(17)(o) of the County's Zoning Ordinance, which requires the Applicant to repair or pay for repairs to damages to the drainage system within a reasonable time after construction.**

   **The Applicant also agrees to comply with the County's proposed Condition #10, which conditions the special use permit on compliance with its terms and conditions. *See* County's Staff Report, p. 8, Condition #10.**

   **The Applicant also agrees to comply with the County's proposed Condition #12, which treats the approval as a covenant running with the land and binding on successors, heirs and assigns. *See* County's Staff Report, p. 9, Condition #12. ("This special use permit and variance shall be treated as a covenant running with the land and is binding on the successors, heirs, and assigns as to the same special use conducted on the property.").**

7. That the concerns regarding the noxious weeds shall be specifically spelled out in the SUP and future agreements.
   ***See* Response to Item #3, above.**

8. It is therefore the position of the Kendall Township Board that no action to approve this Project should go forward until the local body of government in which the project resides has these questions answered to their satisfaction.
   **The Applicant believes that the above responses satisfy the Township's questions, issues, and requests. The Applicant is available to answer questions at the Kendall Township Planning Commission meeting on December 16th and Board meeting on December 17th. Given that the Township Board will not have its recommendation for Petition 24-30 before the RPC or ZBA dates (on December 11th and December 16th, respectively), the Applicant agrees to continue the County's public hearings to January 22, 2025 (for the Regional Planning Commission) and January 27, 2025 (for the County's Zoning Board of Appeals).**

9. In addition there was a request to the NewLeaf Representatives for contact information for non participating property owners for other completed projects that is as of yet outstanding.
   **The contact information of non-participating parcels surrounding previous New Leaf Energy projects is publicly available. New Leaf Energy can supply information pertaining to previous projects if needed. New Leaf representatives are available to answer questions about their projects at the upcoming meetings.**

10. The Next Kendall Township Planning Commission Meeting is presently scheduled for December 16th 2024 at 7:00 PM and the next full board meeting will be Tuesday December 17th at 7:30 PM.
    **Thank you – a New Leaf representative will plan to attend and answer any questions in hopes of receiving a positive recommendation from the Township.**

Sincerely,

Tom Ryan

Senior Project Developer, New Leaf Energy

Cc: Matt Asselmeier, AICP, CFM - masselmeier@kendallcountyil.gov

Encl. Kendall County Solar and Wind Ordinance
Kendall County Staff Report
Preliminary Drain Tile Study
Management and Monitoring Plan
Decommissioning Estimate
Agricultural Impact Mitigation Agreement

# Kendall County Solar and Wind Ordinance

State of Illinois
County of Kendall

Zoning Petition
#23-12

**ORDINANCE NUMBER 2023- 24**

**TEXT AMENDMENTS PERTAINING TO THE REGULATION OF COMMERCIAL SOLAR ENERGY FACILITIES, COMMERCIAL WIND ENERGY FACILITIES, TEST SOLAR ENERGY FACILITIES, TEST WIND TOWERS, SMALL WIND ENERGY SYSTEMS, PRIVATE SOLAR ENERGY SYSTEMS, COMMERCIAL WIND FARMS, SOLAR GARDENS, AND SOLAR FARMS IN THE KENDALL COUNTY ZONING ORDINANCE**

*WHEREAS*, Public Act 102-1123, enacted by the State of Illinois on January 27, 2023, amended the Illinois Counties Code by allowing counties to establish certain zoning and permitting regulations for commercial solar energy facilities, commercial wind energy facilities, test solar energy facilities, and test wind towers; and

*WHEREAS*, Section 13:07 of the Kendall County Zoning Ordinance permits the Kendall County Board to approve text amendments and provides the procedure through which text amendments are granted; and

*WHEREAS*, the Kendall Planning, Building and Zoning Committee, hereinafter be referred to as "Petitioner", desires to have regulations for commercial solar energy facilities, commercial wind energy facilities, test solar energy facilities, and test wind towers in compliance with Public Act 102-1123; and

*WHEREAS*, on February 9, 2023, the Petitioner submitted text amendments to the Kendall County Zoning Ordinance amending, adding, and deleting regulations pertaining to commercial solar energy facilities, commercial wind energy facilities, test solar energy facilities, test wind towers, small wind energy systems, private solar energy systems, commercial wind farms, solar gardens, and solar farms; and

*WHEREAS*, following due and proper notice by publication in the Kendall County Record on March 2, 2023, the Kendall County Zoning Board of Appeals conducted a public hearing on March 27, 2023, at 7:00 p.m., in the County Office Building at 111 W. Fox Street in Yorkville, at which the Petitioner's representative presented evidence, testimony, and exhibits in support of the requested text amendments and zero members of the public testified in favor or in opposition to the request and two members of the public asked questions and provided suggested amendments regarding aspects of the proposal; and

*WHEREAS*, based on the evidence, testimony, and exhibits, the Kendall County Zoning Board of Appeals has recommended approval of the text amendments on March 27, 2023, with an amendment requiring Petitioners for commercial wind and commercial solar projects to notify the drainage district, if the property is in a drainage district, of the proposal by certified, return receipt mail and that proof of the mailing be submitted at the time of application; and

*WHEREAS*, the Kendall County Planning, Building and Zoning Committee of the Kendall County Board has reviewed the testimony presented at the aforementioned public hearing, and has forwarded to the Kendall County Board a recommendation of approval of the requested text amendments; and

*WHEREAS*, the Kendall County Board has considered the recommendations of the Planning, Building and Zoning Committee and the Kendall County Zoning Board of Appeals, and has determined that said petition is in conformance with the provisions and intent of the Kendall County Zoning Ordinance; and

*NOW, THEREFORE, BE IT ORDAINED, BY THE COUNTY BOARD OF KENDALL COUNTY, ILLINOIS,* that the Kendall County Zoning Ordinance be amended as follows:

I. Recitals: The recitals set forth above are incorporated as if fully set forth herein.

II. Amended Text: Section 3:02 of the Kendall County Zoning Ordinance is hereby amended by deleting the following terms:

Grid-Interie Solar Energy System.
Ground Mount Solar Energy System.
Passive Solar Energy System.
Photovoltaic System.
Solar Access.
Solar Energy Easement.
Solar Energy System Addition.
Solar Farm.
Solar Garden.
Solar Heat Exchanger.
Solar Mounting Devices.
Solar Storage Unit.
Wind Farm, Commercial.

III. Amended Text: Section 3:02 of the of the Kendall County Zoning Ordinance is hereby amended by deleting the present definition of Building Integrated Solar Energy System replacing it with the following:

"BUILDING-INTEGRATED SOLAR ENERGY SYSTEMS. An active solar energy system that is an integral part of a principal or accessory building, rather than a separate mechanical device, replacing or substituting for an architectural or structural component of the building. Building-integrated systems include but are not limited to photovoltaic or hot water solar energy systems that are contained within roofing materials, windows, skylights, and awnings."

IV. Amended Text: Section 3:02 of the of the Kendall County Zoning Ordinance is hereby amended by deleting the present definition of Solar Energy System, Private and replacing it with the following:

"SOLAR ENERGY SYSTEM, PRIVATE. A collection of one (1) or more solar collectors designed for use by the occupant(s) of the zoning lot, planned development, commercial and industrial park, or subdivision on which or in which said system is located; excess power generation is limited to net metering or similar technology with regulations set by the local power utility, community, county, and state. Private solar energy system equipment shall conform to applicable industry standards, and applicants for building permits for private solar energy systems shall submit certificates from equipment manufacturers that the equipment is manufactured in compliance with industry standards."

V. Amended Text: Section 3:02 of the of the Kendall County Zoning Ordinance is hereby amended by deleting the present definition of Wind Energy System, Small and replacing it with the following:

"WIND ENERGY SYSTEM, SMALL A wind energy conversion system consisting of a wind turbine, a tower, and associated control or conversion electronics, which has a rated capacity that does not meet the kilowatt capacity in total nameplate generating capacity as defined by 55 ILCS 5/5-12 and which is intended to primarily reduce onsite consumption of utility power. If all applicable regulations are met a small wind energy system may contain more than one wind energy conversion system. This system may power properties in planned developments, commercial and industrial parks, or subdivisions on which or in which said system is located."

VI. Amended Text: Section 3:02 of the of the Kendall County Zoning Ordinance is hereby amended by adding the following terms in the appropriate places alphabetically to the list of definitions:

"COMMERCIAL SOLAR ENERGY FACILITY. Shall have the same meaning as defined in 55 ILCS 5/5-12."

"COMMERCIAL WIND ENERGY FACILITY. Shall have the same meaning as defined in 55 ILCS 5/5-12."

"FACILITY OWNER. For the purposes of commercial solar energy facilities and commercial wind energy facilities, a facility owner shall have the same meaning defined in 55 ILCS 5/5-12."

"NONPARTICIPATING PROPERTY. For the purposes of commercial solar energy facilities and commercial wind energy facilities, a nonparticipating property shall have the same meaning as defined in 55 ILCS 5/5-12."

"NONPARTICIPATING RESIDENCE. For the purposes of commercial solar energy facilities and commercial wind energy facilities, a nonparticipating residence shall have the same meaning as defined in 55 ILCS 5/5-12."

"OCCUPIED COMMUNITY BUILDING. For the purposes of commercial solar energy facilities and commercial wind energy facilities, an occupied community building shall have the same meaning as defined in 55 ILCS 5/5-12."

"PARTICIPATING PROPERTY. For the purposes of commercial solar energy facilities and commercial wind energy facilities, a participating property shall have the same meaning as defined in 55 ILCS 5/5-12."

"PARTICIPATING RESIDENCE. For the purposes of commercial solar energy facilities and commercial wind energy facilities, a participating residence shall have the same meaning as defined in 55 ILCS 5/5-12."

"PROTECTED LANDS. For the purposes of commercial solar energy facilities and commercial wind energy facilities, protected lands shall have the same meaning as defined in 55 ILCS 5/5-12."

"SUPPORTING FACILITIES. For the purposes of commercial solar energy facilities and commercial wind energy facilities, supporting facilities shall have the same meaning as defined in 55 ILCS 5/5-12."

"WIND TOWER. For the purposes of commercial solar energy facilities and commercial wind energy facilities, a wind tower shall have the same meaning as defined in 55 ILCS 5/5-12."

VII. Amended Text: Section 4:05.A.12 of the of the Kendall County Zoning Ordinance is hereby amended by deleting the present text and replacing it with the following:

"12. Small wind energy system (Permitted as Accessory Use only in the A-1, R-1, R-2, R-3, and all Business and Manufacturing Districts – may also be approved as part of a Residential Planned Development) subject to the conditions of Section 4:17."

VIII. Amended Text: Section 4:05.A.13 of the of the Kendall County Zoning Ordinance is hereby amended by deleting the present text and replacing it with the following:

"13. Solar Energy System, Private subject to the conditions of Section 4:18."

IX. Amended Text: Section 4:17.H of the of the Kendall County Zoning Ordinance is hereby amended by deleting the present text and replacing it with the following:

"H. Visual Effects and Safety. All reasonable visual and safety concerns of adjacent property owners must be resolved before Construction Permit will be issued."

X. Amended Text: Section 4:18 of the of the Kendall County Zoning Ordinance is hereby amended by deleting the present text and replacing it with the following:

"4:18 SOLAR ENERGY SYSTEM, PRIVATE

A. Roof Mounted for On-Site Energy Consumption. Solar panels located on the roof of an existing structure shall be permitted in all districts. Roof mounted solar energy systems shall not extend beyond the exterior perimeter of the building on which the system is mounted. Roof mounted solar energy systems shall not exceed the maximum allowed height in any zoning district. Roof mounted or building integrated private solar energy systems for residential or business use shall be considered an accessory use in all zoning districts where there is a principal structure and shall meet the regulations of the Kendall County Zoning Ordinance. Roof mounted solar panels used as accessory to agricultural uses and which the energy generated from the solar panels is consumed on-site shall be exempt from building permits. The use of roof mounted solar panels for on-site energy consumption

shall comply with all applicable federal, state, and local laws and the rules of the local electrical utility.

B. Freestanding for On-Site Energy Consumption. Solar panels located on the ground or attached to a framework located on the ground shall be classified as accessory structures in all zoning districts provided that the system is no larger than necessary to provide one hundred twenty percent (120%) of the electrical and/or thermal requirements of the structure, planned development, commercial and industrial park, or subdivision to which it is accessory as determined by a contractor licensed to install photovoltaic and thermal solar energy systems. Freestanding solar energy systems, private may be the first structure constructed on lots zoned residential, business, or manufacturing. Freestanding solar panels shall be permitted if they comply with the standards listed in the Kendall County Zoning Ordinance. Ground or pole mounted solar energy systems shall not exceed the maximum height, when oriented at maximum tilt, for the zoning district in which it is located. Freestanding solar panels used as accessory to agricultural uses and which the energy generated from the solar panels is consumed on-site shall be exempt from building permits. The use of freestanding solar panels for on-site energy consumption shall comply with all applicable federal, state, and local laws and the rules of the local electrical utility.

C. Setback Requirements. Unless otherwise stated in the Kendall County Zoning Ordinance, the setback requirements for all solar energy systems shall meet the structure minimum setback requirements when the solar energy system is oriented at any and all positions. No solar energy system shall be located in any front yard of any residentially zoned or used property.

D. Design Standards. Active solar energy systems shall be designed to conform to the County's Land Resource Management Plan and to blend into the architecture of the building or may be required to be screened from the routine view from public rights-of-way other than alleys. Screening may be required to the extent it does not affect the operation of the system. The color of the solar collector is not required to be consistent with other roofing materials.

1. Building integrated photovoltaic solar energy systems shall be allowed regardless of whether the system is visible from the public right-of-way, provided the building component in which the system is integrated meets all required setback, land use or performance standards for the district in which the building is located.

2. Solar energy systems using roof mounting devices or ground-mount solar energy systems shall not be restricted if the system is not visible from the closest edge of any public right-of-way or immediately adjacent to a residential structure.

3. All solar energy systems using a reflector to enhance solar production shall minimize glare from the reflector affecting adjacent or nearby properties. Measures to minimize glare include selective placement of the system, screening on the north side of the solar array, modifying the orientation of the system, reducing use of the reflector system, or other remedies that limit glare.

4. Damaged field drain tile shall be repaired or rerouted on a timetable approved by the Kendall County Planning, Building and Zoning Department.

E. Coverage. Roof or building mounted solar energy systems, excluding building-integrated systems, shall allow for adequate roof access for firefighting purposes to the south-facing or flat roof upon which the panels are mounted. Ground-mount private solar energy systems shall be exempt from impervious surface calculations if the soil under the collector is not compacted and maintained in vegetation. Foundations, gravel, or compacted soils are considered impervious.

F. Plan Approval Required. All solar energy systems shall require administrative plan approval by the Kendall County Building Official via the review of the application for a building permit.

1. Plan applications for solar energy systems shall be accompanied by horizontal and vertical (elevation) drawings. The drawings must show the location of the system on the building or on the property for a ground-mount system including the property lines.

2. For all roof-mounted systems other than a flat roof, the elevation must show the highest finished slope of the solar collector and the slope of the finished roof surface on which it is mounted.

3. For flat roof applications, a drawing shall be submitted showing the distance to the roof edge and any parapets on the building shall identify the height of the building on the street frontage side, the shortest distance of the system from the street frontage edge of the building, and the highest finished height of the solar collector above the finished surface of the roof.

4. Applications that meet the design requirements of the Kendall County Zoning Ordinance and do not require an administrative variance shall be granted administrative approval by the Zoning Administrator and not require Planning, Building and Zoning Committee review. Plan approval does not indicate compliance with Building or Electrical Codes.

G. Approved Solar Components. Electric solar energy system components must have a UL listing approved equivalent and solar hot water systems must have an SRCC rating.

H. Compliance with Building Code. All active solar energy systems shall meet approval of County building officials; solar thermal systems shall comply with HVAC-related requirements of the Illinois State Energy Code. All County adopted building codes will apply and take precedence where applicable.

I. Utility Notification. All grid-intertie solar energy systems shall comply with the interconnection requirements of the electric utility. Off-grid systems are exempt from this requirement.

J. Building Permit Requirements and Fees. All solar energy systems will be required to have a Kendall County Building Permit before any work can be started. A written plan and a plat/drawing for the proposed solar energy system shall be provided with the Building Permit Application. The

plat/drawing must show the location of the system on the building or on the property, (for a ground-mount system show arrangement of panels), with all property lines and set back footages indicated. Fees for processing the applications for building permits shall be established by the County Board. Any solar energy system that construction has started before a Building Permit has been applied and paid for will be charged double the permit fee. The above fees do not apply to solar energy systems used to generate energy for on-site consumption of energy for agricultural purposes.

K. Decommissioning Plan.

1. Upon the request of the Kendall County Planning, Building and Zoning Department, an owner of a solar energy system must provide documentation, within thirty (30) days, that the solar energy system is still in use. If the solar energy system is not in use, the owner of the system shall have 180 days, after notification from the Kendall County Planning, Building and Zoning Department, to remove the solar energy system from the property.

2. Decommission of solar panels must occur in the event they are not in use for ninety (90) consecutive days.

L. Other Requirements.

1. No fencing is required; however, if installed on the property the fencing shall have a maximum height of eight feet (8'). The fence shall contain appropriate warning signage that is posted such that is clearly visible on the site.

2. Reflection angles for solar collectors shall be oriented such that they do not project glare onto adjacent properties.

3. Electric solar energy system components must have a UL listing and must be designed with anti-reflective coating(s).

4. Solar energy systems must be in compliance with all State of Illinois Plumbing and Energy Codes.

5. For solar energy systems located within five hundred feet (500') of an airport or within approach zones of an airport, the applicant must complete and provide the results of the Solar Glare Hazard Analysis Tool (SGHAT) for the Airport Traffic Control Tower cab and final approach paths, consistent with the Interim Policy, FAA Review of Solar Energy Projects on Federally Obligated Airports, or most recent version adopted by the FAA.

M. Applicability. The regulations in this Section apply only to solar energy system, private and do not apply to commercial solar energy facilities."

XI. Amended Text: Section 7:01.D of the of the Kendall County Zoning Ordinance is hereby amended by adding the following use to appropriate place alphabetically to the list of special uses:

"Commercial Solar Energy Facility and Test Solar Energy Systems subject to the following conditions:

a. All commercial solar energy facilities and test solar energy systems located within one point five (1.5) miles of a municipality shall either annex to the municipality or obtain an annexation agreement with the municipality requiring the municipality's regulations to flow through the property.

b. The setbacks for commercial solar energy facilities shall be measured from the nearest edge of any component of the facility as follows:

| | |
|---|---|
| Occupied Community Buildings or Dwellings on Nonparticipating Properties | One hundred fifty feet (150') from the nearest point on the outside wall of the structure |
| Boundary Lines of Participating Properties | None |
| Boundary Lines of Nonparticipating Properties | Fifty feet (50') to the nearest point on the property line of the nonparticipating property |
| Public Road Rights-Of-Way | Fifty feet (50') from the nearest edge |

The above setbacks do not exempt or excuse compliance with electric facility clearances approved or required by the National Electrical Code, the National Electrical Safety Code, Illinois Commerce Commission, Federal Energy Regulatory Commission, and their designees or successors.

c. A commercial solar energy facility's perimeter shall be enclosed by fencing having a height of at least six feet (6') and no more than twenty-five feet (25').

d. No component of a solar panel as part of a commercial solar energy facility shall have a height of more than twenty feet (20') above ground when the solar energy facility's arrays are at full tilt.

e. The above setback, fencing, and component height requirements may be waived subject to written consent of the owner of each affected nonparticipating property. This written consent shall be submitted at the time of application submittal.

f. Sound limitations for components in commercial solar energy facilities shall follow the sound

limitations established by the Illinois Pollution Control Board.

g. The County shall not require standards for construction, decommissioning, or deconstruction of a commercial solar energy system or related financial assurances to be more restrictive than agricultural impact mitigation agreement set in State law. The amount of any decommissioning payment shall be limited to the cost identified in the decommissioning or deconstruction plan, as required by the agricultural impact mitigation agreement, minus the salvage value of the project. A copy of the agricultural impact mitigation agreement shall be submitted with the application materials.

h. A vegetative screening shall be placed around the commercial solar energy facility.

i. Commercial solar energy facility applicants shall provide the results and recommendations from consultations with the Illinois Department of Natural Resources obtained through the Ecological Compliance Assessment Tool (EcoCat) or a comparable successor tool. The commercial solar energy facility applicant shall adhere to the recommendations provided through this consultation.

j. Commercial solar energy facility applicants shall provide the results of the United States Fish and Wildlife Service's Information for Planning and Consulting environmental review or a comparable successor toll that is consistent with the U.S. Fish and Wildlife Service's Land-Based Wind Energy Guidelines and any applicable United States Fish and Wildlife Service solar wildlife guidelines that have been subject to public review.

k. A facility owner shall demonstrate avoidance of protected lands as identified by the Illinois Department of Natural Resources and the Illinois Nature Preserve Commission or consider the recommendations of the Illinois Department of Natural Resources for setbacks from protected lands, including areas identified by the Illinois Nature Preserve Commission.

l. A facility owner shall provide evidence at the time of application submittal of consultation with the Illinois State Historic Preservation Office to assess potential impacts on State-registered historic sites under applicable State law.

m. A commercial solar energy facility owner shall plant, establish, and maintain for the life of the facility vegetative ground cover consistent with State law and the guidelines of the Illinois Department of Natural Resources' vegetative management plans. The vegetation management plan shall be required at the time of application submittal.

n. The facility owner shall enter into a road use agreement with the jurisdiction having control over the applicable roads. The road use agreement shall follow applicable law. The facility owner shall supply the Kendall County Planning, Building and Zoning Department with a copy of the road use agreement. This provision shall be waived if the jurisdiction having control over the applicable roads does not wish to enter into an agreement.

o. The facility owner shall repair or pay for the repair of all damage to the drainage system caused by the construction of the commercial solar energy system within a reasonable time after construction of the commercial solar energy facility is complete. The specific time shall be set in the special use permit."

XII. Amended Text: Section 7:01.D of the of the Kendall County Zoning Ordinance is hereby amended by adding the following use to appropriate place alphabetically to the list of special uses:

"Commercial Wind Energy Facility and Test Wind Towers subject to the following conditions:

a. The following conditions apply to all commercial wind energy facilities located outside the one point five (1.5) mile zoning jurisdiction of municipalities and within the one point five (1.5) mile zoning jurisdictions of municipalities under intergovernmental agreements with the County for zoning services. All commercial wind energy facilities located within one point five (1.5) miles of a municipality shall either annex to the municipality or obtain an annexation agreement with the municipality requiring the municipality's regulations to flow through the property, unless not required to do so by applicable law.

b. The setbacks for wind towers as measured from the center of the base of the wind tower shall be as follows:

| | |
|---|---|
| Occupied Community Buildings or Nonparticipating Residences | Two point one (2.1) times the maximum blade tip height of the wind tower to the nearest point on the outside wall of the structure |
| Participating Residences | One point one (1.1) times the maximum blade tip height of the wind tower to the nearest point on the outside wall of the structure |
| Boundary Lines of Participating Properties | None |
| Boundary Lines of Nonparticipating Properties | One point one (1.1) times the maximum blade tip height of the wind tower to the nearest point on the property line of the nonparticipating property |
| Public Road Rights-Of-Way | One point one (1.1) times the maximum blade tip height of the wind tower to the center point of the public road right-of-way |

| | |
|---|---|
| Overhead Communication and Electric Transmission and Distribution Facilities (Not Including Overhead Utility Service Lines to Individual Homes or Outbuildings) | One point one (1.1) times the maximum blade tip height of the wind tower to the nearest edge of the property line, easement, or right-of-way containing the overhead line |
| Overhead Utility Service Lines to Individual Houses or Outbuildings | None |
| Fish and Wildlife Areas and Illinois Nature Preserve Commission Protected Lands | Two point one (2.1) times the maximum blade tip height of the wind tower to the nearest point on the property line of the fish and wildlife or protected land |

The above setbacks do not exempt or excuse compliance with electric facility clearances approved or required by the National Electrical Code, the National Electrical Safety Code, Illinois Commerce Commission, Federal Energy Regulatory Commission, and their designees or successors.

A wind tower of a commercial wind energy facility shall be sited so that industry standard computer modeling indicates that any occupied community building or nonparticipating residence will not experience more than thirty (30) hours per year of shadow flicker under planned operating conditions.

The above setback may be waived subject to written consent of the owner of each affected nonparticipating property. This written consent shall be submitted at the time of application submittal.

c. Sound limitations for wind towers in commercial wind energy facilities shall follow the sound limitations established by the Illinois Pollution Control Board.

d. The County shall not require standards for construction, decommissioning, or deconstruction of a commercial wind energy system or related financial assurances to be more restrictive than agricultural impact mitigation agreement set in State law. The amount of any decommissioning payment shall be limited to the cost identified in the decommissioning or deconstruction plan, as required by the agricultural impact mitigation agreement, minus the salvage value of the project. A copy of the agricultural impact mitigation agreement shall be submitted with the application materials.

e. A vegetative screening shall be placed around the commercial wind energy facility.

f. The commercial wind energy facility shall follow applicable federal regulations pertaining to blade tip height maximums.

g. Commercial wind energy systems applicants shall provide the results and recommendations from consultations with the Illinois Department of Natural Resources obtained through the Ecological Compliance Assessment Tool (EcoCat) or a comparable successor tool. The commercial wind energy system applicant shall adhere to the recommendations provided through this consultation.

h. Commercial wind energy systems applicants shall provide the results of the United States Fish and Wildlife Service's Information for Planning and Consulting environmental review or a comparable successor toll that is consistent with the U.S. Fish and Wildlife Service's Land-Based Wind Energy Guidelines and any applicable United States Fish and Wildlife Service solar wildlife guidelines that have been subject to public review.

i. A facility owner shall demonstrate avoidance of protected lands as identified by the Illinois Department of Natural Resources and the Illinois Nature Preserve Commission or consider the recommendations of the Illinois Department of Natural Resources for setbacks from protected lands. including areas identified by the illinois Nature Preserve Commission.

j. A facility owner shall provide evidence at the time of application submittal of consultation with the Illinois State Historic Preservation Office to assess potential impacts on State-registered historic sites under applicable State law.

k. The facility owner shall enter into a road use agreement with the jurisdiction having control over the applicable roads. The road use agreement shall follow applicable law. The facility owner shall supply the Kendall County Planning, Building and Zoning Department with a copy of the road use agreement. This provision shall be waived if the jurisdiction having control over the applicable roads does not wish to enter into an agreement.

l. The facility owner shall repair or pay for the repair of all damage to the drainage system caused by the construction of the commercial wind energy system within a reasonable time after construction of the commercial wind energy facility is complete. The specific time shall be set in the special use permit."

XIII. Amended Text: Section 7:01.D of the of the Kendall County Zoning Ordinance is hereby amended by adding deleting the following uses from the appropriate places alphabetically from the list of special uses:

Solar Gardens.
Solar Farms.
Wind, Farms Commercial

XIV. Amended Text: Section 7:01.E of the of the Kendall County Zoning Ordinance is hereby amended by adding deleting the following use from the appropriate place alphabetically from the list of conditional uses:

Small Wind Energy Systems.

XV. Amended Text: Section 8:02.B of the of the Kendall County Zoning Ordinance is hereby amended by adding deleting the following use from the appropriate place alphabetically from the list of conditional uses:

Small Wind Energy Systems.

XVI. Amended Text: Section 8:02.C of the of the Kendall County Zoning Ordinance is hereby amended by adding the following uses to the appropriate places alphabetically to the list of special uses:

"Commercial Solar Energy Facility and Test Solar Energy Systems subject to the conditions contained in Section 7:01.D."

"Commercial Wind Energy Facility and Test Wind Towers subject to the conditions contained in Section 7:01.D."

XVII. Amended Text: Section 8:03.G.2.d of the of the Kendall County Zoning Ordinance is hereby amended by adding deleting the following use from the appropriate place alphabetically from the list of conditional uses:

Small Wind Energy Systems.

XVIII. Amended Text: Section 8:03.H.1.o of the of the Kendall County Zoning Ordinance is hereby amended by deleting the following use in the appropriate place alphabetically from the list of special uses:

Solar Gardens.

XIX. Amended Text: Section 8:03.H.1 of the of the Kendall County Zoning Ordinance is hereby amended by adding the following uses to the appropriate places alphabetically to the list of special uses:

"Commercial Solar Energy Facility and Test Solar Energy Systems subject to the conditions contained in Section 7:01.D."

"Commercial Wind Energy Facility and Test Wind Towers subject to the conditions contained in Section 7:01.D."

XX. Amended Text: Section 8:06.B.1 of the of the Kendall County Zoning Ordinance is hereby amended by deleting the present text and replacing it with the following:

"Any use permitted as a special use in the R-1 One-Family Estate Residence District, Section 8:02.C, except Commercial Solar Energy Facilities, Test Solar Energy Facilities, Commercial Wind Energy Facilities, and Test Wind Towers, and that Planned Developments may be considered where the zoning lot proposed for development has a gross area of not less than forty (40) acres."

XXI. Amended Text: Section 8:06.C of the of the Kendall County Zoning Ordinance is hereby amended by adding deleting the following use from the appropriate place alphabetically from the list of conditional uses:

Small Wind Energy Systems.

XXII. Amended Text: Section 8:07.B.1 of the of the Kendall County Zoning Ordinance is hereby amended by deleting the present text and replacing it with the following:

"Any use permitted as a special use in the R-1 One-Family Estate Residence District, Section 8:02.C, except Commercial Solar Energy Facilities, Test Solar Energy Facilities, Commercial Wind Energy Facilities, and Test Wind Towers, and that Planned Developments may be considered where the zoning lot proposed for development has a gross area of not less than forty (40) acres."

XXIII. Amended Text: Section 8:08.B of the of the Kendall County Zoning Ordinance is hereby amended by deleting the following use in the appropriate place alphabetically from the list of special uses:

Solar Gardens.

XXIV. Amended Text: Section 9:01.C of the of the Kendall County Zoning Ordinance is hereby amended by deleting the following use in the appropriate place alphabetically from the list of special uses:

Solar Gardens.

XXV. Amended Text: Section 9:01.D of the of the Kendall County Zoning Ordinance is hereby amended by adding deleting the following use from the appropriate place alphabetically from the list of conditional uses:

Small Wind Energy Systems.

XXVI. Amended Text: Section 9:02.C of the of the Kendall County Zoning Ordinance is hereby amended by deleting the following use in the appropriate place alphabetically from the list of special uses:

Solar Gardens.

XXVII. Amended Text: Section 9:02.D of the of the Kendall County Zoning Ordinance is hereby amended by adding deleting the following use from the appropriate place alphabetically from the list of conditional uses:

Small Wind Energy Systems.

XXVIII. Amended Text: Section 9:03.C of the of the Kendall County Zoning Ordinance is hereby amended by deleting the following use in the appropriate place alphabetically from the list of special uses:

Solar Gardens.

XXIX. Amended Text: Section 9:04.C of the of the Kendall County Zoning Ordinance is hereby amended by deleting the following use in the appropriate place alphabetically from the list of special uses:

Solar Gardens.

XXX. Amended Text: Section 9:04.D of the of the Kendall County Zoning Ordinance is hereby amended by deleting the present text and replacing it with the following:

"Reserved."

XXXI. Amended Text: Section 9:05.E of the of the Kendall County Zoning Ordinance is hereby amended by deleting the following use in the appropriate place alphabetically from the list of special uses:

Solar Gardens.

XXXII. Amended Text: Section 9:06.D of the of the Kendall County Zoning Ordinance is hereby amended by deleting the present text and replacing it with the following:

"Reserved."

XXXIII. Amended Text: Section 10:01.C.1 of the of the Kendall County Zoning Ordinance is hereby amended by adding the following uses to the appropriate places alphabetically to the list of special uses:

"Commercial Solar Energy Facility and Test Solar Energy Systems subject to the conditions contained in Section 7:01.D."

"Commercial Wind Energy Facility and Test Wind Towers subject to the conditions contained in Section 7:01.D."

XXXIV. Amended Text: Section 10:01.D of the of the Kendall County Zoning Ordinance is hereby amended by deleting the present text and replacing it with the following:

"Reserved."

XXXV. Amended Text: Section 10:02.D of the of the Kendall County Zoning Ordinance is hereby amended by deleting the present text and replacing it with the following:

"Reserved."

XXXVI. Amended Text: Section 10:01.C of the of the Kendall County Zoning Ordinance is hereby amended by adding the following uses to the appropriate places alphabetically to the list of special uses:

"Commercial Solar Energy Facility and Test Solar Energy Systems subject to the conditions contained in Section 7:01.D."

"Commercial Wind Energy Facility and Test Wind Towers subject to the conditions contained in Section 7:01.D."

XXXVII. Amended Text: Section 10:03.C of the of the Kendall County Zoning Ordinance is hereby amended by deleting the following use in the appropriate place alphabetically from the list of special uses:

Solar Gardens.

XXXVIII. Amended Text: Section 10:03.D of the of the Kendall County Zoning Ordinance is hereby amended by deleting the present text and replacing it with the following:

"Reserved."

XXXIX. Amended Text: Section 13:08 of the Kendall County Zoning Ordinance is hereby amended by adding the following text:

"4. In cases involving special use permit applications or applications for major amendments to existing special use permits for commercial solar energy facilities and commercial wind energy facilities, the County Board shall make its decision not more than thirty (30) days after the conclusion of the public hearing."

State of Illinois
County of Kendall

Zoning Petition
#23-12

XL. Amended Text: Appendix 9 of the Kendall County Zoning Ordinance is hereby amended to reflect the addition of Commercial Solar Energy Facility and Test Solar Energy Systems as special uses in the A-1, R-1, RPD-1, RPD-2, RPD-3, M-1, M-2, and M-3 Districts.

XLI. Amended Text: Appendix 9 of the Kendall County Zoning Ordinance is hereby amended to reflect the addition of Commercial Wind Energy Facility and Test Wind Towers as special uses in the A-1, R-1, RPD-1, RPD-2, RPD-3, M-1, M-2, and M-3 Districts.

XLII. Amended Text: Appendix 9 of the Kendall County Zoning Ordinance is hereby amended to reflect the addition of Solar Energy System, Private as permitted use in all zoning districts.

XLIII. Amended Text: Appendix 9 of the Kendall County Zoning Ordinance is hereby amended to change Small Wind Energy Systems to permitted uses in the A-1, R-1, RPD-1, RPD-2, RPD-3, R-2, B-1, B-2. B-3, B-4, B-5, B-6, M-1, M-2, and M-3 Districts.

XLIV. Amended Text: Appendix 9 of the Kendall County Zoning Ordinance is hereby amended to reflect the addition of Small Wind Energy Systems as permitted uses in the R-3 Districts.

XLV. Amended Text: Appendix 9 of the Kendall County Zoning Ordinance is hereby amended to reflect the deletion of Solar Farms, Solar Gardens, and Wind Farms, Commercial from the list of uses within the Kendall County Zoning Ordinance.

XLVI. Any reference or citation errors created by the above text amendments are hereby corrected.

*IN WITNESS OF*, this ordinance has been enacted by a majority vote of the Kendall County Board and is effective this 16th day of May, 2023.

Attest:

Kendall County Clerk
Debbie Gillette

COUNTY CLERK
OFFICIAL SEAL
KENDALL COUNTY, ILLINOIS

Kendall County Board Chairman
Matt Kellogg

# Kendall County Staff Report

**DEPARTMENT OF PLANNING, BUILDING & ZONING**
111 West Fox Street • Room 203
Yorkville, IL • 60560
(630) 553-4141 Fax (630) 553-4179

# Petition 24-30
# Nicholas S. Bellone on Behalf of Ament Road Solar 1, LLC (Tenant) and Janet M. Dhuse on Behalf of the Janet Dhuse Declaration of Family Trust Dated March 1, 2013 (Owner)
# A-1 Special Use Permit for Commercial Solar Energy Facility and Variance to Allow the Facility on Land Within 1.5 Miles of a Municipality Without an Annexation Agreement

## INTRODUCTION

The Petitioner is seeking a special use permit for a commercial solar energy facility and a variance to Section 36-282(17)a of the Kendall County Code to allow a commercial solar energy facility on land within one point five (1.5) miles of municipality without an annexation agreement.

The application materials are included as Attachment 1. The wetland delineation reports, including EcoCat information is included as Attachment 2. The NRI Report is included as Attachment 3. The property survey is included as Attachment 4. The site plan is included as Attachment 5. The vegetative management plan is included as Attachment 6. Decommissioning information is included as Attachment 7. Stormwater information is included as Attachment 8. Drain tile information is included as Attachment 9. A glare study is included as Attachment 10. A property value study is included as Attachment 11.

## SITE INFORMATION

PETITIONER: Nicholas S. Bellone on Behalf of Ament Road Solar 1, LLC (Tenant) and Janet M. Dhuse on Behalf of the Janet Dhuse Declaration of Family Trust Dated March 1, 2013 (Owner)

ADDRESS: South of 9949 and 10021 Ament Road, Yorkville

LOCATION: Approximately 0.33 Miles West of Route 47 on the South Side of Ament Road

Aerial of Entire Property



TOWNSHIP: Kendall

PARCEL #s: 05-16-300-006 and 05-17-400-005

LOT SIZE: 93.4 +/- Acres (Total Parcel), 39.3 +/- (Disturbed Area), 35.6 +/- (Fenced Area)

EXISTING LAND USE: Agricultural

ZONING: A-1

LRMP:

| | |
|---|---|
| Future Land Use | Rural Residential (Max 0.65 DU/Acre) (County)<br>Agricultural (Yorkville) |
| Roads | Ament Road is a Local Road maintained by Kendall Township. |
| Trails | The United City of Yorkville has a trail planned along Ament Road. |
| Floodplain/ Wetlands | There are no floodplains on the property. There are two (2) farmed wetlands in the vicinity of the proposed use. |

REQUESTED ACTIONS: Special Use Permit for a Commercial Solar Energy System

Variance to Allow a Commercial Solar Energy System on Land with One Point Five (1.5) Miles of a Municipality without an Annexation Agreement

APPLICABLE REGULATIONS: §36-282(17) – A-1 Special Uses

§36-39 – Variance Procedures

Chapter 36, Article II, Division 3, Subdivision I – Special Use Procedures

**SURROUNDING LAND USE**

| Location | Adjacent Land Use | Adjacent Zoning | Land Resource Management Plan | Zoning within ½ Mile |
|---|---|---|---|---|
| North | Agricultural/Farmstead/ Public Institutional (Cemetery) | A-1 and A-1 SU | Rural Residential (Max 0.65 DU/Acre) and Commercial (County)<br>Agricultural (Yorkville) | A-1, A-1 SU, R-1, R-3, and M-1<br>(County) |
| South | Agricultural/Farmstead | A-1 | Rural Residential (County)<br>Agricultural<br>(Yorkville) | A-1 |
| East | Agricultural/Single-Family Residential | A-1 and R-3 | Rural Residential and Transportation Corridor (County)<br>Agricultural<br>(Yorkville) | A-1, A-1 SU, and R-3<br>(County) |

| | | | | |
|---|---|---|---|---|
| West | Agricultural | A-1 | Rural Residential (County) Agricultural (Yorkville) | A-1, R-1 PUD, and RPD-2 |

The A-1 special use permit to the north is for a cemetery. The A-1 special use permits to the east are for a church and school and for agricultural implement sales and service.

The Deere Crossing subdivision is located near the subject property. Approximately fourteen (14) homes are located within a half mile (0.5) miles of the subject property.

**PHYSICAL DATA**

**ENDANGERED SPECIES REPORT**

EcoCAT Report was submitted on July 10, 2023, for the eastern parcel and November 16, 2023, for the western parcel and consultation was terminated for both parcels, see Attachment 2, Pages 42 and 133.

**NATURAL RESOURCES INVENTORY**

A LESA Score was not generated for the property. The land evaluation was 96 out of 100 indicating the soils were well suited for agricultural. The NRI Report is included as Attachment 3.

**ACTION SUMMARY**

**KENDALL TOWNSHIP**

Petition information was sent to Kendall Township on October 25, 2024.

**UNITED CITY OF YORKVILLE**

Petition information was sent to the United City of Yorkville on October 25, 2024. Prior to formal application submittal, the United City of Yorkville submitted a letter stating they would not pursue annexation at this time, see Attachment 1, Page 16. Yorkville also submitted an email requesting a forty foot (40') right-of-way dedication; Kendall Township was agreeable to this request. The emails related to the right-of-way dedication are included as Attachment 12.

**BRISTOL-KENDALL FIRE PROTECTION DISTRICT**

Petition information was sent to the Bristol-Kendall Fire Protection District on October 25, 2024.

**GENERAL INFORMATION**

§ 36-282(17) of the Kendall County Zoning Ordinance, commercial solar energy facilities businesses can be special uses on A-1 zoned property subject to the following conditions (Staff Comments in Bold):

a. All commercial solar energy facilities and test solar energy systems located within one point five (1.5) miles of a municipality shall either annex to the municipality or obtain an annexation agreement with the municipality requiring the municipality's regulations to flow through the property. **Petitioner is requesting a variance.**

b. The setbacks for commercial solar energy facilities shall be measured from the nearest edge of any component of the facility as follows:

Occupied Community Buildings or Dwellings on Nonparticipating Properties-One hundred fifty feet (150') from the nearest point on the outside wall of the structure

Boundary Lines of Participating Properties-None

Boundary Lines of Nonparticipating Properties- Fifty feet (50') to the nearest point on the property line of the nonparticipating property

Public Road Rights-Of-Way-Fifty feet (50') from the nearest edge

The above setbacks do not exempt or excuse compliance with electric facility clearances approved or

required by the National Electrical Code, the National Electrical Safety Code, Commerce Commission, Federal Energy Regulatory Commission, and their designees or successors. **Per the site plan, see Attachment 5, Page 4, the closet nonparticipating structure is approximately one thousand, thirty feet (1,030') to the southeast of the commercial solar energy facility. A church is located approximately one thousand, four hundred thirty-three feet (1,433') to the northeast of the commercial solar energy facility. The perimeter fence is setback fifty feet (50') from the adjoining property line. The commercial solar energy facility is approximately one thousand, four hundred forty-two feet (1,442') from the Ament Road. At their closest points, the panels are approximately forty-nine feet (49') south of the northern fence line, twenty-nine point five feet (29.5) west of the eastern fence line, just under nineteen feet (19') north of the southern fence line, and twenty-one point five feet (21.5') east of the western fence line.**

c. A commercial solar energy facility's perimeter shall be enclosed by fencing having a height of at least six feet (6') and no more than twenty-five feet (25'). **This is true. Per the site plan, see Attachment 5, Page 5, the fence is proposed to be seven feet (7') in height and will be chain link.**

d. No component of a solar panel as part of a commercial solar energy facility shall have a height of more than twenty feet (20') above ground when the solar energy facility's arrays are at full tilt. **This is true. Per the site plan, see Attachment 5, Page 4, the maximum height will be nine feet (9'). The Petitioner does not want a restriction setting the maximum height at this level.**

e. The above setback, fencing, and component height requirements may be waived subject to written consent of the owner of each affected nonparticipating property. This written consent shall be submitted at the time of application submittal. **No such consent requested or needed.**

f. Sound limitations for components in commercial solar energy facilities shall follow the sound limitations established by the Illinois Pollution Control Board. **No noise information was provided.**

g. The County shall not require standards for construction, decommissioning, or deconstruction of a commercial solar energy system or related financial assurances to be more restrictive than agricultural impact mitigation agreement set in State law. The amount of any decommissioning payment shall be limited to the cost identified in the decommissioning or deconstruction plan, as required by the agricultural impact mitigation agreement, minus the salvage value of the project. A copy of the agricultural impact mitigation agreement shall be submitted with the application materials. **The decommissioning plan is included as Attachment 7 and is outlined in the AIMA provided in Attachment 1, starting on page 18. As noted on Page 6 of Attachment 7, the estimated cost of decommissioning is Four Hundred Twenty-Five Thousand, Eight Hundred Ninety-Seven Dollars and Thirty-Seven Cents ($425,897.37). This money will be provided to the County in the form of a bond as outlined in the AIMA on Pages 28 and 29 of Attachment 1.**

h. A vegetative screening shall be placed around the commercial solar energy facility. **The landscaping plan was included on Pages 7 and 8 of the site plan (Attachment 5) with more detailed landscaping information included in the vegetative management plan (Attachment 6). The plan includes a cover crop seed mix, a native pollinator seed mix, and a native grazing seed mix. The performance standards and ground cover maintenance requirements were included in the vegetative management plan.**

i. Commercial solar energy facility applicants shall provide the results and recommendations from consultations with the Illinois Department of Natural Resources obtained through the Ecological Compliance Assessment Tool (EcoCat) or a comparable successor tool. The commercial solar energy facility applicant shall adhere to the recommendations provided through this consultation. **The EcoCat was submitted and consultation was terminated without any specific recommendations.**

j. Commercial solar energy facility applicants shall provide the results of the United States Fish and Wildlife Service's Information for Planning and Consulting environmental review or a comparable successor toll that is consistent with the U.S. Fish and Wildlife Service's Land-Based Wind Energy Guidelines and any applicable United States Fish and Wildlife Service solar wildlife guidelines that have been subject to public review. **This was provided on Pages 21 and 117 of both wetland delineation**

**reports (Attachment 2). Six (6) threatened or endangered species were in the area, but no impacts were anticipated.**

k. A facility owner shall demonstrate avoidance of protected lands as identified by the Illinois Department of Natural Resources and the Illinois Nature Preserve Commission or consider the recommendations of the Illinois Department of Natural Resources for setbacks from protected lands, including areas identified by the Illinois Nature Preserve Commission. **This is true. The site is designed around the farmed wetlands.**

l. A facility owner shall provide evidence at the time of application submittal of consultation with the Illinois State Historic Preservation Office to assess potential impacts on State-registered historic sites under applicable State law. **No potential impacts to State-registered historic sites exists, see Attachment 1, Page 74.**

m. A commercial solar energy facility owner shall plant, establish, and maintain for the life of the facility vegetative ground cover consistent with State law and the guidelines of the Illinois Department of Natural Resources' vegetative management plans. The vegetation management plan shall be required at the time of application submittal. **The vegetation management plan, including timelines for planting and maintenance of the vegetation was provided, see Attachment 6.**

n. The facility owner shall enter into a road use agreement with the jurisdiction having control over the applicable roads. The road use agreement shall follow applicable law. The facility owner shall supply the Kendall County Planning, Building and Zoning Department with a copy of the road use agreement. This provision shall be waived if the jurisdiction having control over the applicable roads does not wish to enter into an agreement. **As of the date of this memo, the road use agreement negotiations are ongoing. No transportation or access plan was provided. The site plan (Attachment 5) shows one (1) twenty foot (20') wide gravel driveway approximately thirty feet (30') west of the eastern property line.**

o. The facility owner shall repair or pay for the repair of all damage to the drainage system caused by the construction of the commercial solar energy system within a reasonable time after construction of the commercial solar energy facility is complete. The specific time shall be set in the special use permit. **A tentative drain tile study was provided (See Attachment 9). The foundations for the racking will be placed in a manner that minimizes impacts on the drain tile.**

**BUILDINGS AND BUILDING CODES**
No buildings are planned for the site. Any structures proposed for the site, including the solar arrays, shall obtain applicable permits.

**ENVIRONMENTAL HEALTH**
The property is presently farmland. No wells, septic systems, or refuse collection points were identified.

**STORMWATER**
The proposed area of disturbance is slightly less than one (1) acre. The County requested that the Petitioner submit an escrow payment so that WBK can evaluate the proposal.

**ACCESS**
Per the site plan (See Attachment 5), the Petitioner's propose one (1) twenty foot (20') wide access road.

There is one (1) forty foot (40') wide vehicular access gate and approximately ten (10') four foot (4') access gates proposed around the perimeter of the property. The locations of the smaller gates have not been determined. Knox box information will be provided to the County.

**PARKING AND INTERNAL TRAFFIC CIRCULATION**
No permeant parking was proposed. There will be a staging area during construction; the specific location of the staging area was undetermined, but will likely be northwest of the vehicular access gate.

**LIGHTING**
No lighting was proposed.

**SIGNAGE**
No specific signage was planned. The Petitioner was agreeable to installing one (1) sign at the vehicular access gate stating emergency contact information.

**GLARE**
The Petitioner provided a glare study, see Attachment 10.

**IMPACT ON PROPERTY VALUES**
The Petitioner provided a general property values study, see Attachment 11.

**ODORS**
No odors were foreseen.

**RELATION TO OTHER SPECIAL USES**
If approved, this would be the second special use permit for a commercial solar energy facility in unincorporated Kendall County.

**FINDINGS OF FACT-SPECIAL USE PERMIT**
§ 36-119 of the Kendall County Code outlines findings that the Zoning Board of Appeals must make in order to recommend in favor of the applicant on special use permit applications. They are listed below in *italics.* Staff has provided findings in **bold** below based on the recommendation:

*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 Project will generate clean, renewable electricity while producing no air, noise, or water pollution, or ground contamination. The front portion of the parcel closest to Ament Road will be retained for agricultural use as well as the surrounding land of the other parcel, which will create a natural screening during the growing season. The Petitioner submitted a vegetative management plan outlining the types of vegetation that will be planted, the timing of planting, and a maintenance plan for the vegetation.**

*The special use will not be substantially injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, nor substantially diminish and impair property values within the neighborhood. The Zoning classification of property within the general area of the property in question shall be considered in determining consistency with this standard. The proposed use makes adequate provisions for appropriate buffers, landscaping, fencing, lighting, building materials, open space and other improvements necessary to insure that the proposed use does not adversely impact adjacent uses and is compatible with the surrounding area and/or the County as a whole.* **The proposal will not interfere with the use and enjoyment of nearby properties. The surrounding properties are zoned primarily A-1 and will not be prevented from continuing any existing use or from pursuing future uses. The proposal's operations would be quiet and minimal traffic will occur after installation is completed. The solar panels are setback from Ament Road and neighboring houses to avoid negative visual impacts.**

*Adequate utilities, access roads and points of ingress and egress, drainage, and/or other necessary facilities have been or are being provided.* **The proposal will have adequate utility interconnections designed in collaboration with ComEd. The proposal does not require water, sewer, or any other public utility facilities to operate. The Petitioner will also build all roads and entrances at the facility and will enter into an agreement with Kendall Township regarding road use. After initial construction traffic, landscape maintenance and maintenance to the project components are anticipated to occur on an as-needed basis, consistent with the vegetative management plan. Existing traffic patterns will not be impacted in the post-construction operations phase. A drain tile survey will be completed prior to construction and foundation design will work around or reroute any identified drain tiles to ensure proper drainage.**

*The special use shall in all other respects conform to the applicable regulations of the district in which it is located, except as such regulations may in each instance be modified by the County Board pursuant to the*

*recommendation of the Zoning Board of Appeals.* **If the requested variance is granted, the proposal meets all applicable regulations.**

*The special use is consistent with the purpose and objectives of the Land Resource Management Plan and other adopted County or municipal plans and policies.* **The proposal is also consistent with a goal and objective found on page 3-34 of the Land Resource Management Plan**, **"Support the public and private use of sustainable energy systems (examples include wind, solar, and geo-thermal)." However, the proposal is located on property classified as Rural Residential on the Future Land Use Map.**

**FINDINGS OF FACT-VARIANCE**
§36-39 of the Kendall County Code outlines findings that the Zoning Board of Appeals must make in order to grant variations. They are listed below in *italics.* Staff has provided findings in **bold** below based on the recommendation:

*The particular physical surroundings, shape, or topographical condition of the specific property involved would result in a particular hardship or practical difficulty upon the owner if the strict letter of the regulations were carried out.* **The subject property is located within one point five (1.5) miles of the United City of Yorkville. The Petitioner provided a letter from the United City of Yorkville stating that Yorkville did not wish to annex the property or enter into a pre-annexation agreement.**

*The conditions upon which the requested variation is based would not be applicable, generally, to other property within the same zoning classification.* **Other A-1 zoned properties within one point five (1.5) miles of a municipality could request a similar variance, if the municipality refuses to annex or enter into a pre-annexation agreement.**

*The alleged difficulty or hardship has not been created by any person presently having an interest in the property.* **The difficulty was created because the United City of Yorkville did not wish to enter into a pre-annexation agreement or annex the property.**

*The granting of the variation will not materially be detrimental to the public welfare or substantially injurious to other property or improvements in the neighborhood in which the property is located.* **Granting the variance would not be detrimental to the public or substantially injurious to other properties.**

*That the proposed variation will not impair an adequate supply of light and air to adjacent property, or substantially increase the congestion in the public streets or increase the danger of fire, or endanger the public safety or substantially diminish or impair property values within the neighborhood.* **The proposed variance would not impair light or air on adjacent property, cause congestion, increase the danger of fire, or negatively impact property values.**

**RECOMMENDATION**
Staff will wait with issuing a recommendation on this proposal, pending comments from the Regional Planning Commission. The proposed conditions and restrictions are listed; as of the date of this memo, the Petitioner has not agreed to these conditions and restrictions:

1. The site shall be developed substantially in accordance with the submitted site plan (Attachment 5), vegetative management plan, (Attachment 6), decommissioning plan, (Attachment 7), road access plan (yet to be submitted), and Agricultural Impact Mitigation Agreement (Attachment 1, Pages 18-31).
2. Within ninety (90) days of the approval of the special use permit, the owners of the subject property shall dedicate a strip of land forty feet (40') in depth along the northern property line to Kendall Township. The Kendall County Planning, Building and Zoning Committee may grant an extension to this deadline.
3. None of the vehicles or equipment parked or stored on the subject property allowed by the special use permit shall be considered agricultural vehicles or agricultural equipment.
4. All of the vehicles and equipment stored on the subject property allowed by the special use permit shall be maintained in good condition with no deflated tires and shall be licensed if required by law.
5. Any structures, included solar arrays, constructed, installed, or used allowed by this special use permit

shall not be considered for agricultural purposes and must secure applicable building permits.

6. One (1) warning sign shall be placed near or on the vehicular entrance gate. This sign shall include, at minimum, the address of the subject property and a twenty-four (24) hour emergency contact phone number. Additional signage may be installed, if required by applicable law.

7. KenCom and other applicable public safety agencies shall be supplied the access code to the Knox Box/security gate.

8. The operators of the use allowed by this special use permit acknowledge and agree to follow Kendall County's Right to Farm Clause.

9. The property owner and operator of the use allowed by this special use permit shall follow all applicable Federal, State, and Local laws related to the operation of this type of use.

10. Failure to comply with one or more of the above conditions or restrictions could result in the amendment or revocation of the special use permit.

11. If one or more of the above conditions is declared invalid by a court of competent jurisdiction, the remaining conditions shall remain valid.

12. This special use permit and variance shall be treated as a covenant running with the land and is binding on the successors, heirs, and assigns as to the same special use conducted on the property.

**ATTACHMENTS**

1. Application Materials
2. Wetland Delineation Reports
3. NRI Report
4. Property Survey
5. Site Plan
6. Vegetative Management Plan
7. Decommissioning Information
8. Stormwater Management Memo
9. Drain Tile Information
10. Glare Study
11. Property Value Study
12. Right-of-Way Dedication Emails

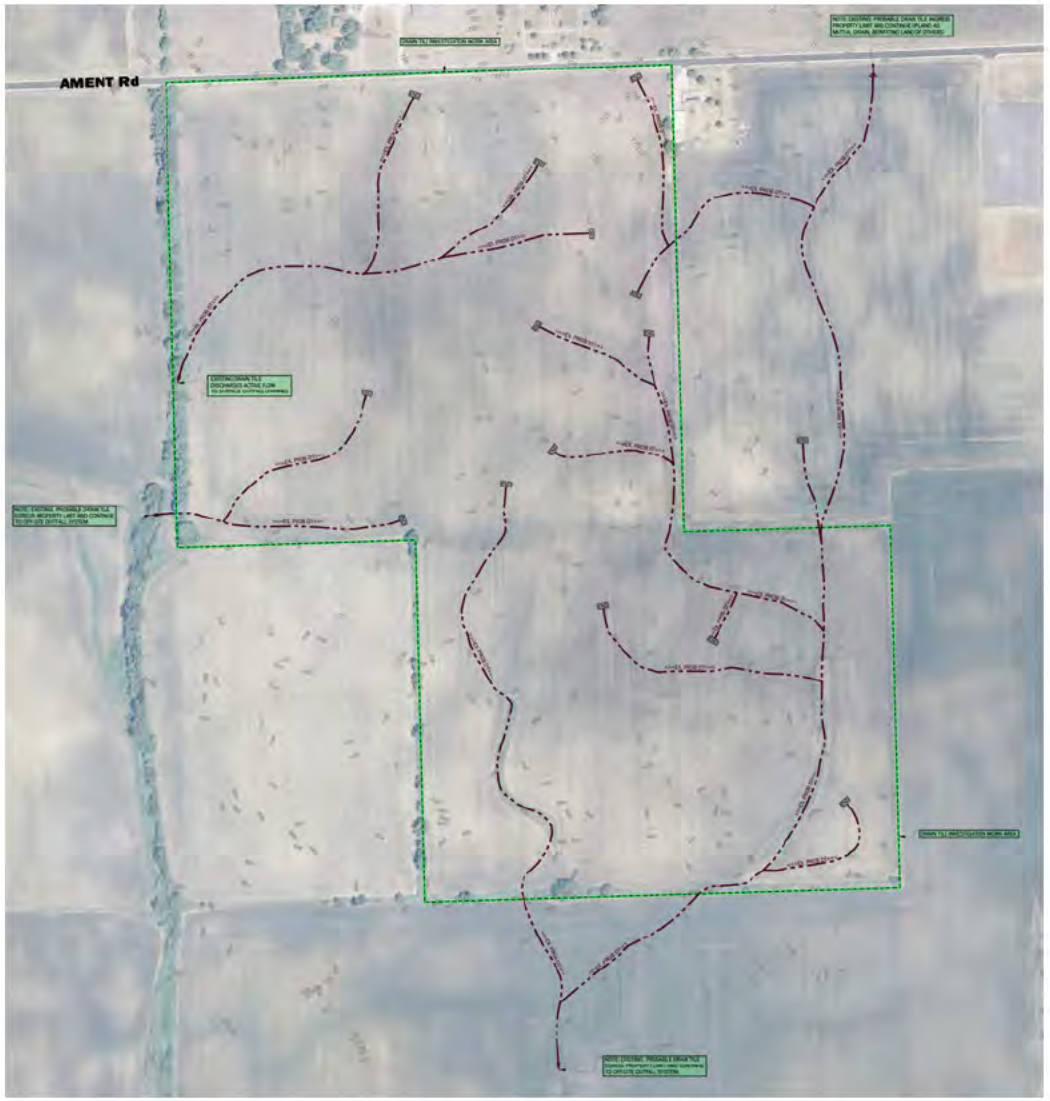
# Preliminary Drain Tile Study

# Project Site Overview: Drainage



**After construction, the field will drain the same way that it did prior to the solar installation:**

- Drain tile is considered in final layout design and avoided when practical
- During construction, tile locations are flagged to facilitate avoidance
- Broken tile is repaired or replaced in-kind
- Construction crews regularly monitor the site for any tile or drainage issues




**Drain Tile Probability Map prepared by Tom Huddleston of Huddleston McBride**


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# Management and Monitoring Plan

# Management and Monitoring (M&M) Specifications & Guidelines

**Project Name: Ament Road Solar Farm**

**Applicant: Ament Road Solar 1, LLC**

**ENCAP, Inc. Project Number: 24-0923D**

**Document Preparer: S. Rowley, PWS, ENCAP, Inc.**

**Date Prepared: October 17, 2024**
**Date Revised: November 27, 2024**

ENCAP INCORPORATED

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# NATIVE AREA SPECIFICATIONS

# AMENT ROAD SOLAR FARM – KENDALL COUNTY

## 1.0 PURPOSE

The purpose of this plan is to provide native area specifications for the Ament Road Solar Farm project. The areas underneath and around the solar array panels will be planted with a native grazing seed mix and a native pollinator seed mix. These native plantings will provide water quality benefits, pollinator friendly habitat, soil stabilization, and watershed benefits for the local streams.

## 2.0 CONTRACTOR QUALIFICATIONS

1. The Native Landscape Contractor chosen for the establishment and enhancement of the natural areas must be experienced in the restoration, installation, and management of said areas. They must have a minimum five years of experience conducting ecological restoration and management projects.

2. There shall be a supervisor available at all times that can identify non-native and native plants by genus and species. The goal of installing successful native plant communities is a long-term process. Therefore, it is imperative that a qualified Native Landscape Contractor perform the initial installation and maintenance.

## 3.0 QUALITY AND CONDITION

1. All native seed proposed for the project shall be provided as Pure Live Seed (PLS) and sourced from within a 200-mile radius of the project location. Plant origins outside of this range must be approved by the Wetland Consultant.

2. Native seeds shall be blended by the vendor, and the mixture and ratio shall be guaranteed in writing to be as specified. The amount of seed indicated on the specifications shall mean the total amount of pure live seed (PLS) per acre for all species listed. It is the sole responsibility of the Native Landscape Contractor to provide approved seed that meets industry-standard PLS requirements.

3. Native Landscape Contractor shall provide the Wetland Consultant with the name and location of the seed supplier, origin of the various kinds of plants, and a statement of the purity of the seed.

4. Seed shall conform to applicable State and Federal regulations as in effect on the date of letting. Unless otherwise specified, seed shall not contain in excess of 1 percent weed seeds; 0 percent is desirable.

5. All storage requirements, stratification, and scarification considerations shall be the sole responsibility of the Native Landscape Contractor.

6. If specified for the seed mixture, mycorrhizal inoculants shall be pelletized and mixed at 1 lb. per acre with the fine seeds before installation. The inoculants shall contain a diverse mixture of Glomales fungal species (*Glomus* spp.) in pelletized form.

7. Under no circumstances shall Wheat (*Triticum aestivum*), Cereal Rye (*Secale cereale*), Perennial Rye (*Lolium perenne*), or Barley (*Hordeum vulgare*) be used as a temporary cover crop.

## 4.0 HANDLING

1. Native Landscape Contractor shall be solely responsible for the proper handling and storage of the seed according to the best seed handling and storage practices, including fungicide treatments and stratification considerations. Owner shall make no compensation for damage to the seed because of improper storage, cleaning, threshing, or screening operations.

2. All native seeds shall be packed and covered in such a manner as to ensure adequate protection against damage and maintain dormancy while in transit, storage, or during planting operations.

3. Seed shall be kept dry and unopened until needed for use. Seed shall not be stored or temporarily stored in locations or vehicles where the temperature will be in excess of 90 degrees F.

## 5.0 SITE PREPARATION

1. Site should be cleared of undesirable vegetation prior to seeding. If necessary, non-selective herbicide (Aquatic-approved Glyphosate formulation) should be applied within the proposed planting zones at least 2 weeks prior to seedbed preparation.

2. The General Contractor and Native Landscape Contractor shall be responsible for performing all work necessary to achieve and maintain an acceptable seedbed prior to seeding. All areas must be properly prepared before seeding begins. Underground utility location maps and plans should be reviewed prior to work. Equipment having low unit pressure ground contact shall be utilized within the planting areas.

3. Unless the Wetland Consultant agrees to another approach, the seedbed shall be prepared by working the topsoil to a depth of 3 inches. Site preparation equipment shall be of a design that can be utilized efficiently by the Native Landscape Contractor to meet the requirements for the work specified. The equipment proposed for use by the Native Landscape Contractor for disking and herbicide applications shall be subject to approval by the Wetland Consultant.

4. Prior to seeding, at least 6 inches of topsoil shall be present and free of all clods, stones, roots, sticks, rivulets, gullies, crusting, and cracking. The soil aggregate size will be no greater than 2 inches in the largest diameter.

5. If present, compacted soils shall be disked or raked prior to seeding. Remedial measures for the access area may, at the direction of the Wetland Consultant, involve ripping from 12 to 18 inches of the soil horizon prior to disking. If compaction is not a concern and the seedbed needs to be loosened prior to seeding to ensure good seed-soil contact, disking or raking shall be performed using equipment and the approach recommended by the Native Landscape Contractor, subject to approval by the Wetland Consultant.

6. If needed, cultivation shall occur within 24 hours prior to seeding. Seeding should occur immediately after the last cultivation, preferably before a rain.

## 6.0 PLANT MATERIALS

**See Sheet C-5.1 for Seed Mixes; however, the following cover crop should be added to both seed mixes during installation.**

| Scientific Name | Common Name | Lbs/Acre |
|---|---|---|
| Avena sativa | Seed Oats | 40.000 |

## 7.0 SEED INSTALLATION

1. Seeding shall take place AFTER solar panel installation is completed.

2. Except where site conditions preclude their use, seeding shall be performed using a Truax drill, Truax Trillion seeder, or comparable equipment designed specifically for installation of native seed. For areas where site conditions preclude the use of specialized equipment, seed may be installed through hand broadcasting and lightly raking in the seed. **Hand broadcast seed shall be spread at twice the specified rate.** Other methods of seed installation may be used with prior approval from the Wetland Consultant.

3. Seasonal Considerations:

   *November 1 through February 28*: Seed must be protected from displacement due to water and wind erosion. Seeding on bare, graded surfaces must be protected with double netted erosion control blankets on slopes. Less cover crop will be observed during the following spring due to frost damage.

   *March 1 through June 29*: Seeding during this period is appropriate but germination of a portion of the seed may not occur until the following season due to lack of cold stratification to break seed dormancy. Cover crop generally germinates within 2-3 weeks of seeding operation. Seeding on bare, graded surfaces must be protected with erosion control blankets on slopes.

   *June 30 through September 15*: Installation of native seed should be suspended unless irrigation can be provided or unseasonably cool conditions persist. Also, any annual forbs planted with the mix during this time period may germinate but not have sufficient time to flower before fall senescence. Seeding on bare, graded surfaces must be protected with erosion control blankets on slopes.

   *September 15 through October 31*: Seeding on bare, graded surfaces must be protected with double netted erosion control blankets on slopes. Less cover crop will be observed during the following spring due to frost damage.

4. Prior to starting work, all seeding equipment shall be calibrated and adjusted to sow seeds at the proper seeding rate. In general, the optimum seeding depth is 0.25 inch below the soil surface. Areas where the seed has not been incorporated into the soil to the proper depths will not be accepted, and no compensation for materials or labor for the rejected work will be made by the Owner.

5. Equipment shall be operated in a manner to ensure complete, uniform coverage of the entire area to be seeded and to avoid damage to existing woody plants. Any area inadequately covered, as solely determined by the Wetland Consultant, shall be retreated at no additional cost to the Owner.

6. Seeding and soil tracking/firming shall not be done during periods of rain, severe drought, high winds, excessive moisture, frozen ground, or other conditions that preclude satisfactory results.

7. To achieve best results, seed boxes should be kept more than one-quarter full at all times and ground speed should be no more than 2 to 3 mph.

8. Seeding operations must occur when soil moisture is appropriate for seeding operation.

9. Native plant seed shall not receive fertilizer.

10. Wet seed that is moldy or otherwise damaged in transit or storage shall not be used.

11. After seeding operation is completed, install erosion control blanket per manufacturer's specifications as necessary.

## 8.0 EROSION CONTROL

1. The Native Landscape Contractor shall be fully responsible for implementing erosion control measures within prescribed planting areas.

2. All disturbed areas or areas of bare soil are recommended to be covered with erosion control blanket; North American Green S-75 or equivalent will be used at a minimum. Fall-winter plantings and/or 3:1 slopes require North American Green S-150 or equivalent. Erosion control blanket shall be installed within 24 hours after an area is seeded. See manufacturer's specifications for erosion control blanket composition.

## 9.0 CLEAN-UP AND PROTECTION

1. During landscape work, store materials and equipment where directed. Keep pavements clean and work areas and adjoining areas in an orderly condition.

2. Protect landscape work and materials from damage due to landscape operations or operations by other trades and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed by the Wetland Consultant.

## 10.0 INSPECTIONS AND ACCEPTANCE

1. Owner reserves the right to inspect all seeds and plants either at place of growth or at site before planting for compliance with requirements for name, variety, size, quantity, quality or mix proportion.

2. Native Landscape Contractor is to keep records of the certificates of composition or invoices of seed mixtures and integrity of plant materials with respect to species, variety, and source after purchase.

3. Native Landscape Contractor is to notify Owner within five days after completing initial and/or supplemental plantings in each area.

# MONITORING AND MANAGEMENT PLAN

# AMENT ROAD SOLAR FARM – KENDALL COUNTY

## 1.0 MONITORING METHODOLOGY – SHORT TERM (YEARS 1-3)

The planted areas will be monitored annually for a three-year period to ensure successful establishment of the plantings. The primary objective of the short-term monitoring program is to track the success of the planted species over the 3-year period of regularly scheduled monitoring sessions. The monitoring documents changes in plant community composition and reveals the need for management changes to improve floristic quality and coverage. Specific goals of the monitoring are to determine the vegetative species present, the percent cover by vegetation, and identify hydrology and erosion problems.

Monitoring within the planted areas shall be conducted annually utilizing a meander survey methodology. The monitoring shall identify:

1. the five dominant vegetative species within each planting zone,
2. the approximate percent coverage by overall vegetation in each planting zone,
3. the approximate percent vegetative coverage by native and non-native/invasive species within each planting zone,
4. erosion or sedimentation issues,
5. bare areas or areas not fully vegetated,
6. management recommendations for improved quality and invasive species removals, and
7. wildlife and pollinator usage (visual observations).

Observations shall be made during the monitoring to identify specific management strategies necessary to reach design goals. Site conditions shall be photo documented during monitoring sessions.

## 2.0 PERFORMANCE CRITERIA (YEARS 1-3)

1. By the end of the first full growing season, the planted areas shall exhibit at least 75% vegetative coverage, primarily by Seed Oats (*Avena sativa*). There shall be no areas greater than 1.0 square meter devoid of vegetation, and at least 25% of the species present as measured by aerial coverage shall be native and non-invasive, or planted species.

2. By the end of the second growing season, at least 90% of the ground as measured by aerial coverage shall be vegetated, and at least 50% of the species present as measured by aerial coverage shall be native and non-invasive, or planted species. There shall be no areas greater than 1.0 square meter devoid of vegetation.

3. By the end of the third growing season, at least 90% of the ground as measured by aerial coverage shall be vegetated, and at least 75% of the species present shall be native and non-invasive, or planted species. There shall be no areas greater than 0.5 square meter devoid of vegetation.

4. At the end of each growing season, none of the three most dominant species within the planted areas shall be non-native, invasive, or noxious weed species, including but not limited to: Giant and Common Ragweed (Ambrosia trifida & artemisiifolia), Wild Carrot (Daucus carota), Purple Loosestrife (Lythrum salicaria), Teasel (Dipsacus spp.), Reed Canary Grass (Phalaris

arundinacea), Sweet Clover (Melilotus spp.), Common Buckthorn (Rhamnus cathartica), Kentucky Blue Grass (Poa pratensis), Thistle (Cirsium spp.), Honeysuckle (Lonicera sp.), Common Reed (Phragmites australis), Sandbar Willow (Salix interior), and Water Hemp (Amaranthus tuberculatus).

## 3.0 REPORTING (YEARS 1-3)

An annual vegetation monitoring report will be submitted to the Owner and Kendall County by January 31st following the monitoring season each year. This report will be used to determine if the natural areas are meeting performance standards. The report shall include information on site location; permit numbers; methodology used (including monitoring dates); data results; summary relative to performance criteria; a summary of the annual monitoring observations; a description of the management performed during the year; a list of recommendations for management during the upcoming year; and representative photographs of the natural areas. The natural areas shall meet certification requirements, associated performance standards, and will be monitored and maintained for a period of three years or until performance standards have been met to ensure successful establishment.

## 4.0 SHORT-TERM MANAGEMENT PLAN (YEARS 1-3)

1. First Year. Mow the planted areas to a height of 8-12 inches, 3 times during the early growing season or as needed to control non-native and invasive annual species. Mowing (including weed whipping) shall take place prior to or when non-native and invasive species are flowering to prevent seed set. Control undesirable plant species, when present in small quantities, by hand pulling prior to the development and maturity of the plant. Hand removal shall include the removal of all aboveground and belowground stems, roots and flower masses prior to development of seeds. Apply herbicide (as necessary) to non-native and invasive perennial species within the natural areas with appropriate herbicide. Management site visits should be conducted at a minimum of 3 times annually. Soil erosion and sediment controls shall be regularly maintained.

2. Second Year. Control of undesirable plant species during the second growing season shall consist primarily of selective herbicide application, spot mowing, and hand pulling. Mowing (including weed whipping) shall be conducted 3 times during the early growing season and as needed to a height of 8-12 inches to prevent annual weeds from producing seed. Management site visits should be conducted at a minimum of 3 times annually. Soil erosion and sediment controls shall be regularly maintained.

3. Third Year. Undesirable plant species will be controlled (as necessary) by mowing (including weed whipping), hand pulling, and/or selective herbicide application. Continue to perform management site visit at least 3 times annually during the growing season. Soil erosion and sediment controls shall be regularly maintained.

   Since the site is not suitable for prescribed burning, it is recommended to conduct a late fall mowing with mulching/thatch removal at the completion of the third growing season, during the dormant season (November-April). This regimen will mimic the conditions and benefits of a controlled burn.

## 5.0 LONG-TERM MANAGEMENT PLAN (YEARS 4+)

1. Long Term. As the planted areas mature, required supplemental management will be significantly reduced. The plant communities will stabilize and be effectively managed through a reduced schedule of spot mowing, selective herbicide application, and hand pulling as necessary. Every 3-5 years, a late fall mowing with thatch mulching/removal should be conducted during the dormant season (November-April). Management site visits should be conducted 2-3 times annually. Soil erosion and sediment controls shall be regularly maintained.

   The natural areas require long-term management to maintain their function as designed. It is expected that the natural areas will be maintained in their permitted condition. The long-term manager for the natural areas will be the Lessee or Owner. An annual letter report documenting the completion of inspection and management tasks based on the information herein should be submitted to the Owner each year.

   Management tasks should be preceded by a site inspection to determine if remedial measures are required and to recommend procedures to correct any deficiencies. The site inspection should be conducted by a qualified individual knowledgeable in native plants and management of native plantings. Areas of observation during the site inspection should include but are not limited to: dominant species within distinct planting communities; erosion or herbivory concerns that develop over time; changes in hydrology that may require additional planting to adjust for higher or lower water levels; or the appearance of invasive species in the managed area that require alternative management methods.

   The following management tasks should be completed annually, unless otherwise specified below:

   a. Debris Removal: All debris shall be removed, via non-invasive methods, from within the natural areas.
   b. Herbicide Application: Selective herbicide to control invasive species should be completed 2-3 times annually. A certified and licensed pesticide applicator shall select herbicide, appropriate for the area of use (such as wetlands or other special management area), and shall apply the herbicide by the appropriate method, to prevent killing of desirable native species. Invasive and non-native species, and woody plant species not specified as part of the planting plan, shall be controlled by appropriate management practices of the approved plan.
   c. Mowing: Selective mowing is a preferred method for control of annual non-native and invasive species to prevent seed proliferation. Mowing with a specialty flail-type mower to mulch thatch or weed whip with thatch removal (or combination) may be substituted for prescribed burns in instances where a burn is not permissible or weather does not allow for a safe/effective burn.
   d. Erosion Control & Stabilization: When conducting the annual inspection, it is important to observe and note areas of bare soil and other early warning signs of erosion. If caught early enough, they may be easily stabilized with seed and erosion control blanket.
   e. Brush Clearing: Management of woody species is not likely necessary if herbicide applications are successful and continued each year. If invasive shrubs become a problem they should be cut and all remaining stumps should be treated with an appropriate herbicide to prevent resprout, either through a basal oil treatment, hand wick applicator, or other approved method. Brush clearing should be conducted in the winter months with frozen ground conditions.

**Table 1: Typical Management Schedule for Natural Areas**

| Management Task | Spring | Summer | Fall | Winter |
|---|---|---|---|---|
| Annual Site Inspection | | X | | |
| Annual Letter Report | | | | X |
| Debris Removal (As Necessary) | X | X | X | X |
| Herbicide Application | X | X | X | |
| Mowing | X | X | X | |
| Erosion Control & Stabilization | X | X | X | |
| Brush Clearing | | | X | X |

## 6.0 HERBICIDE APPLICATION

This section applies to all site preparation and management herbicide application that is proposed to occur onsite.

1. Any person applying herbicide shall hold appropriate licensure for pesticide application in the state of Illinois. A licensed Illinois Pesticide Applicator shall be on-site at all times when herbicide is being applied.

2. Herbicide usage will vary based on site conditions and target species. The following herbicides are allowed for use in natural areas; aquatic approved Glyphosate formulations (Aquaneat®, Rodeo®, etc.), Clethodim (Intensity®, etc.), aquatic approved Imazapyr (Habitat®, etc.), Triclopyr 3A (Tahoe 3A®, Garlon 3A®, etc.), Garlon 4 Ultra® (no substitutions), and Aminopyralid (Milestone®) to control target species. It is the sole responsibility of the Contractor to evaluate the site and select the appropriate herbicide for both site conditions and target species in accordance with herbicide labeling.

# Decommissioning Estimate

# Decommissioning Estimate/Plan

Ament Road
Kendall County, IL

Date: 9/17/2024
Calculated By: CG

This Decommissioning Estimate has been prepared by New Leaf Energy in an attempt to predict the cost associated with the removal of the proposed solar facility. The primary cost of decommissioning is the labor to dismantle and load as well as the cost of trucking and equipment. All material will be removed from the site, including the concrete equipment pads, which will be broken up at the site and hauled to the nearest transfer station.

No salvage values have been assumed in this calculation.

The following values were used in this Decommissioning Estimate:

| System Specifications | |
|---|---|
| Number of Modules | 13,390 |
| Linear Feet of Racking (ft) | 50,213 |
| Number of Inverters | 20 |
| Number of Transformers | 2 |
| Number of Tracker Motors | 6 |
| Electrical Wiring Length (ft) | 3,276 |
| Number of Foundation Piles | 3,044 |
| Length of Perimeter Fence (ft) | 5,096 |
| Number of Power Poles | 5 |
| Access Rd Material Volume (YD) | 1,791 |
| Total Disturbed Area (SF) | 49,851 |
| Total Fence Weight (lbs) | 3,618 |
| Total Racking Weight (lbs) | 314,665 |
| Total Foundation Pile Weight (lbs) | 410,940 |
| Total Solar Module Weight (lbs) | 803,400 |

| Equipment & Material Removal Rates | |
|---|---|
| Module Removal Rate (min/module) | 1 |
| Rack Wiring Rem. Rate (min/mod) | 0.25 |
| Racking Dismantling Rate (min/LF) | 0.2 |
| Inverter Removal Rate (hr/unit) | 0.5 |
| Transformer Removal Rate (hr/unit) | 1 |
| Motor Removal Rate (hr/unit) | 1 |
| Rack Loading Rate (min/LF) | 0.1 |
| Elect. Wiring Removal Rate (min/LF) | 0.5 |
| Pile Rem. Rate (piles/day) | 300 |
| Fence Removal Rate (min/LF) | 1 |
| Days req. to break up concrete pads | 1 |
| Days req. with Rough Grader | 1 |
| Days req. with Fine Grader | 2 |
| Total Truckloads Required | 29 |
| Round-Trip Dist. to Trans. Sta.(miles) | 17 |
| Round-Trip Time to Trans. Sta. (hr) | 0.5 |

| Labor and Equipment Costs | | |
|---|---|---|
| Labor Rate ($/hr) | $ | 35.00 |
| Operator Rate ($/hr) | $ | 47.00 |
| Bobcat Cost ($/hr) | $ | 101.90 |
| Front End Loader Cost ($/Day) | $ | 845.77 |
| Excavator Cost ($/Day) | $ | 1,365.46 |
| Trucking Cost ($/hr) | $ | 127.38 |
| Backhoe Cost ($/hr) | $ | 101.90 |
| Power Pole Removal Cost ($/pole) | $ | 1,500.00 |
| Grader Cost ($/day) | $ | 1,324.70 |
| Gravel Export Cost ($/YD) | $ | 8.00 |
| Loam Import Cost ($/YD) | $ | 20.00 |
| Seeding Cost ($/SF) | $ | 0.10 |
| Fuel Cost ($/mile) | $ | 0.50 |

## Labor, Material, and Equipment Costs

### 1. Remove Modules

The solar modules are fastened to racking with clamps. They slide in a track. A laborer needs only unclamp the module and reach over and slide the module out of the track.

*Module Removal Rate • Total Number of Solar Modules • Labor Rate = Module Removal Cost*

**Total = $ 7,810.83**

### 2. Remove Rack Wiring

The modules are plugged together in the same manner as an electrical cord from a light is plugged into a wall socket. The string wires are in a tray. A laborer needs only unplug the module, reach into the tray and remove the strands of wire.

*Wire Removal Rate • Total Number of Solar Modules • Labor Rate = Rack Wiring Removal Cost*

**Total = $ 1,952.71**

### 3. Dismantle Racks

Tracker module racking primarily consists of torque tubes and a driveline. These are supported on driven piles. The torque tubes and driveline unbolt from the foundation piles.

*Linear feet of Racking • Rack Dismantling Rate • Labor Rate = Rack Dismantling Cost*

**Total = $ 5,858.18**

### 4. Remove and Load Electrical Equipment

Electrical equipment includes transformers, inverters, and tracker motors.

*(Number of Inverters • Inverter Removal Rate + Number of Transformers • Transformer Removal Rate + Number of Motors • Motor Removal Rate) • (Operator Rate + Bobcat Cost) = Electrical Equipment Removal Cost*

**Total = $ 2,680.20**

### 5. Break Up Concrete Pads

Concrete pads are broken up using an excavator and jackhammer.

*Number of Demolition Days • (Excavator Cost + Operator Cost) = Total Concrete Pad Removal*

**Total = $ 1,221.77**

### 6. Load Racks

Once the racking has been dismantled, it will be loaded onto trucks for removal from the site. The trucking cost associated with this line item represents the additional time a truck will be needed during loading. Please see item # 13 for the cost of trucking off-site.

*Linear feet of Racking • Rack Loading Rate • (Operator Cost + Front End Loader Cost + Trucking Cost) = Total Rack Removal Cost*

**Total = $ 23,120.99**

### 7. Remove Electrical Wiring

Electrical wiring will be removed from all underground conduits.

*Cable Length • Cable Removal Rate • (Operator Cost + Backhoe Cost) = Total Cable Removal Cost*

**Total = $ 4,064.97**

### 8. Remove Foundation Piles

Foundation piles will be pulled out of the ground and loaded onto a truck to be removed from site.

*(Total Number of Piles / Daily Pile Removal Rate) • (Operator Rate + Excavator Cost) = Total Pile Removal Cost*

**Total = $ 26,505.02**

### 9. Remove Fencing

Fencing posts, mesh, and foundations will be loaded onto a truck and removed from site. Trucking costs included in this line item are for the removal process. Trucking to a recycling facility are included in item #13.

*(Total Length of Fence • Fence Removal Rate) • (Operator Rate + Bobcat Cost + Trucking Cost) =*

**Total = $ 23,464.96**

### 10. Remove Power Poles

Power poles will be removed and shipped off site.

*Number of Power Poles • Pole Removal cost = Total Power Pole Removal Cost*

**Total = $ 7,500.00**

## 11. Gravel Road Reclamation

Reclamation of the gravel access road will entail removing the gravel material and exporting it off site. The area will then be backfilled with loam and graded.

*(Days with Rough Grader + Days with Fine Grader) • (Grader Cost per Day+Operator Cost per Day) + [Roadway Material Volume • (Gravel Export Cost + Loam Import Cost)] = Gravel Road Reclamation Cost*

**Total = $ 55,253.21**

## 12. Seed Disturbed Areas

Seeding cost includes labor and materials for reseeding all disturbed areas including the reclaimed gravel road area, former electrical areas, and areas disturbed by racking foundation removal.

*Seeding Cost • Disturbed Area = Total Seeding Cost*

**Total = $ 4,985.06**

## 13. Truck to Transfer Station

All material will be trucked to the nearest Transfer station that accepts construction material. The nearest transfer station is Groot Recycling & Waste - Aurora

*(Total Truckloads • Roundtrip Distance • Fuel Cost) + (Total Truckloads • Round Trip Time • Trucking Cost) = Total Trucking Cost to Transfer Station*

**Total = $ 2,093.44**

Salvage Values

Salvage Value Not Included

## Racking Disposal Cost

**1S. Racking Disposal Cost**

The racking can be disposed of at the Transfer Station. They will be trucked to Groot Recycling & Waste - Aurora.

*(Total Racking Weight)/2000 • Cost per Ton of disposal =*

**Total =** $ 32,831.25

## Panel Disposal

**2S. Solar Panel Disposal Cost**

The panels can be disposed of at facilities which except electronics. They will be trucked to Groot Recycling & Waste - Aurora.

*(Total Panel Weight)/2000 • Cost per Ton of disposal =*

**Total =** $ 60,255.00

new leaf energy

Ament Road
Kendall County, IL

## Summary of Decommissioning Costs and Salvage Values

| Line Item | Task | Cost |
|---|---|---|
| 1 | Module Removal | $ 7,810.83 |
| 2 | Rack Wiring Removal | $ 1,952.71 |
| 3 | Rack Dismantling | $ 5,858.18 |
| 4 | Electrical Equipment Loading and Removal | $ 2,680.20 |
| 5 | Break Up Concrete Pads | $ 1,221.77 |
| 6 | Load Racks | $ 23,120.99 |
| 7 | Electrical Wiring Removal | $ 4,064.97 |
| 8 | Foundation Pile Removal | $ 26,505.02 |
| 9 | Fence Removal | $ 23,464.96 |
| 10 | Power Pole Removal | $ 7,500.00 |
| 11 | Gravel Road Reclamation | $ 55,253.21 |
| 12 | Seed Disturbed Areas | $ 4,985.06 |
| 13 | Trucking to Transfer Station | $ 2,093.44 |
| | Subtotal = | $ 166,511.35 |

| Additional Item | Task | Value |
|---|---|---|
| Salvage Values Not Included | | |
| 1S | Racking Disposal Cost | $ 32,831.25 |
| 2S | Solar Panel Disposal Cost | $ 60,255.00 |
| | Additional Item Subtotal | $ 93,086.25 |

**Present Value Total = $ 255,048.39**

| Task | Future Value |
|---|---|

Inflation

# of Years= 25

Inflation Rate= 2.0%

*Total • (1+ Inflation Rate)^Number of Years =Grand Total*

**Grand Total = $ 425,897.37**

# Agricultural Impact Mitigation Agreement

**STANDARD AGRICULTURAL IMPACT MITIGATION AGREEMENT**
between
**Ament Solar 1, LLC**

**and the**
**ILLINOIS DEPARTMENT OF AGRICULTURE**
**Pertaining to the Construction of a Commercial Solar Energy Facility**
**in**
**Kendall County, Illinois**

Pursuant to the Renewable Energy Facilities Agricultural Impact Mitigation Act (505 ILCS 147), the following standards and policies are required by the Illinois Department of Agriculture (IDOA) to help preserve the integrity of any Agricultural Land that is impacted by the Construction and Deconstruction of a Commercial Solar Energy Facility. They were developed with the cooperation of agricultural agencies, organizations, Landowners, Tenants, drainage contractors, and solar energy companies to comprise this Agricultural Impact Mitigation Agreement (AIMA).

Ament Solar 1, LLC, hereafter referred to as Commercial Solar Energy Facility Owner, or simply as Facility Owner, plans to develop and/or operate a 4.99MW Commercial Solar Energy Facility in Kendall County [GPS Coordinates: 41.591540, -88.443737 ], which will consist of up to 36 acres that will be covered by solar facility related components, such as solar panel arrays, racking systems, access roads, an onsite underground collection system, inverters and transformers and any affiliated electric transmission lines. This AIMA is made and entered between the Facility Owner and the IDOA.

If Construction does not commence within four years after this AIMA has been fully executed, this AIMA shall be revised, with the Facility Owner's input, to reflect the IDOA's most current Solar Farm Construction and Deconstruction Standards and Policies. This AIMA, and any updated AIMA, shall be filed with the County Board by the Facility Owner prior to the commencement of Construction.

The below prescribed standards and policies are applicable to Construction and Deconstruction activities occurring partially or wholly on privately owned agricultural land.

## Conditions of the AIMA

The mitigative actions specified in this AIMA shall be subject to the following conditions:

A. All Construction or Deconstruction activities may be subject to County or other local requirements. However, the specifications outlined in this AIMA shall be the minimum standards applied to all Construction or Deconstruction activities. IDOA may utilize any legal means to enforce this AIMA.

B. Except for Section 17. B. through F., all actions set forth in this AIMA are subject to modification through negotiation by Landowners and the Facility Owner, provided such changes are negotiated in advance of the respective Construction or Deconstruction activities.

C. The Facility Owner may negotiate with Landowners to carry out the actions that Landowners wish to perform themselves. In such instances, the Facility Owner shall offer Landowners the area commercial rate for their machinery and labor costs.

D. All provisions of this AIMA shall apply to associated future Construction, maintenance, repairs, and Deconstruction of the Facility referenced by this AIMA.

E. The Facility Owner shall keep the Landowners and Tenants informed of the Facility's Construction and Deconstruction status, and other factors that may have an impact upon their farming operations.

F. The Facility Owner shall include a statement of its adherence to this AIMA in any environmental assessment and/or environmental impact statement.

G. Execution of this AIMA shall be made a condition of any Conditional/Special Use Permit. Not less than 30 days prior to the commencement of Construction, a copy of this AIMA shall be provided by the Facility Owner to each Landowner that is party to an Underlying Agreement. In addition, this AIMA shall be incorporated into each Underlying Agreement.

H. The Facility Owner shall implement all actions to the extent that they do not conflict with the requirements of any applicable federal, state and local rules and regulations and other permits and approvals that are obtained by the Facility Owner for the Facility.

I. No later than 45 days prior to the Construction and/or Deconstruction of a Facility, the Facility Owner shall provide the Landowner(s) with a telephone number the Landowner can call to alert the Facility Owner should the Landowner(s) have questions or concerns with the work which is being done or has been carried out on his/her property.

J. If there is a change in ownership of the Facility, the Facility Owner assuming ownership of the Facility shall provide written notice within 90 days of ownership transfer, to the Department, the County, and to Landowners of such change. The Financial Assurance requirements and the other terms of this AIMA shall apply to the new Facility Owner.

K. The Facility Owner shall comply with all local, state and federal laws and regulations, specifically including the worker protection standards to protect workers from pesticide exposure.

L. Within 30 days of execution of this AIMA, the Facility Owner shall use Best Efforts to provide the IDOA with a list of all Landowners that are party to an Underlying Agreement and known Tenants of said Landowner who may be affected by the Facility. As the list of Landowners and Tenants is updated, the Facility Owner shall notify the IDOA of any additions or deletions.

M. If any provision of this AIMA is held to be unenforceable, no other provision shall be affected by that holding, and the remainder of the AIMA shall be interpreted as if it did not contain the unenforceable provision.

## Definitions

| | |
|---|---|
| Abandonment | When Deconstruction has not been completed within 12 months after the Commercial Solar Energy Facility reaches the end of its useful life. For purposes of this definition, a Commercial Solar Energy Facility shall be presumed to have reached the end of its useful life if the Commercial Solar Energy Facility Owner fails, for a period of 6 consecutive months, to pay the Landowner amounts owed in accordance with an Underlying Agreement. |

| | |
|---|---|
| Aboveground Cable | Electrical power lines installed above ground surface to be utilized for conveyance of power from the solar panels to the solar facility inverter and/or point of interconnection to utility grid or customer electric meter. |
| Agricultural Impact Mitigation Agreement (AIMA) | The Agreement between the Facility Owner and the Illinois Department of Agriculture (IDOA) described herein. |
| Agricultural Land | Land used for Cropland, hayland, pastureland, managed woodlands, truck gardens, farmsteads, commercial ag-related facilities, feedlots, livestock confinement systems, land on which farm buildings are located, and land in government conservation programs used for purposes as set forth above. |
| Best Efforts | Diligent, good faith, and commercially reasonable efforts to achieve a given objective or obligation. |
| Commercial Operation Date | The calendar date of which the Facility Owner notifies the Landowner, County, and IDOA in writing that commercial operation of the facility has commenced. If the Facility Owner fails to provide such notifications, the Commercial Operation Date shall be the execution date of this AIMA plus 6 months. |
| Commercial Solar Energy Facility (Facility) | A solar energy conversion facility equal to or greater than 500 kilowatts in total nameplate capacity, including a solar energy conversion facility seeking an extension of a permit to construct granted by a county or municipality before June 29, 2018. "Commercial solar energy facility" does not include a solar energy conversion facility: (1) for which a permit to construct has been issued before June 29, 2018; (2) that is located on land owned by the commercial solar energy facility owner; (3) that was constructed before June 29, 2018; or (4) that is located on the customer side of the customer's electric meter and is primarily used to offset that customer's electricity load and is limited in nameplate capacity to less than or equal to 2,000 kilowatts. |
| Commercial Solar Energy Facility Owner deemed (Facility Owner) | A person or entity that owns a commercial solar energy facility. A Commercial Solar Energy Facility Owner is not nor shall it be to be a public utility as defined in the Public Utilities Act. |
| County | The County or Counties where the Commercial Solar Energy Facility is located. |
| Construction | The installation, preparation for installation and/or repair of a Facility. |
| Cropland | Land used for growing row crops, small grains or hay; includes land which was formerly used as cropland, but is currently enrolled in a government conservation program; also includes pastureland that is classified as Prime Farmland. |

| | |
|---|---|
| Deconstruction | The removal of a Facility from the property of a Landowner and the restoration of that property as provided in the AIMA. |
| Deconstruction Plan | A plan prepared by a Professional Engineer, at the Facility's expense, that includes:<br>(1) the estimated Deconstruction cost, in current dollars at the time of filing, for the Facility, considering among other things:<br>i. the number of solar panels, racking, and related facilities involved;<br>ii. the original Construction costs of the Facility;<br>iii. the size and capacity, in megawatts of the Facility;<br>iv. the salvage value of the facilities (if all interests in salvage value are subordinate to that of the Financial Assurance holder if abandonment occurs);<br>v. the Construction method and techniques for the Facility and for other similar facilities; and<br>(2) a comprehensive detailed description of how the Facility Owner plans to pay for the Deconstruction of the Facility. |
| Department | The Illinois Department of Agriculture (IDOA). |
| Financial Assurance | A reclamation or surety bond or other commercially available financial assurance that is acceptable to the County, with the County or Landowner as beneficiary. |
| Landowner | Any person with an ownership interest in property that is used for agricultural purposes and that is party to an Underlying Agreement. |
| Prime Farmland | Agricultural Land comprised of soils that are defined by the USDA Natural Resources Conservation Service (NRCS) as "Prime Farmland" (generally considered to be the most productive soils with the least input of nutrients and management). |
| Professional Engineer | An engineer licensed to practice engineering in the State of Illinois. |
| Soil and Water Conservation District (SWCD) | A unit of local government that provides technical and financial assistance to eligible Landowners for the conservation of soil and water resources. |
| Tenant | Any person, apart from the Facility Owner, lawfully residing or leasing/renting land that is subject to an Underlying Agreement. |
| Topsoil | The uppermost layer of the soil that has the darkest color or the highest content of organic matter; more specifically, it is defined as the "A" horizon. |
| Underlying Agreement | The written agreement between the Facility Owner and the Landowner(s) including, but not limited to, an easement, option, lease, or license under the terms of which another person has constructed, constructs, or intends to construct a Facility on the property of the Landowner. |

| | |
|---|---|
| Underground Cable | Electrical power lines installed below the ground surface to be utilized for conveyance of power within a Facility or from a Commercial Solar Energy Facility to the electric grid. |
| USDA Natural Resources Conservation Service (NRCS) | An agency of the United States Department of Agriculture that provides America's farmers with financial and technical assistance to aid with natural resources conservation. |

## Construction and Deconstruction Standards and Policies

### 1. Support Structures

A. Only single pole support structures shall be used for the Construction and operation of the Facility on Agricultural Land. Other types of support structures, such as lattice towers or H-frames, may be used on nonagricultural land.

B. Where a Facility's Aboveground Cable will be adjacent and parallel to highway and/or railroad right-of-way, but on privately owned property, the support structures shall be placed as close as reasonably practicable and allowable by the applicable County Engineer or other applicable authorities to the highway or railroad right-of-way. The only exceptions may be at jogs or weaves on the highway alignment or along highways or railroads where transmission and distribution lines are already present.

C. When it is not possible to locate Aboveground Cable next to highway or railroad right-of-way, Best Efforts shall be expended to place all support poles in such a manner to minimize their placement on Cropland (i.e., longer than normal above ground spans shall be utilized when traversing Cropland).

### 2. Aboveground Facilities

Locations for facilities shall be selected in a manner that is as unobtrusive as reasonably possible to ongoing agricultural activities occurring on the land that contains or is adjacent to the Facility.

### 3. Guy Wires and Anchors

Best Efforts shall be made to place guy wires and their anchors, if used, out of Cropland, pastureland and hayland, placing them instead along existing utilization lines and on land other than Cropland. Where this is not feasible, Best Efforts shall be made to minimize guy wire impact on Cropland. All guy wires shall be shielded with highly visible guards.

### 4. Underground Cabling Depth

A. Underground electrical cables located outside the perimeter of the (fence) of the solar panels shall be buried with:

1. a minimum of 5 feet of top cover where they cross Cropland.
2. a minimum of 5 feet of top cover where they cross pastureland or other non-Cropland classified as Prime Farmland.
3. a minimum of 3 feet of top cover where they cross pastureland and other Agricultural Land not classified as Prime Farmland.

4. a minimum of 3 feet of top cover where they cross wooded/brushy land.

B. Provided that the Facility Owner removes the cables during Deconstruction, underground electric cables may be installed to a minimum depth of 18 inches:

1. Within the fenced perimeter of the Facility; or

2. When buried under an access road associated with the Facility provided that the location and depth of cabling is clearly marked at the surface.

C. If Underground Cables within the fenced perimeter of the solar panels are installed to a minimum depth of 5 feet, they may remain in place after Deconstruction.

**5. Topsoil Removal and Replacement**

A. Any excavation shall be performed in a manner to preserve topsoil. Best Efforts shall be made to store the topsoil near the excavation site in such a manner that it will not become intermixed with subsoil materials.

B. Best Efforts shall be made to store all disturbed subsoil material near the excavation site and separate from the topsoil.

C. When backfilling an excavation site, Best Efforts shall be used to ensure the stockpiled subsoil material will be placed back into the excavation site before replacing the topsoil.

D. Refer to Section 7 for procedures pertaining to rock removal from the subsoil and topsoil.

E. Refer to Section 8 for procedures pertaining to the repair of compaction and rutting of the topsoil.

F. Best Efforts shall be performed to place the topsoil in a manner so that after settling occurs, the topsoil's original depth and contour will be restored as close as reasonably practicable. The same shall apply where excavations are made for road, stream, drainage ditch, or other crossings. In no instance shall the topsoil materials be used for any other purpose unless agreed to explicitly and in writing by the Landowner.

G. Based on the mutual agreement of the landowner and Facility Owner, excess soil material resulting from solar facility excavation shall either be removed or stored on the Landowner's property and reseeded per the applicable National Pollution Discharge Elimination System (NPDES) permit/Stormwater Pollution Prevention Plan (SWPPP). After the Facility reaches the end of its Useful Life, the excess subsoil material shall be returned to an excavation site or removed from the Landowner's property, unless otherwise agreed to by Landowner.

**6. Rerouting and Permanent Repair of Agricultural Drainage Tiles**

The following standards and policies shall apply to underground drainage tile line(s) directly or indirectly affected by Construction and/or Deconstruction:

A. Prior to Construction, the Facility Owner shall work with the Landowner to identify drainage tile lines traversing the property subject to the Underlying Agreement to the extent reasonably practicable. All drainage tile lines identified in this manner shall be shown on the Construction and Deconstruction Plans.

B. The location of all drainage tile lines located adjacent to or within the footprint of the Facility shall be recorded using Global Positioning Systems (GPS) technology. Within 60 days after Construction is complete, the Facility Owner shall provide the Landowner, the IDOA, and the respective County Soil and Water Conservation District (SWCD) with "as built" drawings (strip maps) showing the location of all drainage tile lines by survey station encountered in the Construction of the Facility, including any tile line repair location(s), and any underground cable installed as part of the Facility.

C. **Maintaining Surrounding Area Subsurface Drainage**

If drainage tile lines are damaged by the Facility, the Facility Owner shall repair the lines or install new drainage tile line(s) of comparable quality and cost to the original(s), and of sufficient size and appropriate slope in locations that limit direct impact from the Facility. If the damaged tile lines cause an unreasonable disruption to the drainage system, as determined by the Landowner, then such repairs shall be made promptly to ensure appropriate drainage. Any new line(s) may be located outside of, but adjacent to the perimeter of the Facility. Disrupted adjacent drainage tile lines shall be attached thereto to provide an adequate outlet for the disrupted adjacent tile lines.

D. **Re-establishing Subsurface Drainage Within Facility Footprint**

Following Deconstruction and using Best Efforts, if underground drainage tile lines were present within the footprint of the facility and were severed or otherwise damaged during original Construction, facility operation, and/or facility Deconstruction, the Facility Owner shall repair existing drainage tiles or install new drainage tile lines of comparable quality and cost to the original, within the footprint of the Facility with sufficient capacity to restore the underground drainage capacity that existed within the footprint of the Facility prior to Construction. Such installation shall be completed within 12 months after the end of the useful life of the Facility and shall be compliant with Figures 1 and 2 to this Agreement or based on prudent industry standards if agreed to by Landowner.

E. If there is any dispute between the Landowner and the Facility Owner on the method of permanent drainage tile line repair, the appropriate County SWCD's opinion shall be considered by the Facility Owner and the Landowner.

F. During Deconstruction, all additional permanent drainage tile line repairs beyond those included above in Section 6.D. must be made within 30 days of identification or notification of the damage, weather and soil conditions permitting. At other times, such repairs must be made at a time mutually agreed upon by the Facility Owner and the Landowner. If the Facility Owner and Landowner cannot agree upon a reasonable method to complete this restoration, the Facility Owner may implement the recommendations of the appropriate County SWCD and such implementation constitutes compliance with this provision.

G. Following completion of the work required pursuant to this Section, the Facility Owner shall be responsible for correcting all drainage tile line repairs that fail due to Construction and/or Deconstruction for one year following the completion of Construction or Deconstruction, provided those repairs were made by the Facility Owner. The Facility Owner shall not be responsible for drainage tile repairs that the Facility Owner pays the Landowner to perform.

## 7. Rock Removal

With any excavations, the following rock removal procedures pertain only to rocks found in the uppermost 42 inches of soil, the common freeze zone in Illinois, which emerged or were brought to the site as a result of Construction and/or Deconstruction.

A. Before replacing any topsoil, Best Efforts shall be taken to remove all rocks greater than 3 inches in any dimension from the surface of exposed subsoil which emerged or were brought to the site as a result of Construction and/or Deconstruction.

B. If trenching, blasting, or boring operations are required through rocky terrain, precautions shall be taken to minimize the potential for oversized rocks to become interspersed in adjacent soil material.

C. Rocks and soil containing rocks removed from the subsoil areas, topsoil, or from any excavations, shall be removed from the Landowner's premises or disposed of on the Landowner's premises at a location that is mutually acceptable to the Landowner and the Facility Owner.

## 8. Repair of Compaction and Rutting

A. Unless the Landowner opts to do the restoration work on compaction and rutting, after the topsoil has been replaced post-Deconstruction, all areas within the boundaries of the Facility that were traversed by vehicles and Construction and/or Deconstruction equipment that exhibit compaction and rutting shall be restored by the Facility Owner. All prior Cropland shall be ripped at least 18 inches deep or to the extent practicable, and all pasture and woodland shall be ripped at least 12 inches deep or to the extent practicable. The existence of drainage tile lines or underground utilities may necessitate less ripping depth. The disturbed area shall then be disked.

B. All ripping and disking shall be done at a time when the soil is dry enough for normal tillage operations to occur on Cropland adjacent to the Facility.

C. The Facility Owner shall restore all rutted land to a condition as close as possible to its original condition upon Deconstruction, unless necessary earlier as determined by the Landowner.

D. If there is any dispute between the Landowner and the Facility Owner as to what areas need to be ripped/disked or the depth at which compacted areas should be ripped/disked, the appropriate County SWCD's opinion shall be considered by the Facility Owner and the Landowner.

## 9. Construction During Wet Weather

Except as provided below, construction activities are not allowed on agricultural land during times when normal farming operations, such as plowing, disking, planting or harvesting, cannot take place due to excessively wet soils. With input from the landowner, wet weather conditions may be determined on a field by field basis.

A. Construction activities on prepared surfaces, surfaces where topsoil and subsoil have been removed, heavily compacted in preparation, or otherwise stabilized (e.g. through cement mixing) may occur at the discretion of the Facility Owner in wet weather conditions.

B. Construction activities on unprepared surfaces will be done only when work will not result in rutting which may mix subsoil and topsoil. Determination as to the potential of subsoil and topsoil mixing will be made in consultation with the underlying Landowner, or, if approved by the Landowner, his/her designated tenant or designee.

**10. Prevention of Soil Erosion**

A. The Facility Owner shall work with Landowners and create and follow a SWPPP to prevent excessive erosion on land that has been disturbed by Construction or Deconstruction of a Facility.

B. If the Landowner and Facility Owner cannot agree upon a reasonable method to control erosion on the Landowner's property, the Facility Owner shall consider the recommendations of the appropriate County SWCD to resolve the disagreement.

C. The Facility Owner may, per the requirements of the project SWPPP and in consultation with the Landowner, seed appropriate vegetation around all panels and other facility components to prevent erosion. The Facility Owner must utilize Best Efforts to ensure that all seed mixes will be as free of any noxious weed seeds as possible. The Facility Owner shall consult with the Landowner regarding appropriate varieties to seed.

**11. Repair of Damaged Soil Conservation Practices**

Consultation with the appropriate County SWCD by the Facility Owner shall be carried out to determine if there are soil conservation practices (such as terraces, grassed waterways, etc.) that will be damaged by the Construction and/or Deconstruction of the Facility. Those conservation practices shall be restored to their preconstruction condition as close as reasonably practicable following Deconstruction in accordance with USDA NRCS technical standards. All repair costs shall be the responsibility of the Facility Owner.

**12. Compensation for Damages to Private Property**

The Facility Owner shall reasonably compensate Landowners for damages caused by the Facility Owner. Damage to Agricultural Land shall be reimbursed to the Landowner as prescribed in the applicable Underlying Agreement.

**13. Clearing of Trees and Brush**

A. If trees are to be removed for the Construction or Deconstruction of a Facility, the Facility Owner shall consult with the Landowner to determine if there are trees of commercial or other value to the Landowner.

B. If there are trees of commercial or other value to the Landowner, the Facility Owner shall allow the Landowner the right to retain ownership of the trees to be removed and the disposition of the removed trees shall be negotiated prior to the commencement of land clearing.

**14. Access Roads**

A. To the extent practicable, access roads shall be designed to not impede surface drainage and shall be built to minimize soil erosion on or near the access roads.

B. Access roads may be left intact during Construction, operation or Deconstruction through mutual agreement of the Landowner and the Facility Owner unless otherwise restricted by federal, state, or local regulations.

C. If the access roads are removed, Best Efforts shall be expended to assure that the land shall be restored to equivalent condition(s) as existed prior to their construction, or as otherwise agreed to by the Facility Owner and the Landowner. All access roads that are removed shall be ripped to a depth of 18 inches. All ripping shall be performed consistent with Section 8.

**15. Weed/Vegetation Control**

A. The Facility Owner shall provide for weed control in a manner that prevents the spread of weeds. Chemical control, if used, shall be done by an appropriately licensed pesticide applicator.

B. The Facility Owner shall be responsible for the reimbursement of all reasonable costs incurred by owners of agricultural land where it has been determined by the appropriate state or county entity that weeds have spread from the Facility to their property. Reimbursement is contingent upon written notice to the Facility Owner. Facility Owner shall reimburse the property owner within 45 days after notice is received.

C. The Facility Owner shall ensure that all vegetation growing within the perimeter of the Facility is properly and appropriately maintained. Maintenance may include, but not be limited to, mowing, trimming, chemical control, or the use of livestock as agreed to by the Landowner.

D. The Deconstruction plans must include provisions for the removal of all weed control equipment used in the Facility, including weed-control fabrics or other ground covers.

**16. Indemnification of Landowners**

The Facility Owner shall indemnify all Landowners, their heirs, successors, legal representatives, and assigns from and against all claims, injuries, suits, damages, costs, losses, and reasonable expenses resulting from or arising out of the Commercial Solar Energy Facility, including Construction and Deconstruction thereof, and also including damage to such Facility or any of its appurtenances, except where claims, injuries, suits, damages, costs, losses, and expenses are caused by the negligence or intentional acts, or willful omissions of such Landowners, and/or the Landowners heirs, successors, legal representatives, and assigns.

**17. Deconstruction Plans and Financial Assurance of Commercial Solar Energy Facilities**

A. Deconstruction of a Facility shall include the removal/disposition of all solar related equipment/facilities, including the following utilized for operation of the Facility and located on Landowner property:

1. Solar panels, cells and modules;
2. Solar panel mounts and racking, including any helical piles, ground screws, ballasts, or other anchoring systems;
3. Solar panel foundations, if used (to depth of 5 feet);

4. Transformers, inverters, energy storage facilities, or substations, including all components and foundations; however, Underground Cables at a depth of 5 feet or greater may be left in place;
5. Overhead collection system components;
6. Operations/maintenance buildings, spare parts buildings and substation/switching gear buildings unless otherwise agreed to by the Landowner;
7. Access Road(s) unless Landowner requests in writing that the access road is to remain;
8. Operation/maintenance yard/staging area unless otherwise agreed to by the Landowner; and
9. Debris and litter generated by Deconstruction and Deconstruction crews.

B. The Facility Owner shall, at its expense, complete Deconstruction of a Facility within twelve (12) months after the end of the useful life of the Facility.

C. During the County permit process, or if none, then prior to the commencement of construction, the Facility Owner shall file with the County a Deconstruction Plan. The Facility Owner shall file an updated Deconstruction Plan with the County on or before the end of the tenth year of commercial operation.

D. The Facility Owner shall provide the County with Financial Assurance to cover the estimated costs of Deconstruction of the Facility. Provision of this Financial Assurance shall be phased in over the first 11 years of the Project's operation as follows:

1. On or before the first anniversary of the Commercial Operation Date, the Facility Owner shall provide the County with Financial Assurance to cover ten (10) percent of the estimated costs of Deconstruction of the Facility as determined in the Deconstruction Plan.
2. On or before the sixth anniversary of the Commercial Operation Date, the Facility Owner shall provide the County with Financial Assurance to cover fifty (50) percent of the estimated costs of Deconstruction of the Facility as determined in the Deconstruction Plan.
3. On or before the eleventh anniversary of the Commercial Operation Date, the Facility Owner shall provide the County with Financial Assurance to cover one hundred (100) percent of the estimated costs of Deconstruction of the Facility as determined in the updated Deconstruction Plan provided during the tenth year of commercial operation.

The Financial Assurance shall not release the surety from liability until the Financial Assurance is replaced. The salvage value of the Facility may only be used to reduce the estimated costs of Deconstruction if the County agrees that all interests in the salvage value are subordinate or have been subordinated to that of the County if Abandonment occurs.

E. The County may, but is not required to, reevaluate the estimated costs of Deconstruction of any Facility after the tenth anniversary, and every five years thereafter, of the Commercial Operation Date. Based on any reevaluation, the County may require changes in the level of Financial Assurance used to calculate the phased Financial Assurance levels described in Section 17.D. required from the Facility Owner. If the County is unable to its satisfaction to perform the investigations necessary to approve the Deconstruction Plan filed by the Facility Owner, then the County and Facility may mutually agree on the selection of a Professional Engineer independent of the Facility Owner to conduct any necessary investigations. The Facility Owner shall be responsible for the cost of any such investigations.

F. Upon Abandonment, the County may take all appropriate actions for Deconstruction including drawing upon the Financial Assurance.

## Concurrence of the Parties to this AIMA

The Illinois Department of Agriculture and Ament Solar 1, LLC concur that this AIMA is the complete AIMA governing the mitigation of agricultural impacts that may result from the Construction and Deconstruction of the solar farm project in Kendall County within the State of Illinois.

The effective date of this AIMA commences on the date of execution.

**STATE OF ILLINOIS**
**DEPARTMENT OF AGRICULTURE**

[redacted]

By: Jerry Costello II, Director

[redacted]

By Clay Nordsiek, Deputy General Counsel

801 E. Sangamon Avenue,
State Fairgrounds, POB 19281
Springfield, IL 62794-9281

7/19, 2024

**Ament Solar 1, LLC**

[redacted]

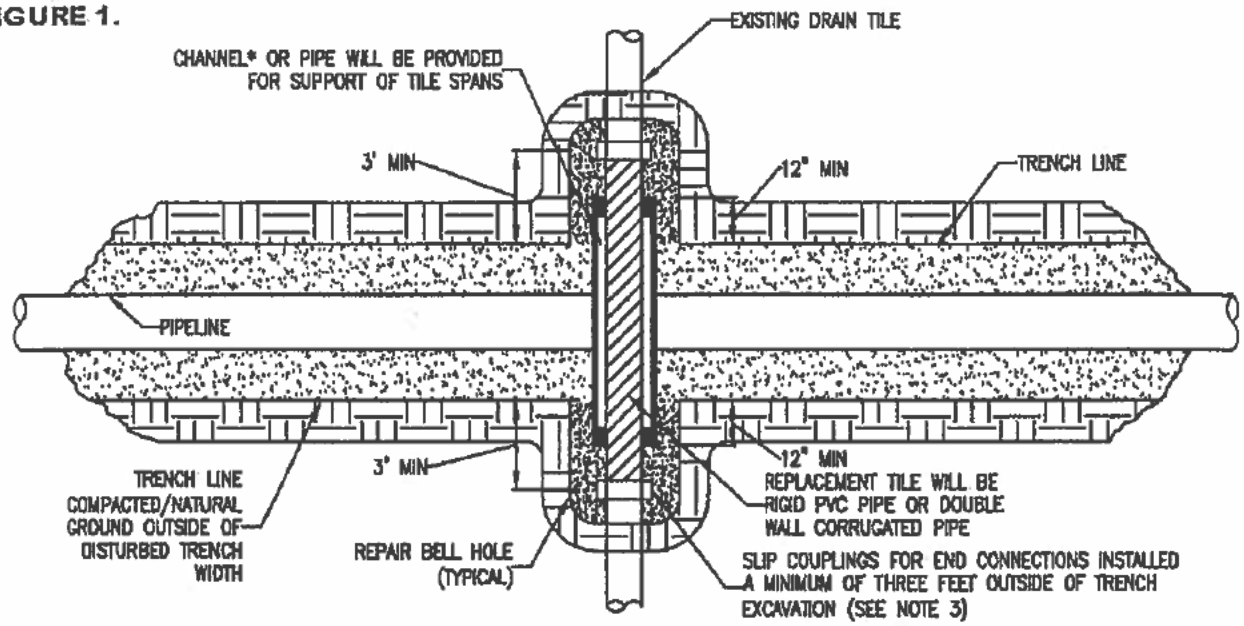
By Nicholas Bellone

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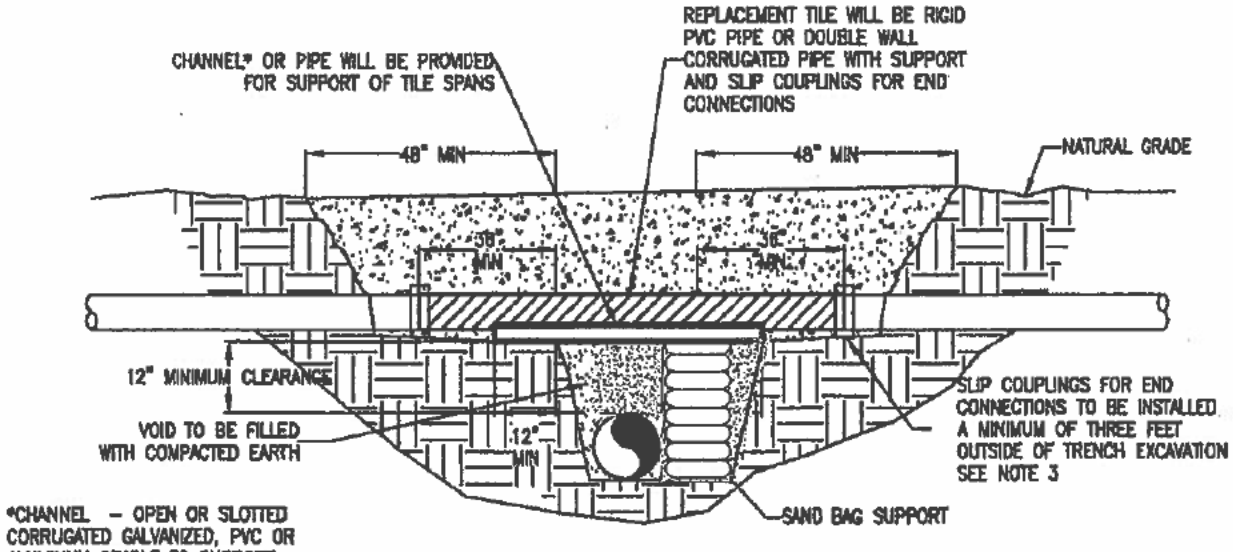
Address

July 16, 2024

**FIGURE 1.**




**PLAN**
N.T.S.




*CHANNEL – OPEN OR SLOTTED CORRUGATED GALVANIZED, PVC OR ALUMINUM CRADLE TO SUPPORT DRAIN TILE.

**CROSS SECTION**
N.T.S.

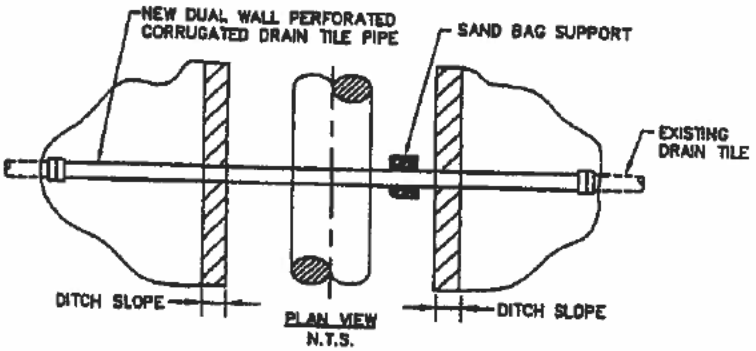
NOTE:

1. IMMEDIATELY REPAIR TILE IF WATER IS FLOWING THROUGH TILE AT TIME OF TRENCHING. IF NO WATER IS FLOWING AND TEMPORARY REPAIR IS DELAYED, OR NOT MADE BY THE END OF THE WORK DAY, A SCREEN OR APPROPRIATE 'NIGHT CAP' SHALL BE PLACED ON OPEN ENDS OF TILE TO PREVENT ENTRAPMENT OF ANIMALS ETC.
2. CHANNEL OR PIPE (OPEN OR SLOTTED) MADE OF CORRUGATED GALVANIZED PIPE, PVC OR ALUMINUM WILL BE USED FOR SUPPORT OF DRAIN TILE SPANS.
3. INDUSTRY STANDARDS SHALL BE FOLLOWED TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES.

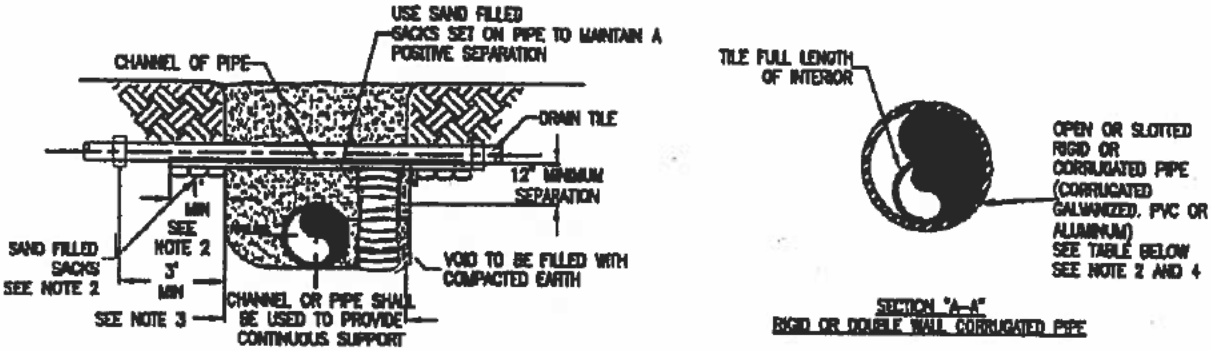
# TEMPORARY DRAIN TILE REPAIR

PAGE 1 of 2

**FIGURE 2.**




## PLAN VIEW




## END VIEWS

| MINIMUM SUPPORT TABLE | | | |
|---|---|---|---|
| TILE SIZE | CHANNEL SIZE | PIPE SIZE | |
| 3" | 4" @ 5.4 #/ft | 4" | STD. WT. |
| 4"-5" | 5" @ 6.7 #/ft | 6" | STD. WT. |
| 6"-9" | 7" @ 9.8 #/ft | 9"-10" | STD. WT. |
| 10" | 10" @ 15.3 #/ft | 12" | STD. WT. |

NOTE:

1. TILE REPAIR AND REPLACEMENT SHALL MAINTAIN ORIGINAL ALIGNMENT GRADIENT AND WATER FLOW TO THE GREATEST EXTENT POSSIBLE. IF THE TILE NEEDS TO BE RELOCATED, THE INSTALLATION ANGLE MAY VARY DUE TO SITE SPECIFIC CONDITIONS AND LANDOWNER RECOMMENDATIONS.
2. 1'-0" MINIMUM LENGTH OF CHANNEL OR RIGID PIPE (OPEN OR SLOTTED CORRUGATED GALVANIZED, PVC OR ALUMINUM CRADLE) SHALL BE SUPPORTED BY UNDISTURBED SOIL, OR IF CROSSING IS NOT AT RIGHT ANGLES TO PIPELINE, EQUIVALENT LENGTH PERPENDICULAR TO TRENCH. SHIM WITH SAND BAGS TO UNDISTURBED SOIL FOR SUPPORT AND DRAINAGE GRADIENT MAINTENANCE (TYPICAL BOTH SIDES).
3. DRAIN TILES WILL BE PERMANENTLY CONNECTED TO EXISTING DRAIN TILES A MINIMUM OF THREE FEET OUTSIDE OF EXCAVATED TRENCH LINE USING INDUSTRY STANDARDS TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES INCLUDING SLIP COUPLINGS.
4. DIAMETER OF RIGID PIPE SHALL BE OF ADEQUATE SIZE TO ALLOW FOR THE INSTALLATION OF THE TILE FOR THE FULL LENGTH OF THE RIGID PIPE.
5. OTHER METHODS OF SUPPORTING DRAIN TILE MAY BE USED IF ALTERNATE PROPOSED IS EQUIVALENT IN STRENGTH TO THE CHANNEL/PIPE SECTIONS SHOWN AND IF APPROVED BY COMPANY REPRESENTATIVES AND LANDOWNER IN ADVANCE. SITE SPECIFIC ALTERNATE SUPPORT SYSTEM TO BE DEVELOPED BY COMPANY REPRESENTATIVES AND FURNISHED TO CONTRACTOR FOR SPANS IN EXCESS OF 20', TILE GREATER THEN 10" DIAMETER, AND FOR "HEADER" SYSTEMS.
6. ALL MATERIAL TO BE FURNISHED BY CONTRACTOR.
7. PRIOR TO REPAIRING TILE, CONTRACTOR SHALL PROBE LATERALLY INTO THE EXISTING TILE TO FULL WIDTH OF THE RIGHTS OF WAY TO DETERMINE IF ADDITIONAL DAMAGE HAS OCCURRED. ALL DAMAGED/DISTURBED TILE SHALL BE REPAIRED AS NEAR AS PRACTICABLE TO ITS ORIGINAL OR BETTER CONDITION.

# PERMANENT DRAIN TILE REPAIR

PAGE 2 of 2

November 15, 2024

Mr. Matt Asselmeier
Kendall County Planning, Building, & Zoning
111 West Fox Street
Yorkville, IL 60560-1498

Subject: 1000 Ament Road – Solar Farm WBK Project 19-102.CI

Dear Mr. Asselmeier:

We have received and reviewed the following information for the subject project:

- Stormwater/ Drainage Memorandum prepared by Atwell, LLC. dated September 27, 2024 and received November 11, 2024.
- Project Narrative Prepared by Atwell, LLC. Dated September 12, 2024 and received November 11, 2024.
- Water Resources Delineation Report Prepared by Encap Inc. Dated July 13, 2023 and June 18, 2024 both received November 11, 2024.
- ALTA/NSPS Land Title Survey Prepared by Atwell, LLC. Dated October 17, 2024 and received November 11, 2024.
- Engineering Plans (Special Use Permit Set) Prepared by Atwell, LLC. Dated October 17, 2024, and received November 11, 2024.
- Management and Monitoring Specifications & Guidelines, Prepared by Encap Inc. dated October 17, 2024, and received November 11, 2024.
- Drain Tile Information, Prepared by Huddleston McBride Professional Land Drainage Services, dated October 17, 2024, and received November 11, 2024.

The following comments require resolution prior to our recommendation for approval of plans and stormwater permit.

**General Comments**

1. Please utilize the attached Kendall County Stormwater Permit Application form to present the information required by Section 16-174.C.1 where applicable.
2. Per requirement in Section 16-174.C.1 please provide copies of all other related permits or permit applications by other jurisdictions or agencies. Wetlands are noted on site and although it appears avoidance is the approach, the consultant recommendations indicate coordinate with USACE for concurrence and clearance to proceed. Provide correspondence with USACE regarding this project. Excerpts noted hereafter:

**RECOMMENDATIONS**

One farmed wetland totaling 0.08 acres was identified on the project area. The boundary of Farmed Wetland 1 was not field staked by ENCAP, Inc. Farmed wetland boundaries must be scaled from the attached aerial photograph (Exhibit G) onto the property boundary survey.

The U.S. Army Corps of Engineers has the final authority in determining the jurisdictional status of the wetland identified on site. ENCAP, Inc. recommends that a request for jurisdictional determination be sent to the U.S. Army Corps of Engineers as soon as possible. An Approved Jurisdictional Determination may take between 3-6 months to receive from the USACE offices.

If wetlands can be completely avoided by project development, a Letter of No Objection (LONO) / No Permit Required may be obtained from the USACE in lieu of an Approved Jurisdictional Determination. A LONO/No Permit Required letter may take between 2-3 months to receive from the USACE offices.

**RECOMMENDATIONS**

Two wetlands totaling approximately 0.55 acres were identified on the project area. The boundaries of Farmed Wetland 1 were not field staked by ENCAP, Inc. Farmed wetland boundaries must be scaled from the attached aerial photograph (Exhibit G) onto the property boundary survey.

The U.S. Army Corps of Engineers has the final authority in determining the jurisdictional status of the wetlands and water resources identified on site. In the past, projects have been able to apply to the USACE for a jurisdictional determination (JD) to find out which governing body regulates the wetlands on site. JD's, however, have been deprioritized and are being discouraged by the USACE Chicago District. In lieu of a JD, which can take over a year to be processed, if wetlands can be completely avoided by project development, a No Permit Required (NPR) may be obtained from the USACE. A No Permit Required letter may take between 2-5 months to receive from the USACE offices.

## Stormwater Report Comments

1. Based on existing topography it appears site disturbance is routed in various directions and not to a single location or outfall. Evaluating the entire site as one drainage area is not representative of proposed conditions.
2. Identify all existing site outfalls based on the full extent of proposed disturbance.
3. Site runoff storage is required for new impervious surfaces greater than 32,000 sf. The project appears to exceed this amount and will require plan revisions to include stormwater storage, decrease impervious surfaces or other measures to mitigate impacts.
4. Identify any off-site flows tributary to the project site and particularly crossing the gravel roadway and parking areas.

## Erosion Control Comments

1. Please include the following information on Sheet C0.0 in the Erosion and Sediment Control Measures Notes.
    - The plan shall provide a description of the nature of the construction activity, the name of the receiving waters, an estimate of the total area of the site and the total area of the site that is expected to be disturbed by excavation, grading or other activities.

- Description of all off-site tributary areas that will cause runoff and the potential to cause sediment flow on to the project site and or within the project limits. The extent of off-site area, nature of land use and off-site land cover shall be identified."
- Description of dust control measures.

2. Sheet C-3.0: Please include drainage pattern arrows and locations of site outfalls. It is noted that these will be existing drainage patterns to be maintained.
3. The specifications and notes both indicate instances where erosion control blanket is required. Please confirm erosion control blanket is not proposed. If erosion control blanket is to be provided, please note this in the landscape plan (Sheet C-5.0) and provide the associated detail (Sheet C-4.0).
4. Sheet C-3.0: The concrete washout basin appears to be located outside of the silt fence. Please relocate or confirm in the call out that the concrete washout basin shall be located within the silt fence.

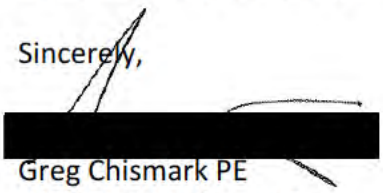
**Engineering Plans**

1. Identify the entity for post-construction maintenance. The entity responsible for maintenance appears to be mentioned for erosion control but not post-construction maintenance. (Sheet C-5.1).
2. Please depict the drain tiles included in Attachment 9 within the plan sheets.
3. Provide a drain tile repair detail on the plan sheets.

The applicant's design professionals are responsible for performing and checking all design computations, dimensions, details, and specifications in accordance with all applicable codes and regulations, and obtaining all permits necessary to complete this work. In no way does this review relieve applicant's design professionals of their duties to comply with the law and any applicable codes and regulations, nor does it relieve the Contractors in any way from their sole responsibility for the quality and workmanship of the work and for strict compliance with the permitted plans and specifications.

If you have any questions or comments, please contact us at (630) 443-7755.

Sincerely,



Greg Chismark PE
WBK Engineering, LLC

# STORMWATER MANAGEMENT PERMIT

PERMIT APPLICATION #_____

Conformance with all Federal, State, and County Regulations is required. Applicants are encouraged to read the Stormwater Management Division of the Kendall County Code and consider a pre-application meeting with Department staff prior to submittal. See attached highlights of regulations.

Property: Name_____

Owner Address_____

Phone_____

Agent: Name_____

Address_____

Phone_____

Site: Address or Location_____

Tax Parcel #_____

Zoning/Land Use/Acres_____

Proposed Development:

Attachments: Plat_____ Construction Plans_____

Soils_____ Landscaping_____

Grading_____ Phasing_____

Other_____

Fees $_____ Processing Fee ($50.00)

$_____ Engineering Review Deposit ($2,500.00 *or* 2% of estimated cost of the proposed improvements, whichever is greater. A $3,500.00 Construction Inspection Services Fee and General Consultation Fee Might Be Required as the Project Progresses)

TOTAL $ _____One check is acceptable made out to the Kendall County Treasurer

Staff will contact Applicant regarding schedule and reviews.

I hereby certify that the information on this application, on the documents attached, and on other submittals made during the review process is true and correct; that I am authorized to file this application; and that I agree to conform to all requirements set forth by the County and all conditions of the Kendall County Code related to stormwater management. I understand that by signing this form, that the property in question may be visited by County Staff and County Engineers throughout the permit and construction process. I also understand that I am responsible for all costs associated with this application. The applicant attests that they are free of debt or current on all debts owed to Kendall County as of the application date.

Owner's Signature (Including Middle Initial)_____Date_____

Agent's Signature (Including Middle Initial)_____Date_____

Kendall County Planning, Building, & Zoning Department
111 West Fox Street, Room 203
Yorkville, Illinois 60560
Phone: (630) 553-4139, Fax (630) 553-4179
www.kendallcountyil.gov

**DEPARTMENT OF PLANNING, BUILDING & ZONING**
111 West Fox Street • Yorkville, IL • 60560
(630) 553-4141 Fax (630) 553-4179

# ENGINEERING CONSULTANT FEES

I, _____ understand that Kendall County uses the services of a
Applicant Name

consultant for engineering reviews and inspections and that I will be responsible for payment of services on _____ project. I authorize the consulting
Project Name

services to proceed.

---

☐ IF THIS IS ***NOT*** PART OF A BUILDING PERMIT APPLICATION, PLEASE CHECK THE BOX AND COMPLETE THIS SECTION:

I hereby submit a deposit of _____ payable to the **Kendall County Treasurer**
$ Amount

to be used by Kendall County to reimburse consultant for charges invoiced for work done in the review, approval and inspection of the proposed improvements.

I understand that if the deposit is depleted that I may be required to replenish the deposit to have work proceed.

I further understand that Kendall County will not issue a Building Permit or a Certificate of Occupancy as the case may be until I provide payment or proof of payment for the engineering services.

Signature of Applicant:_____ Date: _____

**STORMWATER MANAGEMENT REVIEW – ENGINEERING**

Kendall County requires the engineering review of "development" to determine compliance with County regulations including the following portions of the Kendall County Code:

- Countywide Stormwater Ordinance (Includes Soil Erosion Control & Floodplain Protection)
- Subdivision Control Ordinance
- Zoning Ordinance

These portions of the Kendall County Code can be viewed online at https://library.municode.com/il/kendall_county/codes/code_of_ordinances or purchased at the Planning, Building, and Zoning Office. For further information, please contact PBZ Staff.

Development is broadly defined as any activity that has potential for adverse effect on adjacent properties due to changes in stormwater runoff. A permit may be needed for some activities that do not require a land use, subdivision or zoning petition. Please check with the County Planning Building & Zoning Office (630-553-4139) prior to any significant grading or filling on your property.

The consulting firm of WBK Engineering assists the County with the review of engineering plans submitted by developers. WBK is a multi-disciplinary, full-service civil and environmental engineering and consulting firm. Their Project Manager assigned to Kendall County is:

Greg Chismark, P.E.
WBK Engineering
116 West Main Street, Suite 201
St. Charles, IL 60174
Phone: 630-443-7755
Email: GChismark@bodwegroup.com

WBK charges fees for their review and consultation services. The applicant/developer will be expected to open an escrow account with Kendall County at the time of application. WBK's fees are in addition to the application fee charged by the County. Fees vary by project considering each project has different potential impacts and each development plan is different. If there is any question on fees, please contact the County Planning, Building, and Zoning Office (630-553-4139).

**HIGHLIGHTS OF STORMWATER MANAGEMENT REGULATIONS**

**AUTHORITY:** The County has statutory authority to regulate stormwater management and governing the location, width, course, and release rate of all stormwater runoff channels, streams and basins in the County.
**OBJECTIVES:** To protect upstream and downstream land owners from adverse impact of development activities. These impacts relate to stormwater quantity (flooding), soil erosion control, and floodplain and wetland protection.
**EXEMPTIONS & LIMITATIONS:** Most farming activities outside the floodplain and wetlands are exempt from the regulation. A farming activity that results in a total of more than 43,560 square feet of impervious surfaces (old & new) will require a permit. Many projects, such as ponds, berms, shore stabilization where more than 43,500 square feet of ground is disturbed or three feet of fill is placed, require a Stormwater Management Permit. Some exceptions include driveways, some swimming pools, utilities, and public roadway projects.
**PROCEDURES:** The owner should do their best to read and understand the requirements of the regulations prior to contacting the County and preparing an application. If the project involves impacts to floodplain or wetlands, it may be necessary to seek guidance from a design professional. We encourage early communication to help determine permit requirements. A pre-application meeting is encouraged. In order for the meeting to be as productive as possible, we recommend you bring a draft application, the engineering consultants fee deposit form, along with **two** copies of a concept grading plans that includes at a minimum, a location map, the extent of disturbance and a description of the change in ground elevation proposed. We recommend the applicant utilize the County GIS data in preparing initial project concepts. County Staff and WBK will determine if additional data is needed and whether other agency permits/consultation is required.

DEPARTMENT OF PLANNING, BUILDING & ZONING
111 West Fox Street • Room 203
Yorkville, IL • 60560
Phone (630) 553-4139 Fax (630) 553-4179

# STORMWATER MANAGEMENT PERMIT

| IF YOUR PROJECT... | THEN YOU NEED A STORMWATER MANAGEMENT PERMIT |
|---|---|
| ☐ | Any development or a substantial improvement located in the regulatory floodplain or wetland or there is a regulatory floodplain or wetland within the property boundary. |
| ☐ | Any land disturbing activity to be performed in a water course or water body or crossing a water course or waterbody. |
| ☐ | Any fill that will exceed three (3) feet in vertical height at its highest point measured from the natural ground surface. |
| ☐ | Any land disturbing activity requiring a site runoff storage facility (stormwater detention). |
| ☐ | Any development that disturbs more than 43,500 square feet of ground cover, **unless** the development solely involves one or more of the following:<br>a. Installation, renovation, or replacement of a septic system, potable water service line, or other utility to serve an existing structure<br>b. Maintenance, repair, or at grade replacement of: Existing lawn, Garden or cultivated areas or Residential Driveway<br>c. Maintenance of an existing stormwater facility, not requiring other state or federal permits or approvals<br>d. Excavation below final grade for tanks, vaults, tunnels, swimming pools, cellars, or for basements and/or footings of a single-family residence and appurtenant structures on a site that is part of an engineered and final platted subdivision or for which a building permit has been issued by the permitting authority, unless the site would otherwise require a Stormwater Management Permit<br>e. Public roadway or bridge projects; consisting of improvement to an existing public roadway or public bridge sponsored by a public roadway agency and contracted as a public bid project |

The following activities shall be EXEMPT and shall not require a stormwater management permit:

| | |
|---|---|
| • | Tilling of soil for fire protection purposes |
| • | Engaging in the following only if in connection with a farming or other agricultural or conservation enterprise, purpose, or use and only if there is no placement of fill within a floodplain:<br>a. Construction of sod waterways<br>b. Construction of terraces<br>c. Construction of surface water diversions (but not across watershed boundaries)<br>d. Construction of grade stabilization berms or systems<br>e. Tilling of the soil<br>f. The implementation of conservation measures included in a farm conservation plan approved by the Kendall County Soil and Water Conservation District |
| • | Agricultural use of land and development on un-platted residentially zoned property larger than three acres provided the total impervious area is less than or equal to 43,560 square feet and no structure(s) or any substantial improvement to a building is within a floodplain |

ALL DEVELOPMENT SHALL SECURE ALL FEDERAL, STATE, REGIONAL AND LOCAL APPROVALS, INCLUDING, WITHOUT LIMITATION, AN IDNR-OWR FLOODWAY/FLOODPLAIN CONSTRUCTION PERMIT, A USACOE PERMIT AND AN IDNR-OWR DAM SAFETY PERMIT IF REQUIRED, MEETING ALL FEDERAL, STATE, REGIONAL AND LOCAL APPROVALS PRIOR TO THE ISSUANCE OF A STORMWATER MANAGEMENT PERMIT FOR PROPOSED WORK AND AREAS OF A SITE REQUIRING SUCH OTHER APPROVALS.

Table 16-174 Required Submittals (Refer to Sections Listed for Specific Material)

| | Section Number/ Description | | | | | | |
|---|---|---|---|---|---|---|---|
| | 16-174(c) | 16-174(d) | 16-174(e) | 16-174(f) | 16-174(g) | 16-174(h) | 16-174(i) |
| | Application & Project Overview Plan | Erosion Control Plan Set Submittal | Engineering Plan Set Submittal | Stormwater Submittal | Floodplain Submittal | Performance Security | Maintenance Schedule & Funding |
| All Development Requiring a Permit | X | X | | | | | X |
| All Development Requiring Detention/Retention | X | X | X | X | | X | X |
| All Development Requiring a Permit > 20 acres | X | X | X | X | | X | X |
| All Developments on Sites with Floodplains | X | X | X | | X | X | X |
| All Applications Requesting Variances | X | X | X | X | If on site | X | X |

## Matt Asselmeier

**From:** Nicholas Bellone <nbellone@newleafenergy.com>
**Sent:** Friday, December 6, 2024 12:04 PM
**To:** Steve Grebner
**Cc:** Matt Asselmeier; Tom Ryan; Steve Gengler; Cathy Scalise; Doug Westphal; jakecoopfarms[redacted] Don Hirsch; Carolyn Pottinger; Timothy Karales; Doug Thanepohn; bjandersonfarms[redacted] mikehomerding[redacted] mbsweeney919[redacted] Nick Standiford
**Subject:** [External]Re: Position of Kendall Township on the proposed Ament Road Solar Farm 1 LLC Special Use Permit Request 24-30
**Attachments:** Beecher Road 500' Abutters List.pdf; 16400 Newark Road 500' Abutters List.pdf

CAUTION - This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hey Steve,

Attached are 500' abutters list for the two projects that we have had approved in Kendall County. The map showing these properties within the 500' is included in each pdf for reference. We do not have contact information for abutters other than the addresses that we send notice letters to. Please let me know if you need anything else for this request.

Have a great weekend!
Nick

**Nicholas Bellone**
Civil Project Engineer I

nbellone@newleafenergy.com Cell[redacted]

On Tue, Dec 3, 2024 at 4:28 PM Steve Grebner <sgrebner@kendalltwp.com> wrote:
Thank you, Nick, for your response. We will be sure to read your extensive reply. I would like to request, as you offered, a list of the non participating land owners
of your previous projects. While they are public record, I would like to ask you to provide that list.

> ***"The contact information of non-participating parcels surrounding previous New Leaf Energy projects is publicly available. New Leaf Energy can supply information pertaining to previous projects if needed. New Leaf representatives are available to answer questions about their projects at the upcoming meetings."***

Also I do appreciate your decision to hold any votes on this matter until January and your offer to attend our next round of Township Meetings.

Regards,
Steve Grebner, Clerk Kendall Township

---

**From:** Nicholas Bellone <nbellone@newleafenergy.com>,
**Sent:** Tuesday, December 3, 2024 2:38 PM
**To:** Steve Grebner <sgrebner@kendalltwp.com>
**Cc:** masselmeier@kendallcountyil.gov <masselmeier@kendallcountyil.gov>; Tom Ryan <tryan@newleafenergy.com>; Steve Gengler <sgengler@kendalltwp.com>; Cathy Scalise <cscalise@kendalltwp.com>; Doug Westphal <dwestphal@kendalltwp.com>; jakecoopfarm[redacted] <jakecoopfarms[redacted]>; Don Hirsch <dhirsch@kendalltwp.com>; Carolyn Pottinger <cpottinger@kendalltwp.com>; Timothy Karales <tkarales@kendalltwp.com>; Doug Thanepohn <dthanepohn@kendalltwp.com>; bjandersonfarms[redacted] <bjandersonfarms[redacted]>; mikehomerdin[redacted] <mikehomerding[redacted]>; mbsweeney[redacted] <mbsweene[redacted]>; Nick Standiford <nstandiford@schainbanks.com>
**Subject:** Re: Position of Kendall Township on the proposed Ament Road Solar Farm 1 LLC Special Use Permit Request 24-30

Good Afternoon,

In response to the email sent by the Kendall Township Board, New Leaf has put together the attached memo to help address the concerns. We are happy to be put on the next township agenda for December 16th and 17th to go over these concerns and our solutions. In the meantime feel free to reach out with any additional questions or comments.

It is important to us that the Township's concerns are addressed prior to attending the hearings at the county level. With that said, we would like to request a continuance on our Kendall County hearing dates (RPC: Dec. 11th & ZBA: Dec. 16th) to the following month (RPC: Jan. 22nd & ZBA : Jan. 27th) in hopes that these have been resolved.

Thank you,
Nick

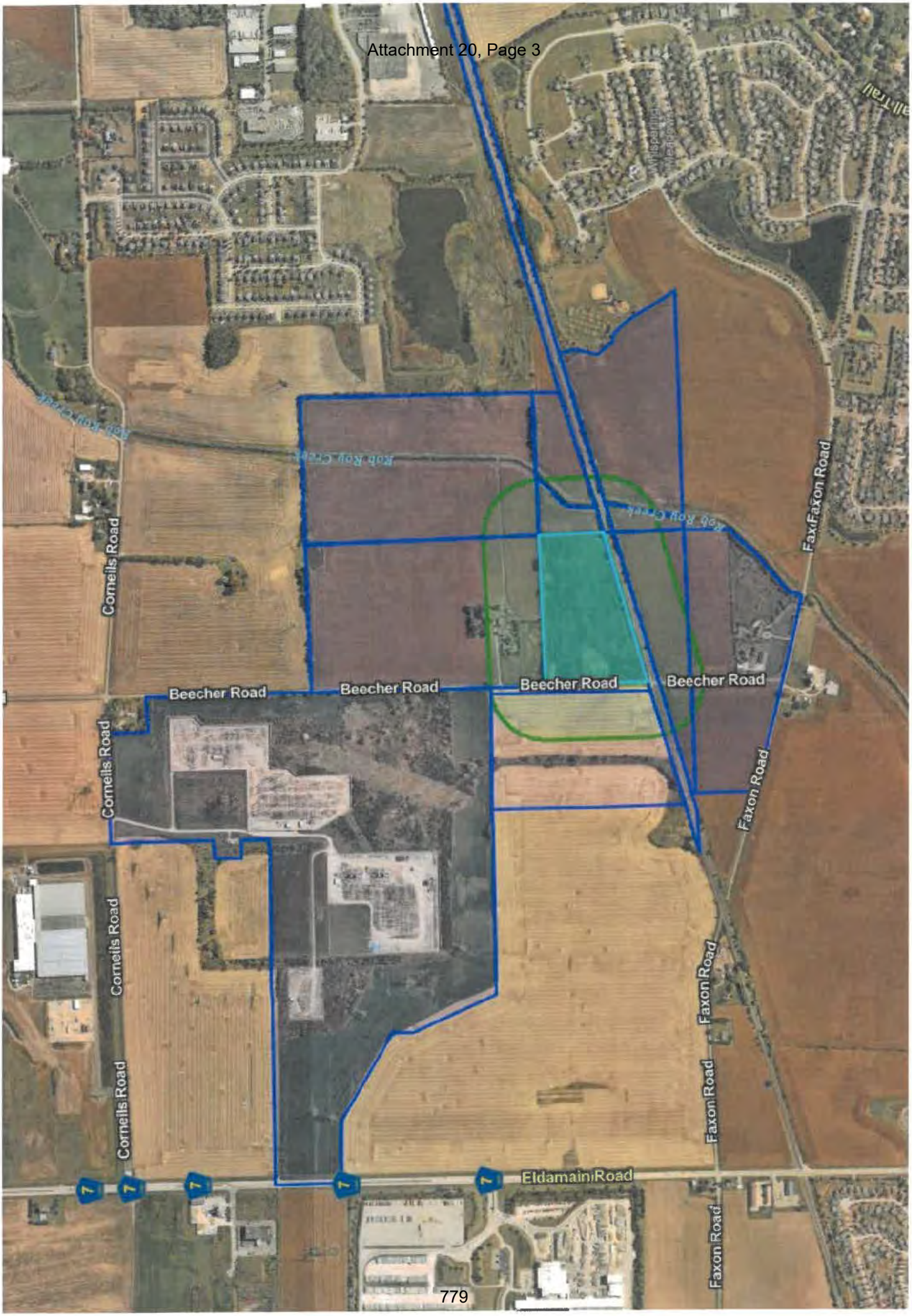
**Nicholas Bellone**
Civil Project Engineer I

nbellone@newleafenergy.com Cell: 401.644.6824

On Fri, Nov 22, 2024 at 2:01 PM Steve Grebner <sgrebner@kendalltwp.com> wrote:

ATTN: Kendall County Zoning Board et. al

Please note that on Monday November 18th the Kendall Township Planning Commission entertained New Leaf Energy Representatives to present the *AMENT ROAD SOLAR FARM 1 LLC* Project. While the individuals were forthcoming and answered the questions to the best of their ability, there were some major concerns. These concerns are addressed in the recommendations below:


Rob Roy Creek
Cornells Road
Beecher Road
Beecher Road
Beecher Road
Beecher Road
Faxon Road
Faxon Road
Cornells Road
Cornells Road
Cornells Road
Faxon Road
Faxon Road
Faxon Road
Eldamain Road

ROBERT M ILDEFONSA LIV TRUST LOFTUS
[redacted]

JYJ LLC
[redacted]

ROBERT M ILDEFONSA LIV TRUST LOFTUS
[redacted]

ROBERT M ILDEFONSA LIV TRUST LOFTUS
[redacted]

C1 YORKVILLE LLC
[redacted]

Beecher Road Solar, approved by the City of Yorkville in 2023 and building permit is nearing completion

COMMONWEALTH EDISON
[redacted]

ROBERT M ILDEFONSA LIV TRUST LOFTUS
[redacted]

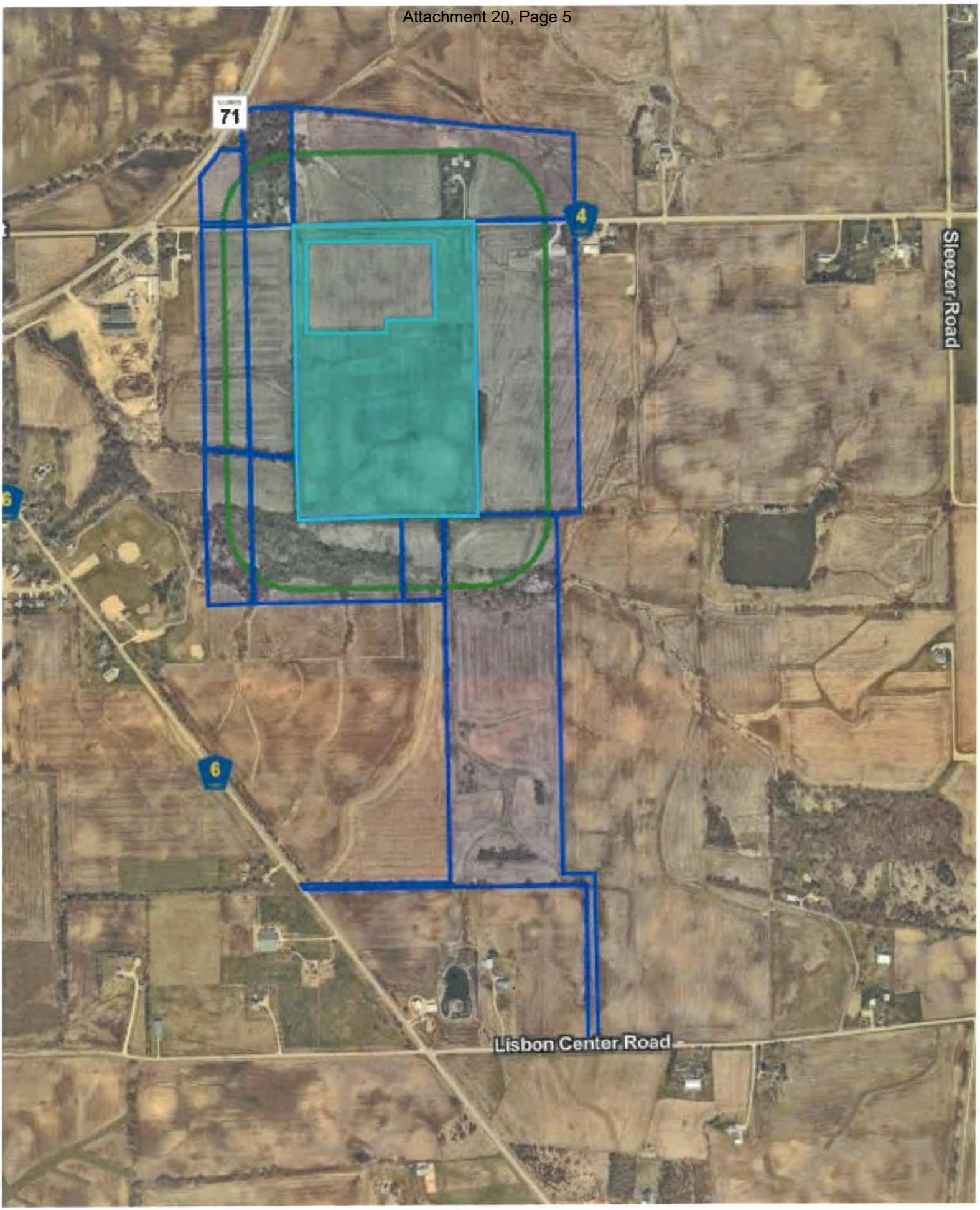
BN&SF RAILWAY CO
PROPERTY TAX DEPARTMENT
[redacted]

YORKVILLE MEADOWS LLC
C/O SHERRIE CHIOU
[redacted]

JYJ LLC
[redacted]

SCOTT D PAPENDICK
[redacted]

BN&SF RAILWAY CO
PROPERTY TAX DEPARTMENT
[redacted]


71
4
6
6
Sleezer Road
Lisbon Center Road

NEWARK ROAD KENDALL SOLAR 1 LLC
[redacted]

MARTIN H MYRE JR
[redacted]

NANCY L HARAZIN
[redacted]

KENDALL COUNTY FOREST PRESERVE 1
[redacted]

MARTIN H JR MYRE
[redacted]

Newark Road Solar, permitted by Borrego Solar and approved by Kendall County in 2018 and is nearing construction

MENTOR LLESHI
[redacted]

SHARP HOLDINGS LLC
[redacted]

DANA FRIESTAD
[redacted]

ROBERT ANDREA MCBROOM
[redacted]

THOMAS O MARY L BROMELAND
[redacted]

DANA J LAURIE M FRIESTAD
[redacted]

KENDALL COUNTY FOREST PRESERVE 1
[redacted]

## Matt Asselmeier

**From:** Steve Grebner <sgrebner@kendalltwp.com>
**Sent:** Tuesday, December 17, 2024 9:01 AM
**To:** Matt Asselmeier
**Cc:** Steve Gengler; jakecoopfarms[redacted]
**Subject:** RE: [External]Re: Position of Kendall Township on the proposed Ament Road Solar Farm 1 LLC Special Use Permit Request 24-30

Hi Matt,
We do not have any action on our agenda for a vote on this at tonight's meeting as the zoning commission had some additional questions for The New Leaf Reps and a good discussion regarding clarification of some points occurred. The New Leaf Reps were going to get back to us with some additional information so it was decided the zoning commission would not change their position regarding the recommendation of conditional approval of the SUP. The whole Township board has a full agenda this evening and given we will have our January monthly meeting before the County Zoning meeting and we will await that additional information from New Leaf Reps and assuming we receive that, the board will plan on making that decision at the January meeting and provide that result at that time.

Both the Zoning Commission and the Township board of trustees are taking their responsibility to represent the electors of Kendall Township very seriously as the long term impact of this project is one that will be around well after many of us.

Regards,
Steve Grebner, Clerk

On Dec 17, 2024 8:34 AM, Matt Asselmeier <masselmeier@kendallcountyil.gov> wrote:

> Steve:
>
> How did it go last night?
>
> Will the Township Board take any action tonight?
>
> Thanks,
>
> Matthew H. Asselmeier, AICP, CFM
>
> Director

## Matt Asselmeier

**From:** Sara Mendez <smendez@yorkville.il.us>
**Sent:** Thursday, January 9, 2025 9:26 AM
**To:** Matt Asselmeier
**Cc:** Krysti Barksdale-Noble; bolson@yorkville.il.us
**Subject:** RE: [External]EDC: Kendall County Petition 24-30 (1.5 Mile Review)

Good morning Matt,

Both EDC and PZC had no issues with the proposal. They recommended to permit the solar farm and variance.

All the best,

***Sara Mendez***
*(she/her)*
Planner I
United City of Yorkville
651 Prairie Pointe Drive
Yorkville, Illinois 60560
(630) 553-8555
(630) 450-1304
www.yorkville.il.us

**From:** Matt Asselmeier <masselmeier@kendallcountyil.gov>
**Sent:** Thursday, January 9, 2025 8:05 AM
**To:** Sara Mendez <smendez@yorkville.il.us>
**Cc:** Krysti Barksdale-Noble <knoble@yorkville.il.us>; Bart Olson <BOlson@yorkville.il.us>
**Subject:** RE: [External]EDC: Kendall County Petition 24-30 (1.5 Mile Review)

Sara:

Did either the EDC or the PZC have any comments regarding this proposal?

What were their recommendations?

Thanks,

Matthew H. Asselmeier, AICP, CFM
Director
Kendall County Planning, Building & Zoning
111 West Fox Street
Yorkville, IL 60560-1498
PH: 630-553-4139
Fax: 630-553-4179

**From:** Sara Mendez <smendez@yorkville.il.us>
**Sent:** Thursday, January 2, 2025 5:38 PM

# KENDALL COUNTY
# REGIONAL PLANNING COMMISSION

***Kendall County Office Building***
***Rooms 209 and 210***
***111 W. Fox Street, Yorkville, Illinois***

**Unapproved - Meeting Minutes of December 11, 2024 - 7:00 p.m.**

Chairman Bill Ashton called the meeting to order at 7:00 p.m.

## ROLL CALL

Members Present: Bill Ashton, Eric Bernacki, Tom Casey, Dave Hamman, Keith Landovitz, Karin McCarthy-Lange, Ruben Rodriguez, Bob Stewart, and Claire Wilson
Members Absent: Seth Wormley
Staff Present: Matthew H. Asselmeier, Director, and Wanda A. Rolf, Office Assistant
Others Present: Tom Ryan, Juan Hernandez, and Tom Ryan

## PETITIONS

### Petition 24-30 Nicholas S. Bellone on Behalf of Ament Solar 1, LLC (Tenant) and Janet M. Dhuse on Behalf of the Janet Dhuse Declaration of Family Trust Dated March 1, 2013 (Owner)

Mr. Asselmeier summarized the request.

In October 2024, the County received an application for a special use permit and variance to allow a commercial solar energy facility on the subject property.

When Kendall Township reviewed the proposal in November, the Kendall Township Board had the following concerns:

1. "That it appears specifically and in writing that any fiduciary instrument (i.e. Bond) be attached to the Title and or abstract of the Subject Property presently identified as *AMENT ROAD SOLAR FARM*. In so much as that responsibility will pass to any and all owners until the end of the deconstruction phase of the project.

2. That the concerns expressed above regarding the subsoil drainage issues be specifically addressed in any SUP, and failure to do so will result in a violation of the terms of the agreement and a monetary penalty will be applied.

3. That the concerns regarding the noxious weeds shall be specifically spelled out in the SUP and future agreements."

In an effort to work with Kendall Township, the Petitioner submitted a request for a continuance to the January 2025 Kendall County Regional Planning Commission meeting and the January 2025 Kendall County Zoning Board of Appeals hearing. The Petitioner's cover email and cover letter, not including attachments, were provided.

The next Kendall Township Planning Commission meeting is December 16, 2024, and the next Kendall Township Board meeting is December 17, 2024.

The complete record of this Petition can be found on the County's website at https://www.kendallcountyil.gov/home/showpublisheddocument/31510/638665763806870000.

Member Berancki asked if the three (3) concerns raised by Kendall Township were actionable items. Mr. Asselmeier responded that bonds are set at a specific figure and then if some action occurs that triggers a need to use the funds, the County will draw on the bond to resolve the applicable issue. Regarding a drainage bond, it would be difficult to determine a dollar amount because the condition of the neighboring field tile is unknown, the impacts of the new field tile located on the subject property on the older field on neighboring properties, and if new problems with tiles on neighboring properties are connected with the development of the solar field. When the bonds funds are exhausted, there would be no additional funds. Regarding subsoil drainage issues, the Petitioners have to submit a drainage plan and the drainage plan would be a part of the special use permit. Also, the Petitioners have applied for a stormwater permit. If a violation to either the special use permit or the stormwater portion of the County Code occurs, the property would have to pay applicable fines. Regarding noxious weeds, there will be a requirement in the special use permit that they have to follow all applicable federal, state, and local laws. If they violate the Illinois Noxious Weed Law, they could be fined per the requirements of the State law and they would be in violation of their special use permit and could be fined for violating their special use permit.

Member Bernacki asked about enforcement of drainage issues. Mr. Asselmeier responded that a property owner cannot cause more or less water to go onto neighboring properties under Illinois Drainage Law. Illinois Drainage Law is enforced civilly. The Kendall County Stormwater Management portion of the County Code contains thresholds triggering the need for a County Stormwater Management Permit. It is possible that an activity does not reach the thresholds contained in the County Code. In that case, the matter would be handled civilly.

Member Wilson said the key was to get a large enough bond to cover the costs to remove all of the components of the solar project. Per State law, the salvage value reduces the total bond amount. She questioned the recycling ability of the solar panels. She encouraged her client in another case to hire their own engineer to estimate the decommissioning costs. She favored having a stormwater analysis. Some projects don't start immediately.

The subject property will be leased.

Member Wilson asked about the nearest crossroads. They are Route 47 and Ament Road. The subject property is west of Route 47 on the south side of Ament Road.

Member Rodriguez asked about the lease and a cleanup situation. It was noted that no solar project in Illinois had gone through the entire life cycle of a project. Mr. Asselmeier explained that the County would ask the court for permission to cleanup a site. The County would then take the bond and any costs the bond didn't cover would be liened against the property; it may take several years to redeem the lien.

Member Landovitz asked if the Township's concerns were about the beneficiaries and not the amount of the bond. Mr. Asselmeier responded that he did not believe a bond amount had been determined. The Township wanted to make sure the property owner and any future property owners knew that the bond was there should it need to be used.

No road use agreement has been finalized with Kendall Township.

Tom Ryan, New Leaf Energy, explained how the company calculates decommissioning bonds; they would use independent engineers if needed.

The continuation request is at the Petitioner's request.

Member Bernacki asked if New Leaf Energy had done any other projects in Illinois. Mr. Ryan responded yes, but most are still being processed and built.

Member Wilson asked about the scope the Planning Commission's review of this proposal. Mr. Asselmeier responded that the Commission's primary role is to examine projects in relation to the consistency with the Land Resource Management Plan and then examining projects in relation to the County's regulations.

Member Wilson asked if the Commission could impose conditions because of State law. Mr. Asselmeier responded that State law makes it difficult for the Commission to add new conditions, but the Petitioner may be agreeable to additional conditions. Mr. Ryan said that they would like to make the County happy.

Member Wilson asked about the relationship between Ament Solar 1, LLC and New Leaf Energy. Mr. Ryan said that Ament Solar 1 was created by New Leaf Energy; it would stay effective during operation.

Member Landovitz made a motion, seconded by Member Hamman, to continue the proposal at the Petitioner's request to the January 22, 2025, meeting, which will be held at the Historic Courthouse at 110 W. Madison Street, Yorkville.

Juan Hernandez noted that the road for the solar project will be next to his property. He was wanting to know pros and cons for having this type of development next to his property. The Petitioner has not met with him. Mr. Hernandez was directed to the County website and Kendall Township will be meeting on the proposal the week of December 16th.

With a voice vote of nine (9) ayes, the motion carried.

Steve Gengler, Kendall Township Supervisor, clarified the Township's position regarding the drain tile issues. Once the solar panels are installed, it will be difficult to work on drain tile. The Township is concerned about the impact on drainage of neighboring properties. Member Wilson noted the runoff from the panels; the field has a good slope.

The proposal goes to the Kendall County Regional Planning Commission on January 22, 2025.

**CITIZENS TO BE HEARD/PUBLIC COMMENT**

None

**OTHER BUSINESS/ANNOUNCEMENTS**

Mr. Asselmeier reported that the application deadline for the January meeting is December 24, 2024. Petitions 24-30 and 24-35 will be on the agenda.

Member Landovitz appreciated the Staff for updating the ordinance as necessary. Mr. Asselmeier said that the Staff was proposing text amendments reducing the number of plats submitted for certain applications.

Member Wilson suggested only including a summary instead of complete NRI Reports.

**ADJOURNMENT**

Member Wilson made a motion, seconded by Member Hamman, to adjourn. With a voice vote of nine (9) ayes,

the motion carried.

The Kendall County Regional Planning Commission meeting adjourned at 8:05 p.m.

Respectfully submitted by,
Matthew H. Asselmeier, AICP, CFM, Director

Enc.

# KENDALL COUNTY
# REGIONAL PLANNING COMMISSION
# DECEMBER 11, 2024

IF YOU WOULD LIKE TO BE CONTACTED ON FUTURE MEETINGS REGARDING THIS TOPIC, PLEASE PROVIDE YOUR ADDRESS OR EMAIL ADDRESS

| NAME | ADDRESS (OPTIONAL) | EMAIL ADDRESS (OPTIONAL) |
|---|---|---|
| Tom Ryan | [redacted] | |
| Juan Hernandez | | |
| Steve Gengler | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**MINUTES – UNOFFICIAL UNTIL APPROVED**
**KENDALL COUNTY**
**ZONING BOARD OF APPEALS MEETING**
111 WEST FOX STREET, COUNTY BOARD ROOM (ROOMS 209 and 210)
YORKVILLE, IL 60560
December 16, 2024 – 7:00 p.m.

**CALL TO ORDER**
Chairman Randy Mohr called the Zoning Board of Appeals meeting to order at 7:00 p.m.

**ROLL CALL:**
Members Present: Scott Cherry, Cliff Fox, Tom LeCuyer, Randy Mohr, Jillian Prodehl, Dick Thompson, and Dick Whitfield
Members Absent: None
Staff Present: Matthew Asselmeier, AICP, CFM, Director and Wanda Rolf, Office Assistant
Others Present: Michael Faulkner and Miranda Marshall-Faulkner

**PETITIONS:**
The Zoning Board of Appeals started their reviews of Petitions 24-30 and 24-35 and opened the public hearings for both at 7:01 p.m.

**Petition 24 – 30 – Nicholas S. Bellone on Behalf of Ament Solar 1, LLC (Tenant) and Janet M. Dhuse on Behalf of the Janet Dhuse Declaration of Family Trust Dated March 1, 2013 (Owner)**

| | |
|---|---|
| Request: | Special Use Permit for a Commercial Solar Energy Facility and Variance to Section 36-282(17)(a) of the Kendall County Code to Allow a Commercial Solar Energy Facility on Land within One Point Five (1.5) Miles of Municipality without an Annexation Agreement |
| PINs: | 05-16-300-006 and 05-17-400-005 |
| Location: | South of 9949 and 10021 Ament Road, Yorkville in Kendall Township |
| Purpose: | Petitioner Would Like to Install a Commercial Solar Energy Facility; Property is Zoned A-1 |

**Petition 24 – 35 – Kendall County Regional Planning Commission**

| | |
|---|---|
| Request: | Text Amendment to the Kendall County Code Amending the Parking Regulations in Front Yard Setbacks |
| Purpose: | Petitioner Would Like to Allow Parking in the Interior ½ of the Front Yard Setback on Properties Zoned A-1 |

At the request of the Petitioners, Chairman Mohr stated that Petition 24 – 30 and Petition 24 – 35 will be continued until the January 27, 2025, meeting, at 7:00 p.m., at the Historic Courthouse.

With a voice vote of seven (7) ayes, the motion carried.

The Zoning Board of Appeals completed their reviews and recessed the public hearings for Petition 24-30 and 24-35 at 7:02 p.m.

**PUBLIC COMMENTS**

Mr. Asselmeier reported that the next application deadline was December 24, 2024. The only petitions, to date, for the January hearing are the solar project on Simons Road and the solar project on Ament Road and the two (2) petitions continued at tonight's meeting.

Michael Faulkner, a property owner in the A-1 district, wanted to speak about Petition 24-35, the parking regulations in the front yard setbacks.

Mr. Asselmeier spoke regarding the issue with the setbacks. It was noted that at their meeting on October 23, 2024, the Kendall County Regional Planning Commission decided to initiate a text amendment to the Kendall County Code allowing parking in the A-1 Zoning District in the interior seventy-five feet (75') from the centerline for properties where the right-of-way was not dedicated and the interior fifty feet (50') from the right-of-way line where a right-of-way existed.

Mr. Faulkner asked why he could not park within the first twenty-five feet (25') of the road if he is a owns property zoned A-1. Mr. Asselmeier stated that Mr. Faulkner is not allowed to count that parking spot as his principal, required parking spot.

Miranda Marshall-Faulkner discussed the situation at 1539 Collins Road regarding the demolition of the house and their concerns about setbacks at the property.

The reasoning behind this proposal was because there was a landscaping business that wanted to have their required parking spaces in the front yard setback and that is against regulation.

Chairman Mohr asked Mr. and Mrs. Faulkner to attend the January 27, 2025, meeting, at 7:00 p.m., at the Historic Courthouse.

Starting in January, the meetings will be in the Historic Courthouse.

**ADJOURNMENT OF THE ZONING BOARD OF APPEALS**

Member LeCuyer made a motion, seconded by Member Prodehl, to adjourn.

With a voice vote of seven ayes, the motion carried.

The Zoning Board of Appeals meeting adjourned at 7:33 p.m.

The next regularly scheduled meeting/hearing will be on Monday, January 27, 2025, in the Historic Courthouse.

Respectfully submitted by,
Wanda A Rolf
Planning, Building and Zoning Part-Time Administrative Assistant

Exhibits

1. Memo on Petition 24-30 Dated December 12, 2024
2. Certificate of Publication and Green Cards from Mailing for Petition 24-30 (Not Included with Report but on file in Planning, Building and Zoning Office)

**DEPARTMENT OF PLANNING, BUILDING & ZONING**
111 West Fox Street • Room 204
Yorkville, IL • 60560
(630) 553-4141 Fax (630) 553-4179

# MEMORANDUM

To: Kendall County Zoning Board of Appeals
From: Matthew H. Asselmeier, AICP, CFM, Director
Date: December 12, 2024
Re: Proposed Commercial Solar Energy Facility South of 9949 and 10021 Ament Road (PINs: 05-16-300-006 and 05-17-400-005), Yorkville in Kendall Township (Petition 24-30)

In October 2024, the County received an application for a special use permit and variance to allow a commercial solar energy facility on the subject property.

When Kendall Township reviewed the proposal in November, the Kendall Township Board had the following concerns:

1. "That it appears specifically and in writing that any fiduciary instrument (i.e. Bond) be attached to the Title and or abstract of the Subject Property presently identified as *AMENT ROAD SOLAR FARM.* In so much as that responsibility will pass to any and all owners until the end of the deconstruction phase of the project.

2. That the concerns expressed above regarding the subsoil drainage issues be specifically addressed in any SUP, and failure to do so will result in a violation of the terms of the agreement and a monetary penalty will be applied.

3. That the concerns regarding the noxious weeds shall be specifically spelled out in the SUP and future agreements."

In an effort to work with Kendall Township, the Petitioner submitted a request for a continuance to the January 2025 Kendall County Regional Planning Commission meeting and the January 2025 Kendall County Zoning Board of Appeals hearing. The Petitioner's cover email and cover letter, not including attachments, are attached to this memo.

The next Kendall Township Planning Commission meeting is December 16, 2024, and the next Kendall Township Board meeting is December 17, 2024.

The Kendall County Regional Planning Commission met on this proposal on December 11, 2024.

The complete record of this Petition can be found on the County's website at https://www.kendallcountyil.gov/home/showpublisheddocument/31510/638665763806870000.

If you have any questions regarding this memo, please let me know.

MHA

Enc.: December 3, 2024, Email and Letter from Nicholas Bellone and Tom Ryan (Cover Letter and Email Only)

new leaf energy

Date: December 23, 2024

To: Greg Chrismark, PE
WBK Engineering

From Nicholas Bellone
Civil Project Engineer
New Leaf Energy

RE: 1000 Ament Road – Solar Farm WBK Project 19-102.CI

New Leaf Energy has reviewed the comments pertaining to the above referenced project, contained in a letter dated November 15, 2024. Our responses are in **bold** and are shown below:

## General Comments

1. Please utilize the attached Kendall County Stormwater Permit Application form to present the information required by Section 16-174.C.1 where applicable.
    - **NLE Response: Based on our conversation on Nov. 27th and the updated calculations per your comments we demonstrated detention is not required. Therefore, the Kendall County Stormwater Permit Application form is not applicable.**

2. Per requirement in Section 16-174.C.1 please provide copies of all other related permits or permit applications by other jurisdictions or agencies. Wetlands are noted on site and although it appears avoidance is the approach, the consultant recommendations indicate coordinate with

**RECOMMENDATIONS**

One farmed wetland totaling 0.08 acres was identified on the project area. The boundary of Farmed Wetland 1 was not field staked by ENCAP, Inc. Farmed wetland boundaries must be scaled from the attached aerial photograph (Exhibit G) onto the property boundary survey.

The U.S. Army Corps of Engineers has the final authority in determining the jurisdictional status of the wetland identified on site. ENCAP, Inc. recommends that a request for jurisdictional determination be sent to the U.S. Army Corps of Engineers as soon as possible. An Approved Jurisdictional Determination may take between 3-6 months to receive from the USACE offices.

If wetlands can be completely avoided by project development, a Letter of No Objection (LONO) / No Permit Required may be obtained from the USACE in lieu of an Approved Jurisdictional Determination. A LONO/No Permit Required letter may take between 2-3 months to receive from the USACE offices.

**RECOMMENDATIONS**

Two wetlands totaling approximately 0.55 acres were identified on the project area. The boundaries of Farmed Wetland 1 were not field staked by ENCAP, Inc. Farmed wetland boundaries must be scaled from the attached aerial photograph (Exhibit G) onto the property boundary survey.

The U.S. Army Corps of Engineers has the final authority in determining the jurisdictional status of the wetlands and water resources identified on site. In the past, projects have been able to apply to the USACE for a jurisdictional determination (JD) to find out which governing body regulates the wetlands on site. JD's, however, have been deprioritized and are being discouraged by the USACE Chicago District. In lieu of a JD, which can take over a year to be processed, if wetlands can be completely avoided by project development, a No Permit Required (NPR) may be obtained from the USACE. A No Permit Required letter may take between 2-5 months to receive from the USACE offices.



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Lowell, MA 01851
newleafenergy.com

USACE for concurrence and clearance to proceed. Provide correspondence with USACE regarding this project. Excerpts noted hereafter:

- **NLE Response: On Dec. 12 we received notice from the USACE that the NPR letter was out on a 10-day review. Once passed through the review, assuming no objections, the letter will be generated and sent out. Once we receive the letter we will forward along for verification on your end.**

**Stormwater Report Comments**

1. Based on existing topography it appears site disturbance is routed in various directions and not to a single location or outfall. Evaluating the entire site as one drainage area is not representative of proposed conditions.
   - **NLE Response: The Stormwater Management (SWM) Report has been updated to show the different drainage divides. The site still drains to the same general area but the separate divides have been shown and the two outfalls from the site have been identified on the drainage divide plans in Appendix B.**

2. Identify all existing site outfalls based on the full extent of proposed disturbance.
   - **NLE Response: This has been shown in the SWM Report. See the drainage maps in Appendix B.**

3. Site runoff storage is required for new impervious surfaces greater than 32,000 sf. The project appears to exceed this amount and will require plan revisions to include stormwater storage, decrease impervious surfaces or other measures to mitigate impacts.
   - **NLE Response: The site does exceed the threshold for the 32,000 sf. of impervious area; however, detention is not required because the reduction in stormwater runoff is achieved through the use of revising the ground cover to absorb more water and increase the time of concentration from the pre-development site.**

4. Identify any off-site flows tributary to the project site and particularly crossing the gravel roadway and parking areas.
   - **NLE Response: This has been shown in the SWM Report. See Appendix B**

**Erosion Control Comments**

1. Please include the following information on Sheet C0.0 in the Erosion and Sediment Control Measures Note:
   - The plan shall provide a description of the nature of the construction activity, the name of the receiving waters, an estimate of the total area of the site and the total area of the site that is expected to be disturbed by excavation, grading or other activities.
   - Description of all off-site tributary areas that will cause runoff and the potential to cause sediment flow on to the project site and or within the project limits. The extent of off-site area, nature of land use and off-site land cover shall be identified.
   - Description of dust control measures.
   - **NLE Response: The notes on Sheet C-0.0 have been updated with these notes. See Erosion and Sediment Control Measure notes 24, 25 and 26.**



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2. Sheet C-3.0: Please include drainage pattern arrows and locations of site outfalls. It is noted that these will be existing drainage patterns to be maintained.
    - **NLE Response: These have been added to Sheet C-3.0.**

3. The specifications and notes both indicate instances where erosion control blanket is required. Please confirm erosion control blanket is not proposed. If erosion control blanket is to be provided, please note this in the landscape plan (Sheet C-5.0) and provide the associated detail (Sheet C-4.0).
    - **NLE Response: There are no instances of erosion control blankets needed within the plan set. If during final engineering plans it is determined that erosion control blankets are needed, they will be provided at that time with specification details and locations.**

4. Sheet C-3.0: The concrete washout basin appears to be located outside of the silt fence. Please relocate or confirm in the call out that the concrete washout basin shall be located within the silt fence.
    - **NLE Response: The limits of the silt fence has be relocated around the concrete washout basin.**

**Engineering Plans**

1. Identify the entity for post-construction maintenance. The entity responsible for maintenance appears to be mentioned for erosion control but not post-construction maintenance. (Sheet C-5.1).
    - **NLE Response: The entity responsible for post-construction maintenance will be determined with the final engineering permit plans.**

2. Please depict the drain tiles included in Attachment 9 within the plan sheets.
    - **NLE Response: The drain tiles in Attachment 9 are from a desktop review performed by Huddleston. A full drain tile survey will be performed if the project receives its Special Use Permit approval. The field surveyed drain tiles will be depicted on the final construction plans.**

3. Provide a drain tile repair detail on the plan sheets
    - **NLE Response: A drain tile repair detail has been added to the detail sheet.**

Please reach out if you have any additional comments or concerns.

Sincerely,

[redacted]

Nicholas Bellone
Civil Project Engineer
New Leaf Energy



55 Technology Drive, Suite 102
Lowell, MA 01851
newleafenergy.com

December 30, 2024

Mr. Matt Asselmeier
Kendall County Planning, Building, & Zoning
111 West Fox Street
Yorkville, IL 60560-1498

Subject: 1000 Ament Road – Solar Farm WBK Project 19-102.CI

Dear Mr. Asselmeier:

We have received and reviewed the following information for the subject project:

- Response Letter prepared by New Leaf Energy dated December 23, 2024 and received December 23, 2024
- Stormwater/ Drainage Memorandum prepared by Atwell, LLC. dated December 19, 2024 and received December 23, 2024.
- Engineering Plans (Special Use Permit Set) prepared by Atwell, LLC. Dated December 19, 2024, and received December 23, 2024.

The following comments require resolution prior to our recommendation for approval of plans and stormwater permit. Prior comments italicized for reference.

**General Comments**

1. *Please utilize the attached Kendall County Stormwater Permit Application form to present the information required by Section 16-174.C.1 where applicable*. Because the new impervious area exceeds 32,000 sf, stormwater storage is technically required under the ordinance. We understand that the intent of the submittal is to demonstrate compliance with the required release rate based on a change in ground cover and the submittal includes a request for approval of the project without stormwater storage. In this situation the vegetative ground cover becomes the stormwater element that needs to remain functional in lieu of storage and will be the permitted "control" element. Please submit the Kendall County Stormwater Permit Application.
2. *Per requirement in Section 16-174.C.1 please provide copies of all other related permits or permit applications by other jurisdictions or agencies. Wetlands are noted on site and although it appears avoidance is the approach, the consultant recommendations indicate coordinate with USACE for concurrence and clearance to proceed. Provide correspondence with USACE regarding this project.*

**Stormwater Report Comments**

1. Existing DA 3 flows to a closed depression. It appears this storage volume is not significant relative to the tributary drainage area. However, please identify this existing feature in your stormwater report narrative as well as provide a professional opinion as to the impact this depressional storage has on peak flow rates.
2. It is highly recommended and preferred if proposed impervious areas are managed within the property boundaries and not allowed to drain unmitigated onto adjacent property.

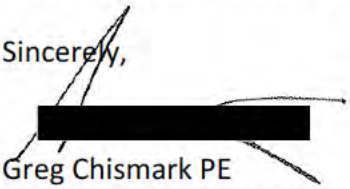
**Engineering Plans**

1. Pitch the gravel access road to the west and away from adjacent land at a 2% cross slope. As determined necessary, construct a low flow drainage pipe from the low point in DA #1 daylighting south to DA #3. Alternatively, raising the access road profile with a relatively flat overland drainage swale along the west side of the access road appears feasible.
2. Identify the entity for post-construction maintenance. The entity responsible for maintenance appears to be mentioned for erosion control but not post-construction maintenance. (Sheet C-5.1).
3. Please depict drain tiles on final engineering plans and provide a drain tile repair detail on the plan sheets.

The applicant's design professionals are responsible for performing and checking all design computations, dimensions, details, and specifications in accordance with all applicable codes and regulations, and obtaining all permits necessary to complete this work. In no way does this review relieve applicant's design professionals of their duties to comply with the law and any applicable codes and regulations, nor does it relieve the Contractors in any way from their sole responsibility for the quality and workmanship of the work and for strict compliance with the permitted plans and specifications.

If you have any questions or comments, please contact us at (630) 443-7755.

Sincerely,



Greg Chismark PE
WBK Engineering, LLC

## Matt Asselmeier

**From:** Steve Grebner <sgrebner@kendalltwp.com>
**Sent:** Tuesday, January 21, 2025 10:38 PM
**To:** Matt Asselmeier
**Cc:** Steve Gengler
**Subject:** [External]Petition 24-30 Kendall Township Full Board vote on Petition 24-30

CAUTION - This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Matt;
At our Monthly meeting on 1/21/2025 the Kendall Township Board of Trustees voted NOT to approve the Petition 24-30. While the township Planning Commission recommended the approval PENDING the approval of the plan by the County Engineer, the Full board was NOT willing to approve the Petition.

So the official position of Kendall Township at this time is NOT to approve the project known as Ament Solar 1 LLC.

Petition 24 – 30 – Nicholas S. Bellone on Behalf of Ament Solar 1, LLC (Tenant) and Janet M. Dhuse on Behalf of the Janet Dhuse Declaration of Family Trust Dated March 1, 2013 (Owner) Special Use Permit for a Commercial Solar Energy Facility and Variance to Section 36 282(17)(a) of the Kendall County Code to Allow a Commercial Solar Energy Facility on Land within One Point Five (1.5) Miles of Municipality without an Annexation Agreement 05-16-300-006 and 05-17-400-005 South of 9949 and 10021 Ament Road, Yorkville in Kendall Township Petitioner Would Like to Install a Commercial Solar Energy Facility; Property is Zoned A 1

Steve Grebner, Clerk Kendall Township
Check out our New Township website by clicking the QR code

# KENDALL COUNTY
# REGIONAL PLANNING COMMISSION

***Kendall County Historic Court House***
***Court Room***
***110 W. Madison Street, Yorkville, Illinois***

**Unapproved - Meeting Minutes of January 22, 2025 - 7:00 p.m.**

Chairman Bill Ashton called the meeting to order at 7:03 p.m.

## ROLL CALL

Members Present: Bill Ashton, Eric Bernacki, Tom Casey, Dave Hamman, Keith Landovitz, Karin McCarthy-Lange, Ruben Rodriguez, Bob Stewart, Claire Wilson, and Seth Wormley
Members Absent: None
Staff Present: Matthew H. Asselmeier, Director, and Wanda A. Rolf, Office Assistant
Others Present: Steve Grebner, Steve Gengler, Tom Ryan, and Nick Standiford

## PETITIONS

### Petition 24-30 Nicholas S. Bellone on Behalf of Ament Solar 1, LLC (Tenant) and Janet M. Dhuse on Behalf of the Janet Dhuse Declaration of Family Trust Dated March 1, 2013 (Owner)

Mr. Asselmeier summarized the request.

The Petitioner is seeking a special use permit for a commercial solar energy facility and a variance to Section 36-282(17)a of the Kendall County Code to allow a commercial solar energy facility on land within one point five (1.5) miles of municipality without an annexation agreement.

The application materials, wetland delineation reports (including EcoCat information), NRI Report, property survey, amended site plan, vegetative management plan, decommissioning information, amended stormwater information, drain tile information, glare study, and property value study were provided.

On November 7, 2024, the property owner submitted a letter supporting the project. This letter was provided.

The property is located south of 9949 and 10021 Ament Road.

The total acreage of the two (2) parcels is approximately ninety-three point four (93.4) acres. The disturbed area is approximately forty-two point four (42.4) acres. The fenced area is approximately thirty-five point seven (35.7) acres.

The existing land use is Agricultural.

The County's Future Land Use Map calls for the property to be Rural Residential. Yorkville's Plan calls for the property to be Agricultural.

Ament Road is a Local Road maintained by Kendall Township.

The United City of Yorkville has a trail planned along Ament Road.

There are no floodplains on the property. There are two (2) farmed wetlands in the vicinity of the proposed use.

The adjacent land uses are Agricultural, Farmstead, Public Institutional (Cemetery), and Single-Family Residential.

The adjacent properties are zoned A-1, A-1SU and R-3.

The County's Plan calls for the area to be Rural Residential and Transportation Corridor.

Yorkville Plan calls for the area to be Agricultural.

Properties within one half (1/2) mile are zoned A-1, A-1SU, R-1, R-1 PUD, R-3, RPD-2, and M-1.

The A-1 special use permit to the north is for a cemetery. The A-1 special use permits to the east are for a church and school and for agricultural implement sales and service.

The Deere Crossing subdivision is located near the subject property. Approximately fourteen (14) homes are located within a half mile (0.5) miles of the subject property.

EcoCAT Report was submitted on July 10, 2023, for the eastern parcel and November 16, 2023, for the western parcel and consultation was terminated for both parcels.

A LESA Score was not generated for the property. The land evaluation was 96 out of 100 indicating the soils were well suited for agricultural. The NRI Report was provided.

Petition information was sent to Kendall Township on October 25, 2024. The Kendall Township Planning Commission met on November 18, 2024. The Kendall Township Planning Commission recommended approval of the proposal with the following conditions:

> "The entity will maintain and repair the subsurface drainage throughout the entirety of the lease to be repaired within the timeframe indicated in the special use permit (sup). The entity will commit to, as part of their maintenance schedule, perform a physical inspection of the property to include drain tile observation for damage and necessary repair. The surrounding property owners shall be provided a copy of the existing drain tile survey of subject property as well as any changes made as part of this project.
>
> We would request that there be a subsurface drainage repair bond to ensure there are sufficient funds available for any required repair of materials and labor at the time of agreement. All replacement tile shall equal to or greater than its current flow.
>
> The planning and zoning committee also recommends as part of the comprehensive MONITORING AND MANAGEMENT PLAN AMENT ROAD SOLAR FARM – KENDALL COUNTY (section 1-6) specific attention to the noxious weeds including but not limited to water hemp, and Giant Ragweed."

The Kendall Township Board met on November 19, 2024, and requested that the County layover this proposal until the following items have been addressed to Kendall Township's satisfaction:

1. "That it appears specifically and in writing that any fiduciary instrument (i.e. Bond) be attached to the Title and or abstract of the Subject Property presently identified as *AMENT ROAD SOLAR FARM*. In so much as that responsibility will pass to any and all owners until the end of the deconstruction phase of the project.

2. That the concerns expressed above regarding the subsoil drainage issues be specifically addressed in any SUP, and failure to do so will result in a violation of the terms of the agreement and a monetary penalty will be applied.

3. That the concerns regarding the noxious weeds shall be specifically spelled out in the SUP and future agreements."

An email outlining Kendall Township's position was provided.

On December 3, 2024, the Petitioner submitted a letter responding to Kendall Township's requests and requesting that the proposal be continued to the January Kendall County Regional Planning Commission meeting and the January Zoning Board of Appeals hearing. This letter was provided.

On December 6, 2024, the Petitioner submitted an email to Kendall Township with the addresses of the abutting property owners for other solar projects in Kendall County. This email was provided.

On December 16, 2024, the Kendall Township Planning Commission met and reaffirmed their previous approval recommendation. An email to that effect was provided.

On January 21, 2025, the Kendall Township Board met and voted not to approve the proposal. An email to that effect was provided.

Petition information was sent to the United City of Yorkville on October 25, 2024. Prior to formal application submittal, the United City of Yorkville submitted a letter stating they would not pursue annexation at this time; this was provided. Yorkville also submitted an email requesting a forty foot (40') right-of-way dedication; Kendall Township was agreeable to this request. The emails related to the right-of-way dedication were provided.

The Yorkville Economic Development Committee reviewed the original proposal on January 7, 2025, and the Yorkville Planning and Zoning Committee reviewed the original proposal on January 8, 2025. Both boards recommended approval. An email from Yorkville was provided. The proposal goes to the Yorkville City Council on January 28, 2025.

Petition information was sent to the Bristol-Kendall Fire Protection District on October 25, 2024. No comments received.

ZPAC reviewed the original proposal at their meeting on November 5, 2024. ZPAC voted to forward the proposal to the Kendall County Regional Planning Commission by a vote of seven (7) in favor and zero (0) in opposition with three (3) members absent. The minutes of the meeting were provided.

The Kendall County Regional Planning Commission started their review of the proposal at their meeting on December 11, 2024. Discussion occurred regarding actionable items related to Kendall Township's concerns. Kendall Township's drainage concerns were centered on the impact of the proposal on neighboring property owners. Discussion occurred regarding Illinois Drainage Law and the need to have bonds of sufficient size to cover the complete cost of decommissioning and site cleanup. Discussion occurred regarding the ability of the County to place additional conditions on the special use permit. It was noted that Ament 1, LLC was created by New Leaf Energy. The Kendall County Regional Planning Commission voted to continue the Petition to the

January 22, 2025, meeting at the Petitioner's request by a vote of nine (9) in favor and zero (0) in opposition with one (1) member absent. The minutes were provided.

The Kendall County Zoning Board of Appeals initiated a public hearing on this proposal on December 16, 2024, and voted to continue the Petition to the January 27, 2025, hearing by a vote of seven (7) in favor and zero (0) in opposition. The minutes were provided.

Per § 36-282(17) of the Kendall County Code, commercial solar energy facilities businesses can be special uses on A-1 zoned property subject to the following conditions:

a. All commercial solar energy facilities and test solar energy systems located within one point five (1.5) miles of a municipality shall either annex to the municipality or obtain an annexation agreement with the municipality requiring the municipality's regulations to flow through the property. Petitioner is requesting a variance.

b. The setbacks for commercial solar energy facilities shall be measured from the nearest edge of any component of the facility as follows:

   Occupied Community Buildings or Dwellings on Nonparticipating Properties-One hundred fifty feet (150') from the nearest point on the outside wall of the structure

   Boundary Lines of Participating Properties-None

   Boundary Lines of Nonparticipating Properties- Fifty feet (50') to the nearest point on the property line of the nonparticipating property

   Public Road Rights-Of-Way-Fifty feet (50') from the nearest edge

   The above setbacks do not exempt or excuse compliance with electric facility clearances approved or required by the National Electrical Code, the National Electrical Safety Code, Commerce Commission, Federal Energy Regulatory Commission, and their designees or successors. Per the site plan, the closet nonparticipating structure is approximately one thousand, thirty feet (1,030') to the southeast of the commercial solar energy facility. A church is located approximately one thousand, four hundred thirty-three feet (1,433') to the northeast of the commercial solar energy facility. The perimeter fence is setback fifty feet (50') from the adjoining property line. The commercial solar energy facility is approximately one thousand, four hundred forty-two feet (1,442') from the Ament Road. At their closest points, the panels are approximately forty-nine feet (49') south of the northern fence line, twenty-nine point five feet (29.5) west of the eastern fence line, just under nineteen feet (19') north of the southern fence line, and twenty-one point five feet (21.5') east of the western fence line.

c. A commercial solar energy facility's perimeter shall be enclosed by fencing having a height of at least six feet (6') and no more than twenty-five feet (25'). This is true. Per the site plan, the fence is proposed to be seven feet (7') in height and will be chain link.

d. No component of a solar panel as part of a commercial solar energy facility shall have a height of more than twenty feet (20') above ground when the solar energy facility's arrays are at full tilt. This is true. Per the site plan, the maximum height will be nine feet (9'). The Petitioner does not want a restriction setting the maximum height at this level.

e. The above setback, fencing, and component height requirements may be waived subject to written

consent of the owner of each affected nonparticipating property. This written consent shall be submitted at the time of application submittal. No such consent requested or needed.

f. Sound limitations for components in commercial solar energy facilities shall follow the sound limitations established by the Illinois Pollution Control Board. A noise study was provided.

g. The County shall not require standards for construction, decommissioning, or deconstruction of a commercial solar energy system or related financial assurances to be more restrictive than agricultural impact mitigation agreement set in State law. The amount of any decommissioning payment shall be limited to the cost identified in the decommissioning or deconstruction plan, as required by the agricultural impact mitigation agreement, minus the salvage value of the project. A copy of the agricultural impact mitigation agreement shall be submitted with the application materials. The decommissioning plan was provided and is outlined in the AIMA. As noted, the estimated cost of decommissioning is Four Hundred Twenty-Five Thousand, Eight Hundred Ninety-Seven Dollars and Thirty-Seven Cents ($425,897.37). This money will be provided to the County in the form of a bond as outlined in the AIMA.

h. A vegetative screening shall be placed around the commercial solar energy facility. The landscaping plan was provided with the site plan and more detailed landscaping information included in the vegetative management plan. The plan includes a cover crop seed mix, a native pollinator seed mix, and a native grazing seed mix. The performance standards and ground cover maintenance requirements were included in the vegetative management plan.

i. Commercial solar energy facility applicants shall provide the results and recommendations from consultations with the Illinois Department of Natural Resources obtained through the Ecological Compliance Assessment Tool (EcoCat) or a comparable successor tool. The commercial solar energy facility applicant shall adhere to the recommendations provided through this consultation. The EcoCat was submitted and consultation was terminated without any specific recommendations.

j. Commercial solar energy facility applicants shall provide the results of the United States Fish and Wildlife Service's Information for Planning and Consulting environmental review or a comparable successor toll that is consistent with the U.S. Fish and Wildlife Service's Land-Based Wind Energy Guidelines and any applicable United States Fish and Wildlife Service solar wildlife guidelines that have been subject to public review. This was provided in both wetland delineation reports. Six (6) threatened or endangered species were in the area, but no impacts were anticipated.

k. A facility owner shall demonstrate avoidance of protected lands as identified by the Illinois Department of Natural Resources and the Illinois Nature Preserve Commission or consider the recommendations of the Illinois Department of Natural Resources for setbacks from protected lands, including areas identified by the Illinois Nature Preserve Commission. This is true. The site is designed around the farmed wetlands.

l. A facility owner shall provide evidence at the time of application submittal of consultation with the Illinois State Historic Preservation Office to assess potential impacts on State-registered historic sites under applicable State law. No potential impacts to State-registered historic sites exist.

m. A commercial solar energy facility owner shall plant, establish, and maintain for the life of the facility vegetative ground cover consistent with State law and the guidelines of the Illinois Department of Natural Resources' vegetative management plans. The vegetation management plan shall be required at the time of application submittal. The vegetation management plan, including timelines for planting and maintenance of the vegetation was provided.

n. The facility owner shall enter into a road use agreement with the jurisdiction having control over the applicable roads. The road use agreement shall follow applicable law. The facility owner shall supply the Kendall County Planning, Building and Zoning Department with a copy of the road use agreement. This provision shall be waived if the jurisdiction having control over the applicable roads does not wish to enter into an agreement. To date, the road use agreement negotiations are ongoing. No transportation or access plan was provided. The site plan shows one (1) twenty foot (20') wide gravel driveway approximately thirty feet (30') west of the eastern property line.

o. The facility owner shall repair or pay for the repair of all damage to the drainage system caused by the construction of the commercial solar energy system within a reasonable time after construction of the commercial solar energy facility is complete. The specific time shall be set in the special use permit. A tentative drain tile study was provided. The foundations for the racking will be placed in a manner that minimizes impacts on the drain tile.

No buildings are planned for the site. Any structures proposed for the site, including the solar arrays, shall obtain applicable permits.

The property is presently farmland. No wells, septic systems, or refuse collection points were identified.

The proposed area of disturbance is slightly less than one (1) acre. The County requested that the Petitioner submit an escrow payment so that WBK can evaluate the proposal; the Petitioner agreed to this request.

On November 15, 2024, WBK submitted a letter with several comments and questions. On December 23, 2024, the Petitioner submitted a response including a revised site plan and revised stormwater information. The cover letter outlining the changes was provided. On December 30, 2024, WBK submitted a response letter. On January 15, 2025, the Petitioner submitted an amendment site plan which incorporated the changes recommended by WBK and included two (2) basins requested by Kendall Township. The basins are shown on pages four (4) and five (5) of the site plan. The western basin has a depth of two point four feet (2.4') from the berm to the bottom of the basin. At the highest elevation, it has a surface area of forty-two thousand, five hundred thirty-five (42,535) square feet and will have a volume of forty-five thousand, three hundred nine (45,309) cubic feet. The eastern basin has a depth of one point eight (1.8') from the berm to the bottom of the basin. At the highest elevation, it has a surface area of thirty-nine thousand, seven hundred seventy-three (39,773) square feet and will have a volume of twenty-nine thousand, five hundred forty-six (29,546) cubic feet.

Per the site plan, the Petitioner propose one (1) twenty foot (20') wide access road.

There is one (1) forty foot (40') wide vehicular access gate and approximately ten (10) four foot (4') access gates proposed around the perimeter of the property. The locations of the smaller gates have not been determined. Knox box information will be provided to the County.

No permeant parking was proposed. There will be a staging area during construction; the specific location of the staging area was undetermined, but will likely be northwest of the vehicular access gate.

No lighting was proposed.

No specific signage was planned. The Petitioner was agreeable to installing one (1) sign at the vehicular access gate stating emergency contact information.

The Petitioner provided a glare study.

The Petitioner provided a general property values study. Mr. Asselmeier noted that the same company that provided the property value study for this project also prepared the property value study for the project on Simons Road. An email outlining the differences between the studies was available. The conclusion of both studies, that property values would not be negatively impacted, was the same.

No odors were foreseen.

The Petitioner provided noise information.

If approved, this would be the second special use permit for a commercial solar energy facility in unincorporated Kendall County.

The proposed Findings of Fact for the special use permit were as follows:

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 Project will generate clean, renewable electricity while producing no air, noise, or water pollution, or ground contamination. The front portion of the parcel closest to Ament Road will be retained for agricultural use as well as the surrounding land of the other parcel, which will create a natural screening during the growing season. The Petitioner submitted a vegetative management plan outlining the types of vegetation that will be planted, the timing of planting, and a maintenance plan for the vegetation.

The special use will not be substantially injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, nor substantially diminish and impair property values within the neighborhood. The Zoning classification of property within the general area of the property in question shall be considered in determining consistency with this standard. The proposed use makes adequate provisions for appropriate buffers, landscaping, fencing, lighting, building materials, open space and other improvements necessary to insure that the proposed use does not adversely impact adjacent uses and is compatible with the surrounding area and/or the County as a whole. The proposal will not interfere with the use and enjoyment of nearby properties. The surrounding properties are zoned primarily A-1 and will not be prevented from continuing any existing use or from pursuing future uses. The proposal's operations would be quiet and minimal traffic will occur after installation is completed. The solar panels are setback from Ament Road and neighboring houses to avoid negative visual impacts.

Adequate utilities, access roads and points of ingress and egress, drainage, and/or other necessary facilities have been or are being provided. The proposal will have adequate utility interconnections designed in collaboration with ComEd. The proposal does not require water, sewer, or any other public utility facilities to operate. The Petitioner will also build all roads and entrances at the facility and will enter into an agreement with Kendall Township regarding road use. After initial construction traffic, landscape maintenance and maintenance to the project components are anticipated to occur on an as-needed basis, consistent with the vegetative management plan. Existing traffic patterns will not be impacted in the post-construction operations phase. A drain tile survey will be completed prior to construction and foundation design will work around or reroute any identified drain tiles to ensure proper drainage.

The special use shall in all other respects conform to the applicable regulations of the district in which it is located, except as such regulations may in each instance be modified by the County Board pursuant to the recommendation of the Zoning Board of Appeals. If the requested variance is granted, the proposal meets all applicable regulations.

The special use is consistent with the purpose and objectives of the Land Resource Management Plan and other adopted County or municipal plans and policies. The proposal is also consistent with a goal and objective found on page 3-34 of the Land Resource Management Plan, "Support the public and private use of sustainable energy systems (examples include wind, solar, and geo-thermal)." However, the proposal is located on property classified as Rural Residential on the Future Land Use Map.

The proposed Findings of Fact for the variance:

The particular physical surroundings, shape, or topographical condition of the specific property involved would result in a particular hardship or practical difficulty upon the owner if the strict letter of the regulations were carried out. The subject property is located within one point five (1.5) miles of the United City of Yorkville. The Petitioner provided a letter from the United City of Yorkville stating that Yorkville did not wish to annex the property or enter into a pre-annexation agreement.

The conditions upon which the requested variation is based would not be applicable, generally, to other property within the same zoning classification. Other A-1 zoned properties within one point five (1.5) miles of a municipality could request a similar variance, if the municipality refuses to annex or enter into a pre-annexation agreement.

The alleged difficulty or hardship has not been created by any person presently having an interest in the property. The difficulty was created because the United City of Yorkville did not wish to enter into a pre-annexation agreement or annex the property.

The granting of the variation will not materially be detrimental to the public welfare or substantially injurious to other property or improvements in the neighborhood in which the property is located. Granting the variance would not be detrimental to the public or substantially injurious to other properties.

That the proposed variation will not impair an adequate supply of light and air to adjacent property, or substantially increase the congestion in the public streets or increase the danger of fire, or endanger the public safety or substantially diminish or impair property values within the neighborhood. The proposed variance would not impair light or air on adjacent property, cause congestion, increase the danger of fire, or negatively impact property values.

Staff will wait with issuing a recommendation on this proposal, pending comments from the Regional Planning Commission. The proposed conditions and restrictions are as follows:

1. The site shall be developed substantially in accordance with the submitted site plan, vegetative management plan, decommissioning plan, road access plan, and Agricultural Impact Mitigation Agreement.
2. A variance to section 36-282(17)(a) of the Kendall County Code is hereby granted allowing a commercial solar energy facility within one point five (1.5) miles of a municipality without an annexation or pre-annexation agreement. (**Added after ZPAC**).

3. Within ninety (90) days of the approval of the special use permit, the owners of the subject property shall dedicate a strip of land forty feet (40') in depth along the northern property line to Kendall Township. The Kendall County Planning, Building and Zoning Committee may grant an extension to this deadline.
4. None of the vehicles or equipment parked or stored on the subject property allowed by the special use permit shall be considered agricultural vehicles or agricultural equipment.
5. All of the vehicles and equipment stored on the subject property allowed by the special use permit shall be maintained in good condition with no deflated tires and shall be licensed if required by law.
6. Any structures, included solar arrays, constructed, installed, or used allowed by this special use permit shall not be considered for agricultural purposes and must secure applicable building permits.
7. One (1) warning sign shall be placed near or on the vehicular entrance gate. This sign shall include, at minimum, the address of the subject property and a twenty-four (24) hour emergency contact phone number. Additional signage may be installed, if required by applicable law.
8. KenCom and other applicable public safety agencies shall be supplied the access code to the Knox Box/security gate.
9. The operators of the use allowed by this special use permit acknowledge and agree to follow Kendall County's Right to Farm Clause.
10. The property owner and operator of the use allowed by this special use permit shall follow all applicable Federal, State, and Local laws related to the operation of this type of use.
11. Failure to comply with one or more of the above conditions or restrictions could result in the amendment or revocation of the special use permit.
12. If one or more of the above conditions is declared invalid by a court of competent jurisdiction, the remaining conditions shall remain valid.
13. This special use permit and variance shall be treated as a covenant running with the land and is binding on the successors, heirs, and assigns as to the same special use conducted on the property.

Chairman Ashton asked about the LESA Score. Mr. Asselmeier responded that the land evaluation score was 96 out of 100.

Member Wilson asked why the County Code required annexation or pre-annexation to a municipality if a proposal was within one point five (1.5) miles of a municipality. Mr. Asselmeier responded that the County did not want commercial wind and solar projects to landlock municipalities. Member Wilson asked if the State law had similar annexation requirement. Mr. Asselmeier responded no.

Member Bernacki asked if WBK's comments had been resolved. Mr. Asselmeier responded that the Petitioner submitted revised stormwater information on January 15, 2025, and, to date, WBK has not provided a response to those comments.

Member Wilson asked if the bond information would be recorded. Mr. Asselmeier said the decommissioning bond would be kept on file at the County. The AIMA outlines when the County can review the bond. Member

Wilson asked why the bond could not be recorded. Mr. Asselmeier said the County could require the bond to be recorded; the special use permit would be recorded. Member Wilson favored recording the bond.

Member Wilson noted that in the financial impact study, there was a comparable project in Colorado. She has a client near the site in Colorado and asked her client for comments on that project. The client said the project is a community solar garden for the houses within the development; they can purchase electrons to offset their electric bills. The client has no complaints about the project.

Member Landovitz asked if WBK was evaluating the stormwater management plan. Mr. Asselmeier responded that the stormwater management plan was still under evaluation. Member Landovitz asked about ground cover as a detention mechanism. Mr. Asselmeier responded that WBK was evaluating the impact of ground cover on stormwater runoff.

Member Landovitz asked about the basis for the costs in the decommissioning estimate. Mr. Asselmeier said the calculation of the bond is based on State law and the AIMA requires periodic review of the bond amount. He was concerned because no authority was provided regarding the figures in the estimate.

Member Wilson requested an independent evaluation of the decommissioning estimate at the Petitioner's expense.

Member Landovitz asked if any projects had been decommissioned. Mr. Asselmeier responded that he was not aware of any commercial solar projects that had been decommissioned.

Member Wilson shared Member Landovitz's concerns regarding decommissioning.

Steve Grebner, Kendall Township Clerk, said that Kendall Township was trying to attach the bond to the title of the property. He praised New Leaf's involvement in this project. He praised the work of the Kendall Township Planning Commission. The Kendall Township Board questioned if the proposal was the best use of land and in the best interest of the residents of Kendall Township. He expressed concerns about the unknowns related to decommissioning. He argued that it might be better to place solar panels on buildings instead of on farmland.

Member Landovitz asked if the objection was about a resolvable detail. Mr. Grebner said the objection steams from the best use of farmland. He provided a history of the detention basins.

Member Wormley asked if the Kendall Township Planning Commission voted on the proposal before the matter went to the Township Board. Mr. Grebner responded yes, pending final sign off of the County engineer.

Member Landovitz stated that he was more in favor of solar than other uses that could go on agricultural land because the solar panels could be removed and the land reverted back to productive agriculture. He also noted the need for landowners to have alternative revenue streams.

Member Landovitz asked about alternative uses that the Township Board would favor. Mr. Grebner responded that other uses were hypothetical and the Township Board evaluated the proposal that was before them. Mr. Grebner questioned if other areas were better suited for solar than quality farmland.

Member Wormley spoke about the land use. Kendall County is the fastest growing county in Illinois. He stated that farming is important, but many of the properties that are agriculture will not be agriculture in the future. Much of the land will become commercial. The solar farm will be detrimental to the County's tax revenue compared to having subdivisions and schools. Member Wormley would like to see the solar farms go to areas without development potential. Kendall County's future land use map is currently outdated and will be updated sometime this year.

Member Bernacki agreed with Member Wormley. He stated there will be positive growth over the next twenty (20) years.

Steve Gengler, Kendall Township Supervisor, stated that just south of the site of the solar farm is a PUD. There are plans for a school to be built. He feels that a solar farm may be harmful near a school.

Member Wilson asked Mr. Asselmeier if he was aware of the PUD that Mr. Gengler referenced. Mr. Asselmeier stated he was not aware of a PUD in the vicinity of the solar farm.

Member Stewart asked Mr. Asselmeier why New Leaf requested a variance to the zoning requirement regarding annexation into Yorkville. Mr. Asselmeier stated that New Leaf requested an annexation agreement into Yorkville, but Yorkville declined.

Member Landovitz was concerned that neither Yorkville nor Kendall Township had any comment as to an alternate vision for the solar farm. Yorkville did not want to annex the project, but they didn't seem to raise a concern about the future use of the land. He understood the reason for a farmer to lease part of their land.

Nick Standiford, Land Use Attorney with Schain Banks, stated that he worked with thirty (30) to fifty (50) community solar farms and has heard many of the same concerns as Kendall County.

Member Casey stated that the main question is land usage. The solar farm will be there for twenty (20) years and extend for five (5) more years.

Tom Ryan, Project Developer for New Leaf Energy, stated that one (1) of the main questions is the use of the land and taking farmland is an issue. Mr. Ryan stated that solar panels are a temporary use. They have a lease with the landowner for a period of twenty (20) years with the right to extend it five (5) years four (4) times. If there is a lot of development in the area in (20) years, they will begin decommissioning and returning the site to its original state. There are many requirements needed for a solar farm. The correct interconnection is needed. Mr. Ryan stated that this area has a huge wave of solar projects. Mr. Ryan stated the solar farm industry will have to renounce some of their projects because of capacity issues. Mr. Ryan stated he received the interconnection and was placed in queue with ComEd three (3) years ago. He stated there was no more capacity in the substation. Until the substation gets upgraded which, will take millions of dollars, the building of solar farms will slow down.

Mr. Standiford stated the if the solar companies were able to find uneven, rocky land that was not good for farming, they would. Sites are limited because of the need for a substation.

Mr. Ryan stated that the landowner had some less favorable land with wetlands. This parcel falls into the best category for solar farms.

Member Wormley asked if they went to other counties to look for land. Mr. Ryan stated they have looked in other counties. They have approximately seventy (70) projects in Illinois. People within a certain radius will receive the community solar benefits.

Mr. Wormley stated that Kendall County is the fastest growing county in Illinois and people do not want to see solar farms. Mr. Ryan stated that the site of the project has been pushed back one thousand (1,000) feet from Ament Road and the same for Route 47. Member Wormley stated that, in the new future land use map, the guideline for solar farms will be one (1) mile from a state road or a county road from any direction.

Mr. Standiford explained the special use standards of approval and the variation standards. He discussed projects that New Leaf Energy has completed in Illinois. He discussed the adjoining land uses, as outlined in both the Kendall County Land Resource Management Plan and Yorkville's Comprehensive Plan. He discussed the pace of residential development in Yorkville. He discussed the proposed findings of fact contained in the Staff Report and the consistency with Land Resource Management Plan. He noted the classification of the property in Yorkville's plan. He noted the votes taken by Kendall Township. Discussion occurred regarding the amount tax dollars generated by the development; over twenty (20) years, the development will pay over Five Hundred Thousand Dollars ($500,000). Member Wormley said houses would generate comparable tax revenue and the property is generating food.

Member Wormley felt the area was not a good location because the area was going commercial or industrial. Those developments will generate more tax revenue.

Discussion occurred regarding updating the Land Resource Management Plan and the work with municipalities to update the Land Resource Management Plan.

Member Wormley discussed the need for the variance and explained the need for consistency in votes, which was why he was voting against the project. Mr. Standiford discussed State law related to the placement of commercial solar farms and the need for electricity.

Member Landovitz asked what the loss opportunity was, if the proposal does not occur at this time. Mr. Ryan responded that the interconnection could be lost.

The proposal goes to the Yorkville City Council on January 28, 2025.

Member Wilson asked why solar panels could not be placed on commercial properties like the former Caterpillar Plant in Montgomery. Mr. Ryan discussed distances to substations, a maximum distance of three (3) miles, and have proper feeder lines.

Member Wilson asked how many homes would be powered by this project. The response was about eight hundred (800).

There were no plans to expand at the site. Even if expansion was possible, New Leaf would an interconnection agreement with Comed.

Mr. Standiford was agreeable to recording the bond and having the Petitioner pay an independent consultant to prepare a decommissioning plan.

Member Hamman discussed the landowner perspective. A project like this could give a landowner additional income to keep their farm. He discussed a project on a property in Grundy County. He asked what happens if the County denies the project and gets sued. Mr. Asselmeier responded the County could get sued if the project is denied. Member Hamman noted that Grundy County denied a project on his property, was sued, and lost in court. Chairman Ashton noted that the Regional Planning Commission is purely advisory to the County Board. Member Hamman discussed predicted best uses on properties over twenty (20) years.

Member Bernacki discussed outstanding issues regarding stormwater and lack of comment from the Yorkville City Council. Mr. Asselmeier noted that the Kendall Township Planning Commission's recommendation was contingent on the resolution of stormwater issues. If those issues were not resolved to Kendall Township's satisfaction, their Planning Commission could recommend denial, which could trigger a supermajority vote at the County Board. Recommendations by the Yorkville City Council would be advisory. The Yorkville City Council could request an annexation agreement.

Member Wilson made a motion, seconded by Member Hamman, to recommend approval of the special use permit and variance with the conditions proposed by Staff, adding a condition that the decommissioning bond be attached to the decommissioning plan which would be recorded against the real estate, and adding a condition that an independent evaluation of the decommissioning cost occur at the Petitioner's expense.

The votes were as follows:
Ayes (2): Hamman and Wilson
Nays (8): Ashton, Bernacki, Casey, Landovitz, McCarthy-Lange, Rodriguez, Stewart, and Wormley
Absent (0): None
Abstain (0): None

The motion failed.

The proposal goes to the Kendall County Zoning Board of Appeals on January 27, 2025.

Member Landovitz voted no because of the potential land uses at the property. He gave deference to the voice of the elected officials, both the County and Kendall Township. He hoped that the updating of the Land Resource Management Plan will remove some of the differences. He felt bad for the landowners and the people that worked on the project.

Member Bernacki voted no because of the current classification of the land in the Land Resource Management Plan. He noted that Plainfield redid their plan recently and reclassified land to agricultural that had annexation agreements. He noted that Yorkville could redo their plan, which was completed in 2016. He felt working with Kendall Township was important. He also said that the Regional Planning Commission recommended denial of the solar project on Simons Road partially due to a lack of an annexation agreement with a municipality.

Member Wilson discussed balancing interests and unknowns. She noted that for farmers, their retirement is in their land. She understood the need to use farmland as a revenue source. She did not like the fact that farmer land is disappearing. In this case, she did not see an aesthetic issue and comparatively little farmland was being lost. She noted that solar panels have to be in certain locations related to substations and related infrastructure. She noted the project would comply with State law and she was unsure if the County's law related to annexation would hold in court. She favored the landowner and noted that the land could revert back to farm ground.

Member Hamman voted in favor of the proposal because the Petitioner presented a good case with the site setback from the roads. He favored being landowner's rights because selling the land may not be an option for tax reasons. He also had concerns regarding the legal aspects of denying this proposal.

Chairman Ashton voted no because of the high land evaluation score. He favored solar panels on ground that was not as productive for farming purposes.

Member Rodriguez discussed new developments and future land use in Kendall County. He voted no because of developments going on in Kendall County and future land uses in the County.

Member Casey favored commercial solar developments on commercial buildings.

Member McCarthy-Lange voted no because the proposal would look in the land use for twenty to forty (20-40) years. The County has changed drastically in the last forty (40) years. She did not want to lock in the land use that close to a municipality for such a long period of time. She would have liked the landowner to be present at the meeting; if the situation was dire, the landowner would appear at the meeting.

**CITIZENS TO BE HEARD/PUBLIC COMMENT**
None

**OTHER BUSINESS/ANNOUNCEMENTS**
Mr. Asselmeier reported there were no petitions for the February 26th meeting.

**ADJOURNMENT**
Member Wilson made a motion, seconded by Member Hamman, to adjourn. With a voice vote of ten (10) ayes, the motion carried.

The Kendall County Regional Planning Commission meeting adjourned at 9:08 p.m.

Respectfully submitted by,
Matthew H. Asselmeier, AICP, CFM, Director

Encs.

# KENDALL COUNTY
# REGIONAL PLANNING COMMISSION
# JANUARY 22, 2025

IF YOU WOULD LIKE TO BE CONTACTED ON FUTURE MEETINGS REGARDING THIS TOPIC, PLEASE PROVIDE YOUR ADDRESS OR EMAIL ADDRESS

| NAME | ADDRESS (OPTIONAL) | EMAIL ADDRESS (OPTIONAL) |
|---|---|---|
| Steve Grebner | | SGrebner@KendallTwp.com |
| Steve Grengler | | SGrengler@Kendall1.com |
| Nick Standiford | | [redacted] |
| Tom Ryan | | |
| | | |
| | | |
| | | |
| | | |

# Ament Road

## Kendall County, IL

## Kendall County

## Zoning Board of Appeals



new leaf energy

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# Agenda

- New Leaf Energy: Company Overview
- Property and Site Overview
- Solar Project Overview
- Drainage
- Project Benefits
- Decommissioning
- Questions



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# Project Team

- Tom Ryan - New Leaf - Project Developer
- Nick Bellone - New Leaf - Civil Project Engineer
- Mike Keith - Atwell LLC - Civil Project Engineer
- Nick Standiford - Schain Banks - Counsel




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# New Leaf Energy: Company Overview

## About Us

- Formerly known as Borrego Solar, we have been business since the 1980s and developing community solar projects since 2002
- Midwest Development team located in Illinois; company is headquartered in Massachusetts

## Our Success in Illinois

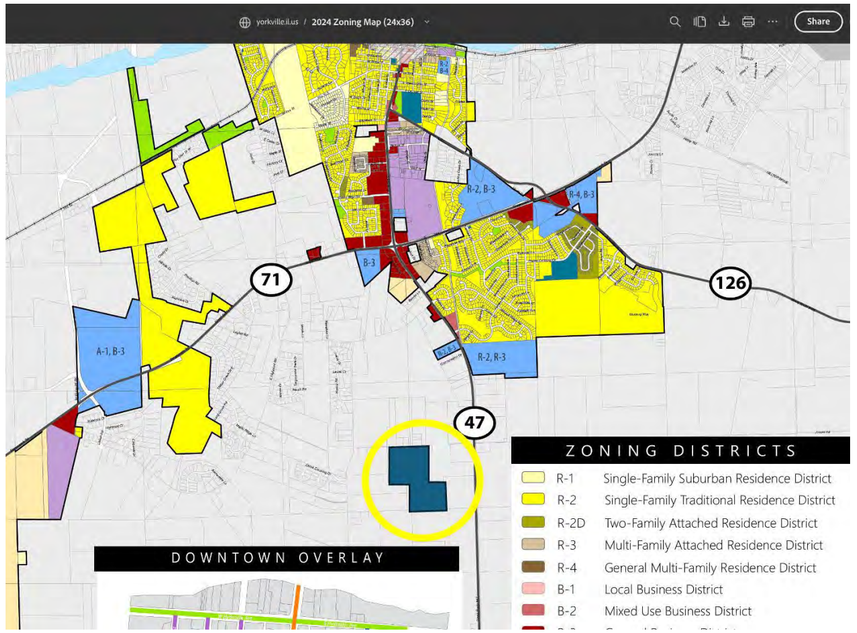
- Permitted over 70 community solar projects throughout Illinois
- 25 projects have been built in Illinois over the past 6 years
- 6 projects currently under construction; 14 projects expected to construct in 2025
- Worked with over 40 counties and municipalities in Illinois

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# Project Site Overview



- Site Address: **Ament Rd - Kendall County**
- Landowner: **Janet Dhuse**
- Coordinates: **(41.597060, -88.443146)**
- Parcel ID: **05-16-300-006 & 05-17-400-005**
- County: **Kendall County**
- Acres of Parcels: **94 acres**
- Targeted usable Acres: **40 acres**




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# Project Site Overview



**Power Capacity - 5MWac**

**Access - Ament Rd**

**Racking Type - Single Axis Tracker**

**Interconnection Status - ComEd**

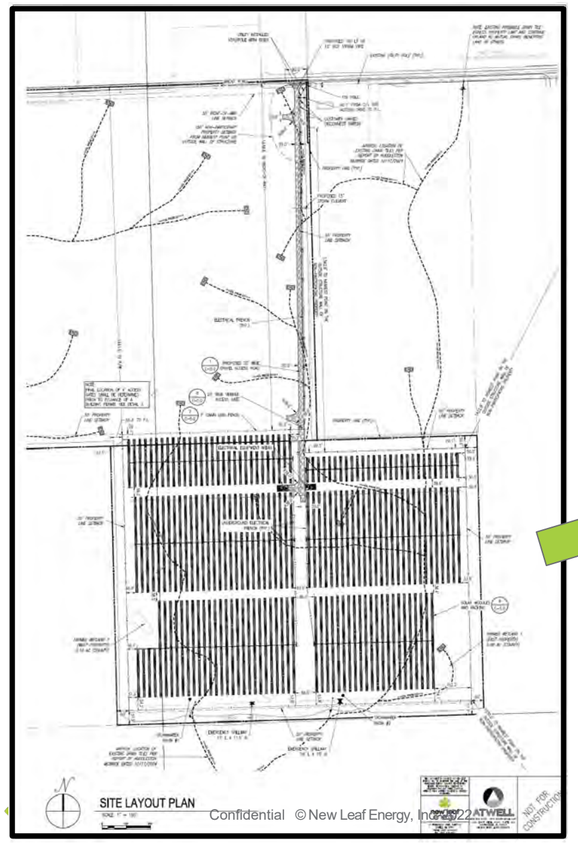
**Storage - None**

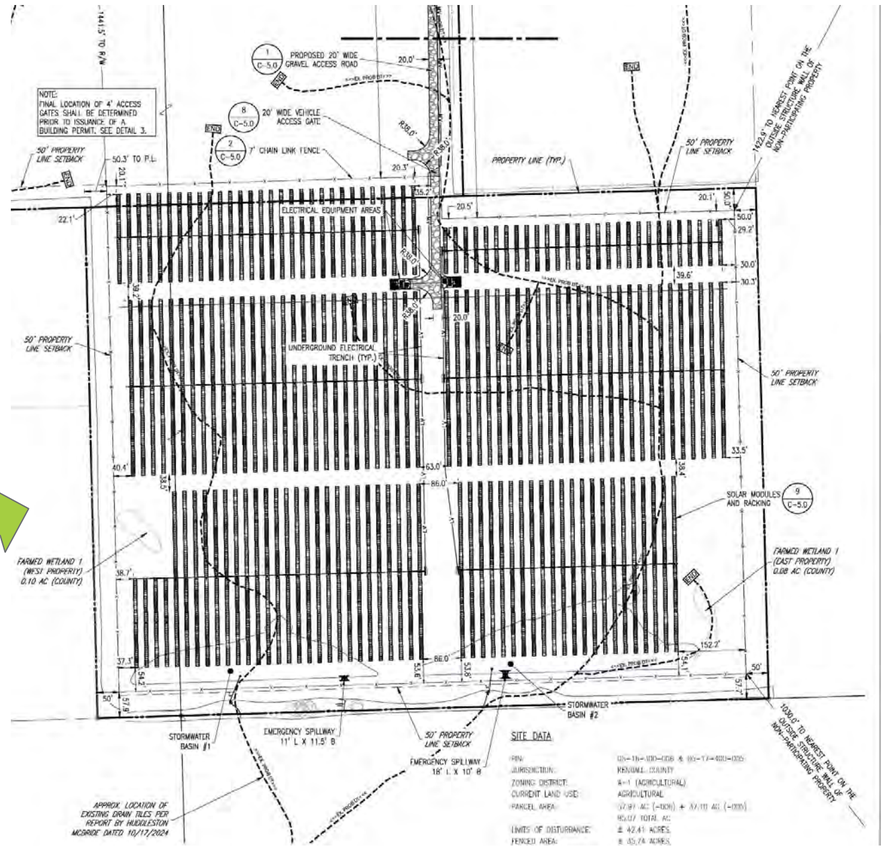



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# Site Layout



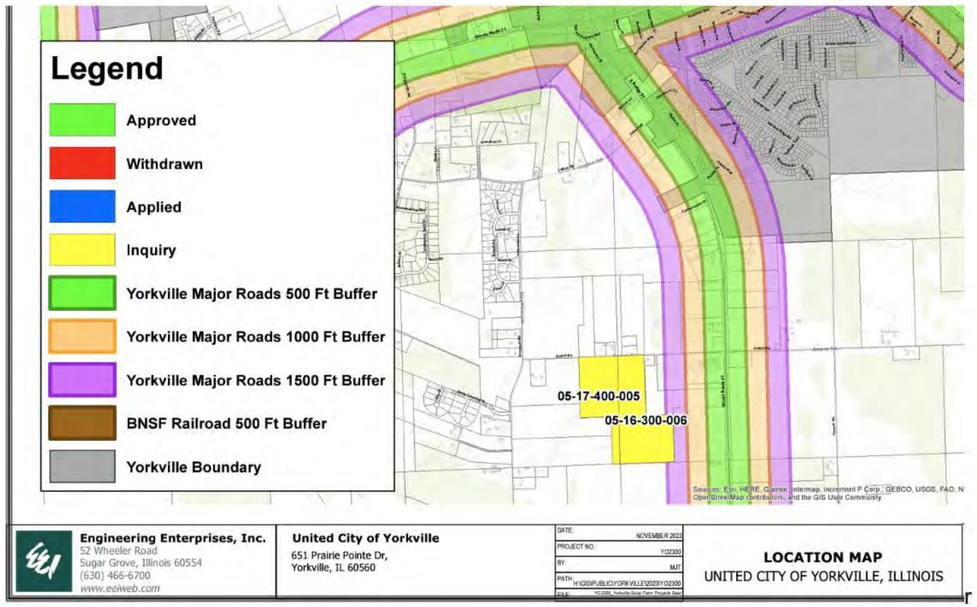


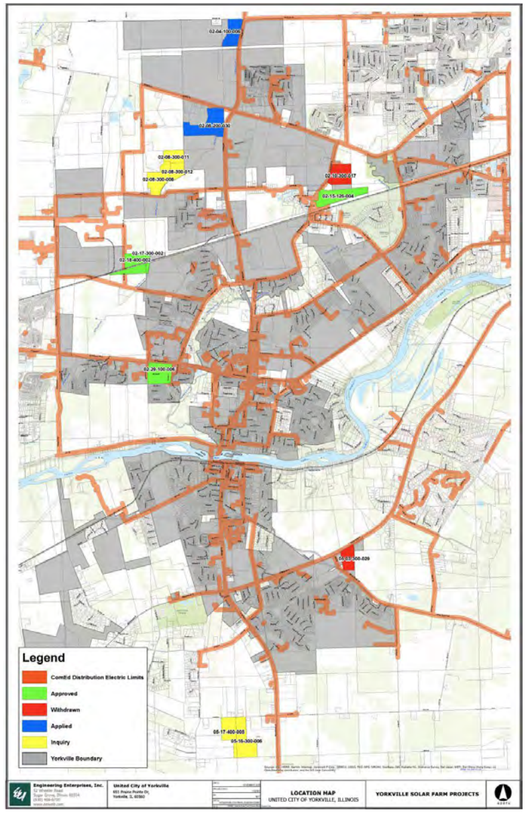




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# Yorkville Ordinance Update





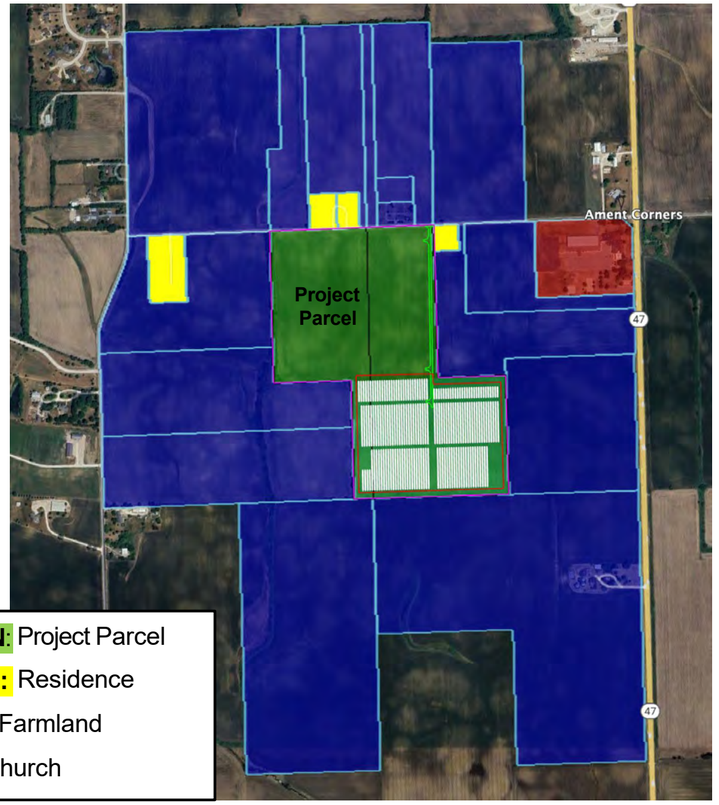


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# Outreach Overview



- Notifications were sent to all surrounding property owners as well as Kendall Townships and The United City of Yorkville
- New Leaf representatives will conduct door to door outreach to all adjacent residences prior to KCRPC hearing.
- Closest residence is 1,378 feet to the north




**GREEN**: Project Parcel
**Yellow:** Residence
**BLUE:** Farmland
**Red:** Church


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# Select Project Attributes





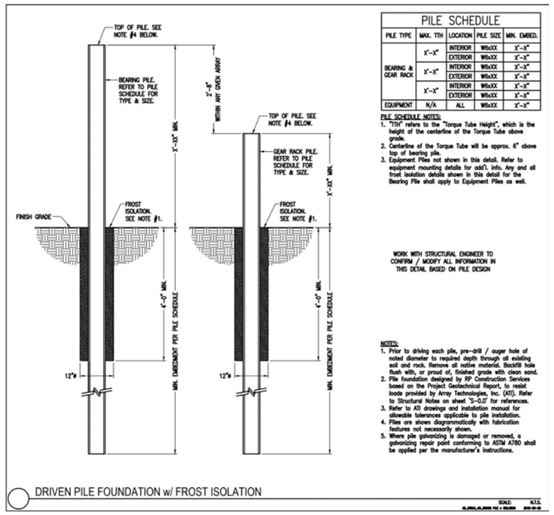
New Leaf Energy site in Will County

- Solar panel arrays consisting of trackers and racking
- Concrete limited to equipment pad for electrical equipment
- Security fence at 7’ height
- Underground trenching/cabling
- Gravel access road
- Limited access road grading and retention basins to maintain drainage patterns
- Planted with native pollinator mix
- Layout designed to accommodate agrivoltaics

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# Racking Foundations






**Driven Pile:**
Most Common in Illinois



**Ground Screw:**
Typically only used when bedrock present (rare in Illinois)

**No concrete or cast foundations are used**

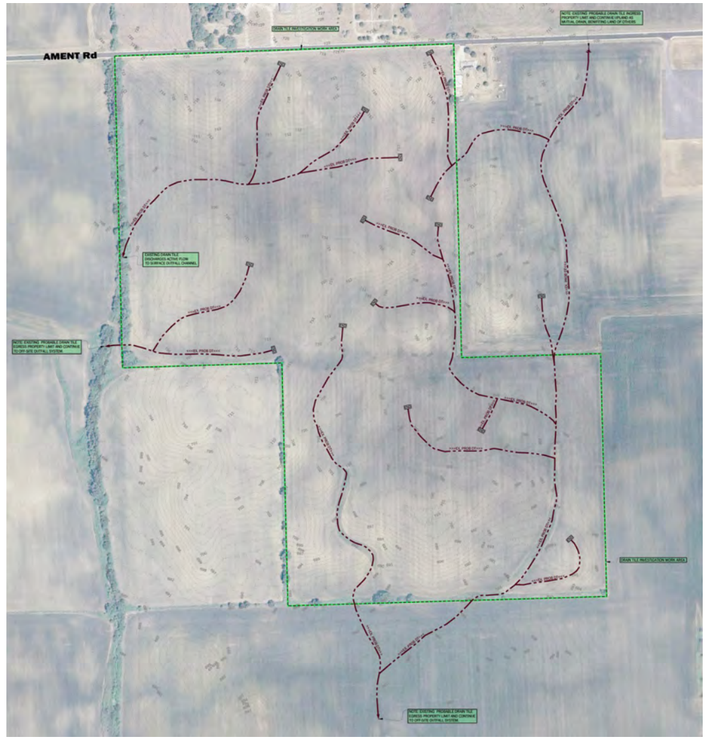

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# Project Site Overview: Drainage



**After construction, the field will drain the same way that it did prior to the solar installation:**

- Drain tile is considered in final layout design and avoided when practical
- During construction, tile locations are flagged to facilitate avoidance
- Broken tile is repaired or replaced in-kind
- Construction crews regularly monitor the site for any tile or drainage issues

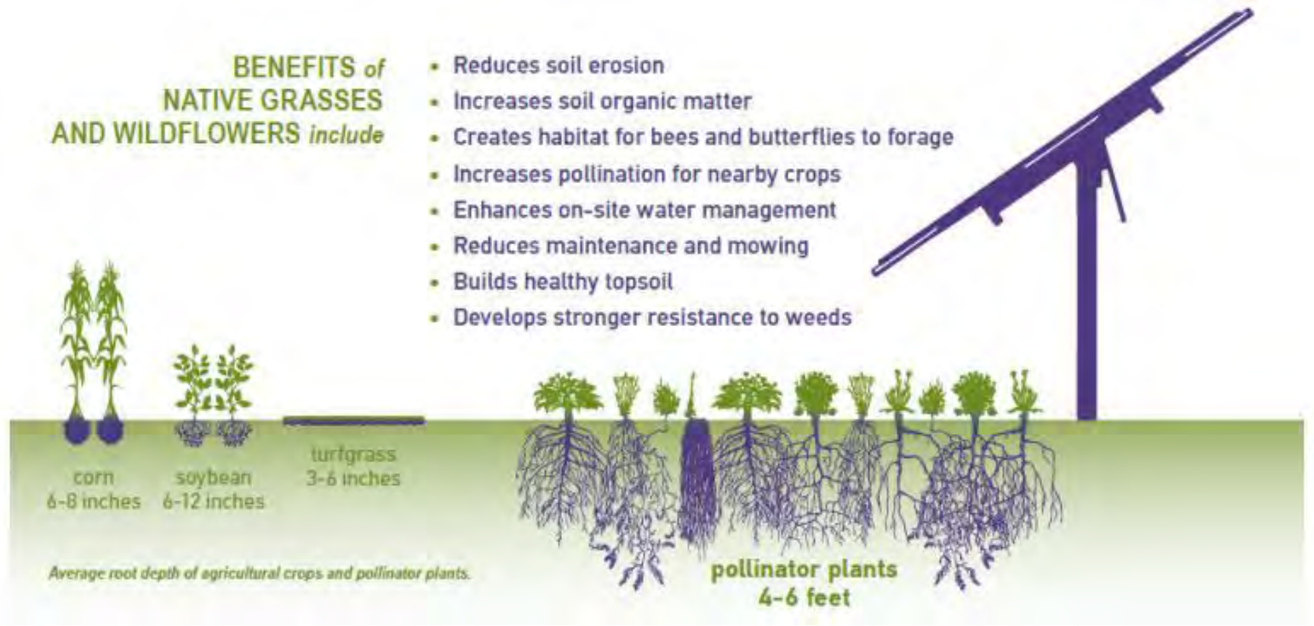



**Drain Tile Probability Map prepared by Tom Huddleston of Huddleston McBride**


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# Pollinators



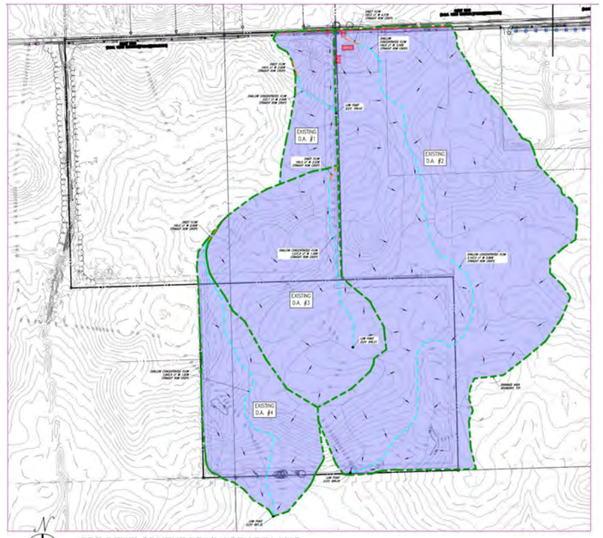




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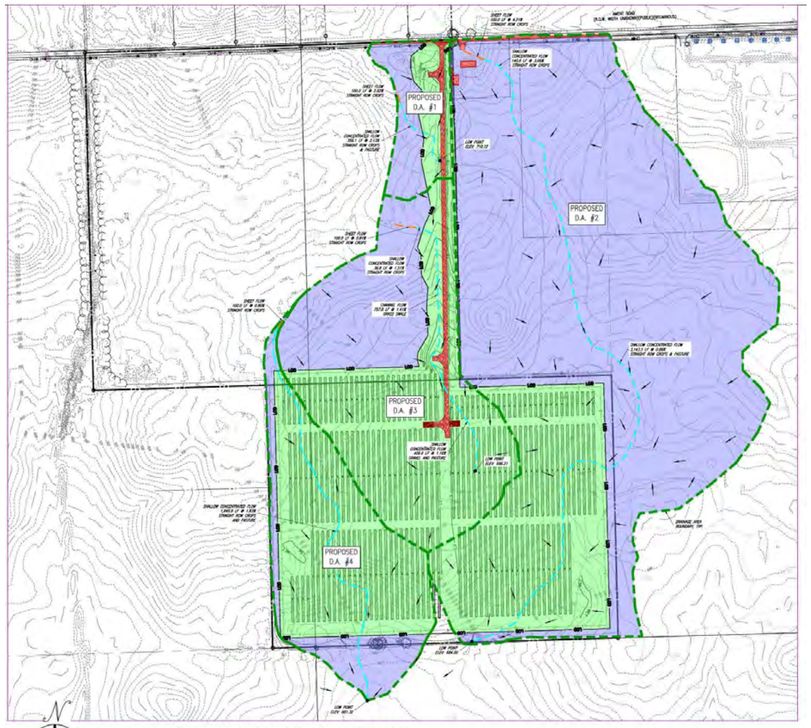
# Stormwater Study






PRE-DEVELOPMENT DRAINAGE AREA MAP

PROJECT LIMITS OF DISTURBANCE
DRAINAGE AREA BOUNDARY
SHEET FLOW
SHALLOW CONCENTRATED FLOW
ROW CROPS – GOOD CONDITION
PASTURE
IMPERVIOUS AREA
DRAINAGE FLOW ARROW



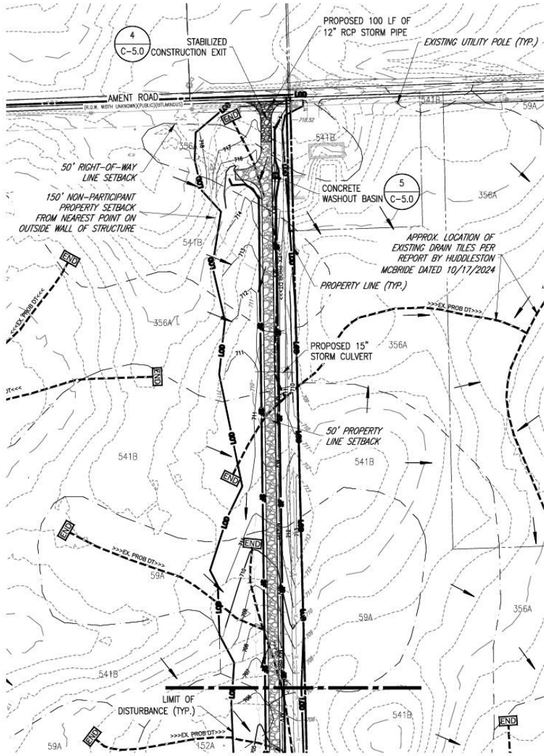

POST-DEVELOPMENT DRAINAGE AREA MAP

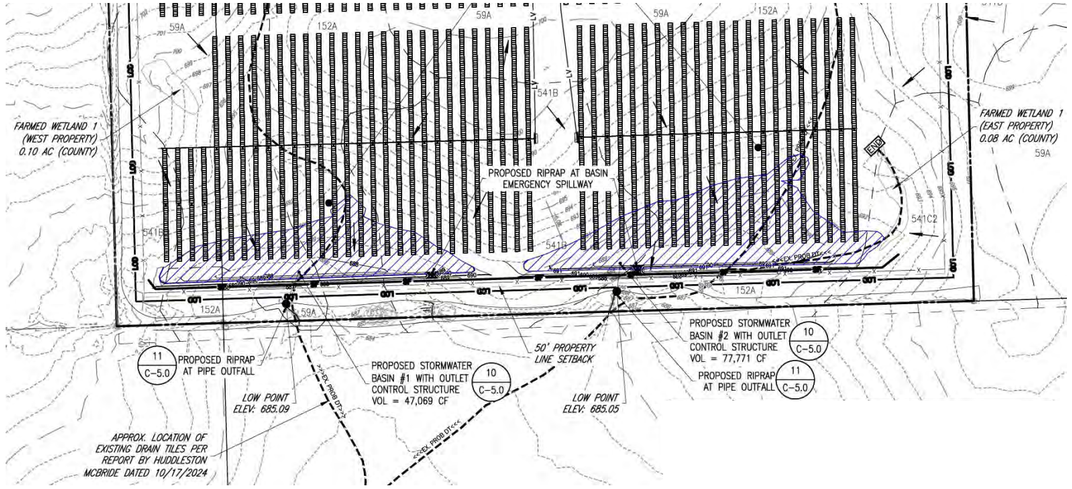
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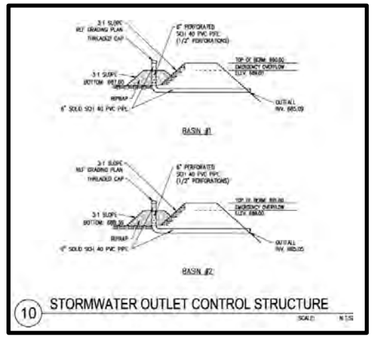
**Prepared by Atwell, LLC on January 12, 2025**

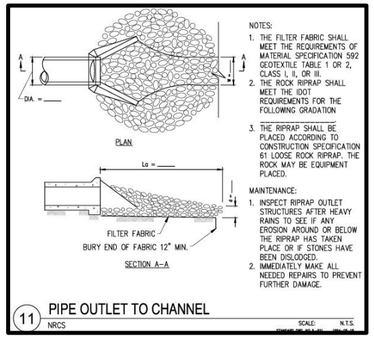
# Stormwater Study - Kendall Township Requests






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# Decommissioning Plan



| Line Item | Task | Cost |
|---|---|---|
| 1 | Module Removal | $ 7,810.83 |
| 2 | Rack Wiring Removal | $ 1,952.71 |
| 3 | Rack Dismantling | $ 5,858.18 |
| 4 | Electrical Equipment Loading and Removal | $ 2,680.20 |
| 5 | Break Up Concrete Pads | $ 1,221.77 |
| 6 | Load Racks | $ 23,120.99 |
| 7 | Electrical Wiring Removal | $ 4,064.97 |
| 8 | Foundation Pile Removal | $ 26,505.02 |
| 9 | Fence Removal | $ 23,464.96 |
| 10 | Power Pole Removal | $ 7,500.00 |
| 11 | Gravel Road Reclamation | $ 55,253.21 |
| 12 | Seed Disturbed Areas | $ 4,985.06 |
| 13 | Trucking to Transfer Station | $ 2,093.44 |
| | **Total =** | **$166,511.35** |

**25 Year Projection**

# of Years = 25
Inflation Rate = 2.0%
Total * (1+ Inflation Rate)^ # of Years + Grand Total

**Decommissioning Bond Total: $425,897.37**

# Project Benefits



- **Will pay $575,858 in property taxes over 20 years**
  - Diversifies local economy without burdening infrastructure and services
- Maintains existing drainage; has minimal impervious areas
- Compatible with agrivoltaic uses like livestock grazing
- Native seed mix allows for reduced runoff and erosion and creates a habitat for pollinators
- Temporary use of the space – allows the soil to rest for 40 years and remain productive when returned to farming




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# Tax Rate



**This project will pay approximately $575,858 in property tax over its first 20 years of operations.**

- The first year of operations will pay $38,994 in property tax.
- Current 2024 property tax at this site area is $2,200.

**20 Years**

| District | % | 20 Years |
|---|---|---|
| SCHOOL DISTRICT CU-115 | 75% | $431,893.50 |
| BRISTOL-KENDALL FPD | 8% | $46,068.64 |
| KENDALL COUNTY | 7% | $40,310.06 |
| JR COLLEGE #516 | 5% | $28,792.90 |
| KENDALL ROAD DISTRICT | 2% | $11,517.16 |
| FOREST PRESERVE | 2% | $11,517.16 |
| KENDALL TOWNSHIP | 1% | $5,758.58 |
| TOTAL | | $575,858.00 |

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# Thank you

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# Appendix

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# LAND USE ANALYSIS



## AMENT SOLAR 1

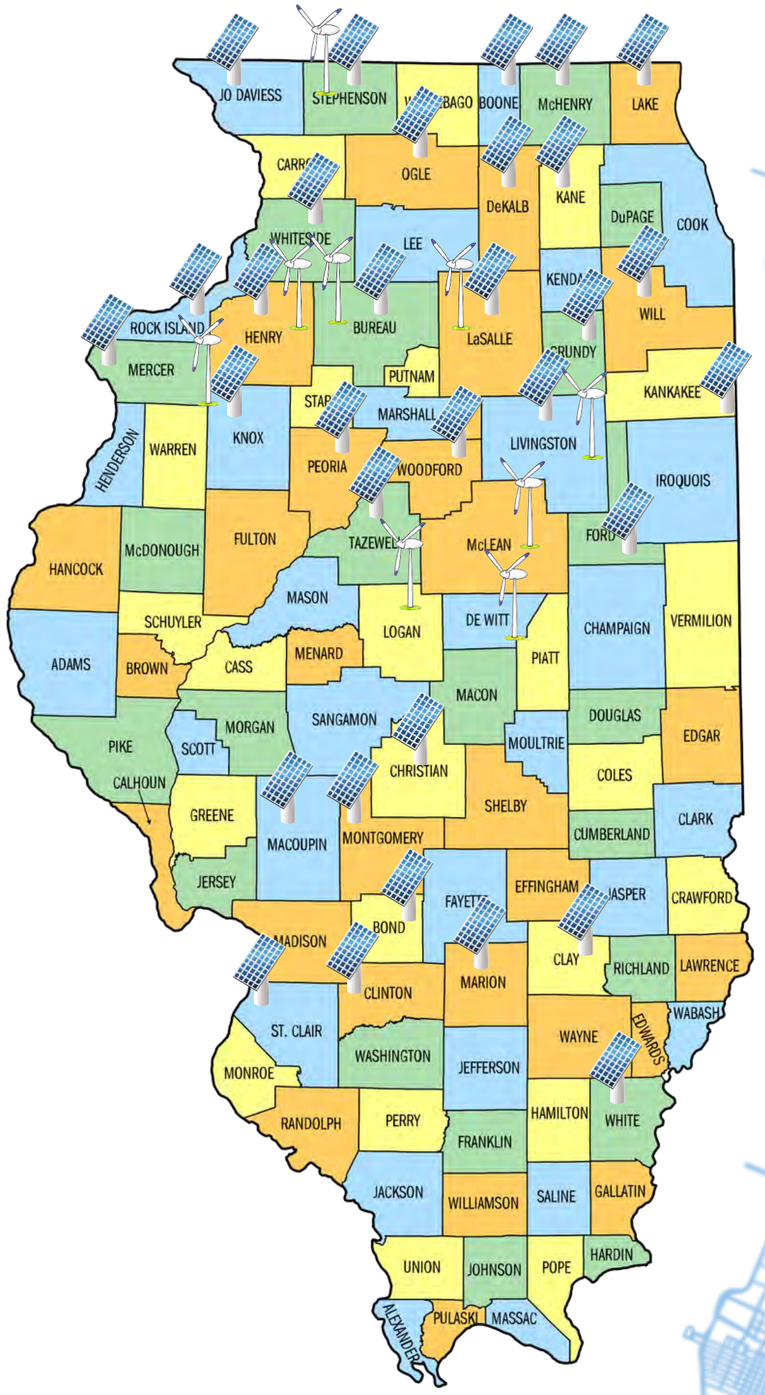
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# SCHAIN BANKS ENERGY APPROVALS

- Obtained siting approvals and special use permits for utility and community scale projects throughout Illinois (as well as Michigan and Indiana)

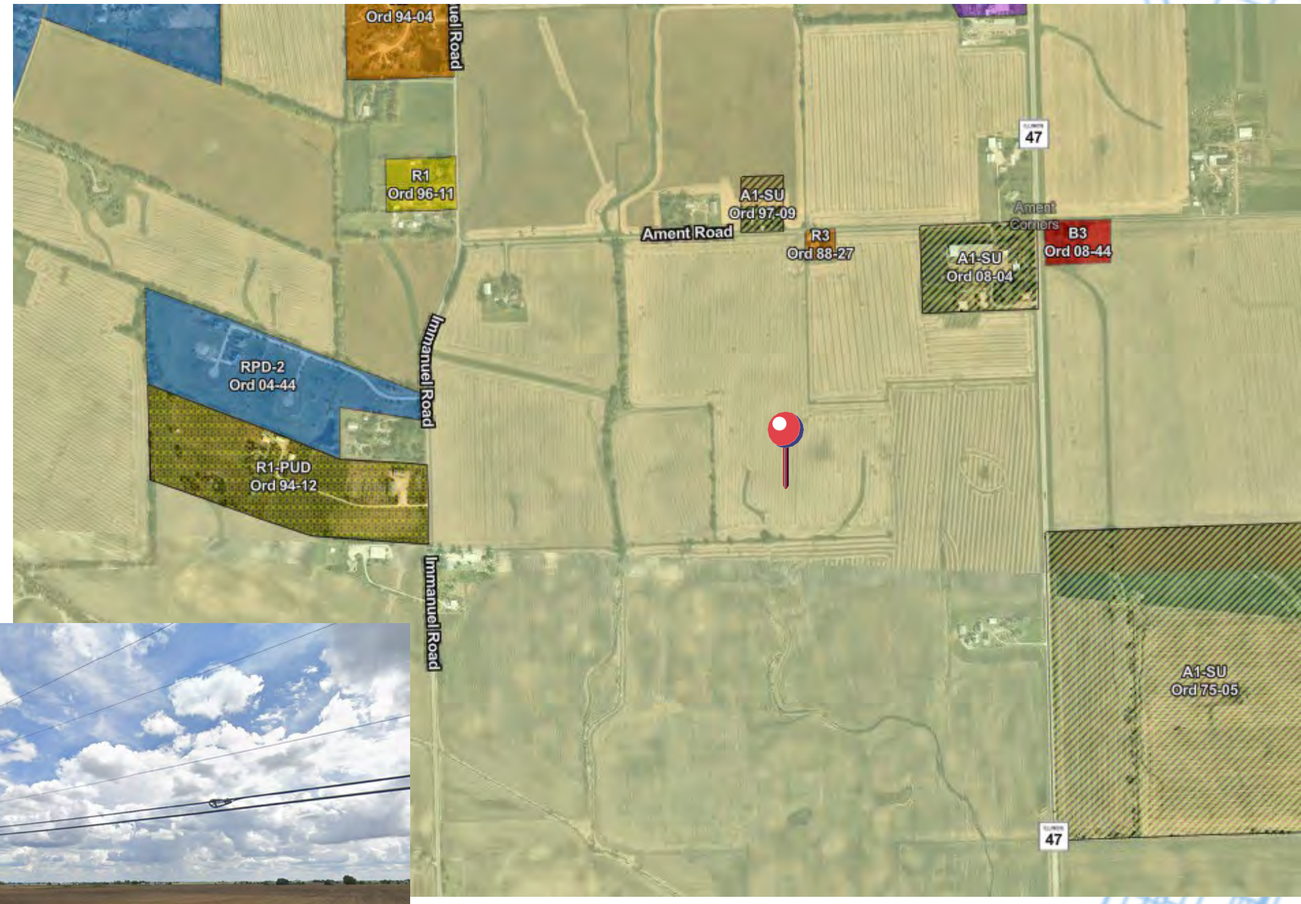






# COUNTY'S ZONING MAP

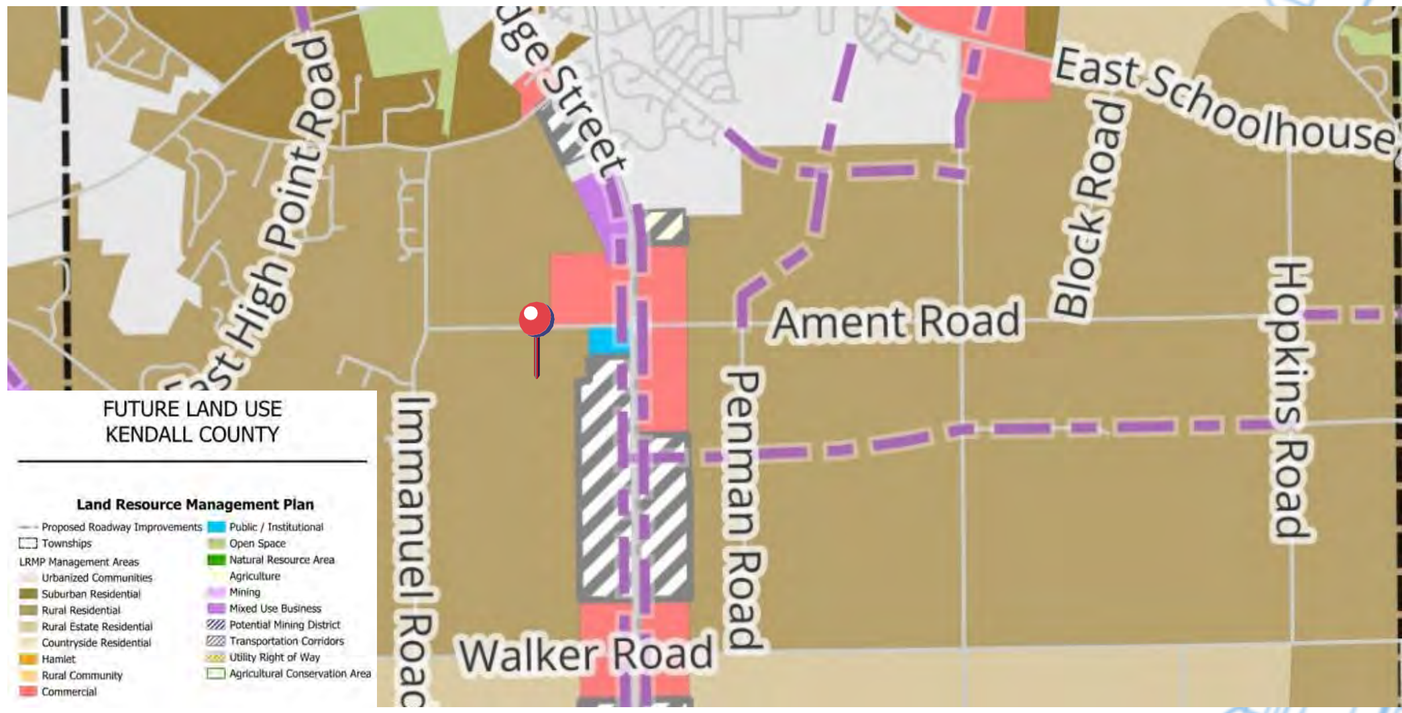
- **Zoned A1**
  - Commercial Solar Energy Facilities permitted by special use
- **Surrounded by A1 zoned parcels**
- **North**
  - R3 (Rancho Hernandez)
  - A1- Special Use (Cemetery)
- **South**
  - A1
- **Northeast**
  - A1- Special Use (Cross Lutheran Church)
- **West**
  - PUDs





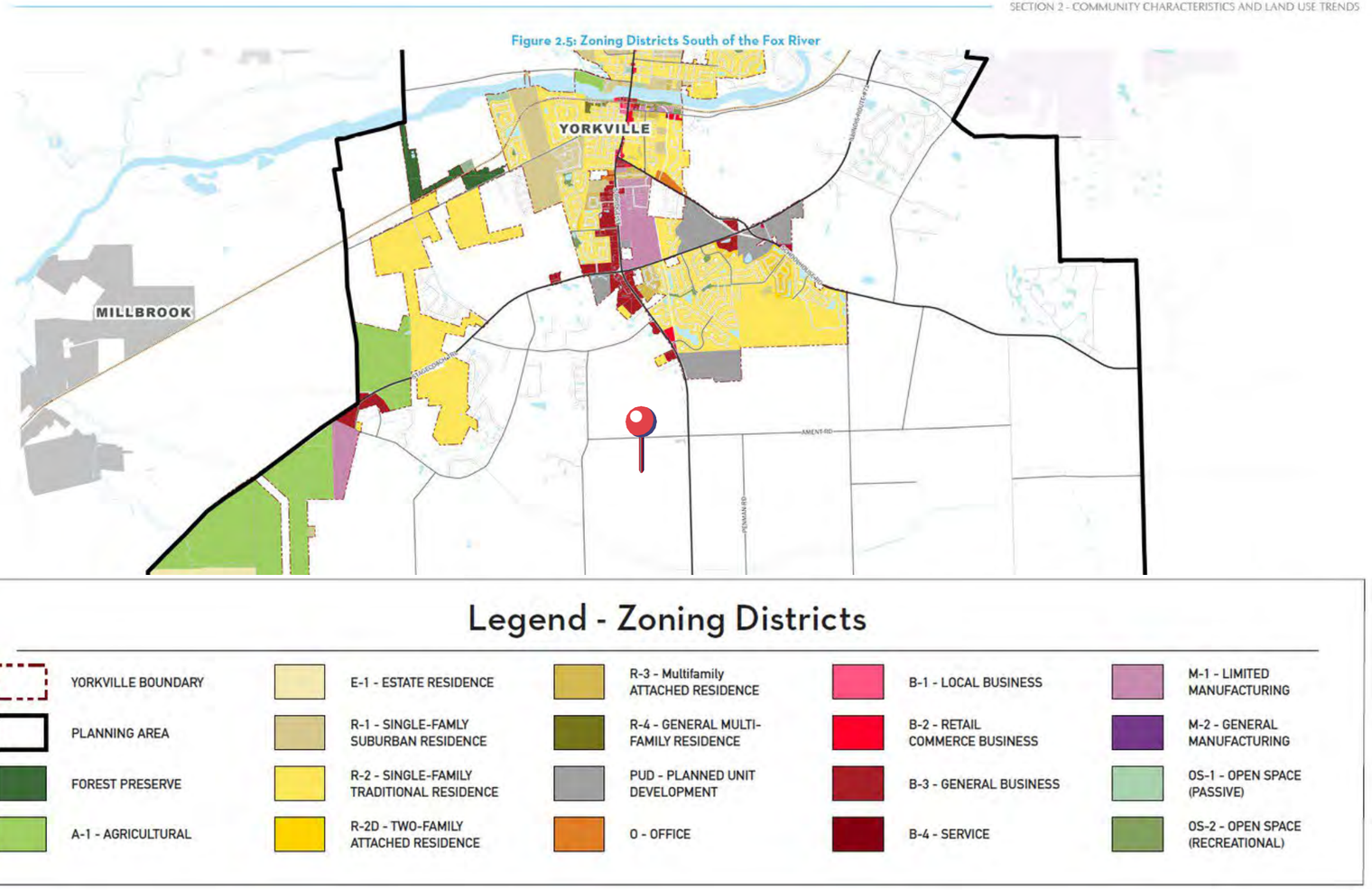

# COUNTY'S FUTURE LAND USE PLAN

- Rural Residential
- Surrounded by Rural Residential
- Commercial to NE
- Transportation Corridor to E



# YORKVILLE'S ZONING MAP

- **Located in "Planning Area"**
  - Yorkville did not require Annexation Agreement
- R-2 to NE
- PUD to NE
- "Due to 2008 recession, recently **planned residential subdivisions have yet to be fully built-out**." (2016 Yorkville Comp. Plan, 8)

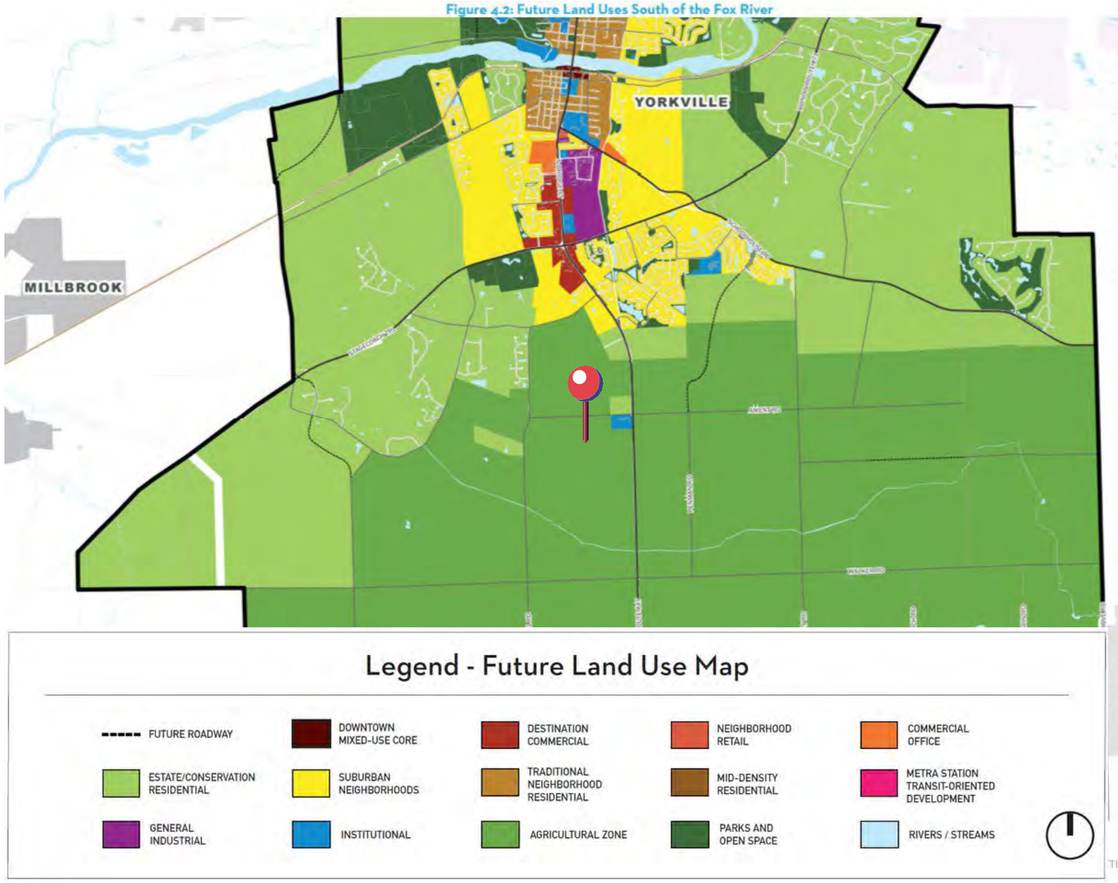


# YORKVILLE'S FUTURE LAND USE PLAN

- Agricultural Zone
- Institutional to E (Church)
- No Commercial to NE
- No Transportation Corridor to E
- "The land use framework proposed in these past plans were based on the assumption of **continued, fast-paced residential and commercial growth, which did not materialize after the 2008 economic recession**." (2016 Yorkville Comp. Plan, 14)




Figure 4.2: Future Land Uses South of the Fox River



# STATEWIDE SITING ACT

- Agricultural Impact Mitigation Agreement
- Setbacks
- 6-foot fence
- No component more than 20 feet in height
- Vegetative screening
- EcoCat consultation
- U.S. Fish and Wildlife consultation
- Illinois Department of Natural Resources recommendations (IDNR)
- Avoid/setback protected lands identified by IDNR and Illinois Nature Preserve Commission
- Illinois State Historic Preservation Office (SHPO) consultation
- Pollinator-Friendly Solar Site Act vegetative ground cover
- Other requirements not more restrictive than the Act





# SPECIAL USE 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.

- **Finding – The Project will generate clean, renewable electricity while producing no air, noise, or water pollution, or ground contamination. The front portion of the parcel closest Ament Road will be retained for agricultural use as well as the surrounding land of the other parcel, which will create a natural screening during the growing season. The Petitioner submitted a vegetative management plan outlining the types of vegetation that will be planted, the timing of planting, and a maintenance plan for the vegetation.**






# SPECIAL USE 2



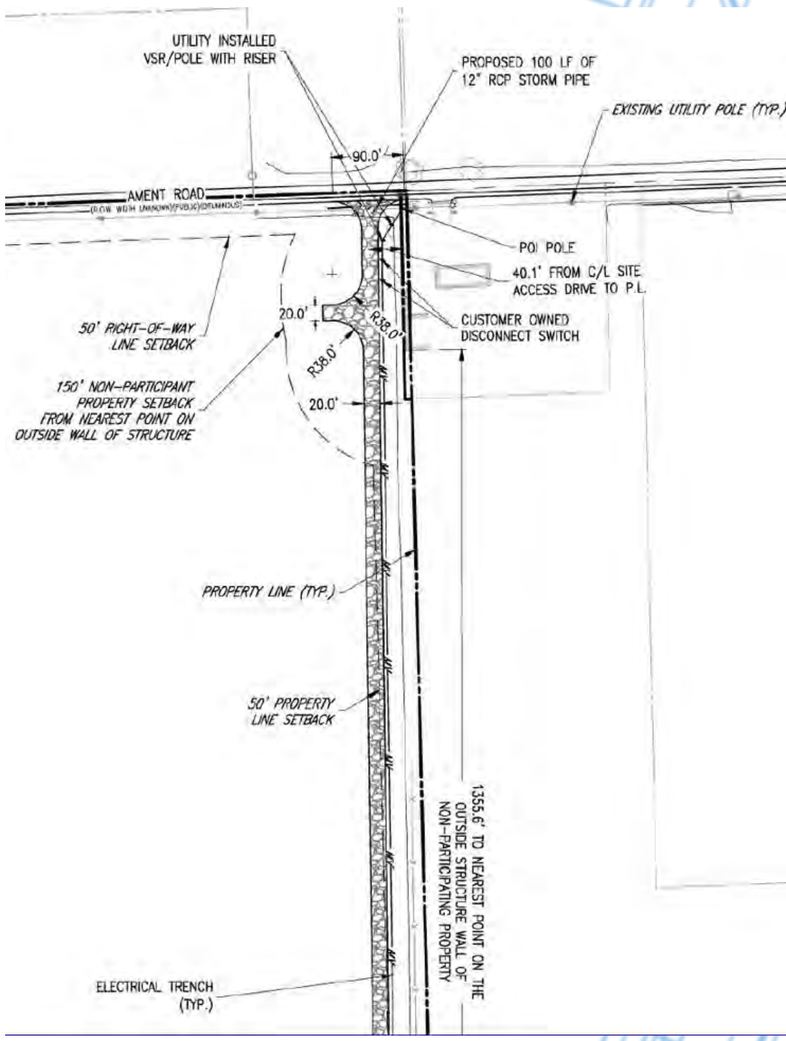

- The special use will not be substantially injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, nor substantially diminish and impair property values within the neighborhood. The zoning classification of property within the general area of the property in question shall be considered in determining consistency with this standard. The proposed use shall make adequate provisions for appropriate buffers, landscaping, fencing, lighting, building materials, open space and other improvements necessary to ensure that the proposed use does not adversely impact adjacent uses and is compatible with the surrounding area and/or the County as a whole.

- **Finding – The Proposal will not interfere with the use and enjoyment of nearby properties. The surrounding properties are zoned primarily A-1 and will not be prevented from continuing any existing use or from pursuing future uses. The proposal's operations would be quiet and minimal traffic will occur after installation is completed. The solar panels are setback from Ament Road and neighboring houses to avoid negative visual impacts.**

# SPECIAL USE 3

- Adequate utilities, access roads and points of ingress and egress, drainage, and/or other necessary facilities have been or are being provided.

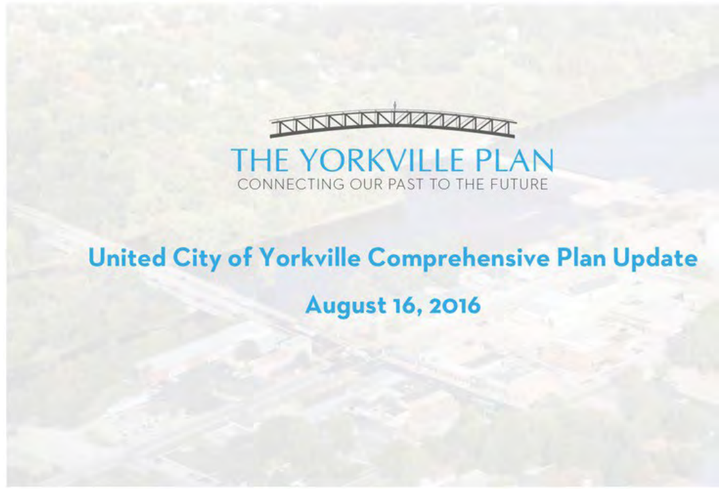
- **Finding – The Proposal will have adequate utility interconnections designed in collaboration with ComEd. The proposal does not require water, sewer, or any other public utility facilities to operate. The Petitioner will also build all roads and entrances at the facility and will enter into an agreement with Kendall Township regarding road use. After initial construction traffic, landscape maintenance and maintenance to the project components are anticipated to occur on an as-needed basis, consistent with the vegetative management plane. Existing traffic patterns will not be impacted in post-construction operations phase. A drain tile survey will be completed prior to construction and foundation design will work around or reroute any identified drain tiles to ensure proper drainage.**

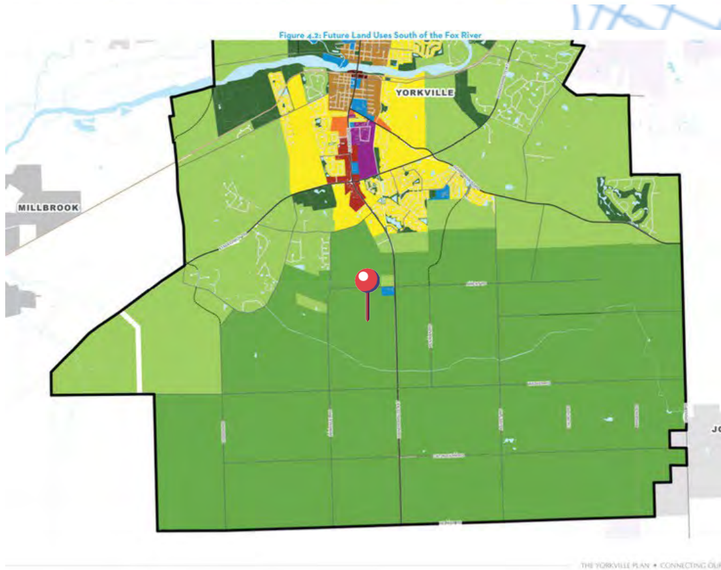


# SPECIAL USE 4

- The special use shall in all other respects conform to the applicable regulations of the district in which it is located, except as such regulations may in each instance be modified by the County Board pursuant to the recommendation of the Zoning Board of Appeals.

- **Finding – If the requested variance is granted, the proposal meets all applicable regulations.**

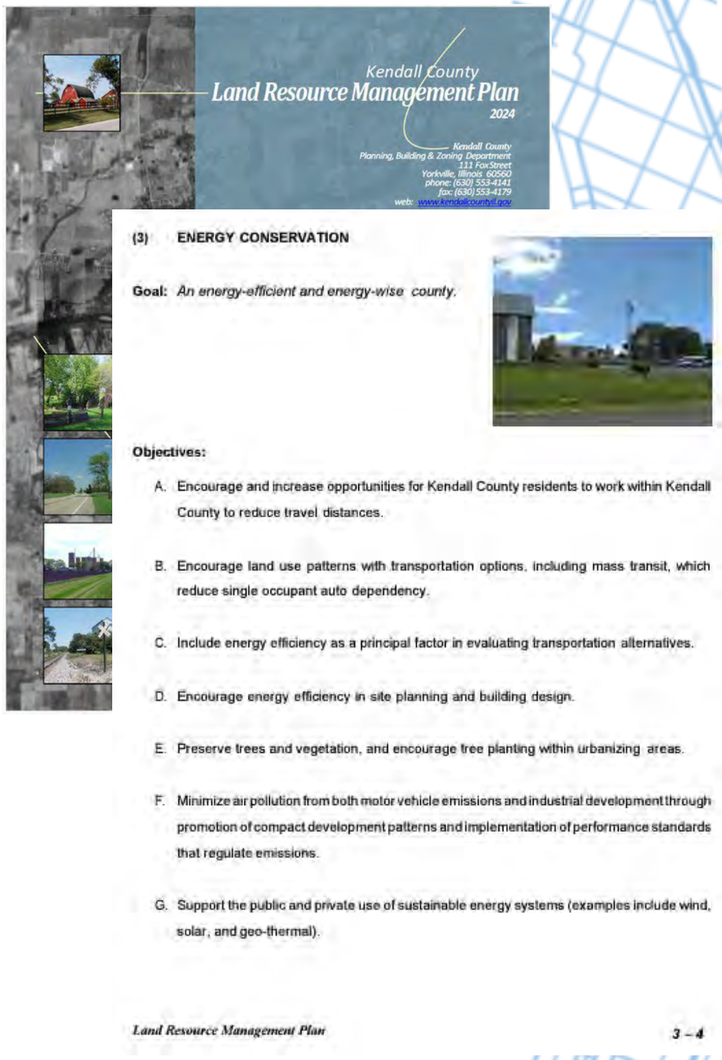


# SPECIAL USE 5

- The special use is consistent with the purpose and objectives of the Land Resource Management Plan and other adopted County or municipal plans and policies.

- **Finding – The Proposal is also consistent with a goal and objective found on page 3 - 4 of the Land Resource Management Plan, " Support the public and private use of sustainable energy systems (examples include wind, solar, and geo-thermal)." ~~However,~~ The proposal is located on property classified as Rural Residential on the Future Land Use Map; however, the proposal is located on property classified as "Agricultural" on the City of Yorkville's Future Land Use Map. Yorkville's Economic Development Committee (EDC) and Planning and Zoning Commission (PZC) recommended to permit the solar farm and variance. The Kendall Township Planning Commission also recommend approval.**



Kendall County
Land Resource Management Plan
2024

Kendall County
Planning, Building & Zoning Department
111 Fox Street
Yorkville, Illinois 60560
phone: (630) 553-4141
fax: (630) 553-4179
web: www.kendallcountyil.gov

(3) ENERGY CONSERVATION

**Goal:** *An energy-efficient and energy-wise county.*

**Objectives:**

A. Encourage and increase opportunities for Kendall County residents to work within Kendall County to reduce travel distances.

B. Encourage land use patterns with transportation options, including mass transit, which reduce single occupant auto dependency.

C. Include energy efficiency as a principal factor in evaluating transportation alternatives.

D. Encourage energy efficiency in site planning and building design.

E. Preserve trees and vegetation, and encourage tree planting within urbanizing areas.

F. Minimize air pollution from both motor vehicle emissions and industrial development through promotion of compact development patterns and implementation of performance standards that regulate emissions.

G. Support the public and private use of sustainable energy systems (examples include wind, solar, and geo-thermal).

*Land Resource Management Plan* 3 – 4

# VARIANCE 1

- That the particular physical surroundings, shape, or topographical condition of the specific property involved would result in a particular hardship or practical difficulty upon the owner if the strict letter of the regulations were carried out.

- **Finding – The subject property is located within one point five (1.5) miles of the Unified City of Yorkville. The Petitioner provided a letter from the City of Yorkville stating that Yorkville did not wish to annex the property or enter into a pre-annexation agreement.**



**United City of Yorkville**
651 Prairie Pointe Drive
Yorkville, Illinois 60560
Telephone: 630-553-4350
www.yorkville.il.us

August 27, 2024

Matthew H. Asselmeier, AICP, CFM (VIA E-MAIL: masselmeier@kendallcountyil.gov)
Kendall County
Planning, Building & Zoning
111 West Fox Street
Yorkville, Illinois 60560

**RE: Ament Road Solar // PINS: 05-16-300-006 & 05-17-400-005**

Dear Mr. Asselmeier,

Section 7:01(D)(17)(a) of the Kendall County Zoning Ordinance states as follows:

> 17. Commercial Solar Energy Facility and Test Solar Energy Systems subject to the following conditions (Amended 5/16/23): a. All commercial solar energy facilities and test solar energy systems located within one point five (1.5) miles of a municipality shall either annex to the municipality or obtain an annexation agreement with the municipality requiring the municipality's regulations to flow through the property.

Please let this letter serve as the City of Yorkville's ("City") notice to Kendall County that the City does not currently seek to annex the above-referenced property or to enter into a pre-annexation agreement with the landowner and developer of this property.

Sincerely,

Krysti Barksdale-Noble

Krysti J. Barksdale-Noble, AICP
Community Development Director

Cc: Kathleen F. Orr, City Attorney kfo@ottosenlaw.com
Bart Olson, City Administrator BOlson@yorkville.il.us
Tom Ryan tryan@newleafenergy.com
Nicholas Sandiford nstandiford@schainbanks.com

# VARIANCE 2

- That the conditions upon which the requested variation is based would not be applicable, generally, to other property within the same zoning classification.

- **Finding - Other A-1zoned properties within the one point five (1.5) miles of a municipality could request a similar variance, if the municipality refuses to annex or enter into a pre-annexation agreement.**

## Memorandum

To: City Council
From: Krysti J. Barksdale-Noble, Community Development Director
CC: Bart Olson, City Administrator
Sara Mendez, Planner I
Date: August 14, 2024
Subject: **Ament Road Solar Farm – Pre-Annexation Agreement Inquiry**

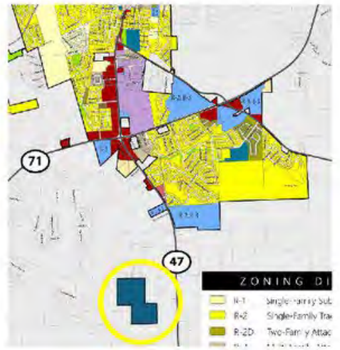
**Summary**

New Leaf Energy has submitted a proposal to develop a solar farm on a site located on Ament Road, west of IL 47. The site in question is currently unincorporated, not contiguous to the City of Yorkville, but falls within the City's 1.5-mile planning jurisdiction. As a result, they are seeking guidance on whether the City of Yorkville is interested in pursuing a pre-annexation agreement.

**Key Considerations**

New Leaf Energy, the developer of the recently annexed and approved community solar project located north of the BNSF railroad and east of Beecher Road, is proposing to develop a 5-megawatt commercial solar energy facility on approximately 40-acres of land located south of Ament Road and west of IL 47. The property is within unincorporated Kendall County and approximately 3,500 feet from Yorkville's corporate boundary. While not contiguous to the city, the property does fall within Yorkville's 1.5-mile planning jurisdiction.





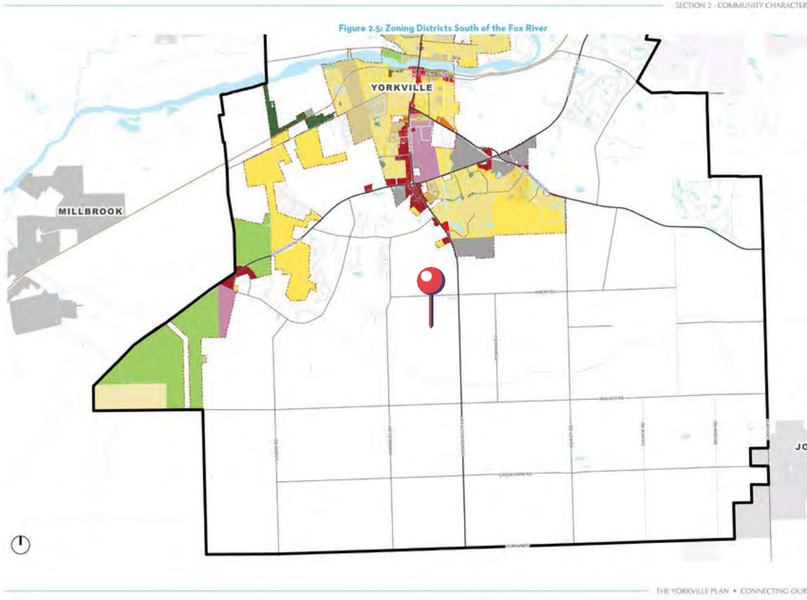

Below is a brief analysis of the approval process, considerations for and against pre-annexation and important proposal details.

1. **Approval Process:**
   - New Leaf Energy is pursuing special use approval through Kendall County.
   - They have the option to seek a pre-annexation agreement with Yorkville, which would require them to undergo the City's site review and building permitting processes.

# VARIANCE 3

- That the alleged difficulty or hardship has not been created by any person presently having an interest in the property

- **Finding - The difficulty was created because the United City of Yorkville did not wish to enter into a pre-annexation agreement or annex the property**



# VARIANCE 4

- That the granting of the variation will not materially be detrimental to the public welfareor substantially injurious to other property or improvements in the neighborhood in which the property is located.

- **Finding – Granting the variance would not be detrimental to the public or substantially injurious to other properties.**



# VARIANCE 5



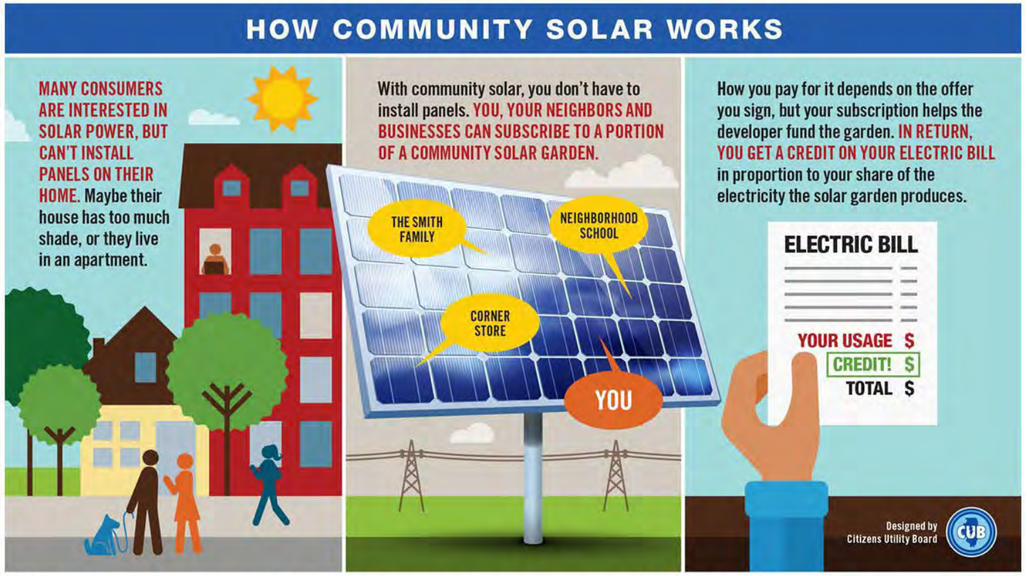
- That the proposed variation will not impair an adequate supply of light and air to adjacent property, or substantially increase the congestion in the public streets or increasethe danger of fire or endanger the public safety or substantially diminish or impair property values within the neighborhood.

- **Finding – The proposed variance would not impair light or air on adjacent property, cause congestion, increase the danger of fire, or negatively impact property values.**

# Community Solar Primer

Community solar allows electricity consumers to realize the benefits of solar energy without having to place panels on their home or business.

Through community solar, consumers subscribe to a portion of the electricity produced by a solar project and in return receive credits on their electricity bill.




**Note:** Community solar projects have a maximum size of 5 Megawatts (MW) of electricity output—roughly 25,000 standard (2 x 1 meter) panels. Also, the utility is required to buy the energy output that hasn't been subscribed out in a solar garden.

**Citizens Utility Board**

21


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# Community Solar Primer: Differences with Utility-Scale



## Community Solar: 25-35 Acres



- Interconnected directly to distribution grid; supplies nearby surrounding communities
- Provides discounted electricity to retail consumers
- 2-3 year development timeline

## Utility-Scale Solar: >500 Acres



- Interconnected to high-voltage transmission; typically exports to demand elsewhere
- Power is sold on a wholesale basis to utilities and large commercial and industrial offtakers
- 5-7 year development timeline



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# Noise Study Results

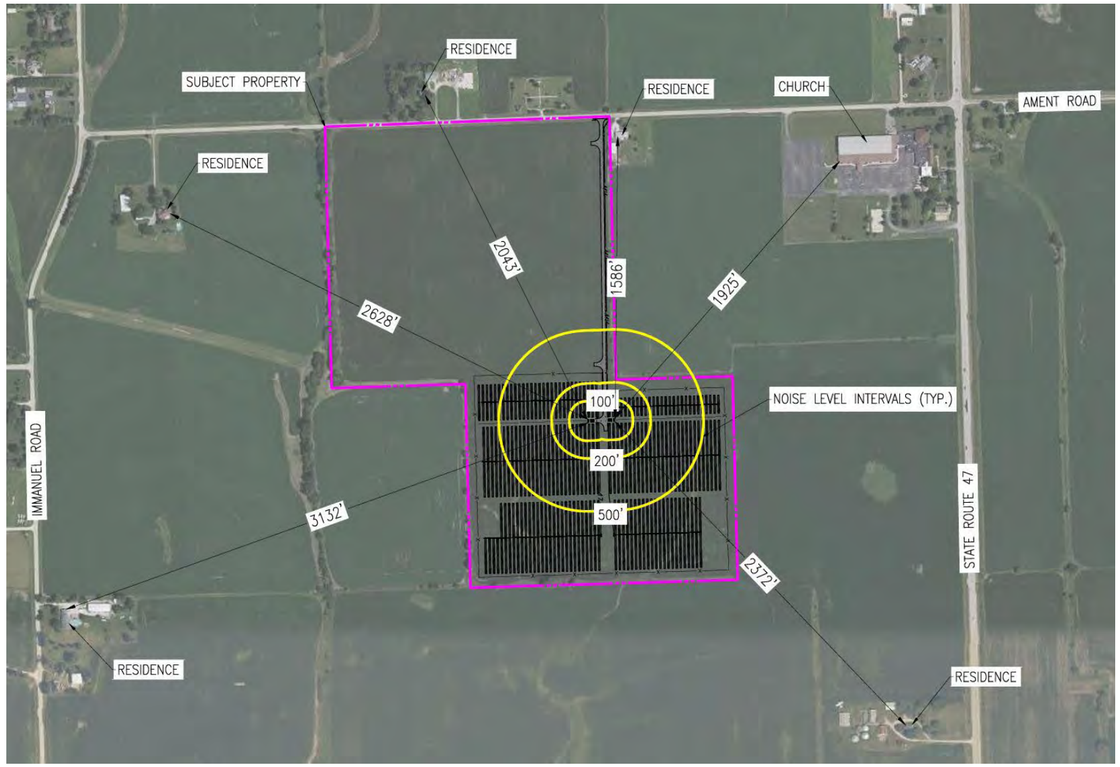


**Noise Levels at 100’ Intervals:**

**100’ = 57 Decibels**
**(Similar to a air conditioner unit)**

**200’ = 51 Decibels**

**500’ = 43 Decibels**
**(Below Background Noise)**




**Prepared by New Leaf Energy, Inc**

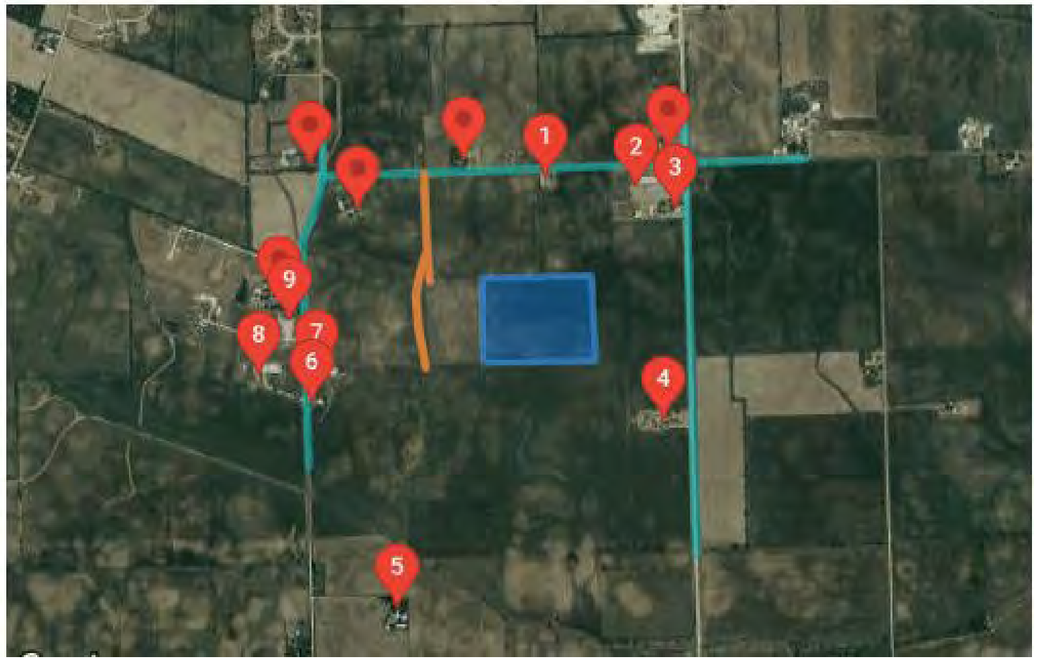
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# Glare Study



| Receptor | Annual Green Glare | | Annual Yellow Glare | |
|---|---|---|---|---|
| | min | hr | min | hr |
| Ament Road | 0 | 0.0 | 0 | 0.0 |
| Illinois Route 47 | 0 | 0.0 | 0 | 0.0 |
| Immanuel Road | 0 | 0.0 | 0 | 0.0 |
| OP 1 | 0 | 0.0 | 0 | 0.0 |
| OP 2 | 0 | 0.0 | 0 | 0.0 |
| OP 3 | 0 | 0.0 | 0 | 0.0 |
| OP 4 | 0 | 0.0 | 0 | 0.0 |
| OP 5 | 0 | 0.0 | 0 | 0.0 |
| OP 6 | 0 | 0.0 | 0 | 0.0 |
| OP 7 | 0 | 0.0 | 0 | 0.0 |
| OP 8 | 0 | 0.0 | 0 | 0.0 |
| OP 9 | 0 | 0.0 | 0 | 0.0 |
| OP 10 | 0 | 0.0 | 0 | 0.0 |
| OP 11 | 0 | 0.0 | 0 | 0.0 |
| OP 12 | 0 | 0.0 | 0 | 0.0 |
| OP 13 | 0 | 0.0 | 0 | 0.0 |
| OP 14 | 0 | 0.0 | 0 | 0.0 |

**No glare was found at any of the receptors**



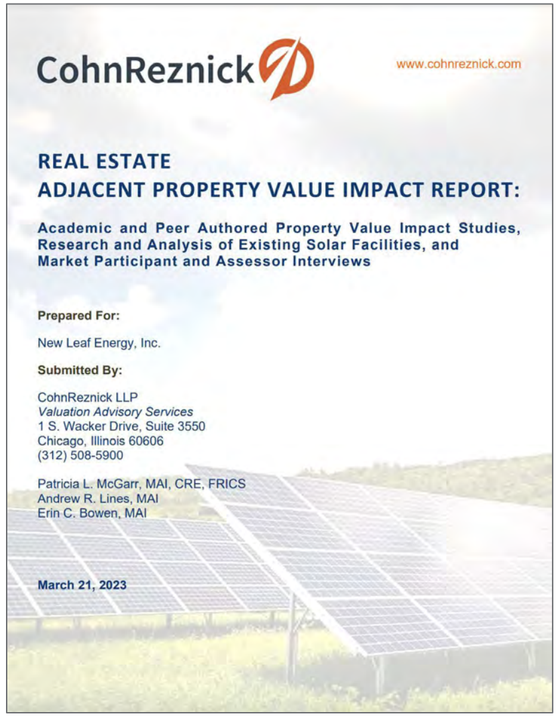

**Prepared by Forge Solar, LLC on July 9, 2024**



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# CohnReznick Property Value Impact Study Results for Solar

- CohnReznick performed a Property Value Impact Study for New Leaf Energy to assess the impact of solar projects on nearby real estate.
- Study included interviews with Market Participants, County and Township Assessors in Illinois as to how the market evaluates:
  - Farmland with views to solar farms - No impact
  - Single-family homes with views to solar farms - No impact
- **Conclusion: no measurable impact to adjacent properties in:**
  - **Range of sales price**
  - **Conditions of sale**
  - **Overall marketability**




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# Fun Facts



ILFBPARTNERS.COM

## FUN FACTS ABOUT Illinois Corn



### Production

Home to nearly 11 million acres dedicated to growing corn, Illinois ranks No. 2 in U.S. corn production.



### Field Corn & Sweet Corn

Almost 98% of corn grown in Illinois is field corn, the kind used to feed livestock and produce many vital products. Sweet corn accounts for about 2% of Illinois-grown corn.

***Field corn***, or dent corn, is the most common type of corn. 98% of the corn grown in Illinois is field corn. Field corn has a hard outer-shell and is full of starch. The kernels on this type of corn are mature and dry before harvest occurs in the fall. Field corn is used in everything from livestock feed to ethanol production and can even be found in cereal, wallpaper, skateboards, cosmetics, and plastic!


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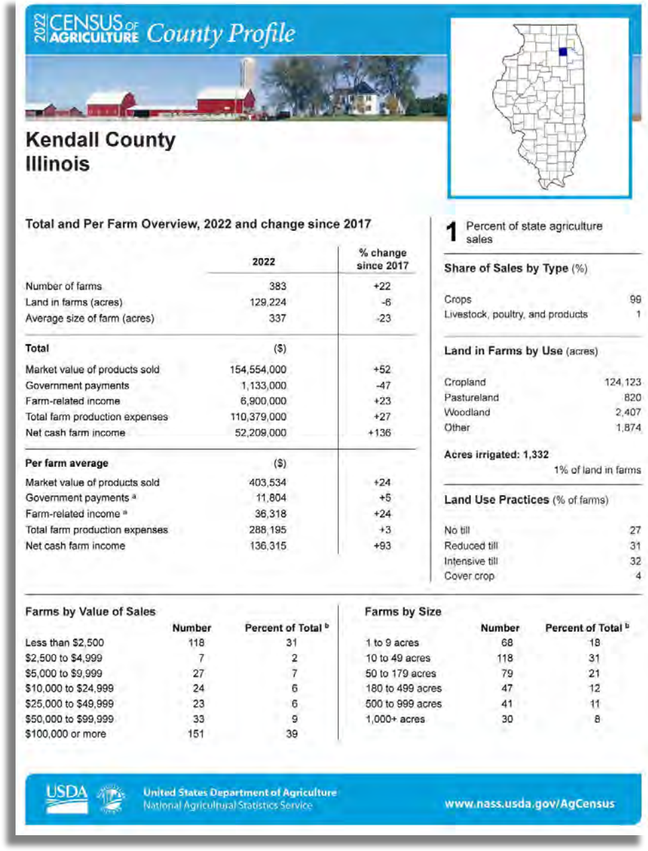
# Soil Conditions



**Cropland**
**124,123 acres**

**Community Solar Site**
**40 acres**

**Percent of Farmland**
**.00032%**



2022 CENSUS OF AGRICULTURE *County Profile*

**Kendall County**
**Illinois**

**Total and Per Farm Overview, 2022 and change since 2017**

| | 2022 | % change since 2017 |
|---|---|---|
| Number of farms | 383 | +22 |
| Land in farms (acres) | 129,224 | -6 |
| Average size of farm (acres) | 337 | -23 |
| **Total** | ($) | |
| Market value of products sold | 154,554,000 | +52 |
| Government payments | 1,133,000 | -47 |
| Farm-related income | 6,900,000 | +23 |
| Total farm production expenses | 110,379,000 | +27 |
| Net cash farm income | 52,209,000 | +136 |
| **Per farm average** | ($) | |
| Market value of products sold | 403,534 | +24 |
| Government payments [a] | 11,804 | +5 |
| Farm-related income [a] | 36,318 | +24 |
| Total farm production expenses | 288,195 | +3 |
| Net cash farm income | 136,315 | +93 |

**1** Percent of state agriculture sales

**Share of Sales by Type** (%)

| | |
|---|---|
| Crops | 99 |
| Livestock, poultry, and products | 1 |

**Land in Farms by Use** (acres)

| | |
|---|---|
| Cropland | 124,123 |
| Pastureland | 820 |
| Woodland | 2,407 |
| Other | 1,874 |

**Acres irrigated: 1,332**
1% of land in farms

**Land Use Practices** (% of farms)

| | |
|---|---|
| No till | 27 |
| Reduced till | 31 |
| Intensive till | 32 |
| Cover crop | 4 |

**Farms by Value of Sales**

| | Number | Percent of Total [b] |
|---|---|---|
| Less than $2,500 | 118 | 31 |
| $2,500 to $4,999 | 7 | 2 |
| $5,000 to $9,999 | 27 | 7 |
| $10,000 to $24,999 | 24 | 6 |
| $25,000 to $49,999 | 23 | 6 |
| $50,000 to $99,999 | 33 | 9 |
| $100,000 or more | 151 | 39 |

**Farms by Size**

| | Number | Percent of Total [b] |
|---|---|---|
| 1 to 9 acres | 68 | 18 |
| 10 to 49 acres | 118 | 31 |
| 50 to 179 acres | 79 | 21 |
| 180 to 499 acres | 47 | 12 |
| 500 to 999 acres | 41 | 11 |
| 1,000+ acres | 30 | 8 |

USDA United States Department of Agriculture
National Agricultural Statistics Service
www.nass.usda.gov/AgCensus

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, CHICAGO DISTRICT
231 SOUTH LA SALLE STREET, SUITE 1500
CHICAGO IL 60604-1437

January 13, 2025

Regulatory Branch (LRC-2024-00481)

SUBJECT: No Permit Required (NPR) Letter for the Ament Road Solar Project in Yorkville, Kendall County, Illinois (Latitude 41.593804°N, Longitude -88.444237°W)

Janel Dhuse
3743 North Kenmore Avenue, #3
Chicago, Illinois 60613

Dear Ms. Dhuse:

The U.S. Army Corps of Engineers, Chicago District, has completed its review of your August 13, 2024 request that the U.S. Army Corps of Engineers issue a No Permit Required (NPR) letter with a Jurisdictional Determination (JD) for the above-referenced activity. The subject project has been assigned number LRC-2024-00481. Please reference this number in all future correspondence concerning this project.

Following a review of the Water Resources Delineation Report dated June 18, 2024, prepared by EnCAP, Inc., and a verification of the information submitted in the report, this office has determined that the subject property contains "waters of the United States" under the jurisdiction of this office and therefore, subject to regulation under Section 404 of the Clean Water Act, specifically: Wetland 1/Intermittent Creek. In addition, Farmed Wetand 1W & Farmed Wetland 1E have been determined to be non-jurisdictional. An Approved Jurisdictional Determination (AJD) is enclosed.

Following a review of the information you furnished to this office and assuming your project is conducted only as set forth in the plans titled “Site Use Permit Set, Ament Road – Kendall, IL” prepared by New Leaf Energy, this office has determined that a Department of the Army (DA) permit is not required to complete the proposed work as your request for a NPR letter states that you are not proposing to discharge dredged or fill material into any aquatic resource situated on the Subject Property. As a result, this office is issuing a NPR letter for the above-referenced activity. Please be aware that any unpermitted discharge into an area within the jurisdiction of this office may result in civil or criminal enforcement under the Clean Water Act, 33 U.S.C. 1319.

This letter is considered an approved jurisdictional determination for your subject site. If you object to this determination, you may appeal, according to 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and a Request for Appeal (RFA) form. If you request to appeal the above determination, you must submit a completed RFA form to the Great Lakes/Ohio River Division Office at the following address:

# Stormwater Management Permit Application



## STORMWATER MANAGEMENT PERMIT

PERMIT APPLICATION #_____

Conformance with all Federal, State, and County Regulations is required. Applicants are encouraged to read the Stormwater Management Division of the Kendall County Code and consider a pre-application meeting with Department staff prior to submittal. See attached highlights of regulations.

Property: Name AMENT ROAD SOLAR 1, LLC

Owner Address 55 TECHNOLOGY DRIVE, SUITE 102 / LOWELL, MA 01851

Phone 800-818-5249

Agent: Name ATWELL, LLC

Address 1250 E. DIEHL ROAD, SUITE 300 / NAPERVILLE, IL 60563

Phone 630-281-8424

Site: Address or Location AMENT ROAD, KENDALL COUNTY, ILLINOIS

Tax Parcel # 05-16-300-006 & 05-17-400-005

Zoning/Land Use/Acres A-1 / AGRICULTURAL / 95.07 TOTAL

Proposed Development:
A 4.99 MW (AC) ground mounted solar power generating facility

Attachments: Plat_____ Construction Plans_____

Soils_____ Landscaping_____

Grading_____ Phasing_____

Other_____

Fees $_____ Processing Fee ($50.00)

$_____ Engineering Review Deposit ($2,500.00 *or* 2% of estimated cost of the proposed improvements, whichever is greater. A $3,500.00 Construction Inspection Services Fee and General Consultation Fee Might Be Required as the Project Progresses)

TOTAL $ _____ One check is acceptable made out to the Kendall County Treasurer

Staff will contact Applicant regarding schedule and reviews.

I hereby certify that the information on this application, on the documents attached, and on other submittals made during the review process is true and correct; that I am authorized to file this application; and that I agree to conform to all requirements set forth by the County and all conditions of the Kendall County Code related to stormwater management. I understand that by signing this form, that the property in question may be visited by County Staff and County Engineers throughout the permit and construction process. I also understand that I am responsible for all costs associated with this application. The applicant attests that they are free of debt or current on all debts owed to Kendall County as of the application date.

Owner's Signature (Including Middle Initial)_____ Date_____

Agent's Signature (Including Middle Initial) Nichan Biller Date 1/15/2025

Kendall County Planning, Building, & Zoning Department
111 West Fox Street, Room 203
Yorkville, Illinois 60560
Phone: (630) 553-4139, Fax (630) 553-4179
www.kendallcountyil.gov

# Materials in a Solar Panel



| COMPONENT | MATERIAL | TOTAL SHARE | REMARK |
|---|---|---|---|
| FRAME | Aluminum | 10 % – 20 % | not hazardous |
| | Silicone | <1 % | not hazardous, see section 8 |
| LAMINATE | Glass | 60 % – 75 % | not hazardous |
| | Plastics (EVA, PET, PE, PPE, PC) | 10 % – 15 % | no hazards known |
| | Silicon | 2 % – 4 % | not hazardous |
| | Metals (Aluminum, Copper, Tin) | 1 % – 3 % | not hazardous |
| | Lead | <0,1 % | hazardous |
| | Silver | <0,05 % | not hazardous |

**As of 2023, solar module manufacturers have removed lead solder from their panels altogether**


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# Decommissioning: Recycling

**Solar panels recycling is not a massive market at present, but it is expected to grow as solar projects begin reaching end of life in the next two decades in Illinois.**

- Currently there is one solar PV recycling facility in Illinois, Interco, which is located in Madison, IL (metro St. Louis).
  - Interco operates a 400,000 square-foot facility and processes over 250,000 salvage solar panels each year.
- It is expected that the State of Illinois will require panels to be recycled in the near future





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# Establishing Meadows



- **Year 1:**
  - Cover Crop / Nurse Crop planting for site stabilization
    - By the end of the first growing season, planted areas will have 90% vegetative cover
  - First mowing for weed management and to encourage native growth
- **Year 2:**
  - 3x mowings to disrupt annual weeds from going to seed while encouraging native wildflowers to put energy into rooting deeply
    - By the end of year two, 50% of the vegetation will be native vs. non-invasive
- **Year 3:**
  - 1 complete site mowing
  - Integrated Vegetation Management (IVM) - Spot mowing, wicking, hand weeding and other methods are used to control invasive species and weeds.
  - Plug Plantings - Mature versions of the plants specified in the seed mix are installed to accelerate the establishment of the pollinator plants.
    - End of year three, 60% native with no non-native/invasive species being among the three most dominant species found on the site.
- **Year 4:**
  - IVM and Plug Planting
  - 2 complete site visits
    - Project monitoring and annual reporting
- **Year 5:**
  - By year five, a self-sustaining field of native pollinators will have been established
    - Project monitoring and reporting will continue





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# Native Pollinators











NATIVE PLANT SEED MIX: 28.8 LBS/AC

| GENUS/SPECIES | COMMON NAME | SEEDS/OZ | OZ/AC |
|---|---|---|---|
| ALLIUM CERNUUM | NODDING ONION | 7,600 | 6.0 |
| ASTER OOLENTANGIENSE | SKY BLUE ASTER | 80,000 | 4.0 |
| ASTRAGALUS CANADENSIS | CANADA MILK VETCH | 17,000 | 2.0 |
| ECHINACEA PALLIDA | PALE PURPLE CONEFLOWER | 5,200 | 32.0 |
| RUDBECKIA HIRTA | BLACK-EYED SUSAN | 92,000 | 16.0 |
| TRADESCANTIA OHIENSIS | OHIO SPIDERWORT | 8,000 | 16.0 |
| ZIZIA AUREA | GOLDEN ALEXANDERS | 11,000 | 16.0 |
| BOUTELOUA CURTIPENDULA | SIDE-OATS GRAMA | 6,000 | 320.0 |
| BROMUS KALMII | PRAIRIE BROME | | 4.0 |
| CAREX BREVIOR | PLAINS OVAL SEDGE | | 8.0 |
| CAREX VULPINOIDEA | BROWN FOX SEDGE | 100,000 | 32.0 |
| SPOROBOLUS HETEROLEPIS | PRAIRIE DROPSEED | 16,000 | 6.0 |
| | 12 SPECIES | | 462 (28.8 LBS/AC) |













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**DEPARTMENT OF PLANNING, BUILDING & ZONING**
807 West John Street • Yorkville, IL • 60560
(630) 553-4141 Fax (630) 553-4179

# MEMORANDUM

To: Kendall County Zoning Board of Appeals
From: Matthew H. Asselmeier, AICP, CFM, Director
Date: January 24, 2025
Re: Proposed Text Amendment Related to Allowing Parking in the Front Yard Setback of A-1 Zoned Properties (Petition 24-35)

Section 36-1013 (f) (6) (a) (1) of the Kendall County Code contains the following regulations regarding parking in the front yard setbacks:

"No parking and drive aisles are permitted in a required front setback except the interior one-half (½) of the front yard in an M-1 Limited Manufacturing District or M-2 Heavy Industrial District."

During the review of the special use permit for a landscaping business between 3900 and 3716 Stewart, Staff was requested to investigate allowing parking in a portion of the required front yard setbacks.

The front yard setbacks for properties zoned A-1 are one hundred fifty feet (150') from the centerline and one hundred feet (100') from the right-of-way line.

The consensus among the members of the Kendall County Regional Planning Commission was that this requirement was too large and prevented property owners from using their land effectively.

At their meeting on October 23, 2024, the Kendall County Regional Planning Commission decided to initiate a text amendment to the Kendall County Code allowing parking in the A-1 Zoning District in the interior seventy-five feet (75') from the centerline for properties where the right-of-way was not dedicated and the interior fifty feet (50') from the right-of-way line where a right-of-way existed.

After review by the Kendall County Regional Planning Commission on December 11, 2024, the proposal was clarified to read as follows:

"No parking and drive aisles are permitted in a required front setback except the interior one-half (½) of the front yard in **A-1 Agricultural District,** M-1 Limited Manufacturing District**,** or M-2 Heavy Industrial District. **Specifically, in the A-1 Agricultural District, no parking is allowed in the exterior seventy-five feet (75') from the centerline for properties where the right-of-way was not dedicated and the exterior fifty feet (50') from the right-of-way line where a right-of-way existed.**"

Information was sent to the Townships on October 25, 2024.

ZPAC reviewed the original proposal at their meeting on November 5, 2024. Discussion occurred regarding the history of front yard setback regulations. ZPAC voted to recommend approval of the proposal by a vote of seven (7) in favor and zero in opposition (0) with three (3) members absent. The minutes of the meeting are provided.

The Kendall County Regional Planning Commission reviewed this proposal at their meeting on December 11, 2024. Discussion occurred regarding grandfathering and the applicability of the standards if a road is widened. The Commission wanted the setback distances of seventy-five feet (75') and fifty (50') emphasized in the regulation. Staff was requested to update the proposal to reflect this emphasis. The Kendall County Regional Planning Commission voted to continue this

proposal by a vote of nine (9) in favor and zero (0) in opposition with one (1) member absent. The minutes of the meeting are provided. The minutes of the meeting are provided.

At their meeting on January 22, 2025, the Kendall County Regional Planning Commission recommended approval of the proposal by a vote of ten (10) in favor and zero (0) in opposition. The minutes of the meeting are provided.

The Kendall County Zoning Board of Appeals initiated a public hearing on this proposal on December 16, 2024. The Kendall County Zoning Board of Appeals voted to continue to the proposal to the January 27, 2025, hearing by a vote of seven (7) in favor and zero (0) in opposition. The minutes of the hearing are provided.

If you have any questions regarding this memo, please let me know.

MHA

Encs.: November 5, 2024, ZPAC Meeting Minutes (This Petition Only)
December 11, 2024, RPC Meeting Minutes (This Petition Only)
December 16, 2024, ZBA Hearing Minutes (This Petition Only)
January 22, 2025 RPC Meeting Minutes (This Petition Only)

**ZONING, PLATTING & ADVISORY COMMITTEE (ZPAC)**
**November 5, 2024 – Unapproved Meeting Minutes**

PBZ Chairman Seth Wormley called the meeting to order at 9:01 a.m.

Present:
Matt Asselmeier – PBZ Department
Lauren Belville – Health Department
David Guritz – Forest Preserve
Brian Holdiman – PBZ Department
Commander Jason Langston – Sheriff's Department
Alyse Olson – Soil and Water Conservation District
Seth Wormley – PBZ Committee Chair

Absent:
Meagan Briganti – GIS Department
Greg Chismark – WBK Engineering, LLC
Fran Klaas – Highway Department

Audience:
James Kerrigan, Nicholas Bellone, and Nicholas Standiford

## PETITIONS

**Petition 24-35 Kendall County Regional Planning Commission**
Mr. Asselmeier summarized the request.

Section 36-1013 (f) (6) (a) (1) of the Kendall County Code contains the following regulations regarding parking in the front yard setbacks:

"No parking and drive aisles are permitted in a required front setback except the interior one-half (½) of the front yard in an M-1 Limited Manufacturing District or M-2 Heavy Industrial District."

During the review of the special use permit for a landscaping business between 3900 and 3716 Stewart, Staff was requested to investigate allowing parking in a portion of the required front yard setbacks.

The front yard setbacks for properties zoned A-1 are one hundred fifty feet (150') from the centerline and one hundred feet (100') from the right-of-way line.

The consensus among the members of the Kendall County Regional Planning Commission was that this requirement was too large and prevented property owners from using their land effectively.

At their meeting on October 23, 2024, the Kendall County Regional Planning Commission decided to initiate a text amendment to the Kendall County Code allowing parking in the A-1 Zoning District in the interior seventy-five feet (75') from the centerline for properties where the right-of-way was not dedicated and the interior fifty feet (50') from the right-of-way line where a right-of-way existed.

Accordingly, the redlined version of the text is as follows:

"No parking and drive aisles are permitted in a required front setback except the interior one-half (½) of the front yard in **A-1 Agricultural District,** M-1 Limited Manufacturing District**,** or M-2 Heavy Industrial District."

Information was sent to the Townships on October 25, 2024. No comments received.

Mr. Holdiman asked if the setback was whichever was greater. Mr. Asselmeier said that, in terms of the setback, the whichever was greater language had been removed from the zoning regulations.

Mr. Guritz asked why the current provisions were in place and what about the impact of changing the regulations. Mr. Asselmeier explained that the requirement of not allowing parking in front yard setbacks had been in the Zoning Ordinance for a long time. However, the setback in the A-1 District had increased over time. Mr. Holdiman noted the increase of

businesses in the agricultural district, like landscaping businesses, that have the need for parking. Mr. Asselmeier said the ordinance already sets the number of parking spaces based on use; stormwater regulations would also apply.

Mr. Guritz made a motion, seconded by Ms. Belville, to recommend approval of the proposal to the Kendall County Regional Planning Commission.

The votes were follows:
Ayes (7): Asselmeier, Belville, Guritz, Holdiman, Langston, Olson, and Wormley
Nays (0): None
Abstain (0): None
Absent (3): Briganti, Chismark, and Klaas

The motion passed.

The proposal goes to the Kendall County Regional Planning Commission on December 11, 2024.

## PUBLIC COMMENT

None

## ADJOURNMENT

Mr. Guritz made a motion, seconded by Commander Langston, to adjourn.

With a voice vote of seven (7) ayes, the motion carried.

The ZPAC, at 9:31 a.m., adjourned.

Respectfully Submitted,
Matthew H. Asselmeier, AICP, CFM
Director

Enc.

**KENDALL COUNTY**
**REGIONAL PLANNING COMMISSION**

***Kendall County Office Building***
***Rooms 209 and 210***
***111 W. Fox Street, Yorkville, Illinois***

**Unapproved - Meeting Minutes of December 11, 2024 - 7:00 p.m.**

Chairman Bill Ashton called the meeting to order at 7:00 p.m.

**ROLL CALL**
Members Present: Bill Ashton, Eric Bernacki, Tom Casey, Dave Hamman, Keith Landovitz, Karin McCarthy-Lange, Ruben Rodriguez, Bob Stewart, and Claire Wilson
Members Absent: Seth Wormley
Staff Present: Matthew H. Asselmeier, Director, and Wanda A. Rolf, Office Assistant
Others Present: Tom Ryan, Juan Hernandez, and Tom Ryan

**PETITIONS**
**Petition 24-35 Kendall County Regional Planning Commission**
Mr. Asselmeier summarized the request.

Section 36-1013 (f) (6) (a) (1) of the Kendall County Code contains the following regulations regarding parking in the front yard setbacks:

"No parking and drive aisles are permitted in a required front setback except the interior one-half (½) of the front yard in an M-1 Limited Manufacturing District or M-2 Heavy Industrial District."

During the review of the special use permit for a landscaping business between 3900 and 3716 Stewart, Staff was requested to investigate allowing parking in a portion of the required front yard setbacks.

The front yard setbacks for properties zoned A-1 are one hundred fifty feet (150') from the centerline and one hundred feet (100') from the right-of-way line.

The consensus among the members of the Kendall County Regional Planning Commission was that this requirement was too large and prevented property owners from using their land effectively.

At their meeting on October 23, 2024, the Kendall County Regional Planning Commission decided to initiate a text amendment to the Kendall County Code allowing parking in the A-1 Zoning District in the interior seventy-five feet (75') from the centerline for properties where the right-of-way was not dedicated and the interior fifty feet (50') from the right-of-way line where a right-of-way existed.

Accordingly, the redlined version of the text is as follows:

"No parking and drive aisles are permitted in a required front setback except the interior one-half (½) of the front yard in **A-1 Agricultural District,** M-1 Limited Manufacturing District**,** or M-2 Heavy Industrial District."

Information was sent to the Townships on October 25, 2024. No comments received.

ZPAC reviewed the proposal at their meeting on November 5, 2024. Discussion occurred regarding the history of front yard setback regulations. ZPAC voted to recommend approval of the proposal by a vote of seven (7) in favor and zero in opposition with three (3) members absent. The minutes of the meeting were provided.

Member Landovitz stated that the dimensions are not clearly stated. Mr. Asselmeier stated the parking is permitted in a required front setback except the interior one-half (½) of the front yard in an M-1 Limited Manufacturing District or M-2 Heavy Industrial District. Member Landovitz favored more explicitly stating the seventy-five foot (75') and fifty foot (50') requirement.

The amendment would read "No parking and drive aisles are permitted in a required front setback except the interior one-half (½) of the front yard in **A-1 Agricultural District,** M-1 Limited Manufacturing District**,** or M-2 Heavy Industrial District. **Specifically, for properties located in the A-1 Agricultural District, parking and driving aisles are permitted within the interior seventy-five feet (75') from the centerline for properties where the right-of-way was not dedicated and the interior fifty feet (50') from the right-of-way line where a right-of-way existed**."

Member Wilson asked if the proposal applied to all roads or rights-of-way. Mr. Asselmeier responded that, if a road authority widened a road, the property would be grandfathered. The property owner could also pursue a variance under the argument that the State created the hardship/non-conformity. Member Wilson discussed a case in Channahon where a restaurant could not be rebuilt.

Member Landovitz made a motion, seconded by Member Bernacki, to continue the Petition to the January 22, 2025, meeting at the Historic Courthouse.

The votes were as follows:
Ayes (9): Ashton, Bernacki, Casey, Hamman, Landovitz, McCarthy-Lange, Rodriguez, Stewart, and Wilson
Nays (0): None
Absent (1): Wormley
Abstain (0): None

The motion carried.

The proposal returns to the Kendall County Regional Planning Commission on January 22, 2025.

**CITIZENS TO BE HEARD/PUBLIC COMMENT**
None

**OTHER BUSINESS/ANNOUNCEMENTS**
Mr. Asselmeier reported that the application deadline for the January meeting is December 24, 2024. Petitions 24-30 and 24-35 will be on the agenda.

Member Landovitz appreciated the Staff for updating the ordinance as necessary. Mr. Asselmeier said that the Staff was proposing text amendments reducing the number of plats submitted for certain applications.

Member Wilson suggested only including a summary instead of complete NRI Reports.

**ADJOURNMENT**
Member Wilson made a motion, seconded by Member Hamman, to adjourn. With a voice vote of nine (9) ayes,

the motion carried.

The Kendall County Regional Planning Commission meeting adjourned at 8:05 p.m.

Respectfully submitted by,
Matthew H. Asselmeier, AICP, CFM, Director

Enc.

# KENDALL COUNTY
# REGIONAL PLANNING COMMISSION
# DECEMBER 11, 2024

IF YOU WOULD LIKE TO BE CONTACTED ON FUTURE MEETINGS REGARDING THIS TOPIC, PLEASE PROVIDE YOUR ADDRESS OR EMAIL ADDRESS

| NAME | ADDRESS (OPTIONAL) | EMAIL ADDRESS (OPTIONAL) |
|---|---|---|
| Tom Ryan | [redacted] | |
| Juan Hernandez | | |
| Steve Gengler | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**MINUTES – UNOFFICIAL UNTIL APPROVED**
**KENDALL COUNTY**
**ZONING BOARD OF APPEALS MEETING**
111 WEST FOX STREET, COUNTY BOARD ROOM (ROOMS 209 and 210)
YORKVILLE, IL 60560
December 16, 2024 – 7:00 p.m.

**CALL TO ORDER**
Chairman Randy Mohr called the Zoning Board of Appeals meeting to order at 7:00 p.m.

**ROLL CALL:**
Members Present: Scott Cherry, Cliff Fox, Tom LeCuyer, Randy Mohr, Jillian Prodehl, Dick Thompson, and Dick Whitfield
Members Absent: None
Staff Present: Matthew Asselmeier, AICP, CFM, Director and Wanda Rolf, Office Assistant
Others Present: Michael Faulkner and Miranda Marshall-Faulkner

**PETITIONS:**
The Zoning Board of Appeals started their reviews of Petitions 24-30 and 24-35 and opened the public hearings for both at 7:01 p.m.

**Petition 24 – 30 – Nicholas S. Bellone on Behalf of Ament Solar 1, LLC (Tenant) and Janet M. Dhuse on Behalf of the Janet Dhuse Declaration of Family Trust Dated March 1, 2013 (Owner)**

| | |
|---|---|
| Request: | Special Use Permit for a Commercial Solar Energy Facility and Variance to Section 36-282(17)(a) of the Kendall County Code to Allow a Commercial Solar Energy Facility on Land within One Point Five (1.5) Miles of Municipality without an Annexation Agreement |
| PINs: | 05-16-300-006 and 05-17-400-005 |
| Location: | South of 9949 and 10021 Ament Road, Yorkville in Kendall Township |
| Purpose: | Petitioner Would Like to Install a Commercial Solar Energy Facility; Property is Zoned A-1 |

**Petition 24 – 35 – Kendall County Regional Planning Commission**

| | |
|---|---|
| Request: | Text Amendment to the Kendall County Code Amending the Parking Regulations in Front Yard Setbacks |
| Purpose: | Petitioner Would Like to Allow Parking in the Interior ½ of the Front Yard Setback on Properties Zoned A-1 |

At the request of the Petitioners, Chairman Mohr stated that Petition 24 – 30 and Petition 24 – 35 will be continued until the January 27, 2025, meeting, at 7:00 p.m., at the Historic Courthouse.

With a voice vote of seven (7) ayes, the motion carried.

The Zoning Board of Appeals completed their reviews and recessed the public hearings for Petition 24-30 and 24-35 at 7:02 p.m.

**PUBLIC COMMENTS**

Mr. Asselmeier reported that the next application deadline was December 24, 2024. The only petitions, to date, for the January hearing are the solar project on Simons Road and the solar project on Ament Road and the two (2) petitions continued at tonight's meeting.

Michael Faulkner, a property owner in the A-1 district, wanted to speak about Petition 24-35, the parking regulations in the front yard setbacks.

Mr. Asselmeier spoke regarding the issue with the setbacks. It was noted that at their meeting on October 23, 2024, the Kendall County Regional Planning Commission decided to initiate a text amendment to the Kendall County Code allowing parking in the A-1 Zoning District in the interior seventy-five feet (75') from the centerline for properties where the right-of-way was not dedicated and the interior fifty feet (50') from the right-of-way line where a right-of-way existed.

Mr. Faulkner asked why he could not park within the first twenty-five feet (25') of the road if he is a owns property zoned A-1. Mr. Asselmeier stated that Mr. Faulkner is not allowed to count that parking spot as his principal, required parking spot.

Miranda Marshall-Faulkner discussed the situation at 1539 Collins Road regarding the demolition of the house and their concerns about setbacks at the property.

The reasoning behind this proposal was because there was a landscaping business that wanted to have their required parking spaces in the front yard setback and that is against regulation.

Chairman Mohr asked Mr. and Mrs. Faulkner to attend the January 27, 2025, meeting, at 7:00 p.m., at the Historic Courthouse.

Starting in January, the meetings will be in the Historic Courthouse.

**ADJOURNMENT OF THE ZONING BOARD OF APPEALS**

Member LeCuyer made a motion, seconded by Member Prodehl, to adjourn.

With a voice vote of seven ayes, the motion carried.

The Zoning Board of Appeals meeting adjourned at 7:33 p.m.

The next regularly scheduled meeting/hearing will be on Monday, January 27, 2025, in the Historic Courthouse.

Respectfully submitted by,
Wanda A Rolf
Planning, Building and Zoning Part-Time Administrative Assistant

Exhibits

1. Memo on Petition 24-35 Dated December 12, 2024
2. Certificate of Publication for Petition 24-35 (Not Included with Report but on file in Planning, Building and Zoning Office)

**KENDALL COUNTY**
**REGIONAL PLANNING COMMISSION**

***Kendall County Historic Court House***
***Court Room***
***110 W. Madison Street, Yorkville, Illinois***

**Unapproved - Meeting Minutes of January 22, 2025 - 7:00 p.m.**

Chairman Bill Ashton called the meeting to order at 7:03 p.m.

## ROLL CALL

Members Present: Bill Ashton, Eric Bernacki, Tom Casey, Dave Hamman, Keith Landovitz, Karin McCarthy-Lange, Ruben Rodriguez, Bob Stewart, Claire Wilson, and Seth Wormley
Members Absent: None
Staff Present: Matthew H. Asselmeier, Director, and Wanda A. Rolf, Office Assistant
Others Present: Steve Grebner, Steve Gengler, Tom Ryan, and Nick Standiford

## PETITIONS

### Petition 24-35 Kendall County Regional Planning Commission

Mr. Asselmeier summarized the request.

Section 36-1013 (f) (6) (a) (1) of the Kendall County Code contains the following regulations regarding parking in the front yard setbacks:

"No parking and drive aisles are permitted in a required front setback except the interior one-half (½) of the front yard in an M-1 Limited Manufacturing District or M-2 Heavy Industrial District." During the review of the special use permit for a landscaping business between 3900 and 3716 Stewart, Staff was requested to investigate allowing parking in a portion of the required front yard setbacks.

The front yard setbacks for properties zoned A-1 are one hundred fifty feet (150') from the centerline and one hundred feet (100') from the right-of-way line.

The consensus among the members of the Kendall County Regional Planning Commission was that this requirement was too large and prevented property owners from using their land effectively.

At their meeting on October 23, 2024, the Kendall County Regional Planning Commission decided to initiate a text amendment to the Kendall County Code allowing parking in the A-1 Zoning District in the interior seventy-five feet (75') from the centerline for properties where the right-of-way was not dedicated and the interior fifty feet (50') from the right-of-way line where a right-of-way existed.

After review by the Kendall County Regional Planning Commission on December 11, 2024, the proposal was clarified to read as follows:

"No parking and drive aisles are permitted in a required front setback except the interior one-half (½) of the front yard in **A-1 Agricultural District,** M-1 Limited Manufacturing District**,** or M-2 Heavy Industrial District. **Specifically, in the A-1 Agricultural District, no parking is allowed in the exterior seventy-five feet (75') from the centerline for properties where the right-of-way was not dedicated and the exterior fifty feet (50') from the right-of-way line where a right-of-way**

**existed."**

Information was sent to the Townships on October 25, 2024. No comments received.

ZPAC reviewed the original proposal at their meeting on November 5, 2024. Discussion occurred regarding the history of front yard setback regulations. ZPAC voted to recommend approval of the proposal by a vote of seven (7) in favor and zero in opposition (0) with three (3) members absent. The minutes of the meeting were provided.

The Kendall County Regional Planning Commission reviewed this proposal at their meeting on December 11, 2024. Discussion occurred regarding grandfathering and the applicability of the standards if a road is widened. The Commission wanted the setback distances of seventy-five feet (75') and fifty (50') emphasized in the regulation. Staff was requested to update the proposal to reflect this emphasis. The Kendall County Regional Planning Commission voted to continue this proposal by a vote of nine (9) in favor and zero (0) in opposition with one (1) member absent. The minutes of the meeting are provided. The minutes of the meeting were provided.

The Kendall County Zoning Board of Appeals initiated a public hearing on this proposal on December 16, 2024. The Kendall County Zoning Board of Appeals voted to continue to the proposal to the January 27, 2025, hearing by a vote of seven (7) in favor and zero (0) in opposition. The minutes of the hearing were provided.

Member Wormley made a motion, seconded by Member Landovitz, to recommend approval of the text amendment.

The votes were as follows:

| | |
|---|---|
| Ayes (10): | Ashton, Bernacki, Casey, Hamman, Landovitz, McCarthy-Lange, Rodriguez, Stewart, Wilson, and Wormley |
| Nays (0): | None |
| Absent (0): | Wormley |
| Abstain (0): | None |

The motion carried.

The proposal goes to the Kendall County Zoning Board of Appeals on January 27, 2025.

**CITIZENS TO BE HEARD/PUBLIC COMMENT**

None

**OTHER BUSINESS/ANNOUNCEMENTS**

Mr. Asselmeier reported there were no petitions for the February 26th meeting.

**ADJOURNMENT**

Member Wilson made a motion, seconded by Member Hamman, to adjourn. With a voice vote of ten (10) ayes, the motion carried.

The Kendall County Regional Planning Commission meeting adjourned at 9:08 p.m.
Respectfully submitted by,
Matthew H. Asselmeier, AICP, CFM, Director

Encs.

# KENDALL COUNTY
# REGIONAL PLANNING COMMISSION
# JANUARY 22, 2025

IF YOU WOULD LIKE TO BE CONTACTED ON FUTURE MEETINGS REGARDING THIS TOPIC, PLEASE PROVIDE YOUR ADDRESS OR EMAIL ADDRESS

| NAME | ADDRESS (OPTIONAL) | EMAIL ADDRESS (OPTIONAL) |
|---|---|---|
| Steve Grebner | | SGrebner@KendallTwp.com |
| Steve Grengler | | SGrengler@KendallTwp.com |
| Nicki Standeford | | [redacted] |
| Tom Ryan | | |
| | | |
| | | |
| | | |
| | | |

KENDALL COUNTY ZONING BOARD OF APPEALS
GENERAL RULES AND BY-LAWS

Article II General Provisions

Section 5. The Office of the Board shall be located at Kendall County Planning, Building and Zoning Office, ~~111 West Fox Street Room 203~~ **807 W. John Street**, Yorkville, Illinois, 60560.

Having been presented at a public meeting on Monday, ~~April 30, 2018~~, **January 27, 2025**, the foregoing rules and regulations are hereby adopted by the Board of Appeals of Kendall County on Monday, ~~June 4, 2018~~ **March 3, 2025**.

_____
Randy Mohr, Chairman

| | |
|---|---|
| _____ | _____ |
| Dick Thompson, Member | Scott Cherry, Member |
| _____ | _____ |
| Tom LeCuyer, Member | Jillian Prodehl, Member |
| _____ | _____ |
| Dick Whitfield, Member | Cliff Fox, Member |

# KENDALL COUNTY
# PLANNING, BUILDING & ZONING COMMITTEE
# REGIONAL PLANNING COMMISSION
# ANNUAL MEETING
## 110 West Madison Street • Court Room •
## Yorkville, IL • 60560
# AGENDA

**February 1, 2025 – 9:00 a.m.**

**I. Call to Order**

**II. KCRPC Roll Call**

*Bill Ashton, Eric Bernacki (Vice-Chairman), Tom Casey, Dave Hamman, Keith Landovitz (Chairman), Karin McCarthy-Lange (Secretary), Ruben Rodriguez, Bob Stewart, Claire Wilson, and Seth Wormley*

**Planning, Building and Zoning Committee Roll Call**

Brian DeBolt, Dan Koukol, Ruben Rodriguez (Vice-Chair), and Seth Wormley (Chairman)

**III. Welcoming Remarks**

*Keith Landovitz, Kendall County Regional Plan Commission Chairman*

**IV. Approval of Agenda**

**V. Review of Minutes from 2024 Annual Meeting**

**VI. Requests for Plan Amendments**

*Residents of Kendall County & Staff*

a. Reclassification of Property Owned by Yorkville School District 115 on River Road (PINs: 02-30-400-006 and 02-31-226-002) in Bristol Township from Rural Residential to Public/Institutional if the Properties Remain Unincorporated

b. Update of the Land Resource Management Plan in its Entirety

c. Appointments to the Comprehensive Land Plan and Ordinance Committee

**VII. 2024 Projects Summary & 2025 Future Projects/Goals**

*Matthew H. Asselmeier, Planning Director & Others in Attendance*

a. Kendall County
b. Other Communities and Organizations in Attendance

**VIII. Old Business**

**IX. New Business**

**X. Other Business**

**XI. Public Comment**

**XII. Adjournment for Planning, Building and Zoning Committee**

**XIII. Adjournment for KCRPC**

If special accommodations or arrangements are needed to attend this County meeting, please contact the Administration Office at 630-553-4171, a minimum of 24-hours prior to the meeting time.

# Land Use Concept Plan

*Tuttle, Burkhart, Kuhn and Holt Properties*

Yorkville, Illinois


JEN LAND DESIGN, INC.
PLANNING • LANDSCAPE ARCHITECTURE
Jennifer Nelson, ASLA, Principal
Ph: 773.743.1320 fax: 773.743.1325 Email: jennifer@jenland.com

MPI
6860 North Frontage Road Suite 100
Burr Ridge, IL 60527
(630) 455-5400


| Revisions |
|---|
| 06-22-04 Holt Property |
| 07-01-04 |
| 08-26-05 18.000 Sq. ft. Lot |
| 07-11-05 |
| 12-15-05 Hwy 34/Route 71 |
| 01-25-06 Hwy 34/Route 71 |

Job # 3103
Date 04-13-04
Scale 1"=200'

## Site Data

Total Site — Acres 616.44 — Density 100.00

Suburban Neighborhood — 334.91 — 49.70

Traditional Neighborhood — 280.53 — 39.53

Traditional Neighborhood
a) Within unincorp.
Total Site Density = 182.53/616.44
Gross Site Density = 182.53/334
Gross Residential Density = 2.11 (182.53/(616.44 - (5.74+13.13+20.54+41.44)))

| Suburban Area | Acres | Density |
|---|---|---|
| Total | 334.91 | 100.00 |
| Patterson Road R.O.W. | 11.75 | 3.11 |
| Proposed Wheeler Road | 10.06 | 1.81 |
| Commercial | 13.00 | 3.33 |
| Commercial | 3.00 | 0.72 |
| Yorkville Bible | 3.00 | 0.90 |
| Open Space/Detention | 41.44 | 10.69 |
| Residential | 142.17 | 38.76 |
| | 290.39 | 33.23 |

Total Density of 2.11 = 729
Total Number of Units = 2,343 Units
Gross Residential Density = 2,343/(616.44 - (729 (3.0 DU/Ac. (729 (3.0 DU/Ac)))

| Fox Milford Area | Acres | Density |
|---|---|---|
| Total | 3.64 | 1.37 |
| Patterson Road R.O.W. | | |
| Commercial | 44.00 | 18.91 |
| Open Space* | 180.70 | 30.91 |
| Residential | 93.84 | 25.78 |

Total Density of 182.53 = 1,823
Gross Residential Density = 2,343/(616.44 - (729 (3.0 DU/Ac. (1,823 (3.0 DU/Ac)))

Residential Breakdown:

| Single Family | Lot Size | Acres | Density | DU. | Persons |
|---|---|---|---|---|---|
| NH 1 | 13,000 Sq. Ft. Min. | 57.91 | 14.03 | 194 | 553.9 |
| NH 2 | 13,000 Sq. Ft. Min. | 37.64 | 13.51 | 139 | 474 |
| NH 3 | 13,000 Sq. Ft. Min. | 23.94 | 13.51 | 139 | 474 |
| NH 4 | 11,000 Sq. Ft. Min. | 28.58 | 6.51 | 74 | 253 |
| NH 5 | 10,000 Sq. Ft. Min. | 38.58 | 6.51 | 74 | 253 |
| NH 6 | 10,000 Sq. Ft. Min. | 43.64 | 13.56 | 172 | 586 |
| NH 7 | 10,000 Sq. Ft. Min. | 31.00 | 8.56 | 87 | 297 |
| NH 8 | 10,000 Sq. Ft. Min. | 31.00 | 8.56 | 87 | 297 |
| NH 9 | 10,000 Sq. Ft. Min. | 74.15 | 8.51 | 86 | 293 |
| NH 10 | 10,000 Sq. Ft. Min. | 34.15 | 8.51 | 86 | 293 |
| NH 11 | 10,000 Sq. Ft. Min. | 13.51 | 4.68 | 47 | 160 |
| Subtotal | | 418.03 | 106.08 | 1,364 | 4,650 |

| Single Family | NH 1, 9, 12, 14 (See Above) | Acres | Density | DU. | Persons |
|---|---|---|---|---|---|
| Townhouse | NH 10 | 278.90 | 73.24 | 878 | 3,000 |
| Condominium | NH 11 | 29.94 | 9.51 | 228 | 1,043 |
| Total/Gross | | 32.68 | 8.68 | 242 | 826 |
| | | 478.53 | 190.68 | 1,744 | 5,869 |

Open Space Breakdown:

Suburban*

| Total | Acres |
|---|---|
| Detention | 180.70 |
| Fox Milford | 32.68 |
| Yorkville | 51.44 |
| Yorkville | 13.51 |
| Park Site | 10.00 |
| Yorkville | 11.45 |