# ADVISORY REPORT

**TO:** Planning Commission

**FROM:** Brandy Williams, Engineer and Zoning Administrator

**DATE:** November 25, 2025

**SUBJECT:** PC 25-02: Request a Special Use Permit on the subject property to, upon annexation, construct operate, and maintain a Solar Garden on PINS 09-27-100-002 and 09-27-300-004 located at Illinois Route 38
Public Hearing scheduled for December 4, 2025, 7:00 PM

**APPLICANT:** SolarStone Partners
125 SE Main St
Minneapolis, MN 55414

**OWNERS:** James R. Walter and James E. Walter
16513 Lynch Rd
DeKalb, IL 60115

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PROPOSAL

SolarStone Partners, as applicant, has filed with the Town of Cortland a request for a Special Use Permit (SUP) in accordance with Title 9, Chapter 10, Section 6B of the Cortland Town Code regarding the property located at Illinois Route 38, DeKalb County, Illinois. The 80.33-acre site is located north of Illinois Route 38 and south of the Union Pacific Railroad comprised of PIN 09-27-100-002 and PIN 09-27-300-004. The applicant is requesting a Special Use Permit on the subject property to, upon annexation, construct, operate, and maintain a Solar Garden as set forth in Title 9, Chapter 4, Section 34 of the Cortland Town Code. The petitioner's application is attached as Exhibit A.

The property is currently not annexed to the Town of Cortland. A joint petition for a Special Use Permit and Annexation was submitted. When a property is annexed to the Town of Cortland, the default zoning is AG, Agricultural. Because AG, Agricultural is the applicant's desired zoning, rezoning is not requested or required. The Town Board evaluates the annexation request.

LOCATION AND DESCRIPTION

The subject property is located east of town proper, on the north side of Illinois Route 38, south of the Union Pacific railroad, west of Airport Road. The subject property is comprised of two parcels PIN 09-27-100-002 and PIN 09-27-300-004 for a total of 80.33 acres.

The applicant intends to, upon annexation, construct, operate, and maintain a Solar Garden. Solar Gardens may be operated under a Special Use Permit in AG Agriculture of I-1 Light Industrial zoning districts. Title 9, Chapter 2 Definitions includes

SOLAR GARDEN: A commercial solar-electric (photovoltaic) array that provides retail electric power (or a financial proxy for retail power) to multiple households or businesses residing or located off-site from the location of the solar energy system.

*Existing and Surrounding Zoning*: The subject parcels are zoned DeKalb County A-1. Properties to the west, east and south are zoned DeKalb County A-1. The property to the north across the Union Pacific Railroad Right of Way is annexed to the Town of Cortland and zoned P-1 Recreation & Open Space.

The zoning map has been included as Exhibit B.
The 2024 Official Zoning Map can be found on the Town of Cortland website and at:
chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.cortlandil.org/uploads/dm/24901/Zoning_Map_2024_Published_in_2025.pdf

*Existing and Surrounding Land Uses:* The subject parcels are listed by DeKalb County as farmland and used as row crop. Properties to the west, east and south across Route 38 are listed by DeKalb County as farmland and used as row crop. Immediately south, adjacent to the subject parcel is a homestead. The property to the north across the Union Pacific Railroad Right of Way is annexed to the Town of Cortland and zoned P-1 Recreation & Open Space.

## BACKGROUND

The subject property has been used as farmland for decades. The subject property is not served by water, sanitary sewer or storm sewer. Roadway access is currently by a farm entrance from Illinois Route 38.

## COMPREHENSIVE PLAN

The Town adopted a Comprehensive Plan in September 2023, which guides development throughout the community. The Future Land Use Map within the Comprehensive Plan depicts the subject property as Agricultural use.

The default zoning does coincide with the Comprehensive Plan. There is no distinction in the Future Land Use Map for Special Use Permits or for Solar Energy Systems, specifically.

Note: An excerpt of the Comprehensive Plan is attached as Exhibit C. The full Comprehensive Plan can be found on the Town of Cortland's website and at:

https://www.cortlandil.org/vertical/sites/%7B869DC155-25BA-43FB-B05D-BD63FEA0657C%7D/uploads/Cortland_2023_Comprehensive_Plan_v05_Final.pdf

## TECHNICAL REVIEW

Water, sanitary sewer, and storm sewer utilities are not required for the project. Any electric infrastructure will be completed by the developer or ComEd as part of the interconnection agreements. Once the facility is operational and the construction traffic ceases, vehicular access will be nominal. However, because the roadway providing the site access is a state route, IDOT will need to review and approve the entrance design. A building permit will not be issued until confirmation of IDOT approval of the entrance is provided to the Town. Variances from Town Code have not been requested as part of the application. Financial obligations and surety will be in accordance with Town Code which differs from language included in the application under "Financial Framework".

## STANDARDS UPON WHICH REVIEW SHOULD BE TAKEN

In accordance with 9-10-6. – Procedures, C. Report of Hearing; Within thirty (30) days following the hearing, the plan commission shall transmit to the town board a written report giving its findings as to compliance of the proposed special use with the standards governing special uses and giving its recommendation for action to be taken by the town board. A copy of the standards to be used is included in Exhibit D. The Findings of Fact report shall consider all information presented.

Advisory Report – Special Use Permit Petition, Illinois Route 38, PIN 09-27-100-002 and 09-27-300-004
November 25, 2025

PLANNING COMMISSION ACTIONS

Open the Public Hearing and accept any and all testimony related to the proposal. Once all testimony has been presented the Commission may close the hearing. After closing the hearing, the Commission may discuss the merits of the presented information, establish the Findings of Fact upon which decisions may be made and render a recommendation to the Town Board.

The Planning Commission may recommend to either approve, deny or provide approval with conditions.
It is important to note that any motion must be made as a positive statement. (I.E., "I make a motion to approve the request for Special Use Permit on the subject property comprised of PINs 09-27-100-002 and 09-27-300-004.")

Respectfully Submitted,

Brandy Williams
Engineer and Zoning Administrator

Exhibit A – Application for SUP and Annexation
Exhibit B – Town of Cortland 2024 Official Zoning Map
Exhibit C – Town of Cortland Comprehensive Map (Excerpt)
Exhibit D – Standards and Conditions for Special Use Permit Compliance

| | |
|---|---|
| Date Filed: | |
| Job Number: | |
| PC Number: | |

# LAND DEVELOPMENT APPLICATION

**THE UNDERSIGNED RESPECTFULLY PETITIONS THE TOWN OF CORTLAND TO REVIEW AND CONSIDER GRANTING THE FOLLOWING APPROVAL ON THE LAND HEREIN DESCRIBED.**
*(Check all that apply)*

- [x] Annexation*
- [ ] Rezoning from _____ to _____
- [ ] Text Amendment (attached proposed language)
- [x] Special Use Permit for a:
- [ ] Planned Unit Development
- [x] Other Two solar gardens for a total of 7 MWac
- [ ] Planned Unit Development:
  - [ ] Concept Plan
  - [ ] Preliminary Development Plan
  - [ ] Final Development Plan
- [ ] Subdivision Plat:
  - [ ] Preliminary Subdivision Plat
  - [ ] Final Subdivision Plat

**** Attach an original copy of the annexation petition to this application***

***PLEASE PRINT OR TYPE IN BLUE OR BLACK INK***

## PART I. APPLICANT INFORMATION

| | APPLICANT | LAND OWNER *(If not the Applicant)* | CONTACT PERSON *(If not the Applicant)* |
|---|---|---|---|
| Name: | Conner Sayles | James R Walter and James E. Walter | |
| Company | Cortland Illinois Dynamics 1 LLC | N/A | |
| Address: | 1083 N. Collier Blvd, #408 | 16513 Lynch Rd | |
| | Marco Island, FL 34145 | DeKalb, IL 60115 | |
| E-mail: | conner.sayles@solarstonepartners.com | jamie@whiskeyacres.com | |
| Phone: | 425-293-1111 | 815-739-8711 | |

IS THE APPLICANT THE OWNER OF THE SUBJECT PROPERTY? ☐ YES ☑ NO

*(If the Applicant is not the owner of the subject property, a notarized letter from the Owner authorizing the Applicant to file the **Land Development Application** must be attached to this application.)*

IS THE APPLICANT AND/OR OWNER A TRUSTEE OR A BENEFICIARY OF A LAND TRUST? ☐ YES ☑ NO

*(If the Applicant and/or Owner of the subject property is a Trustee of a land trust or beneficiary(ies) of a land trust, a disclosure statement identifying each beneficiary of such land trust by name and address and defining his/her interest therein shall be verified by the Trustee and shall be attached hereto.)*

# Cortland Land Development Application

| | |
|---|---|
| Date Filed: | |
| PC Number: | |

## PART II. PROPERTY INFORMATION

**ADDRESS OF PROPERTY:** XXX IL-38, DeKalb, IL 60115 41.913126, -88.657188

**PARCEL INDEX NUMBER(S):** 0927100002 & 0927300004

**LEGAL DESCRIPTION:** *A FULL LEGAL DESCRIPTION MUST BE ATTACHED TO THIS APPLICATION*

**TOTAL AREA OF SUBJECT PROPERTY(IES) (*ACRES*):** 80.33

**IF SUBDIVIDING, NUMBER OF LOTS BEING CREATED:**

**CURRENT ZONING:** AG **PROPOSED ZONING:** AG

**RECOMMENDED LAND USE:** Agricultural

*(Based upon the recommendations of the Cortland Town Plan)*

**PROPOSED LAND USE:** Solar Garden

**NAME OF PROPOSED DEVELOPMENT:** Cortland Illinois Dynamics 1 LLC and Cortland Illinois Dynamics 2 LLC

**The subject property is located in which FIRE PROTECTION DISTRICT?** Maple Park Fire Protection District

**The subject property is located in which SCHOOL DISTRICT?** CUSD #403 - Kaneland

**Attach relevant checklist(s) and associated information as outlined during the pre-application meeting.** ☐

I, Conner Sayles, hereby apply for review and approval of this application and represent that the application and requirements thereof and supporting information have been completed in accordance with the Zoning Ordinance and/or Subdivision Ordinance of the Town of Cortland.

Conner Sayles
Signature of Applicant

10/14/2025
Date

State ~~of Illinois~~ Florida
County of Collier.

Signed before me on October 14th, 2025 by Conner Sayles
*Applicant*

(Seal)

Jill Sesso
Signature of Notary Public

JILL SESSO
Notary Public, State Of Florida
Commission No. HH 290895
My Commission Expires: 7/21/2026

# Request #1 – Annexation Petition

# Item A: Owner Authorization Letter

## Notice of Authorization

I, James E. Walter and James R. Walter of DeKalb, IL owner(s) of certain real farmland property located in Cortland Township, specified by PIN# 0927100002 & PIN# 0927300004, containing approximately 81 acres, MOL, hereby authorize SolarStone Partners, its agents and assigns, to apply for its annexation into the Town of Cortland by completing a Land Development Application on his behalf. I also give authorization to the same to apply for a Special Use for a community solar project with the Town of Cortland, and/or County of DeKalb.

Dated: 5/24/24

James E. Walter

James R. Walter

Owner(s)

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State Of Illinois County Of DeKalb

I, the undersigned, a Notary Public in and for the said County and State aforesaid, do hereby certify that James E. Walter + James R. Walter personally known to me to be the same person(s) whose name(s) is/are subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he/she/they signed, sealed and delivered this instrument as his/her/their free and voluntary act for the uses and purposes therein set forth.

GIVEN under my hand and NOTARIAL SEAL this day of 5/24, 2024.

Notary Public

Nicole Faber

OFFICIAL SEAL
NICOLE FABER
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES October 03, 2026

# Item B: Annexation Petition

STATE OF ILLINOIS
COUNTY OF DEKALB
TOWN OF CORTLAND

PETITION FOR ANNEXATION

TO THE CORPORATE AUTHORITIES OF THE,

TOWN OF CORTLAND, ILLINOIS

WHEREAS, the undersigned Petitioner, hereby respectfully petitions to annex to the Town of Cortland, DeKalb County, Illinois, the territory described on Exhibit "A" attached hereto and made part of hereof ("Territory") and states as follows:

1. The Territory hereinbefore is not within the corporate limits of any municipality;
2. The Territory hereinbefore described is contiguous to the Town of Cortland, DeKalb County, Illinois;
3. The Territory hereinbefore described is located within Cortland Township;
4. There are no electors residing on the Territory hereinbefore described;
5. The Petitioner has been authorized by the sole owner of record of the described territory to petition that said territory be annexed to the Town of Cortland, via an authorization letter attached in "Item A"; and

WHEREFORE, the Petitioner respectfully requests the corporate authorities of the Town of Cortland, DeKalb County, Illinois, to annex the Territory hereinbefore described to said Town in accordance with the provisions of this Petition.

Dated this 25th day of June, 2024.

Conner Sayles

Petitioner: SolarStone Partners

By: Conner Sayles

Title: Development Associate

STATE OF FLORIDA
COUNTY OF COLLIER

I, Jill Sesso, a Notary Public in and for said County in the State aforesaid do hereby certify that Conner Sayles, Development Associate appeared before me this day in person and acknowledged that he caused the within Petition to be duly executed by him as his free and voluntary act and for the uses and purposes therein set forth.

GIVEN under my hand and Notarial Seal this 25th day of June, 2024.

Jill Sesso

JILL SESSO
Notary Public, State Of Florida
Commission No. HH 290895
My Commission Expires: 7/21/2026

# Exhibit A: Annexation Plat & Legal Description

# MAP OF TERRITORY TO BE ANNEXED TO THE TOWN OF CORTLAND, DEKALB COUNTY, ILLINOIS

PARENT PARCEL DESCRIPTION

THE WEST 1/2 OF THE SOUTHWEST 1/4 OF SECTION 27 AND THAT PART OF THE SOUTH 1/2 OF THE NORTHWEST ¼ OF SECTION 27 LYING SOUTH OF THE SOUTH RIGHT OF WAY LINE OF THE CHICAGO AND NORTHWESTERN RAILWAY COMPANY (NOW KNOWN AS ATHE CHICAGO AND NORTH WESTERN TRANSPORTATION COMPANY, A DELAWARE CORPORATION) (EXCEPTING FROM SAID SOUTH 1/2 OF THE NORTHWEST 1/4 OF SECTION 27 AFORESAID. THAT PART FALLING IN THE FOLLOWING DESCRIBED LAND:

PART OF SECTION 27, TOWNSHIP 40 NORTH, RANGE 5, EAST QF THE THIRD PRINCIPAL MERIDIAN, DEKALB COUNTY, ILLINOIS, DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF THE EAST 1/2 OF THE SOUTHWEST 1/4 OF SAID SECTION 27; THENCE EASTERLY ALONG THE NORTH LINE OF THE SOUTHWEST 1/4 OF SAID SECTION 27, A DISTANCE OF 823.0 FEET TO THE WESTERLY BANK OF THE UNION DITCH #1 RUNNING IN A NORTHERLY AND SOUTHERLY DIRECTION OVER SAID SECTION; THENCE NORTHERLY AT AN ANGLE OF 83 DEGREES 53 MINUTES MEASURED CLOCKWISE FROM THE LAST DESCRIBED COURSE ALONG SAID WESTERLY BANK, A DISTANCE OF 166.5 FEET TO THE SOUTHERLY RIGHT OF WAY LINE OF THE CHICAGO & NORTHWESTERN RAILWAY; THENCE SOUTHEASTERLY ALONG THE SOUTHERLY RIGHT OF WAY LINE OF SAID RAILWAY, A DISTANCE OF 1887.12 FEET TO THE WEST LINE OF THE EAST 1/2 OF THE SOUTHEAST 1/4 OF SAID SECTION 27; THENCE SOUTHERLY ALONG THE SAID WEST LINE, A DISTANCE OF 2413.4 FEET, MORE OR LESS, TO THE NORTHERLY RIGHT OF WAY LINE OF FEDERAL AID ROUTE 7 (U.S. ALT. 30 - LINCOLN HIGHWAY); THENCE NORTHWESTERLY ALONG THE NORTHERLY RIGHT OF WAY LINE TO THE SOUTHEASTERLY CORNER OF PROPERTY DESCRIBED IN A WARRANTY DEED RECORDED IN DEED BOOK 332, PAGE 43, IN THE DEKALB COUNTY RECORDER'S OFFICE DESCRIBED AS FOLLOWS: PART OF THE SOUTHWEST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 27, TOWNSHIP 40 NORTH, RANGE 5, EAST OF THE THIRD PRINCIPAL MERIDIAN, DEKALB COUNTY, ILLINOIS, DESCRIBED AS FOLLOWS: COMMENCING AT STATION 336/84 ON THE CENTER LINE OF FEDERAL AID ROUTE 7 AS RECORDED IN DOCUMENT NO. 297030, DEKALB COUNTY, ILLINOIS; THENCE NORTH ALONG A LINE PARALLEL TO THE EAST QUARTER, QUARTER LINE OF SAID SECTION 27 TO A POINT THAT IS 60 FEET DISTANCE FROM (AS MEASURED ON A NORMAL LINE) THE CENTER LINE OF SAID FA ROUTE 7 FOR A POINT OF BEGINNING; THENCE CONTINUING ON THE LAST DESCRIBED COURSE, A DISTANCE OF 200 FEET TO A POINT; THENCE SOUTHWESTERLY TO A POINT ON A LINE 60 FEET FROM (AS MEASUREO ON A NORMAL LINE) AND PARALLEL WITH THE CENTER LINE OF SAID FA ROUTE 7, SAID POINT BEING 10 FEET WESTERLY OF THE POINT OF BEGINNING, AS MEASURED ALONG SAID LINE; THENCE EASTERLY FOR A DISTANCE OF 10 FEET TO THE POINT OF BEGINNING); THENCE NORTHERLY ALONG THE EASTERLY LINE OF THE PROPERTY DESCRIBED IN SAID DEED BOOK 332, PAGE 43, A DISTANCE OF 200 FEET TO THE NORTHERLY CORNER THEREOF; THENCE SOUTHWESTERLY ALONG THE WESTERLY LINE OF THE PROPERTY DESCRIBED IN SAID DEED BOOK332, PAGE 43, TO THE WESTERLY CORNER THEREOF AND THE NORTHERLY RIGHT OF WAY LINE OF SAID FEDERAL AID ROUTE 7; THENCE NORTHWESTERLY ALONG THE NORTHERLY RIGHT OF WAY LINE OF SAID FEDEIIAL AID ROUTE 7 TO THE INTERSECTION WITH THE NORTHERLY RIGHT OF WAY LINE OF S.B.I. ROUTE 6; THENCE SOUTHEASTERLY ALONG THE NORTHERLY RIGHT OF WAY LINE OF SAID S.B.I. ROUTE 6 TO THE WEST LINE OF THE EAST 1/2 OF THE SOUTHEAST 1/4 OF SAID SECTION 27; THENCE SOUTHERLY ALONG SAID WEST LINE TO THE SOUTH LINE OF SAID SECTION 27; THENCE WESTERLY ALONG THE SOUTH LINE OF SAID SECTION 27 TO THE INTERSECTION WITH THE CENTER LINE OF SAID S.B.I. ROUTE 6; THENCE NORTHWESTERLYALONG THE CENTER LINE OF SAID S.B.I. ROUTE 6 TO THE INTERSECTION WITH THE WEST LINE OF THE EAST 1/2 OF THE SOUTHWEST 1/4 OF SAID SECTION 27; THENCE NORTHERLY ALONG THE SAID WEST LINE, A DISTANCE OF 2327.9 FEET TO THE POINT OF BEGINNING, IN DEKALB COUNTY, ILLINOIS) ALL IN SECTION 27, TOWNSHIP 40 NORTH, RANGE 5, EAST OF THE THIRD PRINCIPAL MERIDIAN, IN DEKALB COUNTY, ILLINOIS.

[ALSO EXCEPTING ALL THAT PART OF SAID PREMISES LYING SOUTH OF THE CENTER LINE OF SAID FEDERAL AID ROUTE 7; AND ALSO EXCEPTING THE FOLLOWING: THAT PART THEREOF DESCRIBED AS FOLLOWS:

PART OF THE WEST 1/2 OF THE SOUTHWEST 1/4 OF SECTION 27, TOWNSHIP 40 NORTH, RANGE 5, EAST OF THE THIRD PRINCIPAL MERIDIAN, DEKALB COUNTY, ILLINOIS, DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTIDN 27; THENCE NORTHERLY ALONG THE WEST LINE OF SAID SECTION 27 A DISTANCE OF 586.55 FEET TO THE CENTER LINE OF FEDERAL AID ROUTE 7 FOR THE POINT OF BEGINNING; THENCE CONTINUING NORTHERLY ALONG THE WEST LINE OF SAID SECTION 27 A DISTANCE OF 235.49 FEET; THENCE EASTERLY AT AN ANGLE OF 90 DEGREES 00 MINUTES 00 SECONDS MEASURED COUNTERCLOCKWISE FROM THE LAST DESCRIBED COURSE, A DISTANCE OF 647.11 FEET; THENCE SOUTHERLY PARALLEL WITH THE WEST LINE OF SAID SECTION 27, A DISTANCE OF 362.71 FEET TO THE CENTER LINE OF SAID FEDERAL AID ROUTE 7; THENCE NORTHWESTERLY ALONG THE CENTER LINE OF SAID FEDERAL AID ROUTE 7 A DISTANCE OF 659.49 FEET TO THE POINT OF BEGINNING, EXCEPTING THEREFROM THE ABOVE THAT PART THEREOF DESCRIBED IN WARRANTY DEED IN BOOK 335 ON PAGE 693 IN THE DEKALB COUNTY RECORDER'S OFFICE DESCRIBED AS FOLLOWS: PARCEL A: PART OF THE SOUTHWEST 1/4 OF THE SOUTHWEST 1/4 OF SECTION 27, TOWNSHIP 40 NORTH, RANGE 5, EAST OF THE THIRD PRINCIPAL MERIDIAN, DEKALB COUNTY, ILLINOIS, AS SET FORTH IN DOCUMENT NO. 198481 IN DEKALB COUNTY, ILLINOIS, DESCRIBED AS A STRIP OF LAND 120.0 FEET IN WIDTH, THE CENTER LINE OF SAID 120.0 FOOT STRIP BEING THE CENTER LINE OF FEDERAL AID ROUTE 7 AS RECORDED IN DOCUMEMT NOS. 297144 AND 297145 IN DEKALB COUNTY, ILLINOIS, EXCEPT THAT PORTION PREVIOUSLY DEDICATED AND USED FOR ROAD PURPOSES. PARCEL B: PART OF THE SOUTHWEST 1/4 OF THE SOUTHWEST 1/4 OF SECTION 27, TOWNSHIP 40 NORTH, RANGE 5, EAST OF THE THIRD PRINCIPAL MERIDIAN, DEKALB COUNTY, ILLINOIS, AS SET FORTH IN DOCUMENT NO. 198481, IN DEKALB COUNTY, ILLINOIS, DESCRIBED AS FOLLOWS: COMMENCING AT THE INTERSECTION OF THE WEST LINE OF SAID SECTION 27 WITH THE CENTER LINE OF FEDERAL AID ROUTE 7 AS RECORDED IN DOCUMENT NO. 297144 IN DEKALB COUNTY, ILLINOIS; THENCE SOUTHERLY ALONG SAID WEST LINE TO A POINT THAT IS 60.0 FEET DISTANT FROM (AS MEASURED ON A NORMAL LINE) THE CENTER LINE OF SAID FEDERAL AID ROUTE 7; THENCE SOUTHEASTERLY PARALLEL WITH THE CENTER LINE OF SAID FEDERAL AID ROUTE 7 TO A POINT IN THE EASTERLY RIGHT OF WAY LINE OF A PUBLIC ROAD FOR A POINT OF BEGINNING; THENCE CONTINUING SOUTHEASTERLY PARALLEL WITH THE CENTER LINE OF SAID FEDERAL AID ROUTE 7 FOR A DISTANCE OF 6. 0 FEET; THENCE SOUTHERLY TO A POINT IN THE EASTERLY RIGHT OF WAY LINE OF SAID PUBLIC ROAD, THE LAST MENTIONED POINT BEING 100. 0 FEET DISTANT FROM THE POINT OF BEGINNING AS MEASURED ALONG THE EASTERLY RIGHT OF WAY LINE OF SAID PUBLIC ROAD; THENCE NORTHERLY ALONG SAID EASTERLY RIGHT OF WAY LINE FOR A DISTANCE OF 100.0 FEET TO THE POINT OF BEGINNING.

***General Notes***

1. The horizontal datum and basis of bearing for this project is State Plane Illinois East Zone (GRID) NAD 83 (NA 2011).

2. This survey does not constitute a title search by the Surveyor.

3. The acreage and square footage of the parcels of the Property indicated represents a mathematical closure of the perimeter courses and distances as shown hereon.

4. There are no other survey matters of record, easements or Rights-of-way of which the undersigned has been advised, or other matters evidenced on the ground, other than scheduled title exceptions or except as otherwise shown hereon.

5. No portion of Property lies within the city limits of an incorporated city;

6. Ingress to and egress from the subject property is provided from the public roads shown on the survey; and all roads shown on the survey (unless otherwise noted) are public roads and are maintained by the state or county in which they are located.

7. All shown bearings and distances are shown as measured and are GRID

8. Survey is based on field work completed on February 23, 2024.

9. No title commitment or deed was provided or reviewed as part of this survey. The legal description is based on deeds from the counties record keeping web site.

10. This professional service conforms to the current Illinois Minimum Standards for a boundary survey

11. The area of the Property is 3499201.23 square feet (80.33 acres) as surveyed.

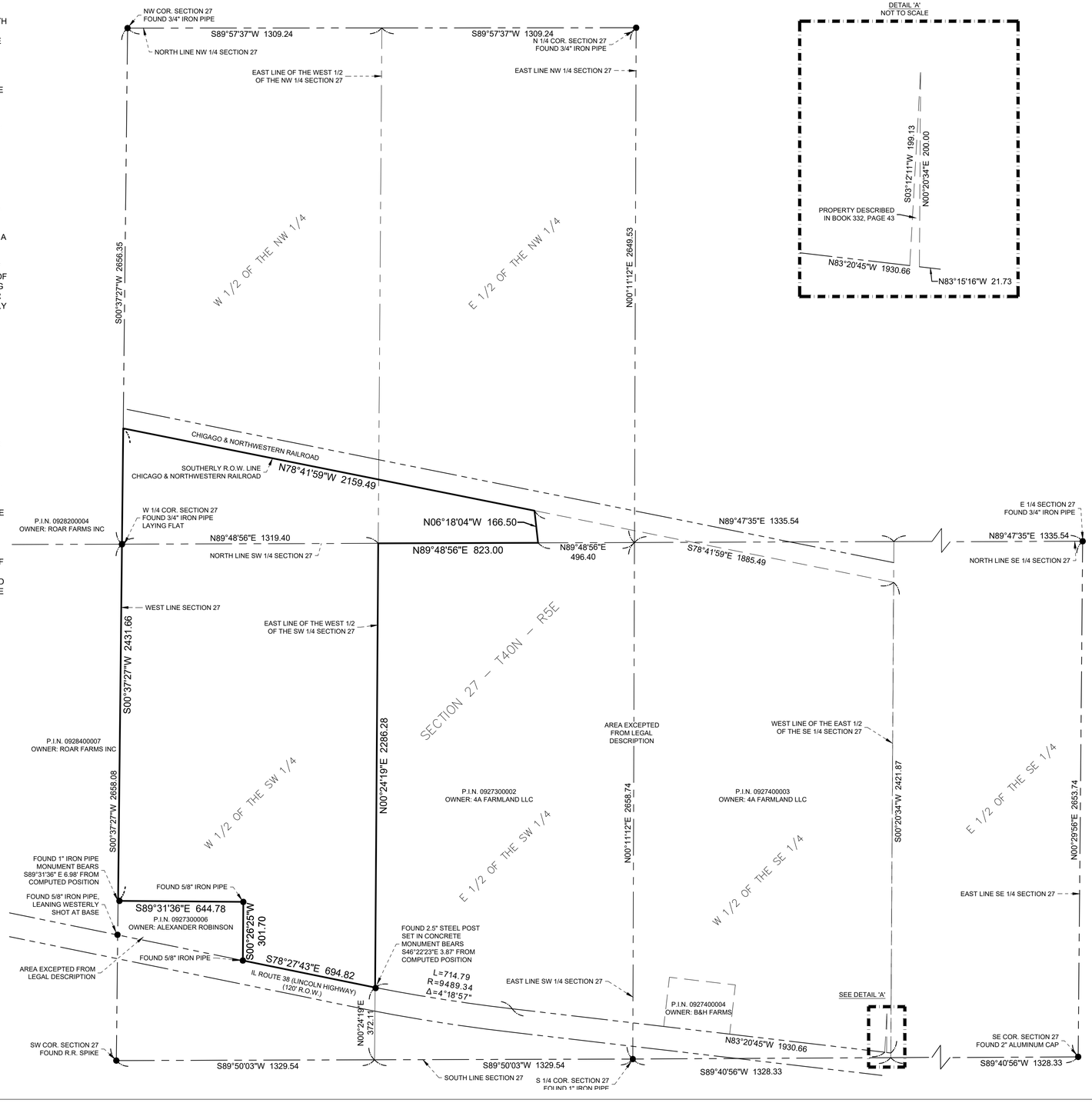
**Certification**

I hereby certify that this survey, plan or report was prepared by me or under my direct supervision and that I am a duly licensed professional land surveyor under the laws of the State of Illinois.

June 4, 2024
Date

Dallas Westerlund, Land Surveyor, IL License No. 035004041
dwesterlund@wsbeng.com
701 Xenia Ave S, Suite 300
Minneapolis, MN 55416
612-269-3325

PROFESSIONAL LAND SURVEYOR — DALLAS WESTERLUND — 035.004041 — BROOKLYN CENTER, MINNESOTA — STATE OF ILLINOIS







wsb

Crew: CL
Checked: DCW
Drawn: MLP
Record Drawing by/date:
Project No.: 024543-000

Revisions:

Prepared for:

SOLARSTONE

N

0 100 200

LEGEND

- FOUND MONUMENT
- CALCULATED CORNER
- SECTION LINE
- QUARTER SECTION LINE
- 16TH SECTION LINE
- PARCEL BOUNDARY
- RIGHT OF WAY LINE

Cortland Solar

DEKALB COUNTY, IL

Annexation Plat

Sheet: 1

Legal Description

THE WEST 1/2 OF THE SOUTHWEST 1/4 OF SECTION 27 AND THAT PART OF THE SOUTH 1/2 OF THE NORTHWEST ¼ OF SECTION 27 LYING SOUTH OF THE SOUTH RIGHT OF WAY LINE OF THE CHICAGO AND NORTHWESTERN RAILWAY COMPANY (NOW KNOWN AS ATHE CHICAGO AND NORTH WESTERN TRANSPORTATION COMPANY, A DELAWARE CORPORATION) (EXCEPTING FROM SAID SOUTH 1/2 OF THE NORTHWEST 1/4 OF SECTION 27 AFORESAID. THAT PART FALLING IN THE FOLLOWING DESCRIBED LAND:

PART OF SECTION 27, TOWNSHIP 40 NORTH, RANGE 5, EAST QF THE THIRD PRINCIPAL MERIDIAN, DEKALB COUNTY, ILLINOIS, DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF THE EAST 1/2 OF THE SOUTHWEST 1/4 OF SAID SECTION 27; THENCE EASTERLY ALONG THE NORTH LINE OF THE SOUTHWEST 1/4 OF SAID SECTION 27, A DISTANCE OF 823.0 FEET TO THE WESTERLY BANK OF THE UNION DITCH #1 RUNNING IN A NORTHERLY AND SOUTHERLY DIRECTION OVER SAID SECTION; THENCE NORTHERLY AT AN ANGLE OF 83 DEGREES 53 MINUTES MEASURED CLOCKWISE FROM THE LAST DESCRIBED COURSE ALONG SAID WESTERLY BANK, A DISTANCE OF 166.5 FEET TO THE SOUTHERLY RIGHT OF WAY LINE OF THE CHICAGO & NORTHWESTERN RAILWAY; THENCE SOUTHEASTERLY ALONG THE SOUTHERLY RIGHT OF WAY LINE OF SAID RAILWAY, A DISTANCE OF 1887.12 FEET TO THE WEST LINE OF THE EAST 1/2 OF THE SOUTHEAST 1/4 OF SAID SECTION 27; THENCE SOUTHERLY ALONG THE SAID WEST LINE, A DISTANCE OF 2413.4 FEET, MORE OR LESS, TO THE NORTHERLY RIGHT OF WAY LINE OF FEDERAL AID ROUTE 7 (U.S. ALT. 30 - LINCOLN HIGHWAY); THENCE NORTHWESTERLY ALONG THE NORTHERLY RIGHT OF WAY LINE TO THE SOUTHEASTERLY CORNER OF PROPERTY DESCRIBED IN A WARRANTY DEED RECORDED IN DEED BOOK 332, PAGE 43, IN THE DEKALB COUNTY RECORDER'S OFFICE DESCRIBED AS FOLLOWS: PART OF THE SOUTHWEST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 27, TOWNSHIP 40 NORTH, RANGE 5, EAST OF THE THIRD PRINCIPAL MERIDIAN, DEKALB COUNTY, ILLINOIS, DESCRIBED AS FOLLOWS: COMMENCING AT STATION 336/84 ON THE CENTER LINE OF FEDERAL AID ROUTE 7 AS RECORDED IN DOCUMENT NO. 297030, DEKALB COUNTY, ILLINOIS; THENCE NORTH ALONG A LINE PARALLEL TO THE EAST QUARTER, QUARTER LINE OF SAID SECTION 27 TO A POINT THAT IS 60 FEET DISTANCE FROM (AS MEASURED ON A NORMAL LINE) THE CENTER LINE OF SAID FA ROUTE 7 FOR A POINT OF BEGINNING; THENCE CONTINUING ON THE LAST DESCRIBED COURSE, A DISTANCE OF 200 FEET TO A POINT; THENCE SOUTHWESTERLY TO A POINT ON A LINE 60 FEET FROM (AS MEASUREO ON A NORMAL LINE) AND PARALLEL WITH THE CENTER LINE OF SAID FA ROUTE 7, SAID POINT BEING 10 FEET WESTERLY OF THE POINT OF BEGINNING, AS MEASURED ALONG SAID LINE; THENCE EASTERLY FOR A DISTANCE OF 10 FEET TO THE POINT OF BEGINNING); THENCE NORTHERLY ALONG THE EASTERLY LINE OF THE PROPERTY DESCRIBED IN SAID DEED BOOK 332, PAG£ 43, A DISTANCE OF 200 FEET TO THE NORTHERLY CORNER THEREOF; THENCE SOUTHWESTERLY ALONG THE WESTERLY LINE OF THE PROPERTY DESCRIBED IN SAID DEED BOOK 332, PAGE 43, TO THE WESTERLY CORNER THEREOF AND THE NORTHERLY RIGHT OF WAY LINE OF SAID FEDERAL AID ROUTE 7; THENCE NORTHWESTERLY ALONG THE NORTHERLY RIGHT OF WAY LINE OF SAID FEDEIIAL AID ROUTE 7 TO THE INTERSECTION WITH THE NORTHERLY RIGHT OF WAY LINE OF S.B.I. ROUTE 6; THENCE SOUTHEASTERLY ALONG THE NORTHERLY RIGHT OF WAY LINE OF SAID S.B.I. ROUTE 6 TO THE WEST LINE OF THE EAST 1/2 OF THE SOUTHEAST 1/4 OF SAID SECTION 27; THENCE SOUTHERLY ALONG SAID WEST LINE TO THE SOUTH LINE OF SAID SECTION 27; THENCE WESTERLY ALONG THE SOUTH LINE OF SAID SECTION 27 TO THE INTERSECTION WITH THE CENTER LINE OF SAID S.B.I. ROUTE 6; THENCE NORTHWESTERLY ALONG THE CENTER LINE OF SAID S.B.I. ROUTE 6 TO THE INTERSECTION WITH THE WEST LINE OF THE EAST 1/2 OF THE SOUTHWEST 1/4 OF SAID SECTION 27; THENCE NORTHERLY ALONG THE SAID WEST LINE, A DISTANCE OF 2327.9 FEET TO THE POINT OF BEGINNING, IN DEKALB COUNTY, ILLINOIS) ALL IN SECTION 27, TOWNSHIP 40 NORTH, RÅNGE 5, EAST OF THE THIRD PRINCIPAL MERIDIAN, IN DEKALB COUNTY, ILLINOIS.

[ALSO EXCEPTING ALL THAT PART OF SAID PREMISES LYING SOUTH OF THE CENTER LINE OF SAID FEDERAL AID ROUTE 7; AND ALSO EXCEPTING THE FOLLOWING: THAT PART THEREOF DESCRIBED AS FOLLOWS:

PART OF THE WEST 1/2 OF THE SOUTHWEST 1/4 OF SECTION 27, TOWNSHIP 40 NORTH, RANGE 5, EAST OF THE THIRD PRINCIPAL MERIDIAN, DEKALB COUNTY, ILLINOIS, DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTIDN 27; THENCE NORTHERLY ALONG THE WEST LINE OF SAID SECTION 27 A DISTANCE OF 586.55 FEET TO THE CENTER LINE OF FEDERAL AID ROUTE 7 FOR THE POINT OF BEGINNING; THENCE CONTINUING NORTHERLY ALONG THE WEST LINE OF SAID SECTION 27 A DISTANCE OF 235.49 FEET; THENCE EASTERLY AT AN ANGLE OF 90 DEGREES 00 MINUTES 00 SECONDS MEASURED COUNTERCLOCKWISE FROM THE LAST DESCRIBED COURSE, A DISTANCE OF 647.11 FEET; THENCE SOUTHERLY PARALLEL WITH THE WEST LINE OF SAID SECTION 27, A DISTANCE OF 362.71 FEET TO THE CENTER LINE OF SAID FEDERAL AID ROUTE 7; THENCE NORTHWESTERLY ALONG THE CENTER LINE OF SAID FEDERAL AID ROUTE 7 A DISTANCE OF 659.49 FEET TO THE POINT OF BEGINNING, EXCEPTING THEREFROM THE ABOVE THAT PART THEREOF DESCRIBED IN WARRANTY DEED IN BOOK 335 ON PAGE 693 IN THE DEKALB COUNTY RECORDER'S OFFICE DESCRIBED AS FOLLOWS: PARCEL A: PART OF THE SOUTHWEST 1/4 OF THE SOUTHWEST 1/4 OF SECTION 27, TOWNSHIP 40 NORTH, RANGE 5, EAST OF THE THIRD PRINCIPAL MERIDIAN, DEKALB COUNTY, ILLINOIS, AS SET FORTH IN DOCUMENT NO.

198481 IN DEKALB COUNTY, ILLINOIS, DESCRIBED AS A STRIP OF LAND 120.0 FEET IN WIDTH, THE CENTER LINE OF SAID 120.0 FOOT STRIP BEING THE CENTER LINE OF FEDERAL AID ROUTE 7 AS RECORDED IN DOCUMEMT NOS. 297144 AND 297145 IN DEKALB COUNTY, ILLINOIS, EXCEPT THAT PORTION PREVIOUSLY DEDICATED AND USED FOR ROAD PURPOSES. PARCEL B: PART OF THE SOUTHWEST 1/4 OF THE SOUTHWEST 1/4 OF SECTION 27, TOWNSHIP 40 NORTH, RANGE 5, EAST OF THE THIRD PRINCIPAL MERIDIAN, DEKALB COUNTY, ILLINOIS, AS SET FORTH IN DOCUMENT NO. 198481, IN DEKALB COUNTY, ILLINOIS, DESCRIBED AS FOLLOWS: COMMENCING AT THE INTERSECTION OF THE WEST LINE OF SAID SECTION 27 WITH THE CENTER LINE OF FEDERAL AID ROUTE 7 AS RECORDED IN DOCUMENT NO. 297144 IN DEKALB COUNTY, ILLINOIS; THENCE SOUTHERLY ALONG SAID WEST LINE TO A POINT THAT IS 60.0 FEET DISTANT FROM (AS MEASURED ON A NORMAL LINE) THE CENTER LINE OF SAID FEDERAL AID ROUTE 7; THENCE SOUTHEASTERLY PARALLEL WITH THE CENTER LINE OF SAID FEDERAL AID ROUTE 7 TO A POINT IN THE EASTERLY RIGHT OF WAY LINE OF A PUBLIC ROAD FOR A POINT OF BEGINNING; THENCE CONTINUING SOUTHEASTERLY PARALLEL WITH THE CENTER LINE OF SAID FEDERAL AID ROUTE 7 FOR A DISTANCE OF 6. 0 FEET; THENCE SOUTHERLY TO A POINT IN THE EASTERLY RIGHT OF WAY LINE OF SAID PUBLIC ROAD, THE LAST MENTIONED POINT BEING 100. 0 FEET DISTANT FROM THE POINT OF BEGINNING AS MEASURED ALONG THE EASTERLY RIGHT OF WAY LINE OF SAID PUBLIC ROAD; THENCE NORTHERLY ALONG SAID EASTERLY RIGHT OF WAY LINE FOR A DISTANCE OF 100.0 FEET TO THE POINT OF BEGINNING.

# Item C: Natural Resources Information Report

# Natural Resource Information Report

*Compiled By*

*The DeKalb County Soil and Water Conservation District*

***DeKalb County Soil and Water Conservation District***
***1350 West Prairie Drive, Sycamore IL, 60178***
***Phone: (815) 756-3234 x3***
***dekalbswcd@gmail.com***

# Project Information

| | |
|---|---|
| **Natural Resource Information File Number** | #736 |
| **Date the SWCD Board Reviews Report** | May 8th, 2024 |
| **Name of Petitioner** | Cortland Illinois Solar, LLC |
| **Size of Area of Review** | 81.1 acres |
| **Current Zoning** | A1 (Agricultural) – DeKalb County |
| **Proposed Zoning** | AG, Special Use – Town of Cortland |
| **Parcel Numbers** | 09-27-100-002, 09-27-300-004 |
| **Contact Person** | Conner Sayles |

| **Copies of this report and notification of the proposed land use changes were provided to:** | Yes | No |
|---|---|---|
| The Petitioner | X | |
| The Petitioners Legal Representation | | X |
| Town of Cortland | X | |
| DeKalb County SWCD District Files | X | |

***Report Prepared By**: Jeff Woodyatt* ***Position**: Resource Conservationist*

# Purpose and Intent of This Report

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:

DeKalb County Soil and Water Conservation District
1350 West Prairie Drive, Sycamore, IL 60178
Phone: 815-756-3234 ext. 3
E-mail: DeKalbswcd@gmail.com

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**Supplement Material**

**Supplemental A. - Custom Soils Resource Report**

**Supplemental B. - NRCS Conservation Practice Standard 560 (Access Road)**

# *Executive Summary*

| **Natural Resource Information File Number:** | **#736** |
|---|---|
| **Petitioners Name:** | Cortland Illinois Solar, LLC |
| **Contact Person:** | Conner Sayles |
| **Unit of Government Responsible for Land Use Change:** | Town of Cortland |
| **Location of parcel:** | *Part of the Southwest Quarter in Section 27 of Township 40 North, Range 5, East of the third principal meridian (Cortland Township).* |
| **Property Address, PIN Number** | 09-27-100-002, 09-27-300-004 |
| **Existing Land Use:** | A1 (Agricultural) – DeKalb County |
| **Surrounding Land Use:** | A1, Ag. Row Crops |
| **Proposed Land Use:** | Commercial Solar Energy System |
| **Proposed Water Supply:** | N/A |
| **Proposed Wastewater Treatment:** | N/A |
| **2007 Cortland Future Land Use Plan** | Open Space, Mixed Residential, and Commercial |

# Highlights of the Natural Resource Concerns

**Land Evaluation and Site Assessment (LESA):** Land Evaluation score is **91.7** out of 100. The Site Assessment for the proposed project was not calculated for this report; the assessment factors used for the Site Assessment are grouped into five major areas of consideration:

1. Agricultural/Land Use
2. Zoning
3. Compatibility and Impact of Uses
4. Land Use Feasibility
5. Compatibility with Comprehensive Development Plans

The proposed project is to be located within an A-1 zoned district with Special Use condition. This project will have little impact to the factors listed above, therefore the Site Assessment would not be feasible in this situation as there would be little deviation from the current zoning for this site.

**Prime Farmland:** Prime farmland soils are an important resource for DeKalb County. Each soil type is assigned a rating, which is then used to determine the Land Evaluation (LE) score for the site. Sites with a LE score of 80 or greater are considered to be prime farmland. This site has a score of **91.7** on the LE soil evaluation system, which places it within the definition of Prime Farmland. A complete description of the farmland classification for this site can be found in the **Custom Soils Resource Report** (**Supplemental A)** starting on **page 39**.

**Stormwater:** The District encourages the use of on-site detention for stormwater runoff if required by the municipality or County. The DeKalb County Stormwater Ordinance should be used to determine detention requirements. There should be no changes made to the natural surface flow of water on the site. All roadways associated with the project should follow the natural contours of the land. Culverts should be used to a minimum or not at all. The Natural Resource Conservation Service (NRCS) Conservation **Practice Standard for Access Roads** (**Supplemental B)** is included with this report as a resource document.

**NPDES Permits:** An NPDES (National Pollution Discharge Elimination System) permit from the Illinois EPA is required for all construction and demolition sites that disturb 1 acre or more.

**Sediment and Erosion Control:** Development on this site should include a sedimentation and erosion control plan which is required by the ILR10 permit (SWPPP) with the Illinois EPA. The DeKalb County Soil and Water Conservation District recommends the use of the Illinois Urban Manual in selecting proper Best Management Practices (BMPs). Based on the topography and soils found on this site the District recommends establishing ground cover prior to construction to prevent excessive erosion.

**Hydrologic Soils:** 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.

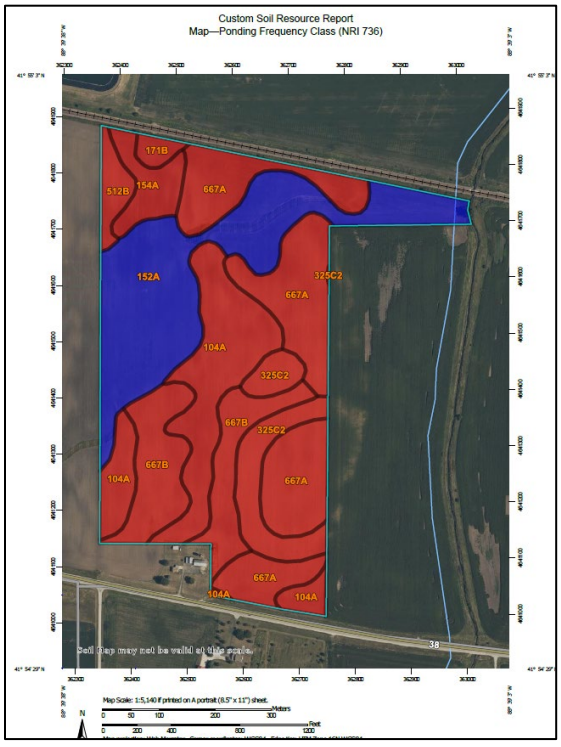
The specific soil types and hydrologic soil groups associated with this site are:

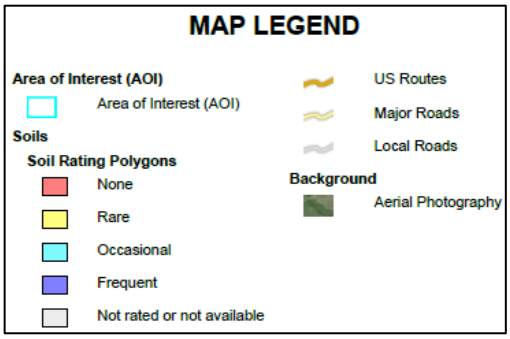
**Table—Hydrologic Soil Group (NRI 736)**

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| 104A | Virgil silt loam, 0 to 2 percent slopes | B/D | 14.7 | 18.1% |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes | B/D | 21.3 | 26.3% |
| 154A | Flanagan silt loam, 0 to 2 percent slopes | C/D | 3.2 | 3.9% |
| 171B | Catlin silt loam, 2 to 5 percent slopes | C | 0.9 | 1.1% |
| 325C2 | Dresden silt loam, 4 to 6 percent slopes, eroded | B | 6.5 | 8.0% |
| 512B | Danabrook silt loam, 2 to 5 percent slopes | C | 1.9 | 2.4% |
| 667A | Kaneville silt loam, 0 to 2 percent slopes | C | 21.2 | 26.2% |
| 667B | Kaneville silt loam, 2 to 5 percent slopes | C | 11.2 | 13.8% |
| **Totals for Area of Interest** | | | **80.9** | **100.0%** |

A complete description of the hydrologic soil groups that have been identified for this site are located in the **Custom Soils Resource Report** starting on **page 53**.

**Ponding Frequency:** Drummer silty clay loam (152A) make up 26.3% or 21.3 acres of the reviewed area, are classified as very poorly drained soils. Their ponding classification is “Frequent.” Meaning that ponding occurs, on average, more than once in 2 years. The chance of ponding is more than 50 percent in any year. Please refer to **page 64** of the **Custom Soil Resource Report** for additional information.



**NWI Wetlands:** A review of U.S. Fish & Wildlife Service National Wetland Inventory (NWI) maps identified **no potential wetland areas** on this site. Please refer to **page 31** of the **Natural Resource Information Report.**

**USDA-NRCS Wetland Inventory:** A review of NRCS (Natural Resources Conservation Service) Wetlands Inventory maps identified **no potential wetland area within the project area.** Refer to the USDA-NRCS Wetland map on **page 32** of the **Natural Resource Information Report.**

**Floodplain:** A review of FEMA's National Flood Hazard Layer identifies a small area in the northeast corner of the parcel in question within a flood hazard area (Zone A). Based on the proposed site plans this area is outside of current development plans, thus no impacts to floodplains are expected. Please refer to **pages 26** of the **Natural Resource Information Report.**

**Aquifer Sensitivity:** Based on Illinois State Water Survey maps this area has **aquifer material identified within 50 feet of the surface and the potential for aquifer contamination is present (page 21).** The District recommends the use of Best Management Practices to prevent the release of any pollutants on the site during or after construction. Proper clean up and containment procedures should be developed and implemented for this site.

**Ecological Considerations:** The District recognizes two potential sources of water pollution from solar farms. Each of these concerns have best management practices that can be used to mitigate risks. The potential pollution sources and best management practices include:

**Cracked panels** - Leaching of toxic materials could be an issue if a large number of broken panels were exposed to precipitation over a long period of time. To prevent leaching from becoming an issue, solar farm operators should regularly inspect for cracked panels. Any cracked panels must be immediately stored under protective cover to prevent exposure to precipitation. No broken panels, or any parts of broken panels, shall remain exposed to the elements while stored on-site. To reduce risks over time and prevent an excessive number of panels from being stored onsite, cracked panels should be periodically transported offsite for recycling or proper offsite storage.

**Oil leaks or spills from transformers** - Electrical transformers are used to step up output voltage from the solar farms to the electrical grid. Electrical transformers contain oil, even those used in renewable energy systems. Oil leaks or spills resulting in environmental damage can occur. The size and voltage of the solar farm affects the size of the electrical transformers and the volume of oil being used. To mitigate risks of oil pollution from transformers, the following best management practices are recommended.

- Use only biodegradable oil in the transformers. Larger transformers typically use mineral based oil unless biodegradable oil is specifically requested. While leaks and spills of biodegradable oil must still be prevented, risks for groundwater contamination would be reduced and clean-up efforts simplified in the event of a release.
- Provide secondary containment systems such as trays, membranes, or vaults to collect and contain all oil in the event of a leak or spill. The containment systems must be designed to manage stormwater so adequate containment volume is maintained. If the containment area were to fill up with stormwater, there would not be sufficient storage volume to capture and contain the oil. A variety of secondary containment options are available. Solar farm developers would be responsible for selecting the secondary containment system and demonstrating its effectiveness.

**Solar Farm Ground Cover:** The District would like to remind the developer of the requirement of installing and maintaining a **native perennial vegetative ground cover, per the Town of Cortland's SES Town Code (Section 9-4-34 part B-8).** It is highly recommended that the developer establishes a detailed Landscape Monitoring and Maintenance Plan. If requested, the District will review these plans and make recommendations where applicable. It is important for the long-term success of the ground cover that these plans are developed by an experienced individual that takes into consideration the qualitative characteristics of the project site, mainly soil and hydrologic factors that affect plant growth and establishment across the site.

Benefits of native shrubs and groundcovers, such as grasses and wildflowers, include improved erosion control, pesticide avoidance, stormwater infiltration, wildlife habitat, and reduced overall maintenance. In addition, native fruiting and flowering plants provide a food source and habitat for wild native bees. Native bees make a considerable contribution to agricultural crops through pollination.

Promoting habitat for native bees and other pollinators can have a positive ecological impact on disturbed sites, as well as a positive economic impact on neighboring insect-pollinated crops. Planting native grasses and wildflowers in low maintenance areas of solar farms also reduces long-term maintenance costs and emissions. These naturalized meadows, once established, are more drought tolerant, require little to no fertilization, and only need to be mowed once or twice a year.

Sustainable landscaping strategies serve as an educational tool to the community about positive agricultural and environmental practices, and act as a visual demonstration of commitment to land stewardship.

# DeKalb County SWCD
# Land Use Opinion

The DeKalb County Soil and Water Conservation District (here after SWCD or District) has reviewed the natural resource information for a Solar Energy System site proposed by Cortland Illinois Solar, LLC. This site is located in part of the Southwest Quarter in Section 27 of Township 40 North, Range 5, East of the third principal meridian (Cortland Township). The area of review includes two parcels (09-27-100-002 and 09-27-300-004) totaling 81.1 acres. The parcels are currently zoned A-1 (DeKalb County) with the intent to have the parcels be rezoned under an annexation agreement with the Town of Cortland to AG with a Special Use for a Solar Farm.

Based on the DeKalb County Soil Survey, this site is principally comprised of Prime Farmland soils. These types of soils are recognized for their highly productive qualities for growing agriculturally important grain and fiber crops. Preserving soil resources, especially those that are designated Prime Farmland, is an important consideration as we look forward towards the food and fiber needs in our communities. The SWCD Board of Directors is irresolute in their consideration of changing land use that has such a significant impact on agriculture production. The Land Evaluation score for the area of review was 91.7. A site that scores 80 or greater is considered prime farmland.

The DeKalb County SWCD also acknowledges that land taken out of agriculture production and used for the purpose of a solar farm can have beneficial effects on soil health and surface water quality leaving the site. The District would like to remind the developer of the requirement of installing and maintaining a native perennial vegetative ground cover, per the Town of Cortland's SES Town Code (Section 9-4-34 part B-8.

The DeKalb County SWCD strongly recommends the use of diverse native ground cover, specifically plant varieties beneficial to pollinator species, be used to vegetate the site. Recent field studies have indicated the benefits of native plant use in solar arrays not only to soil health and habitat creation, but also the resiliency of such ground cover to drought and prolonged wet conditions, and reduced maintenance needs after successful establishment. Native vegetation will help improve surface water quality within the project site along with the adjacent stream (Union Ditch Number 2). It will be the responsibility of the Developer to protect the natural resources on and surrounding this site from potential contaminants.

The DeKalb County SWCD recommends that a sub-surface drainage tile investigation is completed prior to the disturbance of the site. Several areas on the site contain areas that either possess soils that are poorly or very poorly drained and have a high likelihood of frequent ponding. The current proposed site plan does primarily avoid these areas, however if plans are altered the district recommends that the areas with high ponding frequencies and surface water flow be carefully considered due to water maintenance, development, and erosion issues.

Moreover, studies regarding Solar Farms have been completed to evaluate hydrologic effects and examine whether water management is needed to control runoff. These studies show that it is important to have vegetative cover during construction and after to protect the soil from erosion. In some cases, it may be necessary to have detention; an Engineer will determine any specific detention requirements that may be applicable for this site. The District would like to recommend that the site be

established with a temporary cover prior to construction if possible, in order to stabilize the site and minimize soil erosion. It has been observed on similar developments that a lack of temporary cover results in significant challenges managing field conditions during the construction phase of the project.

If development occurs, a soil erosion and sediment control plan will need to be in place. If the area has land disturbance of one acre or more the developer will need to comply with the IEPA ILR-10 permit which includes a Storm Water Pollution Prevention Plan. Sediment leaving the area can damage streams, ponds, and wetlands. Best Management Practices will need to be in place to protect the site and surrounding areas from erosion and sedimentation.

As a SWCD, we have established that it is our mission to "responsibly protect our healthy soils and clean water for all generations." The proposed project will provide vegetative cover of the soil for the length of its project life. Established vegetation will provide protection from erosion and improve soil health. This report contains information regarding potential issues with recommendations to address them accordingly.

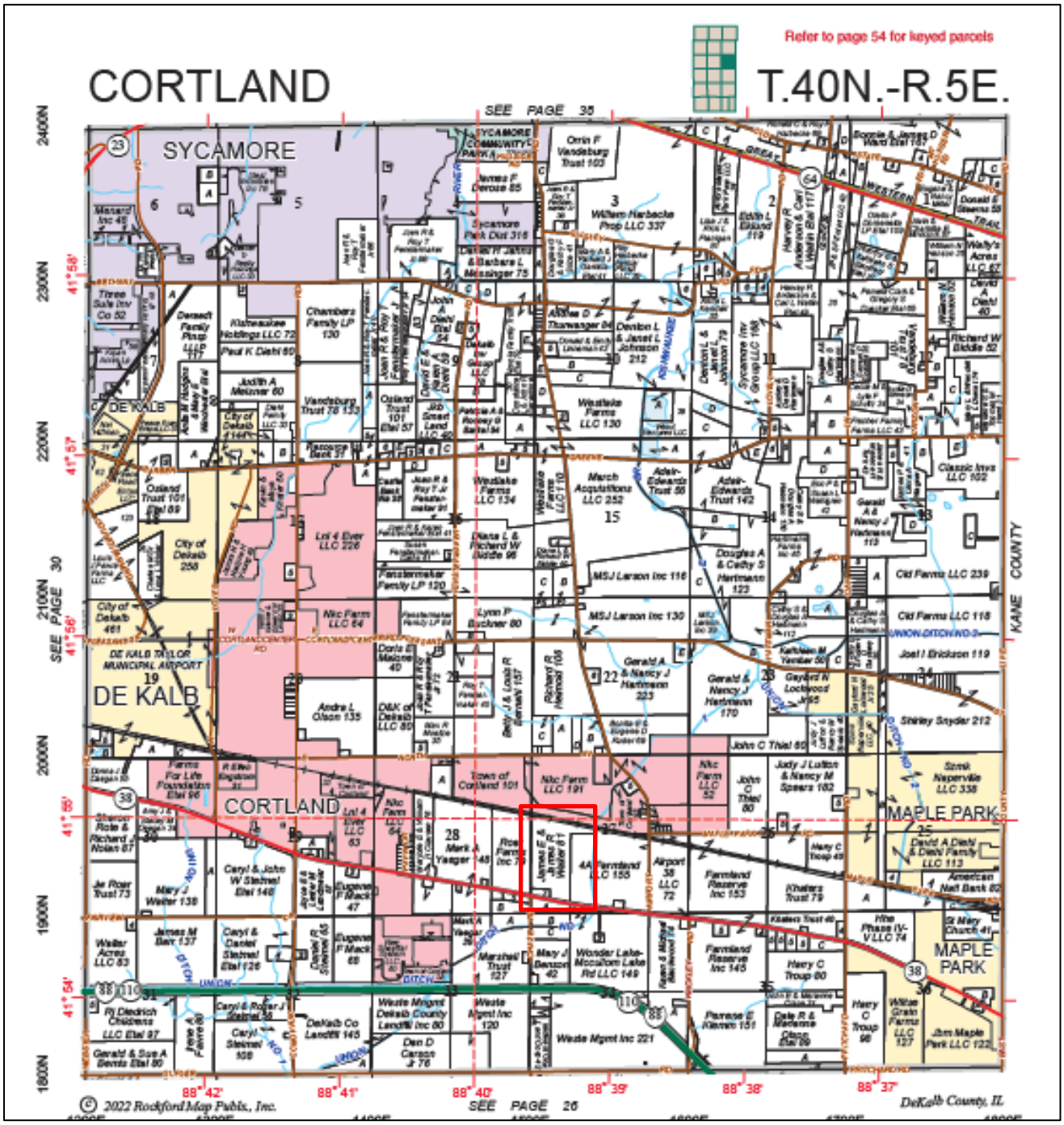
The DeKalb County Soil and Water Conservation District hereby approves the Petitioners request provided that the aforementioned items stated above are addressed, as well as the information gathered here is considered during the planning stages of any future development of this site.

The information that is included in this Natural Resource Information Report is to ensure 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).

Paul Kuhn
SWCD Chairman

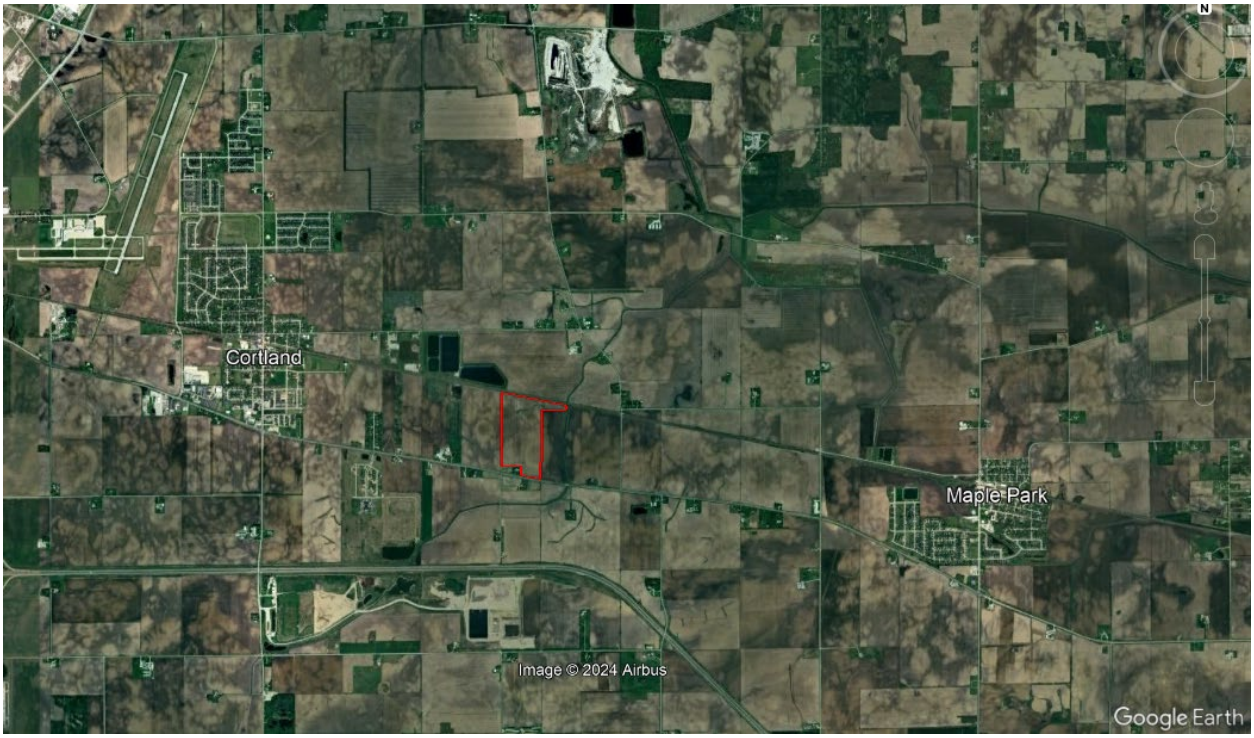
5-14-2024
Date

# Parcel Location and Photos




*Reproduced with the Permission of the Rockford Map Publishers Inc.*

Legal Description of Property: *Part of the Southwest Quarter in Section 27 of Township 40 North, Range 5, East of the third principal meridian (Cortland Township).*




*The parcel in question is located approximately 1.5 miles east of the Town of Cortland and 2.5 miles west of the Village of Maple Park (Google Earth).*

*The parcel in question is located north of the intersection of Chase Road and Lincoln Hwy 38 (Google Earth).*

*Aerial photo of parcel in question showing area of concentrated surface water flow (center of parcel flowing east) and ponding area in southern portion (Google Earth 7/2020).*

# Soils Information

## Map Unit Legend (NRI 736)

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| 104A | Virgil silt loam, 0 to 2 percent slopes | 14.7 | 18.1% |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes | 21.3 | 26.3% |
| 154A | Flanagan silt loam, 0 to 2 percent slopes | 3.2 | 3.9% |
| 171B | Catlin silt loam, 2 to 5 percent slopes | 0.9 | 1.1% |
| 325C2 | Dresden silt loam, 4 to 6 percent slopes, eroded | 6.5 | 8.0% |
| 512B | Danabrook silt loam, 2 to 5 percent slopes | 1.9 | 2.4% |
| 667A | Kaneville silt loam, 0 to 2 percent slopes | 21.2 | 26.2% |
| 667B | Kaneville silt loam, 2 to 5 percent slopes | 11.2 | 13.8% |
| **Totals for Area of Interest** | | **80.9** | **100.0%** |

***Please refer to the Custom Soil Resource Report (Supplemental A) for additional soils information.***

# Archaeologic / Cultural Resources

Simply stated, cultural resources are all the past activities and accomplishments of people. They include the following: buildings; objects made or used by people; locations; and less tangible resources, such as stories, dance forms, and holiday traditions. The Soil and Water Conservation District most often encounters cultural resources as historical properties. These may be prehistoric or historical sites, buildings, structures, features, or objects.

The most common type of historical property that the Soil and Water Conservation District may encounter are 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.

**Historic aerial photography *(1939 photo)* does not identify any historical structures within the parcel in question aside from the current farmstead.**

*The Illinois Historic Preservation Agency has not been notified of the proposed land use change by the DeKalb County SWCD. The applicant may need to contact the IHPA according to current Illinois Law.*

# Ecologically Sensitive Areas

## What is Biological Diversity and why should it be conserved?

Biological diversity, or biodiversity, is the range of life on our planet. A more thorough definition is presented by botanist Peter H. Raven: "At the simplest level, biodiversity is the sum 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 well-being, they need a holistic, organic experience. Prolonged exposure to urban monotony produces neuroses, for which cultural and natural diversity cure.

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

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

## Biological Resources Concerning the Subject Parcel

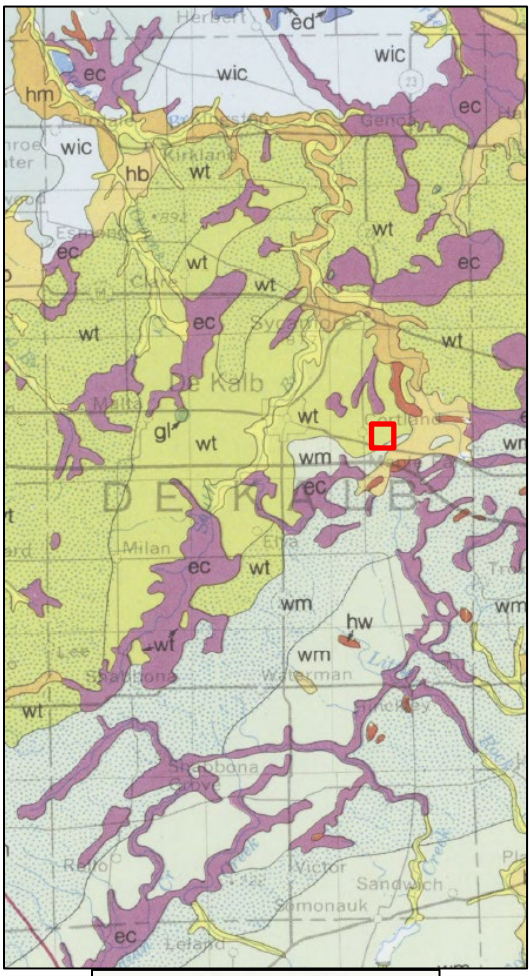
As part of the Natural Resources Information Report, staff checks office maps to determine if any nature preserves are in the general vicinity of the parcel in question. If there is a nature preserve in the area, then that resource will be identified as part of the report. The SWCD recommends that every 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 do not indicate any ecologically sensitive area in the general vicinity of the parcel in question.*

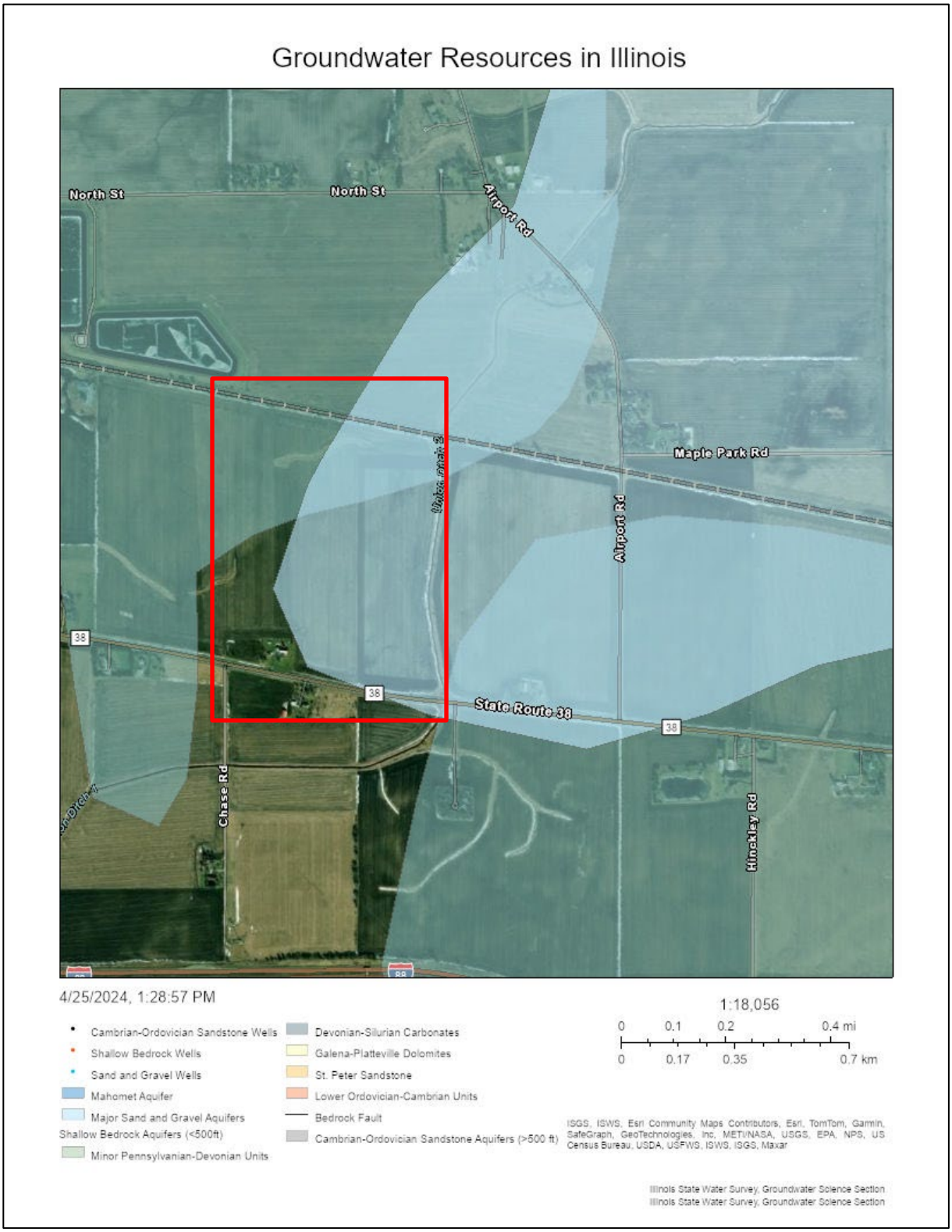
# Geologic/Aquifer Information

## Geology and the Proposed Land Use

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



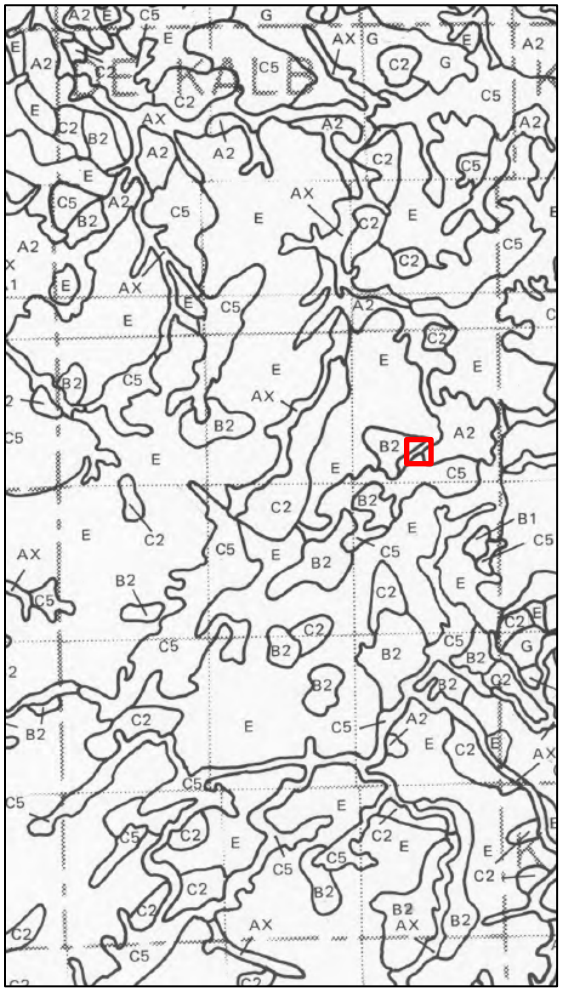
## Aquifer Information




***Based on Illinois State Water Survey maps this area has aquifer material identified within 50 feet of the surface and the potential for aquifer contamination is present.***

# Potential for Contamination of Shallow Aquifers in Illinois

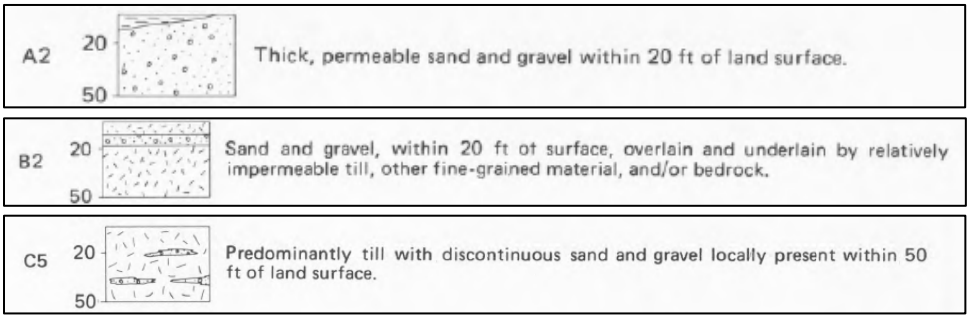
*Illinois State Geological Survey*




| Primarily bedrock | | Primarily glacial drift | | Materials generally having few limitations |
|---|---|---|---|---|
| Limitation | | Limitation | | |
| Groundwater contamination potential | Trench construction problems and/or surface contamination | Groundwater contamination potential | Trench design problems and surface contamination | |
| A1 | (A1)* | A2 | | |
| A3 A4 A5 | (A4) | | AX | |
| | BX | (B1) B2 | B1 (B2) | |
| C1 C3 C4 | | C2 | | |
| | | C5 | | (C5) |
| | (F) | | | D E F G |

**Figure 11** Summary: geologic limitations for land burial of municipal wastes. (*Map units in parentheses indicate secondary or local limitations.)

***Approximate location of parcel in question.***



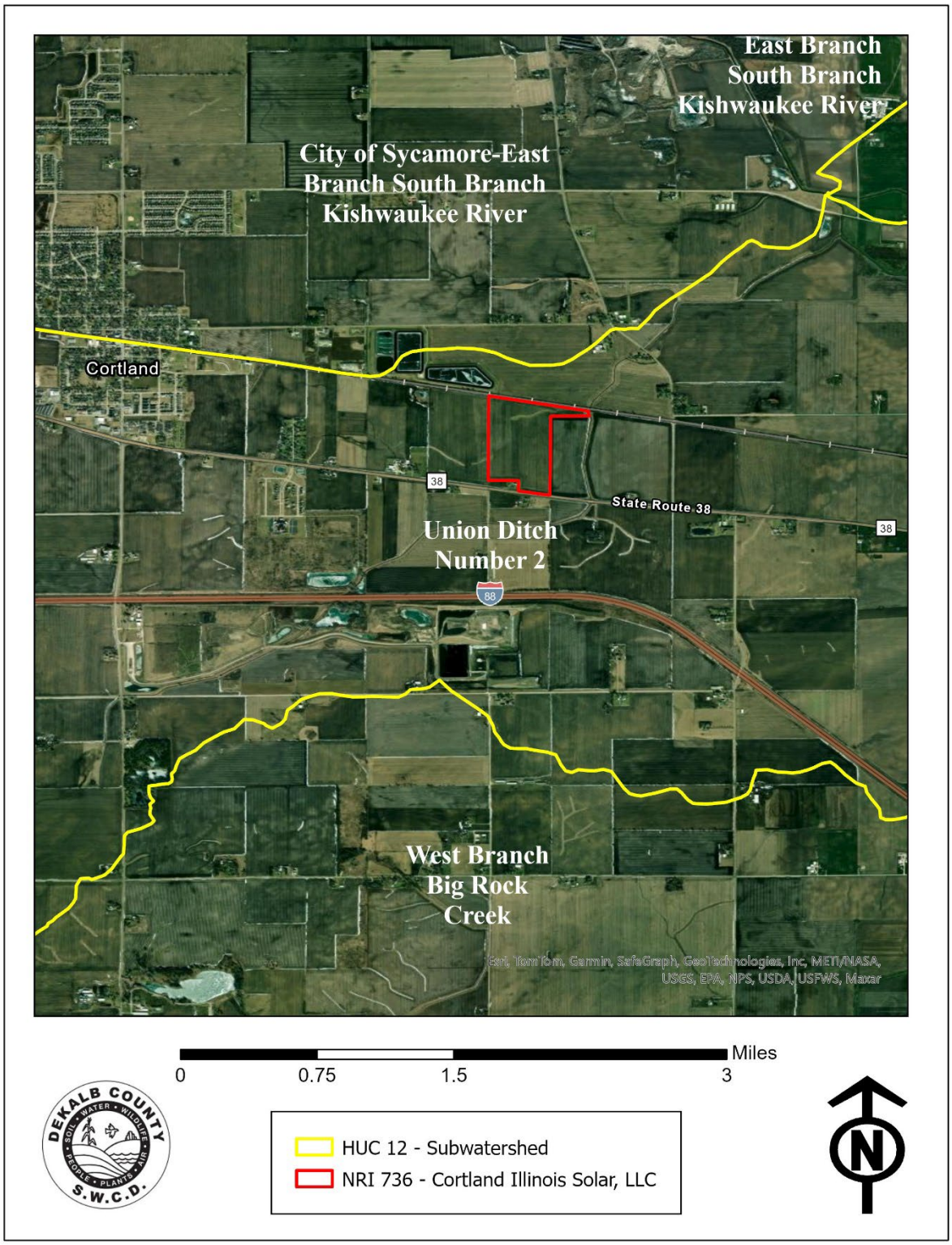
# Watershed Information

## Watershed and Subwatershed Information

A watershed is the area of land that drains into a specific point including a stream, lake, or other body of water. High points on the Earth's surface, such as hills and ridges define watersheds. When rain falls in the watershed, it flows across the ground towards a stream or lake. Rainwater carries any pollutants it comes in contact with such as oils, pesticides, and soil.

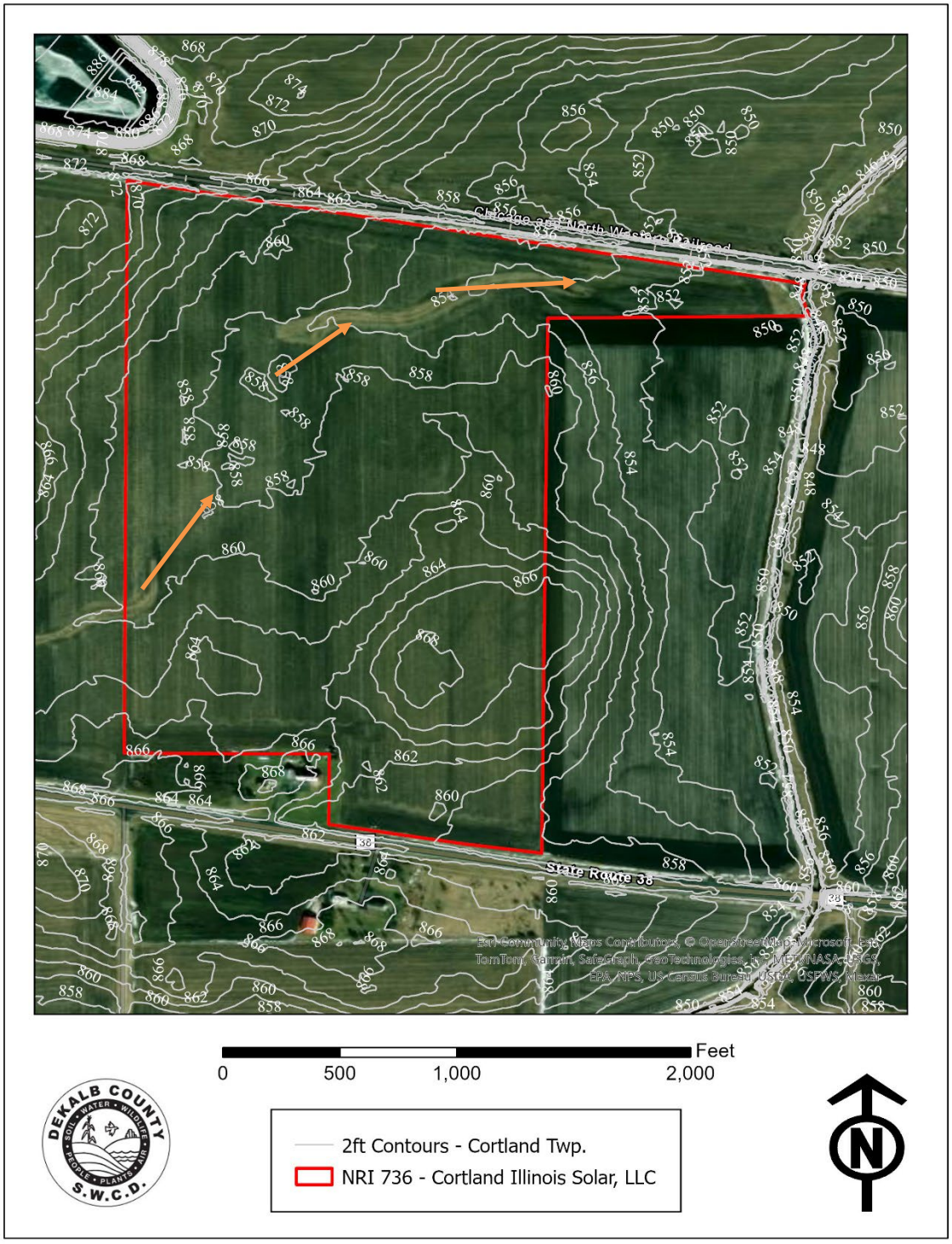
Everyone lives in a watershed. Their actions can impact natural resources and people living downstream. Residents and developers can minimize this impact by being aware of their environment and implications of their activities, implementing practices recommended in watershed plans and educating others about their watershed.

**The parcel in question is located Union Ditch Number 2 (HUC 12). This subwatershed area is included within the Town of Cortland and DeKalb County approved IL-EPA East Branch South Branch Watershed Improvement Plan (2014).** More information can be found about completed Watershed Improvement Plans and Best Management Practices at www.dekalbcountywatersheds-il.org




*The parcel in question is located within Union Ditch Number 2 (HUC 12).*

# Topographic/FEMA Information




*The elevation of this parcel ranges from 872 feet to 848 feet above sea level. The site largely drains to the northeast with approximately 20 feet of total fall.*

## 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.

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

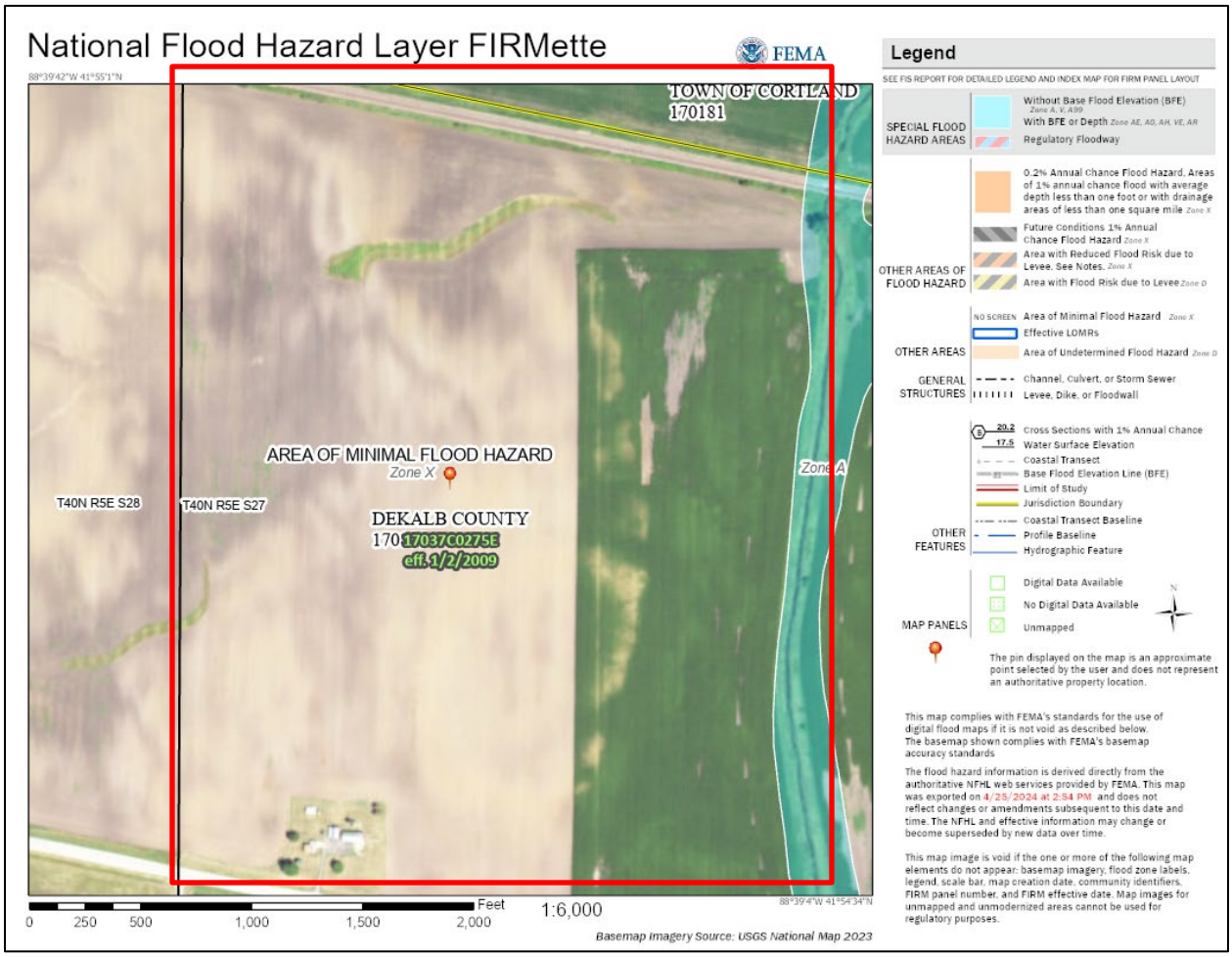
The Hydrologic Atlas (H.A.) Series of the Flood of Record Map is also used for the topographic information. This map is different from the FIRM map mainly because it will show isolated or pocketed flooded areas. DeKalb County uses both these maps in conjunction with each other for flooded area determinations. The Flood of Record maps, show the areas of flood for various years. Both of these maps stress that the recurrence of flooding is merely statistical. That is to say a 100-year flood may occur twice in one year, or twice in one week, for that matter.

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

Floodplains play a vital role in reducing the flood damage potential associated with an urbanizing area and, when left in an undisturbed state, also provide valuable wildlife habitat benefits. If it is the petitioner's intent to conduct floodplain filling or modification activities, the petitioner, and the Unit of Government responsible need to consider the potentially adverse effects this type of action could have on adjacent properties. The change or loss of natural floodplain storage often increases the frequency and severity of flooding on adjacent property.

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

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




***FEMA's National Flood Hazard Layer identify a small area in the Northeast corner of the parcel in question as a flood hazard area (Zone A).***

***Based on the proposed site plans this area will be out of the area of disturbance.***

# Soil Erosion and Sediment Control

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

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

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

Soil erosion during and after this proposed construction can be a primary non-point source of water pollution. Eroded soil during the construction phase can create unsafe conditions on roadways, decrease the storage capacity of lakes, clog streams and drainage channels, cause deterioration of aquatic habitats, and increase water treatment costs. Soil erosion also increases the risk of flooding by choking culverts, ditches, and storm sewers, and by reducing the capacity of natural and man-made detention facilities.

The general principles of erosion and sedimentation control measures include:

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

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

The SWCD recommends an erosion control plan for all sites, especially if near a wetland or stream.

| Map Unit Symbol | Map Unit Name | Acres | Percent |
|---|---|---|---|
| 104A | Virgil silt loam, 0 to 2 percent slopes | 14.7 | 18.1% |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes | 21.3 | 26.3% |
| 154A | Flanagan silt loam, 0 to 2 percent slopes | 3.2 | 3.9% |
| 171B | Catlin silt loam, 2 to 5 percent slopes | 0.9 | 1.1% |
| 325C2 | Dresden silt loam, 4 to 6 percent slopes, eroded | 6.5 | 8.0% |
| 512B | Danabrook silt loam, 2 to 5 percent slopes | 1.9 | 2.4% |
| 667A | Kaneville silt loam, 0 to 2 percent slopes | 21.2 | 26.2% |
| 667B | Kaneville silt loam, 2 to 5 percent slopes | 11.2 | 13.8% |
| **Eroded Soils** | | 6.5 | 8.0% |

# 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 wetlands a year and has saved 5 million acres total (since 1934). One acre of wetland can filter 7.3 million gallons of water a year. These are reasons why our wetlands are high quality and important.

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

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

***There are no areas within the project area that are identified as potential wetlands based on U.S. Fish and Wildlife Service National Wetland Inventory (NWI) maps.***

*A review of USDA-NRCS Wetlands Inventory maps identified no potential wetland area within the project area.*

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

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

## WHO MUST APPLY

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

## REGULATORY AGENCIES:

- **Wetlands or U.S. Waters: U.S. Army Corps of Engineers**, Rock Island District, Clock Tower Building, P.O. Box 2004, Rock Island, IL 61204-2004. Phone: (309) 794-5379.
- **Flood plains: Illinois Department of Natural Resources \ Office of Water Resources**, Natural Resources Way, Springfield, IL 62702-1270.
- **Water Quality \ Erosion Control: Illinois Environmental Protection Agency**, Division of Water Pollution Control, Permit Section, Watershed Unit, 2200 Churchill Road, Springfield, IL 62706, phone (217)- 782-0610.

## COORDINATION

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

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

# Land Evaluation Site Assessment

## (LESA) Background Information

The DeKalb County Land Evaluation and Site Assessment System (LESA) is designed to evaluate the viability of a site for agricultural uses. Although the framework of the system was developed by the Natural Resources Conservation Service of the U.S. Department of Agriculture, the contents of the County's LESA System were prepared locally to utilize soil survey information and interpretations and to incorporate local values and objectives regarding the protection of agricultural land use and the coordination of growth, affecting land development.

Decision makers use the LESA system to determine the suitability of a land use change and/or a zoning request as it relates to agricultural land. The LESA system is a two-step procedure that includes:

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

The systems two parts are evaluated based on the assignment of points, with a maximum of 300 total. The Land Evaluation has a maximum of 100 points and is used to rate farmland for its agricultural productivity and its prime farmland category. Generally, the Land Evaluation arranges the County's soils by their relative values, represented by a score of 0 to 100, with 0 being the worst for agriculture and 100 the best. The data for formulating the land evaluation is derived from the soil survey of DeKalb County.

Moreover, Land Evaluation encompasses information regarding soils found on the site and their suitability for agricultural purposes. The soils of DeKalb County consist of thirty-one different soil series ranging from very poorly drained Houghton Muck to well drained Harvard. DeKalb County is known for its highly productive agricultural soils such as Drummer, Flanagan and Muscatine. For the purposes of the Land Evaluation portion of the LESA system, each soil is rated higher on the overall LESA score. DeKalb County SWCD provides a weighted average of the soils using a simple, mechanical, unbiased method of determining agricultural suitability of soils on site.

The Site Assessment considers important factors other than soils relative to a specific parcel, which determine viability for agricultural use. The maximum number of points for the Site Assessment is 200. The Site Assessment identifies and weighs 15 criteria. The determination to include the specific site assessment factors directly resulted from the following:

* DeKalb County Zoning Ordinance
* Land Use Plan
* Health Department Criteria for Septic
* Other adopted county policies.

If a parcel were to receive a total of 215 points or more for the completed evaluation, that would indicate that the site has a high rating for agriculture. In utilizing the LESA System, the higher the point value, the greater the productivity and the more viable the site for agricultural use.

The DeKalb County LESA System is a valuable tool to guide land use decisions for the County. It does not take away the power of local officials to make land use decisions; rather, it assists them in making rational, consistent, and supportable land use decisions. Applications of the LESA System will generally fall under two types of requests involving conversion of land from agricultural use to non-agricultural use. The most frequent application of LESA will be when a request is made to rezone a tract of land from the County's agricultural districts to another zoning district or for special use. The LESA System can also be used to review state and federal projects for compliance with the Illinois Farmland Preservation Act and the Federal Farmland Protection Policy Act and their impact on important farmland.

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

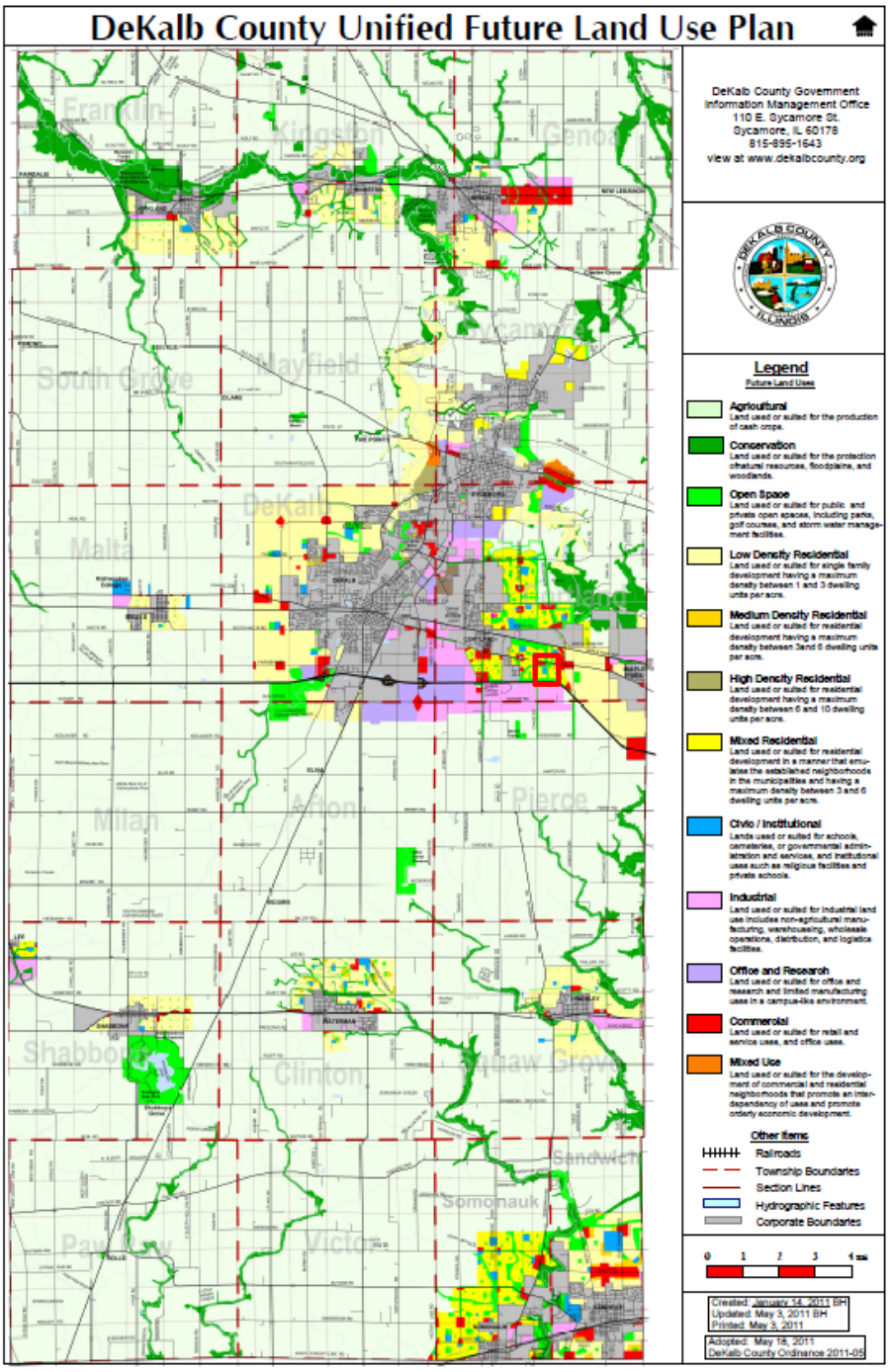
Figure 2. LAND EVALUATION (LE) WORKSHEET

| Soil | Value Group | Percentage | Acreage | Value Factor | Adjusted Farm Unit Size | Adjusted Ag. Point Value |
|---|---|---|---|---|---|---|
| 104A | 3 | 18.1% | 14.7 | 92 | 13.5 | 16.7 |
| 152A | 1 | 26.3% | 21.3 | 100 | 21.3 | 26.3 |
| 154A | 1 | 3.9% | 3.2 | 100 | 3.2 | 3.9 |
| 171B | 2 | 1.1% | 0.9 | 95 | 0.9 | 1.0 |
| 325C2 | 4 | 8.0% | 6.5 | 76 | 4.9 | 6.1 |
| 512B | 2 | 2.4% | 1.9 | 95 | 1.8 | 2.3 |
| 667A | 3 | 26.2% | 21.2 | 89 | 18.9 | 23.3 |
| 667B | 3 | 13.8% | 11.2 | 88 | 9.9 | 12.1 |
| Totals | | 100% | 80.9 | | 74.3 | 91.72 |

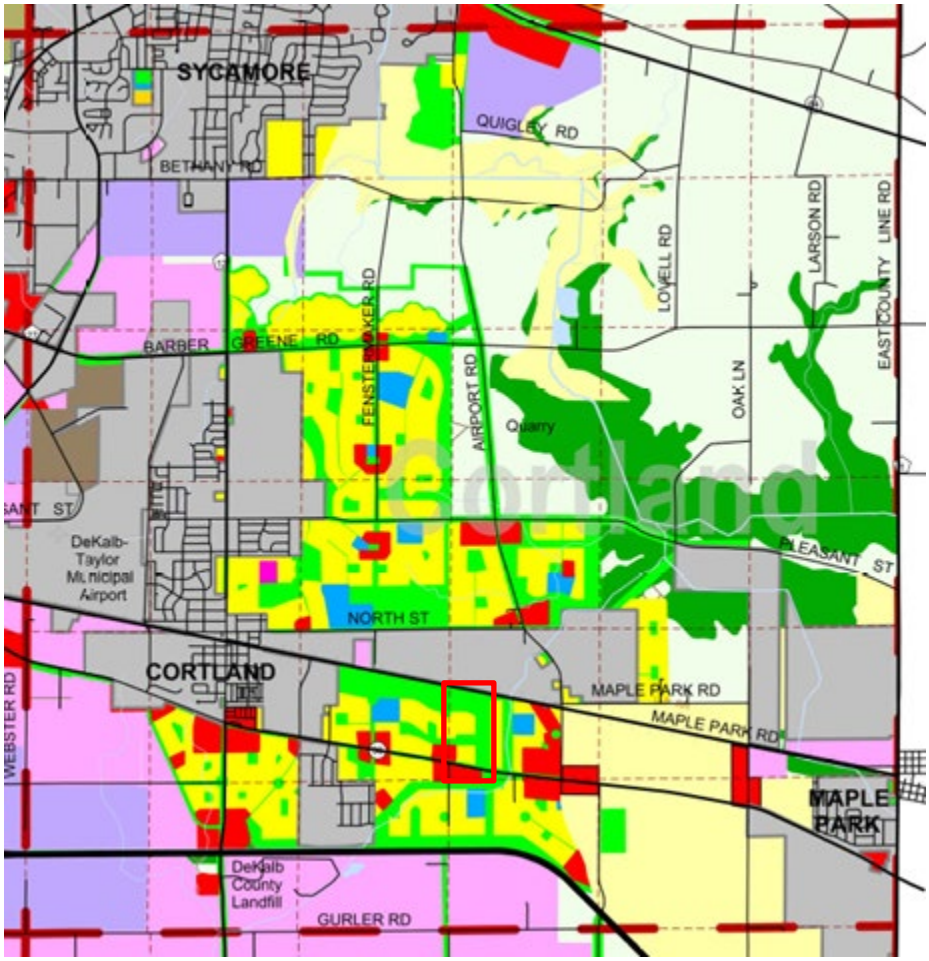
Explanation of the LE Worksheet

Soil Number: is the soil type of the polygon on the soils map.
Percentage and Acreage: the percentages of the parcel, and the area that the soil polygon represents.
Value: the numeric value from 0-100 that is assinged that soil units.
Adjusted Farm Unit Size: the acreage multiplied by the value of that soil unit.
Adjusted Ag. Point Value: the percentage multiplied by the value factor of that soil unit.
**** The LE score is the Total Value Number (shaded on the table)***
*Note: the soil types and percentages may differ from the limitations table for this calculation because of buildings, driveways, and other manmade impediments to agriculture. See figure 9 for the approximate "footprint" of the features (if any.)

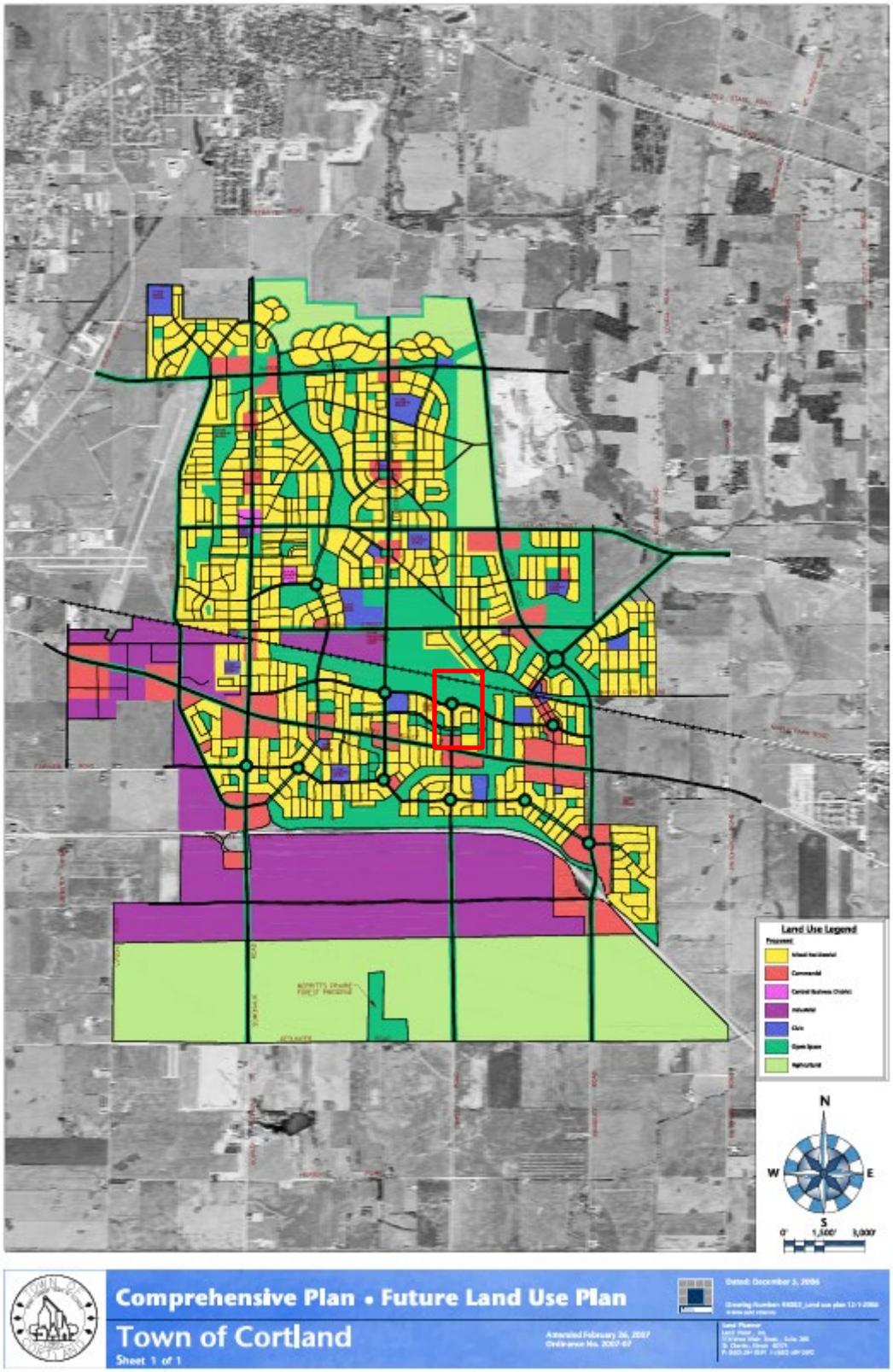
# Future Land Use Plan Maps



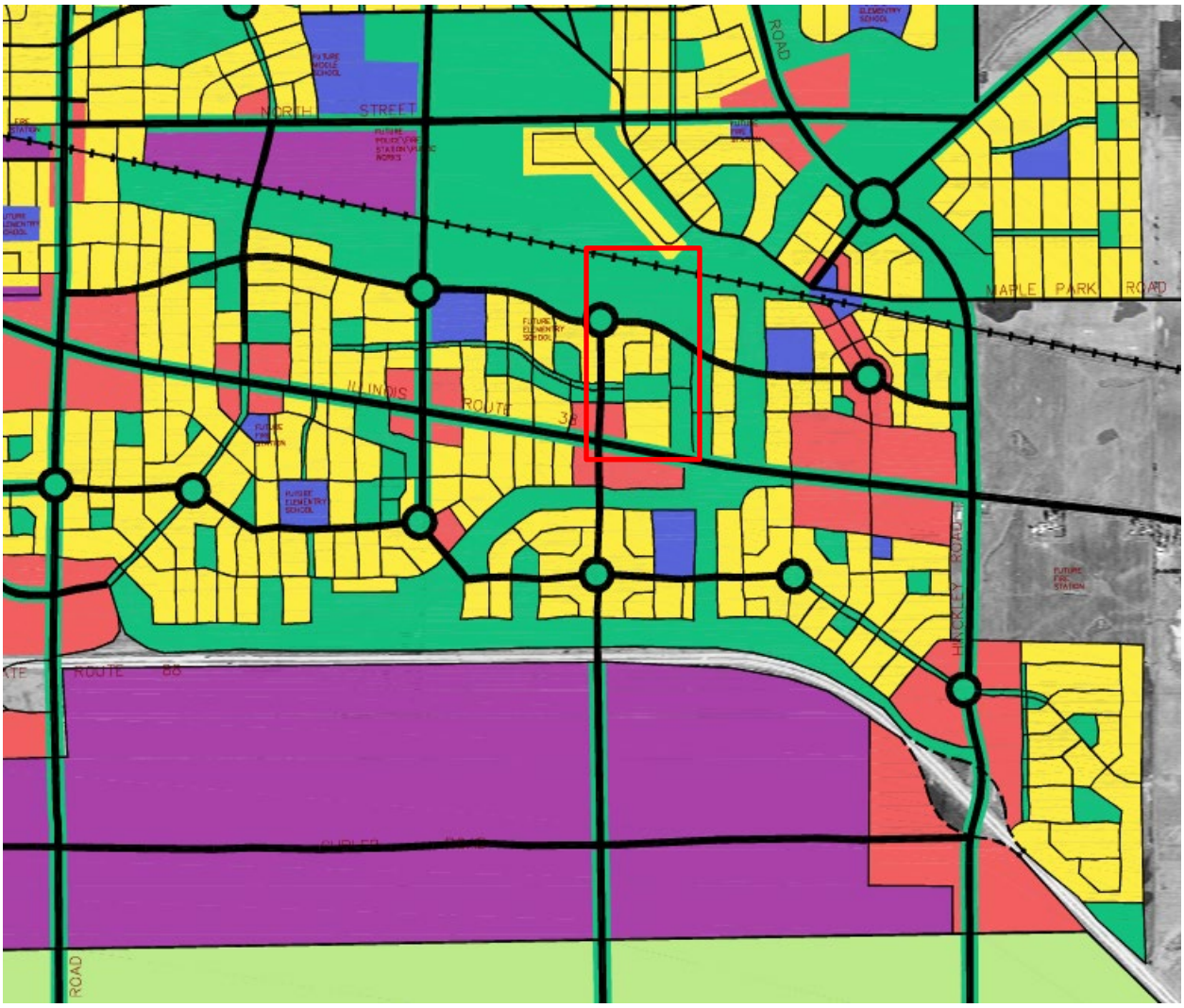

*2011 DeKalb County Unified Future Land Use Plan Map*




*This parcel in question is located within an area identified for Open Space, Mixed Residential, and Commercial zoning in the 2011 DeKalb County Unified Future Land Use Plan Map.*




*2007 Cortland Future Land Use Plan*




*This parcel in question is located within an area identified for Open Space, Mixed Residential, and Commercial zoning in the 2007 Cortland Future Land Use Plan.*

# 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.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**PALUSTRINE** - Name given to inland freshwater wetlands.

**PERMEABILITY** - Values listed estimate the range (in rate and time) it takes for downward movement of water in the major soil layers when saturated but allowed to drain freely. The estimates are based on soil texture, soil structure, available data on permeability and infiltration tests, and observation of water movement through soils or other geologic materials.

**PIQ** - Parcel in question

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

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

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is

acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 5 percent. (Source USDA Natural Resources Conservation Service)

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

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

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

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

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

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

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

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

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

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

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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 DeKalb County, Illinois

## NRI 736

April 25, 2024

# 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 (NRI 736)

Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

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

**Water Features**
- Streams and Canals

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

**Background**
- Aerial Photography

## MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: DeKalb County, Illinois
Survey Area Data: Version 18, 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—Aug 24, 2019

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 (NRI 736)

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| 104A | Virgil silt loam, 0 to 2 percent slopes | 14.7 | 18.1% |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes | 21.3 | 26.3% |
| 154A | Flanagan silt loam, 0 to 2 percent slopes | 3.2 | 3.9% |
| 171B | Catlin silt loam, 2 to 5 percent slopes | 0.9 | 1.1% |
| 325C2 | Dresden silt loam, 4 to 6 percent slopes, eroded | 6.5 | 8.0% |
| 512B | Danabrook silt loam, 2 to 5 percent slopes | 1.9 | 2.4% |
| 667A | Kaneville silt loam, 0 to 2 percent slopes | 21.2 | 26.2% |
| 667B | Kaneville silt loam, 2 to 5 percent slopes | 11.2 | 13.8% |
| **Totals for Area of Interest** | | **80.9** | **100.0%** |

# Map Unit Descriptions (NRI 736)

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.

# DeKalb County, Illinois

## 104A—Virgil silt loam, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol:* 2wsqz
*Elevation:* 670 to 1,160 feet
*Mean annual precipitation:* 31 to 37 inches
*Mean annual air temperature:* 45 to 52 degrees F
*Frost-free period:* 140 to 180 days
*Farmland classification:* Prime farmland if drained

### Map Unit Composition

*Virgil and similar soils:* 90 percent
*Minor components:* 10 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Virgil

#### Setting

*Landform:* Drainageways on ground moraines
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Parent material:* Loess over loamy outwash and/or loamy till

#### Typical profile

*Ap - 0 to 7 inches:* silt loam
*E - 7 to 13 inches:* silt loam
*Bt - 13 to 49 inches:* silty clay loam
*2Btg - 49 to 58 inches:* loam
*2C - 58 to 79 inches:* stratified loamy sand to clay loam

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat poorly drained
*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 6 to 24 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 20 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* High (about 11.3 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2w
*Hydrologic Soil Group:* B/D
*Ecological site:* R108XA014IL - Outwash Savanna
*Forage suitability group:* High AWC, high water table (G095BY007WI)
*Other vegetative classification:* High AWC, high water table (G095BY007WI)
*Hydric soil rating:* No

**Minor Components**

**Drummer, drained**

*Percent of map unit:* 4 percent
*Landform:* Depressions on ground moraines
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Ecological site:* F095XB004WI - Wet Loamy or Clayey Lowland
*Hydric soil rating:* Yes

**Pella**

*Percent of map unit:* 4 percent
*Landform:* Depressions on ground moraines
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Ecological site:* F095XB004WI - Wet Loamy or Clayey Lowland
*Hydric soil rating:* Yes

**Sable**

*Percent of map unit:* 2 percent
*Landform:* Depressions on ground moraines
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Ecological site:* F095XB004WI - Wet Loamy or Clayey Lowland
*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:* Concave, linear
*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, R108XA013IL - Wet Outwash Prairie, R111XD020IN - Wet Outwash Mollisol
*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

## 154A—Flanagan silt loam, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol:* 2ssry
*Elevation:* 570 to 990 feet
*Mean annual precipitation:* 34 to 42 inches
*Mean annual air temperature:* 46 to 54 degrees F
*Frost-free period:* 160 to 190 days
*Farmland classification:* All areas are prime farmland

### Map Unit Composition

*Flanagan and similar soils:* 95 percent
*Minor components:* 5 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Flanagan

#### Setting

*Landform:* Ground moraines, till plains
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loess over loamy till

#### Typical profile

*Ap - 0 to 8 inches:* silt loam
*A - 8 to 18 inches:* silty clay loam
*Bt1 - 18 to 32 inches:* silty clay loam
*Bt2 - 32 to 45 inches:* silty clay loam
*2Bt3 - 45 to 49 inches:* silt loam
*2C - 49 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)

*Sodium adsorption ratio, maximum:* 6.0
*Available water supply, 0 to 60 inches:* High (about 9.5 inches)

**Interpretive groups**
*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 1
*Hydrologic Soil Group:* C/D
*Ecological site:* R108XA006IL - Loess Upland Prairie
*Other vegetative classification:* Grass/Prairie (Herbaceous Vegetation)
*Hydric soil rating:* No

**Minor Components**

**Elpaso, drained**
*Percent of map unit:* 4 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:* R110XY024IL - Ponded Depressional Sedge Meadow, R108XA007IL - Wet Loess Upland Prairie, R108XA008IL - Ponded Loess Sedge Meadow
*Other vegetative classification:* Grass/Prairie (Herbaceous Vegetation)
*Hydric soil rating:* Yes

**Urban land**
*Percent of map unit:* 1 percent
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 171B—Catlin silt loam, 2 to 5 percent slopes

**Map Unit Setting**
*National map unit symbol:* 2t6zl
*Elevation:* 590 to 980 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:* All areas are prime farmland

**Map Unit Composition**
*Catlin and similar soils:* 99 percent
*Minor components:* 1 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Catlin**

**Setting**
*Landform:* Moraines, till plains

*Landform position (two-dimensional):* Summit, backslope
*Landform position (three-dimensional):* Interfluve
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Loess over loamy till

**Typical profile**

*Ap - 0 to 11 inches:* silt loam
*AB - 11 to 16 inches:* silty clay loam
*Bt - 16 to 41 inches:* silty clay loam
*2BC - 41 to 45 inches:* clay loam
*2C - 45 to 60 inches:* 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 high (0.20 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
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* High (about 9.3 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2e
*Hydrologic Soil Group:* C
*Ecological site:* R108XA006IL - Loess Upland Prairie
*Hydric soil rating:* No

**Minor Components**

**Urban land**

*Percent of map unit:* 1 percent
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 325C2—Dresden silt loam, 4 to 6 percent slopes, eroded

**Map Unit Setting**

*National map unit symbol:* 2wspz
*Elevation:* 690 to 1,030 feet
*Mean annual precipitation:* 35 to 37 inches
*Mean annual air temperature:* 45 to 52 degrees F
*Frost-free period:* 138 to 180 days
*Farmland classification:* All areas are prime farmland

**Map Unit Composition**

*Dresden, eroded, and similar soils:* 90 percent
*Minor components:* 10 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Dresden, Eroded**

**Setting**

*Landform:* Plains
*Landform position (three-dimensional):* Rise
*Down-slope shape:* Convex
*Across-slope shape:* Linear
*Parent material:* Loess and/or loamy glaciofluvial deposits over sandy and gravelly outwash

**Typical profile**

*Ap - 0 to 7 inches:* silt loam
*Bt1 - 7 to 18 inches:* silty clay loam
*2Bt2 - 18 to 31 inches:* sandy clay loam
*3C - 31 to 79 inches:* stratified gravelly loamy sand to extremely gravelly coarse sand

**Properties and qualities**

*Slope:* 4 to 6 percent
*Depth to restrictive feature:* 30 to 40 inches to strongly contrasting textural stratification
*Drainage class:* Well drained
*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:* More than 80 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:* Low (about 5.2 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2e
*Hydrologic Soil Group:* B
*Ecological site:* R110XY009IL - Dry Glacial Drift Upland Savanna, R108XA014IL - Outwash Savanna
*Forage suitability group:* Mod AWC, adequately drained (G095BY005WI)
*Other vegetative classification:* Mod AWC, adequately drained (G095BY005WI)
*Hydric soil rating:* No

**Minor Components**

**Kane**

*Percent of map unit:* 6 percent
*Landform:* Plains
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* F095XB005WI - Moist Loamy or Clayey Lowland
*Hydric soil rating:* No

**Will**

*Percent of map unit:* 4 percent
*Landform:* Plains
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Linear
*Across-slope shape:* Concave
*Ecological site:* R110XY024IL - Ponded Depressional Sedge Meadow
*Hydric soil rating:* Yes

## 512B—Danabrook silt loam, 2 to 5 percent slopes

**Map Unit Setting**

*National map unit symbol:* 2ytdf
*Elevation:* 800 to 930 feet
*Mean annual precipitation:* 30 to 40 inches
*Mean annual air temperature:* 45 to 52 degrees F
*Frost-free period:* 140 to 180 days
*Farmland classification:* All areas are prime farmland

**Map Unit Composition**

*Danabrook and similar soils:* 92 percent
*Minor components:* 8 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Danabrook**

**Setting**

*Landform:* End moraines, ground moraines
*Landform position (two-dimensional):* Summit, backslope
*Landform position (three-dimensional):* Interfluve
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loess over till

**Typical profile**

*Ap - 0 to 13 inches:* silt loam
*Bt - 13 to 33 inches:* silty clay loam
*2Bt - 33 to 42 inches:* clay loam
*2C - 42 to 60 inches:* 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 high (0.20 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
*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):* 2e
*Hydrologic Soil Group:* C
*Ecological site:* F095XB007WI - Loamy Upland with Carbonates
*Hydric soil rating:* No

**Minor Components**

**Drummer, drained**

*Percent of map unit:* 8 percent
*Landform:* Swales on outwash plains, ground moraines, stream terraces on outwash plains
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope, talf
*Down-slope shape:* Linear
*Across-slope shape:* Concave, linear
*Ecological site:* F095XB004WI - Wet Loamy or Clayey Lowland
*Hydric soil rating:* Yes

## 667A—Kaneville silt loam, 0 to 2 percent slopes

**Map Unit Setting**

*National map unit symbol:* 65c6
*Elevation:* 590 to 1,020 feet
*Mean annual precipitation:* 32 to 40 inches
*Mean annual air temperature:* 45 to 54 degrees F
*Frost-free period:* 160 to 180 days
*Farmland classification:* All areas are prime farmland

**Map Unit Composition**

*Kaneville and similar soils:* 92 percent
*Minor components:* 8 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Kaneville**

**Setting**

*Landform:* Stream terraces, outwash plains
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Interfluve
*Down-slope shape:* Linear
*Across-slope shape:* Linear

**Typical profile**

*H1 - 0 to 8 inches:* silt loam
*H2 - 8 to 42 inches:* silty clay loam

*H3 - 42 to 56 inches:* loam
*H4 - 56 to 80 inches:* stratified clay loam to loamy sand

**Properties and qualities**

*Slope:* 0 to 2 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 high to high (0.60 to 2.00 in/hr)
*Depth to water table:* About 24 to 42 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 20 percent
*Available water supply, 0 to 60 inches:* High (about 10.5 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 1
*Hydrologic Soil Group:* C
*Ecological site:* R108XA014IL - Outwash Savanna
*Hydric soil rating:* No

**Minor Components**

**Drummer**

*Percent of map unit:* 8 percent
*Landform:* Outwash plains, ground moraines
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R108XA013IL - Wet Outwash Prairie, R110XY008IL - Wet Glacial Drift Upland Prairie
*Hydric soil rating:* Yes

## 667B—Kaneville silt loam, 2 to 5 percent slopes

**Map Unit Setting**

*National map unit symbol:* 65c7
*Elevation:* 590 to 1,020 feet
*Mean annual precipitation:* 32 to 40 inches
*Mean annual air temperature:* 46 to 54 degrees F
*Frost-free period:* 160 to 180 days
*Farmland classification:* All areas are prime farmland

**Map Unit Composition**

*Kaneville and similar soils:* 92 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Kaneville

#### Setting

*Landform:* Stream terraces, outwash plains
*Landform position (two-dimensional):* Backslope, summit
*Landform position (three-dimensional):* Interfluve
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Loess and in the underlying outwash

#### Typical profile

*H1 - 0 to 9 inches:* silt loam
*H2 - 9 to 44 inches:* silty clay loam
*H3 - 44 to 52 inches:* silt loam
*H4 - 52 to 80 inches:* stratified clay loam to loamy sand

#### 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 high to high (0.60 to 2.00 in/hr)
*Depth to water table:* About 24 to 42 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 20 percent
*Available water supply, 0 to 60 inches:* High (about 10.6 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2e
*Hydrologic Soil Group:* C
*Ecological site:* R108XA014IL - Outwash Savanna
*Hydric soil rating:* No

### Minor Components

#### Drummer

*Percent of map unit:*
*Landform:* Ground moraines, outwash plains
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R108XA013IL - Wet Outwash Prairie, R110XY008IL - Wet Glacial Drift Upland Prairie
*Hydric soil rating:* Yes

# Soil Information for All Uses

## Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations 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 interpretation.

## Building Site Development

Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

### Solar Arrays, Soil-based Anchor Systems (NRI 736)

ENG - Engineering

Ground-based Solar Arrays, Soil-penetrating Anchor Systems

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

flooding, and ponding. Other factors that will contribute to the function of a solar power array include daily hours of sunlight and shading from hills, trees or buildings.

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

Soils can be a non-member, partial member or complete members of the set of soils that are limited for "Ground-based Solar Panel Arrays". If a soil's property within 150 cm (60 inches) of the soil surface has a membership indices greater than zero, then that soil property is limiting and the soil restrictive feature is identified. The overall interpretive rating assigned is the maximum membership indices of each soil interpretive property that comprise the "Ground-based Solar Panel Array" interpretive rule. Minor restrictive soil features are identified but not considered as part of the overall rating process. These restrictive features could be important factors where the major restrictive features are overcome through design application.

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

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

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

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

References:

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

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

Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

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

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

**Soil Rating Lines**
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

**Soil Rating Points**
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

**Water Features**
- Streams and Canals

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

**Background**
- Aerial Photography

## MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: DeKalb County, Illinois
Survey Area Data: Version 18, 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—Aug 24, 2019

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.

## Tables—Solar Arrays, Soil-based Anchor Systems (NRI 736)

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|---|---|---|---|---|---|---|
| 104A | Virgil silt loam, 0 to 2 percent slopes | Very limited | Virgil (90%) | Frost action (1.00) | 14.7 | 18.1% |
| | | | | Low strength (1.00) | | |
| | | | | Depth to saturated zone (0.94) | | |
| | | | | Steel corrosion (0.75) | | |
| | | | | Shrink-swell (0.27) | | |
| | | | Drummer, drained (4%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Steel corrosion (0.75) | | |
| | | | Pella (4%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (0.99) | | |
| | | | | Slope shape across (0.30) | | |
| | | | Sable (2%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Steel corrosion (0.75) | | |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes | Very limited | Drummer, drained (94%) | Ponding (1.00) | 21.3 | 26.3% |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|---|---|---|---|---|---|---|
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Steel corrosion (0.75) | | |
| | | | Harpster, drained (3%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Steel corrosion (0.75) | | |
| | | | Peotone, drained (3%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Shrink-swell (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| 154A | Flanagan silt loam, 0 to 2 percent slopes | Very limited | Flanagan (95%) | Low strength (1.00) | 3.2 | 3.9% |
| | | | | Shrink-swell (0.89) | | |
| | | | | Steel corrosion (0.75) | | |
| | | | | Depth to saturated zone (0.75) | | |
| | | | | Frost action (0.50) | | |
| | | | Elpaso, drained (4%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|---|---|---|---|---|---|---|
| | | | | Steel corrosion (0.75) | | |
| 171B | Catlin silt loam, 2 to 5 percent slopes | Very limited | Catlin (99%) | Frost action (1.00) | 0.9 | 1.1% |
| | | | | Low strength (1.00) | | |
| | | | | Steel corrosion (0.75) | | |
| | | | | Shrink-swell (0.61) | | |
| | | | | Hillslope position (0.25) | | |
| 325C2 | Dresden silt loam, 4 to 6 percent slopes, eroded | Somewhat limited | Dresden, eroded (90%) | Steel corrosion (0.75) | 6.5 | 8.0% |
| | | | | Frost action (0.50) | | |
| | | | | Low strength (0.00) | | |
| 512B | Danabrook silt loam, 2 to 5 percent slopes | Very limited | Danabrook (92%) | Frost action (1.00) | 1.9 | 2.4% |
| | | | | Low strength (0.93) | | |
| | | | | Steel corrosion (0.75) | | |
| | | | | Hillslope position (0.25) | | |
| | | | | Shrink-swell (0.21) | | |
| | | | Drummer, drained (8%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Steel corrosion (0.75) | | |
| 667A | Kaneville silt loam, 0 to 2 percent slopes | Very limited | Kaneville (92%) | Frost action (1.00) | 21.2 | 26.2% |
| | | | | Low strength (0.96) | | |
| | | | | Steel corrosion (0.75) | | |
| | | | | Shrink-swell (0.50) | | |
| | | | | Hillslope position (0.25) | | |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|---|---|---|---|---|---|---|
| | | | Drummer (8%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Steel corrosion (0.75) | | |
| 667B | Kaneville silt loam, 2 to 5 percent slopes | Very limited | Kaneville (92%) | Frost action (1.00) | 11.2 | 13.8% |
| | | | | Low strength (0.96) | | |
| | | | | Steel corrosion (0.75) | | |
| | | | | Shrink-swell (0.50) | | |
| | | | | Hillslope position (0.25) | | |
| **Totals for Area of Interest** | | | | | **80.9** | **100.0%** |

| Rating | Acres in AOI | Percent of AOI |
|---|---|---|
| Very limited | 74.4 | 92.0% |
| Somewhat limited | 6.5 | 8.0% |
| **Totals for Area of Interest** | **80.9** | **100.0%** |

### Rating Options—Solar Arrays, Soil-based Anchor Systems (NRI 736)

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

## Unpaved Local Roads and Streets (NRI 736)

ENG - Engineering

Unpaved local roads and streets are those roads and streets that carry traffic year round but have a graded surface of local soil material or aggregate.

Description:

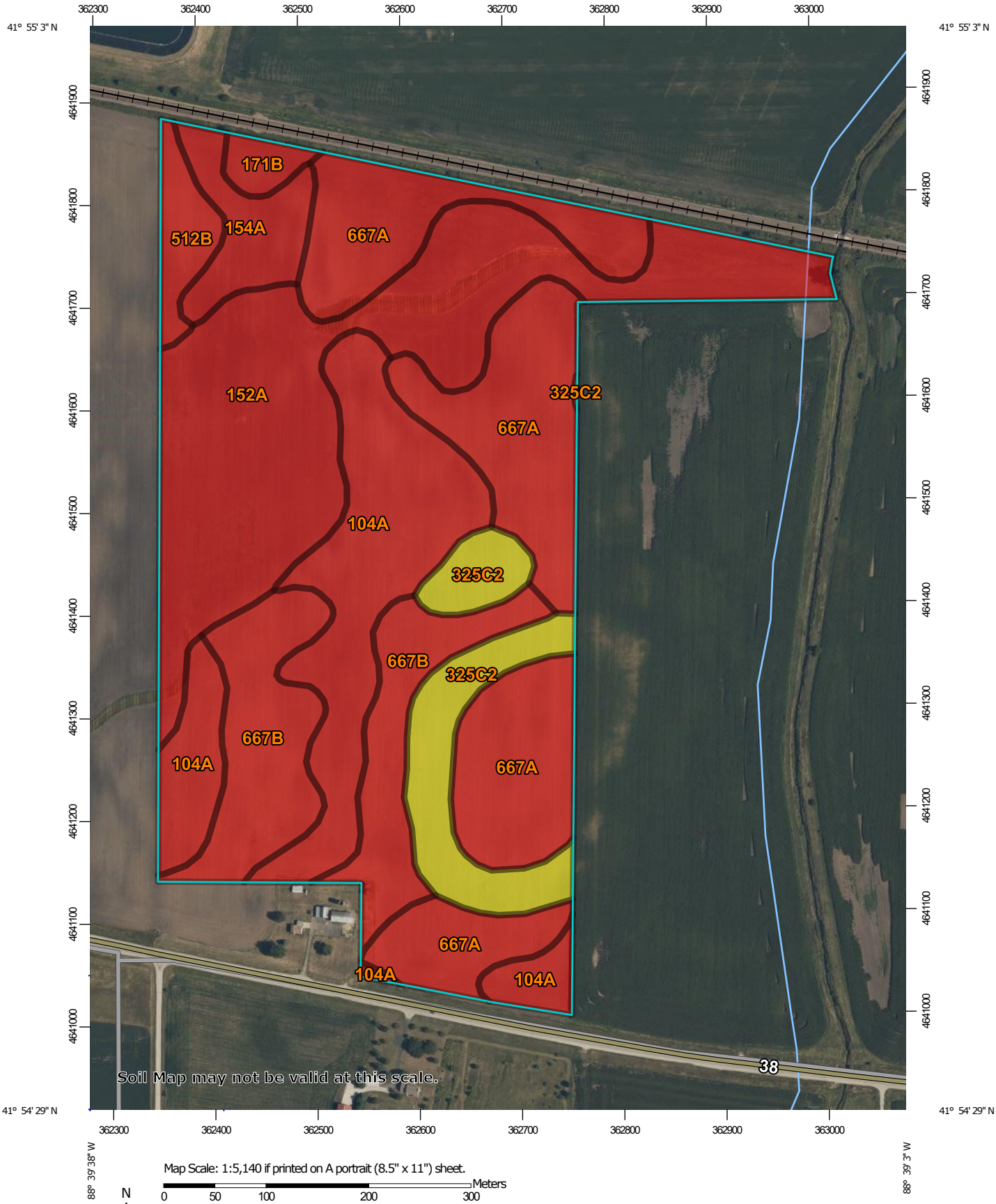
Unpaved local roads and streets are those roads and streets that carry traffic year round but have a graded surface of local soil material or aggregate.

The roads and streets consist of

(1) the underlying local soil material, either cut or fill, which is called "the sub-grade";

(2) the surface, which may be the same as the subgrade or may have aggrate such as crushed limestone added.

They are graded to shed water, and conventional drainage measures are provided. These roads and streets are built mainly from the soil at the site. Soil interpretations for local roads and streets are used as a tool in evaluating soil suitability and identifying soil limitations for the practice. The rating is for soils in their present condition and does not consider present land use. Soil properties and qualities that affect local roads and streets are those that influence the ease of excavation and grading and the traffic-supporting capacity. The properties and qualities that affect the ease of excavation and grading are hardness of bedrock or a cemented pan, depth to bedrock or a cemented pan, depth to a water table, flooding, the amount of large stones, and slope. The properties that affect traffic-supporting capacity are soil strength as inferred from the AASHTO group index and the Unified classification, subsidence, shrink-swell behavior, potential frost action, and depth to the seasonal high water table. The dust generating tendacy of the soil is also considered.




Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

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

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

**Soil Rating Lines**
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

**Soil Rating Points**
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

**Water Features**
- Streams and Canals

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

**Background**
- Aerial Photography

## MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: DeKalb County, Illinois
Survey Area Data: Version 18, 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—Aug 24, 2019

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.

## Tables—Unpaved Local Roads and Streets (NRI 736)

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|---|---|---|---|---|---|---|
| 104A | Virgil silt loam, 0 to 2 percent slopes | Very limited | Virgil (90%) | Frost action (1.00) | 14.7 | 18.1% |
| | | | | Low strength (1.00) | | |
| | | | | Depth to saturated zone (0.94) | | |
| | | | | Shrink-swell (0.27) | | |
| | | | | Dusty (0.05) | | |
| | | | Drummer, drained (4%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.44) | | |
| | | | Pella (4%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (0.99) | | |
| | | | | Shrink-swell (0.24) | | |
| | | | Sable (2%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.52) | | |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes | Very limited | Drummer, drained (94%) | Ponding (1.00) | 21.3 | 26.3% |
| | | | | Depth to saturated zone (1.00) | | |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|---|---|---|---|---|---|---|
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.37) | | |
| | | | Harpster, drained (3%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.29) | | |
| | | | Peotone, drained (3%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Shrink-swell (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| 154A | Flanagan silt loam, 0 to 2 percent slopes | Very limited | Flanagan (95%) | Low strength (1.00) | 3.2 | 3.9% |
| | | | | Shrink-swell (0.89) | | |
| | | | | Depth to saturated zone (0.75) | | |
| | | | | Frost action (0.50) | | |
| | | | | Dusty (0.06) | | |
| | | | Elpaso, drained (4%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.24) | | |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|---|---|---|---|---|---|---|
| 171B | Catlin silt loam, 2 to 5 percent slopes | Very limited | Catlin (99%) | Frost action (1.00) | 0.9 | 1.1% |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.61) | | |
| | | | | Dusty (0.05) | | |
| 325C2 | Dresden silt loam, 4 to 6 percent slopes, eroded | Somewhat limited | Dresden, eroded (90%) | Frost action (0.50) | 6.5 | 8.0% |
| | | | | Dusty (0.04) | | |
| | | | | Low strength (0.00) | | |
| 512B | Danabrook silt loam, 2 to 5 percent slopes | Very limited | Danabrook (92%) | Frost action (1.00) | 1.9 | 2.4% |
| | | | | Low strength (0.93) | | |
| | | | | Shrink-swell (0.21) | | |
| | | | | Dusty (0.04) | | |
| | | | Drummer, drained (8%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.65) | | |
| 667A | Kaneville silt loam, 0 to 2 percent slopes | Very limited | Kaneville (92%) | Frost action (1.00) | 21.2 | 26.2% |
| | | | | Low strength (0.96) | | |
| | | | | Shrink-swell (0.50) | | |
| | | | | Dusty (0.04) | | |
| | | | Drummer (8%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.50) | | |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|---|---|---|---|---|---|---|
| 667B | Kaneville silt loam, 2 to 5 percent slopes | Very limited | Kaneville (92%) | Frost action (1.00) | 11.2 | 13.8% |
| | | | | Low strength (0.96) | | |
| | | | | Shrink-swell (0.50) | | |
| | | | | Dusty (0.05) | | |
| **Totals for Area of Interest** | | | | | **80.9** | **100.0%** |

| Rating | Acres in AOI | Percent of AOI |
|---|---|---|
| Very limited | 74.4 | 92.0% |
| Somewhat limited | 6.5 | 8.0% |
| **Totals for Area of Interest** | **80.9** | **100.0%** |

### Rating Options—Unpaved Local Roads and Streets (NRI 736)

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

# Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

## Farmland Classification (NRI 736)

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

Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

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

# MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

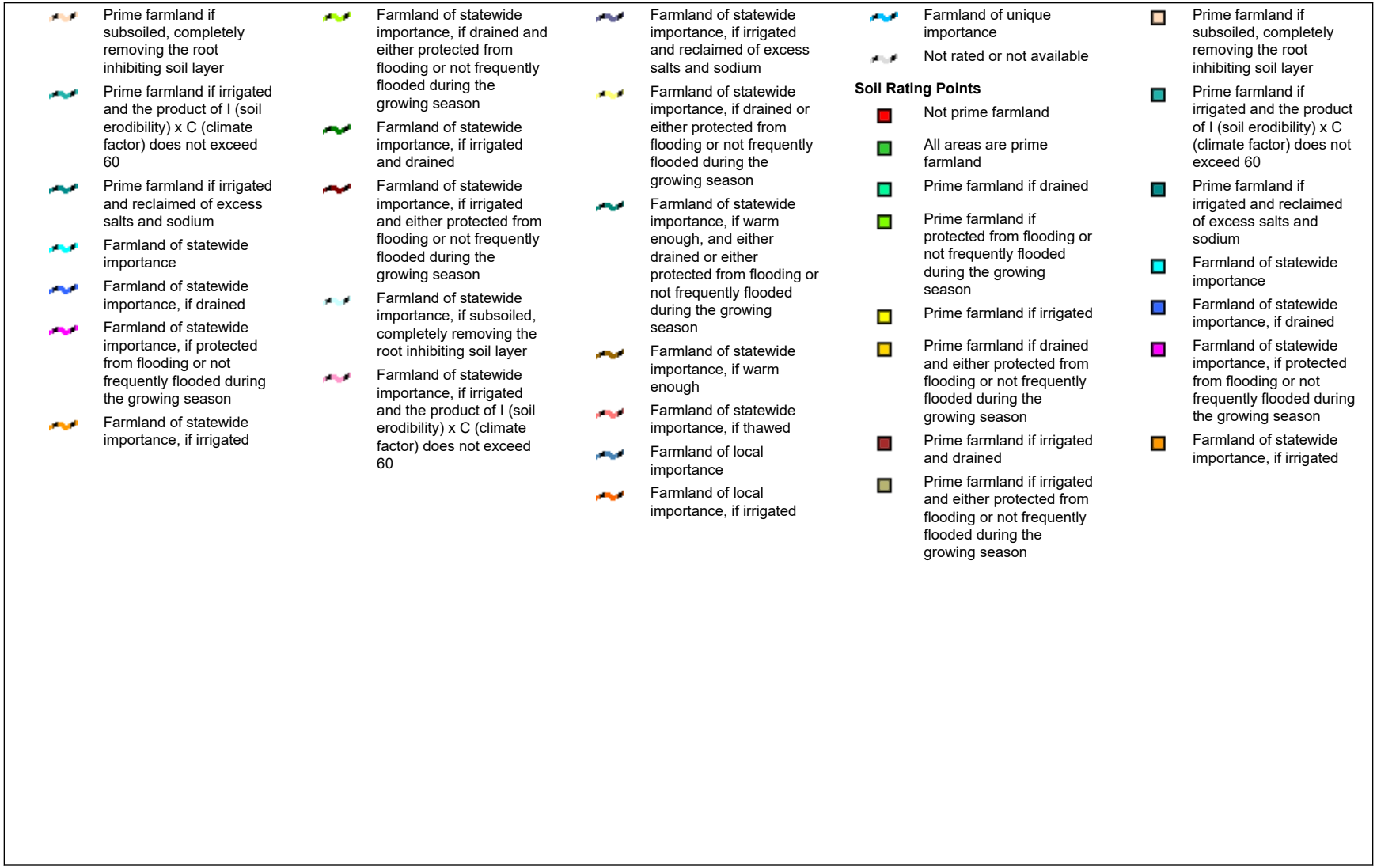
**Soils**

**Soil Rating Polygons**

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

**Soil Rating Lines**

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


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

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

**Water Features**

- Streams and Canals

**Transportation**

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

**Background**

- Aerial Photography

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

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

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

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

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

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

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

Soil Survey Area: DeKalb County, Illinois
Survey Area Data: Version 18, 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—Aug 24, 2019

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—Farmland Classification (NRI 736)

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| 104A | Virgil silt loam, 0 to 2 percent slopes | Prime farmland if drained | 14.7 | 18.1% |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes | Prime farmland if drained | 21.3 | 26.3% |
| 154A | Flanagan silt loam, 0 to 2 percent slopes | All areas are prime farmland | 3.2 | 3.9% |
| 171B | Catlin silt loam, 2 to 5 percent slopes | All areas are prime farmland | 0.9 | 1.1% |
| 325C2 | Dresden silt loam, 4 to 6 percent slopes, eroded | All areas are prime farmland | 6.5 | 8.0% |
| 512B | Danabrook silt loam, 2 to 5 percent slopes | All areas are prime farmland | 1.9 | 2.4% |
| 667A | Kaneville silt loam, 0 to 2 percent slopes | All areas are prime farmland | 21.2 | 26.2% |
| 667B | Kaneville silt loam, 2 to 5 percent slopes | All areas are prime farmland | 11.2 | 13.8% |
| **Totals for Area of Interest** | | | **80.9** | **100.0%** |

### Rating Options—Farmland Classification (NRI 736)

*Aggregation Method:* No Aggregation Necessary

*Tie-break Rule:* Lower

# Water Management

Water Management interpretations are tools for evaluating the potential of the soil in the application of various water management practices. Example interpretations include pond reservoir area, embankments, dikes, levees, and excavated ponds.

## Surface Water Management, System (NRI 736)

The ratings for Surface Water Management, System are based on the soil properties that affect the capacity of the soil to convey surface water across the landscape. Factors affecting the system installation and performance are considered. Water conveyances include graded ditches, grassed waterways, terraces, and diversions. The ratings are for soils in their natural condition and do not consider present land use. The properties that affect the surface system performance include depth to bedrock, saturated hydraulic conductivity, depth to cemented pan, slope, flooding, ponding, large stone content, sodicity, surface water erosion, and gypsum content.

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

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

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

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

## Map—Surface Water Management, System (NRI 736)

Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

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

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

**Soil Rating Lines**
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

**Soil Rating Points**
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

**Water Features**
- Streams and Canals

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

**Background**
- Aerial Photography

## MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: DeKalb County, Illinois
Survey Area Data: Version 18, 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—Aug 24, 2019

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.

## Tables—Surface Water Management, System (NRI 736)

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|---|---|---|---|---|---|---|
| 104A | Virgil silt loam, 0 to 2 percent slopes | Not limited | Virgil (90%) | | 14.7 | 18.1% |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes | Somewhat limited | Drummer, drained (94%) | Ponding (0.50) | 21.3 | 26.3% |
| | | | Harpster, drained (3%) | Ponding (0.50) | | |
| | | | Peotone, drained (3%) | Ponding (0.50) | | |
| 154A | Flanagan silt loam, 0 to 2 percent slopes | Not limited | Flanagan (95%) | | 3.2 | 3.9% |
| 171B | Catlin silt loam, 2 to 5 percent slopes | Not limited | Catlin (99%) | | 0.9 | 1.1% |
| 325C2 | Dresden silt loam, 4 to 6 percent slopes, eroded | Somewhat limited | Dresden, eroded (90%) | Slope (0.78) | 6.5 | 8.0% |
| | | | | Water Erosion (0.18) | | |
| | | | Will (4%) | Ponding (0.50) | | |
| 512B | Danabrook silt loam, 2 to 5 percent slopes | Somewhat limited | Danabrook (92%) | Slope (0.06) | 1.9 | 2.4% |
| | | | | Water Erosion (0.01) | | |
| | | | Drummer, drained (8%) | Ponding (0.50) | | |
| 667A | Kaneville silt loam, 0 to 2 percent slopes | Not limited | Kaneville (92%) | | 21.2 | 26.2% |
| 667B | Kaneville silt loam, 2 to 5 percent slopes | Somewhat limited | Kaneville (92%) | Slope (0.06) | 11.2 | 13.8% |
| | | | | Water Erosion (0.04) | | |
| **Totals for Area of Interest** | | | | | **80.9** | **100.0%** |

| Rating | Acres in AOI | Percent of AOI |
|---|---|---|
| Somewhat limited | 40.9 | 50.6% |
| Not limited | 40.0 | 49.4% |
| **Totals for Area of Interest** | **80.9** | **100.0%** |

## Rating Options—Surface Water Management, System (NRI 736)

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

# Soil Properties and Qualities

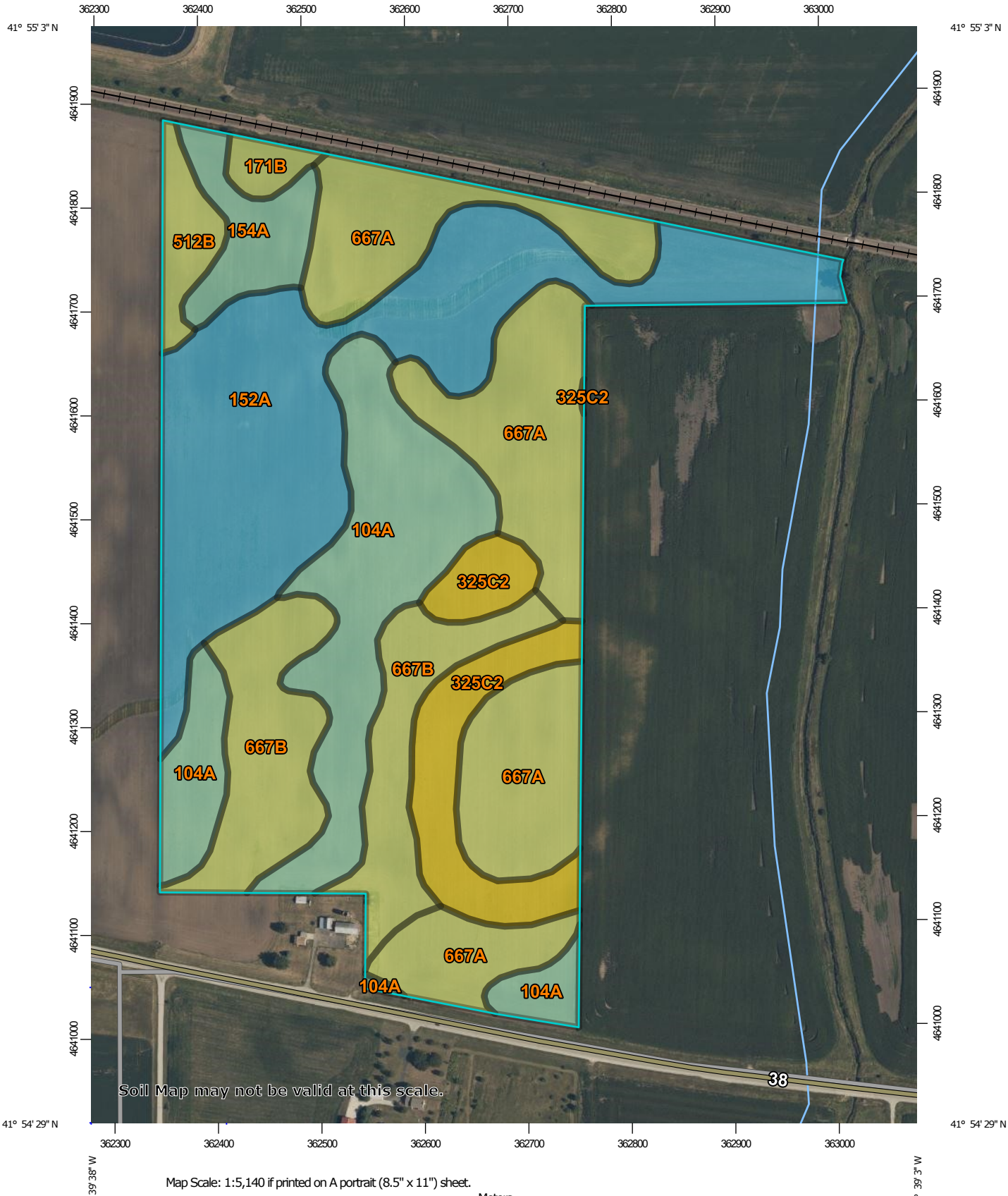
The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual 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.

### Drainage Class (NRI 736)

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




Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

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

## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**

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

**Soil Rating Lines**

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

**Soil Rating Points**

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

**Water Features**

- Streams and Canals

**Transportation**

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

**Background**

- Aerial Photography

## MAP INFORMATION

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

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

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

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

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

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Survey Area Data: Version 18, 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—Aug 24, 2019

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### Table—Drainage Class (NRI 736)

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| 104A | Virgil silt loam, 0 to 2 percent slopes | Somewhat poorly drained | 14.7 | 18.1% |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes | Poorly drained | 21.3 | 26.3% |
| 154A | Flanagan silt loam, 0 to 2 percent slopes | Somewhat poorly drained | 3.2 | 3.9% |
| 171B | Catlin silt loam, 2 to 5 percent slopes | Moderately well drained | 0.9 | 1.1% |
| 325C2 | Dresden silt loam, 4 to 6 percent slopes, eroded | Well drained | 6.5 | 8.0% |
| 512B | Danabrook silt loam, 2 to 5 percent slopes | Moderately well drained | 1.9 | 2.4% |
| 667A | Kaneville silt loam, 0 to 2 percent slopes | Moderately well drained | 21.2 | 26.2% |
| 667B | Kaneville silt loam, 2 to 5 percent slopes | Moderately well drained | 11.2 | 13.8% |
| **Totals for Area of Interest** | | | **80.9** | **100.0%** |

### Rating Options—Drainage Class (NRI 736)

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

## Hydrologic Soil Group (NRI 736)

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 (NRI 736)

Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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

## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Soil Rating Lines**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Soil Rating Points**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Water Features**

- Streams and Canals

**Transportation**

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

**Background**

- Aerial Photography

## MAP INFORMATION

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

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

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

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Survey Area Data: Version 18, Aug 28, 2023

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Date(s) aerial images were photographed: Aug 3, 2019—Aug 24, 2019

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### Table—Hydrologic Soil Group (NRI 736)

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| 104A | Virgil silt loam, 0 to 2 percent slopes | B/D | 14.7 | 18.1% |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes | B/D | 21.3 | 26.3% |
| 154A | Flanagan silt loam, 0 to 2 percent slopes | C/D | 3.2 | 3.9% |
| 171B | Catlin silt loam, 2 to 5 percent slopes | C | 0.9 | 1.1% |
| 325C2 | Dresden silt loam, 4 to 6 percent slopes, eroded | B | 6.5 | 8.0% |
| 512B | Danabrook silt loam, 2 to 5 percent slopes | C | 1.9 | 2.4% |
| 667A | Kaneville silt loam, 0 to 2 percent slopes | C | 21.2 | 26.2% |
| 667B | Kaneville silt loam, 2 to 5 percent slopes | C | 11.2 | 13.8% |
| **Totals for Area of Interest** | | | **80.9** | **100.0%** |

### Rating Options—Hydrologic Soil Group (NRI 736)

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

# Water Features

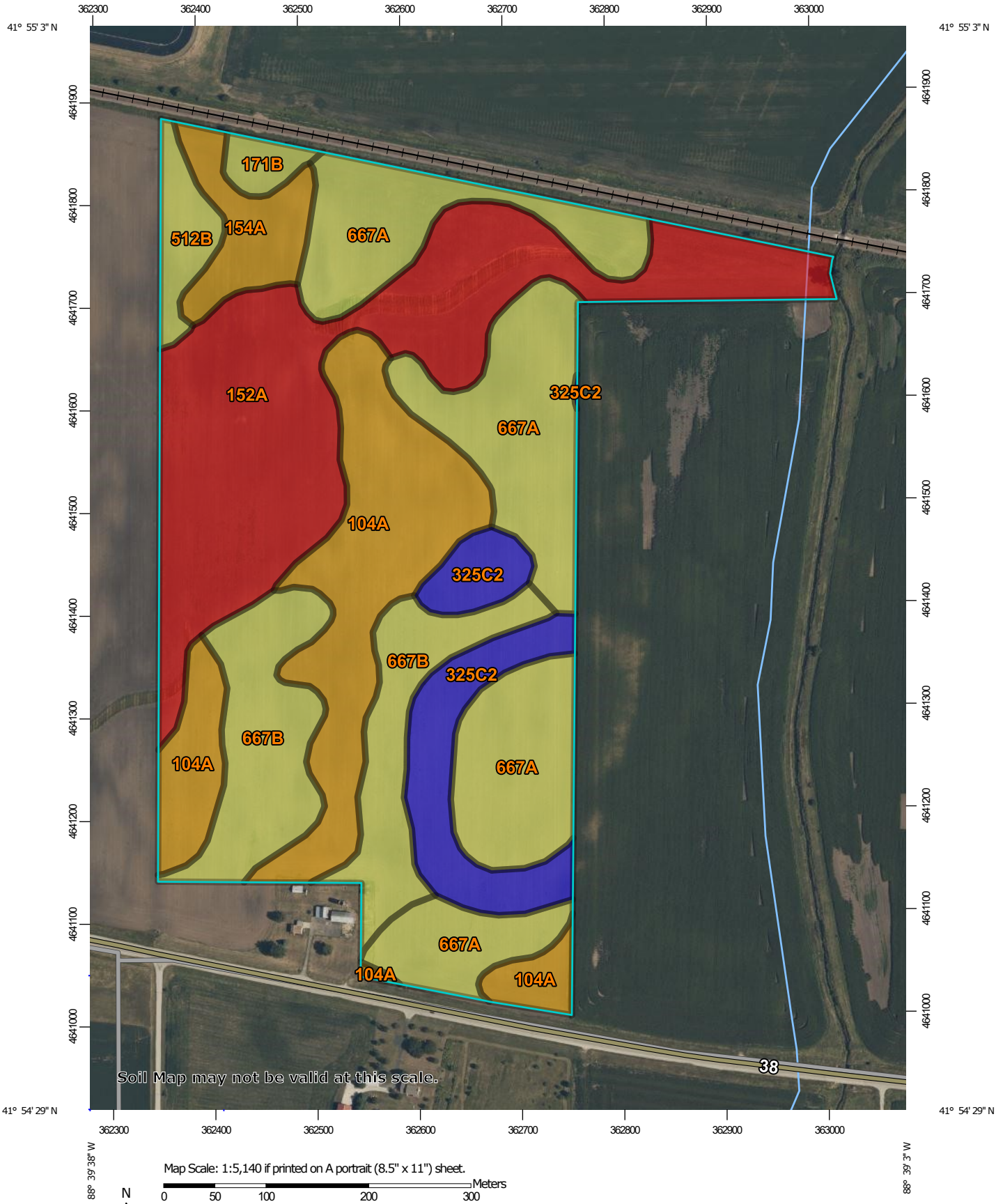
Water Features include ponding frequency, flooding frequency, and depth to water table.

## Depth to Water Table (NRI 736)

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

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

# Custom Soil Resource Report
## Map—Depth to Water Table (NRI 736)




Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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

## MAP LEGEND

**Area of Interest (AOI)**

Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

**Soil Rating Lines**

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

**Soil Rating Points**

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

**Water Features**

Streams and Canals

**Transportation**

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

**Background**

Aerial Photography

## MAP INFORMATION

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

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

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

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Survey Area Data: Version 18, Aug 28, 2023

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Date(s) aerial images were photographed: Aug 3, 2019—Aug 24, 2019

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## Table—Depth to Water Table (NRI 736)

| Map unit symbol | Map unit name | Rating (centimeters) | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| 104A | Virgil silt loam, 0 to 2 percent slopes | 38 | 14.7 | 18.1% |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes | 15 | 21.3 | 26.3% |
| 154A | Flanagan silt loam, 0 to 2 percent slopes | 46 | 3.2 | 3.9% |
| 171B | Catlin silt loam, 2 to 5 percent slopes | 81 | 0.9 | 1.1% |
| 325C2 | Dresden silt loam, 4 to 6 percent slopes, eroded | >200 | 6.5 | 8.0% |
| 512B | Danabrook silt loam, 2 to 5 percent slopes | 84 | 1.9 | 2.4% |
| 667A | Kaneville silt loam, 0 to 2 percent slopes | 84 | 21.2 | 26.2% |
| 667B | Kaneville silt loam, 2 to 5 percent slopes | 84 | 11.2 | 13.8% |
| **Totals for Area of Interest** | | | **80.9** | **100.0%** |

### Rating Options—Depth to Water Table (NRI 736)

*Units of Measure:* centimeters

*Aggregation Method:* Dominant Component

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Lower

*Interpret Nulls as Zero:* No

*Beginning Month:* January

*Ending Month:* December

## Flooding Frequency Class (NRI 736)

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

Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent.

"None" means that flooding is not probable. The chance of flooding is nearly 0 percent in any year. Flooding occurs less than once in 500 years.

"Very rare" means that flooding is very unlikely but possible under extremely unusual weather conditions. The chance of flooding is less than 1 percent in any year.

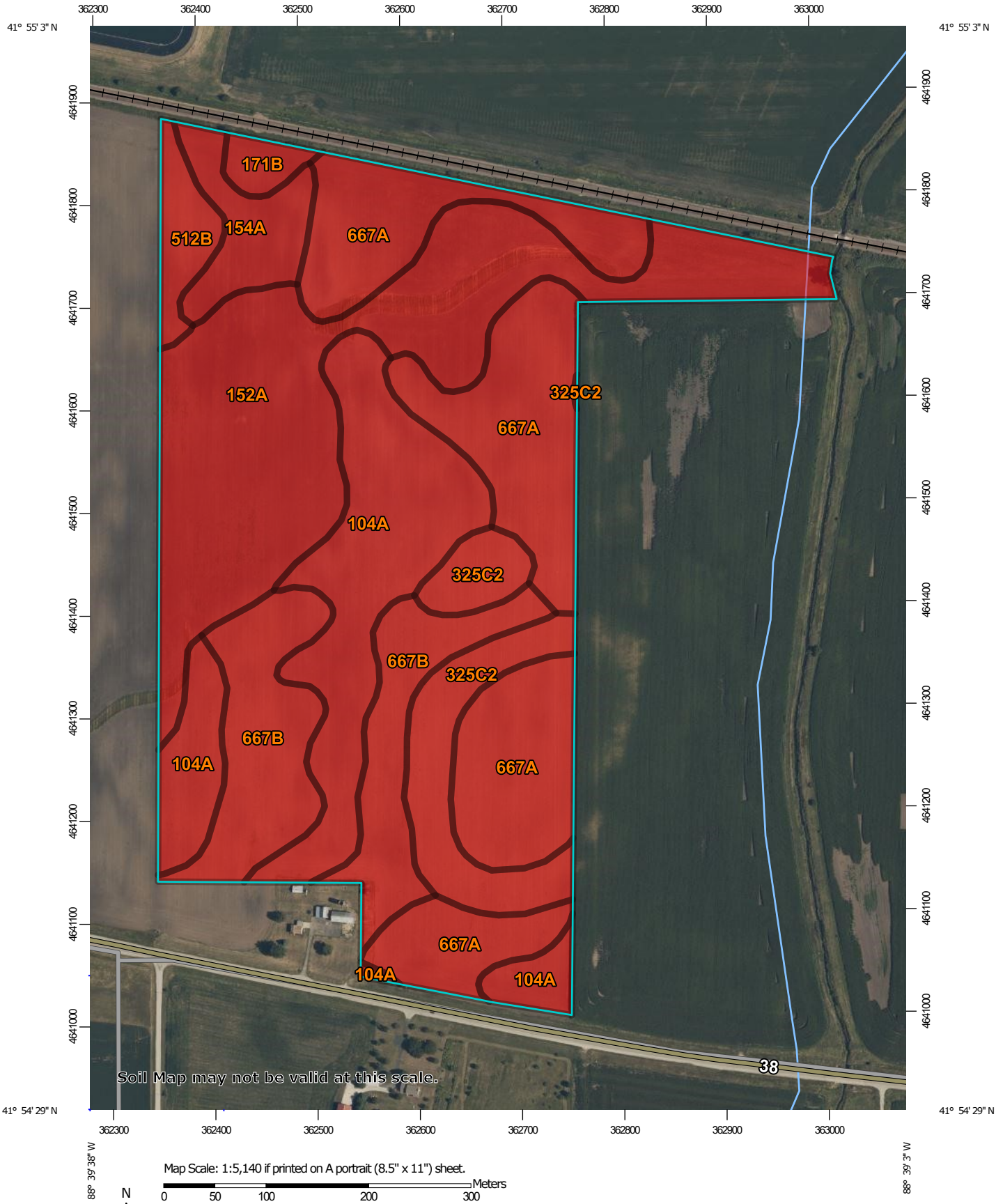
"Rare" means that flooding is unlikely but possible under unusual weather conditions. The chance of flooding is 1 to 5 percent in any year.

"Occasional" means that flooding occurs infrequently under normal weather conditions. The chance of flooding is 5 to 50 percent in any year.

"Frequent" means that flooding is likely to occur often under normal weather conditions. The chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year.

"Very frequent" means that flooding is likely to occur very often under normal weather conditions. The chance of flooding is more than 50 percent in all months of any year.

# Custom Soil Resource Report
## Map—Flooding Frequency Class (NRI 736)




Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**
- None
- Very Rare
- Rare
- Occasional
- Common
- Frequent
- Very Frequent
- Not rated or not available

**Soil Rating Lines**
- None
- Very Rare
- Rare
- Occasional
- Common
- Frequent
- Very Frequent
- Not rated or not available

**Soil Rating Points**
- None
- Very Rare
- Rare
- Occasional
- Common
- Frequent
- Very Frequent
- Not rated or not available

**Water Features**
- Streams and Canals

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

**Background**
- Aerial Photography

## MAP INFORMATION

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

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

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

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

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Survey Area Data: Version 18, Aug 28, 2023

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Date(s) aerial images were photographed: Aug 3, 2019—Aug 24, 2019

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### Table—Flooding Frequency Class (NRI 736)

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| 104A | Virgil silt loam, 0 to 2 percent slopes | None | 14.7 | 18.1% |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes | None | 21.3 | 26.3% |
| 154A | Flanagan silt loam, 0 to 2 percent slopes | None | 3.2 | 3.9% |
| 171B | Catlin silt loam, 2 to 5 percent slopes | None | 0.9 | 1.1% |
| 325C2 | Dresden silt loam, 4 to 6 percent slopes, eroded | None | 6.5 | 8.0% |
| 512B | Danabrook silt loam, 2 to 5 percent slopes | None | 1.9 | 2.4% |
| 667A | Kaneville silt loam, 0 to 2 percent slopes | None | 21.2 | 26.2% |
| 667B | Kaneville silt loam, 2 to 5 percent slopes | None | 11.2 | 13.8% |
| **Totals for Area of Interest** | | | **80.9** | **100.0%** |

### Rating Options—Flooding Frequency Class (NRI 736)

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* More Frequent

*Beginning Month:* January

*Ending Month:* December

## Ponding Frequency Class (NRI 736)

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

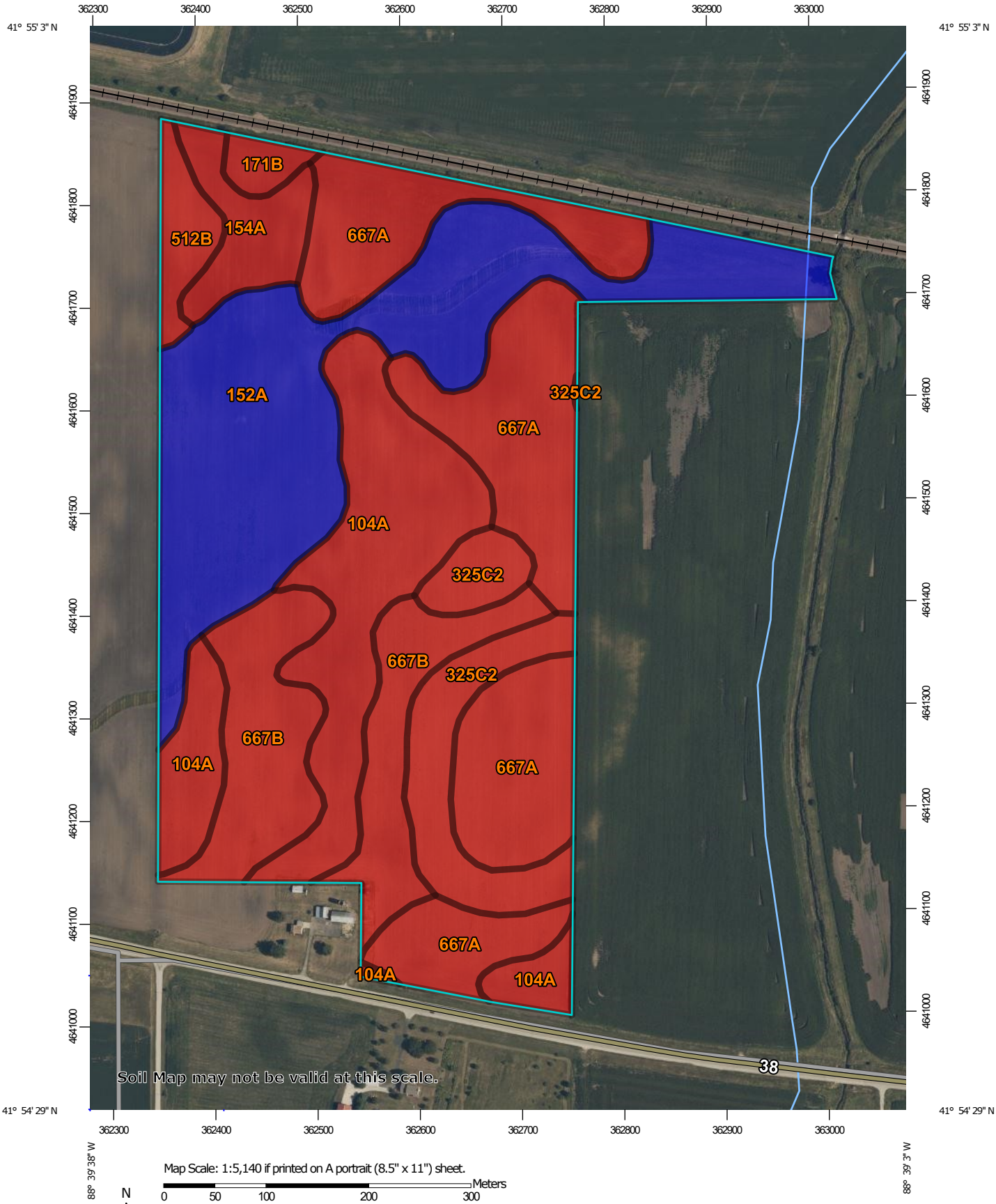
"None" means that ponding is not probable. The chance of ponding is nearly 0 percent in any year.

"Rare" means that ponding is unlikely but possible under unusual weather conditions. The chance of ponding is nearly 0 percent to 5 percent in any year.

"Occasional" means that ponding occurs, on the average, once or less in 2 years. The chance of ponding is 5 to 50 percent in any year.

"Frequent" means that ponding occurs, on the average, more than once in 2 years. The chance of ponding is more than 50 percent in any year.

# Custom Soil Resource Report
## Map—Ponding Frequency Class (NRI 736)




Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**
- None
- Rare
- Occasional
- Frequent
- Not rated or not available

**Soil Rating Lines**
- None
- Rare
- Occasional
- Frequent
- Not rated or not available

**Soil Rating Points**
- None
- Rare
- Occasional
- Frequent
- Not rated or not available

**Water Features**
- Streams and Canals

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

**Background**
- Aerial Photography

## MAP INFORMATION

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

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

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## Table—Ponding Frequency Class (NRI 736)

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| 104A | Virgil silt loam, 0 to 2 percent slopes | None | 14.7 | 18.1% |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes | Frequent | 21.3 | 26.3% |
| 154A | Flanagan silt loam, 0 to 2 percent slopes | None | 3.2 | 3.9% |
| 171B | Catlin silt loam, 2 to 5 percent slopes | None | 0.9 | 1.1% |
| 325C2 | Dresden silt loam, 4 to 6 percent slopes, eroded | None | 6.5 | 8.0% |
| 512B | Danabrook silt loam, 2 to 5 percent slopes | None | 1.9 | 2.4% |
| 667A | Kaneville silt loam, 0 to 2 percent slopes | None | 21.2 | 26.2% |
| 667B | Kaneville silt loam, 2 to 5 percent slopes | None | 11.2 | 13.8% |
| **Totals for Area of Interest** | | | **80.9** | **100.0%** |

## Rating Options—Ponding Frequency Class (NRI 736)

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* More Frequent

*Beginning Month:* January

*Ending Month:* December

# Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

# Soil Erosion

This folder contains a collection of tabular reports that present soil erosion factors and groupings. The reports (tables) include all selected map units and components for each map unit. Soil erosion factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

## RUSLE2 Related Attributes (NRI 736)

This report summarizes those soil attributes used by the Revised Universal Soil Loss Equation Version 2 (RUSLE2) for the map units in the selected area. The report includes the map unit symbol, the component name, and the percent of the component in the map unit. Soil property data for each map unit component include the hydrologic soil group, erosion factor Kf for the surface horizon, erosion factor T, and the representative percentage of sand, silt, and clay in the mineral surface horizon. Missing surface data may indicate the presence of an organic layer.

### Report—RUSLE2 Related Attributes (NRI 736)

Soil properties and interpretations for erosion runoff calculations. The surface mineral horizon properties are displayed or the first mineral horizon below an organic surface horizon. Organic horizons are not displayed.

**RUSLE2 Related Attributes–DeKalb County, Illinois**

| Map symbol and soil name | Pct. of map unit | Slope length (ft) | Hydrologic group | Kf | T factor | Representative value | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | % Sand | % Silt | % Clay |
| 104A—Virgil silt loam, 0 to 2 percent slopes | | | | | | | | |
| Virgil | 90 | 249 | B/D | .37 | 5 | 5.0 | 74.0 | 21.0 |
| 152A—Drummer silty clay loam, 0 to 2 percent slopes | | | | | | | | |
| Drummer, drained | 94 | 298 | B/D | .24 | 5 | 8.0 | 61.0 | 31.0 |

| RUSLE2 Related Attributes–DeKalb County, Illinois | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Map symbol and soil name | Pct. of map unit | Slope length (ft) | Hydrologic group | Kf | T factor | Representative value | | |
| | | | | | | % Sand | % Silt | % Clay |
| 154A—Flanagan silt loam, 0 to 2 percent slopes | | | | | | | | |
| Flanagan | 95 | 298 | C/D | .32 | 5 | 5.0 | 71.0 | 24.0 |
| 171B—Catlin silt loam, 2 to 5 percent slopes | | | | | | | | |
| Catlin | 99 | 249 | C | .32 | 5 | 4.0 | 70.0 | 26.0 |
| 325C2—Dresden silt loam, 4 to 6 percent slopes, eroded | | | | | | | | |
| Dresden, eroded | 90 | 151 | B | .32 | 3 | 18.0 | 59.5 | 22.5 |
| 512B—Danabrook silt loam, 2 to 5 percent slopes | | | | | | | | |
| Danabrook | 92 | 298 | C | .32 | 5 | 7.0 | 71.0 | 22.0 |
| 667A—Kaneville silt loam, 0 to 2 percent slopes | | | | | | | | |
| Kaneville | 92 | 298 | C | .43 | 5 | 5.0 | 74.0 | 21.0 |
| 667B—Kaneville silt loam, 2 to 5 percent slopes | | | | | | | | |
| Kaneville | 92 | 249 | C | .37 | 5 | 5.0 | 75.0 | 20.0 |

# Water Features

This folder contains tabular reports that present soil hydrology information. The reports (tables) include all selected map units and components for each map unit. Water Features include ponding frequency, flooding frequency, and depth to water table.

## Hydrologic Soil Group and Surface Runoff (NRI 736)

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

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

The four hydrologic soil groups are:

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

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained

soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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

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

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

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

## Report—Hydrologic Soil Group and Surface Runoff (NRI 736)

Absence of an entry indicates that the data were not estimated. The dash indicates no documented presence.

| Hydrologic Soil Group and Surface Runoff–DeKalb County, Illinois | | | |
|---|---|---|---|
| **Map symbol and soil name** | **Pct. of map unit** | **Surface Runoff** | **Hydrologic Soil Group** |
| | | | |
| 104A—Virgil silt loam, 0 to 2 percent slopes | | | |
| Virgil | 90 | — | B/D |
| 152A—Drummer silty clay loam, 0 to 2 percent slopes | | | |
| Drummer, drained | 94 | Negligible | B/D |
| 154A—Flanagan silt loam, 0 to 2 percent slopes | | | |
| Flanagan | 95 | Low | C/D |
| 171B—Catlin silt loam, 2 to 5 percent slopes | | | |
| Catlin | 99 | Low | C |
| 325C2—Dresden silt loam, 4 to 6 percent slopes, eroded | | | |
| Dresden, eroded | 90 | — | B |
| 512B—Danabrook silt loam, 2 to 5 percent slopes | | | |
| Danabrook | 92 | Low | C |
| 667A—Kaneville silt loam, 0 to 2 percent slopes | | | |
| Kaneville | 92 | Low | C |
| 667B—Kaneville silt loam, 2 to 5 percent slopes | | | |
| Kaneville | 92 | Low | C |

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## Natural Resources Conservation Service

## CONSERVATION PRACTICE STANDARD

# ACCESS ROAD

## CODE 560

## (ft)

### DEFINITION

An access road is an established route for equipment and vehicles.

### PURPOSE

This practice is used to accomplish one or more of the following purposes:

- To provide a fixed route for vehicular travel for resource activities involving the management of conservation forestry operations, livestock, agriculture, wildlife habitat, and other conservation enterprises

### CONDITIONS WHERE PRACTICE APPLIES

This practice applies where access is needed from a private or public road or highway to a land use enterprise or conservation measure, or where access is needed in a planned land use area.

Access roads range from single-purpose, seasonal-use roads, designed for low speed and rough driving conditions, to all-purpose, all-weather roads. Single-purpose roads provide access to areas such as forest fire lines, forest management activities, remote recreation areas, or for maintenance of facilities.

This practice does not apply to temporary or infrequently used trails used for logging. Use NRCS Conservation Practice Standard (CPS) Forest Trails and Landings (Code 655) to meet this need. Trails and walkways used for animals, pedestrians, or off-road vehicles are addressed in NRCS CPS Trails and Walkways (Code 575).

### CRITERIA

**General Criteria Applicable to All Purposes**

Design the access road to serve the enterprise or planned use with the expected vehicular or equipment traffic. Factors in the design include the type of vehicle or equipment and the speed, loads, soils, climate, turning radius, and other conditions under which vehicles and equipment are expected to operate.

**Location**

Locate the access road to serve the purpose intended, to facilitate the control and disposal of surface and subsurface water, to control or reduce erosion, and to make the best use of topographic features. Design the layout of the road to follow natural contours and slopes to minimize disturbance of drainage patterns. Locate the access road where it can be maintained and where water management problems are not created. To reduce potential pollution, position the road as far as possible from water bodies and watercourses. To the extent possible, do not impede overland flow.

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide online by going to the NRCS website at https://www.nrcs.usda.gov/ and type FOTG in the search field.

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**Alignment**
Adapt the gradient and horizontal alignment to the intensity of use, the mode of travel, the type of equipment and load weights, and the level of development.

Grades normally should not exceed 10 percent except for short lengths. A maximum grade of 15 percent should only be exceeded if necessary for special uses such as field access roads or fire protection roads.

**Width**
The minimum width of the roadbed for an all-purpose road is 14 feet for one-way traffic and 20 feet for two-way traffic. The roadbed width includes a tread-width of 10 feet for one-way traffic or 16 feet for two-way traffic and 2 feet of shoulder width on each side. Increase the two-way traffic width by a minimum of 4 feet for trailer traffic. Single-purpose roads will have a minimum width of 10 feet with greater widths at curves and turnouts. Use vegetation or other measures to protect the shoulders from erosion.

Use turnouts on single lane roads where vehicles travel in both directions on a limited basis. Design the turnout to accommodate the anticipated vehicle use.

Provide a turnaround at the end of dead end roads. Size the turnaround for the anticipated vehicle type that will be using the road.

Provide parking space as needed to keep vehicles from parking on the shoulder or other undesirable locations.

**Side slopes**
Design all cuts and fills to have stable slopes that are a minimum of 2 horizontal to 1 vertical. For short lengths, rock areas, or very steep hillsides, steeper slopes may be permitted if soil conditions warrant and special stabilization measures are installed. Where possible, design slopes to a minimum of 4 horizontal to 1 vertical to improve establishment and maintenance of turf.

Where possible, avoid areas with geological conditions and soils that are subject to slides. When the area cannot be avoided, treat the area to prevent slides.

**Drainage**
The type of drainage structures used will depend on the intended use and runoff conditions. Provide a culvert, bridge, ford, or surface cross drain for water management at every natural drainageway. The capacity and design of the drainage feature must be consistent with sound engineering principles and must be adequate for the class of vehicle, road type, land use in the watershed, and intensity of use.

When a culvert or bridge is installed in a drainageway, it must have a minimum capacity that is sufficient to convey the design storm runoff without causing erosion or road overtopping. Table 1 lists minimum design storm frequencies for various road types.

**Table 1: Minimum design storm frequencies**

| Road Intensity and Usage | Storm Frequency |
|---|---|
| Intermittent; single-purpose or farm use | 2 year - 24 Hour |
| Frequent; farm headquarters, livestock access, isolated recreation areas | 10 year - 24 Hour |
| High intensity; residential or public access | 25 year - 24 Hour |

For public access roads, design storm frequencies must also meet local standards.

Use NRCS CPSs Stream Crossing (Code 578), or Aquatic Organism Passage (Code 396) when aquatic species are present, to design stream crossings.

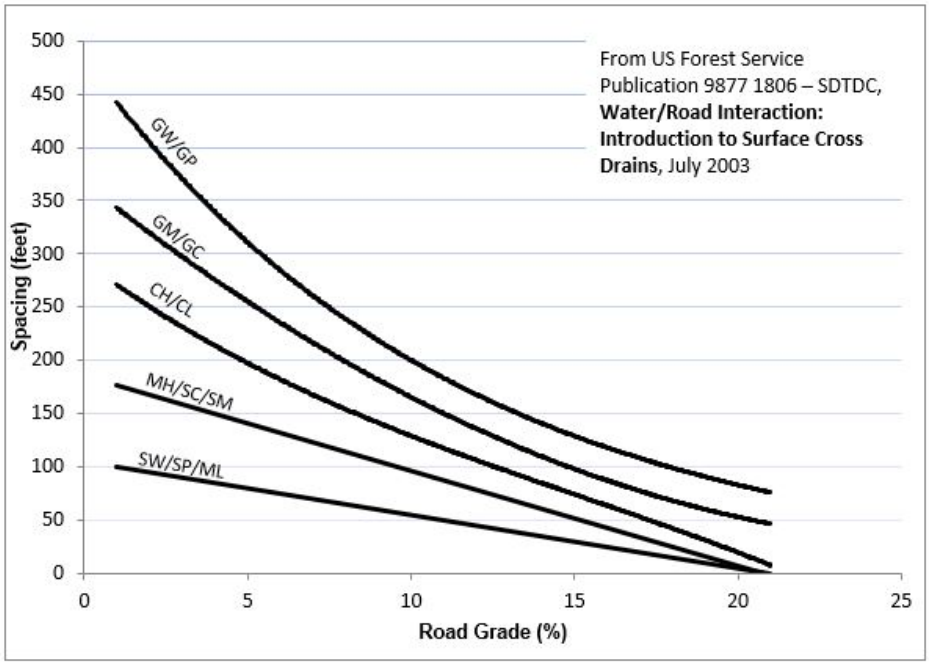
An erosion-resistant low point or overflow area may be constructed across the access road to supplement the culvert capacity on nonpublic-use roads.

Surface cross drains, such as broad-based or rolling dips, may be used to control and direct water flow off the road surface on low-intensity-use forest, ranch, or similar roads. Protect the outlets of drainage measures to limit erosion. On steep grades where water could run down the road, use a broad-based dip or other similar feature to divert runoff. The surface cross drain must be constructed of materials that are compatible with the use and maintenance of the road surface. The discharge area for a surface cross drain must be well-vegetated or have other erosion resistant materials (see fig. 1). Reduce separation distances as needed to account for local hydrologic conditions.

Design a minimum cross slope to direct precipitation off of the roadway. Cross slopes range from 1.5 to 2 percent for paved surfaces and 2 to 6 percent for unpaved surfaces.

Provide ditches, as needed, to move water away from the road. Maintain unobstructed flow into the ditches to prevent flows from causing roadside erosion. The capacity of a roadside ditch must be adequate to carry the drainage from the road surface. Design ditch channels to have stable grades and side slopes. Provide a stable outlet for the ditch. Protection may include riprap or other similar materials. Use NRCS CPSs Structure for Water Control (Code 587), Lined Waterway or Outlet (Code 468), or Grade Stabilization Structure (Code 410), if needed.

**Figure 1. Recommended spacing of surface cross drains based on soil types**




**Surfacing**

Install a wearing course or surface treatment on the access road if required by traffic needs, soil, climate, erosion control, particulate matter emission control, or other site condition. If none of these factors apply, no special treatment of the surface is required.

When a treatment is used, the type of treatment will depend on local conditions, available materials, and the existing road base. On roads made of soils with weak bearing capacity, such as silts, organics, and clays, or where it is necessary to separate the surfacing material from the foundation material, place a geotextile material specifically designed for road stabilization applications under the surface treatment. Use the criteria in NRCS CPS Heavy Use Area Protection (Code 561) to design the surface treatment. Do not use toxic and acid-forming materials to build the road.

**Safety**
Provide passing lanes, turnouts, guardrails, signs, and other facilities as needed for safe traffic flow. Design an intersection to a public highway to meet applicable Federal, State, and local criteria.

**Erosion control**
Use the criteria in NRCS CPS Critical Area Planting (Code 342) or the NRCS State-approved seeding specification to vegetate road banks and disturbed areas as soon as soil and climatic conditions are favorable. If permanent vegetation cannot be established in a timely manner, use appropriate temporary measures to control erosion. If the use of vegetation is precluded and protection against erosion is needed, use the criteria in NRCS CPS Mulching (Code 484) to provide surface protection.

During and after construction, use erosion and sediment control measures to minimize offsite damages.

## CONSIDERATIONS

Consider visual resources and environmental values during planning and design of the road system.

Consider locating roads outside of the active floodplain to reduce bank erosion potential and the effects on stream hydrology.

Limiting the number of vehicles and vehicle speed will reduce the potential for generation of particulate matter and decrease safety and air quality concerns.

Consider using additional conservation practices such as NRCS CPS Windbreak/Shelterbelt Establishment (Code 380), to reduce the potential for generation and transport of particulate matter emissions.

During adverse weather, some roads may become unsafe or may be damaged by use. Consider restricting access to the road at that time.

When revegetation is needed, consider revegetating using species or diverse mixes that are native or adapted to the site and have multiple benefits. In addition, where appropriate, consider a diverse mixture of forbs and wildflowers to support pollinator and other wildlife habitat.

Consideration should be given to—

- Effects on downstream flows, wetlands, or aquifers that would affect other water uses or users.
- Effects on wildlife habitats that would be associated with the practice.
- Utilizing buffers where possible to protect surface water.
- Short-term and construction-related effects of this practice.

## PLANS AND SPECIFICATIONS

Provide plans and specifications that describe the requirements for applying the practice to achieve its intended purpose. As a minimum, include—

- A plan view of the proposed road that shows water features, known utilities, and other features that affect the design.
- Road width and length with profile and typical cross section(s) including turnouts, parking, and turnarounds.
- Design road grades or maximum grades when applicable.
- Soils investigation. Include location of soil borings and plot of the soil/geologic boring showing the Unified Soil Classification System, as needed.
- Type and thickness of surface treatment including any subbase preparation.
- Grading plan.

- Cut and fill slopes where applicable.
- Planned drainage features.
- Location, size, type, length, and invert elevations of all required water control structures.
- Vegetative requirements that include vegetation materials to be used, establishment rates, and season of planting.
- Erosion and sediment control measures, as needed.
- Safety features.
- Construction and material specifications.

## OPERATION AND MAINTENANCE

Prepare a written operation and maintenance plan for the access road. As a minimum, include the following activities:

- Inspect culverts, roadside ditches, water bars, and outlets after each major runoff event and restore flow capacity as needed. Ensure proper cross section is available and outlets are stable.
- Maintain vegetated areas in adequate cover to meet the intended purpose(s).
- Fill low areas in travel treads and regrade, as needed, to maintain road cross section. Repair or replace surfacing materials as needed.
- Selection of chemical treatment(s) for surface treatment or snow/ice removal, as needed. Select the chemicals used for surface treatment or snow and ice removal to minimize adverse effects on stabilizing vegetation.
- Selection of dust control measures, as needed.

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# Request #2 – Special Use Permit

# Memorandum

**To:** **Brandy Williams, Town of Cortland Zoning Administrator**

**From:** **Eric Zweber, AICP, WSB**
**Lauren Zion, WSB**

**Date:** **October 22, 2025**

**Re:** **Cortland Solar Garden Special Use Permit Application**
***PINs: 0927300004; 0927100002***
*WSB Project No. 024543-000*

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Cortland Illinois Dynamics 1 LLC and Cortland Illinois Dynamics 2 LLC ("Cortland Solar" and "The Applicant") is pleased to present the necessary applications for two community solar photovoltaic (PV) projects in DeKalb County, Illinois. The proposed projects require the following Town approvals:

- **Annexation Approval –** An annexation must be approved by the Town of Cortland prior to any decision on a Special Use Permit.
- **Special Use Permit -** A Special Use Permit is requested, as a solar garden is listed as a Special Use in the AG, agricultural district.

The annexation approval is addressed separately in the preceding files of this packet. This memorandum addresses requirements for the Special Use Permit Approval.

**Overview and Project Description**

Cortland Solar is developing community solar projects in conjunction with the State of Illinois Future Energy Jobs Act (FEJA). Through this Act, the State established the Community Solar Program allowing developers to develop, permit, own, and operate solar projects with the ability to sell solar electricity directly to customers. The solar facilities connect to the ComEd distribution grid. ComEd delivers the power to customers and Cortland Solar bills the customer for the electricity they purchase.

Cortland Solar is proposing to develop a 5-megawatt AC solar project (Cortland 1) and a 2-megawatt AC solar project (Cortland 2) on property in DeKalb County **(Appendix A)**. The proposed solar sites are proposed to be annexed into the Town of Cortland as AG district property. The proposed solar sites are located in the northeast corner of the

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intersection of Lincoln Highway (State Route 38) and Chase Road. The site is located in Section 27, Township 40 North, Range 5 East in DeKalb County, Illinois.

The total area of the affected property is 80.3 acres. A portion of the property is proposed to be developed from agricultural cropland use into two solar sites. The proposed solar panel area is 29.9 acres, and the estimated disturbed area is 37.5 acres **(Appendix A)**. The remaining area (approximately 12.9 acres) will remain as agricultural cropland. After the solar panels are in place, the disturbed area will be reseeded with a short growth pollinator friendly seed mix **(Appendix A).**

The phasing plan for this project is to obtain the required jurisdictional and regulatory approvals for the solar projects to commence with a shovel ready project by July 4, 2026. Our objective would be to have the solar facilities commercially operational by December 31, 2028. We will complete the necessary requirements for the building permit application and approval after state selections have been made.

The site is suitable for a second phase of development consisting of an additional solar area, where it is located north of the proposed area identified in the site plan. The proposed development and associated improvements are all identified in the site plan.

**Zoning and Performance Standards**

The property is proposed for annexation into the AG, agricultural district. Solar Gardens are listed as a Special Use in the AG district. The performance standards for a Solar Garden are listed in section 9-4-34. B. of the Cortland Illinois Zoning Ordinance:

1. Bulk regulations:
    a. Minimum Lot Area: Five (5) Acres.
    b. Front and Corner Side Yard: Fifty feet (50').
    c. Side Yard: Fifty feet (50').
    d. Rear Yard: Fifty feet (50').
    e. Height: Ground or pole mounted solar energy system shall not exceed ten feet (10') in height as measured when the system is oriented at its maximum tilt. All other equipment shall not exceed fifteen feet (15') in height.

    *The parcels involved are approximately 62 acres and 19 acres, respectively. All equipment, including fences are located over 50' from any property line. The smallest proposed distance from fence to property line is 50'. When at full tilt, the system height will not exceed 10' in height.* ***(Appendix A)****.*

2. Off-Street Parking: There shall be a minimum of two (2) parking spaces with minimum dimensions of ten by twenty feet (10' x 20'). Accessways shall be a minimum of twelve feet (12') wide. Parking spaces and accessways located on

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private property do not have to be paved but do need to have a minimum of a seven inch (7") compacted stone base. Accessways located within the right-of-way shall meet standards set by the town engineer.

*Two off-street parking spaces with a minimum of a 7" compacted stone base will be provided on site **(Appendix A)**. The access driveway will be 18' wide, pursuant to approval by IDOT.*

3. Signage: An identification sign shall be posted at the entrance(s) to the site. Each such identification sign shall list the name and phone number of the operator. In addition to the identification sign(s) there shall be appropriate warning signage that is posted along all property lines which are clearly visible on the site. Both the identification sign(s) and the warning sign(s) are exempt from section 9-6 of the Municipal Code.

   *Warning signs will be posted on the sites, in locations to be identified prior to building permit application. Warning signs will comply with relevant safety signage standards.*

4. Power and Communication Lines: Power and communication lines running between banks of solar panels and to electric substations or interconnections with buildings shall be buried underground.

   *Utility lines will be placed underground as feasible up to the point of interconnection along State Route 38. The point of interconnection will require 14 aboveground utility poles. Six will be owned by Cortland Solar and located within the fenced area near the provided parking spaces. Eight will be owned by ComEd and located near the point of interconnection at State Route 38 **(Appendix A)**. Lines between these four sets of poles will be placed underground.*

5. Batteries: If the solar farm or solar garden consists of batteries or storage of batteries, adequate design must be provided to ensure all local, state and federal requirements regulating outdoor battery storage have been met.

   *No battery storage is included in either proposed solar garden facility.*

6. Interconnection: An interconnection agreement must be completed with the electric utility in whose service territory the system is located.

   *All interconnection studies have been completed, and we expect to sign the Generator Interconnection Agreement by December, 2025 **(Appendix B).***

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7. Stormwater and NPDES: Solar farms and solar gardens are subject to the town's stormwater management and erosion and sediment control provisions and NPDES permit requirements.

   *All site development will comply with the Town of Cortland's stormwater management and sediment control provisions. A NPDES permit will be received as needed, prior to construction. A site development permit from the Town will be required prior to construction. A stormwater management analysis is provided in* ***Appendix C****. The proposed conditions would result in a net reduction in peak flow rates and runoff volumes, due to the best management practice (BMP) of a low-growth pollinator grass seed mix. Final Stormwater BMPs will be provided at time of building permit submittal. As required in the AIMA* ***(Appendix D),*** *the Applicant is responsible for repairing any impacts to drainage tiles on site. The landowner has confirmed there is drainage tile on site through the grass waterways and in other locations. To avoid and mitigate impact, a drainage tile survey will be completed and submitted prior to building permit issuance.*

8. Ground Cover and Buffer Areas: The site of a ground mounted solar farm or solar garden energy system shall be improved and maintained with a native perennial vegetative ground cover over the entire property including under and around solar panels. The purpose of this ground cover shall be the prevention of soil erosion and the management of stormwater run-off. Topsoil shall not be removed during development, unless part of a remediation effort.

   *The area around and underneath the solar panels will be planted with a native low-growth pollinator grass mix, in compliance with IDNR standards* ***(Appendix A)****. Any necessary changes to existing grade will be identified before building permit application. As required per the ordinance and the AIMA, topsoil will not be removed from site during the development unless it's part of a remediation effort.*

9. Foundation: A qualified engineer shall certify that the foundation and design of the solar panels racking and support is within accepted professional standards, given local soil and climate conditions.

   *A geotechnical analysis of the site will be conducted following zoning approval and prior to building permit application. The geotechnical report will inform the appropriate mounting hardware, foundations, and installation methods for tracker poles given local soil, subsurface, and climate conditions.*

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10. Other Standards and Codes: All solar farms and solar gardens shall be in compliance with all applicable local, state and federal regulatory codes.

    *The proposed solar gardens will comply with all applicable regulations including but not limited to ANSI safety regulations, IPCB noise regulations, National Electric Code, and Building Code.*

11. Site Plan Required: A detailed site plan for both existing and proposed conditions must be submitted, showing location of all solar arrays, other structures, property lines, rights-of-way, easements, service roads, floodplains, wetlands and other protected natural resources, topography, electric equipment, and all other characteristics requested by the Town.

    *A site plan is attached in **Appendix A**.*

12. FAA Compliance: Solar farms and solar gardens that are located within five hundred feet (500') of an airport or within approach zones of an airport, are required to 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.

    *Based on the FAA Notice Criteria tool, the proposed structures on the site do not require FAA noticing or approval **(Appendix E)**. The nearest airport is the DeKalb Taylor Municipal Airport, located approximately 2.5 miles from the site area.*

13. Endangered Species and Wetlands: Solar farm and solar garden developers shall be required to initiate a natural resource review consultation with the Illinois Department of Natural Resources (IDNR) through the department's online, EcoCat program. Areas reviewed through this process will be endangered species and wetlands. The cost of the EcoCat consultation will be borne by the developer. Results of this consultation will be included in the special use application packet.

    *Consultation was concluded with IDNR EcoCAT. Results are included in **Appendix E, attachment C.** The USFWS Information for Planning and Consultation tool results are also included in **Appendix E, attachment D**.*

14. Upon request from the town, the owner or operator of a solar farm or solar garden must submit, within fourteen (14) calendar days, a current operation and maintenance report to the town.

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*Upon request, current operation and maintenance reports will be provided to the Town.*

15. Decommissioning:
    a. A decommissioning plan shall be required to be submitted when applying for all solar farms and solar gardens, to ensure that facilities are properly removed after their useful life.
    b. Decommissioning of solar panels must occur in the event they are not in use for ninety (90) consecutive days.
    c. The owner or operator will have six (6) months to complete the decommissioning plan after operation of a solar farm or solar garden stops being operational.
    d. The decommissioning plan shall include provisions for removal of all structures and foundations, restoration of soil and vegetation and a plan ensuring financial resources will be available to fully decommission the site.
    e. The town board of trustees may require the posting of a bond, letter of credit, or the establishment of an escrow account to ensure the proper decommissioning. The posting of financial surety may be required prior to the issuance of a building permit for the facility. Said surety shall remained updated and valid until the solar farm/solar garden has been completely decommissioned in accordance with the latest approved decommissioning plan and restored in compliance with section 9-4-34.B.15. As outlined in the chapter establishing the special use permit, the amount of surety shall be periodically reviewed by staff and the surety amount adjusted accordingly.
    f. In the event that the State of Illinois enacts a law with regards to the decommissioning of a solar farm or solar garden, the strictest requirements shall prevail.
    g. The owner of a solar energy facility shall submit an update to this decommissioning plan every three (3) to five (5) years following issuance of the special use.

*The Applicant will follow all state and town regulations related to facility decommissioning. A decommissioning plan and cost estimate has been provided in **Appendix F**. The AIMA contains standard provisions on decommissioning and restoration including removal of all solar related equipment after the useful life of the facility and filing of necessary financial assurances during operation **(Appendix D).** In addition, decommissioning will be completed within six months as required by the town ordinance and will follow requirements of the Cortland Ordinance.*

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16. Restoration Requirements: The owner of a solar farm or solar garden shall provide the zoning administrator with a written notice of termination of operations or abandonment of the solar energy facility. Within one hundred twenty (120) consecutive calendar days immediately following the town's receipt of such written notice or within one hundred twenty (120) consecutive calendar days immediately following the termination of such special use, whichever first occurs, the owner of each such solar farm or solar garden shall:
    a. Remove all structures, buildings, solar panels, above ground improvements, outdoor storage, fencing, equipment, and roadways; and
    b. Completely remove all foundations, pads, and underground electrical wires; and
    c. Remove all hazardous material from the property and dispose of the hazardous material in accordance with all applicable federal, Illinois, and Town laws, statues, ordinances, rules, and regulations; and
    d. Restoration of all soil and vegetation.

    *The owner will provide written notice when the facility reaches the end of its operational life. A decommissioning plan and cost estimate has been provided in* ***Appendix F****. The site decommissioning will be completed within six months, as required by the Cortland Ordinance.*

17. Bonds: Prior to the issuance of a building permit, the owner of a solar energy facility shall provide the town with a performance and payment bond with adequate security or surety bond in an amount determined adequate by the town board to guarantee the performance of the aforesaid restoration requirements and decommissioning plan.

    *Prior to issuance of a building permit, the Applicant will provide the Town with a financial surety as required, consistent with the decommissioning costs as identified in the decommissioning plan* ***(Appendix F)****.*

18. Abandonment: A decommission plan shall be approved by the town board during the special use permit process. At the time of building permit, a letter of credit, or other financial surety instrument approved by the town attorney, in the amount of the estimated cost of decommission, as approved by the town engineer, shall be submitted to the town. If the solar farm or solar garden is abandoned and not properly decommissioned, the town shall utilize the funds to restore the property to its original or an improved condition.

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*Prior to issuance of a building permit, the Applicant will provide the Town with a financial surety as required, to guarantee the performance of decommissioning as identified in the decommissioning plan **(Appendix F)**.*

**Special Use Permit Standards**

The proposed solar projects will provide public benefit by producing renewable energy to improve quality of life. The projects will generate no greenhouse gas emissions during operation, avoiding some greenhouse gas emissions that would have otherwise been created during conventional electricity production for residents in the area. The proposed use will not have a substantial adverse effect on the neighborhood or adjacent property. The projects will not unduly increase traffic congestion (see "project parameters" below), nor will it be detrimental to public health, safety, or general welfare. Adequate public utilities, access roads, and drainage have been provided. The projects will not increase flood danger and will reduce runoff volumes **(Appendix C)**. The projects will not limit existing or future development of neighboring property.

**Site Appearance**

The existing land use within the property is approximately 80.3 acres of cultivated cropland per the USGS NLCD. Primarily agricultural cropland and sparse rural residential uses encompass the areas surrounding the site. The municipal water treatment plant is located to the NW of the site. The proposed land use will include approximately 29.9 acres of solar panels and corresponding equipment within the fenced area. The area around and underneath the solar panels will be planted with native low-growth pollinator grass mixes.

One (1) access driveway off State Route 38 is proposed to provide an approach to the solar arrays for light duty service vehicles for maintenance and equipment purposes. The access road will be 18 feet in width. An 8-foot high chain link security fence will be constructed around the perimeter of the solar arrays. In addition, to be consistent with IDNR recommendations, we propose a 6" animal migration space at the bottom of the fence. Rows of panels are separated by lanes 14 to 25 feet wide.

The solar arrays will consist of one 5-megawatt AC solar facility and one 2-megawatt AC solar facility in which the total solar panel area is 29.9 acres and the estimated disturbed area is 37.5 acres **(Appendix A)**. The final layout of the arrays will be subject to construction and electrical engineering and ComEd's final interconnection approval. The ground-mounted solar array for Cortland 1 will consist of 10,500 bifacial 620-Watt modules and 105 single axis solar tracker systems that will connect to 150 kW smart inverters, while Cortland 2 will consist of 4,600 bifacial 620-Watt modules and 48 single axis solar tracker systems that will connect to 150 kW smart inverters. Smart inverters are then connected to a meter which measures the amount of electrical energy produced. The electrical energy will then be distributed directly to the public utility grid

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via a point of interconnection (POI) along State Route 38. The POI will require 14 aboveground utility poles. Six will be owned by Cortland Solar (which are located near the fence line for each array), and eight will be owned by ComEd (that will located near and within the IL Route 38 ROW) . There will be a total of 153 single axis trackers on site **(Appendix A).** There will be 48 inverters on site, and the project will require approximately 1,508 posts supporting the tracker systems and solar modules.

The angle of the solar arrays will change throughout the day as panels “track” the Sun. These trackers provide a lower view shed of the solar panels (maximum height 10 feet) with the added benefit of further reducing glare. The maximum tilt that a panel will reach is 36%. Solar array quantities and manufacturer information is provided in **Appendix A**. All photovoltaic systems will comply with the Illinois State Electric Code and National Electric Code.

**Project Parameters**

The maximum number of occupants on the site at one time will be 2 people. The maximum number of occupants on-site per day during construction will be approximately 25 people. The maximum number of employees on site per day during operation is approximately 2 employees periodically during any given month.

Vehicles accessing the site for maintenance will include light duty service vehicles for maintenance and equipment purposes. The maximum number of vehicles per day during construction will be approximately 30 vehicles. The maximum number of vehicles per day during operation will be approximately 2 vehicles periodically during any given month. Two parking spaces are proposed on site, as required by the ordinance. There are no existing or proposed public restrooms or floor drains on the site.

**Hydrological Features**

The FEMA FIRM maps for DeKalb County, Illinois identify that the site includes a minor portion (approximately 0.5 acres) of the 100-year floodplain **(Appendix C, figure 3A).** A stormwater management analysis of the site was conducted and provided in **Appendix C**. The analysis concludes that the proposed development and establishment of short growth pollinator mix will result in lower peak flow rates and lower runoff volumes from the project site than currently exist.

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) *Web Soil Survey* defines Hydrologic Soil Groups (HSG) on the property. HSG D, defined as having high runoff potential when thoroughly wet, is the predominant soil type on approximately 37.6 acres **(Appendix C, figure 4).** HSG C, defined as having moderately high runoff potential when thoroughly wet, covers an additional 36.3 acres while HSG B, defined as having moderately low runoff potential when wet, is the predominant soil type on the remaining 6.4 acres of the site.

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Topography within the project area ranges from 852 feet above mean sea level (AMSL) in the northeastern corner of the project area to 868 ft AMSL in the southeastern portion of the project area. Topographic relief is moderate, with an elevation difference of approximately 16 feet across the project area **(Appendix E, figure 3).** Erosion control best management practices and a Stormwater Pollution Prevention Plan (SWPPP) will be submitted prior to application for a building permit.

**Wetlands**

The U.S. Fish and Wildlife Service (USFWS) *National Wetlands Inventory* (NWI) indicates that a riverine wetland is mapped within the project area **(Appendix E, figure 8).** A level I desktop wetland delineation identified three potential wetlands within the project area **(Appendix G).** A level II wetland delineation determined approximately 0.04 acres of wetland is located just outside of the northeastern edge of the proposed fence line **(Appendix H)**. The proposed site design avoids impacts to the onsite wetland identified by the level II analysis. Impacts are avoided by maintaining a 50 feet distance from all potential wetland areas to the security fence.

**Critical Issue Analysis**

A critical issue analysis was conducted for the site and is provided in **Appendix E**. The IDNR EcoCAT indicated that there are no records of state listed species, dedicated Illinois Nature Preserves, or Illinois Natural Area Inventory (INAI) sites within the project area or within in the project vicinity. The EcoCAT results and consultation termination letter and USFWS consultation report are included as **Appendix E, *Attachments B - C***. The proposed development will comply with all applicable avoidance, mitigation, or permitting requirements identified by USFWS.

The farmland ratings within the disturbance area include *Prime Farmland* and *Prime Farmland if drained.* The primary soil in the disturbance area is *Prime Farmland.* The soils classification map is included in **Appendix E, figure 7.** Detailed soils information is also included in **Appendix E, table 3.**

**Plan for Right-of-Way Use**

During construction, equipment and construction materials will be delivered to the site on large trucks. The delivery route will utilize State Route 38 and enter via an access driveway on the north side of the route. All necessary IDOT permits and agreements will be filed prior to construction. Comments from IDOT regarding access driveway location feasibility were received on April 30, 2024 **(Appendix I)**. IDOT noted that the proposed access driveway location is feasible.

**Potential to Affect the Environment and Public Health**

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Minimal impacts to public health and the environment are anticipated at the site during construction or during the 30-year operation of the facilities. The generation of electricity from photovoltaic (PV) solar panels is researched to be safe and effective. According to the U.S. Department of Energy, few power-generating technologies have as little environmental impact as PV solar panels. There are no anticipated negative effects on public health from the installation and maintenance of these solar arrays. Unlike conventional fossil fuel power generation (such as coal, gas, and oil), generating electricity with ground-mounted solar arrays uses no water, and produces no direct emissions or contaminants.

**Conclusion**

The Applicant is seeking a Special Use Permit to operate a 5-megawatt AC Community Solar project and a 2-megawatt AC Community Solar project on two parcels totaling 80.3 acres in the Town of Cortland. Solar installation is a clean, efficient means of power production with few moving parts and minimal maintenance that creates no noise, dust, runoff, or nuisance factors associated with other forms of power production.

We appreciate your consideration of the requested Solar Garden Special Use Permit. If you have questions or need additional information, please feel free to call Conner Sayles at 425-293-1111 or Brendan Cohen at 651-336-4640.

cc. Conner Sayles and Brendan Cohen, Cortland Solar

Appendix A: Site Plan
Appendix B: Interconnection Statuses
Appendix C: Stormwater Management Analysis
- Figure 1: Project Location
- Figure 2: Property Details
- Figure 3A: FEMA Floodplain Map
- Figure 3B: Existing Conditions Drainage Area Map
- Figure 4: Hydrologic Soils Map
- Figure 5: Land Cover Map
- Figure 6: Proposed Site Plan

Appendix D: AIMA
Appendix E: Critical Issues Analysis
- Figure 1: Project Location (Street)
- Figure 2: Project Location (Aerial)
- Figure 3: Topography
- Figure 4: Land Cover (NLCD)
- Figure 5: Karst Features
- Figure 6: Soils – Hydric Rating

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Figure 7: Soils – Farmland Classification
Figure 8: Surficial Hydrological Resources
Figure 9: Rusty Patched Bumble Bee Potential Zone
Attachment A: FAA Notice Criteria Tool Results
Attachment B: National Pipeline Mapping System Results
Attachment C: Illinois DNR EcoCAT
Attachment D: USFWS Consultation Report
Appendix F: Decommissioning Plan
Appendix G: Offsite Wetland Hydrology Assessment (Level I Wetland Delineation)
Appendix H: Onsite Wetland Delineation Report (Level II Wetland Delineation)
Appendix I: IDOT Access Driveway Feasibility Response

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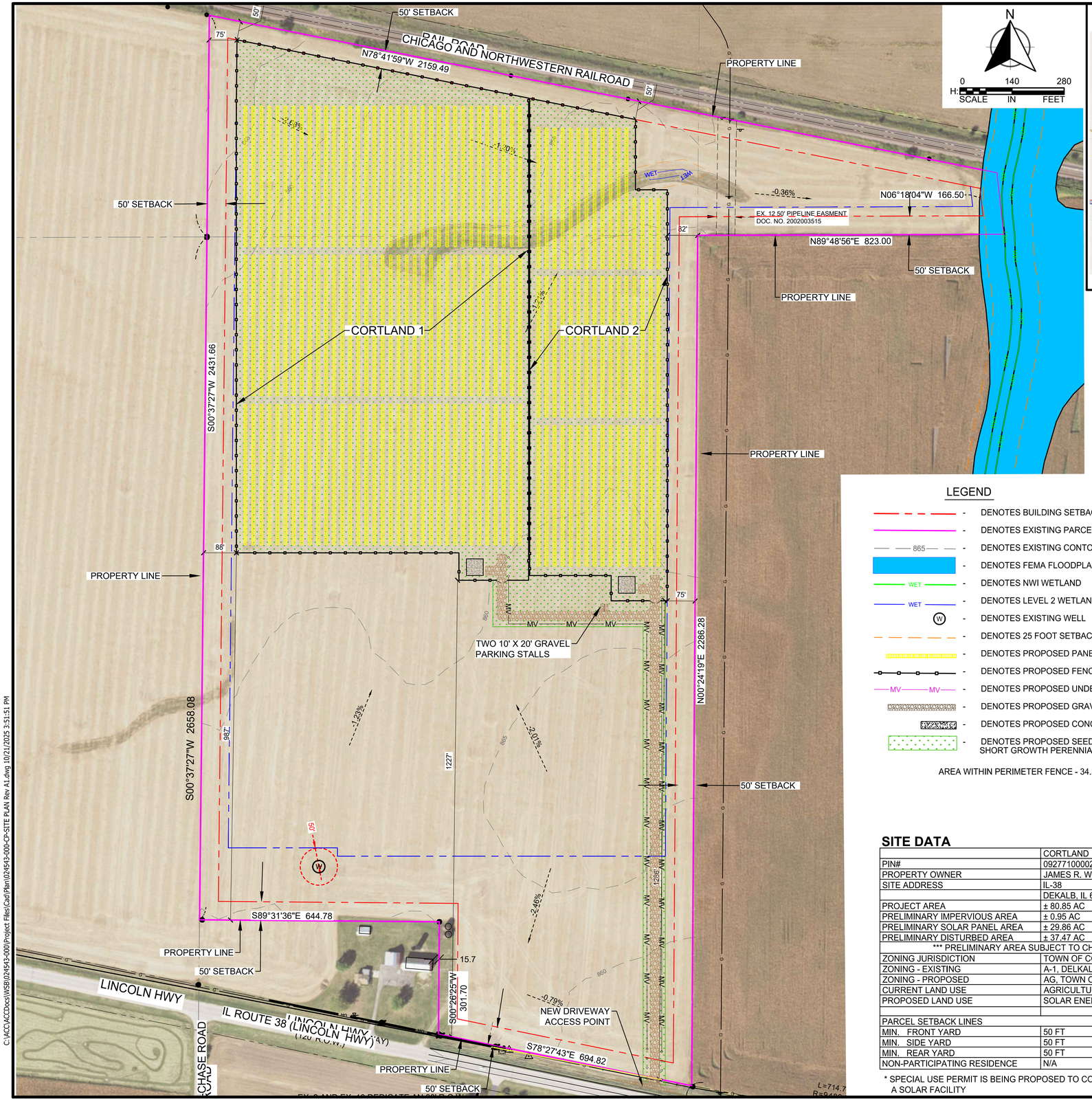
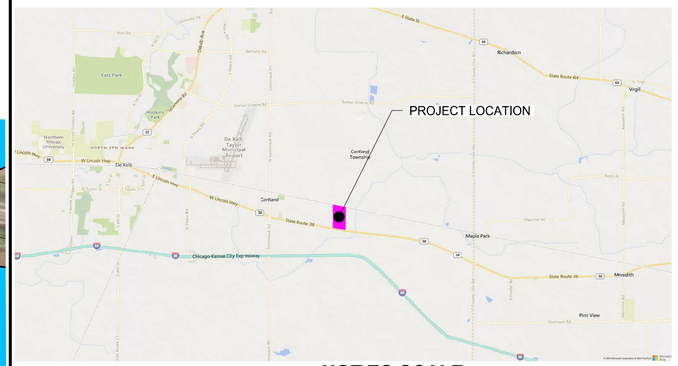
# Appendix A: Site Plan




## LOCATION




**NOT TO SCALE**

## LEGEND

- DENOTES BUILDING SETBACK LINE
- DENOTES EXISTING PARCEL LINE
- DENOTES EXISTING CONTOUR
- DENOTES FEMA FLOODPLAIN
- DENOTES NWI WETLAND
- DENOTES LEVEL 2 WETLAND LINE
- DENOTES EXISTING WELL
- DENOTES 25 FOOT SETBACK LINE
- DENOTES PROPOSED PANELS
- DENOTES PROPOSED FENCE
- DENOTES PROPOSED UNDERGROUND MV FEEDER
- DENOTES PROPOSED GRAVEL ACCESS ROAD
- DENOTES PROPOSED CONCRETE
- DENOTES PROPOSED SEEDED AREA SHORT GROWTH PERENNIAL POLLINATORS

AREA WITHIN PERIMETER FENCE - 34.30 ACRES

## SITE DATA

| | |
|---|---|
| | CORTLAND 1 AND 2 |
| PIN# | 09277100002 &0927300004 |
| PROPERTY OWNER | JAMES R. WALTER & JAMES E. WALTER |
| SITE ADDRESS | IL-38 |
| | DEKALB, IL 60115 |
| PROJECT AREA | ± 80.85 AC |
| PRELIMINARY IMPERVIOUS AREA | ± 0.95 AC |
| PRELIMINARY SOLAR PANEL AREA | ± 29.86 AC |
| PRELIMINARY DISTURBED AREA | ± 37.47 AC |
| *** PRELIMINARY AREA SUBJECT TO CHANGE *** | |
| ZONING JURISDICTION | TOWN OF CORTLAND |
| ZONING - EXISTING | A-1, DELKALB COUNTY |
| ZONING - PROPOSED | AG, TOWN OF CORTLAND |
| CURRENT LAND USE | AGRICULTURE |
| PROPOSED LAND USE | SOLAR ENERGY SYSTEM |
| | |
| PARCEL SETBACK LINES | |
| MIN. FRONT YARD | 50 FT |
| MIN. SIDE YARD | 50 FT |
| MIN. REAR YARD | 50 FT |
| NON-PARTICIPATING RESIDENCE | N/A |

* SPECIAL USE PERMIT IS BEING PROPOSED TO CONSTRUCT / OPERATE A SOLAR FACILITY

| ELECTRICAL DESIGN INFORMATION - CORTLAND 1 | |
|---|---|
| PV MODULE BRAND | **CANADIANSOLAR** |
| PV MODULE MODEL | CS6.2-66TB-620 |
| PV MODULE TYPE | BIFACIAL |
| INVERTER BRAND | SMA |
| INVERTER | SUNNY HIGH POWER PEAK3 150-US |
| GCR% | 36% |
| RACKING | ATI |
| TOTAL # OF MODULES | 10500 |
| TOTAL # OF STRINGS | 420 |
| MODULES PER STRING | 25 |
| TOTAL # OF TRACKERS | 105 |
| TOTAL # OF INVERTERS | 34 |
| DC SYSTEM SIZE (MW) | 6.510 |
| AC SYSTEM SIZE (MW) | 5.007 |
| DC/AC RATIO | 1.30 |
| ROW SPACING | 13.89' |
| ACCESS ROAD WIDTH | 18' |
| MAX & MIN TEMP | 35°C & -26°C |
| SNOW LOAD & WIND SPEED(RISK CATEGORY III) | 25 LB/SQFT & 120 MPH |

| ELECTRICAL DESIGN INFORMATION - CORTLAND 2 | |
|---|---|
| PV MODULE BRAND | **CANADIANSOLAR** |
| PV MODULE MODEL | CS6.2-66TB-620 |
| PV MODULE TYPE | BIFACIAL |
| INVERTER BRAND | SMA |
| INVERTER | SUNNY HIGH POWER PEAK3 150-US |
| GCR% | 36.4% |
| RACKING | ATI |
| TOTAL # OF MODULES | 4600 |
| TOTAL # OF STRINGS | 184 |
| MODULES PER STRING | 25 |
| TOTAL # OF TRACKERS | 48 |
| TOTAL # OF INVERTERS | 14 |
| DC SYSTEM SIZE (MW) | 2.852 |
| AC SYSTEM SIZE (MW) | 2.00 |
| DC/AC RATIO | 1.42 |
| ROW SPACING | 13.69' |
| ACCESS ROAD WIDTH | 18' |
| MAX & MIN TEMP | 35°C & -26°C |
| SNOW LOAD & WIND SPEED(RISK CATEGORY III) | 25 LB/SQFT & 120 MPH |

SOLARSTONE
SOLARSTONE PARTNERS
1083 N. COLLIER BLVD., #408
MARCO ISLAND, FL 34145
www.solarstonepartners.com

wsb
WSB PROJECT NO.:
024543-000

WSB
701 XENIA AVE S, #300
GOLDEN VALLEY, MN 55416
(763) 541-4800

PLAN: ECY DESIGN: ECY
CHECK: LP / EZ

REVISIONS

| NO. | DESCRIPTION | DATE |
|---|---|---|

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PLAN DATE: OCTOBER 15, 2025

# CORTLAND 1 & 2 SOLAR PROJECTS
DEKALB COUNTY, IL
BLUE SOLAR ONE, LLC
SOLARSTONE DEVELOPMENT, LLC

## OVERALL SITE PLAN

SHEET
C-001

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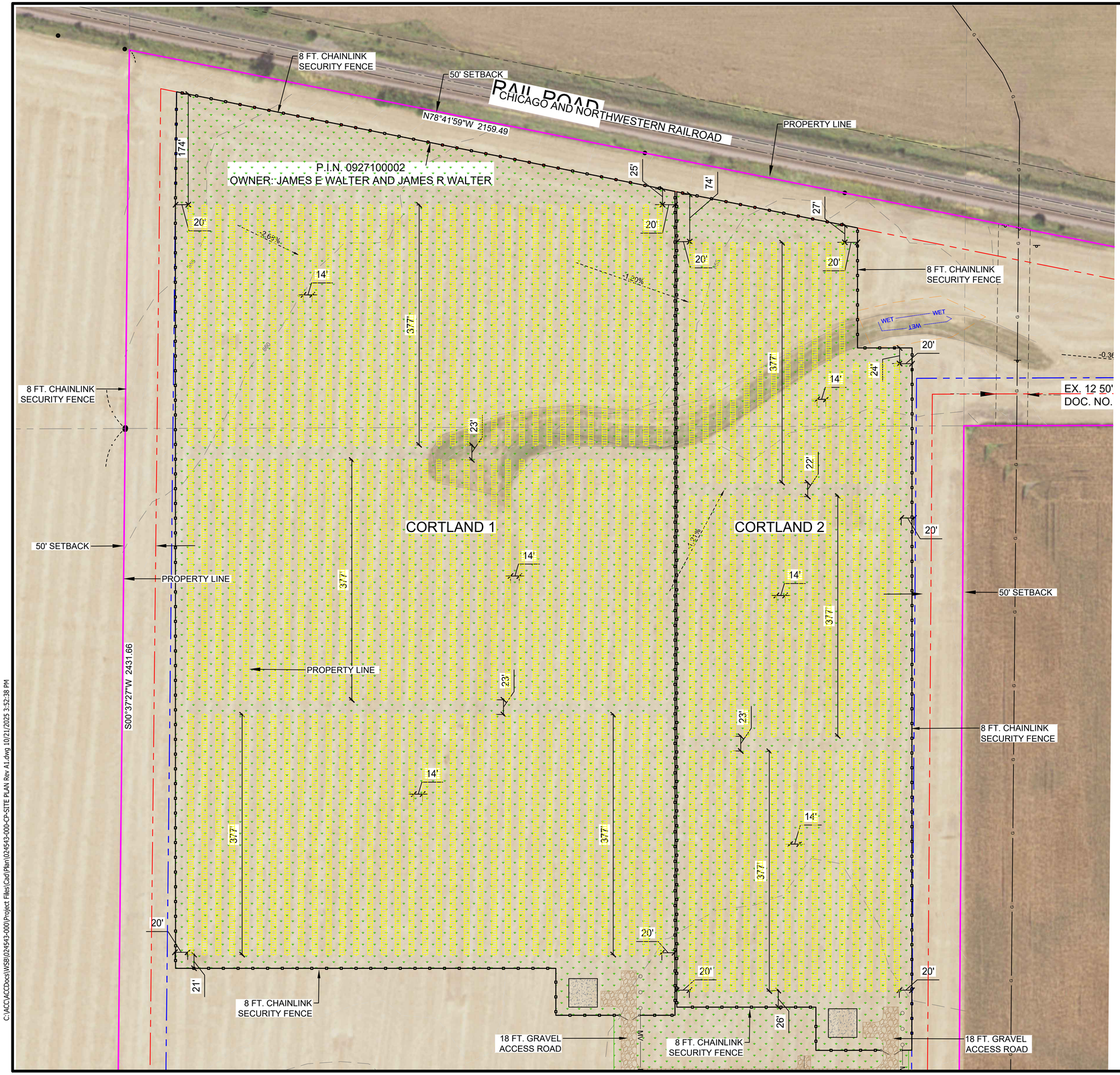


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## LEGEND

- DENOTES BUILDING SETBACK LINE
- DENOTES EXISTING PARCEL LINE
- DENOTES EXISTING CONTOUR
- DENOTES FEMA FLOODPLAIN
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AREA WITHIN PERIMETER FENCE - 34.30 ACRES

## GENERAL NOTES

1. THE PURPOSE OF THIS PLAN IS FOR ZONING APPROVAL FOR REVIEW AND APPROVAL BY THE TOWN OF CORTLAND TO CONSTRUCT A SOLAR ENERGY SYSTEM.
2. THIS PLAN WAS PRODUCED UTILIZING GIS RESOURCES AND INFORMATION FROM MULTIPLE SOURCES, INCLUDING DEKALB COUNTY, USGS, FEMA, NATIONAL WETLANDS INVENTORY AND BING.
3. NO PORTION OF THE SUBJECT PROPERTY LIES WITHIN A SPECIAL FLOOD HAZARD AS SHOWN ON THE FLOOD INSURANCE RATE MAP, PUBLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA).
4. NO PORTION OF THE SUBJECT PROPERTY CONTAINS KARST GEOLOGY ACCORDING TO THE U.S. GEOLOGICAL SURVEY OPEN-FILE REPORT.
5. A PORTION OF THE SUBJECT PROPERTY CONTAINS WELLS ACCORDING TO ILLINOIS STATE GEOLOGICAL SURVEY AND HOMELAND INFRASTRUCTURE FOUNDATION - LEVEL DATA.
6. THE BUILDABLE AREA EXCLUDES ALL CONSTRAINTS OF THE SITE, INCLUDING REQUIRED PANEL SETBACKS.
7. NO DRAIN TILE DATA PROVIDED OR SHOWN ON THIS CONSTRAINTS MAP.

SOLARSTONE
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MARCO ISLAND, FL 34145
www.solarstonepartners.com

wsb
WSB PROJECT NO.:
024543-000

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GOLDEN VALLEY, MN 55416
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PLAN: ECY DESIGN: ECY
CHECK: LP / EZ

REVISIONS

| NO. | DESCRIPTION | DATE |
|---|---|---|

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PLAN DATE : OCTOBER 15, 2025

CORTLAND 1 & 2 SOLAR PROJECTS
DEKALB COUNTY, IL
BLUE SOLAR ONE, LLC
SOLARSTONE DEVELOPMENT, LLC

PRELIMINARY SITE PLAN
SOLAR ARRAY DETAIL

SHEET
C-002

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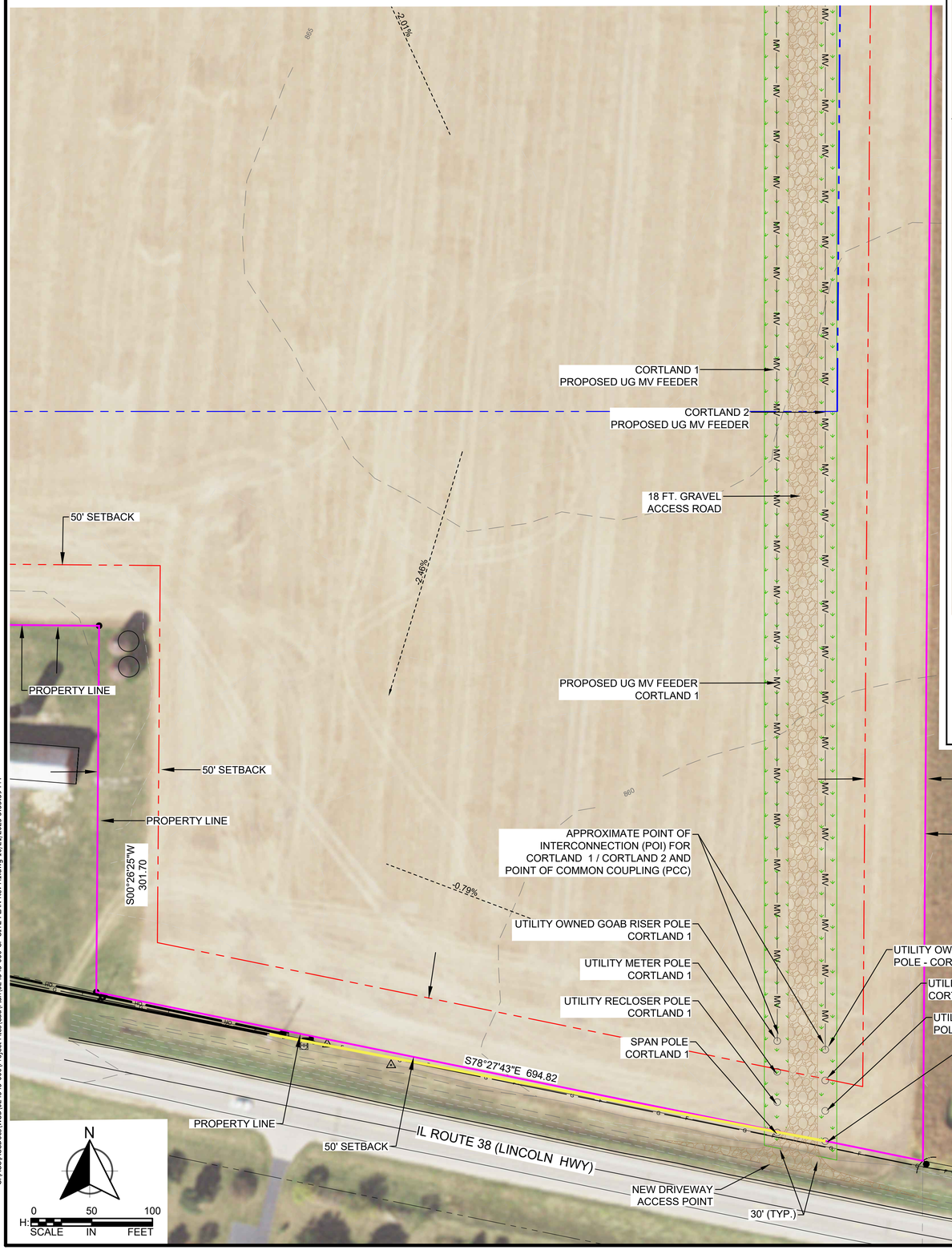
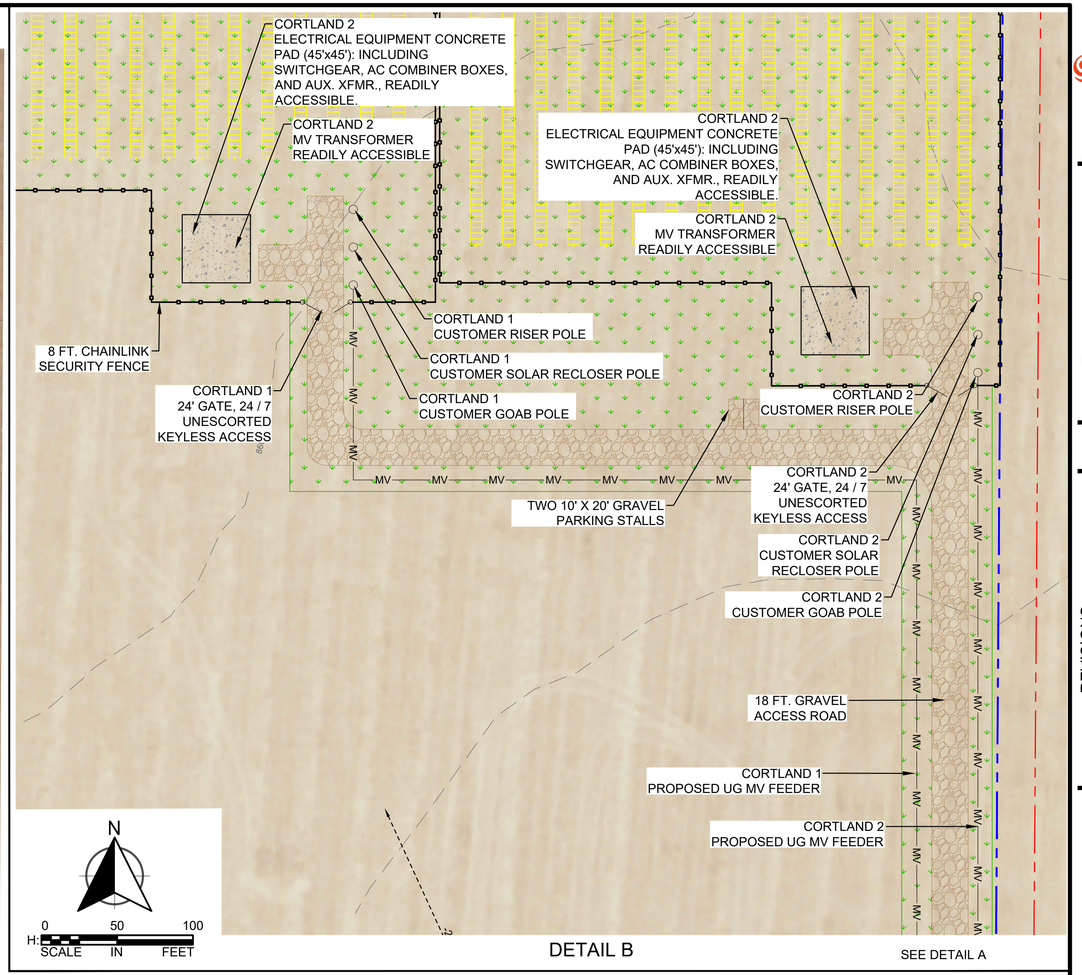
DETAIL A

SEE DETAIL B




DETAIL B

SEE DETAIL A

## LEGEND

- DENOTES BUILDING SETBACK LINE
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AREA WITHIN PERIMETER FENCE - 34.30 ACRES

## CONSTRUCTION NOTES:

- GRAVEL ACCESS DRIVE WILL BE CONSTRUCTED OVER SUBGRADE STRIPPED OF ALL TOPSOIL AND ORGANICS.
- ROAD SECTION THICKNESS AS RECOMMENDED IN GEOTECH REPORT.
- 3:1 SLOPES MAXIMUM EXCEPT WHERE NOTED OTHERWISE.
- ALL DISTURBED AREAS TO BE RESTORED WITH NATIVE PERENNIAL SHORT GROWTH POLLINATOR SEED MIX.

## UTILITY LOCATIONS NOTE:

PRIOR TO BEGINNING WORK ON THIS PROJECT, THE CONTRACTOR SHALL HAVE ALL PUBLIC AND PRIVATE UTILITY LOCATIONS MARKED ON THE PROJECT SITE.

DISCREPANCIES BETWEEN LOCATIONS SHOWN AS EXISTING CONDITIONS ON PLAN SHEETS AND THOSE ACTUALLY MARKED ON THE PROJECT SITE SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER/ENGINEER.

## GENERAL NOTES:

CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING STRUCTURES, UTILITIES, TREES, SITE AMENITIES, ETC. THAT ARE TO REMAIN FROM DAMAGE DURING CONSTRUCTION.

CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECTING ANY DAMAGE TO EXISTING ITEMS TO REMAIN (AT CONTRACTOR'S EXPENSE) AND IS CONSIDERED INCIDENTAL TO THE CONTRACT.

HORIZONTAL DATUM IS NSRS 2011 ILLINOIS STATE PLANES, WEST ZONE, US FOOT. VERTICAL DATUM IS BASED ON COUNTY LIDAR DATA.


SOLARSTONE

SOLARSTONE PARTNERS
1083 N. COLLIER BLVD., #408
MARCO ISLAND, FL 34145
www.solarstonepartners.com

wsb

WSB PROJECT NO.:
024543-000

WSB
701 XENIA AVE S, #300
GOLDEN VALLEY, MN 55416
(763) 541-4800


PLAN: ECY DESIGN: ECY
CHECK: LP / EZ

REVISIONS

| NO. | DATE | DESCRIPTION |
|---|---|---|

THIS DOCUMENT IS RELEASED FOR PERMITTING PURPOSES ONLY AND IS NOT FOR CONSTRUCTION

PLAN DATE : OCTOBER 15, 2025

CORTLAND 1 & 2 SOLAR PROJECTS
DEKALB COUNTY, IL
BLUE SOLAR ONE, LLC
SOLARSTONE DEVELOPMENT, LLC

PRELIMINARY SITE PLAN ACCESS ROAD DETAIL

SHEET

C-003

C:\ACC\ACCDocs\WSB\024543-000\Project Files\Cad\Plan\024543-000-CP-SITE PLAN Rev A1.dwg, 10/21/2025 3:53:59 PM

# Appendix B: Interconnection Status

Outlook

**FW: State Route 38, DeKalb, Illinois 60115, 25-03483 has a new post**

**From** brendan.cohen@solarstonepartners.com <brendan.cohen@solarstonepartners.com>
**Date** Tue 10/21/2025 10:20 AM
**To** 'Conner Sayles' <conner.sayles@solarstonepartners.com>

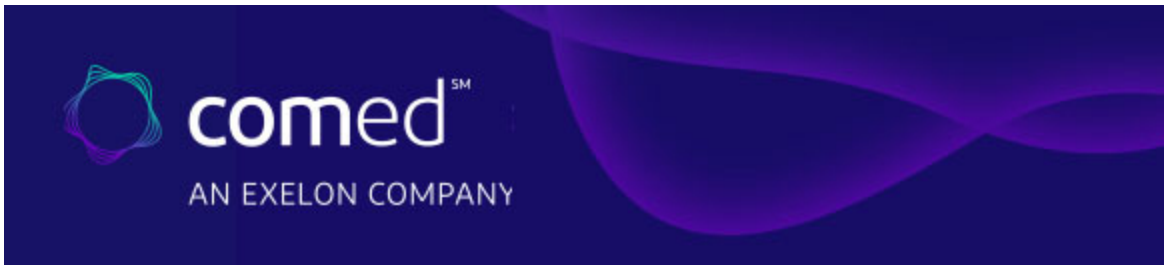
Cortland 1

**Brendan Cohen**
Senior Director - Project Development
Phone: 651-336-4640
Email: brendan.cohen@solarstonepartners.com
Website: www.solarstonepartners.com

SOLARSTONE

This email, and any files transmitted with it, is confidential and is intended solely for the use of the addressee. If you are not the addressee, please delete this email from your system.

**From:** no-reply@comed.com <no-reply@comed.com>
**Sent:** Monday, September 22, 2025 2:06 PM
**To:** brendan.cohen@solarstonepartners.com
**Subject:** State Route 38, DeKalb, Illinois 60115, 25-03483 has a new post




Dear Brendan Cohen,

Dear Valued Interconnection Customer,

You requested the payment option interconnection agreement for Project 25-03483. The revised Interconnection Agreement requiring your signature, is now available in the Documents section of your application.

You now have three options to pay the 100% customer deposit payment:
- Wire or check to ComEd
- Wire transfer to a JP Morgan interest bearing escrow account
- Letter of Credit

Attachment 3 has been updated and Attachment 9 has been added to reflect the above options. You will need to choose which option you intend to utilize and follow the outline below by 11/4/2025.

IF WIRE OR CHECK TO COMED PAYMENT IS SELECTED:
1. send a message through the ComEd interconnection portal as to your choice of payment
2. execute and upload the interconnection agreement to the ComEd interconnection portal
3. pay the 100% deposit

IF ESCROW ACCOUNT IS SELECTED:
1. send a message through the ComEd interconnection portal as to your choice of payment
2. execute and upload the interconnection agreement to the ComEd interconnection portal
3. execute the amendment to the interconnection agreement for the escrow account found in Attachment 9 and upload it to the ComEd interconnection portal
4. execute the JP Morgan escrow agreement found in Attachment 9 and upload it to the ComEd interconnection portal
5. set up and fully fund your escrow account with JP Morgan

IF LETTER OF CREDIT IS SELECTED:
1. send a message through the ComEd interconnection portal as to your choice of payment
2. execute and upload the interconnection agreement to the ComEd interconnection portal
3. execute the amendment to the interconnection agreement for the letter of credit found in Attachment 9 and upload it to the ComEd interconnection portal
4. execute the letter of credit with your selected bank and upload it to the ComEd interconnection portal and send hardcopy to Exelon Corporation, 10 S. Dearborn, Floor 51, Chicago, IL 60603, (Attn: Enterprise Credit(Interconnection))
5. Provide your 25% first scheduled payment, as set forth in 3.4.1

Please review, complete, and execute the Interconnection Agreement within 30 business days. The signed agreement must be returned by 11/4/2025. If it is not received by 5:00 PM CST on 11/4/2025, the application will be considered withdrawn unless a written request for a 15-business-day extension is submitted prior to 11/4/2025. If you have any questions or need further clarification, feel free to reach out.

This interconnection request is eligible to participate in the Contact Sharing program. This initiative enables interconnection customers with assigned queue positions to request the sharing of contact information with other customers in the same substation queue.

If you would like to participate, please respond through the portal with the following message: "Yes – I would like to participate in Contact Sharing."

Thank you,
Lindsey Ewig

Contractors can check the latest activity for this application here:
https://secure.comed.com/ContractorConnect/

Sincerely,
ComEd

Outlook

---

**FW: IL-38, DeKalb, Illinois 60115, 25-02614 has a new post**

---

**From** brendan.cohen@solarstonepartners.com <brendan.cohen@solarstonepartners.com>
**Date** Tue 10/21/2025 10:17 AM
**To** 'Conner Sayles' <conner.sayles@solarstonepartners.com>

Cortland 2

**Brendan Cohen**
Senior Director - Project Development
Phone: 651-336-4640
Email: brendan.cohen@solarstonepartners.com
Website: www.solarstonepartners.com

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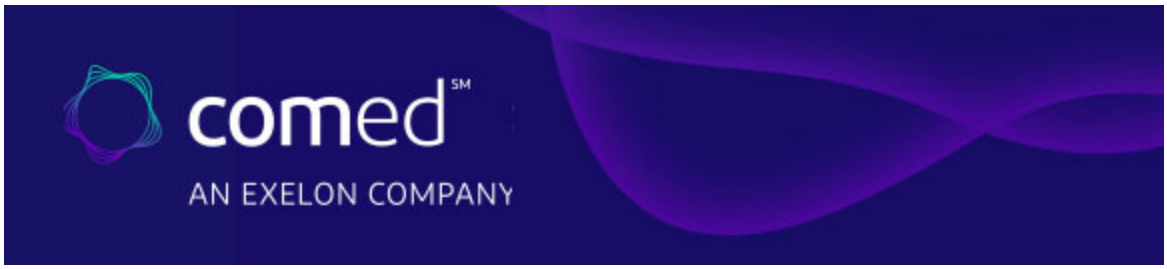
**From:** no-reply@comed.com <no-reply@comed.com>
**Sent:** Monday, September 22, 2025 10:53 AM
**To:** brendan.cohen@solarstonepartners.com
**Subject:** IL-38, DeKalb, Illinois 60115, 25-02614 has a new post




Dear Brendan Cohen,

Dear Valued Interconnection Customer,

You requested the payment option interconnection agreement for Project 25-02614. The revised Interconnection Agreement requiring your signature, is now available in the Documents section of your application.

You now have three options to pay the 100% customer deposit payment:
- Wire or check to ComEd
- Wire transfer to a JP Morgan interest bearing escrow account
- Letter of Credit

Attachment 3 has been updated and Attachment 9 has been added to reflect the above options. You will need to choose which option you intend to utilize and follow the outline below by 11/4/2025.

IF WIRE OR CHECK TO COMED PAYMENT IS SELECTED:
1. send a message through the ComEd interconnection portal as to your choice of payment
2. execute and upload the interconnection agreement to the ComEd interconnection portal
3. pay the 100% deposit

IF ESCROW ACCOUNT IS SELECTED:
1. send a message through the ComEd interconnection portal as to your choice of payment
2. execute and upload the interconnection agreement to the ComEd interconnection portal
3. execute the amendment to the interconnection agreement for the escrow account found in Attachment 9 and upload it to the ComEd interconnection portal
4. execute the JP Morgan escrow agreement found in Attachment 9 and upload it to the ComEd interconnection portal
5. set up and fully fund your escrow account with JP Morgan

IF LETTER OF CREDIT IS SELECTED:
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2. execute and upload the interconnection agreement to the ComEd interconnection portal
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Please review, complete, and execute the Interconnection Agreement within 30 business days. The signed agreement must be returned by 11/4/2025. If it is not received by 5:00 PM CST on 11/4/2025, the application will be considered withdrawn unless a written request for a 15-business-day extension is submitted prior to 11/4/2025. If you have any questions or need further clarification, feel free to reach out.

This interconnection request is eligible to participate in the Contact Sharing program. This initiative enables interconnection customers with assigned queue positions to request the sharing of contact information with other customers in the same substation queue.

If you would like to participate, please respond through the portal with the following message: "Yes – I would like to participate in Contact Sharing."

Thank you,
Lindsey Ewig

Contractors can check the latest activity for this application here:
https://secure.comed.com/ContractorConnect/

Sincerely,
ComEd

# Appendix C: Stormwater Management Analysis

# Memorandum

To: Cortland Illinois Solar, LLC

From: Earth Evans, PE, WSB
Michelle Jennings, EIT, WSB

Date: November 21, 2024
Revised October 14, 2025

Re: Cortland Solar Project Stormwater Management Analysis
WSB Project No. 024543-000

701 XENIA AVENUE S | SUITE 300 | MINNEAPOLIS, MN | 55416 | 763.541.4800 | WSBENG.COM

## Project Summary

Cortland Illinois Solar, LLC is proposing to develop a 5-megawatt solar project (Cortland 1) and a 2-megawatt solar project (Cortland 2) within Dekalb County, Illinois. This project, referred to as Cortland Solar, is located in between State Route 38 and the Chicago and Northwestern Railroad, southeast of the City of Cortland, Illinois (***Figure 1***).

## Site Characteristics

The Cortland Solar project site consists of approximately 80.3 total acres of cultivated crop, (***Figure 5***) based on the 2021 land use data.[1] The proposed solar panel area is 29.9 acres, and the estimated disturbed area is 37.5 acres (***Figure 6***). 37.6 acres of the site have Hydrologic Soil Group (HSG) D soils, 36.3 acres of the site have HSG C soils, and 6.4 acres of the site have HSG B soils (***Figure 4)***.[2]

The Cortland Solar project site includes a minor portion (approx. 0.5 acres) of the 100-year floodplain in the northeastern edge of the project boundary. This floodplain is classified as FEMA flood hazard area Zone A (i.e., floodplain without established Base Flood Elevation), per FEMA FIRM Panel 17037C0275E for Dekalb County, Illinois (***Figure 3A***).

There are no National Wetland Inventory (NWI) wetlands located within the project boundary. The level 2 wetland assessment determined approximately 114 square feet of wetland located outside of the northeastern edge of the proposed fence line. An offsite NWI freshwater emergent wetland is located just outside of the project boundary along the northeastern portion of the site (***Figure 3B***). The proposed solar panels arrays avoid impacts to the level 2 delineated wetlands within the site, and the offsite wetland by keeping the proposed solar panel area within the limits.

## Summary of Findings

The Existing Conditions of the Cortland Solar project site consists of pervious surfaces with high peak flows and runoff volumes due to tighter soils that are not conducive to infiltration.

---

[1] National Land Cover Database. United States Geological Survey.
https://www.usgs.gov/centers/eros/science/national-land-cover-database

[2] Web Soil Survey. United States Department of Agriculture.
http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

The proposed development at the Cortland Solar project site will take place on the central portion of the site and will result in approximately 0.95 acres (41,453 sq ft) of new impervious surface consisting of 18-foot-wide access/maintenance roads and other project components. The proposed improvements will include replacing the existing pervious area within the proposed solar panel area with native short growth perennial pollinator mixes of grasses and flowers underneath the panels. Converting this existing pervious and impervious area with the proposed short growth pollinators will off-set the addition of the proposed impervious coverages and result in overall lower peak flow rates and runoff volumes from the project site. The proposed PV array avoids impacts to the offsite riverine wetland and onsite delineated wetland (***Figure 6***).

Because survey was not obtained for this site, this model utilized estimated outlet pipe sizes based on LiDAR and Google Earth measurements.

**HydroCAD Model - Hydrologic Analysis**

Using the Curve Number method, a hydrologic analysis was conducted at the Cortland Solar project site to determine the Peak Flow Rates and Runoff Volume for both Existing and Proposed Conditions. The analysis was developed using a HydroCAD model (version 10).

The rainfall distribution was based on the SCS Type II 24-hr storm type coupled with the Illinois State Water Survey Bulletin 70 rainfall depths data for: 24-hour 2-year, 10-year, 25-year, 50-year, and 100-year at the Cortland Solar project site (***Table 1***). The SCS type II distribution was used as an alternative to the Huff distributions presented in the Illinois State Survey Water Bulletin 70 per the Town of Cortland Illinois Stormwater Management Ordinance.

**Table 1: Illinois State Water Bulletin 70[3]**

| Storm | Depth (in) |
|---|---|
| 2-year | 3.04 |
| 10-year | 4.47 |
| 25-year | 5.51 |
| 50-year | 6.46 |
| 100-year | 7.58 |

Site areas and composite curve numbers were determined using a GIS platform (ArcGIS Pro). An area weighted average was used to calculate the composite curve number. The soils at the project site are predominantly HSG D (approx. 37.6 acres) and HSG C (approx. 36.3 acres) with small areas of HSG B (approx. 6.4 acres) (***Figure 5)***.

**Existing Conditions**

The site was delineated into eleven separate drainage/tributary areas that include offsite areas that contribute flow into the site (***Figure 3B***). Drainage area delineations were based off existing contours, LiDAR, and existing roads. The proposed development is located within DA 8 and 9. Drainage will exit the site via a flow path that drains northeast through the center portion of the site into the floodplain to the northeast of the site.
The parameters of the culverts upstream of the Cortland Solar project site were assumed using LiDAR and Google Earth. Survey on these culverts was not obtained and dimensions were estimated for the hydrologic analysis.

[3] Frequency Distributions and Hydroclimatic Characteristics of Heavy Rainstorms in Illinois: Bulletin 70 https://www.isws.illinois.edu/pubdoc/B/ISWSB-70.pdf

An NWI riverine is located outside of the northeastern edge of the site. This riverine flowing to the south has multiple large tributary areas contributing flow to it. Due to the presence of this riverine, all areas contributing drainage to this riverine were assessed during the Hydrologic Analysis. Drainage will run from the high points west and southwest of the site and drain to the east. Because Drainage Areas 8 and 9 contain the proposed Cortland Solar development, the peak flows and runoff volumes leaving these drainage areas were assessed separately to properly determine the changes from Existing to Proposed Conditions. As a result, there is no change in peak flow or runoff rates from existing to proposed conditions for the remaining drainage areas.

Due to the large offsite area that contributes flow within Drainage Area 8, Drainage Area 8 was separated into two subcatchments for offsite and onsite drainage. Drainage Area 8 Onsite encloses the proposed solar panel area that will be revegetated from cultivated cropland to the proposed vegetation resulting in a reduction in curve number from Existing to Proposed Conditions. Because the remaining drainage areas did not enclose the solar panel area, there was no change in curve number from Existing to Proposed Conditions. Using the NRCS guidelines, the curve numbers for each drainage area summarized in **Table 2** were used to define the Existing Conditions.

The time of concentration was calculated using the Sheet Flow method with a P2 (2-year, 24-hr rainfall) value, the Shallow Concentrated Flow method with a velocity factor, and the Channel Flow method with a Manning's N number. The hydraulic data for the site's Existing Conditions are summarized in (***Table 2***). The hydraulic data for the site's Existing Conditions are summarized in (***Table 2***).

**Table 2: Existing Project Site Characteristics**

| Drainage Area | Drainage Area (ac) | EX Impervious Area (ac) | Composite Curve Number | Time of Concentration (minutes) |
|---|---|---|---|---|
| DA-1 | 8.4 | 0.0 | 86 | 26.2 |
| DA-2 | 4.3 | 0.1 | 86 | 10.7 |
| DA-3 | 31.8 | 0.5 | 87 | 44.9 |
| DA-4 | 1.9 | 0.1 | 87 | 11.3 |
| DA-5 | 10.2 | 2.4 | 87 | 20.0 |
| DA-6 | 12.7 | 1.9 | 86 | 20.0 |
| DA-7 | 67.6 | 1.8 | 86 | 62.4 |
| DA-8 Offsite | 142.8 | 4.0 | 87 | 109.4 |
| DA-8 Onsite | 80.3 | 0.0 | 86 | 57.5 |
| DA-9 | 14.1 | 0.7 | 85 | 20.0 |
| DA-10 | 4.2 | 0.0 | 86 | 15.7 |
| DA-11 | 1.5 | 0.3 | 87 | 18.7 |
| Total | 377.4 | 11.8 | 87 | N/A |

## Proposed Conditions

The Proposed Conditions model was created by including proposed impervious surfaces such as access roads and other project components. Additionally, the buildable area under the panels will be revegetated with a specified native low-growth pollinator grass seed mix as the Best Management Practice (BMP) for this project. This BMP will act as a method to reduce Peak Flows and Runoff Volumes and treat infiltrated water before it leaves the site. It was assumed that soil underneath the panels will have improved infiltration properties with the addition of the short-growth native pollinator grasses.

Because such a small addition of impervious area is being constructed for this site and the disturbed area will be revegetated from bare untilled land, there was a decrease in the composite curve number for every drainage area which will result in lower runoff potential in proposed conditions. The proposed conditions were modeled to generate a conservative curve number using a surface description of a non-grazed meadow. The hydraulic data for the site's Proposed Conditions are summarized in (***Table 3***).

**Table 3: Proposed Project Site Characteristics**

| Drainage Area | Drainage Area (ac) | EX Impervious Area (ac) | Total Impervious Area (ac) | Composite Curve Number | Time of Concentration (minutes) |
|---|---|---|---|---|---|
| DA-1 | 8.4 | 0.0 | 0.0 | 86 | 26.2 |
| DA-2 | 4.3 | 0.1 | 0.1 | 86 | 10.7 |
| DA-3 | 31.8 | 0.5 | 0.5 | 87 | 44.9 |
| DA-4 | 1.9 | 0.1 | 0.1 | 87 | 11.3 |
| DA-5 | 10.2 | 2.4 | 2.4 | 87 | 20.0 |
| DA-6 | 12.7 | 1.9 | 1.9 | 86 | 20.0 |
| DA-7 | 67.6 | 1.8 | 1.8 | 86 | 62.4 |
| DA-8 Offsite | 142.8 | 4.0 | 4.0 | 87 | 109.4 |
| DA-8 Onsite | 80.3 | 0.0 | 0.6 | 81 | 63.9 |
| DA-9 | 14.1 | 0.7 | 1.0 | 85 | 20.0 |
| DA-10 | 4.2 | 0.0 | 0.0 | 86 | 15.7 |
| DA-11 | 1.5 | 0.3 | 0.3 | 87 | 18.7 |
| Total | 377.4 | 11.8 | 13.1 | 85 | N/A |

## Hydrologic Runoff Analysis Results

Peak flow rates for the 2-year, 10-year, 25-year, 50-year, and 100-year storms were calculated at the Cortland Solar project site based on the drainage areas. The Hydrologic Runoff Analysis Results of this project illustrate Peak Flow and Runoff Volume values leaving the site overall. Runoff for the 2-year (***Table 4),*** 10-year (***Table 5***), 25-year (***Table 6***), 50-year (***Table 7***), and 100-year (***Table 8***) storms were calculated for the Existing and Proposed Conditions.

**Table 4: 2-year Site Flows**

| Destination | Peak Flow (cfs) | | Runoff Volume (af) | |
|---|---|---|---|---|
| | Existing | Proposed | Existing | Proposed |
| Leaving DA 8 Onsite | 75.2 | 53.7 | 11.2 | 8.8 |
| Leaving DA 9 | 25.4 | 25.4 | 1.9 | 1.9 |
| Total | 100.6 | 79.1 | 13.1 | 10.7 |

**Table 5: 10-year Site Flows**

| Destination | Peak Flow (cfs) | | Runoff Volume (af) | |
|---|---|---|---|---|
| | Existing | Proposed | Existing | Proposed |
| Leaving DA 8 Onsite | 132.2 | 103.2 | 19.6 | 16.6 |
| Leaving DA 9 | 45.0 | 45.0 | 3.4 | 3.4 |
| Total | 177.2 | 148.2 | 23.0 | 20.0 |

**Table 6: 25-year Site Flows**

| Destination | Peak Flow (cfs) | | Runoff Volume (af) | |
|---|---|---|---|---|
| | Existing | Proposed | Existing | Proposed |
| Leaving DA 8 Onsite | 147.5 | 141.0 | 26.1 | 22.7 |
| Leaving DA 9 | 59.5 | 59.5 | 4.5 | 4.5 |
| Total | 207.0 | 200.5 | 30.6 | 27.2 |

**Table 7: 50-year Site Flows**

| Destination | Peak Flow (cfs) | | Runoff Volume (af) | |
|---|---|---|---|---|
| | Existing | Proposed | Existing | Proposed |
| Leaving DA 8 Onsite | 213.2 | 176.2 | 32.0 | 28.4 |
| Leaving DA 9 | 72.9 | 72.9 | 5.5 | 5.5 |
| Total | 286.1 | 249.1 | 37.5 | 33.9 |

**Table 8: 100-year Site Flows**

| Destination | Peak Flow (cfs) | | Runoff Volume (af) | |
|---|---|---|---|---|
| | Existing | Proposed | Existing | Proposed |
| Leaving DA 8 Onsite | 258.9 | 218.4 | 39.2 | 35.3 |
| Leaving DA 9 | 88.6 | 88.6 | 6.8 | 6.8 |
| Total | 347.5 | 307.0 | 46.0 | 42.1 |

There is a large tributary area of approximately 290 acres that drains through the site. The flow path for this tributary area will be maintained from existing to proposed conditions. The limited added impervious surfaces in combination with revegetation of the disturbed area with a specified low-growth native seed mix as a stormwater management BMP would result in a net reduction in peak flow rates and runoff volumes.

No additional mitigating stormwater management BMPs based on the Town of Cortland's Stormwater Management requirements will be needed aside from erosion control BMP's that will be implemented as part of construction and as shown on the proposed erosion control plans and project Stormwater Pollution Prevention Plan (SWPPP) for future submittals.

**OTHER CONSIDERATIONS:**

**Scour and Erosion Potential**

The potential for scour is a function of localized topography and flow patterns. Due to moderate slopes, scour potential is unlikely. The erosion control plan will be developed to include potential BMPs such as silt fencing, straw waddles and other BMPs for erosion control during construction activities for the proposed conditions.

**Town of Cortland Drainage Requirements**[4]

Based on current city boundaries, the Cortland Solar Project is located outside of city limits. According to the City of Cortland Stormwater Ordinance, in all cases where a development lies within one and one-half (1.5) miles of the corporate limits of an incorporated municipality the development shall conform to all applicable ordinances and plans of such municipality. This project therefore follows the requirements of the City of Cortland stormwater ordinance. In the case that this property is annexed by the City, City requirements for stormwater management will be met.

Before beginning any construction, improvement or development of any structure, project or land, the Town of Cortland requires that no land disturbing activity shall be permitted which alters natural or manmade waterways or drainage features, including but not limited to ditches, culverts, swales, drain tiles, streams, rivers, ponds, lakes, wetlands and floodplains. Because the Cortland Solar project site will likely disturb more than 5,000 square feet of area, A Site Development Permit submitted to the Town of Cortland Zoning Office shall be required.

The City of Cortland Storm Water Management Ordinance states that a detention basin is required for any development resulting in greater than or equal to one acre of new impervious area. Because the current proposed impervious for the Cortland Solar Project is less than one acre, a detention basin is not required.

Regarding site runoff control requirements, the Town of Cortland requires that post-development discharge rates shall not exceed the Existing Conditions discharge rates for the 2-, 10-, 25-, 50- and 100-year critical duration storm events. Peak rates of discharge indicated by the post-development analysis are less than the peak rates of discharge indicated by the Existing Conditions as shown in ***Tables 4-8*** and minimizing impervious surfaces on the property, meeting the Town of Cortland runoff control requirements.

[4] Storm Water Management Ordinance: Town of Cortland, Illinois
https://library.municode.com/il/cortland/codes/code_of_ordinances?nodeId=TIT8BURE_CH2STWAMA

This project preserves natural features and existing natural streams, channels, and drainageways by utilizing a 50-foot floodplain/wetland buffer zone for all nearby floodplain and wetland features. This project's proposed BMP of revegetation of the buildable area with a short-growth perennial pollinator mix of grasses and flowers as natural landscaping further meets the runoff control requirements.

The following additional runoff requirements apply to this project: the proposed temporary and proposed soil erosion and sediment control practices that will be outlined in this project's SWPPP, a schedule of construction activities including, a plan for the short- and long-term maintenance and the responsible party for maintaining the storm water storage areas will be outlined in this project's SWPPP.

**Permitting**[5]

The following permits and documents may apply to this project.

An NPDES Construction General Permit application (CGP) under the state of Illinois and a Storm Water Pollution Prevention Plan (SWPPP) are typically needed if a site results in more than one acre of soil disturbance. Additionally, a Notice of Intent (NOI) must also be submitted along with the CGP and the SWPPP before the start of construction. The Illinois Environmental Protection Agency (IEPA) in compliance with the Federal Electronic Reporting Rule has transitioned all General Storm Water Permits for Construction Site Activities to the Central Data Exchange (CDX) resulting in the following construction permit forms to be submitted in order to submit the NOI:

- An electronic copy of the SWPPP;
- A copy of the Historic Preservation Office (SHPO) approval letter stating compliance with State law on historic preservation and endangered species;
- A copy of the Ecological Compliance Assessment Tool (EcoCAT) approval letter.

The NOI shall include the following information:

- The location of the construction site;
- The owner's information;
- The names of receiving waters;
- The number of NPDES permits for any discharge from the site;
- A detailed scope of the project.

A Site Development Permit submitted to the Town of Cortland is required if the following conditions are met:

- The development results in greater than or equal to one acre of new impervious area.
- The development resulting in less than one acre of new impervious area and is part of a larger common plan of development.
- The development disturbs mor than five thousand (5,000) square feet of land.

The proposed development and grading operations will likely result in more than one acre of soil disturbance thus triggering the need for an NPDES permit, a SWPPP, an Operations and Maintenance Plan, and a Notice of Intent to be submitted to the Illinois Environmental Protection Agency Stormwater Program which administers the NPDES permit and the NOI for the State of Illinois.

[5] Illinois Environmental Protection Agency. NPDES Permit for Construction Activities. https://www2.illinois.gov/epa/topics/forms/water-permits/storm-water/Pages/construction.aspx

The proposed development will result in creating 21,036 square feet of new impervious and likely disturb more than 5,000 square feet of land thus triggering the Town of Cortland Site Development Permit. Because this site will likely disturb more than 5,000 square feet of land, this project shall follow the Soil Erosion and Sediment Control guidelines outlined in the Town of Cortland's Stormwater Ordinance for future submittals.

**Floodplain and Wetland Considerations**

As stated above, there is one NWI wetland (approx. 0.1 acres) within the northeastern edge of the Cortland Solar project site referred to as a riverine. The level 2 wetland assessment determined approximately 114 square feet of wetland located outside of the northeastern portion of the proposed fence line. There is also a freshwater wetland located approximately 663 feet northwest of the at the closest ***(Figure 3B)***. This project does not propose solar panel arrays near the onsite or offsite NWI wetlands or level 2 wetlands, avoiding impacts.

Although the Cortland Solar project site includes a minor portion (approx. 0.1 acres) of FEMA Zone A, no solar arrays are proposed within FEMA Zone A floodplain zone, or the floodplain features nor is the site near or within FEMA Zone A or the floodplain features.

The Cortland Solar project site includes a minor portion (approx. 0.5 acres) of the 100-year floodplain, classified as FEMA flood hazard area Zone A (i.e., floodplain without established Base Flood Elevation), per FEMA FIRM Panel 17037C0275E for Dekalb County, Illinois (***Figure 3A***). This wetland is located in the northeastern edge of the site.

**Attachments:**

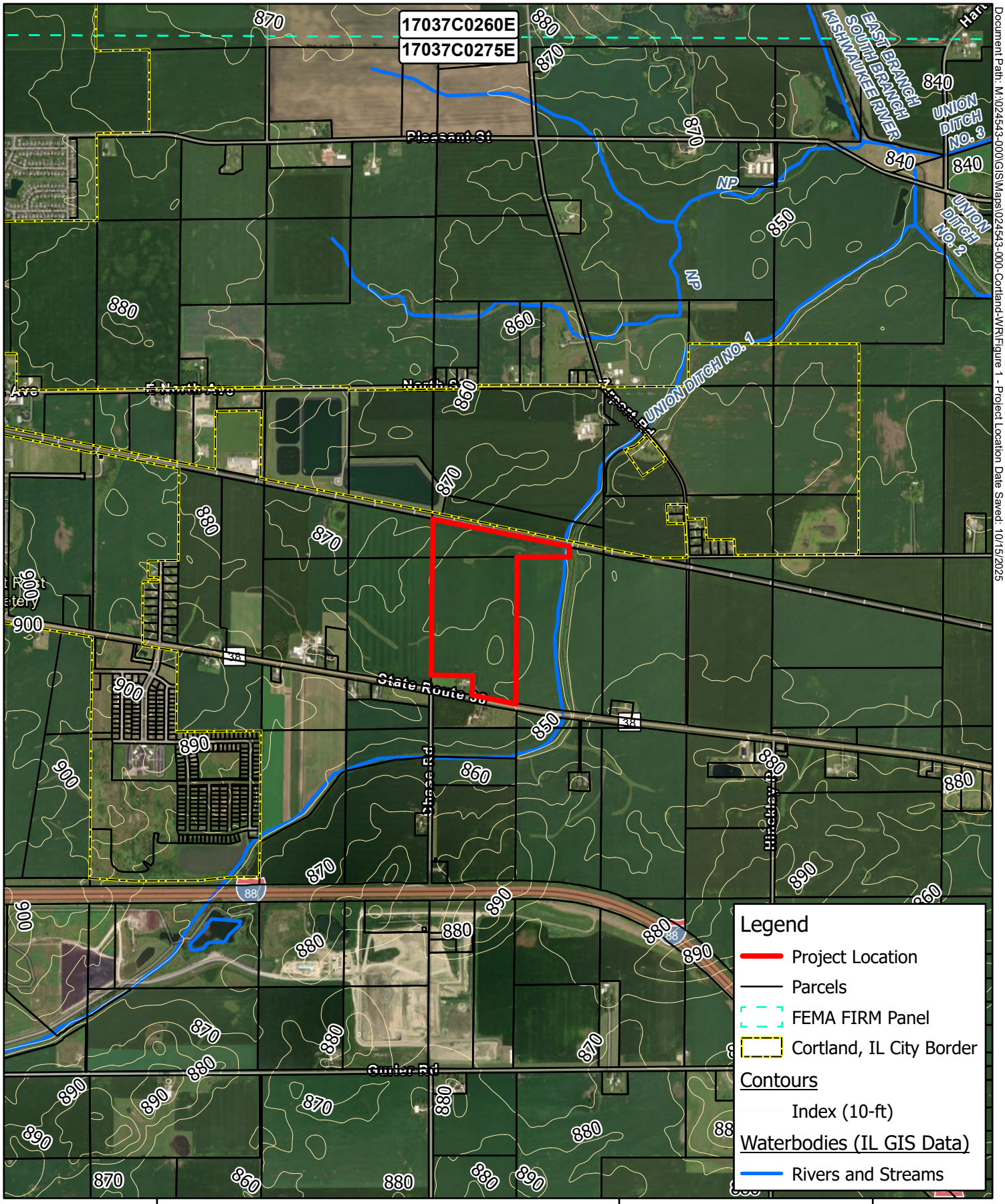
Existing

- Figure 1 - Project Location
- Figure 2 - Property Details
- Figure 3A - FEMA Floodplain Map
- Figure 3B – Existing Conditions Drainage Map
- Figure 4 - Hydrologic Soils Map
- Figure 5 - Land Cover Map

Proposed

- Figure 6 – Proposed Site Plan

FEMA FIRM Panel 17037C0275E
HydroCAD Model




Document Path: M:\024543-000\GIS\Maps\024543-000-Cortland-WR\Figure 1 - Project Location Date Saved: 10/15/2025

# Figure 1: Project Location

Cortland Solar Development
Cortland Illinois Solar, LLC

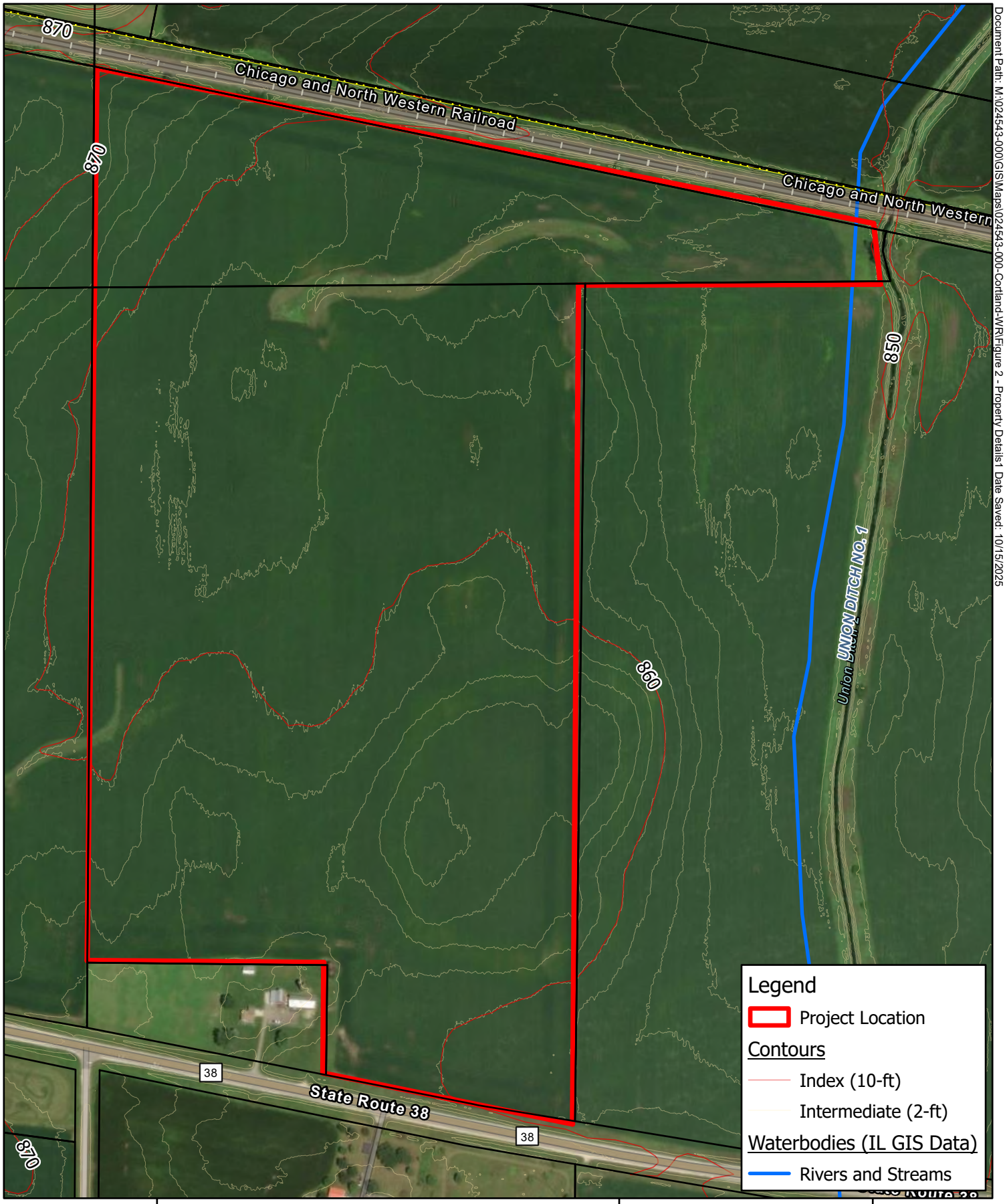
N

0 2,000 Feet

1 inch = 2,000 feet

SOLARSTONE

wsb




Document Path: M:\024543-000\GIS\Maps\024543-000-Cortland-WRI\Figure 2 - Property Details1 Date Saved: 10/15/2025

SOLARSTONE

# Figure 2 - Property Details

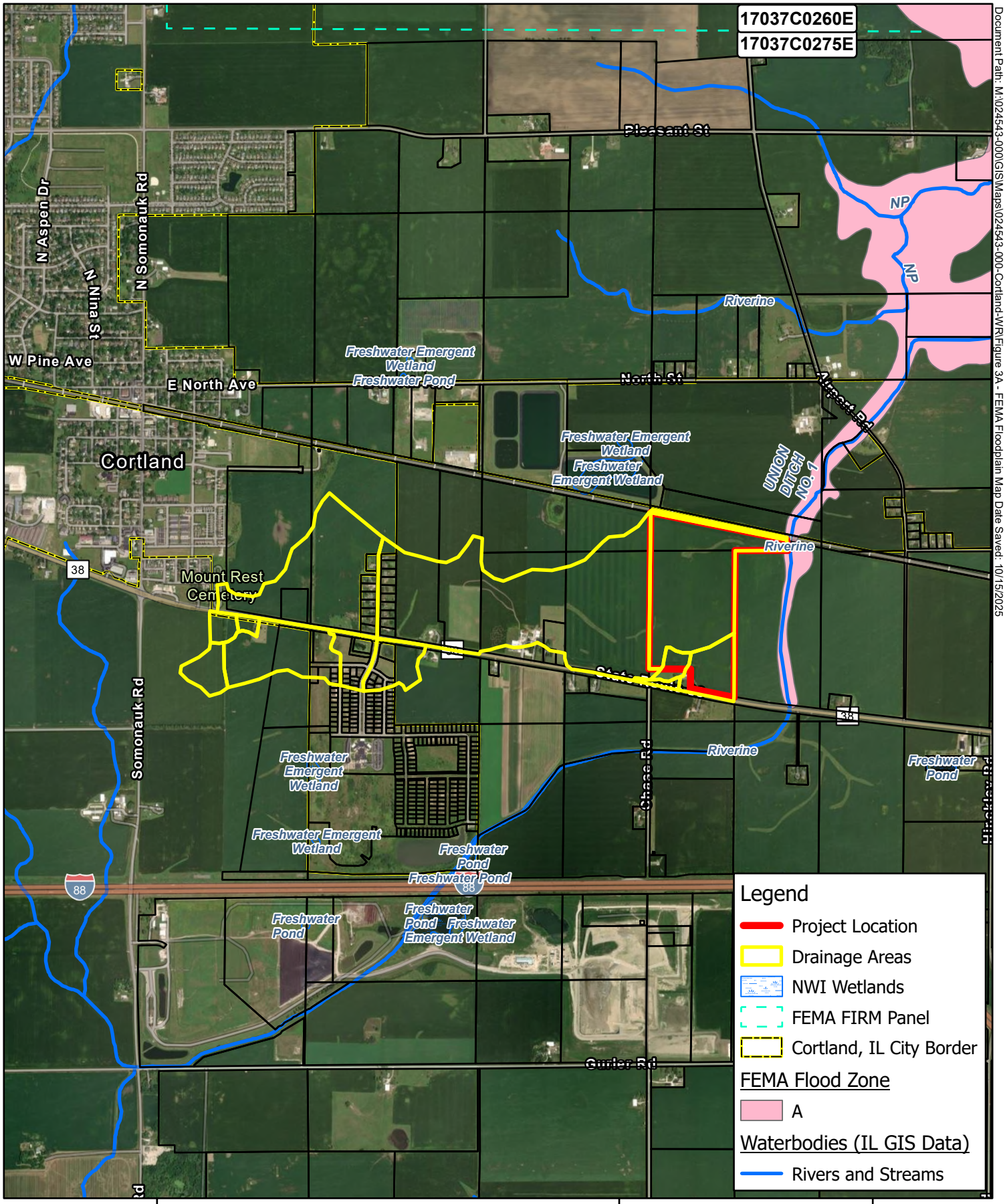
Cortland Solar Development
Cortland Illinois Solar, LLC

N

0 350 Feet

1 inch = 350 feet

wsb




Document Path: M:\024543-000\GIS\Maps\024543-000-Cortland-WRI\Figure 3A - FEMA Floodplain Map Date Saved: 10/15/2025

# Figure 3A - FEMA Floodplain Map

Cortland Solar Development
Cortland Illinois Solar, LLC

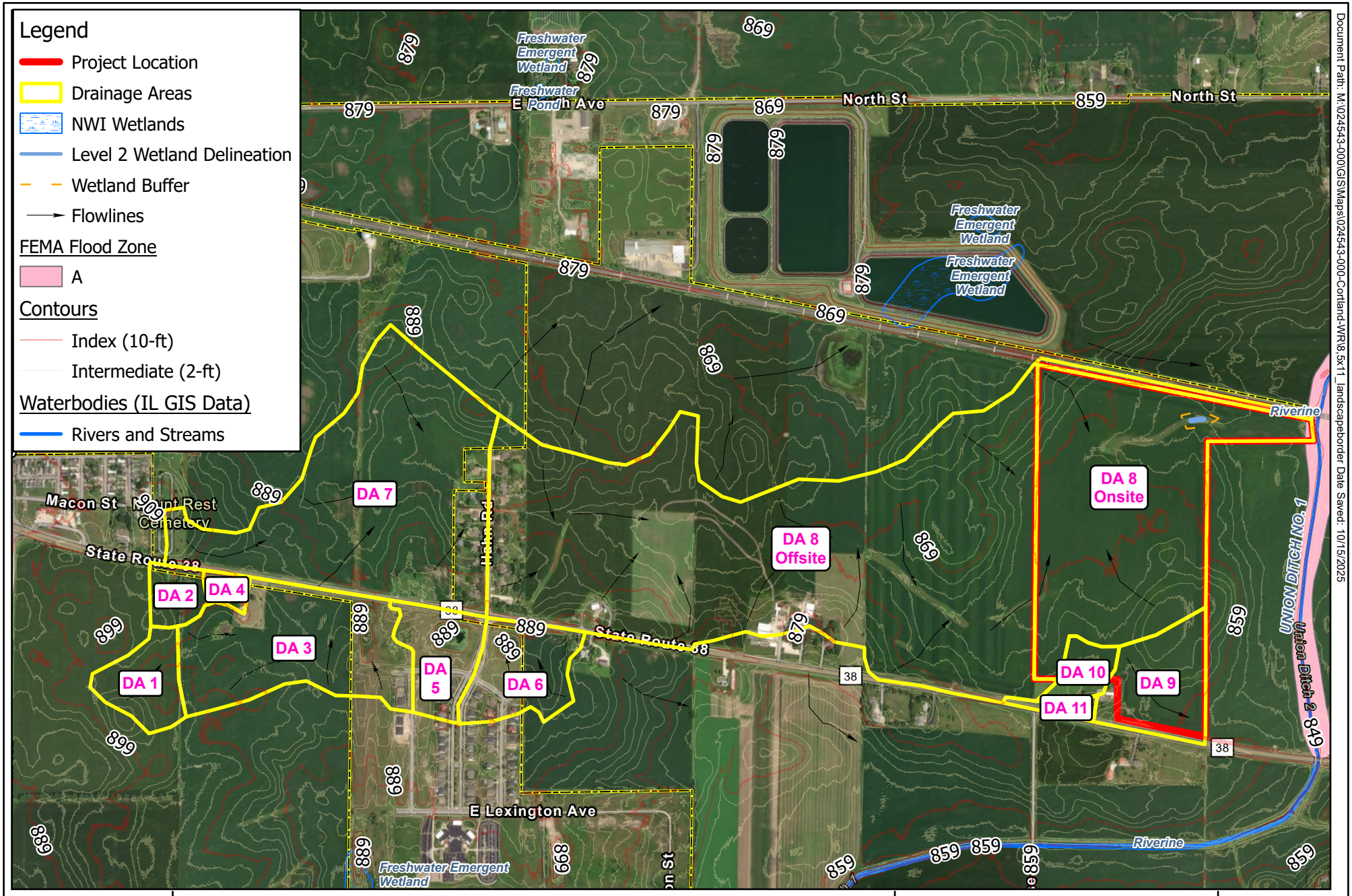
N

0 2,000 Feet

1 inch = 2,000 feet

SOLARSTONE

wsb




# Figure 3B - Existing Drainage Area Map

Cortland Solar Development
Cortland Illinois Solar, LLC

N

0 1,000 Feet

1 inch = 1,000 feet

SOLARSTONE

wsb

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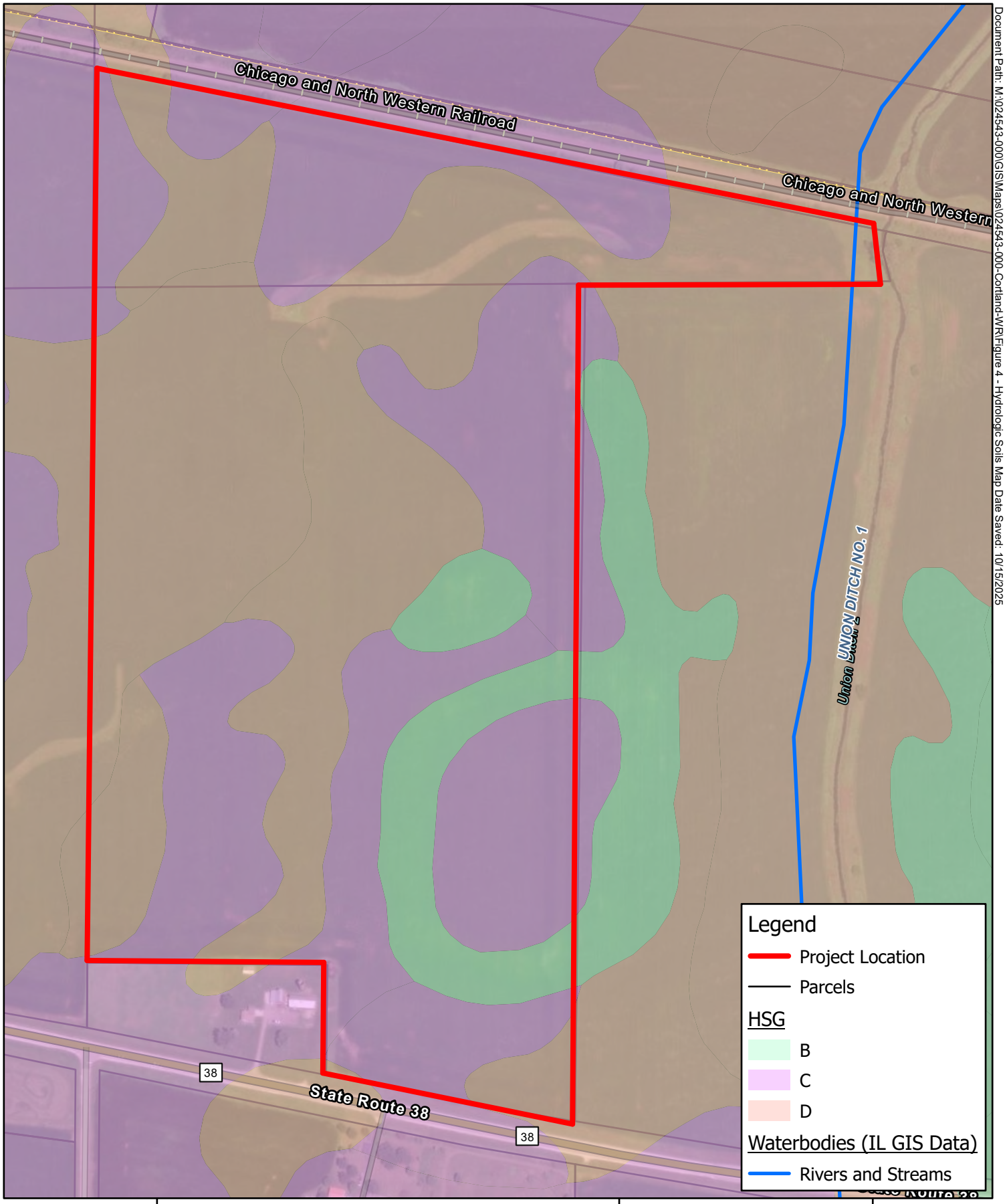



Document Path: M:\024543-000\GIS\Maps\024543-000-Cortland-WRI\Figure 4 - Hydrologic Soils Map Date Saved: 10/15/2025

SOLARSTONE

# Figure 4 - Hydrologic Soils Map

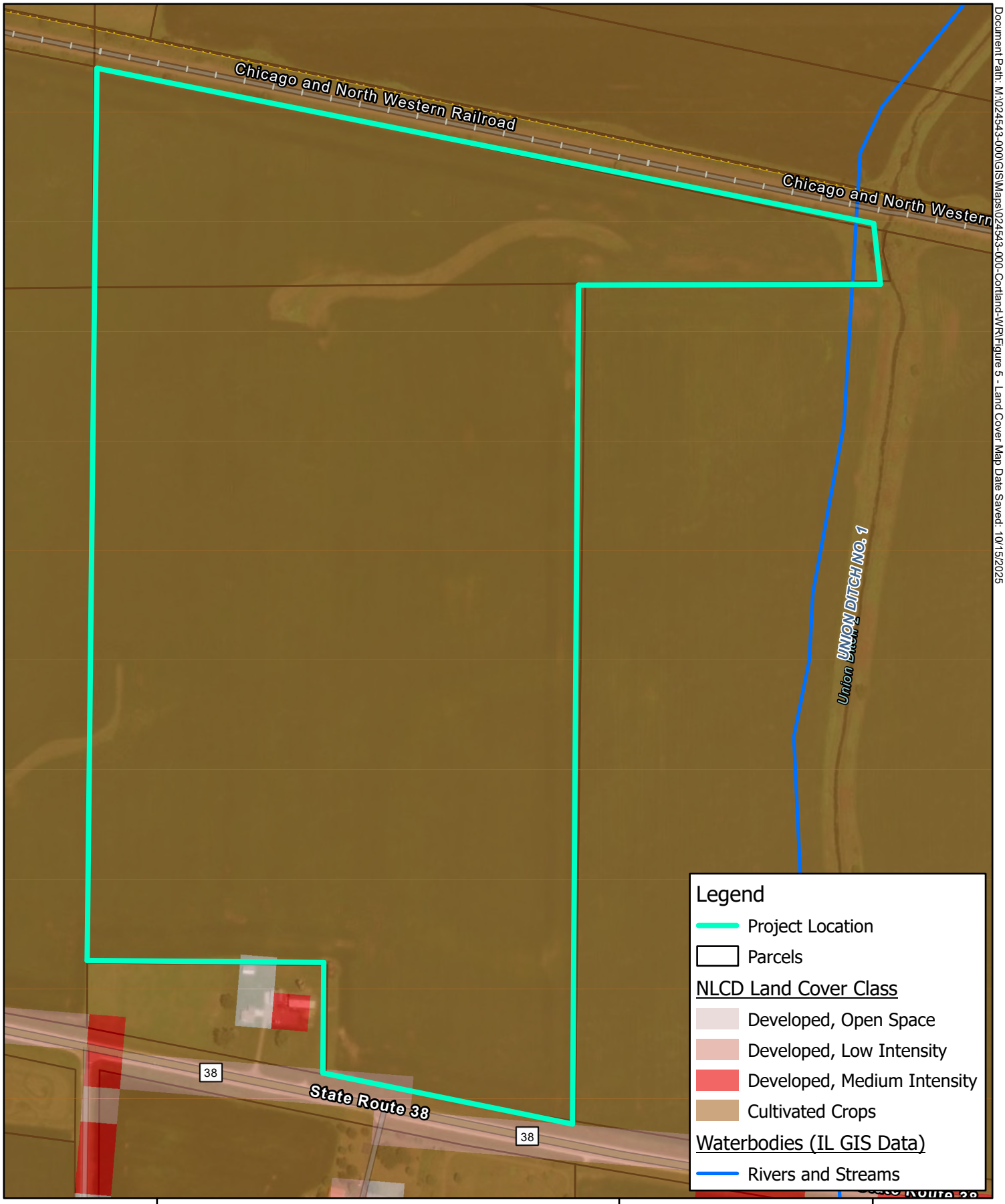
Cortland Solar Development
Cortland Illinois Solar, LLC

N

0 350 Feet

1 inch = 350 feet

wsb




Document Path: M:\024543-000\GIS\Maps\024543-000-Cortland-WRI\Figure 5 - Land Cover Map Date Saved: 10/15/2025

SOLARSTONE

# Figure 5 - Land Cover Map

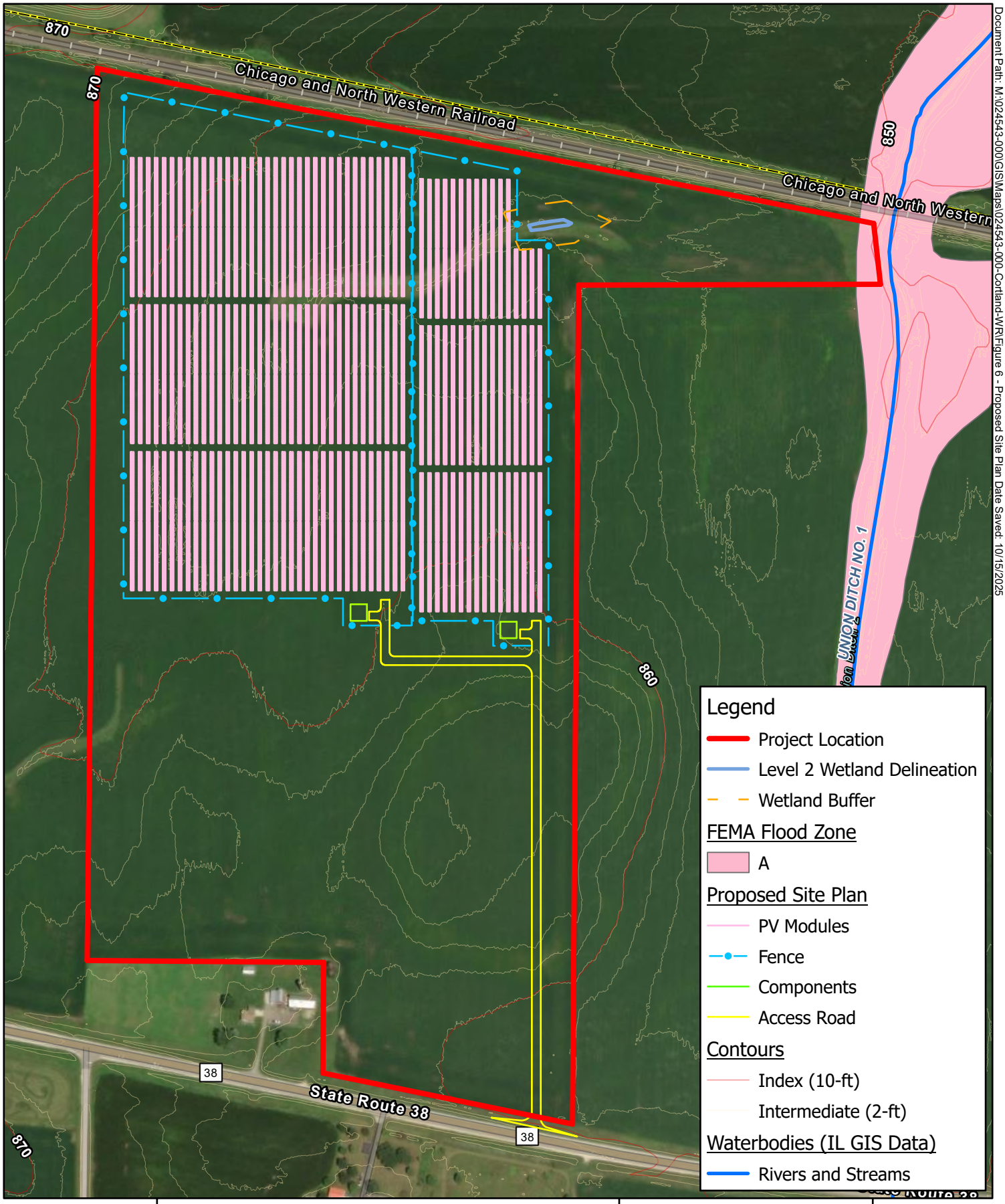
Cortland Solar Development
Cortland Illinois Solar, LLC

N

0 350 Feet

1 inch = 350 feet

wsb




Document Path: M:\024543-000\GIS\Maps\024543-000-Cortland-WRI\Figure 6 - Proposed Site Plan Date Saved: 10/15/2025

# Figure 6 - Proposed Site Plan

Cortland Solar Development
Cortland Illinois Solar, LLC

SOLARSTONE

N

0 350 Feet

1 inch = 350 feet

wsb

## NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or flood plain management.

**Coastal Base Flood Elevations** shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and flood plain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

In the State of Illinois, any portion of a stream or watercourse that lies within the **floodway fringe** of a studied (AE) stream may have a state regulated floodway. The FIRM may not depict these state regulated floodways.

**Floodways** restricted by anthropogenic features such as bridges and culverts are drawn to reflect natural conditions and may not agree with the model computed widths listed in the Floodway Data table in the Flood Insurance Study report.

Multiple **topographic sources** may have been used in the delineation of Special Flood Hazard Areas. See Flood Insurance Study report for details on source resolution and geographic extent.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 16. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services, NOAA, N/NGS12
National Geodetic Survey SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at www.ngs.noaa.gov.

**Base map** information shown on this FIRM was provided in digital format by the United States Geological Survey. Digital orthoimagery with a spatial resolution of 0.5 meter ground sample distance were photogrammetrically compiled from aerial photography acquired during the leaf-off period of spring 2005.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The Special Flood Hazard Areas and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

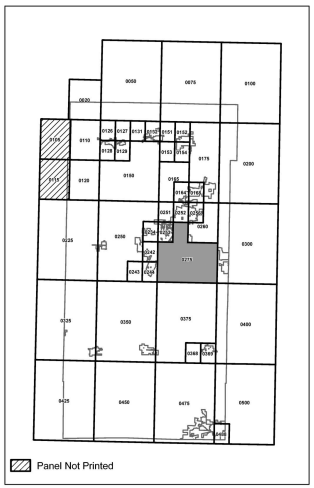
**Corporate limits** shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

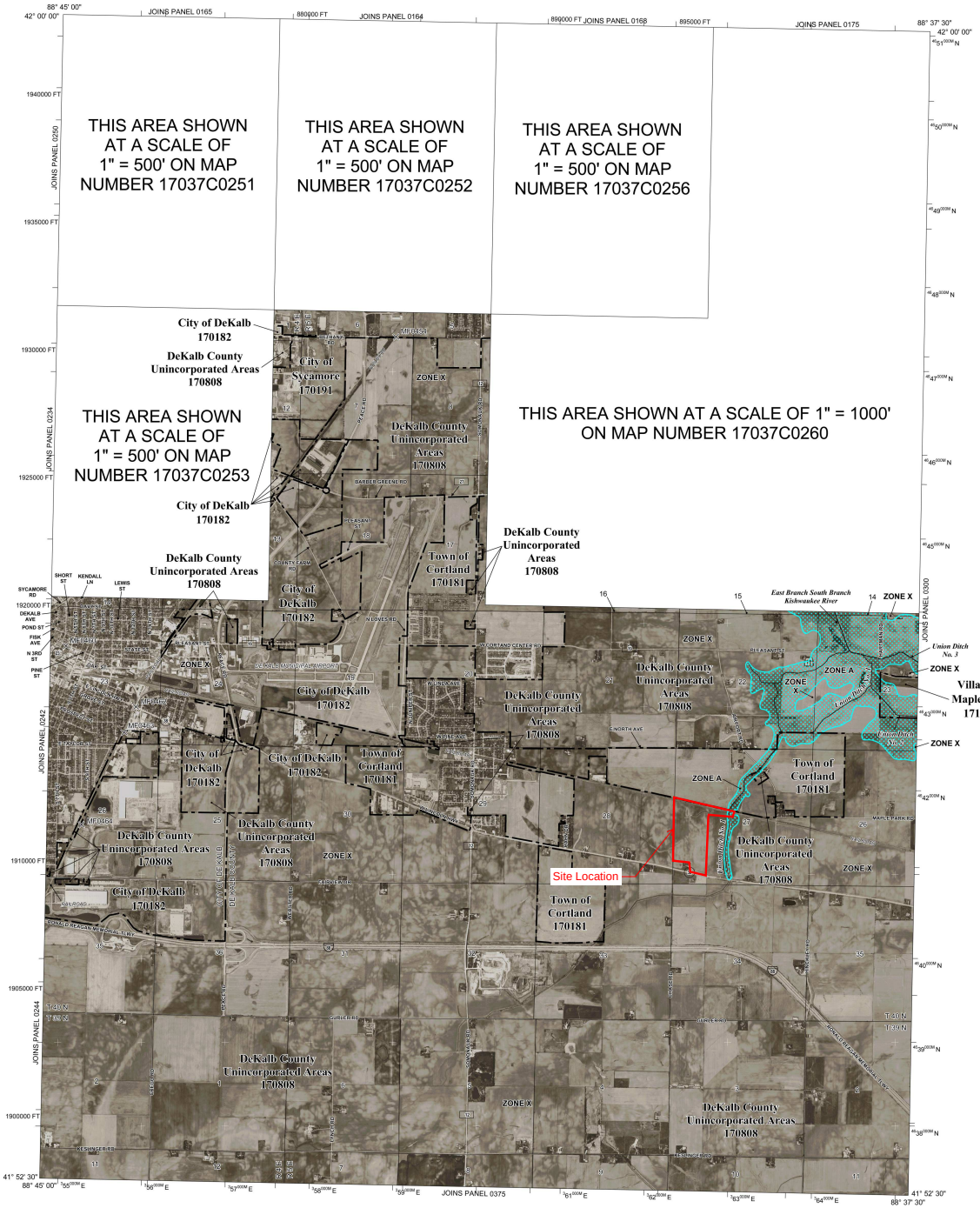
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital version of this map. The FEMA Map Service Center may also be reached by fax at 1-800-358-9620 and its website at www.msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at www.fema.gov/business/nfip.

## PANEL INDEX

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THIS AREA SHOWN AT A SCALE OF 1" = 500' ON MAP NUMBER 17037C0252
THIS AREA SHOWN AT A SCALE OF 1" = 500' ON MAP NUMBER 17037C0256
THIS AREA SHOWN AT A SCALE OF 1" = 500' ON MAP NUMBER 17037C0253
THIS AREA SHOWN AT A SCALE OF 1" = 1000' ON MAP NUMBER 17037C0260
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JOINS PANEL 0164
JOINS PANEL 0168
JOINS PANEL 0175
JOINS PANEL 0250
JOINS PANEL 0234
JOINS PANEL 0242
JOINS PANEL 0244
JOINS PANEL 0375
JOINS PANEL 0300
City of DeKalb 170182
DeKalb County Unincorporated Areas 170808
City of Sycamore 170191
Town of Cortland 170181
East Branch South Branch Kishwaukee River
Union Ditch No. 3
Village of Maple Park 171018
Site Location
ZONE X
ZONE A
ZONE AE
SYCAMORE RD
DEKALB AVE
POND ST
FISK AVE
N 3RD ST
PINE ST
SHORT ST
KENDALL LN
LEWIS ST
GRANT ST
PEACE RD
BARBER GREENE RD
PLEASANT VIEW DR
N LEWIS RD
W CORTLAND CENTER RD
N MAIN ST
N ANNIE GLIDDEN RD
N NORTH ST
E NORTH AVE
MAPLE RANK RD
MAPLE RD
ROUTE 64
PLANK RD
SUBLETTE RD
KISHWAUKEE RD
ANNIE GLIDDEN RD
DE KALB-SYCAMORE RD
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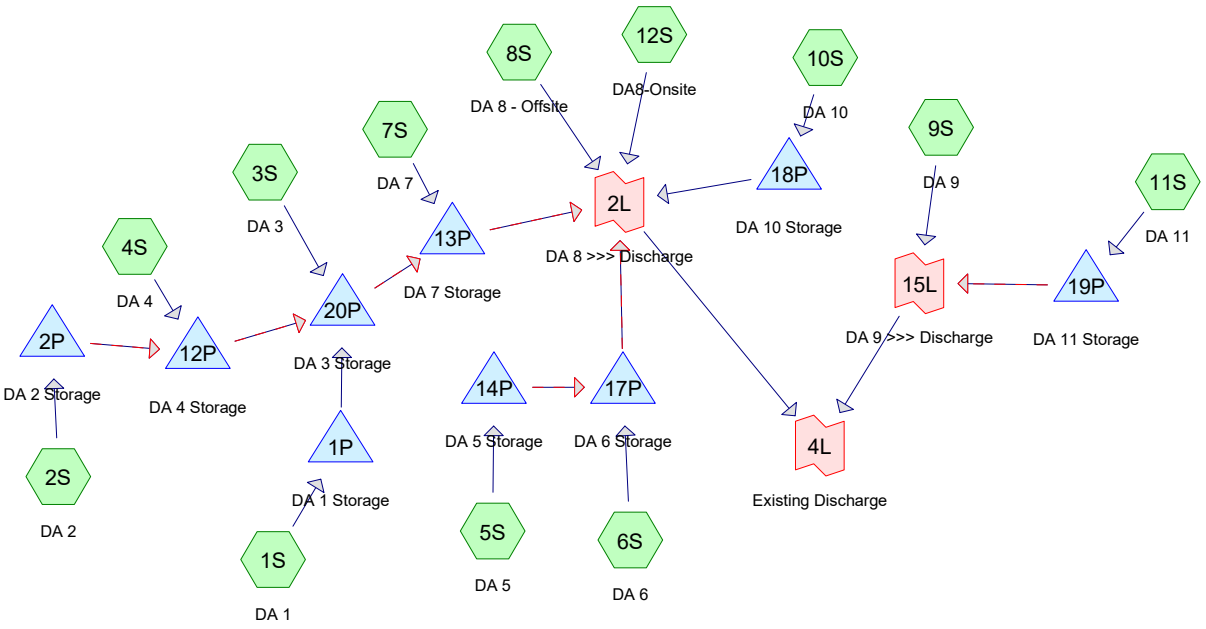
**Existing Conditions**




Subcat Reach Pond Link

**Routing Diagram for Cortland Solar Existing**
Prepared by WSB & Associates Inc, Printed 10/15/2025
HydroCAD® 10.20-7a s/n 00883 © 2025 HydroCAD Software Solutions LLC

## Rainfall Events Listing (selected events)

| Event# | Event Name | Storm Type | Curve | Mode | Duration (hours) | B/B | Depth (inches) | AMC |
|---|---|---|---|---|---|---|---|---|
| 1 | 2-Year Bulletin 70 | Type II 24-hr | | Default | 24.00 | 1 | 3.04 | 2 |
| 2 | 10-Year Bulletin 70 | Type II 24-hr | | Default | 24.00 | 1 | 4.47 | 2 |
| 3 | 25-Year Bulletin 70 | Type II 24-hr | | Default | 24.00 | 1 | 5.51 | 2 |
| 4 | 50-Year Bulletin 70 | Type II 24-hr | | Default | 24.00 | 1 | 6.46 | 2 |
| 5 | 100-Year Bulletin 70 | Type II 24-hr | | Default | 24.00 | 1 | 7.58 | 2 |

## Area Listing (selected nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 13.139 | 80 | 1/2 acre lots, 25% imp, HSG C (5S, 6S, 7S, 8S) |
| 4.319 | 85 | 1/2 acre lots, 25% imp, HSG D (5S, 6S, 7S, 8S) |
| 7.700 | 98 | EX Imp (2S, 3S, 4S, 5S, 6S, 7S, 9S, 11S) |
| 3.970 | 98 | Ex Imp (8S) |
| 3.593 | 79 | Pasture/grassland/range, Fair, HSG C (7S, 8S) |
| 3.079 | 84 | Pasture/grassland/range, Fair, HSG D (7S, 8S) |
| 8.905 | 78 | Row crops, straight row, Good, HSG B (9S, 12S) |
| 198.922 | 85 | Row crops, straight row, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S) |
| 136.342 | 89 | Row crops, straight row, Good, HSG D (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S) |
| **379.969** | **86** | **TOTAL AREA** |

## Soil Listing (selected nodes)

| Area (acres) | Soil Group | Subcatchment Numbers |
|---|---|---|
| 0.000 | HSG A | |
| 8.905 | HSG B | 9S, 12S |
| 215.654 | HSG C | 1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S |
| 143.740 | HSG D | 1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S |
| 11.670 | Other | 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 11S |
| **379.969** | | **TOTAL AREA** |

## Ground Covers (selected nodes)

| HSG-A (acres) | HSG-B (acres) | HSG-C (acres) | HSG-D (acres) | Other (acres) | Total (acres) | Ground Cover | Subcatchme Numbers |
|---|---|---|---|---|---|---|---|
| 0.000 | 0.000 | 13.139 | 4.319 | 0.000 | 17.458 | 1/2 acre lots, 25% imp | |
| 0.000 | 0.000 | 0.000 | 0.000 | 7.700 | 7.700 | EX Imp | |
| 0.000 | 0.000 | 0.000 | 0.000 | 3.970 | 3.970 | Ex Imp | |
| 0.000 | 0.000 | 3.593 | 3.079 | 0.000 | 6.672 | Pasture/grassland/range, Fair | |
| 0.000 | 8.905 | 198.922 | 136.342 | 0.000 | 344.169 | Row crops, straight row, Good | |
| **0.000** | **8.905** | **215.654** | **143.740** | **11.670** | **379.969** | **TOTAL AREA** | |

## Pipe Listing (selected nodes)

| Line# | Node Number | In-Invert (feet) | Out-Invert (feet) | Length (feet) | Slope (ft/ft) | n | Width (inches) | Diam/Height (inches) | Inside-Fill (inches) | Nod Nam |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2P | 897.00 | 896.25 | 37.0 | 0.0203 | 0.025 | 0.0 | 12.0 | 0.0 | |
| 2 | 12P | 895.00 | 894.20 | 40.0 | 0.0200 | 0.025 | 0.0 | 12.0 | 0.0 | |
| 3 | 13P | 879.00 | 878.65 | 45.0 | 0.0078 | 0.025 | 0.0 | 12.0 | 0.0 | |
| 4 | 14P | 889.18 | 888.20 | 138.0 | 0.0071 | 0.012 | 0.0 | 15.0 | 0.0 | |
| 5 | 17P | 886.93 | 884.76 | 63.0 | 0.0344 | 0.012 | 0.0 | 18.0 | 0.0 | |
| 6 | 19P | 862.00 | 861.90 | 38.0 | 0.0026 | 0.025 | 0.0 | 12.0 | 0.0 | |
| 7 | 20P | 890.27 | 890.13 | 47.0 | 0.0030 | 0.025 | 0.0 | 12.0 | 0.0 | |

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1S: DA 1** Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>1.69"
Flow Length=697' Tc=26.2 min CN=86 Runoff=13.61 cfs 1.186 af

**Subcatchment 2S: DA 2** Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>1.69"
Flow Length=412' Tc=10.7 min CN=86 Runoff=10.97 cfs 0.608 af

**Subcatchment 3S: DA 3** Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>1.75"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=37.30 cfs 4.644 af

**Subcatchment 4S: DA 4** Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>1.77"
Flow Length=419' Tc=11.3 min CN=87 Runoff=4.99 cfs 0.283 af

**Subcatchment 5S: DA 5** Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>1.77"
Tc=20.0 min CN=87 Runoff=20.07 cfs 1.497 af

**Subcatchment 6S: DA 6** Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>1.69"
Tc=20.0 min CN=86 Runoff=24.06 cfs 1.793 af

**Subcatchment 7S: DA 7** Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>1.67"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=59.45 cfs 9.403 af

**Subcatchment 8S: DA 8 - Offsite** Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>1.72"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=86.22 cfs 20.498 af

**Subcatchment 9S: DA 9** Runoff Area=14.102 ac 4.61% Impervious Runoff Depth>1.61"
Flow Length=838' Tc=20.0 min CN=85 Runoff=25.44 cfs 1.896 af

**Subcatchment 10S: DA 10** Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>1.69"
Flow Length=529' Tc=15.7 min CN=86 Runoff=9.08 cfs 0.595 af

**Subcatchment 11S: DA 11** Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>1.77"
Flow Length=696' Tc=18.7 min CN=87 Runoff=3.16 cfs 0.226 af

**Subcatchment 12S: DA8-Onsite** Runoff Area=80.300 ac 0.00% Impervious Runoff Depth>1.67"
Flow Length=1,500' Slope=0.0100 '/' Tc=57.5 min CN=86 Runoff=75.19 cfs 11.181 af

**Pond 1P: DA 1 Storage** Peak Elev=898.81' Storage=37,429 cf Inflow=13.61 cfs 1.186 af
Outflow=0.71 cfs 0.342 af

**Pond 2P: DA 2 Storage** Peak Elev=897.55' Storage=14,028 cf Inflow=10.97 cfs 0.608 af
Primary=0.89 cfs 0.484 af Secondary=0.00 cfs 0.000 af Outflow=0.89 cfs 0.484 af

**Pond 12P: DA 4 Storage** Peak Elev=895.85' Storage=4,744 cf Inflow=5.44 cfs 0.768 af
Primary=1.83 cfs 0.751 af Secondary=0.00 cfs 0.000 af Outflow=1.83 cfs 0.751 af

**Pond 13P: DA 7 Storage** Peak Elev=881.11' Storage=273,890 cf Inflow=59.86 cfs 10.456 af
Primary=2.94 cfs 2.842 af Secondary=3.50 cfs 1.817 af Outflow=6.44 cfs 4.659 af

**Pond 14P: DA 5 Storage** Peak Elev=889.76' Storage=169,367 cf Inflow=20.07 cfs 1.497 af
Primary=1.39 cfs 0.980 af Secondary=0.00 cfs 0.000 af Outflow=1.39 cfs 0.980 af

**Pond 17P: DA 6 Storage** Peak Elev=888.02' Storage=106,374 cf Inflow=24.52 cfs 2.772 af
Primary=4.90 cfs 2.391 af Secondary=0.00 cfs 0.000 af Outflow=4.90 cfs 2.391 af

**Pond 18P: DA 10 Storage** Peak Elev=863.42' Storage=17,721 cf Inflow=9.08 cfs 0.595 af
Outflow=0.41 cfs 0.203 af

**Pond 19P: DA 11 Storage** Peak Elev=863.30' Storage=1,895 cf Inflow=3.16 cfs 0.226 af
Primary=1.76 cfs 0.225 af Secondary=0.00 cfs 0.000 af Outflow=1.76 cfs 0.225 af

**Pond 20P: DA 3 Storage** Peak Elev=891.25' Storage=441,668 cf Inflow=39.11 cfs 5.736 af
Primary=1.28 cfs 1.053 af Secondary=0.00 cfs 0.000 af Outflow=1.28 cfs 1.053 af

**Link 2L: DA 8 >>> Discharge** Inflow=140.78 cfs 38.932 af
Primary=140.78 cfs 38.932 af

**Link 4L: Existing Discharge** Inflow=144.87 cfs 41.053 af
Primary=144.87 cfs 41.053 af

**Link 15L: DA 9 >>> Discharge** Inflow=27.07 cfs 2.121 af
Primary=27.07 cfs 2.121 af

**Total Runoff Area = 379.969 ac Runoff Volume = 53.809 af Average Runoff Depth = 1.70"**
**95.78% Pervious = 363.934 ac 4.22% Impervious = 16.034 ac**

## Summary for Subcatchment 1S: DA 1

Runoff = 13.61 cfs @ 12.20 hrs, Volume= 1.186 af, Depth> 1.69"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| Area (ac) | CN | Description |
|---|---|---|
| 5.805 | 85 | Row crops, straight row, Good, HSG C |
| 2.642 | 89 | Row crops, straight row, Good, HSG D |
| 8.447 | 86 | Weighted Average |
| 8.447 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.3 | 100 | 0.0102 | 0.26 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 19.9 | 597 | 0.0031 | 0.50 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 26.2 | 697 | Total | | | |

## Summary for Subcatchment 2S: DA 2

Runoff = 10.97 cfs @ 12.02 hrs, Volume= 0.608 af, Depth> 1.69"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.080 | 98 | EX Imp |
| | 3.280 | 85 | Row crops, straight row, Good, HSG C |
| | 0.950 | 89 | Row crops, straight row, Good, HSG D |
| | 4.310 | 86 | Weighted Average |
| | 4.230 | | 98.14% Pervious Area |
| | 0.080 | | 1.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0090 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 4.1 | 312 | 0.0196 | 1.26 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 10.7 | 412 | Total | | | |

## Summary for Subcatchment 3S: DA 3

Runoff = 37.30 cfs @ 12.42 hrs, Volume= 4.644 af, Depth> 1.75"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.540 | 98 | EX Imp |
| | 18.238 | 85 | Row crops, straight row, Good, HSG C |
| | 13.000 | 89 | Row crops, straight row, Good, HSG D |
| | 31.778 | 87 | Weighted Average |
| | 31.238 | | 98.30% Pervious Area |
| | 0.540 | | 1.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.3 | 100 | 0.0160 | 0.32 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 39.6 | 1,803 | 0.0071 | 0.76 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 44.9 | 1,903 | Total | | | |

## Summary for Subcatchment 4S: DA 4

Runoff = 4.99 cfs @ 12.03 hrs, Volume= 0.283 af, Depth> 1.77"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.110 | 98 | EX Imp |
| | 1.206 | 85 | Row crops, straight row, Good, HSG C |
| | 0.607 | 89 | Row crops, straight row, Good, HSG D |
| | 1.923 | 87 | Weighted Average |
| | 1.813 | | 94.28% Pervious Area |
| | 0.110 | | 5.72% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | 100 | 0.0188 | 0.34 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 6.3 | 319 | 0.0089 | 0.85 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 11.3 | 419 | Total | | | |

## Summary for Subcatchment 5S: DA 5

Runoff = 20.07 cfs @ 12.12 hrs, Volume= 1.497 af, Depth> 1.77"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 3.625 | 85 | Row crops, straight row, Good, HSG C |
| | 0.487 | 89 | Row crops, straight row, Good, HSG D |
| * | 2.350 | 98 | EX Imp |
| | 2.941 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.771 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 10.174 | 87 | Weighted Average |
| | 6.896 | | 67.78% Pervious Area |
| | 3.278 | | 32.22% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 6S: DA 6

Runoff = 24.06 cfs @ 12.13 hrs, Volume= 1.793 af, Depth> 1.69"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.860 | 98 | EX Imp |
| | 6.291 | 85 | Row crops, straight row, Good, HSG C |
| | 0.955 | 89 | Row crops, straight row, Good, HSG D |
| | 3.140 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.499 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 12.745 | 86 | Weighted Average |
| | 9.975 | | 78.27% Pervious Area |
| | 2.770 | | 21.73% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 7S: DA 7

Runoff = 59.45 cfs @ 12.68 hrs, Volume= 9.403 af, Depth> 1.67"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 39.504 | 85 | Row crops, straight row, Good, HSG C |
| | 18.825 | 89 | Row crops, straight row, Good, HSG D |
| * | 1.820 | 98 | EX Imp |
| | 3.089 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.709 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 1.150 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.527 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 67.624 | 86 | Weighted Average |
| | 64.604 | | 95.53% Pervious Area |
| | 3.020 | | 4.47% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0360 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 58.6 | 3,034 | 0.0092 | 0.86 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 62.4 | 3,134 | Total | | | |

## Summary for Subcatchment 8S: DA 8 - Offsite

Runoff = 86.22 cfs @ 13.25 hrs, Volume= 20.498 af, Depth> 1.72"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.970 | 98 | Ex Imp |
| | 3.969 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.340 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 2.443 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.552 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 0.000 | 78 | Row crops, straight row, Good, HSG B |
| | 71.424 | 85 | Row crops, straight row, Good, HSG C |
| | 58.103 | 89 | Row crops, straight row, Good, HSG D |
| | 142.801 | 87 | Weighted Average |
| | 137.504 | | 96.29% Pervious Area |
| | 5.297 | | 3.71% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 100 | 0.0217 | 0.36 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 103.4 | 3,704 | 0.0044 | 0.60 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 1.3 | 1,685 | 0.0055 | 22.10 | 72,207.12 | **Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding |
| 109.4 | 5,489 | Total | | | |

## Summary for Subcatchment 9S: DA 9

Runoff = 25.44 cfs @ 12.13 hrs, Volume= 1.896 af, Depth> 1.61"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.650 | 98 | EX Imp |
| | 2.505 | 78 | Row crops, straight row, Good, HSG B |
| | 9.212 | 85 | Row crops, straight row, Good, HSG C |
| | 1.735 | 89 | Row crops, straight row, Good, HSG D |
| | 14.102 | 85 | Weighted Average |
| | 13.452 | | 95.39% Pervious Area |
| | 0.650 | | 4.61% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.9 | 100 | 0.0081 | 0.24 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 13.1 | 738 | 0.0109 | 0.94 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 20.0 | 838 | Total | | | |

## Summary for Subcatchment 10S: DA 10

Runoff = 9.08 cfs @ 12.08 hrs, Volume= 0.595 af, Depth> 1.69"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| Area (ac) | CN | Description |
|---|---|---|
| 2.804 | 85 | Row crops, straight row, Good, HSG C |
| 1.423 | 89 | Row crops, straight row, Good, HSG D |
| 4.227 | 86 | Weighted Average |
| 4.227 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.5 | 100 | 0.0067 | 0.22 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 8.2 | 429 | 0.0095 | 0.88 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 15.7 | 529 | Total | | | |

## Summary for Subcatchment 11S: DA 11

Runoff = 3.16 cfs @ 12.11 hrs, Volume= 0.226 af, Depth> 1.77"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.290 | 98 | EX Imp |
| | 1.233 | 85 | Row crops, straight row, Good, HSG C |
| | 0.015 | 89 | Row crops, straight row, Good, HSG D |
| | 1.538 | 87 | Weighted Average |
| | 1.248 | | 81.14% Pervious Area |
| | 0.290 | | 18.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0361 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 14.9 | 596 | 0.0055 | 0.67 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 18.7 | 696 | Total | | | |

## Summary for Subcatchment 12S: DA8-Onsite

Runoff = 75.19 cfs @ 12.59 hrs, Volume= 11.181 af, Depth> 1.67"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| Area (ac) | CN | Description |
|---|---|---|
| 37.600 | 89 | Row crops, straight row, Good, HSG D |
| 36.300 | 85 | Row crops, straight row, Good, HSG C |
| 6.400 | 78 | Row crops, straight row, Good, HSG B |
| 80.300 | 86 | Weighted Average |
| 80.300 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 35.3 | 300 | 0.0100 | 0.14 | | **Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04" |
| 22.2 | 1,200 | 0.0100 | 0.90 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 57.5 | 1,500 | Total | | | |

## Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 1.69" for 2-Year Bulletin 70 event
Inflow = 13.61 cfs @ 12.20 hrs, Volume= 1.186 af
Outflow = 0.71 cfs @ 14.94 hrs, Volume= 0.342 af, Atten= 95%, Lag= 164.5 min
Primary = 0.71 cfs @ 14.94 hrs, Volume= 0.342 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.81' @ 14.94 hrs Surf.Area= 74,193 sf Storage= 37,429 cf

Plug-Flow detention time= 379.2 min calculated for 0.342 af (29% of inflow)
Center-of-Mass det. time= 249.6 min ( 1,085.8 - 836.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 898.00' | 394,067 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 898.00 | 18,479 | 0 | 0 |
| 899.00 | 87,451 | 52,965 | 52,965 |
| 900.00 | 175,260 | 131,356 | 184,321 |
| 901.00 | 244,232 | 209,746 | 394,067 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 898.79' | **120.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=0.71 cfs @ 14.94 hrs HW=898.81' TW=891.10' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.71 cfs @ 0.33 fps)

## Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 1.69" for 2-Year Bulletin 70 event
Inflow = 10.97 cfs @ 12.02 hrs, Volume= 0.608 af
Outflow = 0.89 cfs @ 12.73 hrs, Volume= 0.484 af, Atten= 92%, Lag= 42.4 min
Primary = 0.89 cfs @ 12.73 hrs, Volume= 0.484 af
Routed to Pond 12P : DA 4 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.55' @ 12.73 hrs Surf.Area= 33,582 sf Storage= 14,028 cf

Plug-Flow detention time= 243.2 min calculated for 0.484 af (80% of inflow)
Center-of-Mass det. time= 160.5 min ( 984.9 - 824.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 897.00' | 178,312 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 897.00 | 17,532 | 0 | 0 |
| 898.00 | 46,772 | 32,152 | 32,152 |
| 899.00 | 72,833 | 59,803 | 91,955 |
| 900.00 | 99,882 | 86,358 | 178,312 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Secondary | 897.75' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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 |
| #2 | Primary | 897.00' | **12.0" Round Culvert** L= 37.0' Ke= 0.500<br>Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.89 cfs @ 12.73 hrs HW=897.55' TW=895.81' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 0.89 cfs @ 2.94 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=897.00' TW=895.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 1.48" for 2-Year Bulletin 70 event
Inflow = 5.44 cfs @ 12.04 hrs, Volume= 0.768 af
Outflow = 1.83 cfs @ 12.31 hrs, Volume= 0.751 af, Atten= 66%, Lag= 16.6 min
Primary = 1.83 cfs @ 12.31 hrs, Volume= 0.751 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 895.85' @ 12.31 hrs Surf.Area= 10,246 sf Storage= 4,744 cf

Plug-Flow detention time= 41.6 min calculated for 0.750 af (98% of inflow)
Center-of-Mass det. time= 30.3 min ( 954.7 - 924.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 895.00' | 194,049 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 895.00 | 931 | 0 | 0 |
| 896.00 | 11,904 | 6,418 | 6,418 |
| 897.00 | 26,038 | 18,971 | 25,389 |
| 898.00 | 49,659 | 37,849 | 63,237 |
| 900.00 | 81,153 | 130,812 | 194,049 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 895.00' | **12.0" Round Culvert** L= 40.0' Ke= 0.500<br>Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 898.00' | **15.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=1.83 cfs @ 12.31 hrs HW=895.85' TW=890.54' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.83 cfs @ 3.48 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 1.10" for 2-Year Bulletin 70 event
Inflow = 59.86 cfs @ 12.68 hrs, Volume= 10.456 af
Outflow = 6.44 cfs @ 15.79 hrs, Volume= 4.659 af, Atten= 89%, Lag= 186.5 min
Primary = 2.94 cfs @ 15.79 hrs, Volume= 2.842 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 3.50 cfs @ 15.79 hrs, Volume= 1.817 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.11' @ 15.79 hrs Surf.Area= 321,111 sf Storage= 273,890 cf

Plug-Flow detention time= 333.0 min calculated for 4.659 af (45% of inflow)
Center-of-Mass det. time= 191.4 min ( 1,081.6 - 890.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 879.00' | 654,217 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 879.00 | 3,000 | 0 | 0 |
| 880.00 | 90,812 | 46,906 | 46,906 |
| 881.00 | 293,662 | 192,237 | 239,143 |
| 882.00 | 536,485 | 415,074 | 654,217 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 879.00' | **12.0" Round Culvert** L= 45.0' Ke= 0.500<br>Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 881.00' | **37.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.94 cfs @ 15.79 hrs HW=881.11' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.94 cfs @ 3.74 fps)

**Secondary OutFlow** Max=3.50 cfs @ 15.79 hrs HW=881.11' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 3.50 cfs @ 0.84 fps)

## Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 1.77" for 2-Year Bulletin 70 event
Inflow = 20.07 cfs @ 12.12 hrs, Volume= 1.497 af
Outflow = 1.39 cfs @ 13.57 hrs, Volume= 0.980 af, Atten= 93%, Lag= 86.7 min
Primary = 1.39 cfs @ 13.57 hrs, Volume= 0.980 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.18' Surf.Area= 53,391 sf Storage= 130,918 cf
Peak Elev= 889.76' @ 13.57 hrs Surf.Area= 79,483 sf Storage= 169,367 cf (38,449 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 204.2 min ( 1,032.0 - 827.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 886.00' | 525,760 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 886.00 | 30,908 | 0 | 0 |
| 887.00 | 40,872 | 35,890 | 35,890 |
| 889.00 | 45,276 | 86,148 | 122,038 |
| 891.00 | 135,445 | 180,721 | 302,759 |
| 892.10 | 270,011 | 223,001 | 525,760 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 889.18' | **15.0" Round Culvert** L= 138.0' Ke= 0.500<br>Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf |
| #2 | Secondary | 892.00' | **73.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=1.39 cfs @ 13.57 hrs HW=889.76' TW=887.94' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 1.39 cfs @ 3.67 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=889.18' TW=886.93' (Dynamic Tailwater)
**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 1.45" for 2-Year Bulletin 70 event
Inflow = 24.52 cfs @ 12.13 hrs, Volume= 2.772 af
Outflow = 4.90 cfs @ 12.74 hrs, Volume= 2.391 af, Atten= 80%, Lag= 36.7 min
Primary = 4.90 cfs @ 12.74 hrs, Volume= 2.391 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 888.02' @ 12.74 hrs Surf.Area= 37,003 sf Storage= 106,374 cf (38,860 cf above start)

Plug-Flow detention time= 510.0 min calculated for 0.841 af (30% of inflow)
Center-of-Mass det. time= 88.9 min ( 991.2 - 902.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 884.00' | 487,275 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 884.00 | 10,000 | 0 | 0 |
| 885.00 | 16,000 | 13,000 | 13,000 |
| 886.00 | 31,740 | 23,870 | 36,870 |
| 889.00 | 39,548 | 106,932 | 143,802 |
| 891.00 | 150,950 | 190,498 | 334,300 |
| 892.00 | 155,000 | 152,975 | 487,275 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 886.93' | **18.0" Round Culvert** L= 63.0' Ke= 0.500<br>Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf |
| #2 | Secondary | 890.00' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=4.90 cfs @ 12.74 hrs HW=888.02' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 4.90 cfs @ 3.56 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=886.93' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 1.69" for 2-Year Bulletin 70 event
Inflow = 9.08 cfs @ 12.08 hrs, Volume= 0.595 af
Outflow = 0.41 cfs @ 14.16 hrs, Volume= 0.203 af, Atten= 95%, Lag= 124.7 min
Primary = 0.41 cfs @ 14.16 hrs, Volume= 0.203 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.42' @ 14.16 hrs Surf.Area= 54,352 sf Storage= 17,721 cf

Plug-Flow detention time= 345.4 min calculated for 0.203 af (34% of inflow)
Center-of-Mass det. time= 220.4 min ( 1,048.6 - 828.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 863.00' | 3,373,778 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 863.00 | 29,607 | 0 | 0 |
| 864.00 | 88,227 | 58,917 | 58,917 |
| 895.00 | 125,635 | 3,314,861 | 3,373,778 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 863.40' | **50.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=0.41 cfs @ 14.16 hrs HW=863.42' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.41 cfs @ 0.37 fps)

## Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 1.77" for 2-Year Bulletin 70 event
Inflow = 3.16 cfs @ 12.11 hrs, Volume= 0.226 af
Outflow = 1.76 cfs @ 12.27 hrs, Volume= 0.225 af, Atten= 44%, Lag= 9.7 min
Primary = 1.76 cfs @ 12.27 hrs, Volume= 0.225 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.30' @ 12.28 hrs Surf.Area= 3,490 sf Storage= 1,895 cf

Plug-Flow detention time= 15.2 min calculated for 0.225 af (99% of inflow)
Center-of-Mass det. time= 12.0 min ( 838.8 - 826.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 862.00' | 17,715 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 862.00 | 100 | 0 | 0 |
| 863.00 | 2,048 | 1,074 | 1,074 |
| 864.00 | 6,912 | 4,480 | 5,554 |
| 865.00 | 17,409 | 12,161 | 17,715 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 862.00' | **12.0" Round Culvert** L= 38.0' Ke= 0.500<br>Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 864.00' | **24.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=1.76 cfs @ 12.27 hrs HW=863.30' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.76 cfs @ 2.26 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=862.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 1.48" for 2-Year Bulletin 70 event
Inflow = 39.11 cfs @ 12.42 hrs, Volume= 5.736 af
Outflow = 1.28 cfs @ 24.00 hrs, Volume= 1.053 af, Atten= 97%, Lag= 694.7 min
Primary = 1.28 cfs @ 24.00 hrs, Volume= 1.053 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 891.25' @ 24.00 hrs Surf.Area= 268,996 sf Storage= 441,668 cf (203,998 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 251.6 min ( 1,126.8 - 875.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 887.00' | 1,151,208 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 887.00 | 21,488 | 0 | 0 |
| 890.00 | 113,506 | 202,491 | 202,491 |
| 893.00 | 486,505 | 900,017 | 1,102,508 |
| 893.10 | 487,505 | 48,701 | 1,151,208 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 890.27' | **12.0" Round Culvert** L= 47.0' Ke= 0.500<br>Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 893.00' | **13.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=1.28 cfs @ 24.00 hrs HW=891.25' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.28 cfs @ 2.07 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.14% Impervious, Inflow Depth > 1.28" for 2-Year Bulletin 70 event
Inflow = 140.78 cfs @ 12.84 hrs, Volume= 38.932 af
Primary = 140.78 cfs @ 12.84 hrs, Volume= 38.932 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 4L: Existing Discharge

Inflow Area = 379.969 ac, 4.22% Impervious, Inflow Depth > 1.30" for 2-Year Bulletin 70 event
Inflow = 144.87 cfs @ 12.78 hrs, Volume= 41.053 af
Primary = 144.87 cfs @ 12.78 hrs, Volume= 41.053 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 6.01% Impervious, Inflow Depth > 1.63" for 2-Year Bulletin 70 event
Inflow = 27.07 cfs @ 12.13 hrs, Volume= 2.121 af
Primary = 27.07 cfs @ 12.13 hrs, Volume= 2.121 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1S: DA 1** Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>2.96"
Flow Length=697' Tc=26.2 min CN=86 Runoff=23.75 cfs 2.082 af

**Subcatchment 2S: DA 2** Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>2.97"
Flow Length=412' Tc=10.7 min CN=86 Runoff=18.90 cfs 1.066 af

**Subcatchment 3S: DA 3** Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>3.04"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=64.42 cfs 8.048 af

**Subcatchment 4S: DA 4** Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>3.06"
Flow Length=419' Tc=11.3 min CN=87 Runoff=8.48 cfs 0.491 af

**Subcatchment 5S: DA 5** Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>3.06"
Tc=20.0 min CN=87 Runoff=34.38 cfs 2.592 af

**Subcatchment 6S: DA 6** Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>2.96"
Tc=20.0 min CN=86 Runoff=41.86 cfs 3.146 af

**Subcatchment 7S: DA 7** Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>2.93"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=104.36 cfs 16.518 af

**Subcatchment 8S: DA 8 - Offsite** Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>2.99"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=149.67 cfs 35.585 af

**Subcatchment 9S: DA 9** Runoff Area=14.102 ac 4.61% Impervious Runoff Depth>2.87"
Flow Length=838' Tc=20.0 min CN=85 Runoff=44.98 cfs 3.370 af

**Subcatchment 10S: DA 10** Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>2.96"
Flow Length=529' Tc=15.7 min CN=86 Runoff=15.74 cfs 1.044 af

**Subcatchment 11S: DA 11** Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>3.06"
Flow Length=696' Tc=18.7 min CN=87 Runoff=5.40 cfs 0.392 af

**Subcatchment 12S: DA8-Onsite** Runoff Area=80.300 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=1,500' Slope=0.0100 '/' Tc=57.5 min CN=86 Runoff=132.20 cfs 19.638 af

**Pond 1P: DA 1 Storage** Peak Elev=898.89' Storage=43,911 cf Inflow=23.75 cfs 2.082 af
Outflow=9.71 cfs 1.232 af

**Pond 2P: DA 2 Storage** Peak Elev=897.81' Storage=23,723 cf Inflow=18.90 cfs 1.066 af
Primary=1.71 cfs 0.843 af Secondary=1.40 cfs 0.064 af Outflow=3.11 cfs 0.907 af

**Pond 12P: DA 4 Storage** Peak Elev=896.34' Storage=11,331 cf Inflow=9.60 cfs 1.398 af
Primary=2.82 cfs 1.373 af Secondary=0.00 cfs 0.000 af Outflow=2.82 cfs 1.373 af

**Pond 13P: DA 7 Storage** Peak Elev=881.43' Storage=387,065 cf Inflow=105.51 cfs 18.309 af
Primary=3.24 cfs 3.180 af Secondary=26.72 cfs 8.957 af Outflow=29.96 cfs 12.136 af

**Pond 14P: DA 5 Storage** Peak Elev=890.08' Storage=197,189 cf Inflow=34.38 cfs 2.592 af
Primary=2.95 cfs 1.896 af Secondary=0.00 cfs 0.000 af Outflow=2.95 cfs 1.896 af

**Pond 17P: DA 6 Storage** Peak Elev=888.83' Storage=137,094 cf Inflow=43.20 cfs 5.042 af
Primary=9.12 cfs 4.548 af Secondary=0.00 cfs 0.000 af Outflow=9.12 cfs 4.548 af

**Pond 18P: DA 10 Storage** Peak Elev=863.51' Storage=22,709 cf Inflow=15.74 cfs 1.044 af
Outflow=4.53 cfs 0.648 af

**Pond 19P: DA 11 Storage** Peak Elev=863.75' Storage=4,005 cf Inflow=5.40 cfs 0.392 af
Primary=2.40 cfs 0.390 af Secondary=0.00 cfs 0.000 af Outflow=2.40 cfs 0.390 af

**Pond 20P: DA 3 Storage** Peak Elev=891.85' Storage=623,637 cf Inflow=75.61 cfs 10.653 af
Primary=2.02 cfs 1.792 af Secondary=0.00 cfs 0.000 af Outflow=2.02 cfs 1.792 af

**Link 2L: DA 8 >>> Discharge** Inflow=253.85 cfs 72.555 af
Primary=253.85 cfs 72.555 af

**Link 4L: Existing Discharge** Inflow=260.64 cfs 76.315 af
Primary=260.64 cfs 76.315 af

**Link 15L: DA 9 >>> Discharge** Inflow=47.01 cfs 3.761 af
Primary=47.01 cfs 3.761 af

**Total Runoff Area = 379.969 ac Runoff Volume = 93.971 af Average Runoff Depth = 2.97"**
**95.78% Pervious = 363.934 ac 4.22% Impervious = 16.034 ac**

## Summary for Subcatchment 1S: DA 1

Runoff = 23.75 cfs @ 12.20 hrs, Volume= 2.082 af, Depth> 2.96"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| Area (ac) | CN | Description |
|---|---|---|
| 5.805 | 85 | Row crops, straight row, Good, HSG C |
| 2.642 | 89 | Row crops, straight row, Good, HSG D |
| 8.447 | 86 | Weighted Average |
| 8.447 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.3 | 100 | 0.0102 | 0.26 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 19.9 | 597 | 0.0031 | 0.50 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 26.2 | 697 | Total | | | |

## Summary for Subcatchment 2S: DA 2

Runoff = 18.90 cfs @ 12.02 hrs, Volume= 1.066 af, Depth> 2.97"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.080 | 98 | EX Imp |
| | 3.280 | 85 | Row crops, straight row, Good, HSG C |
| | 0.950 | 89 | Row crops, straight row, Good, HSG D |
| | 4.310 | 86 | Weighted Average |
| | 4.230 | | 98.14% Pervious Area |
| | 0.080 | | 1.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0090 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 4.1 | 312 | 0.0196 | 1.26 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 10.7 | 412 | Total | | | |

## Summary for Subcatchment 3S: DA 3

Runoff = 64.42 cfs @ 12.42 hrs, Volume= 8.048 af, Depth> 3.04"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.540 | 98 | EX Imp |
| | 18.238 | 85 | Row crops, straight row, Good, HSG C |
| | 13.000 | 89 | Row crops, straight row, Good, HSG D |
| | 31.778 | 87 | Weighted Average |
| | 31.238 | | 98.30% Pervious Area |
| | 0.540 | | 1.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.3 | 100 | 0.0160 | 0.32 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 39.6 | 1,803 | 0.0071 | 0.76 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 44.9 | 1,903 | Total | | | |

## Summary for Subcatchment 4S: DA 4

Runoff = 8.48 cfs @ 12.03 hrs, Volume= 0.491 af, Depth> 3.06"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.110 | 98 | EX Imp |
| | 1.206 | 85 | Row crops, straight row, Good, HSG C |
| | 0.607 | 89 | Row crops, straight row, Good, HSG D |
| | 1.923 | 87 | Weighted Average |
| | 1.813 | | 94.28% Pervious Area |
| | 0.110 | | 5.72% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | 100 | 0.0188 | 0.34 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 6.3 | 319 | 0.0089 | 0.85 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 11.3 | 419 | Total | | | |

## Summary for Subcatchment 5S: DA 5

Runoff = 34.38 cfs @ 12.12 hrs, Volume= 2.592 af, Depth> 3.06"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 3.625 | 85 | Row crops, straight row, Good, HSG C |
| | 0.487 | 89 | Row crops, straight row, Good, HSG D |
| * | 2.350 | 98 | EX Imp |
| | 2.941 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.771 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 10.174 | 87 | Weighted Average |
| | 6.896 | | 67.78% Pervious Area |
| | 3.278 | | 32.22% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 6S: DA 6

Runoff = 41.86 cfs @ 12.12 hrs, Volume= 3.146 af, Depth> 2.96"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.860 | 98 | EX Imp |
| | 6.291 | 85 | Row crops, straight row, Good, HSG C |
| | 0.955 | 89 | Row crops, straight row, Good, HSG D |
| | 3.140 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.499 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 12.745 | 86 | Weighted Average |
| | 9.975 | | 78.27% Pervious Area |
| | 2.770 | | 21.73% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 7S: DA 7

Runoff = 104.36 cfs @ 12.68 hrs, Volume= 16.518 af, Depth> 2.93"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 39.504 | 85 | Row crops, straight row, Good, HSG C |
| | 18.825 | 89 | Row crops, straight row, Good, HSG D |
| * | 1.820 | 98 | EX Imp |
| | 3.089 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.709 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 1.150 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.527 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 67.624 | 86 | Weighted Average |
| | 64.604 | | 95.53% Pervious Area |
| | 3.020 | | 4.47% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0360 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 58.6 | 3,034 | 0.0092 | 0.86 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 62.4 | 3,134 | Total | | | |

## Summary for Subcatchment 8S: DA 8 - Offsite

Runoff = 149.67 cfs @ 13.25 hrs, Volume= 35.585 af, Depth> 2.99"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.970 | 98 | Ex Imp |
| | 3.969 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.340 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 2.443 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.552 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 0.000 | 78 | Row crops, straight row, Good, HSG B |
| | 71.424 | 85 | Row crops, straight row, Good, HSG C |
| | 58.103 | 89 | Row crops, straight row, Good, HSG D |
| | 142.801 | 87 | Weighted Average |
| | 137.504 | | 96.29% Pervious Area |
| | 5.297 | | 3.71% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 100 | 0.0217 | 0.36 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 103.4 | 3,704 | 0.0044 | 0.60 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 1.3 | 1,685 | 0.0055 | 22.10 | 72,207.12 | **Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding |
| 109.4 | 5,489 | Total | | | |

## Summary for Subcatchment 9S: DA 9

Runoff = 44.98 cfs @ 12.12 hrs, Volume= 3.370 af, Depth> 2.87"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.650 | 98 | EX Imp |
| | 2.505 | 78 | Row crops, straight row, Good, HSG B |
| | 9.212 | 85 | Row crops, straight row, Good, HSG C |
| | 1.735 | 89 | Row crops, straight row, Good, HSG D |
| | 14.102 | 85 | Weighted Average |
| | 13.452 | | 95.39% Pervious Area |
| | 0.650 | | 4.61% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.9 | 100 | 0.0081 | 0.24 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 13.1 | 738 | 0.0109 | 0.94 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 20.0 | 838 | Total | | | |

## Summary for Subcatchment 10S: DA 10

Runoff = 15.74 cfs @ 12.07 hrs, Volume= 1.044 af, Depth> 2.96"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| Area (ac) | CN | Description |
|---|---|---|
| 2.804 | 85 | Row crops, straight row, Good, HSG C |
| 1.423 | 89 | Row crops, straight row, Good, HSG D |
| 4.227 | 86 | Weighted Average |
| 4.227 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.5 | 100 | 0.0067 | 0.22 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 8.2 | 429 | 0.0095 | 0.88 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 15.7 | 529 | Total | | | |

## Summary for Subcatchment 11S: DA 11

Runoff = 5.40 cfs @ 12.11 hrs, Volume= 0.392 af, Depth> 3.06"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.290 | 98 | EX Imp |
| | 1.233 | 85 | Row crops, straight row, Good, HSG C |
| | 0.015 | 89 | Row crops, straight row, Good, HSG D |
| | 1.538 | 87 | Weighted Average |
| | 1.248 | | 81.14% Pervious Area |
| | 0.290 | | 18.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0361 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 14.9 | 596 | 0.0055 | 0.67 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 18.7 | 696 | Total | | | |

## Summary for Subcatchment 12S: DA8-Onsite

Runoff = 132.20 cfs @ 12.59 hrs, Volume= 19.638 af, Depth> 2.93"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| Area (ac) | CN | Description |
|---|---|---|
| 37.600 | 89 | Row crops, straight row, Good, HSG D |
| 36.300 | 85 | Row crops, straight row, Good, HSG C |
| 6.400 | 78 | Row crops, straight row, Good, HSG B |
| 80.300 | 86 | Weighted Average |
| 80.300 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 35.3 | 300 | 0.0100 | 0.14 | | **Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04" |
| 22.2 | 1,200 | 0.0100 | 0.90 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 57.5 | 1,500 | Total | | | |

## Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 2.96" for 10-Year Bulletin 70 event
Inflow = 23.75 cfs @ 12.20 hrs, Volume= 2.082 af
Outflow = 9.71 cfs @ 12.53 hrs, Volume= 1.232 af, Atten= 59%, Lag= 19.7 min
Primary = 9.71 cfs @ 12.53 hrs, Volume= 1.232 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.89' @ 12.53 hrs Surf.Area= 79,992 sf Storage= 43,911 cf

Plug-Flow detention time= 198.7 min calculated for 1.232 af (59% of inflow)
Center-of-Mass det. time= 93.5 min ( 914.0 - 820.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 898.00' | 394,067 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 898.00 | 18,479 | 0 | 0 |
| 899.00 | 87,451 | 52,965 | 52,965 |
| 900.00 | 175,260 | 131,356 | 184,321 |
| 901.00 | 244,232 | 209,746 | 394,067 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 898.79' | **120.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=9.71 cfs @ 12.53 hrs HW=898.89' TW=891.03' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 9.71 cfs @ 0.79 fps)

## Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 2.97" for 10-Year Bulletin 70 event
Inflow = 18.90 cfs @ 12.02 hrs, Volume= 1.066 af
Outflow = 3.11 cfs @ 12.34 hrs, Volume= 0.907 af, Atten= 84%, Lag= 19.2 min
Primary = 1.71 cfs @ 12.34 hrs, Volume= 0.843 af
Routed to Pond 12P : DA 4 Storage
Secondary = 1.40 cfs @ 12.34 hrs, Volume= 0.064 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.81' @ 12.34 hrs Surf.Area= 41,166 sf Storage= 23,723 cf

Plug-Flow detention time= 211.0 min calculated for 0.907 af (85% of inflow)
Center-of-Mass det. time= 143.9 min ( 952.4 - 808.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 897.00' | 178,312 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 897.00 | 17,532 | 0 | 0 |
| 898.00 | 46,772 | 32,152 | 32,152 |
| 899.00 | 72,833 | 59,803 | 91,955 |
| 900.00 | 99,882 | 86,358 | 178,312 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Secondary | 897.75' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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 |
| #2 | Primary | 897.00' | **12.0" Round Culvert** L= 37.0' Ke= 0.500<br>Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.71 cfs @ 12.34 hrs HW=897.81' TW=896.26' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 1.71 cfs @ 3.43 fps)

**Secondary OutFlow** Max=1.40 cfs @ 12.34 hrs HW=897.81' TW=896.26' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.40 cfs @ 0.60 fps)

## Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 2.69" for 10-Year Bulletin 70 event
Inflow = 9.60 cfs @ 12.04 hrs, Volume= 1.398 af
Outflow = 2.82 cfs @ 13.37 hrs, Volume= 1.373 af, Atten= 71%, Lag= 80.1 min
Primary = 2.82 cfs @ 13.37 hrs, Volume= 1.373 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 896.34' @ 12.82 hrs Surf.Area= 16,752 sf Storage= 11,331 cf

Plug-Flow detention time= 48.6 min calculated for 1.372 af (98% of inflow)
Center-of-Mass det. time= 39.2 min ( 940.0 - 900.9 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 895.00' | 194,049 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 895.00 | 931 | 0 | 0 |
| 896.00 | 11,904 | 6,418 | 6,418 |
| 897.00 | 26,038 | 18,971 | 25,389 |
| 898.00 | 49,659 | 37,849 | 63,237 |
| 900.00 | 81,153 | 130,812 | 194,049 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 895.00' | **12.0" Round Culvert** L= 40.0' Ke= 0.500<br>Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 898.00' | **15.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.82 cfs @ 13.37 hrs HW=896.28' TW=891.47' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 2.82 cfs @ 3.64 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 1.93" for 10-Year Bulletin 70 event
Inflow = 105.51 cfs @ 12.68 hrs, Volume= 18.309 af
Outflow = 29.96 cfs @ 13.75 hrs, Volume= 12.136 af, Atten= 72%, Lag= 64.6 min
Primary = 3.24 cfs @ 13.75 hrs, Volume= 3.180 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 26.72 cfs @ 13.75 hrs, Volume= 8.957 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.43' @ 13.75 hrs Surf.Area= 397,587 sf Storage= 387,065 cf

Plug-Flow detention time= 235.8 min calculated for 12.136 af (66% of inflow)
Center-of-Mass det. time= 122.4 min ( 996.3 - 873.9 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 879.00' | 654,217 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 879.00 | 3,000 | 0 | 0 |
| 880.00 | 90,812 | 46,906 | 46,906 |
| 881.00 | 293,662 | 192,237 | 239,143 |
| 882.00 | 536,485 | 415,074 | 654,217 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 879.00' | **12.0" Round Culvert** L= 45.0' Ke= 0.500<br>Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 881.00' | **37.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=3.24 cfs @ 13.75 hrs HW=881.43' TW=0.00' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 3.24 cfs @ 4.13 fps)

**Secondary OutFlow** Max=26.72 cfs @ 13.75 hrs HW=881.43' TW=0.00' (Dynamic Tailwater)
**2=Broad-Crested Rectangular Weir** (Weir Controls 26.72 cfs @ 1.69 fps)

## Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 3.06" for 10-Year Bulletin 70 event
Inflow = 34.38 cfs @ 12.12 hrs, Volume= 2.592 af
Outflow = 2.95 cfs @ 13.12 hrs, Volume= 1.896 af, Atten= 91%, Lag= 59.9 min
Primary = 2.95 cfs @ 13.12 hrs, Volume= 1.896 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.18' Surf.Area= 53,391 sf Storage= 130,918 cf
Peak Elev= 890.08' @ 13.12 hrs Surf.Area= 93,948 sf Storage= 197,189 cf (66,271 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 198.8 min ( 1,011.2 - 812.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 886.00' | 525,760 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 886.00 | 30,908 | 0 | 0 |
| 887.00 | 40,872 | 35,890 | 35,890 |
| 889.00 | 45,276 | 86,148 | 122,038 |
| 891.00 | 135,445 | 180,721 | 302,759 |
| 892.10 | 270,011 | 223,001 | 525,760 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 889.18' | **15.0" Round Culvert** L= 138.0' Ke= 0.500<br>Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf |
| #2 | Secondary | 892.00' | **73.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.95 cfs @ 13.12 hrs HW=890.08' TW=888.77' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 2.95 cfs @ 4.36 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=889.18' TW=886.93' (Dynamic Tailwater)
**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 2.64" for 10-Year Bulletin 70 event
Inflow = 43.20 cfs @ 12.13 hrs, Volume= 5.042 af
Outflow = 9.12 cfs @ 12.71 hrs, Volume= 4.548 af, Atten= 79%, Lag= 35.4 min
Primary = 9.12 cfs @ 12.71 hrs, Volume= 4.548 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 888.83' @ 12.71 hrs Surf.Area= 39,104 sf Storage= 137,094 cf (69,580 cf above start)

Plug-Flow detention time= 329.8 min calculated for 2.998 af (59% of inflow)
Center-of-Mass det. time= 84.1 min ( 973.3 - 889.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 884.00' | 487,275 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 884.00 | 10,000 | 0 | 0 |
| 885.00 | 16,000 | 13,000 | 13,000 |
| 886.00 | 31,740 | 23,870 | 36,870 |
| 889.00 | 39,548 | 106,932 | 143,802 |
| 891.00 | 150,950 | 190,498 | 334,300 |
| 892.00 | 155,000 | 152,975 | 487,275 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 886.93' | **18.0" Round Culvert** L= 63.0' Ke= 0.500<br>Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf |
| #2 | Secondary | 890.00' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=9.12 cfs @ 12.71 hrs HW=888.83' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 9.12 cfs @ 5.16 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=886.93' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 2.96" for 10-Year Bulletin 70 event
Inflow = 15.74 cfs @ 12.07 hrs, Volume= 1.044 af
Outflow = 4.53 cfs @ 12.35 hrs, Volume= 0.648 af, Atten= 71%, Lag= 16.6 min
Primary = 4.53 cfs @ 12.35 hrs, Volume= 0.648 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.51' @ 12.35 hrs Surf.Area= 59,490 sf Storage= 22,709 cf

Plug-Flow detention time= 197.5 min calculated for 0.648 af (62% of inflow)
Center-of-Mass det. time= 93.4 min ( 905.7 - 812.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 863.00' | 3,373,778 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 863.00 | 29,607 | 0 | 0 |
| 864.00 | 88,227 | 58,917 | 58,917 |
| 895.00 | 125,635 | 3,314,861 | 3,373,778 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 863.40' | **50.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=4.53 cfs @ 12.35 hrs HW=863.51' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 4.53 cfs @ 0.82 fps)

## Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 3.06" for 10-Year Bulletin 70 event
Inflow = 5.40 cfs @ 12.11 hrs, Volume= 0.392 af
Outflow = 2.40 cfs @ 12.33 hrs, Volume= 0.390 af, Atten= 56%, Lag= 13.1 min
Primary = 2.40 cfs @ 12.33 hrs, Volume= 0.390 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.75' @ 12.33 hrs Surf.Area= 5,719 sf Storage= 4,005 cf

Plug-Flow detention time= 18.4 min calculated for 0.390 af (100% of inflow)
Center-of-Mass det. time= 15.7 min ( 827.1 - 811.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 862.00' | 17,715 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 862.00 | 100 | 0 | 0 |
| 863.00 | 2,048 | 1,074 | 1,074 |
| 864.00 | 6,912 | 4,480 | 5,554 |
| 865.00 | 17,409 | 12,161 | 17,715 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 862.00' | **12.0" Round Culvert** L= 38.0' Ke= 0.500<br>Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 864.00' | **24.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.40 cfs @ 12.33 hrs HW=863.75' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.40 cfs @ 3.05 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=862.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 2.75" for 10-Year Bulletin 70 event
Inflow = 75.61 cfs @ 12.44 hrs, Volume= 10.653 af
Outflow = 2.02 cfs @ 24.00 hrs, Volume= 1.792 af, Atten= 97%, Lag= 693.6 min
Primary = 2.02 cfs @ 24.00 hrs, Volume= 1.792 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 891.85' @ 24.00 hrs Surf.Area= 342,941 sf Storage= 623,637 cf (385,968 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 252.6 min ( 1,107.9 - 855.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 887.00' | 1,151,208 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 887.00 | 21,488 | 0 | 0 |
| 890.00 | 113,506 | 202,491 | 202,491 |
| 893.00 | 486,505 | 900,017 | 1,102,508 |
| 893.10 | 487,505 | 48,701 | 1,151,208 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 890.27' | **12.0" Round Culvert** L= 47.0' Ke= 0.500<br>Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 893.00' | **13.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.02 cfs @ 24.00 hrs HW=891.85' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.02 cfs @ 2.57 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.14% Impervious, Inflow Depth > 2.39" for 10-Year Bulletin 70 event
Inflow = 253.85 cfs @ 12.89 hrs, Volume= 72.555 af
Primary = 253.85 cfs @ 12.89 hrs, Volume= 72.555 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 4L: Existing Discharge

Inflow Area = 379.969 ac, 4.22% Impervious, Inflow Depth > 2.41" for 10-Year Bulletin 70 event
Inflow = 260.64 cfs @ 12.88 hrs, Volume= 76.315 af
Primary = 260.64 cfs @ 12.88 hrs, Volume= 76.315 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 6.01% Impervious, Inflow Depth > 2.89" for 10-Year Bulletin 70 event
Inflow = 47.01 cfs @ 12.12 hrs, Volume= 3.761 af
Primary = 47.01 cfs @ 12.12 hrs, Volume= 3.761 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1S: DA 1** Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>3.92"
Flow Length=697' Tc=26.2 min CN=86 Runoff=31.25 cfs 2.761 af

**Subcatchment 2S: DA 2** Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>3.94"
Flow Length=412' Tc=10.7 min CN=86 Runoff=24.74 cfs 1.414 af

**Subcatchment 3S: DA 3** Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>4.01"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=84.41 cfs 10.618 af

**Subcatchment 4S: DA 4** Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>4.04"
Flow Length=419' Tc=11.3 min CN=87 Runoff=11.03 cfs 0.647 af

**Subcatchment 5S: DA 5** Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>4.03"
Tc=20.0 min CN=87 Runoff=44.94 cfs 3.419 af

**Subcatchment 6S: DA 6** Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>3.93"
Tc=20.0 min CN=86 Runoff=55.03 cfs 4.172 af

**Subcatchment 7S: DA 7** Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>3.89"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=137.80 cfs 21.917 af

**Subcatchment 8S: DA 8 - Offsite** Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>3.95"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=196.60 cfs 46.985 af

**Subcatchment 9S: DA 9** Runoff Area=14.102 ac 4.61% Impervious Runoff Depth>3.82"
Flow Length=838' Tc=20.0 min CN=85 Runoff=59.51 cfs 4.495 af

**Subcatchment 10S: DA 10** Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>3.93"
Flow Length=529' Tc=15.7 min CN=86 Runoff=20.66 cfs 1.385 af

**Subcatchment 11S: DA 11** Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>4.03"
Flow Length=696' Tc=18.7 min CN=87 Runoff=7.04 cfs 0.517 af

**Subcatchment 12S: DA8-Onsite** Runoff Area=80.300 ac 0.00% Impervious Runoff Depth>3.89"
Flow Length=1,500' Slope=0.0100 '/' Tc=57.5 min CN=86 Runoff=174.47 cfs 26.056 af

**Pond 1P: DA 1 Storage** Peak Elev=898.96' Storage=49,133 cf Inflow=31.25 cfs 2.761 af
Outflow=20.10 cfs 1.908 af

**Pond 2P: DA 2 Storage** Peak Elev=897.92' Storage=28,310 cf Inflow=24.74 cfs 1.414 af
Primary=2.05 cfs 0.961 af Secondary=6.71 cfs 0.275 af Outflow=8.77 cfs 1.236 af

**Pond 12P: DA 4 Storage** Peak Elev=896.91' Storage=23,066 cf Inflow=15.31 cfs 1.883 af
Primary=3.32 cfs 1.854 af Secondary=0.00 cfs 0.000 af Outflow=3.32 cfs 1.854 af

**Pond 13P: DA 7 Storage** Peak Elev=881.62' Storage=468,012 cf Inflow=139.37 cfs 24.181 af
Primary=3.41 cfs 3.401 af Secondary=48.79 cfs 14.393 af Outflow=52.20 cfs 17.794 af

**Pond 14P: DA 5 Storage** Peak Elev=890.31' Storage=219,855 cf Inflow=44.94 cfs 3.419 af
Primary=3.87 cfs 2.592 af Secondary=0.00 cfs 0.000 af Outflow=3.87 cfs 2.592 af

**Pond 17P: DA 6 Storage** Peak Elev=889.36' Storage=161,619 cf Inflow=57.10 cfs 6.764 af
Primary=11.03 cfs 6.192 af Secondary=0.00 cfs 0.000 af Outflow=11.03 cfs 6.192 af

**Pond 18P: DA 10 Storage** Peak Elev=863.58' Storage=27,026 cf Inflow=20.66 cfs 1.385 af
Outflow=9.50 cfs 0.986 af

**Pond 19P: DA 11 Storage** Peak Elev=864.02' Storage=5,710 cf Inflow=7.04 cfs 0.517 af
Primary=2.75 cfs 0.513 af Secondary=0.20 cfs 0.002 af Outflow=2.94 cfs 0.515 af

**Pond 20P: DA 3 Storage** Peak Elev=892.23' Storage=765,397 cf Inflow=107.50 cfs 14.379 af
Primary=2.51 cfs 2.264 af Secondary=0.00 cfs 0.000 af Outflow=2.51 cfs 2.264 af

**Link 2L: DA 8 >>> Discharge** Inflow=352.13 cfs 98.012 af
Primary=352.13 cfs 98.012 af

**Link 4L: Existing Discharge** Inflow=360.78 cfs 103.022 af
Primary=360.78 cfs 103.022 af

**Link 15L: DA 9 >>> Discharge** Inflow=61.86 cfs 5.010 af
Primary=61.86 cfs 5.010 af

**Total Runoff Area = 379.969 ac Runoff Volume = 124.385 af Average Runoff Depth = 3.93"**
**95.78% Pervious = 363.934 ac 4.22% Impervious = 16.034 ac**

## Summary for Subcatchment 1S: DA 1

Runoff = 31.25 cfs @ 12.20 hrs, Volume= 2.761 af, Depth> 3.92"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| Area (ac) | CN | Description |
|---|---|---|
| 5.805 | 85 | Row crops, straight row, Good, HSG C |
| 2.642 | 89 | Row crops, straight row, Good, HSG D |
| 8.447 | 86 | Weighted Average |
| 8.447 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.3 | 100 | 0.0102 | 0.26 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 19.9 | 597 | 0.0031 | 0.50 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 26.2 | 697 | Total | | | |

## Summary for Subcatchment 2S: DA 2

Runoff = 24.74 cfs @ 12.02 hrs, Volume= 1.414 af, Depth> 3.94"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.080 | 98 | EX Imp |
| | 3.280 | 85 | Row crops, straight row, Good, HSG C |
| | 0.950 | 89 | Row crops, straight row, Good, HSG D |
| | 4.310 | 86 | Weighted Average |
| | 4.230 | | 98.14% Pervious Area |
| | 0.080 | | 1.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0090 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 4.1 | 312 | 0.0196 | 1.26 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 10.7 | 412 | Total | | | |

## Summary for Subcatchment 3S: DA 3

Runoff = 84.41 cfs @ 12.42 hrs, Volume= 10.618 af, Depth> 4.01"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.540 | 98 | EX Imp |
| | 18.238 | 85 | Row crops, straight row, Good, HSG C |
| | 13.000 | 89 | Row crops, straight row, Good, HSG D |
| | 31.778 | 87 | Weighted Average |
| | 31.238 | | 98.30% Pervious Area |
| | 0.540 | | 1.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.3 | 100 | 0.0160 | 0.32 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 39.6 | 1,803 | 0.0071 | 0.76 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 44.9 | 1,903 | Total | | | |

## Summary for Subcatchment 4S: DA 4

Runoff = 11.03 cfs @ 12.03 hrs, Volume= 0.647 af, Depth> 4.04"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.110 | 98 | EX Imp |
| | 1.206 | 85 | Row crops, straight row, Good, HSG C |
| | 0.607 | 89 | Row crops, straight row, Good, HSG D |
| | 1.923 | 87 | Weighted Average |
| | 1.813 | | 94.28% Pervious Area |
| | 0.110 | | 5.72% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | 100 | 0.0188 | 0.34 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 6.3 | 319 | 0.0089 | 0.85 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 11.3 | 419 | Total | | | |

## Summary for Subcatchment 5S: DA 5

Runoff = 44.94 cfs @ 12.11 hrs, Volume= 3.419 af, Depth> 4.03"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 3.625 | 85 | Row crops, straight row, Good, HSG C |
| | 0.487 | 89 | Row crops, straight row, Good, HSG D |
| * | 2.350 | 98 | EX Imp |
| | 2.941 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.771 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 10.174 | 87 | Weighted Average |
| | 6.896 | | 67.78% Pervious Area |
| | 3.278 | | 32.22% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 6S: DA 6

Runoff = 55.03 cfs @ 12.12 hrs, Volume= 4.172 af, Depth> 3.93"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.860 | 98 | EX Imp |
| | 6.291 | 85 | Row crops, straight row, Good, HSG C |
| | 0.955 | 89 | Row crops, straight row, Good, HSG D |
| | 3.140 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.499 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 12.745 | 86 | Weighted Average |
| | 9.975 | | 78.27% Pervious Area |
| | 2.770 | | 21.73% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 7S: DA 7

Runoff = 137.80 cfs @ 12.62 hrs, Volume= 21.917 af, Depth> 3.89"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 39.504 | 85 | Row crops, straight row, Good, HSG C |
| | 18.825 | 89 | Row crops, straight row, Good, HSG D |
| * | 1.820 | 98 | EX Imp |
| | 3.089 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.709 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 1.150 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.527 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 67.624 | 86 | Weighted Average |
| | 64.604 | | 95.53% Pervious Area |
| | 3.020 | | 4.47% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0360 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 58.6 | 3,034 | 0.0092 | 0.86 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 62.4 | 3,134 | Total | | | |

## Summary for Subcatchment 8S: DA 8 - Offsite

Runoff = 196.60 cfs @ 13.25 hrs, Volume= 46.985 af, Depth> 3.95"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.970 | 98 | Ex Imp |
| | 3.969 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.340 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 2.443 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.552 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 0.000 | 78 | Row crops, straight row, Good, HSG B |
| | 71.424 | 85 | Row crops, straight row, Good, HSG C |
| | 58.103 | 89 | Row crops, straight row, Good, HSG D |
| | 142.801 | 87 | Weighted Average |
| | 137.504 | | 96.29% Pervious Area |
| | 5.297 | | 3.71% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 100 | 0.0217 | 0.36 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 103.4 | 3,704 | 0.0044 | 0.60 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 1.3 | 1,685 | 0.0055 | 22.10 | 72,207.12 | **Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding |
| 109.4 | 5,489 | Total | | | |

## Summary for Subcatchment 9S: DA 9

Runoff = 59.51 cfs @ 12.12 hrs, Volume= 4.495 af, Depth> 3.82"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.650 | 98 | EX Imp |
| | 2.505 | 78 | Row crops, straight row, Good, HSG B |
| | 9.212 | 85 | Row crops, straight row, Good, HSG C |
| | 1.735 | 89 | Row crops, straight row, Good, HSG D |
| | 14.102 | 85 | Weighted Average |
| | 13.452 | | 95.39% Pervious Area |
| | 0.650 | | 4.61% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.9 | 100 | 0.0081 | 0.24 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 13.1 | 738 | 0.0109 | 0.94 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 20.0 | 838 | Total | | | |

## Summary for Subcatchment 10S: DA 10

Runoff = 20.66 cfs @ 12.07 hrs, Volume= 1.385 af, Depth> 3.93"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| Area (ac) | CN | Description |
|---|---|---|
| 2.804 | 85 | Row crops, straight row, Good, HSG C |
| 1.423 | 89 | Row crops, straight row, Good, HSG D |
| 4.227 | 86 | Weighted Average |
| 4.227 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.5 | 100 | 0.0067 | 0.22 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 8.2 | 429 | 0.0095 | 0.88 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 15.7 | 529 | Total | | | |

## Summary for Subcatchment 11S: DA 11

Runoff = 7.04 cfs @ 12.11 hrs, Volume= 0.517 af, Depth> 4.03"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.290 | 98 | EX Imp |
| | 1.233 | 85 | Row crops, straight row, Good, HSG C |
| | 0.015 | 89 | Row crops, straight row, Good, HSG D |
| | 1.538 | 87 | Weighted Average |
| | 1.248 | | 81.14% Pervious Area |
| | 0.290 | | 18.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0361 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 14.9 | 596 | 0.0055 | 0.67 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 18.7 | 696 | Total | | | |

## Summary for Subcatchment 12S: DA8-Onsite

Runoff = 174.47 cfs @ 12.58 hrs, Volume= 26.056 af, Depth> 3.89"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| Area (ac) | CN | Description |
|---|---|---|
| 37.600 | 89 | Row crops, straight row, Good, HSG D |
| 36.300 | 85 | Row crops, straight row, Good, HSG C |
| 6.400 | 78 | Row crops, straight row, Good, HSG B |
| 80.300 | 86 | Weighted Average |
| 80.300 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 35.3 | 300 | 0.0100 | 0.14 | | **Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04" |
| 22.2 | 1,200 | 0.0100 | 0.90 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 57.5 | 1,500 | Total | | | |

## Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 3.92" for 25-Year Bulletin 70 event
Inflow = 31.25 cfs @ 12.20 hrs, Volume= 2.761 af
Outflow = 20.10 cfs @ 12.39 hrs, Volume= 1.908 af, Atten= 36%, Lag= 11.7 min
Primary = 20.10 cfs @ 12.39 hrs, Volume= 1.908 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.96' @ 12.39 hrs Surf.Area= 84,374 sf Storage= 49,133 cf

Plug-Flow detention time= 164.7 min calculated for 1.908 af (69% of inflow)
Center-of-Mass det. time= 69.7 min ( 882.4 - 812.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 898.00' | 394,067 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 898.00 | 18,479 | 0 | 0 |
| 899.00 | 87,451 | 52,965 | 52,965 |
| 900.00 | 175,260 | 131,356 | 184,321 |
| 901.00 | 244,232 | 209,746 | 394,067 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 898.79' | **120.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=20.10 cfs @ 12.39 hrs HW=898.96' TW=891.10' (Dynamic Tailwater)
**1=Broad-Crested Rectangular Weir** (Weir Controls 20.10 cfs @ 1.01 fps)

## Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 3.94" for 25-Year Bulletin 70 event
Inflow = 24.74 cfs @ 12.02 hrs, Volume= 1.414 af
Outflow = 8.77 cfs @ 12.18 hrs, Volume= 1.236 af, Atten= 65%, Lag= 9.9 min
Primary = 2.05 cfs @ 12.18 hrs, Volume= 0.961 af
Routed to Pond 12P : DA 4 Storage
Secondary = 6.71 cfs @ 12.18 hrs, Volume= 0.275 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.92' @ 12.18 hrs Surf.Area= 44,305 sf Storage= 28,310 cf

Plug-Flow detention time= 177.3 min calculated for 1.236 af (87% of inflow)
Center-of-Mass det. time= 117.6 min ( 918.2 - 800.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 897.00' | 178,312 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 897.00 | 17,532 | 0 | 0 |
| 898.00 | 46,772 | 32,152 | 32,152 |
| 899.00 | 72,833 | 59,803 | 91,955 |
| 900.00 | 99,882 | 86,358 | 178,312 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Secondary | 897.75' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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 |
| #2 | Primary | 897.00' | **12.0" Round Culvert** L= 37.0' Ke= 0.500<br>Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |

**Primary OutFlow** Max=2.05 cfs @ 12.18 hrs HW=897.92' TW=896.52' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 2.05 cfs @ 3.57 fps)

**Secondary OutFlow** Max=6.71 cfs @ 12.18 hrs HW=897.92' TW=896.52' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 6.71 cfs @ 1.01 fps)

## Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 3.63" for 25-Year Bulletin 70 event
Inflow = 15.31 cfs @ 12.09 hrs, Volume= 1.883 af
Outflow = 3.32 cfs @ 12.91 hrs, Volume= 1.854 af, Atten= 78%, Lag= 48.8 min
Primary = 3.32 cfs @ 12.91 hrs, Volume= 1.854 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 896.91' @ 12.91 hrs Surf.Area= 24,745 sf Storage= 23,066 cf

Plug-Flow detention time= 71.6 min calculated for 1.854 af (98% of inflow)
Center-of-Mass det. time= 62.9 min ( 939.8 - 876.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 895.00' | 194,049 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 895.00 | 931 | 0 | 0 |
| 896.00 | 11,904 | 6,418 | 6,418 |
| 897.00 | 26,038 | 18,971 | 25,389 |
| 898.00 | 49,659 | 37,849 | 63,237 |
| 900.00 | 81,153 | 130,812 | 194,049 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 895.00' | **12.0" Round Culvert** L= 40.0' Ke= 0.500<br>Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 898.00' | **15.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=3.32 cfs @ 12.91 hrs HW=896.91' TW=891.63' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.32 cfs @ 4.23 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 2.54" for 25-Year Bulletin 70 event
Inflow = 139.37 cfs @ 12.63 hrs, Volume= 24.181 af
Outflow = 52.20 cfs @ 13.49 hrs, Volume= 17.794 af, Atten= 63%, Lag= 51.6 min
Primary = 3.41 cfs @ 13.49 hrs, Volume= 3.401 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 48.79 cfs @ 13.49 hrs, Volume= 14.393 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.62' @ 13.49 hrs Surf.Area= 444,282 sf Storage= 468,012 cf

Plug-Flow detention time= 203.0 min calculated for 17.794 af (74% of inflow)
Center-of-Mass det. time= 103.4 min ( 968.9 - 865.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 879.00' | 654,217 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 879.00 | 3,000 | 0 | 0 |
| 880.00 | 90,812 | 46,906 | 46,906 |
| 881.00 | 293,662 | 192,237 | 239,143 |
| 882.00 | 536,485 | 415,074 | 654,217 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 879.00' | **12.0" Round Culvert** L= 45.0' Ke= 0.500<br>Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 881.00' | **37.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=3.41 cfs @ 13.49 hrs HW=881.62' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.41 cfs @ 4.34 fps)

**Secondary OutFlow** Max=48.79 cfs @ 13.49 hrs HW=881.62' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 48.79 cfs @ 2.13 fps)

## Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 4.03" for 25-Year Bulletin 70 event
Inflow = 44.94 cfs @ 12.11 hrs, Volume= 3.419 af
Outflow = 3.87 cfs @ 14.39 hrs, Volume= 2.592 af, Atten= 91%, Lag= 136.4 min
Primary = 3.87 cfs @ 14.39 hrs, Volume= 2.592 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.18' Surf.Area= 53,391 sf Storage= 130,918 cf
Peak Elev= 890.31' @ 13.15 hrs Surf.Area= 104,259 sf Storage= 219,855 cf (88,937 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 205.2 min ( 1,009.9 - 804.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 886.00' | 525,760 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 886.00 | 30,908 | 0 | 0 |
| 887.00 | 40,872 | 35,890 | 35,890 |
| 889.00 | 45,276 | 86,148 | 122,038 |
| 891.00 | 135,445 | 180,721 | 302,759 |
| 892.10 | 270,011 | 223,001 | 525,760 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 889.18' | **15.0" Round Culvert** L= 138.0' Ke= 0.500<br>Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf |
| #2 | Secondary | 892.00' | **73.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=3.87 cfs @ 14.39 hrs HW=890.26' TW=889.01' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.87 cfs @ 4.62 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=889.18' TW=886.93' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 3.54" for 25-Year Bulletin 70 event
Inflow = 57.10 cfs @ 12.12 hrs, Volume= 6.764 af
Outflow = 11.03 cfs @ 12.74 hrs, Volume= 6.192 af, Atten= 81%, Lag= 37.3 min
Primary = 11.03 cfs @ 12.74 hrs, Volume= 6.192 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 889.36' @ 12.74 hrs Surf.Area= 59,572 sf Storage= 161,619 cf (94,105 cf above start)

Plug-Flow detention time= 285.4 min calculated for 4.642 af (69% of inflow)
Center-of-Mass det. time= 89.3 min ( 974.6 - 885.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 884.00' | 487,275 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 884.00 | 10,000 | 0 | 0 |
| 885.00 | 16,000 | 13,000 | 13,000 |
| 886.00 | 31,740 | 23,870 | 36,870 |
| 889.00 | 39,548 | 106,932 | 143,802 |
| 891.00 | 150,950 | 190,498 | 334,300 |
| 892.00 | 155,000 | 152,975 | 487,275 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 886.93' | **18.0" Round Culvert** L= 63.0' Ke= 0.500<br>Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf |
| #2 | Secondary | 890.00' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=11.03 cfs @ 12.74 hrs HW=889.36' TW=0.00' (Dynamic Tailwater)
**1=Culvert** (Inlet Controls 11.03 cfs @ 6.24 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=886.93' TW=0.00' (Dynamic Tailwater)
**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 3.93" for 25-Year Bulletin 70 event
Inflow = 20.66 cfs @ 12.07 hrs, Volume= 1.385 af
Outflow = 9.50 cfs @ 12.25 hrs, Volume= 0.986 af, Atten= 54%, Lag= 10.9 min
Primary = 9.50 cfs @ 12.25 hrs, Volume= 0.986 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.58' @ 12.25 hrs Surf.Area= 63,601 sf Storage= 27,026 cf

Plug-Flow detention time= 166.0 min calculated for 0.985 af (71% of inflow)
Center-of-Mass det. time= 72.5 min ( 876.9 - 804.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 863.00' | 3,373,778 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 863.00 | 29,607 | 0 | 0 |
| 864.00 | 88,227 | 58,917 | 58,917 |
| 895.00 | 125,635 | 3,314,861 | 3,373,778 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 863.40' | **50.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=9.50 cfs @ 12.25 hrs HW=863.58' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 9.50 cfs @ 1.06 fps)

## Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 4.03" for 25-Year Bulletin 70 event
Inflow = 7.04 cfs @ 12.11 hrs, Volume= 0.517 af
Outflow = 2.94 cfs @ 12.34 hrs, Volume= 0.515 af, Atten= 58%, Lag= 13.8 min
Primary = 2.75 cfs @ 12.34 hrs, Volume= 0.513 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 0.20 cfs @ 12.34 hrs, Volume= 0.002 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 864.02' @ 12.34 hrs Surf.Area= 7,145 sf Storage= 5,710 cf

Plug-Flow detention time= 20.7 min calculated for 0.515 af (100% of inflow)
Center-of-Mass det. time= 18.2 min ( 821.9 - 803.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 862.00' | 17,715 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 862.00 | 100 | 0 | 0 |
| 863.00 | 2,048 | 1,074 | 1,074 |
| 864.00 | 6,912 | 4,480 | 5,554 |
| 865.00 | 17,409 | 12,161 | 17,715 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 862.00' | **12.0" Round Culvert** L= 38.0' Ke= 0.500<br>Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 864.00' | **24.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.75 cfs @ 12.34 hrs HW=864.02' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.75 cfs @ 3.50 fps)

**Secondary OutFlow** Max=0.20 cfs @ 12.34 hrs HW=864.02' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.20 cfs @ 0.37 fps)

## Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 3.71" for 25-Year Bulletin 70 event
Inflow = 107.50 cfs @ 12.42 hrs, Volume= 14.379 af
Outflow = 2.51 cfs @ 24.00 hrs, Volume= 2.264 af, Atten= 98%, Lag= 695.0 min
Primary = 2.51 cfs @ 24.00 hrs, Volume= 2.264 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 892.23' @ 24.00 hrs Surf.Area= 390,972 sf Storage= 765,397 cf (527,728 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 256.9 min ( 1,103.7 - 846.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 887.00' | 1,151,208 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 887.00 | 21,488 | 0 | 0 |
| 890.00 | 113,506 | 202,491 | 202,491 |
| 893.00 | 486,505 | 900,017 | 1,102,508 |
| 893.10 | 487,505 | 48,701 | 1,151,208 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 890.27' | **12.0" Round Culvert** L= 47.0' Ke= 0.500<br>Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 893.00' | **13.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.51 cfs @ 24.00 hrs HW=892.23' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.51 cfs @ 3.19 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.14% Impervious, Inflow Depth > 3.23" for 25-Year Bulletin 70 event
Inflow = 352.13 cfs @ 12.89 hrs, Volume= 98.012 af
Primary = 352.13 cfs @ 12.89 hrs, Volume= 98.012 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 4L: Existing Discharge

Inflow Area = 379.969 ac, 4.22% Impervious, Inflow Depth > 3.25" for 25-Year Bulletin 70 event
Inflow = 360.78 cfs @ 12.89 hrs, Volume= 103.022 af
Primary = 360.78 cfs @ 12.89 hrs, Volume= 103.022 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 6.01% Impervious, Inflow Depth > 3.84" for 25-Year Bulletin 70 event
Inflow = 61.86 cfs @ 12.12 hrs, Volume= 5.010 af
Primary = 61.86 cfs @ 12.12 hrs, Volume= 5.010 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1S: DA 1** Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>4.82"
Flow Length=697' Tc=26.2 min CN=86 Runoff=38.09 cfs 3.393 af

**Subcatchment 2S: DA 2** Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>4.84"
Flow Length=412' Tc=10.7 min CN=86 Runoff=30.07 cfs 1.737 af

**Subcatchment 3S: DA 3** Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>4.91"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=102.67 cfs 13.004 af

**Subcatchment 4S: DA 4** Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>4.95"
Flow Length=419' Tc=11.3 min CN=87 Runoff=13.36 cfs 0.793 af

**Subcatchment 5S: DA 5** Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>4.94"
Tc=20.0 min CN=87 Runoff=54.55 cfs 4.186 af

**Subcatchment 6S: DA 6** Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>4.83"
Tc=20.0 min CN=86 Runoff=67.13 cfs 5.127 af

**Subcatchment 7S: DA 7** Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>4.78"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=168.55 cfs 26.943 af

**Subcatchment 8S: DA 8 - Offsite** Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>4.84"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=239.57 cfs 57.572 af

**Subcatchment 9S: DA 9** Runoff Area=14.102 ac 4.61% Impervious Runoff Depth>4.72"
Flow Length=838' Tc=20.0 min CN=85 Runoff=72.90 cfs 5.544 af

**Subcatchment 10S: DA 10** Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>4.83"
Flow Length=529' Tc=15.7 min CN=86 Runoff=25.14 cfs 1.702 af

**Subcatchment 11S: DA 11** Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>4.94"
Flow Length=696' Tc=18.7 min CN=87 Runoff=8.54 cfs 0.633 af

**Subcatchment 12S: DA8-Onsite** Runoff Area=80.300 ac 0.00% Impervious Runoff Depth>4.79"
Flow Length=1,500' Slope=0.0100 '/' Tc=57.5 min CN=86 Runoff=213.21 cfs 32.029 af

**Pond 1P: DA 1 Storage** Peak Elev=899.00' Storage=53,153 cf Inflow=38.09 cfs 3.393 af
Outflow=29.25 cfs 2.537 af

**Pond 2P: DA 2 Storage** Peak Elev=898.00' Storage=32,031 cf Inflow=30.07 cfs 1.737 af
Primary=2.30 cfs 1.023 af Secondary=12.34 cfs 0.518 af Outflow=14.64 cfs 1.541 af

**Pond 12P: DA 4 Storage** Peak Elev=897.30' Storage=34,168 cf Inflow=24.00 cfs 2.334 af
Primary=3.68 cfs 2.300 af Secondary=0.00 cfs 0.000 af Outflow=3.68 cfs 2.300 af

**Pond 13P: DA 7 Storage** Peak Elev=881.78' Storage=543,354 cf Inflow=170.27 cfs 29.559 af
Primary=3.55 cfs 3.587 af Secondary=68.94 cfs 19.418 af Outflow=72.49 cfs 23.005 af

**Pond 14P: DA 5 Storage** Peak Elev=890.51' Storage=241,588 cf Inflow=54.55 cfs 4.186 af
Primary=4.37 cfs 3.223 af Secondary=0.00 cfs 0.000 af Outflow=4.37 cfs 3.223 af

**Pond 17P: DA 6 Storage** Peak Elev=889.70' Storage=185,205 cf Inflow=69.84 cfs 8.349 af
Primary=12.10 cfs 7.700 af Secondary=0.00 cfs 0.000 af Outflow=12.10 cfs 7.700 af

**Pond 18P: DA 10 Storage** Peak Elev=863.63' Storage=30,610 cf Inflow=25.14 cfs 1.702 af
Outflow=14.24 cfs 1.300 af

**Pond 19P: DA 11 Storage** Peak Elev=864.12' Storage=6,451 cf Inflow=8.54 cfs 0.633 af
Primary=2.86 cfs 0.591 af Secondary=2.45 cfs 0.039 af Outflow=5.31 cfs 0.631 af

**Pond 20P: DA 3 Storage** Peak Elev=892.56' Storage=900,834 cf Inflow=133.86 cfs 17.841 af
Primary=2.86 cfs 2.616 af Secondary=0.00 cfs 0.000 af Outflow=2.86 cfs 2.616 af

**Link 2L: DA 8 >>> Discharge** Inflow=444.52 cfs 121.606 af
Primary=444.52 cfs 121.606 af

**Link 4L: Existing Discharge** Inflow=454.67 cfs 127.781 af
Primary=454.67 cfs 127.781 af

**Link 15L: DA 9 >>> Discharge** Inflow=75.41 cfs 6.174 af
Primary=75.41 cfs 6.174 af

**Total Runoff Area = 379.969 ac Runoff Volume = 152.662 af Average Runoff Depth = 4.82"**
**95.78% Pervious = 363.934 ac 4.22% Impervious = 16.034 ac**

## Summary for Subcatchment 1S: DA 1

Runoff = 38.09 cfs @ 12.19 hrs, Volume= 3.393 af, Depth> 4.82"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| Area (ac) | CN | Description |
|---|---|---|
| 5.805 | 85 | Row crops, straight row, Good, HSG C |
| 2.642 | 89 | Row crops, straight row, Good, HSG D |
| 8.447 | 86 | Weighted Average |
| 8.447 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.3 | 100 | 0.0102 | 0.26 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 19.9 | 597 | 0.0031 | 0.50 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 26.2 | 697 | Total | | | |

## Summary for Subcatchment 2S: DA 2

Runoff = 30.07 cfs @ 12.02 hrs, Volume= 1.737 af, Depth> 4.84"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.080 | 98 | EX Imp |
| | 3.280 | 85 | Row crops, straight row, Good, HSG C |
| | 0.950 | 89 | Row crops, straight row, Good, HSG D |
| | 4.310 | 86 | Weighted Average |
| | 4.230 | | 98.14% Pervious Area |
| | 0.080 | | 1.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0090 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 4.1 | 312 | 0.0196 | 1.26 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 10.7 | 412 | Total | | | |

## Summary for Subcatchment 3S: DA 3

Runoff = 102.67 cfs @ 12.42 hrs, Volume= 13.004 af, Depth> 4.91"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.540 | 98 | EX Imp |
| | 18.238 | 85 | Row crops, straight row, Good, HSG C |
| | 13.000 | 89 | Row crops, straight row, Good, HSG D |
| | 31.778 | 87 | Weighted Average |
| | 31.238 | | 98.30% Pervious Area |
| | 0.540 | | 1.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.3 | 100 | 0.0160 | 0.32 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 39.6 | 1,803 | 0.0071 | 0.76 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 44.9 | 1,903 | Total | | | |

## Summary for Subcatchment 4S: DA 4

Runoff = 13.36 cfs @ 12.02 hrs, Volume= 0.793 af, Depth> 4.95"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.110 | 98 | EX Imp |
| | 1.206 | 85 | Row crops, straight row, Good, HSG C |
| | 0.607 | 89 | Row crops, straight row, Good, HSG D |
| | 1.923 | 87 | Weighted Average |
| | 1.813 | | 94.28% Pervious Area |
| | 0.110 | | 5.72% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | 100 | 0.0188 | 0.34 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 6.3 | 319 | 0.0089 | 0.85 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 11.3 | 419 | Total | | | |

## Summary for Subcatchment 5S: DA 5

Runoff = 54.55 cfs @ 12.11 hrs, Volume= 4.186 af, Depth> 4.94"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 3.625 | 85 | Row crops, straight row, Good, HSG C |
| | 0.487 | 89 | Row crops, straight row, Good, HSG D |
| * | 2.350 | 98 | EX Imp |
| | 2.941 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.771 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 10.174 | 87 | Weighted Average |
| | 6.896 | | 67.78% Pervious Area |
| | 3.278 | | 32.22% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 6S: DA 6

Runoff = 67.13 cfs @ 12.11 hrs, Volume= 5.127 af, Depth> 4.83"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.860 | 98 | EX Imp |
| | 6.291 | 85 | Row crops, straight row, Good, HSG C |
| | 0.955 | 89 | Row crops, straight row, Good, HSG D |
| | 3.140 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.499 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 12.745 | 86 | Weighted Average |
| | 9.975 | | 78.27% Pervious Area |
| | 2.770 | | 21.73% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 7S: DA 7

Runoff = 168.55 cfs @ 12.62 hrs, Volume= 26.943 af, Depth> 4.78"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 39.504 | 85 | Row crops, straight row, Good, HSG C |
| | 18.825 | 89 | Row crops, straight row, Good, HSG D |
| * | 1.820 | 98 | EX Imp |
| | 3.089 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.709 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 1.150 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.527 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 67.624 | 86 | Weighted Average |
| | 64.604 | | 95.53% Pervious Area |
| | 3.020 | | 4.47% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0360 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 58.6 | 3,034 | 0.0092 | 0.86 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 62.4 | 3,134 | Total | | | |

## Summary for Subcatchment 8S: DA 8 - Offsite

Runoff = 239.57 cfs @ 13.25 hrs, Volume= 57.572 af, Depth> 4.84"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.970 | 98 | Ex Imp |
| | 3.969 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.340 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 2.443 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.552 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 0.000 | 78 | Row crops, straight row, Good, HSG B |
| | 71.424 | 85 | Row crops, straight row, Good, HSG C |
| | 58.103 | 89 | Row crops, straight row, Good, HSG D |
| | 142.801 | 87 | Weighted Average |
| | 137.504 | | 96.29% Pervious Area |
| | 5.297 | | 3.71% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 100 | 0.0217 | 0.36 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 103.4 | 3,704 | 0.0044 | 0.60 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 1.3 | 1,685 | 0.0055 | 22.10 | 72,207.12 | **Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding |
| 109.4 | 5,489 | Total | | | |

## Summary for Subcatchment 9S: DA 9

Runoff = 72.90 cfs @ 12.11 hrs, Volume= 5.544 af, Depth> 4.72"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.650 | 98 | EX Imp |
| | 2.505 | 78 | Row crops, straight row, Good, HSG B |
| | 9.212 | 85 | Row crops, straight row, Good, HSG C |
| | 1.735 | 89 | Row crops, straight row, Good, HSG D |
| | 14.102 | 85 | Weighted Average |
| | 13.452 | | 95.39% Pervious Area |
| | 0.650 | | 4.61% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.9 | 100 | 0.0081 | 0.24 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 13.1 | 738 | 0.0109 | 0.94 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 20.0 | 838 | Total | | | |

## Summary for Subcatchment 10S: DA 10

Runoff = 25.14 cfs @ 12.07 hrs, Volume= 1.702 af, Depth> 4.83"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| Area (ac) | CN | Description |
|---|---|---|
| 2.804 | 85 | Row crops, straight row, Good, HSG C |
| 1.423 | 89 | Row crops, straight row, Good, HSG D |
| 4.227 | 86 | Weighted Average |
| 4.227 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.5 | 100 | 0.0067 | 0.22 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 8.2 | 429 | 0.0095 | 0.88 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 15.7 | 529 | Total | | | |

## Summary for Subcatchment 11S: DA 11

Runoff = 8.54 cfs @ 12.11 hrs, Volume= 0.633 af, Depth> 4.94"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.290 | 98 | EX Imp |
| | 1.233 | 85 | Row crops, straight row, Good, HSG C |
| | 0.015 | 89 | Row crops, straight row, Good, HSG D |
| | 1.538 | 87 | Weighted Average |
| | 1.248 | | 81.14% Pervious Area |
| | 0.290 | | 18.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0361 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 14.9 | 596 | 0.0055 | 0.67 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 18.7 | 696 | Total | | | |

## Summary for Subcatchment 12S: DA8-Onsite

Runoff = 213.21 cfs @ 12.58 hrs, Volume= 32.029 af, Depth> 4.79"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| Area (ac) | CN | Description |
|---|---|---|
| 37.600 | 89 | Row crops, straight row, Good, HSG D |
| 36.300 | 85 | Row crops, straight row, Good, HSG C |
| 6.400 | 78 | Row crops, straight row, Good, HSG B |
| 80.300 | 86 | Weighted Average |
| 80.300 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 35.3 | 300 | 0.0100 | 0.14 | | **Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04" |
| 22.2 | 1,200 | 0.0100 | 0.90 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 57.5 | 1,500 | Total | | | |

## Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 4.82" for 50-Year Bulletin 70 event
Inflow = 38.09 cfs @ 12.19 hrs, Volume= 3.393 af
Outflow = 29.25 cfs @ 12.34 hrs, Volume= 2.537 af, Atten= 23%, Lag= 8.5 min
Primary = 29.25 cfs @ 12.34 hrs, Volume= 2.537 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 899.00' @ 12.34 hrs Surf.Area= 87,640 sf Storage= 53,153 cf

Plug-Flow detention time= 146.8 min calculated for 2.537 af (75% of inflow)
Center-of-Mass det. time= 59.8 min ( 866.8 - 807.0 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 898.00' | 394,067 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 898.00 | 18,479 | 0 | 0 |
| 899.00 | 87,451 | 52,965 | 52,965 |
| 900.00 | 175,260 | 131,356 | 184,321 |
| 901.00 | 244,232 | 209,746 | 394,067 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 898.79' | **120.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=29.24 cfs @ 12.34 hrs HW=899.00' TW=891.21' (Dynamic Tailwater)
**1=Broad-Crested Rectangular Weir** (Weir Controls 29.24 cfs @ 1.15 fps)

## Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 4.84" for 50-Year Bulletin 70 event
Inflow = 30.07 cfs @ 12.02 hrs, Volume= 1.737 af
Outflow = 14.64 cfs @ 12.15 hrs, Volume= 1.541 af, Atten= 51%, Lag= 7.6 min
Primary = 2.30 cfs @ 12.15 hrs, Volume= 1.023 af
Routed to Pond 12P : DA 4 Storage
Secondary = 12.34 cfs @ 12.15 hrs, Volume= 0.518 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.00' @ 12.15 hrs Surf.Area= 46,697 sf Storage= 32,031 cf

Plug-Flow detention time= 160.9 min calculated for 1.540 af (89% of inflow)
Center-of-Mass det. time= 105.8 min ( 900.5 - 794.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 897.00' | 178,312 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 897.00 | 17,532 | 0 | 0 |
| 898.00 | 46,772 | 32,152 | 32,152 |
| 899.00 | 72,833 | 59,803 | 91,955 |
| 900.00 | 99,882 | 86,358 | 178,312 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Secondary | 897.75' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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 |
| #2 | Primary | 897.00' | **12.0" Round Culvert** L= 37.0' Ke= 0.500<br>Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |

**Primary OutFlow** Max=2.30 cfs @ 12.15 hrs HW=898.00' TW=896.74' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 2.30 cfs @ 3.64 fps)

**Secondary OutFlow** Max=12.33 cfs @ 12.15 hrs HW=898.00' TW=896.74' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 12.33 cfs @ 1.25 fps)

## Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 4.49" for 50-Year Bulletin 70 event
Inflow = 24.00 cfs @ 12.09 hrs, Volume= 2.334 af
Outflow = 3.68 cfs @ 12.95 hrs, Volume= 2.300 af, Atten= 85%, Lag= 51.7 min
Primary = 3.68 cfs @ 12.95 hrs, Volume= 2.300 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.30' @ 12.95 hrs Surf.Area= 33,056 sf Storage= 34,168 cf

Plug-Flow detention time= 92.8 min calculated for 2.299 af (98% of inflow)
Center-of-Mass det. time= 84.6 min ( 948.3 - 863.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 895.00' | 194,049 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 895.00 | 931 | 0 | 0 |
| 896.00 | 11,904 | 6,418 | 6,418 |
| 897.00 | 26,038 | 18,971 | 25,389 |
| 898.00 | 49,659 | 37,849 | 63,237 |
| 900.00 | 81,153 | 130,812 | 194,049 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 895.00' | **12.0" Round Culvert** L= 40.0' Ke= 0.500<br>Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 898.00' | **15.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=3.68 cfs @ 12.95 hrs HW=897.30' TW=891.91' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.68 cfs @ 4.69 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 3.11" for 50-Year Bulletin 70 event
Inflow = 170.27 cfs @ 12.62 hrs, Volume= 29.559 af
Outflow = 72.49 cfs @ 13.38 hrs, Volume= 23.005 af, Atten= 57%, Lag= 45.4 min
Primary = 3.55 cfs @ 13.38 hrs, Volume= 3.587 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 68.94 cfs @ 13.38 hrs, Volume= 19.418 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.78' @ 13.38 hrs Surf.Area= 483,711 sf Storage= 543,354 cf

Plug-Flow detention time= 183.6 min calculated for 22.995 af (78% of inflow)
Center-of-Mass det. time= 94.4 min ( 953.0 - 858.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 879.00' | 654,217 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 879.00 | 3,000 | 0 | 0 |
| 880.00 | 90,812 | 46,906 | 46,906 |
| 881.00 | 293,662 | 192,237 | 239,143 |
| 882.00 | 536,485 | 415,074 | 654,217 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 879.00' | **12.0" Round Culvert** L= 45.0' Ke= 0.500<br>Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 881.00' | **37.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=3.55 cfs @ 13.38 hrs HW=881.78' TW=0.00' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 3.55 cfs @ 4.52 fps)

**Secondary OutFlow** Max=68.94 cfs @ 13.38 hrs HW=881.78' TW=0.00' (Dynamic Tailwater)
**2=Broad-Crested Rectangular Weir** (Weir Controls 68.94 cfs @ 2.38 fps)

## Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 4.94" for 50-Year Bulletin 70 event
Inflow = 54.55 cfs @ 12.11 hrs, Volume= 4.186 af
Outflow = 4.37 cfs @ 15.31 hrs, Volume= 3.223 af, Atten= 92%, Lag= 191.7 min
Primary = 4.37 cfs @ 15.31 hrs, Volume= 3.223 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.18' Surf.Area= 53,391 sf Storage= 130,918 cf
Peak Elev= 890.51' @ 13.24 hrs Surf.Area= 113,268 sf Storage= 241,588 cf (110,670 cf above start)

Plug-Flow detention time= 902.5 min calculated for 0.217 af (5% of inflow)
Center-of-Mass det. time= 217.3 min ( 1,016.4 - 799.1 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 886.00' | 525,760 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 886.00 | 30,908 | 0 | 0 |
| 887.00 | 40,872 | 35,890 | 35,890 |
| 889.00 | 45,276 | 86,148 | 122,038 |
| 891.00 | 135,445 | 180,721 | 302,759 |
| 892.10 | 270,011 | 223,001 | 525,760 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 889.18' | **15.0" Round Culvert** L= 138.0' Ke= 0.500<br>Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf |
| #2 | Secondary | 892.00' | **73.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=4.37 cfs @ 15.31 hrs HW=890.40' TW=889.22' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 4.37 cfs @ 4.56 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=889.18' TW=886.93' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 4.37" for 50-Year Bulletin 70 event
Inflow = 69.84 cfs @ 12.12 hrs, Volume= 8.349 af
Outflow = 12.10 cfs @ 12.79 hrs, Volume= 7.700 af, Atten= 83%, Lag= 40.5 min
Primary = 12.10 cfs @ 12.79 hrs, Volume= 7.700 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 889.70' @ 12.79 hrs Surf.Area= 78,590 sf Storage= 185,205 cf (117,691 cf above start)

Plug-Flow detention time= 268.2 min calculated for 6.148 af (74% of inflow)
Center-of-Mass det. time= 97.4 min ( 982.2 - 884.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 884.00' | 487,275 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 884.00 | 10,000 | 0 | 0 |
| 885.00 | 16,000 | 13,000 | 13,000 |
| 886.00 | 31,740 | 23,870 | 36,870 |
| 889.00 | 39,548 | 106,932 | 143,802 |
| 891.00 | 150,950 | 190,498 | 334,300 |
| 892.00 | 155,000 | 152,975 | 487,275 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 886.93' | **18.0" Round Culvert** L= 63.0' Ke= 0.500<br>Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf |
| #2 | Secondary | 890.00' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=12.10 cfs @ 12.79 hrs HW=889.70' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 12.10 cfs @ 6.84 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=886.93' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 4.83" for 50-Year Bulletin 70 event
Inflow = 25.14 cfs @ 12.07 hrs, Volume= 1.702 af
Outflow = 14.24 cfs @ 12.22 hrs, Volume= 1.300 af, Atten= 43%, Lag= 8.8 min
Primary = 14.24 cfs @ 12.22 hrs, Volume= 1.300 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.63' @ 12.22 hrs Surf.Area= 66,823 sf Storage= 30,610 cf

Plug-Flow detention time= 149.1 min calculated for 1.300 af (76% of inflow)
Center-of-Mass det. time= 63.5 min ( 862.3 - 798.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 863.00' | 3,373,778 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 863.00 | 29,607 | 0 | 0 |
| 864.00 | 88,227 | 58,917 | 58,917 |
| 895.00 | 125,635 | 3,314,861 | 3,373,778 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 863.40' | **50.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=14.24 cfs @ 12.22 hrs HW=863.63' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 14.24 cfs @ 1.21 fps)

## Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 4.94" for 50-Year Bulletin 70 event
Inflow = 8.54 cfs @ 12.11 hrs, Volume= 0.633 af
Outflow = 5.31 cfs @ 12.26 hrs, Volume= 0.631 af, Atten= 38%, Lag= 9.0 min
Primary = 2.86 cfs @ 12.26 hrs, Volume= 0.591 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 2.45 cfs @ 12.26 hrs, Volume= 0.039 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 864.12' @ 12.26 hrs Surf.Area= 8,161 sf Storage= 6,451 cf

Plug-Flow detention time= 19.9 min calculated for 0.630 af (100% of inflow)
Center-of-Mass det. time= 17.5 min ( 815.6 - 798.1 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 862.00' | 17,715 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 862.00 | 100 | 0 | 0 |
| 863.00 | 2,048 | 1,074 | 1,074 |
| 864.00 | 6,912 | 4,480 | 5,554 |
| 865.00 | 17,409 | 12,161 | 17,715 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 862.00' | **12.0" Round Culvert** L= 38.0' Ke= 0.500<br>Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 864.00' | **24.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.86 cfs @ 12.26 hrs HW=864.12' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.86 cfs @ 3.64 fps)

**Secondary OutFlow** Max=2.45 cfs @ 12.26 hrs HW=864.12' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 2.45 cfs @ 0.86 fps)

## Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 4.61" for 50-Year Bulletin 70 event
Inflow = 133.86 cfs @ 12.38 hrs, Volume= 17.841 af
Outflow = 2.86 cfs @ 24.00 hrs, Volume= 2.616 af, Atten= 98%, Lag= 697.1 min
Primary = 2.86 cfs @ 24.00 hrs, Volume= 2.616 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 892.56' @ 24.00 hrs Surf.Area= 431,900 sf Storage= 900,834 cf (663,164 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 256.8 min ( 1,099.0 - 842.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 887.00' | 1,151,208 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 887.00 | 21,488 | 0 | 0 |
| 890.00 | 113,506 | 202,491 | 202,491 |
| 893.00 | 486,505 | 900,017 | 1,102,508 |
| 893.10 | 487,505 | 48,701 | 1,151,208 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 890.27' | **12.0" Round Culvert** L= 47.0' Ke= 0.500<br>Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 893.00' | **13.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.86 cfs @ 24.00 hrs HW=892.56' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.86 cfs @ 3.64 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.14% Impervious, Inflow Depth > 4.01" for 50-Year Bulletin 70 event
Inflow = 444.52 cfs @ 12.89 hrs, Volume= 121.606 af
Primary = 444.52 cfs @ 12.89 hrs, Volume= 121.606 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 4L: Existing Discharge

Inflow Area = 379.969 ac, 4.22% Impervious, Inflow Depth > 4.04" for 50-Year Bulletin 70 event
Inflow = 454.67 cfs @ 12.88 hrs, Volume= 127.781 af
Primary = 454.67 cfs @ 12.88 hrs, Volume= 127.781 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 6.01% Impervious, Inflow Depth > 4.74" for 50-Year Bulletin 70 event
Inflow = 75.41 cfs @ 12.12 hrs, Volume= 6.174 af
Primary = 75.41 cfs @ 12.12 hrs, Volume= 6.174 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1S: DA 1** Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>5.89"
Flow Length=697' Tc=26.2 min CN=86 Runoff=46.16 cfs 4.148 af

**Subcatchment 2S: DA 2** Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>5.91"
Flow Length=412' Tc=10.7 min CN=86 Runoff=36.33 cfs 2.123 af

**Subcatchment 3S: DA 3** Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>5.98"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=124.15 cfs 15.848 af

**Subcatchment 4S: DA 4** Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>6.03"
Flow Length=419' Tc=11.3 min CN=87 Runoff=16.10 cfs 0.966 af

**Subcatchment 5S: DA 5** Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>6.02"
Tc=20.0 min CN=87 Runoff=65.84 cfs 5.101 af

**Subcatchment 6S: DA 6** Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>5.90"
Tc=20.0 min CN=86 Runoff=81.30 cfs 6.266 af

**Subcatchment 7S: DA 7** Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>5.85"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=204.74 cfs 32.941 af

**Subcatchment 8S: DA 8 - Offsite** Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>5.90"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=290.16 cfs 70.192 af

**Subcatchment 9S: DA 9** Runoff Area=14.102 ac 4.61% Impervious Runoff Depth>5.78"
Flow Length=838' Tc=20.0 min CN=85 Runoff=88.60 cfs 6.797 af

**Subcatchment 10S: DA 10** Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>5.91"
Flow Length=529' Tc=15.7 min CN=86 Runoff=30.42 cfs 2.080 af

**Subcatchment 11S: DA 11** Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>6.02"
Flow Length=696' Tc=18.7 min CN=87 Runoff=10.31 cfs 0.771 af

**Subcatchment 12S: DA8-Onsite** Runoff Area=80.300 ac 0.00% Impervious Runoff Depth>5.85"
Flow Length=1,500' Slope=0.0100 '/' Tc=57.5 min CN=86 Runoff=258.85 cfs 39.159 af

**Pond 1P: DA 1 Storage** Peak Elev=899.05' Storage=57,060 cf Inflow=46.16 cfs 4.148 af
Outflow=38.95 cfs 3.288 af

**Pond 2P: DA 2 Storage** Peak Elev=898.08' Storage=35,839 cf Inflow=36.33 cfs 2.123 af
Primary=2.51 cfs 1.032 af Secondary=18.97 cfs 0.871 af Outflow=21.48 cfs 1.904 af

**Pond 12P: DA 4 Storage** Peak Elev=897.66' Storage=47,765 cf Inflow=34.01 cfs 2.870 af
Primary=3.99 cfs 2.829 af Secondary=0.00 cfs 0.000 af Outflow=3.99 cfs 2.829 af

**Pond 13P: DA 7 Storage** Peak Elev=881.96' Storage=632,165 cf Inflow=206.85 cfs 35.908 af
Primary=3.69 cfs 3.789 af Secondary=93.12 cfs 25.390 af Outflow=96.82 cfs 29.179 af

**Pond 14P: DA 5 Storage** Peak Elev=890.73' Storage=268,433 cf Inflow=65.84 cfs 5.101 af
Primary=4.87 cfs 3.935 af Secondary=0.00 cfs 0.000 af Outflow=4.87 cfs 3.935 af

**Pond 17P: DA 6 Storage** Peak Elev=890.02' Storage=213,410 cf Inflow=84.59 cfs 10.202 af
Primary=13.02 cfs 9.431 af Secondary=0.35 cfs 0.010 af Outflow=13.37 cfs 9.441 af

**Pond 18P: DA 10 Storage** Peak Elev=863.69' Storage=34,315 cf Inflow=30.42 cfs 2.080 af
Outflow=19.59 cfs 1.676 af

**Pond 19P: DA 11 Storage** Peak Elev=864.19' Storage=7,032 cf Inflow=10.31 cfs 0.771 af
Primary=2.94 cfs 0.676 af Secondary=4.84 cfs 0.093 af Outflow=7.78 cfs 0.769 af

**Pond 20P: DA 3 Storage** Peak Elev=892.92' Storage=1,065,249 cf Inflow=163.66 cfs 21.965 af
Primary=3.20 cfs 2.966 af Secondary=0.00 cfs 0.000 af Outflow=3.20 cfs 2.966 af

**Link 2L: DA 8 >>> Discharge** Inflow=551.74 cfs 149.647 af
Primary=551.74 cfs 149.647 af

**Link 4L: Existing Discharge** Inflow=563.58 cfs 157.213 af
Primary=563.58 cfs 157.213 af

**Link 15L: DA 9 >>> Discharge** Inflow=93.14 cfs 7.566 af
Primary=93.14 cfs 7.566 af

**Total Runoff Area = 379.969 ac Runoff Volume = 186.393 af Average Runoff Depth = 5.89"**
**95.78% Pervious = 363.934 ac 4.22% Impervious = 16.034 ac**

## Summary for Subcatchment 1S: DA 1

Runoff = 46.16 cfs @ 12.19 hrs, Volume= 4.148 af, Depth> 5.89"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| Area (ac) | CN | Description |
|---|---|---|
| 5.805 | 85 | Row crops, straight row, Good, HSG C |
| 2.642 | 89 | Row crops, straight row, Good, HSG D |
| 8.447 | 86 | Weighted Average |
| 8.447 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.3 | 100 | 0.0102 | 0.26 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 19.9 | 597 | 0.0031 | 0.50 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 26.2 | 697 | Total | | | |

## Summary for Subcatchment 2S: DA 2

Runoff = 36.33 cfs @ 12.02 hrs, Volume= 2.123 af, Depth> 5.91"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.080 | 98 | EX Imp |
| | 3.280 | 85 | Row crops, straight row, Good, HSG C |
| | 0.950 | 89 | Row crops, straight row, Good, HSG D |
| | 4.310 | 86 | Weighted Average |
| | 4.230 | | 98.14% Pervious Area |
| | 0.080 | | 1.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0090 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 4.1 | 312 | 0.0196 | 1.26 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 10.7 | 412 | Total | | | |

## Summary for Subcatchment 3S: DA 3

Runoff = 124.15 cfs @ 12.42 hrs, Volume= 15.848 af, Depth> 5.98"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.540 | 98 | EX Imp |
| | 18.238 | 85 | Row crops, straight row, Good, HSG C |
| | 13.000 | 89 | Row crops, straight row, Good, HSG D |
| | 31.778 | 87 | Weighted Average |
| | 31.238 | | 98.30% Pervious Area |
| | 0.540 | | 1.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.3 | 100 | 0.0160 | 0.32 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 39.6 | 1,803 | 0.0071 | 0.76 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 44.9 | 1,903 | Total | | | |

## Summary for Subcatchment 4S: DA 4

Runoff = 16.10 cfs @ 12.02 hrs, Volume= 0.966 af, Depth> 6.03"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.110 | 98 | EX Imp |
| | 1.206 | 85 | Row crops, straight row, Good, HSG C |
| | 0.607 | 89 | Row crops, straight row, Good, HSG D |
| | 1.923 | 87 | Weighted Average |
| | 1.813 | | 94.28% Pervious Area |
| | 0.110 | | 5.72% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | 100 | 0.0188 | 0.34 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 6.3 | 319 | 0.0089 | 0.85 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 11.3 | 419 | Total | | | |

## Summary for Subcatchment 5S: DA 5

Runoff = 65.84 cfs @ 12.11 hrs, Volume= 5.101 af, Depth> 6.02"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 3.625 | 85 | Row crops, straight row, Good, HSG C |
| | 0.487 | 89 | Row crops, straight row, Good, HSG D |
| * | 2.350 | 98 | EX Imp |
| | 2.941 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.771 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 10.174 | 87 | Weighted Average |
| | 6.896 | | 67.78% Pervious Area |
| | 3.278 | | 32.22% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 6S: DA 6

Runoff = 81.30 cfs @ 12.11 hrs, Volume= 6.266 af, Depth> 5.90"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.860 | 98 | EX Imp |
| | 6.291 | 85 | Row crops, straight row, Good, HSG C |
| | 0.955 | 89 | Row crops, straight row, Good, HSG D |
| | 3.140 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.499 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 12.745 | 86 | Weighted Average |
| | 9.975 | | 78.27% Pervious Area |
| | 2.770 | | 21.73% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 7S: DA 7

Runoff = 204.74 cfs @ 12.62 hrs, Volume= 32.941 af, Depth> 5.85"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 39.504 | 85 | Row crops, straight row, Good, HSG C |
| | 18.825 | 89 | Row crops, straight row, Good, HSG D |
| * | 1.820 | 98 | EX Imp |
| | 3.089 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.709 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 1.150 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.527 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 67.624 | 86 | Weighted Average |
| | 64.604 | | 95.53% Pervious Area |
| | 3.020 | | 4.47% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0360 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 58.6 | 3,034 | 0.0092 | 0.86 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 62.4 | 3,134 | Total | | | |

## Summary for Subcatchment 8S: DA 8 - Offsite

Runoff = 290.16 cfs @ 13.25 hrs, Volume= 70.192 af, Depth> 5.90"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.970 | 98 | Ex Imp |
| | 3.969 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.340 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 2.443 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.552 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 0.000 | 78 | Row crops, straight row, Good, HSG B |
| | 71.424 | 85 | Row crops, straight row, Good, HSG C |
| | 58.103 | 89 | Row crops, straight row, Good, HSG D |
| | 142.801 | 87 | Weighted Average |
| | 137.504 | | 96.29% Pervious Area |
| | 5.297 | | 3.71% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 100 | 0.0217 | 0.36 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 103.4 | 3,704 | 0.0044 | 0.60 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 1.3 | 1,685 | 0.0055 | 22.10 | 72,207.12 | **Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding |
| 109.4 | 5,489 | Total | | | |

## Summary for Subcatchment 9S: DA 9

Runoff = 88.60 cfs @ 12.11 hrs, Volume= 6.797 af, Depth> 5.78"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.650 | 98 | EX Imp |
| | 2.505 | 78 | Row crops, straight row, Good, HSG B |
| | 9.212 | 85 | Row crops, straight row, Good, HSG C |
| | 1.735 | 89 | Row crops, straight row, Good, HSG D |
| | 14.102 | 85 | Weighted Average |
| | 13.452 | | 95.39% Pervious Area |
| | 0.650 | | 4.61% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.9 | 100 | 0.0081 | 0.24 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 13.1 | 738 | 0.0109 | 0.94 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 20.0 | 838 | Total | | | |

## Summary for Subcatchment 10S: DA 10

Runoff = 30.42 cfs @ 12.07 hrs, Volume= 2.080 af, Depth> 5.91"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| Area (ac) | CN | Description |
|---|---|---|
| 2.804 | 85 | Row crops, straight row, Good, HSG C |
| 1.423 | 89 | Row crops, straight row, Good, HSG D |
| 4.227 | 86 | Weighted Average |
| 4.227 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.5 | 100 | 0.0067 | 0.22 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 8.2 | 429 | 0.0095 | 0.88 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 15.7 | 529 | Total | | | |

## Summary for Subcatchment 11S: DA 11

Runoff = 10.31 cfs @ 12.11 hrs, Volume= 0.771 af, Depth> 6.02"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.290 | 98 | EX Imp |
| | 1.233 | 85 | Row crops, straight row, Good, HSG C |
| | 0.015 | 89 | Row crops, straight row, Good, HSG D |
| | 1.538 | 87 | Weighted Average |
| | 1.248 | | 81.14% Pervious Area |
| | 0.290 | | 18.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0361 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 14.9 | 596 | 0.0055 | 0.67 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 18.7 | 696 | Total | | | |

## Summary for Subcatchment 12S: DA8-Onsite

Runoff = 258.85 cfs @ 12.58 hrs, Volume= 39.159 af, Depth> 5.85"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| Area (ac) | CN | Description |
|---|---|---|
| 37.600 | 89 | Row crops, straight row, Good, HSG D |
| 36.300 | 85 | Row crops, straight row, Good, HSG C |
| 6.400 | 78 | Row crops, straight row, Good, HSG B |
| 80.300 | 86 | Weighted Average |
| 80.300 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 35.3 | 300 | 0.0100 | 0.14 | | **Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04" |
| 22.2 | 1,200 | 0.0100 | 0.90 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 57.5 | 1,500 | Total | | | |

## Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 5.89" for 100-Year Bulletin 70 event
Inflow = 46.16 cfs @ 12.19 hrs, Volume= 4.148 af
Outflow = 38.95 cfs @ 12.30 hrs, Volume= 3.288 af, Atten= 16%, Lag= 6.6 min
Primary = 38.95 cfs @ 12.30 hrs, Volume= 3.288 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 899.05' @ 12.30 hrs Surf.Area= 91,471 sf Storage= 57,060 cf

Plug-Flow detention time= 132.5 min calculated for 3.288 af (79% of inflow)
Center-of-Mass det. time= 53.6 min ( 855.1 - 801.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 898.00' | 394,067 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 898.00 | 18,479 | 0 | 0 |
| 899.00 | 87,451 | 52,965 | 52,965 |
| 900.00 | 175,260 | 131,356 | 184,321 |
| 901.00 | 244,232 | 209,746 | 394,067 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 898.79' | **120.0' long x 10.0' breadth Broad-Crested Rectangular Weir** |
| | | | Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 |
| | | | Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=38.94 cfs @ 12.30 hrs HW=899.05' TW=891.36' (Dynamic Tailwater)
**1=Broad-Crested Rectangular Weir** (Weir Controls 38.94 cfs @ 1.27 fps)

## Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 5.91" for 100-Year Bulletin 70 event
Inflow = 36.33 cfs @ 12.02 hrs, Volume= 2.123 af
Outflow = 21.48 cfs @ 12.12 hrs, Volume= 1.904 af, Atten= 41%, Lag= 6.3 min
Primary = 2.51 cfs @ 12.12 hrs, Volume= 1.032 af
Routed to Pond 12P : DA 4 Storage
Secondary = 18.97 cfs @ 12.12 hrs, Volume= 0.871 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.08' @ 12.12 hrs Surf.Area= 48,783 sf Storage= 35,839 cf

Plug-Flow detention time= 149.3 min calculated for 1.903 af (90% of inflow)
Center-of-Mass det. time= 97.6 min ( 886.9 - 789.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 897.00' | 178,312 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 897.00 | 17,532 | 0 | 0 |
| 898.00 | 46,772 | 32,152 | 32,152 |
| 899.00 | 72,833 | 59,803 | 91,955 |
| 900.00 | 99,882 | 86,358 | 178,312 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Secondary | 897.75' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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 |
| #2 | Primary | 897.00' | **12.0" Round Culvert** L= 37.0' Ke= 0.500<br>Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |

**Primary OutFlow** Max=2.51 cfs @ 12.12 hrs HW=898.08' TW=897.00' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 2.51 cfs @ 3.70 fps)

**Secondary OutFlow** Max=18.96 cfs @ 12.12 hrs HW=898.08' TW=897.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 18.96 cfs @ 1.45 fps)

## Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 5.52" for 100-Year Bulletin 70 event
Inflow = 34.01 cfs @ 12.08 hrs, Volume= 2.870 af
Outflow = 3.99 cfs @ 13.01 hrs, Volume= 2.829 af, Atten= 88%, Lag= 55.8 min
Primary = 3.99 cfs @ 13.01 hrs, Volume= 2.829 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.66' @ 13.01 hrs Surf.Area= 41,654 sf Storage= 47,765 cf

Plug-Flow detention time= 118.5 min calculated for 2.829 af (99% of inflow)
Center-of-Mass det. time= 110.4 min ( 963.6 - 853.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 895.00' | 194,049 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 895.00 | 931 | 0 | 0 |
| 896.00 | 11,904 | 6,418 | 6,418 |
| 897.00 | 26,038 | 18,971 | 25,389 |
| 898.00 | 49,659 | 37,849 | 63,237 |
| 900.00 | 81,153 | 130,812 | 194,049 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 895.00' | **12.0" Round Culvert** L= 40.0' Ke= 0.500<br>Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 898.00' | **15.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=3.99 cfs @ 13.01 hrs HW=897.66' TW=892.23' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.99 cfs @ 5.08 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 3.78" for 100-Year Bulletin 70 event
Inflow = 206.85 cfs @ 12.62 hrs, Volume= 35.908 af
Outflow = 96.82 cfs @ 13.30 hrs, Volume= 29.179 af, Atten= 53%, Lag= 40.8 min
Primary = 3.69 cfs @ 13.30 hrs, Volume= 3.789 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 93.12 cfs @ 13.30 hrs, Volume= 25.390 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.96' @ 13.30 hrs Surf.Area= 526,409 sf Storage= 632,165 cf

Plug-Flow detention time= 168.3 min calculated for 29.179 af (81% of inflow)
Center-of-Mass det. time= 88.3 min ( 940.1 - 851.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 879.00' | 654,217 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 879.00 | 3,000 | 0 | 0 |
| 880.00 | 90,812 | 46,906 | 46,906 |
| 881.00 | 293,662 | 192,237 | 239,143 |
| 882.00 | 536,485 | 415,074 | 654,217 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 879.00' | **12.0" Round Culvert** L= 45.0' Ke= 0.500<br>Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 881.00' | **37.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=3.69 cfs @ 13.30 hrs HW=881.96' TW=0.00' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 3.69 cfs @ 4.70 fps)

**Secondary OutFlow** Max=93.12 cfs @ 13.30 hrs HW=881.96' TW=0.00' (Dynamic Tailwater)
**2=Broad-Crested Rectangular Weir** (Weir Controls 93.12 cfs @ 2.63 fps)

## Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 6.02" for 100-Year Bulletin 70 event
Inflow = 65.84 cfs @ 12.11 hrs, Volume= 5.101 af
Outflow = 4.87 cfs @ 16.29 hrs, Volume= 3.935 af, Atten= 93%, Lag= 250.8 min
Primary = 4.87 cfs @ 16.29 hrs, Volume= 3.935 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.18' Surf.Area= 53,391 sf Storage= 130,918 cf
Peak Elev= 890.73' @ 13.44 hrs Surf.Area= 123,492 sf Storage= 268,433 cf (137,515 cf above start)

Plug-Flow detention time= 699.9 min calculated for 0.929 af (18% of inflow)
Center-of-Mass det. time= 236.0 min ( 1,029.7 - 793.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 886.00' | 525,760 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 886.00 | 30,908 | 0 | 0 |
| 887.00 | 40,872 | 35,890 | 35,890 |
| 889.00 | 45,276 | 86,148 | 122,038 |
| 891.00 | 135,445 | 180,721 | 302,759 |
| 892.10 | 270,011 | 223,001 | 525,760 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 889.18' | **15.0" Round Culvert** L= 138.0' Ke= 0.500<br>Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf |
| #2 | Secondary | 892.00' | **73.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=4.88 cfs @ 16.29 hrs HW=890.56' TW=889.42' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 4.88 cfs @ 4.50 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=889.18' TW=886.93' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 5.34" for 100-Year Bulletin 70 event
Inflow = 84.59 cfs @ 12.11 hrs, Volume= 10.202 af
Outflow = 13.37 cfs @ 12.83 hrs, Volume= 9.441 af, Atten= 84%, Lag= 42.7 min
Primary = 13.02 cfs @ 12.83 hrs, Volume= 9.431 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.35 cfs @ 12.83 hrs, Volume= 0.010 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 890.02' @ 12.83 hrs Surf.Area= 96,532 sf Storage= 213,410 cf (145,896 cf above start)

Plug-Flow detention time= 261.6 min calculated for 7.888 af (77% of inflow)
Center-of-Mass det. time= 107.9 min ( 994.4 - 886.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 884.00' | 487,275 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 884.00 | 10,000 | 0 | 0 |
| 885.00 | 16,000 | 13,000 | 13,000 |
| 886.00 | 31,740 | 23,870 | 36,870 |
| 889.00 | 39,548 | 106,932 | 143,802 |
| 891.00 | 150,950 | 190,498 | 334,300 |
| 892.00 | 155,000 | 152,975 | 487,275 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 886.93' | **18.0" Round Culvert** L= 63.0' Ke= 0.500<br>Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf |
| #2 | Secondary | 890.00' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=13.02 cfs @ 12.83 hrs HW=890.02' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 13.02 cfs @ 7.37 fps)

**Secondary OutFlow** Max=0.35 cfs @ 12.83 hrs HW=890.02' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.35 cfs @ 0.38 fps)

## Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 5.91" for 100-Year Bulletin 70 event
Inflow = 30.42 cfs @ 12.07 hrs, Volume= 2.080 af
Outflow = 19.59 cfs @ 12.20 hrs, Volume= 1.676 af, Atten= 36%, Lag= 7.6 min
Primary = 19.59 cfs @ 12.20 hrs, Volume= 1.676 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.69' @ 12.20 hrs Surf.Area= 69,998 sf Storage= 34,315 cf

Plug-Flow detention time= 135.0 min calculated for 1.675 af (81% of inflow)
Center-of-Mass det. time= 57.9 min ( 851.1 - 793.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 863.00' | 3,373,778 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 863.00 | 29,607 | 0 | 0 |
| 864.00 | 88,227 | 58,917 | 58,917 |
| 895.00 | 125,635 | 3,314,861 | 3,373,778 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 863.40' | **50.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=19.58 cfs @ 12.20 hrs HW=863.69' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 19.58 cfs @ 1.36 fps)

## Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 6.02" for 100-Year Bulletin 70 event
Inflow = 10.31 cfs @ 12.11 hrs, Volume= 0.771 af
Outflow = 7.78 cfs @ 12.22 hrs, Volume= 0.769 af, Atten= 24%, Lag= 6.6 min
Primary = 2.94 cfs @ 12.22 hrs, Volume= 0.676 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 4.84 cfs @ 12.22 hrs, Volume= 0.093 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 864.19' @ 12.22 hrs Surf.Area= 8,878 sf Storage= 7,032 cf

Plug-Flow detention time= 18.7 min calculated for 0.768 af (100% of inflow)
Center-of-Mass det. time= 16.5 min ( 809.2 - 792.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 862.00' | 17,715 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 862.00 | 100 | 0 | 0 |
| 863.00 | 2,048 | 1,074 | 1,074 |
| 864.00 | 6,912 | 4,480 | 5,554 |
| 865.00 | 17,409 | 12,161 | 17,715 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 862.00' | **12.0" Round Culvert** L= 38.0' Ke= 0.500<br>Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 864.00' | **24.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.94 cfs @ 12.22 hrs HW=864.19' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.94 cfs @ 3.74 fps)

**Secondary OutFlow** Max=4.84 cfs @ 12.22 hrs HW=864.19' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 4.84 cfs @ 1.08 fps)

## Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 5.67" for 100-Year Bulletin 70 event
Inflow = 163.66 cfs @ 12.37 hrs, Volume= 21.965 af
Outflow = 3.20 cfs @ 24.00 hrs, Volume= 2.966 af, Atten= 98%, Lag= 697.6 min
Primary = 3.20 cfs @ 24.00 hrs, Volume= 2.966 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 892.92' @ 24.00 hrs Surf.Area= 476,888 sf Storage= 1,065,249 cf (827,579 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 254.9 min ( 1,093.8 - 839.0 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 887.00' | 1,151,208 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 887.00 | 21,488 | 0 | 0 |
| 890.00 | 113,506 | 202,491 | 202,491 |
| 893.00 | 486,505 | 900,017 | 1,102,508 |
| 893.10 | 487,505 | 48,701 | 1,151,208 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 890.27' | **12.0" Round Culvert** L= 47.0' Ke= 0.500<br>Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 893.00' | **13.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=3.20 cfs @ 24.00 hrs HW=892.92' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.20 cfs @ 4.07 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.14% Impervious, Inflow Depth > 4.93" for 100-Year Bulletin 70 event
Inflow = 551.74 cfs @ 12.88 hrs, Volume= 149.647 af
Primary = 551.74 cfs @ 12.88 hrs, Volume= 149.647 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 4L: Existing Discharge

Inflow Area = 379.969 ac, 4.22% Impervious, Inflow Depth > 4.97" for 100-Year Bulletin 70 event
Inflow = 563.58 cfs @ 12.88 hrs, Volume= 157.213 af
Primary = 563.58 cfs @ 12.88 hrs, Volume= 157.213 af, Atten= 0%, Lag= 0.0 min

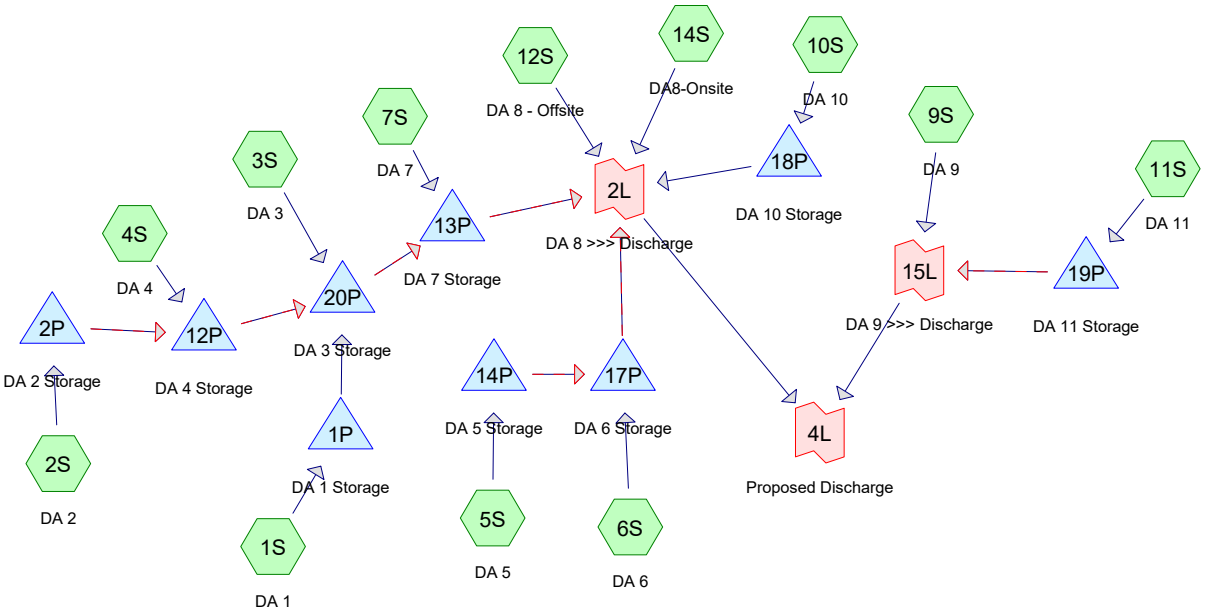
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 6.01% Impervious, Inflow Depth > 5.81" for 100-Year Bulletin 70 event
Inflow = 93.14 cfs @ 12.13 hrs, Volume= 7.566 af
Primary = 93.14 cfs @ 12.13 hrs, Volume= 7.566 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

**Proposed Conditions**




Subcat Reach Pond Link

**Routing Diagram for Cortland Solar Proposed**
Prepared by WSB & Associates Inc, Printed 10/15/2025
HydroCAD® 10.20-7a s/n 00883 © 2025 HydroCAD Software Solutions LLC

## Rainfall Events Listing (selected events)

| Event# | Event Name | Storm Type | Curve | Mode | Duration (hours) | B/B | Depth (inches) | AMC |
|---|---|---|---|---|---|---|---|---|
| 1 | 2-Year Bulletin 70 | Type II 24-hr | | Default | 24.00 | 1 | 3.04 | 2 |
| 2 | 10-Year Bulletin 70 | Type II 24-hr | | Default | 24.00 | 1 | 4.47 | 2 |
| 3 | 25-Year Bulletin 70 | Type II 24-hr | | Default | 24.00 | 1 | 5.51 | 2 |
| 4 | 50-Year Bulletin 70 | Type II 24-hr | | Default | 24.00 | 1 | 6.46 | 2 |
| 5 | 100-Year Bulletin 70 | Type II 24-hr | | Default | 24.00 | 1 | 7.58 | 2 |

## Area Listing (selected nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 13.139 | 80 | 1/2 acre lots, 25% imp, HSG C (5S, 6S, 7S, 12S) |
| 4.319 | 85 | 1/2 acre lots, 25% imp, HSG D (5S, 6S, 7S, 12S) |
| 7.700 | 98 | EX Imp (2S, 3S, 4S, 5S, 6S, 7S, 9S, 11S) |
| 3.970 | 98 | Ex Imp (12S) |
| 1.100 | 58 | Meadow, non-grazed, HSG B (14S) |
| 9.905 | 71 | Meadow, non-grazed, HSG C (9S, 14S) |
| 23.130 | 78 | Meadow, non-grazed, HSG D (14S) |
| 3.593 | 79 | Pasture/grassland/range, Fair, HSG C (7S, 12S) |
| 3.079 | 84 | Pasture/grassland/range, Fair, HSG D (7S, 12S) |
| 0.355 | 98 | Prop Imp (9S) |
| 0.600 | 98 | Proposed Impervious (14S) |
| 7.751 | 78 | Row crops, straight row, Good, HSG B (9S, 14S) |
| 188.600 | 85 | Row crops, straight row, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 7S, 9S, 10S, 11S, 12S, 14S) |
| 112.728 | 89 | Row crops, straight row, Good, HSG D (1S, 2S, 3S, 4S, 5S, 6S, 7S, 9S, 10S, 11S, 12S, 14S) |
| **379.969** | **85** | **TOTAL AREA** |

## Soil Listing (selected nodes)

| Area (acres) | Soil Group | Subcatchment Numbers |
|---|---|---|
| 0.000 | HSG A | |
| 8.851 | HSG B | 9S, 14S |
| 215.237 | HSG C | 1S, 2S, 3S, 4S, 5S, 6S, 7S, 9S, 10S, 11S, 12S, 14S |
| 143.256 | HSG D | 1S, 2S, 3S, 4S, 5S, 6S, 7S, 9S, 10S, 11S, 12S, 14S |
| 12.625 | Other | 2S, 3S, 4S, 5S, 6S, 7S, 9S, 11S, 12S, 14S |
| **379.969** | | **TOTAL AREA** |

## Ground Covers (selected nodes)

| HSG-A (acres) | HSG-B (acres) | HSG-C (acres) | HSG-D (acres) | Other (acres) | Total (acres) | Ground Cover | Subcatchme Numbers |
|---|---|---|---|---|---|---|---|
| 0.000 | 0.000 | 13.139 | 4.319 | 0.000 | 17.458 | 1/2 acre lots, 25% imp | |
| 0.000 | 0.000 | 0.000 | 0.000 | 7.700 | 7.700 | EX Imp | |
| 0.000 | 0.000 | 0.000 | 0.000 | 3.970 | 3.970 | Ex Imp | |
| 0.000 | 1.100 | 9.905 | 23.130 | 0.000 | 34.135 | Meadow, non-grazed | |
| 0.000 | 0.000 | 3.593 | 3.079 | 0.000 | 6.672 | Pasture/grassland/range, Fair | |
| 0.000 | 0.000 | 0.000 | 0.000 | 0.355 | 0.355 | Prop Imp | |
| 0.000 | 0.000 | 0.000 | 0.000 | 0.600 | 0.600 | Proposed Impervious | |
| 0.000 | 7.751 | 188.600 | 112.728 | 0.000 | 309.079 | Row crops, straight row, Good | |
| **0.000** | **8.851** | **215.237** | **143.256** | **12.625** | **379.969** | **TOTAL AREA** | |

## Pipe Listing (selected nodes)

| Line# | Node Number | In-Invert (feet) | Out-Invert (feet) | Length (feet) | Slope (ft/ft) | n | Width (inches) | Diam/Height (inches) | Inside-Fill (inches) | Nod Nam |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2P | 897.00 | 896.25 | 37.0 | 0.0203 | 0.025 | 0.0 | 12.0 | 0.0 | |
| 2 | 12P | 895.00 | 894.20 | 40.0 | 0.0200 | 0.025 | 0.0 | 12.0 | 0.0 | |
| 3 | 13P | 879.00 | 878.65 | 45.0 | 0.0078 | 0.025 | 0.0 | 12.0 | 0.0 | |
| 4 | 14P | 889.18 | 888.20 | 138.0 | 0.0071 | 0.012 | 0.0 | 15.0 | 0.0 | |
| 5 | 17P | 886.93 | 884.76 | 63.0 | 0.0344 | 0.012 | 0.0 | 18.0 | 0.0 | |
| 6 | 19P | 862.00 | 861.90 | 38.0 | 0.0026 | 0.025 | 0.0 | 12.0 | 0.0 | |
| 7 | 20P | 890.27 | 890.13 | 47.0 | 0.0030 | 0.025 | 0.0 | 12.0 | 0.0 | |

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1S: DA 1** Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>1.69"
Flow Length=697' Tc=26.2 min CN=86 Runoff=13.61 cfs 1.186 af

**Subcatchment 2S: DA 2** Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>1.69"
Flow Length=412' Tc=10.7 min CN=86 Runoff=10.97 cfs 0.608 af

**Subcatchment 3S: DA 3** Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>1.75"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=37.30 cfs 4.644 af

**Subcatchment 4S: DA 4** Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>1.77"
Flow Length=419' Tc=11.3 min CN=87 Runoff=4.99 cfs 0.283 af

**Subcatchment 5S: DA 5** Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>1.77"
Tc=20.0 min CN=87 Runoff=20.07 cfs 1.497 af

**Subcatchment 6S: DA 6** Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>1.69"
Tc=20.0 min CN=86 Runoff=24.06 cfs 1.793 af

**Subcatchment 7S: DA 7** Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>1.67"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=59.45 cfs 9.403 af

**Subcatchment 9S: DA 9** Runoff Area=14.102 ac 7.13% Impervious Runoff Depth>1.61"
Flow Length=838' Tc=20.0 min CN=85 Runoff=25.44 cfs 1.896 af

**Subcatchment 10S: DA 10** Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>1.69"
Flow Length=529' Tc=15.7 min CN=86 Runoff=9.08 cfs 0.595 af

**Subcatchment 11S: DA 11** Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>1.77"
Flow Length=696' Tc=18.7 min CN=87 Runoff=3.16 cfs 0.226 af

**Subcatchment 12S: DA 8 - Offsite** Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>1.72"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=86.22 cfs 20.498 af

**Subcatchment 14S: DA8-Onsite** Runoff Area=80.300 ac 0.75% Impervious Runoff Depth>1.32"
Flow Length=1,500' Slope=0.0100 '/' Tc=63.9 min CN=81 Runoff=53.77 cfs 8.822 af

**Pond 1P: DA 1 Storage** Peak Elev=898.81' Storage=37,429 cf Inflow=13.61 cfs 1.186 af
Outflow=0.71 cfs 0.342 af

**Pond 2P: DA 2 Storage** Peak Elev=897.55' Storage=14,028 cf Inflow=10.97 cfs 0.608 af
Primary=0.89 cfs 0.484 af Secondary=0.00 cfs 0.000 af Outflow=0.89 cfs 0.484 af

**Pond 12P: DA 4 Storage** Peak Elev=895.85' Storage=4,744 cf Inflow=5.44 cfs 0.768 af
Primary=1.83 cfs 0.751 af Secondary=0.00 cfs 0.000 af Outflow=1.83 cfs 0.751 af

**Pond 13P: DA 7 Storage** Peak Elev=881.11' Storage=273,890 cf Inflow=59.86 cfs 10.456 af
Primary=2.94 cfs 2.842 af Secondary=3.50 cfs 1.817 af Outflow=6.44 cfs 4.659 af

**Pond 14P: DA 5 Storage** Peak Elev=889.76' Storage=169,733 cf Inflow=20.07 cfs 1.497 af
Primary=1.41 cfs 0.991 af Secondary=0.00 cfs 0.000 af Outflow=1.41 cfs 0.991 af

**Pond 17P: DA 6 Storage** Peak Elev=888.02' Storage=106,446 cf Inflow=24.54 cfs 2.783 af
Primary=4.92 cfs 2.401 af Secondary=0.00 cfs 0.000 af Outflow=4.92 cfs 2.401 af

**Pond 18P: DA 10 Storage** Peak Elev=863.42' Storage=17,721 cf Inflow=9.08 cfs 0.595 af
Outflow=0.41 cfs 0.203 af

**Pond 19P: DA 11 Storage** Peak Elev=863.30' Storage=1,895 cf Inflow=3.16 cfs 0.226 af
Primary=1.76 cfs 0.225 af Secondary=0.00 cfs 0.000 af Outflow=1.76 cfs 0.225 af

**Pond 20P: DA 3 Storage** Peak Elev=891.25' Storage=441,668 cf Inflow=39.11 cfs 5.736 af
Primary=1.28 cfs 1.053 af Secondary=0.00 cfs 0.000 af Outflow=1.28 cfs 1.053 af

**Link 2L: DA 8 >>> Discharge** Inflow=131.27 cfs 36.583 af
Primary=131.27 cfs 36.583 af

**Link 4L: Proposed Discharge** Inflow=134.49 cfs 38.704 af
Primary=134.49 cfs 38.704 af

**Link 15L: DA 9 >>> Discharge** Inflow=27.07 cfs 2.121 af
Primary=27.07 cfs 2.121 af

**Total Runoff Area = 379.969 ac Runoff Volume = 51.450 af Average Runoff Depth = 1.62"**
**95.53% Pervious = 362.979 ac 4.47% Impervious = 16.989 ac**

## Summary for Subcatchment 1S: DA 1

Runoff = 13.61 cfs @ 12.20 hrs, Volume= 1.186 af, Depth> 1.69"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| Area (ac) | CN | Description |
|---|---|---|
| 5.805 | 85 | Row crops, straight row, Good, HSG C |
| 2.642 | 89 | Row crops, straight row, Good, HSG D |
| 8.447 | 86 | Weighted Average |
| 8.447 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.3 | 100 | 0.0102 | 0.26 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 19.9 | 597 | 0.0031 | 0.50 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 26.2 | 697 | Total | | | |

## Summary for Subcatchment 2S: DA 2

Runoff = 10.97 cfs @ 12.02 hrs, Volume= 0.608 af, Depth> 1.69"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.080 | 98 | EX Imp |
| | 3.280 | 85 | Row crops, straight row, Good, HSG C |
| | 0.950 | 89 | Row crops, straight row, Good, HSG D |
| | 4.310 | 86 | Weighted Average |
| | 4.230 | | 98.14% Pervious Area |
| | 0.080 | | 1.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0090 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 4.1 | 312 | 0.0196 | 1.26 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 10.7 | 412 | Total | | | |

## Summary for Subcatchment 3S: DA 3

Runoff = 37.30 cfs @ 12.42 hrs, Volume= 4.644 af, Depth> 1.75"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.540 | 98 | EX Imp |
| | 18.238 | 85 | Row crops, straight row, Good, HSG C |
| | 13.000 | 89 | Row crops, straight row, Good, HSG D |
| | 31.778 | 87 | Weighted Average |
| | 31.238 | | 98.30% Pervious Area |
| | 0.540 | | 1.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.3 | 100 | 0.0160 | 0.32 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 39.6 | 1,803 | 0.0071 | 0.76 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 44.9 | 1,903 | Total | | | |

## Summary for Subcatchment 4S: DA 4

Runoff = 4.99 cfs @ 12.03 hrs, Volume= 0.283 af, Depth> 1.77"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.110 | 98 | EX Imp |
| | 1.206 | 85 | Row crops, straight row, Good, HSG C |
| | 0.607 | 89 | Row crops, straight row, Good, HSG D |
| | 1.923 | 87 | Weighted Average |
| | 1.813 | | 94.28% Pervious Area |
| | 0.110 | | 5.72% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | 100 | 0.0188 | 0.34 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 6.3 | 319 | 0.0089 | 0.85 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 11.3 | 419 | Total | | | |

## Summary for Subcatchment 5S: DA 5

Runoff = 20.07 cfs @ 12.12 hrs, Volume= 1.497 af, Depth> 1.77"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 3.625 | 85 | Row crops, straight row, Good, HSG C |
| | 0.487 | 89 | Row crops, straight row, Good, HSG D |
| * | 2.350 | 98 | EX Imp |
| | 2.941 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.771 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 10.174 | 87 | Weighted Average |
| | 6.896 | | 67.78% Pervious Area |
| | 3.278 | | 32.22% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 6S: DA 6

Runoff = 24.06 cfs @ 12.13 hrs, Volume= 1.793 af, Depth> 1.69"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.860 | 98 | EX Imp |
| | 6.291 | 85 | Row crops, straight row, Good, HSG C |
| | 0.955 | 89 | Row crops, straight row, Good, HSG D |
| | 3.140 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.499 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 12.745 | 86 | Weighted Average |
| | 9.975 | | 78.27% Pervious Area |
| | 2.770 | | 21.73% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 7S: DA 7

Runoff = 59.45 cfs @ 12.68 hrs, Volume= 9.403 af, Depth> 1.67"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 39.504 | 85 | Row crops, straight row, Good, HSG C |
| | 18.825 | 89 | Row crops, straight row, Good, HSG D |
| * | 1.820 | 98 | EX Imp |
| | 3.089 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.709 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 1.150 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.527 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 67.624 | 86 | Weighted Average |
| | 64.604 | | 95.53% Pervious Area |
| | 3.020 | | 4.47% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0360 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 58.6 | 3,034 | 0.0092 | 0.86 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 62.4 | 3,134 | Total | | | |

## Summary for Subcatchment 9S: DA 9

Runoff = 25.44 cfs @ 12.13 hrs, Volume= 1.896 af, Depth> 1.61"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.650 | 98 | EX Imp |
| | 2.451 | 78 | Row crops, straight row, Good, HSG B |
| | 8.970 | 85 | Row crops, straight row, Good, HSG C |
| | 1.651 | 89 | Row crops, straight row, Good, HSG D |
| | 0.000 | 58 | Meadow, non-grazed, HSG B |
| | 0.025 | 71 | Meadow, non-grazed, HSG C |
| | 0.000 | 78 | Meadow, non-grazed, HSG D |
| * | 0.355 | 98 | Prop Imp |
| | 14.102 | 85 | Weighted Average |
| | 13.097 | | 92.87% Pervious Area |
| | 1.005 | | 7.13% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.9 | 100 | 0.0081 | 0.24 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 13.1 | 738 | 0.0109 | 0.94 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 20.0 | 838 | Total | | | |

## Summary for Subcatchment 10S: DA 10

Runoff = 9.08 cfs @ 12.08 hrs, Volume= 0.595 af, Depth> 1.69"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| Area (ac) | CN | Description |
|---|---|---|
| 2.804 | 85 | Row crops, straight row, Good, HSG C |
| 1.423 | 89 | Row crops, straight row, Good, HSG D |
| 0.000 | 71 | Meadow, non-grazed, HSG C |
| 0.000 | 78 | Meadow, non-grazed, HSG D |
| 4.227 | 86 | Weighted Average |
| 4.227 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.5 | 100 | 0.0067 | 0.22 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 8.2 | 429 | 0.0095 | 0.88 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 15.7 | 529 | Total | | | |

## Summary for Subcatchment 11S: DA 11

Runoff = 3.16 cfs @ 12.11 hrs, Volume= 0.226 af, Depth> 1.77"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.290 | 98 | EX Imp |
| | 1.233 | 85 | Row crops, straight row, Good, HSG C |
| | 0.015 | 89 | Row crops, straight row, Good, HSG D |
| | 1.538 | 87 | Weighted Average |
| | 1.248 | | 81.14% Pervious Area |
| | 0.290 | | 18.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0361 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 14.9 | 596 | 0.0055 | 0.67 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 18.7 | 696 | Total | | | |

## Summary for Subcatchment 12S: DA 8 - Offsite

Runoff = 86.22 cfs @ 13.25 hrs, Volume= 20.498 af, Depth> 1.72"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.970 | 98 | Ex Imp |
| | 3.969 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.340 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 2.443 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.552 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 0.000 | 78 | Row crops, straight row, Good, HSG B |
| | 71.424 | 85 | Row crops, straight row, Good, HSG C |
| | 58.103 | 89 | Row crops, straight row, Good, HSG D |
| | 142.801 | 87 | Weighted Average |
| | 137.504 | | 96.29% Pervious Area |
| | 5.297 | | 3.71% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 100 | 0.0217 | 0.36 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 103.4 | 3,704 | 0.0044 | 0.60 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 1.3 | 1,685 | 0.0055 | 22.10 | 72,207.12 | **Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding |
| 109.4 | 5,489 | Total | | | |

## Summary for Subcatchment 14S: DA8-Onsite

Runoff = 53.77 cfs @ 12.71 hrs, Volume= 8.822 af, Depth> 1.32"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 14.070 | 89 | Row crops, straight row, Good, HSG D |
| | 26.220 | 85 | Row crops, straight row, Good, HSG C |
| | 5.300 | 78 | Row crops, straight row, Good, HSG B |
| * | 0.600 | 98 | Proposed Impervious |
| | 1.100 | 58 | Meadow, non-grazed, HSG B |
| | 9.880 | 71 | Meadow, non-grazed, HSG C |
| | 23.130 | 78 | Meadow, non-grazed, HSG D |
| | 80.300 | 81 | Weighted Average |
| | 79.700 | | 99.25% Pervious Area |
| | 0.600 | | 0.75% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 35.3 | 300 | 0.0100 | 0.14 | | **Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04" |
| 28.6 | 1,200 | 0.0100 | 0.70 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 63.9 | 1,500 | Total | | | |

## Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 1.69" for 2-Year Bulletin 70 event
Inflow = 13.61 cfs @ 12.20 hrs, Volume= 1.186 af
Outflow = 0.71 cfs @ 14.94 hrs, Volume= 0.342 af, Atten= 95%, Lag= 164.5 min
Primary = 0.71 cfs @ 14.94 hrs, Volume= 0.342 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.81' @ 14.94 hrs Surf.Area= 74,193 sf Storage= 37,429 cf

Plug-Flow detention time= 379.2 min calculated for 0.342 af (29% of inflow)
Center-of-Mass det. time= 249.6 min ( 1,085.8 - 836.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 898.00' | 394,067 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 898.00 | 18,479 | 0 | 0 |
| 899.00 | 87,451 | 52,965 | 52,965 |
| 900.00 | 175,260 | 131,356 | 184,321 |
| 901.00 | 244,232 | 209,746 | 394,067 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 898.79' | **120.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=0.71 cfs @ 14.94 hrs HW=898.81' TW=891.10' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.71 cfs @ 0.33 fps)

## Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 1.69" for 2-Year Bulletin 70 event
Inflow = 10.97 cfs @ 12.02 hrs, Volume= 0.608 af
Outflow = 0.89 cfs @ 12.73 hrs, Volume= 0.484 af, Atten= 92%, Lag= 42.4 min
Primary = 0.89 cfs @ 12.73 hrs, Volume= 0.484 af
Routed to Pond 12P : DA 4 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.55' @ 12.73 hrs Surf.Area= 33,582 sf Storage= 14,028 cf

Plug-Flow detention time= 243.2 min calculated for 0.484 af (80% of inflow)
Center-of-Mass det. time= 160.5 min ( 984.9 - 824.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 897.00' | 178,312 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 897.00 | 17,532 | 0 | 0 |
| 898.00 | 46,772 | 32,152 | 32,152 |
| 899.00 | 72,833 | 59,803 | 91,955 |
| 900.00 | 99,882 | 86,358 | 178,312 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Secondary | 897.75' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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 |
| #2 | Primary | 897.00' | **12.0" Round Culvert** L= 37.0' Ke= 0.500<br>Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.89 cfs @ 12.73 hrs HW=897.55' TW=895.81' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 0.89 cfs @ 2.94 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=897.00' TW=895.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 1.48" for 2-Year Bulletin 70 event
Inflow = 5.44 cfs @ 12.04 hrs, Volume= 0.768 af
Outflow = 1.83 cfs @ 12.31 hrs, Volume= 0.751 af, Atten= 66%, Lag= 16.6 min
Primary = 1.83 cfs @ 12.31 hrs, Volume= 0.751 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 895.85' @ 12.31 hrs Surf.Area= 10,246 sf Storage= 4,744 cf

Plug-Flow detention time= 41.6 min calculated for 0.750 af (98% of inflow)
Center-of-Mass det. time= 30.3 min ( 954.7 - 924.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 895.00' | 194,049 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 895.00 | 931 | 0 | 0 |
| 896.00 | 11,904 | 6,418 | 6,418 |
| 897.00 | 26,038 | 18,971 | 25,389 |
| 898.00 | 49,659 | 37,849 | 63,237 |
| 900.00 | 81,153 | 130,812 | 194,049 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 895.00' | **12.0" Round Culvert** L= 40.0' Ke= 0.500<br>Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 898.00' | **15.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=1.83 cfs @ 12.31 hrs HW=895.85' TW=890.54' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.83 cfs @ 3.48 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 1.10" for 2-Year Bulletin 70 event
Inflow = 59.86 cfs @ 12.68 hrs, Volume= 10.456 af
Outflow = 6.44 cfs @ 15.79 hrs, Volume= 4.659 af, Atten= 89%, Lag= 186.5 min
Primary = 2.94 cfs @ 15.79 hrs, Volume= 2.842 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 3.50 cfs @ 15.79 hrs, Volume= 1.817 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.11' @ 15.79 hrs Surf.Area= 321,111 sf Storage= 273,890 cf

Plug-Flow detention time= 333.0 min calculated for 4.659 af (45% of inflow)
Center-of-Mass det. time= 191.4 min ( 1,081.6 - 890.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 879.00' | 654,217 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 879.00 | 3,000 | 0 | 0 |
| 880.00 | 90,812 | 46,906 | 46,906 |
| 881.00 | 293,662 | 192,237 | 239,143 |
| 882.00 | 536,485 | 415,074 | 654,217 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 879.00' | **12.0" Round Culvert** L= 45.0' Ke= 0.500<br>Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 881.00' | **37.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.94 cfs @ 15.79 hrs HW=881.11' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.94 cfs @ 3.74 fps)

**Secondary OutFlow** Max=3.50 cfs @ 15.79 hrs HW=881.11' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 3.50 cfs @ 0.84 fps)

## Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 1.77" for 2-Year Bulletin 70 event
Inflow = 20.07 cfs @ 12.12 hrs, Volume= 1.497 af
Outflow = 1.41 cfs @ 13.54 hrs, Volume= 0.991 af, Atten= 93%, Lag= 85.1 min
Primary = 1.41 cfs @ 13.54 hrs, Volume= 0.991 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.19' Surf.Area= 53,842 sf Storage= 131,454 cf
Peak Elev= 889.76' @ 13.54 hrs Surf.Area= 79,690 sf Storage= 169,733 cf (38,279 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 202.9 min ( 1,030.6 - 827.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 886.00' | 525,760 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 886.00 | 30,908 | 0 | 0 |
| 887.00 | 40,872 | 35,890 | 35,890 |
| 889.00 | 45,276 | 86,148 | 122,038 |
| 891.00 | 135,445 | 180,721 | 302,759 |
| 892.10 | 270,011 | 223,001 | 525,760 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 889.18' | **15.0" Round Culvert** L= 138.0' Ke= 0.500<br>Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf |
| #2 | Secondary | 892.00' | **73.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=1.41 cfs @ 13.54 hrs HW=889.76' TW=887.95' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 1.41 cfs @ 3.68 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=889.19' TW=886.93' (Dynamic Tailwater)
**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 1.46" for 2-Year Bulletin 70 event
Inflow = 24.54 cfs @ 12.13 hrs, Volume= 2.783 af
Outflow = 4.92 cfs @ 12.74 hrs, Volume= 2.401 af, Atten= 80%, Lag= 36.7 min
Primary = 4.92 cfs @ 12.74 hrs, Volume= 2.401 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 888.02' @ 12.74 hrs Surf.Area= 37,008 sf Storage= 106,446 cf (38,933 cf above start)

Plug-Flow detention time= 508.4 min calculated for 0.851 af (31% of inflow)
Center-of-Mass det. time= 88.9 min ( 991.3 - 902.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 884.00' | 487,275 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 884.00 | 10,000 | 0 | 0 |
| 885.00 | 16,000 | 13,000 | 13,000 |
| 886.00 | 31,740 | 23,870 | 36,870 |
| 889.00 | 39,548 | 106,932 | 143,802 |
| 891.00 | 150,950 | 190,498 | 334,300 |
| 892.00 | 155,000 | 152,975 | 487,275 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 886.93' | **18.0" Round Culvert** L= 63.0' Ke= 0.500<br>Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf |
| #2 | Secondary | 890.00' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=4.92 cfs @ 12.74 hrs HW=888.02' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 4.92 cfs @ 3.56 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=886.93' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 1.69" for 2-Year Bulletin 70 event
Inflow = 9.08 cfs @ 12.08 hrs, Volume= 0.595 af
Outflow = 0.41 cfs @ 14.16 hrs, Volume= 0.203 af, Atten= 95%, Lag= 124.7 min
Primary = 0.41 cfs @ 14.16 hrs, Volume= 0.203 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.42' @ 14.16 hrs Surf.Area= 54,352 sf Storage= 17,721 cf

Plug-Flow detention time= 345.4 min calculated for 0.203 af (34% of inflow)
Center-of-Mass det. time= 220.4 min ( 1,048.6 - 828.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 863.00' | 3,373,778 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 863.00 | 29,607 | 0 | 0 |
| 864.00 | 88,227 | 58,917 | 58,917 |
| 895.00 | 125,635 | 3,314,861 | 3,373,778 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 863.40' | **50.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=0.41 cfs @ 14.16 hrs HW=863.42' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.41 cfs @ 0.37 fps)

## Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 1.77" for 2-Year Bulletin 70 event
Inflow = 3.16 cfs @ 12.11 hrs, Volume= 0.226 af
Outflow = 1.76 cfs @ 12.27 hrs, Volume= 0.225 af, Atten= 44%, Lag= 9.7 min
Primary = 1.76 cfs @ 12.27 hrs, Volume= 0.225 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.30' @ 12.28 hrs Surf.Area= 3,490 sf Storage= 1,895 cf

Plug-Flow detention time= 15.2 min calculated for 0.225 af (99% of inflow)
Center-of-Mass det. time= 12.0 min ( 838.8 - 826.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 862.00' | 17,715 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 862.00 | 100 | 0 | 0 |
| 863.00 | 2,048 | 1,074 | 1,074 |
| 864.00 | 6,912 | 4,480 | 5,554 |
| 865.00 | 17,409 | 12,161 | 17,715 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 862.00' | **12.0" Round Culvert** L= 38.0' Ke= 0.500<br>Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 864.00' | **24.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=1.76 cfs @ 12.27 hrs HW=863.30' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.76 cfs @ 2.26 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=862.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 1.48" for 2-Year Bulletin 70 event
Inflow = 39.11 cfs @ 12.42 hrs, Volume= 5.736 af
Outflow = 1.28 cfs @ 24.00 hrs, Volume= 1.053 af, Atten= 97%, Lag= 694.7 min
Primary = 1.28 cfs @ 24.00 hrs, Volume= 1.053 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 891.25' @ 24.00 hrs Surf.Area= 268,996 sf Storage= 441,668 cf (203,998 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 251.6 min ( 1,126.8 - 875.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 887.00' | 1,151,208 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 887.00 | 21,488 | 0 | 0 |
| 890.00 | 113,506 | 202,491 | 202,491 |
| 893.00 | 486,505 | 900,017 | 1,102,508 |
| 893.10 | 487,505 | 48,701 | 1,151,208 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 890.27' | **12.0" Round Culvert** L= 47.0' Ke= 0.500<br>Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 893.00' | **13.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=1.28 cfs @ 24.00 hrs HW=891.25' TW=0.00' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 1.28 cfs @ 2.07 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.31% Impervious, Inflow Depth > 1.20" for 2-Year Bulletin 70 event
Inflow = 131.27 cfs @ 13.00 hrs, Volume= 36.583 af
Primary = 131.27 cfs @ 13.00 hrs, Volume= 36.583 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 4L: Proposed Discharge

Inflow Area = 379.969 ac, 4.47% Impervious, Inflow Depth > 1.22" for 2-Year Bulletin 70 event
Inflow = 134.49 cfs @ 12.99 hrs, Volume= 38.704 af
Primary = 134.49 cfs @ 12.99 hrs, Volume= 38.704 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 8.28% Impervious, Inflow Depth > 1.63" for 2-Year Bulletin 70 event
Inflow = 27.07 cfs @ 12.13 hrs, Volume= 2.121 af
Primary = 27.07 cfs @ 12.13 hrs, Volume= 2.121 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1S: DA 1** Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>2.96"
Flow Length=697' Tc=26.2 min CN=86 Runoff=23.75 cfs 2.082 af

**Subcatchment 2S: DA 2** Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>2.97"
Flow Length=412' Tc=10.7 min CN=86 Runoff=18.90 cfs 1.066 af

**Subcatchment 3S: DA 3** Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>3.04"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=64.42 cfs 8.048 af

**Subcatchment 4S: DA 4** Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>3.06"
Flow Length=419' Tc=11.3 min CN=87 Runoff=8.48 cfs 0.491 af

**Subcatchment 5S: DA 5** Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>3.06"
Tc=20.0 min CN=87 Runoff=34.38 cfs 2.592 af

**Subcatchment 6S: DA 6** Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>2.96"
Tc=20.0 min CN=86 Runoff=41.86 cfs 3.146 af

**Subcatchment 7S: DA 7** Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>2.93"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=104.36 cfs 16.518 af

**Subcatchment 9S: DA 9** Runoff Area=14.102 ac 7.13% Impervious Runoff Depth>2.87"
Flow Length=838' Tc=20.0 min CN=85 Runoff=44.98 cfs 3.370 af

**Subcatchment 10S: DA 10** Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>2.96"
Flow Length=529' Tc=15.7 min CN=86 Runoff=15.74 cfs 1.044 af

**Subcatchment 11S: DA 11** Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>3.06"
Flow Length=696' Tc=18.7 min CN=87 Runoff=5.40 cfs 0.392 af

**Subcatchment 12S: DA 8 - Offsite** Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>2.99"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=149.67 cfs 35.585 af

**Subcatchment 14S: DA8-Onsite** Runoff Area=80.300 ac 0.75% Impervious Runoff Depth>2.48"
Flow Length=1,500' Slope=0.0100 '/' Tc=63.9 min CN=81 Runoff=103.15 cfs 16.591 af

**Pond 1P: DA 1 Storage** Peak Elev=898.89' Storage=43,911 cf Inflow=23.75 cfs 2.082 af
Outflow=9.71 cfs 1.232 af

**Pond 2P: DA 2 Storage** Peak Elev=897.81' Storage=23,723 cf Inflow=18.90 cfs 1.066 af
Primary=1.71 cfs 0.843 af Secondary=1.40 cfs 0.064 af Outflow=3.11 cfs 0.907 af

**Pond 12P: DA 4 Storage** Peak Elev=896.34' Storage=11,331 cf Inflow=9.60 cfs 1.398 af
Primary=2.82 cfs 1.373 af Secondary=0.00 cfs 0.000 af Outflow=2.82 cfs 1.373 af

**Pond 13P: DA 7 Storage** Peak Elev=881.43' Storage=387,065 cf Inflow=105.51 cfs 18.309 af
Primary=3.24 cfs 3.180 af Secondary=26.72 cfs 8.957 af Outflow=29.96 cfs 12.136 af

**Pond 14P: DA 5 Storage** Peak Elev=890.08' Storage=197,532 cf Inflow=34.38 cfs 2.592 af
Primary=2.97 cfs 1.908 af Secondary=0.00 cfs 0.000 af Outflow=2.97 cfs 1.908 af

**Pond 17P: DA 6 Storage** Peak Elev=888.83' Storage=137,197 cf Inflow=43.22 cfs 5.053 af
Primary=9.13 cfs 4.559 af Secondary=0.00 cfs 0.000 af Outflow=9.13 cfs 4.559 af

**Pond 18P: DA 10 Storage** Peak Elev=863.51' Storage=22,709 cf Inflow=15.74 cfs 1.044 af
Outflow=4.53 cfs 0.648 af

**Pond 19P: DA 11 Storage** Peak Elev=863.75' Storage=4,005 cf Inflow=5.40 cfs 0.392 af
Primary=2.40 cfs 0.390 af Secondary=0.00 cfs 0.000 af Outflow=2.40 cfs 0.390 af

**Pond 20P: DA 3 Storage** Peak Elev=891.85' Storage=623,637 cf Inflow=75.61 cfs 10.653 af
Primary=2.02 cfs 1.792 af Secondary=0.00 cfs 0.000 af Outflow=2.02 cfs 1.792 af

**Link 2L: DA 8 >>> Discharge** Inflow=249.07 cfs 69.519 af
Primary=249.07 cfs 69.519 af

**Link 4L: Proposed Discharge** Inflow=255.03 cfs 73.279 af
Primary=255.03 cfs 73.279 af

**Link 15L: DA 9 >>> Discharge** Inflow=47.01 cfs 3.761 af
Primary=47.01 cfs 3.761 af

**Total Runoff Area = 379.969 ac Runoff Volume = 90.924 af Average Runoff Depth = 2.87"**
**95.53% Pervious = 362.979 ac 4.47% Impervious = 16.989 ac**

## Summary for Subcatchment 1S: DA 1

Runoff = 23.75 cfs @ 12.20 hrs, Volume= 2.082 af, Depth> 2.96"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| Area (ac) | CN | Description |
|---|---|---|
| 5.805 | 85 | Row crops, straight row, Good, HSG C |
| 2.642 | 89 | Row crops, straight row, Good, HSG D |
| 8.447 | 86 | Weighted Average |
| 8.447 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.3 | 100 | 0.0102 | 0.26 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 19.9 | 597 | 0.0031 | 0.50 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 26.2 | 697 | Total | | | |

## Summary for Subcatchment 2S: DA 2

Runoff = 18.90 cfs @ 12.02 hrs, Volume= 1.066 af, Depth> 2.97"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.080 | 98 | EX Imp |
| | 3.280 | 85 | Row crops, straight row, Good, HSG C |
| | 0.950 | 89 | Row crops, straight row, Good, HSG D |
| | 4.310 | 86 | Weighted Average |
| | 4.230 | | 98.14% Pervious Area |
| | 0.080 | | 1.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0090 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 4.1 | 312 | 0.0196 | 1.26 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 10.7 | 412 | Total | | | |

## Summary for Subcatchment 3S: DA 3

Runoff = 64.42 cfs @ 12.42 hrs, Volume= 8.048 af, Depth> 3.04"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.540 | 98 | EX Imp |
| | 18.238 | 85 | Row crops, straight row, Good, HSG C |
| | 13.000 | 89 | Row crops, straight row, Good, HSG D |
| | 31.778 | 87 | Weighted Average |
| | 31.238 | | 98.30% Pervious Area |
| | 0.540 | | 1.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.3 | 100 | 0.0160 | 0.32 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 39.6 | 1,803 | 0.0071 | 0.76 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 44.9 | 1,903 | Total | | | |

## Summary for Subcatchment 4S: DA 4

Runoff = 8.48 cfs @ 12.03 hrs, Volume= 0.491 af, Depth> 3.06"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.110 | 98 | EX Imp |
| | 1.206 | 85 | Row crops, straight row, Good, HSG C |
| | 0.607 | 89 | Row crops, straight row, Good, HSG D |
| | 1.923 | 87 | Weighted Average |
| | 1.813 | | 94.28% Pervious Area |
| | 0.110 | | 5.72% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | 100 | 0.0188 | 0.34 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 6.3 | 319 | 0.0089 | 0.85 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 11.3 | 419 | Total | | | |

## Summary for Subcatchment 5S: DA 5

Runoff = 34.38 cfs @ 12.12 hrs, Volume= 2.592 af, Depth> 3.06"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 3.625 | 85 | Row crops, straight row, Good, HSG C |
| | 0.487 | 89 | Row crops, straight row, Good, HSG D |
| * | 2.350 | 98 | EX Imp |
| | 2.941 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.771 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 10.174 | 87 | Weighted Average |
| | 6.896 | | 67.78% Pervious Area |
| | 3.278 | | 32.22% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 6S: DA 6

Runoff = 41.86 cfs @ 12.12 hrs, Volume= 3.146 af, Depth> 2.96"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.860 | 98 | EX Imp |
| | 6.291 | 85 | Row crops, straight row, Good, HSG C |
| | 0.955 | 89 | Row crops, straight row, Good, HSG D |
| | 3.140 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.499 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 12.745 | 86 | Weighted Average |
| | 9.975 | | 78.27% Pervious Area |
| | 2.770 | | 21.73% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 7S: DA 7

Runoff = 104.36 cfs @ 12.68 hrs, Volume= 16.518 af, Depth> 2.93"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 39.504 | 85 | Row crops, straight row, Good, HSG C |
| | 18.825 | 89 | Row crops, straight row, Good, HSG D |
| * | 1.820 | 98 | EX Imp |
| | 3.089 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.709 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 1.150 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.527 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 67.624 | 86 | Weighted Average |
| | 64.604 | | 95.53% Pervious Area |
| | 3.020 | | 4.47% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0360 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 58.6 | 3,034 | 0.0092 | 0.86 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 62.4 | 3,134 | Total | | | |

## Summary for Subcatchment 9S: DA 9

Runoff = 44.98 cfs @ 12.12 hrs, Volume= 3.370 af, Depth> 2.87"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.650 | 98 | EX Imp |
| | 2.451 | 78 | Row crops, straight row, Good, HSG B |
| | 8.970 | 85 | Row crops, straight row, Good, HSG C |
| | 1.651 | 89 | Row crops, straight row, Good, HSG D |
| | 0.000 | 58 | Meadow, non-grazed, HSG B |
| | 0.025 | 71 | Meadow, non-grazed, HSG C |
| | 0.000 | 78 | Meadow, non-grazed, HSG D |
| * | 0.355 | 98 | Prop Imp |
| | 14.102 | 85 | Weighted Average |
| | 13.097 | | 92.87% Pervious Area |
| | 1.005 | | 7.13% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.9 | 100 | 0.0081 | 0.24 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 13.1 | 738 | 0.0109 | 0.94 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 20.0 | 838 | Total | | | |

## Summary for Subcatchment 10S: DA 10

Runoff = 15.74 cfs @ 12.07 hrs, Volume= 1.044 af, Depth> 2.96"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| Area (ac) | CN | Description |
|---|---|---|
| 2.804 | 85 | Row crops, straight row, Good, HSG C |
| 1.423 | 89 | Row crops, straight row, Good, HSG D |
| 0.000 | 71 | Meadow, non-grazed, HSG C |
| 0.000 | 78 | Meadow, non-grazed, HSG D |
| 4.227 | 86 | Weighted Average |
| 4.227 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.5 | 100 | 0.0067 | 0.22 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 8.2 | 429 | 0.0095 | 0.88 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 15.7 | 529 | Total | | | |

## Summary for Subcatchment 11S: DA 11

Runoff = 5.40 cfs @ 12.11 hrs, Volume= 0.392 af, Depth> 3.06"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.290 | 98 | EX Imp |
| | 1.233 | 85 | Row crops, straight row, Good, HSG C |
| | 0.015 | 89 | Row crops, straight row, Good, HSG D |
| | 1.538 | 87 | Weighted Average |
| | 1.248 | | 81.14% Pervious Area |
| | 0.290 | | 18.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0361 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 14.9 | 596 | 0.0055 | 0.67 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 18.7 | 696 | Total | | | |

## Summary for Subcatchment 12S: DA 8 - Offsite

Runoff = 149.67 cfs @ 13.25 hrs, Volume= 35.585 af, Depth> 2.99"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.970 | 98 | Ex Imp |
| | 3.969 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.340 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 2.443 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.552 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 0.000 | 78 | Row crops, straight row, Good, HSG B |
| | 71.424 | 85 | Row crops, straight row, Good, HSG C |
| | 58.103 | 89 | Row crops, straight row, Good, HSG D |
| | 142.801 | 87 | Weighted Average |
| | 137.504 | | 96.29% Pervious Area |
| | 5.297 | | 3.71% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 100 | 0.0217 | 0.36 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 103.4 | 3,704 | 0.0044 | 0.60 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 1.3 | 1,685 | 0.0055 | 22.10 | 72,207.12 | **Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding |
| 109.4 | 5,489 | Total | | | |

## Summary for Subcatchment 14S: DA8-Onsite

Runoff = 103.15 cfs @ 12.70 hrs, Volume= 16.591 af, Depth> 2.48"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 14.070 | 89 | Row crops, straight row, Good, HSG D |
| | 26.220 | 85 | Row crops, straight row, Good, HSG C |
| | 5.300 | 78 | Row crops, straight row, Good, HSG B |
| * | 0.600 | 98 | Proposed Impervious |
| | 1.100 | 58 | Meadow, non-grazed, HSG B |
| | 9.880 | 71 | Meadow, non-grazed, HSG C |
| | 23.130 | 78 | Meadow, non-grazed, HSG D |
| | 80.300 | 81 | Weighted Average |
| | 79.700 | | 99.25% Pervious Area |
| | 0.600 | | 0.75% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 35.3 | 300 | 0.0100 | 0.14 | | **Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04" |
| 28.6 | 1,200 | 0.0100 | 0.70 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 63.9 | 1,500 | Total | | | |

## Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 2.96" for 10-Year Bulletin 70 event
Inflow = 23.75 cfs @ 12.20 hrs, Volume= 2.082 af
Outflow = 9.71 cfs @ 12.53 hrs, Volume= 1.232 af, Atten= 59%, Lag= 19.7 min
Primary = 9.71 cfs @ 12.53 hrs, Volume= 1.232 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.89' @ 12.53 hrs Surf.Area= 79,992 sf Storage= 43,911 cf

Plug-Flow detention time= 198.7 min calculated for 1.232 af (59% of inflow)
Center-of-Mass det. time= 93.5 min ( 914.0 - 820.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 898.00' | 394,067 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 898.00 | 18,479 | 0 | 0 |
| 899.00 | 87,451 | 52,965 | 52,965 |
| 900.00 | 175,260 | 131,356 | 184,321 |
| 901.00 | 244,232 | 209,746 | 394,067 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 898.79' | **120.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=9.71 cfs @ 12.53 hrs HW=898.89' TW=891.03' (Dynamic Tailwater)
**1=Broad-Crested Rectangular Weir** (Weir Controls 9.71 cfs @ 0.79 fps)

## Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 2.97" for 10-Year Bulletin 70 event
Inflow = 18.90 cfs @ 12.02 hrs, Volume= 1.066 af
Outflow = 3.11 cfs @ 12.34 hrs, Volume= 0.907 af, Atten= 84%, Lag= 19.2 min
Primary = 1.71 cfs @ 12.34 hrs, Volume= 0.843 af
Routed to Pond 12P : DA 4 Storage
Secondary = 1.40 cfs @ 12.34 hrs, Volume= 0.064 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.81' @ 12.34 hrs Surf.Area= 41,166 sf Storage= 23,723 cf

Plug-Flow detention time= 211.0 min calculated for 0.907 af (85% of inflow)
Center-of-Mass det. time= 143.9 min ( 952.4 - 808.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 897.00' | 178,312 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 897.00 | 17,532 | 0 | 0 |
| 898.00 | 46,772 | 32,152 | 32,152 |
| 899.00 | 72,833 | 59,803 | 91,955 |
| 900.00 | 99,882 | 86,358 | 178,312 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Secondary | 897.75' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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 |
| #2 | Primary | 897.00' | **12.0" Round Culvert** L= 37.0' Ke= 0.500<br>Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.71 cfs @ 12.34 hrs HW=897.81' TW=896.26' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 1.71 cfs @ 3.43 fps)

**Secondary OutFlow** Max=1.40 cfs @ 12.34 hrs HW=897.81' TW=896.26' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.40 cfs @ 0.60 fps)

## Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 2.69" for 10-Year Bulletin 70 event
Inflow = 9.60 cfs @ 12.04 hrs, Volume= 1.398 af
Outflow = 2.82 cfs @ 13.37 hrs, Volume= 1.373 af, Atten= 71%, Lag= 80.1 min
Primary = 2.82 cfs @ 13.37 hrs, Volume= 1.373 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 896.34' @ 12.82 hrs Surf.Area= 16,752 sf Storage= 11,331 cf

Plug-Flow detention time= 48.6 min calculated for 1.372 af (98% of inflow)
Center-of-Mass det. time= 39.2 min ( 940.0 - 900.9 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 895.00' | 194,049 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 895.00 | 931 | 0 | 0 |
| 896.00 | 11,904 | 6,418 | 6,418 |
| 897.00 | 26,038 | 18,971 | 25,389 |
| 898.00 | 49,659 | 37,849 | 63,237 |
| 900.00 | 81,153 | 130,812 | 194,049 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 895.00' | **12.0" Round Culvert** L= 40.0' Ke= 0.500<br>Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 898.00' | **15.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.82 cfs @ 13.37 hrs HW=896.28' TW=891.47' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 2.82 cfs @ 3.64 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 1.93" for 10-Year Bulletin 70 event
Inflow = 105.51 cfs @ 12.68 hrs, Volume= 18.309 af
Outflow = 29.96 cfs @ 13.75 hrs, Volume= 12.136 af, Atten= 72%, Lag= 64.6 min
Primary = 3.24 cfs @ 13.75 hrs, Volume= 3.180 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 26.72 cfs @ 13.75 hrs, Volume= 8.957 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.43' @ 13.75 hrs Surf.Area= 397,587 sf Storage= 387,065 cf

Plug-Flow detention time= 235.8 min calculated for 12.136 af (66% of inflow)
Center-of-Mass det. time= 122.4 min ( 996.3 - 873.9 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 879.00' | 654,217 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 879.00 | 3,000 | 0 | 0 |
| 880.00 | 90,812 | 46,906 | 46,906 |
| 881.00 | 293,662 | 192,237 | 239,143 |
| 882.00 | 536,485 | 415,074 | 654,217 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 879.00' | **12.0" Round Culvert** L= 45.0' Ke= 0.500<br>Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 881.00' | **37.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=3.24 cfs @ 13.75 hrs HW=881.43' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.24 cfs @ 4.13 fps)

**Secondary OutFlow** Max=26.72 cfs @ 13.75 hrs HW=881.43' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 26.72 cfs @ 1.69 fps)

## Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 3.06" for 10-Year Bulletin 70 event
Inflow = 34.38 cfs @ 12.12 hrs, Volume= 2.592 af
Outflow = 2.97 cfs @ 13.11 hrs, Volume= 1.908 af, Atten= 91%, Lag= 59.4 min
Primary = 2.97 cfs @ 13.11 hrs, Volume= 1.908 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.19' Surf.Area= 53,842 sf Storage= 131,454 cf
Peak Elev= 890.08' @ 13.11 hrs Surf.Area= 94,112 sf Storage= 197,532 cf (66,078 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 197.9 min ( 1,010.4 - 812.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 886.00' | 525,760 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 886.00 | 30,908 | 0 | 0 |
| 887.00 | 40,872 | 35,890 | 35,890 |
| 889.00 | 45,276 | 86,148 | 122,038 |
| 891.00 | 135,445 | 180,721 | 302,759 |
| 892.10 | 270,011 | 223,001 | 525,760 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 889.18' | **15.0" Round Culvert** L= 138.0' Ke= 0.500<br>Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf |
| #2 | Secondary | 892.00' | **73.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.97 cfs @ 13.11 hrs HW=890.08' TW=888.78' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 2.97 cfs @ 4.37 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=889.19' TW=886.93' (Dynamic Tailwater)
**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 2.65" for 10-Year Bulletin 70 event
Inflow = 43.22 cfs @ 12.13 hrs, Volume= 5.053 af
Outflow = 9.13 cfs @ 12.72 hrs, Volume= 4.559 af, Atten= 79%, Lag= 35.4 min
Primary = 9.13 cfs @ 12.72 hrs, Volume= 4.559 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 888.83' @ 12.72 hrs Surf.Area= 39,111 sf Storage= 137,197 cf (69,683 cf above start)

Plug-Flow detention time= 329.3 min calculated for 3.007 af (60% of inflow)
Center-of-Mass det. time= 84.1 min ( 973.3 - 889.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 884.00' | 487,275 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 884.00 | 10,000 | 0 | 0 |
| 885.00 | 16,000 | 13,000 | 13,000 |
| 886.00 | 31,740 | 23,870 | 36,870 |
| 889.00 | 39,548 | 106,932 | 143,802 |
| 891.00 | 150,950 | 190,498 | 334,300 |
| 892.00 | 155,000 | 152,975 | 487,275 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 886.93' | **18.0" Round Culvert** L= 63.0' Ke= 0.500<br>Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf |
| #2 | Secondary | 890.00' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=9.13 cfs @ 12.72 hrs HW=888.83' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 9.13 cfs @ 5.17 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=886.93' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 2.96" for 10-Year Bulletin 70 event
Inflow = 15.74 cfs @ 12.07 hrs, Volume= 1.044 af
Outflow = 4.53 cfs @ 12.35 hrs, Volume= 0.648 af, Atten= 71%, Lag= 16.6 min
Primary = 4.53 cfs @ 12.35 hrs, Volume= 0.648 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.51' @ 12.35 hrs Surf.Area= 59,490 sf Storage= 22,709 cf

Plug-Flow detention time= 197.5 min calculated for 0.648 af (62% of inflow)
Center-of-Mass det. time= 93.4 min ( 905.7 - 812.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 863.00' | 3,373,778 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 863.00 | 29,607 | 0 | 0 |
| 864.00 | 88,227 | 58,917 | 58,917 |
| 895.00 | 125,635 | 3,314,861 | 3,373,778 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 863.40' | **50.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=4.53 cfs @ 12.35 hrs HW=863.51' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 4.53 cfs @ 0.82 fps)

## Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 3.06" for 10-Year Bulletin 70 event
Inflow = 5.40 cfs @ 12.11 hrs, Volume= 0.392 af
Outflow = 2.40 cfs @ 12.33 hrs, Volume= 0.390 af, Atten= 56%, Lag= 13.1 min
Primary = 2.40 cfs @ 12.33 hrs, Volume= 0.390 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.75' @ 12.33 hrs Surf.Area= 5,719 sf Storage= 4,005 cf

Plug-Flow detention time= 18.4 min calculated for 0.390 af (100% of inflow)
Center-of-Mass det. time= 15.7 min ( 827.1 - 811.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 862.00' | 17,715 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 862.00 | 100 | 0 | 0 |
| 863.00 | 2,048 | 1,074 | 1,074 |
| 864.00 | 6,912 | 4,480 | 5,554 |
| 865.00 | 17,409 | 12,161 | 17,715 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 862.00' | **12.0" Round Culvert** L= 38.0' Ke= 0.500<br>Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 864.00' | **24.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.40 cfs @ 12.33 hrs HW=863.75' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.40 cfs @ 3.05 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=862.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 2.75" for 10-Year Bulletin 70 event
Inflow = 75.61 cfs @ 12.44 hrs, Volume= 10.653 af
Outflow = 2.02 cfs @ 24.00 hrs, Volume= 1.792 af, Atten= 97%, Lag= 693.6 min
Primary = 2.02 cfs @ 24.00 hrs, Volume= 1.792 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 891.85' @ 24.00 hrs Surf.Area= 342,941 sf Storage= 623,637 cf (385,968 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 252.6 min ( 1,107.9 - 855.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 887.00' | 1,151,208 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 887.00 | 21,488 | 0 | 0 |
| 890.00 | 113,506 | 202,491 | 202,491 |
| 893.00 | 486,505 | 900,017 | 1,102,508 |
| 893.10 | 487,505 | 48,701 | 1,151,208 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 890.27' | **12.0" Round Culvert** L= 47.0' Ke= 0.500<br>Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 893.00' | **13.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.02 cfs @ 24.00 hrs HW=891.85' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.02 cfs @ 2.57 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.31% Impervious, Inflow Depth > 2.29" for 10-Year Bulletin 70 event
Inflow = 249.07 cfs @ 13.01 hrs, Volume= 69.519 af
Primary = 249.07 cfs @ 13.01 hrs, Volume= 69.519 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 4L: Proposed Discharge

Inflow Area = 379.969 ac, 4.47% Impervious, Inflow Depth > 2.31" for 10-Year Bulletin 70 event
Inflow = 255.03 cfs @ 13.00 hrs, Volume= 73.279 af
Primary = 255.03 cfs @ 13.00 hrs, Volume= 73.279 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 8.28% Impervious, Inflow Depth > 2.89" for 10-Year Bulletin 70 event
Inflow = 47.01 cfs @ 12.12 hrs, Volume= 3.761 af
Primary = 47.01 cfs @ 12.12 hrs, Volume= 3.761 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1S: DA 1** Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>3.92"
Flow Length=697' Tc=26.2 min CN=86 Runoff=31.25 cfs 2.761 af

**Subcatchment 2S: DA 2** Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>3.94"
Flow Length=412' Tc=10.7 min CN=86 Runoff=24.74 cfs 1.414 af

**Subcatchment 3S: DA 3** Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>4.01"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=84.41 cfs 10.618 af

**Subcatchment 4S: DA 4** Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>4.04"
Flow Length=419' Tc=11.3 min CN=87 Runoff=11.03 cfs 0.647 af

**Subcatchment 5S: DA 5** Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>4.03"
Tc=20.0 min CN=87 Runoff=44.94 cfs 3.419 af

**Subcatchment 6S: DA 6** Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>3.93"
Tc=20.0 min CN=86 Runoff=55.03 cfs 4.172 af

**Subcatchment 7S: DA 7** Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>3.89"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=137.80 cfs 21.917 af

**Subcatchment 9S: DA 9** Runoff Area=14.102 ac 7.13% Impervious Runoff Depth>3.82"
Flow Length=838' Tc=20.0 min CN=85 Runoff=59.51 cfs 4.495 af

**Subcatchment 10S: DA 10** Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>3.93"
Flow Length=529' Tc=15.7 min CN=86 Runoff=20.66 cfs 1.385 af

**Subcatchment 11S: DA 11** Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>4.03"
Flow Length=696' Tc=18.7 min CN=87 Runoff=7.04 cfs 0.517 af

**Subcatchment 12S: DA 8 - Offsite** Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>3.95"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=196.60 cfs 46.985 af

**Subcatchment 14S: DA8-Onsite** Runoff Area=80.300 ac 0.75% Impervious Runoff Depth>3.39"
Flow Length=1,500' Slope=0.0100 '/' Tc=63.9 min CN=81 Runoff=140.99 cfs 22.652 af

**Pond 1P: DA 1 Storage** Peak Elev=898.96' Storage=49,133 cf Inflow=31.25 cfs 2.761 af
Outflow=20.10 cfs 1.908 af

**Pond 2P: DA 2 Storage** Peak Elev=897.92' Storage=28,310 cf Inflow=24.74 cfs 1.414 af
Primary=2.05 cfs 0.961 af Secondary=6.71 cfs 0.275 af Outflow=8.77 cfs 1.236 af

**Pond 12P: DA 4 Storage** Peak Elev=896.91' Storage=23,066 cf Inflow=15.31 cfs 1.883 af
Primary=3.32 cfs 1.854 af Secondary=0.00 cfs 0.000 af Outflow=3.32 cfs 1.854 af

**Pond 13P: DA 7 Storage** Peak Elev=881.62' Storage=468,012 cf Inflow=139.37 cfs 24.181 af
Primary=3.41 cfs 3.401 af Secondary=48.79 cfs 14.393 af Outflow=52.20 cfs 17.794 af

**Pond 14P: DA 5 Storage** Peak Elev=890.31' Storage=220,166 cf Inflow=44.94 cfs 3.419 af
Primary=3.88 cfs 2.603 af Secondary=0.00 cfs 0.000 af Outflow=3.88 cfs 2.603 af

**Pond 17P: DA 6 Storage** Peak Elev=889.36' Storage=161,733 cf Inflow=57.12 cfs 6.775 af
Primary=11.03 cfs 6.203 af Secondary=0.00 cfs 0.000 af Outflow=11.03 cfs 6.203 af

**Pond 18P: DA 10 Storage** Peak Elev=863.58' Storage=27,026 cf Inflow=20.66 cfs 1.385 af
Outflow=9.50 cfs 0.986 af

**Pond 19P: DA 11 Storage** Peak Elev=864.02' Storage=5,710 cf Inflow=7.04 cfs 0.517 af
Primary=2.75 cfs 0.513 af Secondary=0.20 cfs 0.002 af Outflow=2.94 cfs 0.515 af

**Pond 20P: DA 3 Storage** Peak Elev=892.23' Storage=765,397 cf Inflow=107.50 cfs 14.379 af
Primary=2.51 cfs 2.264 af Secondary=0.00 cfs 0.000 af Outflow=2.51 cfs 2.264 af

**Link 2L: DA 8 >>> Discharge** Inflow=349.82 cfs 94.619 af
Primary=349.82 cfs 94.619 af

**Link 4L: Proposed Discharge** Inflow=357.46 cfs 99.629 af
Primary=357.46 cfs 99.629 af

**Link 15L: DA 9 >>> Discharge** Inflow=61.86 cfs 5.010 af
Primary=61.86 cfs 5.010 af

**Total Runoff Area = 379.969 ac Runoff Volume = 120.981 af Average Runoff Depth = 3.82"**
**95.53% Pervious = 362.979 ac 4.47% Impervious = 16.989 ac**

## Summary for Subcatchment 1S: DA 1

Runoff = 31.25 cfs @ 12.20 hrs, Volume= 2.761 af, Depth> 3.92"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| Area (ac) | CN | Description |
|---|---|---|
| 5.805 | 85 | Row crops, straight row, Good, HSG C |
| 2.642 | 89 | Row crops, straight row, Good, HSG D |
| 8.447 | 86 | Weighted Average |
| 8.447 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.3 | 100 | 0.0102 | 0.26 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 19.9 | 597 | 0.0031 | 0.50 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 26.2 | 697 | Total | | | |

## Summary for Subcatchment 2S: DA 2

Runoff = 24.74 cfs @ 12.02 hrs, Volume= 1.414 af, Depth> 3.94"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.080 | 98 | EX Imp |
| | 3.280 | 85 | Row crops, straight row, Good, HSG C |
| | 0.950 | 89 | Row crops, straight row, Good, HSG D |
| | 4.310 | 86 | Weighted Average |
| | 4.230 | | 98.14% Pervious Area |
| | 0.080 | | 1.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0090 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 4.1 | 312 | 0.0196 | 1.26 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 10.7 | 412 | Total | | | |

## Summary for Subcatchment 3S: DA 3

Runoff = 84.41 cfs @ 12.42 hrs, Volume= 10.618 af, Depth> 4.01"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.540 | 98 | EX Imp |
| | 18.238 | 85 | Row crops, straight row, Good, HSG C |
| | 13.000 | 89 | Row crops, straight row, Good, HSG D |
| | 31.778 | 87 | Weighted Average |
| | 31.238 | | 98.30% Pervious Area |
| | 0.540 | | 1.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.3 | 100 | 0.0160 | 0.32 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 39.6 | 1,803 | 0.0071 | 0.76 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 44.9 | 1,903 | Total | | | |

## Summary for Subcatchment 4S: DA 4

Runoff = 11.03 cfs @ 12.03 hrs, Volume= 0.647 af, Depth> 4.04"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.110 | 98 | EX Imp |
| | 1.206 | 85 | Row crops, straight row, Good, HSG C |
| | 0.607 | 89 | Row crops, straight row, Good, HSG D |
| | 1.923 | 87 | Weighted Average |
| | 1.813 | | 94.28% Pervious Area |
| | 0.110 | | 5.72% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | 100 | 0.0188 | 0.34 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 6.3 | 319 | 0.0089 | 0.85 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 11.3 | 419 | Total | | | |

## Summary for Subcatchment 5S: DA 5

Runoff = 44.94 cfs @ 12.11 hrs, Volume= 3.419 af, Depth> 4.03"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 3.625 | 85 | Row crops, straight row, Good, HSG C |
| | 0.487 | 89 | Row crops, straight row, Good, HSG D |
| * | 2.350 | 98 | EX Imp |
| | 2.941 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.771 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 10.174 | 87 | Weighted Average |
| | 6.896 | | 67.78% Pervious Area |
| | 3.278 | | 32.22% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 6S: DA 6

Runoff = 55.03 cfs @ 12.12 hrs, Volume= 4.172 af, Depth> 3.93"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.860 | 98 | EX Imp |
| | 6.291 | 85 | Row crops, straight row, Good, HSG C |
| | 0.955 | 89 | Row crops, straight row, Good, HSG D |
| | 3.140 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.499 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 12.745 | 86 | Weighted Average |
| | 9.975 | | 78.27% Pervious Area |
| | 2.770 | | 21.73% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 7S: DA 7

Runoff = 137.80 cfs @ 12.62 hrs, Volume= 21.917 af, Depth> 3.89"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 39.504 | 85 | Row crops, straight row, Good, HSG C |
| | 18.825 | 89 | Row crops, straight row, Good, HSG D |
| * | 1.820 | 98 | EX Imp |
| | 3.089 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.709 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 1.150 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.527 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 67.624 | 86 | Weighted Average |
| | 64.604 | | 95.53% Pervious Area |
| | 3.020 | | 4.47% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0360 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 58.6 | 3,034 | 0.0092 | 0.86 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 62.4 | 3,134 | Total | | | |

## Summary for Subcatchment 9S: DA 9

Runoff = 59.51 cfs @ 12.12 hrs, Volume= 4.495 af, Depth> 3.82"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.650 | 98 | EX Imp |
| | 2.451 | 78 | Row crops, straight row, Good, HSG B |
| | 8.970 | 85 | Row crops, straight row, Good, HSG C |
| | 1.651 | 89 | Row crops, straight row, Good, HSG D |
| | 0.000 | 58 | Meadow, non-grazed, HSG B |
| | 0.025 | 71 | Meadow, non-grazed, HSG C |
| | 0.000 | 78 | Meadow, non-grazed, HSG D |
| * | 0.355 | 98 | Prop Imp |
| | 14.102 | 85 | Weighted Average |
| | 13.097 | | 92.87% Pervious Area |
| | 1.005 | | 7.13% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.9 | 100 | 0.0081 | 0.24 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 13.1 | 738 | 0.0109 | 0.94 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 20.0 | 838 | Total | | | |

## Summary for Subcatchment 10S: DA 10

Runoff = 20.66 cfs @ 12.07 hrs, Volume= 1.385 af, Depth> 3.93"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| Area (ac) | CN | Description |
|---|---|---|
| 2.804 | 85 | Row crops, straight row, Good, HSG C |
| 1.423 | 89 | Row crops, straight row, Good, HSG D |
| 0.000 | 71 | Meadow, non-grazed, HSG C |
| 0.000 | 78 | Meadow, non-grazed, HSG D |
| 4.227 | 86 | Weighted Average |
| 4.227 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.5 | 100 | 0.0067 | 0.22 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 8.2 | 429 | 0.0095 | 0.88 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 15.7 | 529 | Total | | | |

## Summary for Subcatchment 11S: DA 11

Runoff = 7.04 cfs @ 12.11 hrs, Volume= 0.517 af, Depth> 4.03"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.290 | 98 | EX Imp |
| | 1.233 | 85 | Row crops, straight row, Good, HSG C |
| | 0.015 | 89 | Row crops, straight row, Good, HSG D |
| | 1.538 | 87 | Weighted Average |
| | 1.248 | | 81.14% Pervious Area |
| | 0.290 | | 18.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0361 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 14.9 | 596 | 0.0055 | 0.67 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 18.7 | 696 | Total | | | |

## Summary for Subcatchment 12S: DA 8 - Offsite

Runoff = 196.60 cfs @ 13.25 hrs, Volume= 46.985 af, Depth> 3.95"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.970 | 98 | Ex Imp |
| | 3.969 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.340 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 2.443 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.552 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 0.000 | 78 | Row crops, straight row, Good, HSG B |
| | 71.424 | 85 | Row crops, straight row, Good, HSG C |
| | 58.103 | 89 | Row crops, straight row, Good, HSG D |
| | 142.801 | 87 | Weighted Average |
| | 137.504 | | 96.29% Pervious Area |
| | 5.297 | | 3.71% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 100 | 0.0217 | 0.36 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 103.4 | 3,704 | 0.0044 | 0.60 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 1.3 | 1,685 | 0.0055 | 22.10 | 72,207.12 | **Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding |
| 109.4 | 5,489 | Total | | | |

## Summary for Subcatchment 14S: DA8-Onsite

Runoff = 140.99 cfs @ 12.70 hrs, Volume= 22.652 af, Depth> 3.39"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 14.070 | 89 | Row crops, straight row, Good, HSG D |
| | 26.220 | 85 | Row crops, straight row, Good, HSG C |
| | 5.300 | 78 | Row crops, straight row, Good, HSG B |
| * | 0.600 | 98 | Proposed Impervious |
| | 1.100 | 58 | Meadow, non-grazed, HSG B |
| | 9.880 | 71 | Meadow, non-grazed, HSG C |
| | 23.130 | 78 | Meadow, non-grazed, HSG D |
| | 80.300 | 81 | Weighted Average |
| | 79.700 | | 99.25% Pervious Area |
| | 0.600 | | 0.75% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 35.3 | 300 | 0.0100 | 0.14 | | **Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04" |
| 28.6 | 1,200 | 0.0100 | 0.70 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 63.9 | 1,500 | Total | | | |

## Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 3.92" for 25-Year Bulletin 70 event
Inflow = 31.25 cfs @ 12.20 hrs, Volume= 2.761 af
Outflow = 20.10 cfs @ 12.39 hrs, Volume= 1.908 af, Atten= 36%, Lag= 11.7 min
Primary = 20.10 cfs @ 12.39 hrs, Volume= 1.908 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.96' @ 12.39 hrs Surf.Area= 84,374 sf Storage= 49,133 cf

Plug-Flow detention time= 164.7 min calculated for 1.908 af (69% of inflow)
Center-of-Mass det. time= 69.7 min ( 882.4 - 812.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 898.00' | 394,067 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 898.00 | 18,479 | 0 | 0 |
| 899.00 | 87,451 | 52,965 | 52,965 |
| 900.00 | 175,260 | 131,356 | 184,321 |
| 901.00 | 244,232 | 209,746 | 394,067 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 898.79' | **120.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=20.10 cfs @ 12.39 hrs HW=898.96' TW=891.10' (Dynamic Tailwater)
**1=Broad-Crested Rectangular Weir** (Weir Controls 20.10 cfs @ 1.01 fps)

## Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 3.94" for 25-Year Bulletin 70 event
Inflow = 24.74 cfs @ 12.02 hrs, Volume= 1.414 af
Outflow = 8.77 cfs @ 12.18 hrs, Volume= 1.236 af, Atten= 65%, Lag= 9.9 min
Primary = 2.05 cfs @ 12.18 hrs, Volume= 0.961 af
Routed to Pond 12P : DA 4 Storage
Secondary = 6.71 cfs @ 12.18 hrs, Volume= 0.275 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.92' @ 12.18 hrs Surf.Area= 44,305 sf Storage= 28,310 cf

Plug-Flow detention time= 177.3 min calculated for 1.236 af (87% of inflow)
Center-of-Mass det. time= 117.6 min ( 918.2 - 800.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 897.00' | 178,312 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 897.00 | 17,532 | 0 | 0 |
| 898.00 | 46,772 | 32,152 | 32,152 |
| 899.00 | 72,833 | 59,803 | 91,955 |
| 900.00 | 99,882 | 86,358 | 178,312 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Secondary | 897.75' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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 |
| #2 | Primary | 897.00' | **12.0" Round Culvert** L= 37.0' Ke= 0.500<br>Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |

**Primary OutFlow** Max=2.05 cfs @ 12.18 hrs HW=897.92' TW=896.52' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 2.05 cfs @ 3.57 fps)

**Secondary OutFlow** Max=6.71 cfs @ 12.18 hrs HW=897.92' TW=896.52' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 6.71 cfs @ 1.01 fps)

## Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 3.63" for 25-Year Bulletin 70 event
Inflow = 15.31 cfs @ 12.09 hrs, Volume= 1.883 af
Outflow = 3.32 cfs @ 12.91 hrs, Volume= 1.854 af, Atten= 78%, Lag= 48.8 min
Primary = 3.32 cfs @ 12.91 hrs, Volume= 1.854 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 896.91' @ 12.91 hrs Surf.Area= 24,745 sf Storage= 23,066 cf

Plug-Flow detention time= 71.6 min calculated for 1.854 af (98% of inflow)
Center-of-Mass det. time= 62.9 min ( 939.8 - 876.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 895.00' | 194,049 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 895.00 | 931 | 0 | 0 |
| 896.00 | 11,904 | 6,418 | 6,418 |
| 897.00 | 26,038 | 18,971 | 25,389 |
| 898.00 | 49,659 | 37,849 | 63,237 |
| 900.00 | 81,153 | 130,812 | 194,049 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 895.00' | **12.0" Round Culvert** L= 40.0' Ke= 0.500<br>Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 898.00' | **15.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=3.32 cfs @ 12.91 hrs HW=896.91' TW=891.63' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 3.32 cfs @ 4.23 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 2.54" for 25-Year Bulletin 70 event
Inflow = 139.37 cfs @ 12.63 hrs, Volume= 24.181 af
Outflow = 52.20 cfs @ 13.49 hrs, Volume= 17.794 af, Atten= 63%, Lag= 51.6 min
Primary = 3.41 cfs @ 13.49 hrs, Volume= 3.401 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 48.79 cfs @ 13.49 hrs, Volume= 14.393 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.62' @ 13.49 hrs Surf.Area= 444,282 sf Storage= 468,012 cf

Plug-Flow detention time= 203.0 min calculated for 17.794 af (74% of inflow)
Center-of-Mass det. time= 103.4 min ( 968.9 - 865.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 879.00' | 654,217 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 879.00 | 3,000 | 0 | 0 |
| 880.00 | 90,812 | 46,906 | 46,906 |
| 881.00 | 293,662 | 192,237 | 239,143 |
| 882.00 | 536,485 | 415,074 | 654,217 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 879.00' | **12.0" Round Culvert** L= 45.0' Ke= 0.500<br>Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 881.00' | **37.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=3.41 cfs @ 13.49 hrs HW=881.62' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.41 cfs @ 4.34 fps)

**Secondary OutFlow** Max=48.79 cfs @ 13.49 hrs HW=881.62' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 48.79 cfs @ 2.13 fps)

## Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 4.03" for 25-Year Bulletin 70 event
Inflow = 44.94 cfs @ 12.11 hrs, Volume= 3.419 af
Outflow = 3.88 cfs @ 14.40 hrs, Volume= 2.603 af, Atten= 91%, Lag= 136.9 min
Primary = 3.88 cfs @ 14.40 hrs, Volume= 2.603 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.19' Surf.Area= 53,842 sf Storage= 131,454 cf
Peak Elev= 890.31' @ 13.14 hrs Surf.Area= 104,394 sf Storage= 220,166 cf (88,712 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 204.5 min ( 1,009.2 - 804.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 886.00' | 525,760 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 886.00 | 30,908 | 0 | 0 |
| 887.00 | 40,872 | 35,890 | 35,890 |
| 889.00 | 45,276 | 86,148 | 122,038 |
| 891.00 | 135,445 | 180,721 | 302,759 |
| 892.10 | 270,011 | 223,001 | 525,760 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 889.18' | **15.0" Round Culvert** L= 138.0' Ke= 0.500<br>Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf |
| #2 | Secondary | 892.00' | **73.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=3.88 cfs @ 14.40 hrs HW=890.26' TW=889.01' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 3.88 cfs @ 4.62 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=889.19' TW=886.93' (Dynamic Tailwater)
**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 3.55" for 25-Year Bulletin 70 event
Inflow = 57.12 cfs @ 12.12 hrs, Volume= 6.775 af
Outflow = 11.03 cfs @ 12.74 hrs, Volume= 6.203 af, Atten= 81%, Lag= 37.4 min
Primary = 11.03 cfs @ 12.74 hrs, Volume= 6.203 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 889.36' @ 12.74 hrs Surf.Area= 59,679 sf Storage= 161,733 cf (94,220 cf above start)

Plug-Flow detention time= 285.2 min calculated for 4.651 af (69% of inflow)
Center-of-Mass det. time= 89.4 min ( 974.6 - 885.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 884.00' | 487,275 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 884.00 | 10,000 | 0 | 0 |
| 885.00 | 16,000 | 13,000 | 13,000 |
| 886.00 | 31,740 | 23,870 | 36,870 |
| 889.00 | 39,548 | 106,932 | 143,802 |
| 891.00 | 150,950 | 190,498 | 334,300 |
| 892.00 | 155,000 | 152,975 | 487,275 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 886.93' | **18.0" Round Culvert** L= 63.0' Ke= 0.500<br>Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf |
| #2 | Secondary | 890.00' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=11.03 cfs @ 12.74 hrs HW=889.36' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 11.03 cfs @ 6.24 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=886.93' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 3.93" for 25-Year Bulletin 70 event
Inflow = 20.66 cfs @ 12.07 hrs, Volume= 1.385 af
Outflow = 9.50 cfs @ 12.25 hrs, Volume= 0.986 af, Atten= 54%, Lag= 10.9 min
Primary = 9.50 cfs @ 12.25 hrs, Volume= 0.986 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.58' @ 12.25 hrs Surf.Area= 63,601 sf Storage= 27,026 cf

Plug-Flow detention time= 166.0 min calculated for 0.985 af (71% of inflow)
Center-of-Mass det. time= 72.5 min ( 876.9 - 804.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 863.00' | 3,373,778 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 863.00 | 29,607 | 0 | 0 |
| 864.00 | 88,227 | 58,917 | 58,917 |
| 895.00 | 125,635 | 3,314,861 | 3,373,778 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 863.40' | **50.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=9.50 cfs @ 12.25 hrs HW=863.58' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 9.50 cfs @ 1.06 fps)

## Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 4.03" for 25-Year Bulletin 70 event
Inflow = 7.04 cfs @ 12.11 hrs, Volume= 0.517 af
Outflow = 2.94 cfs @ 12.34 hrs, Volume= 0.515 af, Atten= 58%, Lag= 13.8 min
Primary = 2.75 cfs @ 12.34 hrs, Volume= 0.513 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 0.20 cfs @ 12.34 hrs, Volume= 0.002 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 864.02' @ 12.34 hrs Surf.Area= 7,145 sf Storage= 5,710 cf

Plug-Flow detention time= 20.7 min calculated for 0.515 af (100% of inflow)
Center-of-Mass det. time= 18.2 min ( 821.9 - 803.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 862.00' | 17,715 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 862.00 | 100 | 0 | 0 |
| 863.00 | 2,048 | 1,074 | 1,074 |
| 864.00 | 6,912 | 4,480 | 5,554 |
| 865.00 | 17,409 | 12,161 | 17,715 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 862.00' | **12.0" Round Culvert** L= 38.0' Ke= 0.500<br>Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 864.00' | **24.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.75 cfs @ 12.34 hrs HW=864.02' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.75 cfs @ 3.50 fps)

**Secondary OutFlow** Max=0.20 cfs @ 12.34 hrs HW=864.02' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.20 cfs @ 0.37 fps)

## Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 3.71" for 25-Year Bulletin 70 event
Inflow = 107.50 cfs @ 12.42 hrs, Volume= 14.379 af
Outflow = 2.51 cfs @ 24.00 hrs, Volume= 2.264 af, Atten= 98%, Lag= 695.0 min
Primary = 2.51 cfs @ 24.00 hrs, Volume= 2.264 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 892.23' @ 24.00 hrs Surf.Area= 390,972 sf Storage= 765,397 cf (527,728 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 256.9 min ( 1,103.7 - 846.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 887.00' | 1,151,208 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 887.00 | 21,488 | 0 | 0 |
| 890.00 | 113,506 | 202,491 | 202,491 |
| 893.00 | 486,505 | 900,017 | 1,102,508 |
| 893.10 | 487,505 | 48,701 | 1,151,208 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 890.27' | **12.0" Round Culvert** L= 47.0' Ke= 0.500<br>Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 893.00' | **13.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.51 cfs @ 24.00 hrs HW=892.23' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.51 cfs @ 3.19 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.31% Impervious, Inflow Depth > 3.12" for 25-Year Bulletin 70 event
Inflow = 349.82 cfs @ 13.00 hrs, Volume= 94.619 af
Primary = 349.82 cfs @ 13.00 hrs, Volume= 94.619 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 4L: Proposed Discharge

Inflow Area = 379.969 ac, 4.47% Impervious, Inflow Depth > 3.15" for 25-Year Bulletin 70 event
Inflow = 357.46 cfs @ 13.00 hrs, Volume= 99.629 af
Primary = 357.46 cfs @ 13.00 hrs, Volume= 99.629 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 8.28% Impervious, Inflow Depth > 3.84" for 25-Year Bulletin 70 event
Inflow = 61.86 cfs @ 12.12 hrs, Volume= 5.010 af
Primary = 61.86 cfs @ 12.12 hrs, Volume= 5.010 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1S: DA 1** Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>4.82"
Flow Length=697' Tc=26.2 min CN=86 Runoff=38.09 cfs 3.393 af

**Subcatchment 2S: DA 2** Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>4.84"
Flow Length=412' Tc=10.7 min CN=86 Runoff=30.07 cfs 1.737 af

**Subcatchment 3S: DA 3** Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>4.91"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=102.67 cfs 13.004 af

**Subcatchment 4S: DA 4** Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>4.95"
Flow Length=419' Tc=11.3 min CN=87 Runoff=13.36 cfs 0.793 af

**Subcatchment 5S: DA 5** Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>4.94"
Tc=20.0 min CN=87 Runoff=54.55 cfs 4.186 af

**Subcatchment 6S: DA 6** Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>4.83"
Tc=20.0 min CN=86 Runoff=67.13 cfs 5.127 af

**Subcatchment 7S: DA 7** Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>4.78"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=168.55 cfs 26.943 af

**Subcatchment 9S: DA 9** Runoff Area=14.102 ac 7.13% Impervious Runoff Depth>4.72"
Flow Length=838' Tc=20.0 min CN=85 Runoff=72.90 cfs 5.544 af

**Subcatchment 10S: DA 10** Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>4.83"
Flow Length=529' Tc=15.7 min CN=86 Runoff=25.14 cfs 1.702 af

**Subcatchment 11S: DA 11** Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>4.94"
Flow Length=696' Tc=18.7 min CN=87 Runoff=8.54 cfs 0.633 af

**Subcatchment 12S: DA 8 - Offsite** Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>4.84"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=239.57 cfs 57.572 af

**Subcatchment 14S: DA8-Onsite** Runoff Area=80.300 ac 0.75% Impervious Runoff Depth>4.24"
Flow Length=1,500' Slope=0.0100 '/' Tc=63.9 min CN=81 Runoff=176.17 cfs 28.367 af

**Pond 1P: DA 1 Storage** Peak Elev=899.00' Storage=53,153 cf Inflow=38.09 cfs 3.393 af
Outflow=29.25 cfs 2.537 af

**Pond 2P: DA 2 Storage** Peak Elev=898.00' Storage=32,031 cf Inflow=30.07 cfs 1.737 af
Primary=2.30 cfs 1.023 af Secondary=12.34 cfs 0.518 af Outflow=14.64 cfs 1.541 af

**Pond 12P: DA 4 Storage** Peak Elev=897.30' Storage=34,168 cf Inflow=24.00 cfs 2.334 af
Primary=3.68 cfs 2.300 af Secondary=0.00 cfs 0.000 af Outflow=3.68 cfs 2.300 af

**Pond 13P: DA 7 Storage** Peak Elev=881.78' Storage=543,354 cf Inflow=170.27 cfs 29.559 af
Primary=3.55 cfs 3.587 af Secondary=68.94 cfs 19.418 af Outflow=72.49 cfs 23.005 af

**Pond 14P: DA 5 Storage** Peak Elev=890.51' Storage=241,872 cf Inflow=54.55 cfs 4.186 af
Primary=4.38 cfs 3.234 af Secondary=0.00 cfs 0.000 af Outflow=4.38 cfs 3.234 af

**Pond 17P: DA 6 Storage** Peak Elev=889.70' Storage=185,322 cf Inflow=69.86 cfs 8.361 af
Primary=12.10 cfs 7.711 af Secondary=0.00 cfs 0.000 af Outflow=12.10 cfs 7.711 af

**Pond 18P: DA 10 Storage** Peak Elev=863.63' Storage=30,610 cf Inflow=25.14 cfs 1.702 af
Outflow=14.24 cfs 1.300 af

**Pond 19P: DA 11 Storage** Peak Elev=864.12' Storage=6,451 cf Inflow=8.54 cfs 0.633 af
Primary=2.86 cfs 0.591 af Secondary=2.45 cfs 0.039 af Outflow=5.31 cfs 0.631 af

**Pond 20P: DA 3 Storage** Peak Elev=892.56' Storage=900,834 cf Inflow=133.86 cfs 17.841 af
Primary=2.86 cfs 2.616 af Secondary=0.00 cfs 0.000 af Outflow=2.86 cfs 2.616 af

**Link 2L: DA 8 >>> Discharge** Inflow=442.57 cfs 117.955 af
Primary=442.57 cfs 117.955 af

**Link 4L: Proposed Discharge** Inflow=451.56 cfs 124.130 af
Primary=451.56 cfs 124.130 af

**Link 15L: DA 9 >>> Discharge** Inflow=75.41 cfs 6.174 af
Primary=75.41 cfs 6.174 af

**Total Runoff Area = 379.969 ac Runoff Volume = 149.000 af Average Runoff Depth = 4.71"**
**95.53% Pervious = 362.979 ac 4.47% Impervious = 16.989 ac**

## Summary for Subcatchment 1S: DA 1

Runoff = 38.09 cfs @ 12.19 hrs, Volume= 3.393 af, Depth> 4.82"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| Area (ac) | CN | Description |
|---|---|---|
| 5.805 | 85 | Row crops, straight row, Good, HSG C |
| 2.642 | 89 | Row crops, straight row, Good, HSG D |
| 8.447 | 86 | Weighted Average |
| 8.447 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.3 | 100 | 0.0102 | 0.26 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 19.9 | 597 | 0.0031 | 0.50 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 26.2 | 697 | Total | | | |

## Summary for Subcatchment 2S: DA 2

Runoff = 30.07 cfs @ 12.02 hrs, Volume= 1.737 af, Depth> 4.84"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.080 | 98 | EX Imp |
| | 3.280 | 85 | Row crops, straight row, Good, HSG C |
| | 0.950 | 89 | Row crops, straight row, Good, HSG D |
| | 4.310 | 86 | Weighted Average |
| | 4.230 | | 98.14% Pervious Area |
| | 0.080 | | 1.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0090 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 4.1 | 312 | 0.0196 | 1.26 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 10.7 | 412 | Total | | | |

## Summary for Subcatchment 3S: DA 3

Runoff = 102.67 cfs @ 12.42 hrs, Volume= 13.004 af, Depth> 4.91"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.540 | 98 | EX Imp |
| | 18.238 | 85 | Row crops, straight row, Good, HSG C |
| | 13.000 | 89 | Row crops, straight row, Good, HSG D |
| | 31.778 | 87 | Weighted Average |
| | 31.238 | | 98.30% Pervious Area |
| | 0.540 | | 1.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.3 | 100 | 0.0160 | 0.32 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 39.6 | 1,803 | 0.0071 | 0.76 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 44.9 | 1,903 | Total | | | |

## Summary for Subcatchment 4S: DA 4

Runoff = 13.36 cfs @ 12.02 hrs, Volume= 0.793 af, Depth> 4.95"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.110 | 98 | EX Imp |
| | 1.206 | 85 | Row crops, straight row, Good, HSG C |
| | 0.607 | 89 | Row crops, straight row, Good, HSG D |
| | 1.923 | 87 | Weighted Average |
| | 1.813 | | 94.28% Pervious Area |
| | 0.110 | | 5.72% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | 100 | 0.0188 | 0.34 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 6.3 | 319 | 0.0089 | 0.85 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 11.3 | 419 | Total | | | |

## Summary for Subcatchment 5S: DA 5

Runoff = 54.55 cfs @ 12.11 hrs, Volume= 4.186 af, Depth> 4.94"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 3.625 | 85 | Row crops, straight row, Good, HSG C |
| | 0.487 | 89 | Row crops, straight row, Good, HSG D |
| * | 2.350 | 98 | EX Imp |
| | 2.941 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.771 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 10.174 | 87 | Weighted Average |
| | 6.896 | | 67.78% Pervious Area |
| | 3.278 | | 32.22% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 6S: DA 6

Runoff = 67.13 cfs @ 12.11 hrs, Volume= 5.127 af, Depth> 4.83"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.860 | 98 | EX Imp |
| | 6.291 | 85 | Row crops, straight row, Good, HSG C |
| | 0.955 | 89 | Row crops, straight row, Good, HSG D |
| | 3.140 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.499 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 12.745 | 86 | Weighted Average |
| | 9.975 | | 78.27% Pervious Area |
| | 2.770 | | 21.73% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 7S: DA 7

Runoff = 168.55 cfs @ 12.62 hrs, Volume= 26.943 af, Depth> 4.78"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 39.504 | 85 | Row crops, straight row, Good, HSG C |
| | 18.825 | 89 | Row crops, straight row, Good, HSG D |
| * | 1.820 | 98 | EX Imp |
| | 3.089 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.709 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 1.150 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.527 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 67.624 | 86 | Weighted Average |
| | 64.604 | | 95.53% Pervious Area |
| | 3.020 | | 4.47% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0360 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 58.6 | 3,034 | 0.0092 | 0.86 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 62.4 | 3,134 | Total | | | |

## Summary for Subcatchment 9S: DA 9

Runoff = 72.90 cfs @ 12.11 hrs, Volume= 5.544 af, Depth> 4.72"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.650 | 98 | EX Imp |
| | 2.451 | 78 | Row crops, straight row, Good, HSG B |
| | 8.970 | 85 | Row crops, straight row, Good, HSG C |
| | 1.651 | 89 | Row crops, straight row, Good, HSG D |
| | 0.000 | 58 | Meadow, non-grazed, HSG B |
| | 0.025 | 71 | Meadow, non-grazed, HSG C |
| | 0.000 | 78 | Meadow, non-grazed, HSG D |
| * | 0.355 | 98 | Prop Imp |
| | 14.102 | 85 | Weighted Average |
| | 13.097 | | 92.87% Pervious Area |
| | 1.005 | | 7.13% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.9 | 100 | 0.0081 | 0.24 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 13.1 | 738 | 0.0109 | 0.94 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 20.0 | 838 | Total | | | |

## Summary for Subcatchment 10S: DA 10

Runoff = 25.14 cfs @ 12.07 hrs, Volume= 1.702 af, Depth> 4.83"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| Area (ac) | CN | Description |
|---|---|---|
| 2.804 | 85 | Row crops, straight row, Good, HSG C |
| 1.423 | 89 | Row crops, straight row, Good, HSG D |
| 0.000 | 71 | Meadow, non-grazed, HSG C |
| 0.000 | 78 | Meadow, non-grazed, HSG D |
| 4.227 | 86 | Weighted Average |
| 4.227 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.5 | 100 | 0.0067 | 0.22 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 8.2 | 429 | 0.0095 | 0.88 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 15.7 | 529 | Total | | | |

## Summary for Subcatchment 11S: DA 11

Runoff = 8.54 cfs @ 12.11 hrs, Volume= 0.633 af, Depth> 4.94"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.290 | 98 | EX Imp |
| | 1.233 | 85 | Row crops, straight row, Good, HSG C |
| | 0.015 | 89 | Row crops, straight row, Good, HSG D |
| | 1.538 | 87 | Weighted Average |
| | 1.248 | | 81.14% Pervious Area |
| | 0.290 | | 18.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0361 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 14.9 | 596 | 0.0055 | 0.67 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 18.7 | 696 | Total | | | |

## Summary for Subcatchment 12S: DA 8 - Offsite

Runoff = 239.57 cfs @ 13.25 hrs, Volume= 57.572 af, Depth> 4.84"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.970 | 98 | Ex Imp |
| | 3.969 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.340 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 2.443 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.552 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 0.000 | 78 | Row crops, straight row, Good, HSG B |
| | 71.424 | 85 | Row crops, straight row, Good, HSG C |
| | 58.103 | 89 | Row crops, straight row, Good, HSG D |
| | 142.801 | 87 | Weighted Average |
| | 137.504 | | 96.29% Pervious Area |
| | 5.297 | | 3.71% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 100 | 0.0217 | 0.36 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 103.4 | 3,704 | 0.0044 | 0.60 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 1.3 | 1,685 | 0.0055 | 22.10 | 72,207.12 | **Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding |
| 109.4 | 5,489 | Total | | | |

## Summary for Subcatchment 14S: DA8-Onsite

Runoff = 176.17 cfs @ 12.70 hrs, Volume= 28.367 af, Depth> 4.24"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 14.070 | 89 | Row crops, straight row, Good, HSG D |
| | 26.220 | 85 | Row crops, straight row, Good, HSG C |
| | 5.300 | 78 | Row crops, straight row, Good, HSG B |
| * | 0.600 | 98 | Proposed Impervious |
| | 1.100 | 58 | Meadow, non-grazed, HSG B |
| | 9.880 | 71 | Meadow, non-grazed, HSG C |
| | 23.130 | 78 | Meadow, non-grazed, HSG D |
| | 80.300 | 81 | Weighted Average |
| | 79.700 | | 99.25% Pervious Area |
| | 0.600 | | 0.75% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 35.3 | 300 | 0.0100 | 0.14 | | **Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04" |
| 28.6 | 1,200 | 0.0100 | 0.70 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 63.9 | 1,500 | Total | | | |

## Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 4.82" for 50-Year Bulletin 70 event
Inflow = 38.09 cfs @ 12.19 hrs, Volume= 3.393 af
Outflow = 29.25 cfs @ 12.34 hrs, Volume= 2.537 af, Atten= 23%, Lag= 8.5 min
Primary = 29.25 cfs @ 12.34 hrs, Volume= 2.537 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 899.00' @ 12.34 hrs Surf.Area= 87,640 sf Storage= 53,153 cf

Plug-Flow detention time= 146.8 min calculated for 2.537 af (75% of inflow)
Center-of-Mass det. time= 59.8 min ( 866.8 - 807.0 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 898.00' | 394,067 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 898.00 | 18,479 | 0 | 0 |
| 899.00 | 87,451 | 52,965 | 52,965 |
| 900.00 | 175,260 | 131,356 | 184,321 |
| 901.00 | 244,232 | 209,746 | 394,067 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 898.79' | **120.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=29.24 cfs @ 12.34 hrs HW=899.00' TW=891.21' (Dynamic Tailwater)
**1=Broad-Crested Rectangular Weir** (Weir Controls 29.24 cfs @ 1.15 fps)

## Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 4.84" for 50-Year Bulletin 70 event
Inflow = 30.07 cfs @ 12.02 hrs, Volume= 1.737 af
Outflow = 14.64 cfs @ 12.15 hrs, Volume= 1.541 af, Atten= 51%, Lag= 7.6 min
Primary = 2.30 cfs @ 12.15 hrs, Volume= 1.023 af
Routed to Pond 12P : DA 4 Storage
Secondary = 12.34 cfs @ 12.15 hrs, Volume= 0.518 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.00' @ 12.15 hrs Surf.Area= 46,697 sf Storage= 32,031 cf

Plug-Flow detention time= 160.9 min calculated for 1.540 af (89% of inflow)
Center-of-Mass det. time= 105.8 min ( 900.5 - 794.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 897.00' | 178,312 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 897.00 | 17,532 | 0 | 0 |
| 898.00 | 46,772 | 32,152 | 32,152 |
| 899.00 | 72,833 | 59,803 | 91,955 |
| 900.00 | 99,882 | 86,358 | 178,312 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Secondary | 897.75' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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 |
| #2 | Primary | 897.00' | **12.0" Round Culvert** L= 37.0' Ke= 0.500<br>Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |

**Primary OutFlow** Max=2.30 cfs @ 12.15 hrs HW=898.00' TW=896.74' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 2.30 cfs @ 3.64 fps)

**Secondary OutFlow** Max=12.33 cfs @ 12.15 hrs HW=898.00' TW=896.74' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 12.33 cfs @ 1.25 fps)

## Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 4.49" for 50-Year Bulletin 70 event
Inflow = 24.00 cfs @ 12.09 hrs, Volume= 2.334 af
Outflow = 3.68 cfs @ 12.95 hrs, Volume= 2.300 af, Atten= 85%, Lag= 51.7 min
Primary = 3.68 cfs @ 12.95 hrs, Volume= 2.300 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.30' @ 12.95 hrs Surf.Area= 33,056 sf Storage= 34,168 cf

Plug-Flow detention time= 92.8 min calculated for 2.299 af (98% of inflow)
Center-of-Mass det. time= 84.6 min ( 948.3 - 863.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 895.00' | 194,049 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 895.00 | 931 | 0 | 0 |
| 896.00 | 11,904 | 6,418 | 6,418 |
| 897.00 | 26,038 | 18,971 | 25,389 |
| 898.00 | 49,659 | 37,849 | 63,237 |
| 900.00 | 81,153 | 130,812 | 194,049 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 895.00' | **12.0" Round Culvert** L= 40.0' Ke= 0.500<br>Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 898.00' | **15.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=3.68 cfs @ 12.95 hrs HW=897.30' TW=891.91' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 3.68 cfs @ 4.69 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 3.11" for 50-Year Bulletin 70 event
Inflow = 170.27 cfs @ 12.62 hrs, Volume= 29.559 af
Outflow = 72.49 cfs @ 13.38 hrs, Volume= 23.005 af, Atten= 57%, Lag= 45.4 min
Primary = 3.55 cfs @ 13.38 hrs, Volume= 3.587 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 68.94 cfs @ 13.38 hrs, Volume= 19.418 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.78' @ 13.38 hrs Surf.Area= 483,711 sf Storage= 543,354 cf

Plug-Flow detention time= 183.6 min calculated for 22.995 af (78% of inflow)
Center-of-Mass det. time= 94.4 min ( 953.0 - 858.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 879.00' | 654,217 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 879.00 | 3,000 | 0 | 0 |
| 880.00 | 90,812 | 46,906 | 46,906 |
| 881.00 | 293,662 | 192,237 | 239,143 |
| 882.00 | 536,485 | 415,074 | 654,217 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 879.00' | **12.0" Round Culvert** L= 45.0' Ke= 0.500<br>Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 881.00' | **37.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=3.55 cfs @ 13.38 hrs HW=881.78' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.55 cfs @ 4.52 fps)

**Secondary OutFlow** Max=68.94 cfs @ 13.38 hrs HW=881.78' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 68.94 cfs @ 2.38 fps)

## Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 4.94" for 50-Year Bulletin 70 event
Inflow = 54.55 cfs @ 12.11 hrs, Volume= 4.186 af
Outflow = 4.38 cfs @ 15.30 hrs, Volume= 3.234 af, Atten= 92%, Lag= 191.4 min
Primary = 4.38 cfs @ 15.30 hrs, Volume= 3.234 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.19' Surf.Area= 53,842 sf Storage= 131,454 cf
Peak Elev= 890.51' @ 13.24 hrs Surf.Area= 113,381 sf Storage= 241,872 cf (110,418 cf above start)

Plug-Flow detention time= 903.2 min calculated for 0.216 af (5% of inflow)
Center-of-Mass det. time= 216.6 min ( 1,015.7 - 799.1 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 886.00' | 525,760 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 886.00 | 30,908 | 0 | 0 |
| 887.00 | 40,872 | 35,890 | 35,890 |
| 889.00 | 45,276 | 86,148 | 122,038 |
| 891.00 | 135,445 | 180,721 | 302,759 |
| 892.10 | 270,011 | 223,001 | 525,760 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 889.18' | **15.0" Round Culvert** L= 138.0' Ke= 0.500<br>Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf |
| #2 | Secondary | 892.00' | **73.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=4.38 cfs @ 15.30 hrs HW=890.40' TW=889.22' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 4.38 cfs @ 4.56 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=889.19' TW=886.93' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 4.38" for 50-Year Bulletin 70 event
Inflow = 69.86 cfs @ 12.12 hrs, Volume= 8.361 af
Outflow = 12.10 cfs @ 12.79 hrs, Volume= 7.711 af, Atten= 83%, Lag= 40.5 min
Primary = 12.10 cfs @ 12.79 hrs, Volume= 7.711 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 889.70' @ 12.79 hrs Surf.Area= 78,673 sf Storage= 185,322 cf (117,808 cf above start)

Plug-Flow detention time= 268.2 min calculated for 6.159 af (74% of inflow)
Center-of-Mass det. time= 97.4 min ( 982.2 - 884.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 884.00' | 487,275 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 884.00 | 10,000 | 0 | 0 |
| 885.00 | 16,000 | 13,000 | 13,000 |
| 886.00 | 31,740 | 23,870 | 36,870 |
| 889.00 | 39,548 | 106,932 | 143,802 |
| 891.00 | 150,950 | 190,498 | 334,300 |
| 892.00 | 155,000 | 152,975 | 487,275 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 886.93' | **18.0" Round Culvert** L= 63.0' Ke= 0.500<br>Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf |
| #2 | Secondary | 890.00' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=12.10 cfs @ 12.79 hrs HW=889.70' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 12.10 cfs @ 6.85 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=886.93' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 4.83" for 50-Year Bulletin 70 event
Inflow = 25.14 cfs @ 12.07 hrs, Volume= 1.702 af
Outflow = 14.24 cfs @ 12.22 hrs, Volume= 1.300 af, Atten= 43%, Lag= 8.8 min
Primary = 14.24 cfs @ 12.22 hrs, Volume= 1.300 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.63' @ 12.22 hrs Surf.Area= 66,823 sf Storage= 30,610 cf

Plug-Flow detention time= 149.1 min calculated for 1.300 af (76% of inflow)
Center-of-Mass det. time= 63.5 min ( 862.3 - 798.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 863.00' | 3,373,778 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 863.00 | 29,607 | 0 | 0 |
| 864.00 | 88,227 | 58,917 | 58,917 |
| 895.00 | 125,635 | 3,314,861 | 3,373,778 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 863.40' | **50.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=14.24 cfs @ 12.22 hrs HW=863.63' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 14.24 cfs @ 1.21 fps)

## Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 4.94" for 50-Year Bulletin 70 event
Inflow = 8.54 cfs @ 12.11 hrs, Volume= 0.633 af
Outflow = 5.31 cfs @ 12.26 hrs, Volume= 0.631 af, Atten= 38%, Lag= 9.0 min
Primary = 2.86 cfs @ 12.26 hrs, Volume= 0.591 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 2.45 cfs @ 12.26 hrs, Volume= 0.039 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 864.12' @ 12.26 hrs Surf.Area= 8,161 sf Storage= 6,451 cf

Plug-Flow detention time= 19.9 min calculated for 0.630 af (100% of inflow)
Center-of-Mass det. time= 17.5 min ( 815.6 - 798.1 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 862.00' | 17,715 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 862.00 | 100 | 0 | 0 |
| 863.00 | 2,048 | 1,074 | 1,074 |
| 864.00 | 6,912 | 4,480 | 5,554 |
| 865.00 | 17,409 | 12,161 | 17,715 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 862.00' | **12.0" Round Culvert** L= 38.0' Ke= 0.500<br>Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 864.00' | **24.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.86 cfs @ 12.26 hrs HW=864.12' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.86 cfs @ 3.64 fps)

**Secondary OutFlow** Max=2.45 cfs @ 12.26 hrs HW=864.12' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 2.45 cfs @ 0.86 fps)

## Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 4.61" for 50-Year Bulletin 70 event
Inflow = 133.86 cfs @ 12.38 hrs, Volume= 17.841 af
Outflow = 2.86 cfs @ 24.00 hrs, Volume= 2.616 af, Atten= 98%, Lag= 697.1 min
Primary = 2.86 cfs @ 24.00 hrs, Volume= 2.616 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 892.56' @ 24.00 hrs Surf.Area= 431,900 sf Storage= 900,834 cf (663,164 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 256.8 min ( 1,099.0 - 842.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 887.00' | 1,151,208 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 887.00 | 21,488 | 0 | 0 |
| 890.00 | 113,506 | 202,491 | 202,491 |
| 893.00 | 486,505 | 900,017 | 1,102,508 |
| 893.10 | 487,505 | 48,701 | 1,151,208 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 890.27' | **12.0" Round Culvert** L= 47.0' Ke= 0.500<br>Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 893.00' | **13.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.86 cfs @ 24.00 hrs HW=892.56' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.86 cfs @ 3.64 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.31% Impervious, Inflow Depth > 3.89" for 50-Year Bulletin 70 event
Inflow = 442.57 cfs @ 13.00 hrs, Volume= 117.955 af
Primary = 442.57 cfs @ 13.00 hrs, Volume= 117.955 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 4L: Proposed Discharge

Inflow Area = 379.969 ac, 4.47% Impervious, Inflow Depth > 3.92" for 50-Year Bulletin 70 event
Inflow = 451.56 cfs @ 13.00 hrs, Volume= 124.130 af
Primary = 451.56 cfs @ 13.00 hrs, Volume= 124.130 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 8.28% Impervious, Inflow Depth > 4.74" for 50-Year Bulletin 70 event
Inflow = 75.41 cfs @ 12.12 hrs, Volume= 6.174 af
Primary = 75.41 cfs @ 12.12 hrs, Volume= 6.174 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1S: DA 1** Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>5.89"
Flow Length=697' Tc=26.2 min CN=86 Runoff=46.16 cfs 4.148 af

**Subcatchment 2S: DA 2** Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>5.91"
Flow Length=412' Tc=10.7 min CN=86 Runoff=36.33 cfs 2.123 af

**Subcatchment 3S: DA 3** Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>5.98"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=124.15 cfs 15.848 af

**Subcatchment 4S: DA 4** Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>6.03"
Flow Length=419' Tc=11.3 min CN=87 Runoff=16.10 cfs 0.966 af

**Subcatchment 5S: DA 5** Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>6.02"
Tc=20.0 min CN=87 Runoff=65.84 cfs 5.101 af

**Subcatchment 6S: DA 6** Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>5.90"
Tc=20.0 min CN=86 Runoff=81.30 cfs 6.266 af

**Subcatchment 7S: DA 7** Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>5.85"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=204.74 cfs 32.941 af

**Subcatchment 9S: DA 9** Runoff Area=14.102 ac 7.13% Impervious Runoff Depth>5.78"
Flow Length=838' Tc=20.0 min CN=85 Runoff=88.60 cfs 6.797 af

**Subcatchment 10S: DA 10** Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>5.91"
Flow Length=529' Tc=15.7 min CN=86 Runoff=30.42 cfs 2.080 af

**Subcatchment 11S: DA 11** Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>6.02"
Flow Length=696' Tc=18.7 min CN=87 Runoff=10.31 cfs 0.771 af

**Subcatchment 12S: DA 8 - Offsite** Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>5.90"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=290.16 cfs 70.192 af

**Subcatchment 14S: DA8-Onsite** Runoff Area=80.300 ac 0.75% Impervious Runoff Depth>5.27"
Flow Length=1,500' Slope=0.0100 '/' Tc=63.9 min CN=81 Runoff=218.24 cfs 35.252 af

**Pond 1P: DA 1 Storage** Peak Elev=899.05' Storage=57,060 cf Inflow=46.16 cfs 4.148 af
Outflow=38.95 cfs 3.288 af

**Pond 2P: DA 2 Storage** Peak Elev=898.08' Storage=35,839 cf Inflow=36.33 cfs 2.123 af
Primary=2.51 cfs 1.032 af Secondary=18.97 cfs 0.871 af Outflow=21.48 cfs 1.904 af

**Pond 12P: DA 4 Storage** Peak Elev=897.66' Storage=47,765 cf Inflow=34.01 cfs 2.870 af
Primary=3.99 cfs 2.829 af Secondary=0.00 cfs 0.000 af Outflow=3.99 cfs 2.829 af

**Pond 13P: DA 7 Storage** Peak Elev=881.96' Storage=632,165 cf Inflow=206.85 cfs 35.908 af
Primary=3.69 cfs 3.789 af Secondary=93.12 cfs 25.390 af Outflow=96.82 cfs 29.179 af

**Pond 14P: DA 5 Storage** Peak Elev=890.74' Storage=268,693 cf Inflow=65.84 cfs 5.101 af
Primary=4.88 cfs 3.946 af Secondary=0.00 cfs 0.000 af Outflow=4.88 cfs 3.946 af

**Pond 17P: DA 6 Storage** Peak Elev=890.02' Storage=213,504 cf Inflow=84.61 cfs 10.213 af
Primary=13.03 cfs 9.440 af Secondary=0.37 cfs 0.011 af Outflow=13.40 cfs 9.451 af

**Pond 18P: DA 10 Storage** Peak Elev=863.69' Storage=34,315 cf Inflow=30.42 cfs 2.080 af
Outflow=19.59 cfs 1.676 af

**Pond 19P: DA 11 Storage** Peak Elev=864.19' Storage=7,032 cf Inflow=10.31 cfs 0.771 af
Primary=2.94 cfs 0.676 af Secondary=4.84 cfs 0.093 af Outflow=7.78 cfs 0.769 af

**Pond 20P: DA 3 Storage** Peak Elev=892.92' Storage=1,065,249 cf Inflow=163.66 cfs 21.965 af
Primary=3.20 cfs 2.966 af Secondary=0.00 cfs 0.000 af Outflow=3.20 cfs 2.966 af

**Link 2L: DA 8 >>> Discharge** Inflow=550.71 cfs 145.750 af
Primary=550.71 cfs 145.750 af

**Link 4L: Proposed Discharge** Inflow=561.22 cfs 153.316 af
Primary=561.22 cfs 153.316 af

**Link 15L: DA 9 >>> Discharge** Inflow=93.14 cfs 7.566 af
Primary=93.14 cfs 7.566 af

**Total Runoff Area = 379.969 ac Runoff Volume = 182.487 af Average Runoff Depth = 5.76"**
**95.53% Pervious = 362.979 ac 4.47% Impervious = 16.989 ac**

## Summary for Subcatchment 1S: DA 1

Runoff = 46.16 cfs @ 12.19 hrs, Volume= 4.148 af, Depth> 5.89"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| Area (ac) | CN | Description |
|---|---|---|
| 5.805 | 85 | Row crops, straight row, Good, HSG C |
| 2.642 | 89 | Row crops, straight row, Good, HSG D |
| 8.447 | 86 | Weighted Average |
| 8.447 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.3 | 100 | 0.0102 | 0.26 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 19.9 | 597 | 0.0031 | 0.50 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 26.2 | 697 | Total | | | |

## Summary for Subcatchment 2S: DA 2

Runoff = 36.33 cfs @ 12.02 hrs, Volume= 2.123 af, Depth> 5.91"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.080 | 98 | EX Imp |
| | 3.280 | 85 | Row crops, straight row, Good, HSG C |
| | 0.950 | 89 | Row crops, straight row, Good, HSG D |
| | 4.310 | 86 | Weighted Average |
| | 4.230 | | 98.14% Pervious Area |
| | 0.080 | | 1.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.6 | 100 | 0.0090 | 0.25 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 4.1 | 312 | 0.0196 | 1.26 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 10.7 | 412 | Total | | | |

## Summary for Subcatchment 3S: DA 3

Runoff = 124.15 cfs @ 12.42 hrs, Volume= 15.848 af, Depth> 5.98"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.540 | 98 | EX Imp |
| | 18.238 | 85 | Row crops, straight row, Good, HSG C |
| | 13.000 | 89 | Row crops, straight row, Good, HSG D |
| | 31.778 | 87 | Weighted Average |
| | 31.238 | | 98.30% Pervious Area |
| | 0.540 | | 1.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.3 | 100 | 0.0160 | 0.32 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 39.6 | 1,803 | 0.0071 | 0.76 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 44.9 | 1,903 | Total | | | |

## Summary for Subcatchment 4S: DA 4

Runoff = 16.10 cfs @ 12.02 hrs, Volume= 0.966 af, Depth> 6.03"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.110 | 98 | EX Imp |
| | 1.206 | 85 | Row crops, straight row, Good, HSG C |
| | 0.607 | 89 | Row crops, straight row, Good, HSG D |
| | 1.923 | 87 | Weighted Average |
| | 1.813 | | 94.28% Pervious Area |
| | 0.110 | | 5.72% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | 100 | 0.0188 | 0.34 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 6.3 | 319 | 0.0089 | 0.85 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 11.3 | 419 | Total | | | |

## Summary for Subcatchment 5S: DA 5

Runoff = 65.84 cfs @ 12.11 hrs, Volume= 5.101 af, Depth> 6.02"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 3.625 | 85 | Row crops, straight row, Good, HSG C |
| | 0.487 | 89 | Row crops, straight row, Good, HSG D |
| * | 2.350 | 98 | EX Imp |
| | 2.941 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.771 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 10.174 | 87 | Weighted Average |
| | 6.896 | | 67.78% Pervious Area |
| | 3.278 | | 32.22% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 6S: DA 6

Runoff = 81.30 cfs @ 12.11 hrs, Volume= 6.266 af, Depth> 5.90"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 1.860 | 98 | EX Imp |
| | 6.291 | 85 | Row crops, straight row, Good, HSG C |
| | 0.955 | 89 | Row crops, straight row, Good, HSG D |
| | 3.140 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 0.499 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 12.745 | 86 | Weighted Average |
| | 9.975 | | 78.27% Pervious Area |
| | 2.770 | | 21.73% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 20.0 | | | | | **Direct Entry,** |

## Summary for Subcatchment 7S: DA 7

Runoff = 204.74 cfs @ 12.62 hrs, Volume= 32.941 af, Depth> 5.85"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 39.504 | 85 | Row crops, straight row, Good, HSG C |
| | 18.825 | 89 | Row crops, straight row, Good, HSG D |
| * | 1.820 | 98 | EX Imp |
| | 3.089 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.709 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 1.150 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.527 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 67.624 | 86 | Weighted Average |
| | 64.604 | | 95.53% Pervious Area |
| | 3.020 | | 4.47% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0360 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 58.6 | 3,034 | 0.0092 | 0.86 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 62.4 | 3,134 | Total | | | |

## Summary for Subcatchment 9S: DA 9

Runoff = 88.60 cfs @ 12.11 hrs, Volume= 6.797 af, Depth> 5.78"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.650 | 98 | EX Imp |
| | 2.451 | 78 | Row crops, straight row, Good, HSG B |
| | 8.970 | 85 | Row crops, straight row, Good, HSG C |
| | 1.651 | 89 | Row crops, straight row, Good, HSG D |
| | 0.000 | 58 | Meadow, non-grazed, HSG B |
| | 0.025 | 71 | Meadow, non-grazed, HSG C |
| | 0.000 | 78 | Meadow, non-grazed, HSG D |
| * | 0.355 | 98 | Prop Imp |
| | 14.102 | 85 | Weighted Average |
| | 13.097 | | 92.87% Pervious Area |
| | 1.005 | | 7.13% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.9 | 100 | 0.0081 | 0.24 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 13.1 | 738 | 0.0109 | 0.94 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 20.0 | 838 | Total | | | |

## Summary for Subcatchment 10S: DA 10

Runoff = 30.42 cfs @ 12.07 hrs, Volume= 2.080 af, Depth> 5.91"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| Area (ac) | CN | Description |
|---|---|---|
| 2.804 | 85 | Row crops, straight row, Good, HSG C |
| 1.423 | 89 | Row crops, straight row, Good, HSG D |
| 0.000 | 71 | Meadow, non-grazed, HSG C |
| 0.000 | 78 | Meadow, non-grazed, HSG D |
| 4.227 | 86 | Weighted Average |
| 4.227 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 7.5 | 100 | 0.0067 | 0.22 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 8.2 | 429 | 0.0095 | 0.88 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 15.7 | 529 | Total | | | |

## Summary for Subcatchment 11S: DA 11

Runoff = 10.31 cfs @ 12.11 hrs, Volume= 0.771 af, Depth> 6.02"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 0.290 | 98 | EX Imp |
| | 1.233 | 85 | Row crops, straight row, Good, HSG C |
| | 0.015 | 89 | Row crops, straight row, Good, HSG D |
| | 1.538 | 87 | Weighted Average |
| | 1.248 | | 81.14% Pervious Area |
| | 0.290 | | 18.86% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 3.8 | 100 | 0.0361 | 0.44 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 14.9 | 596 | 0.0055 | 0.67 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 18.7 | 696 | Total | | | |

## Summary for Subcatchment 12S: DA 8 - Offsite

Runoff = 290.16 cfs @ 13.25 hrs, Volume= 70.192 af, Depth> 5.90"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| * | 3.970 | 98 | Ex Imp |
| | 3.969 | 80 | 1/2 acre lots, 25% imp, HSG C |
| | 1.340 | 85 | 1/2 acre lots, 25% imp, HSG D |
| | 2.443 | 79 | Pasture/grassland/range, Fair, HSG C |
| | 1.552 | 84 | Pasture/grassland/range, Fair, HSG D |
| | 0.000 | 78 | Row crops, straight row, Good, HSG B |
| | 71.424 | 85 | Row crops, straight row, Good, HSG C |
| | 58.103 | 89 | Row crops, straight row, Good, HSG D |
| | 142.801 | 87 | Weighted Average |
| | 137.504 | | 96.29% Pervious Area |
| | 5.297 | | 3.71% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 100 | 0.0217 | 0.36 | | **Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04" |
| 103.4 | 3,704 | 0.0044 | 0.60 | | **Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps |
| 1.3 | 1,685 | 0.0055 | 22.10 | 72,207.12 | **Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding |
| 109.4 | 5,489 | Total | | | |

## Summary for Subcatchment 14S: DA8-Onsite

Runoff = 218.24 cfs @ 12.64 hrs, Volume= 35.252 af, Depth> 5.27"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 14.070 | 89 | Row crops, straight row, Good, HSG D |
| | 26.220 | 85 | Row crops, straight row, Good, HSG C |
| | 5.300 | 78 | Row crops, straight row, Good, HSG B |
| * | 0.600 | 98 | Proposed Impervious |
| | 1.100 | 58 | Meadow, non-grazed, HSG B |
| | 9.880 | 71 | Meadow, non-grazed, HSG C |
| | 23.130 | 78 | Meadow, non-grazed, HSG D |
| | 80.300 | 81 | Weighted Average |
| | 79.700 | | 99.25% Pervious Area |
| | 0.600 | | 0.75% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 35.3 | 300 | 0.0100 | 0.14 | | **Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04" |
| 28.6 | 1,200 | 0.0100 | 0.70 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 63.9 | 1,500 | Total | | | |

## Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 5.89" for 100-Year Bulletin 70 event
Inflow = 46.16 cfs @ 12.19 hrs, Volume= 4.148 af
Outflow = 38.95 cfs @ 12.30 hrs, Volume= 3.288 af, Atten= 16%, Lag= 6.6 min
Primary = 38.95 cfs @ 12.30 hrs, Volume= 3.288 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 899.05' @ 12.30 hrs Surf.Area= 91,471 sf Storage= 57,060 cf

Plug-Flow detention time= 132.5 min calculated for 3.288 af (79% of inflow)
Center-of-Mass det. time= 53.6 min ( 855.1 - 801.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 898.00' | 394,067 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 898.00 | 18,479 | 0 | 0 |
| 899.00 | 87,451 | 52,965 | 52,965 |
| 900.00 | 175,260 | 131,356 | 184,321 |
| 901.00 | 244,232 | 209,746 | 394,067 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 898.79' | **120.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=38.94 cfs @ 12.30 hrs HW=899.05' TW=891.36' (Dynamic Tailwater)
**1=Broad-Crested Rectangular Weir** (Weir Controls 38.94 cfs @ 1.27 fps)

## Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 5.91" for 100-Year Bulletin 70 event
Inflow = 36.33 cfs @ 12.02 hrs, Volume= 2.123 af
Outflow = 21.48 cfs @ 12.12 hrs, Volume= 1.904 af, Atten= 41%, Lag= 6.3 min
Primary = 2.51 cfs @ 12.12 hrs, Volume= 1.032 af
Routed to Pond 12P : DA 4 Storage
Secondary = 18.97 cfs @ 12.12 hrs, Volume= 0.871 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.08' @ 12.12 hrs Surf.Area= 48,783 sf Storage= 35,839 cf

Plug-Flow detention time= 149.3 min calculated for 1.903 af (90% of inflow)
Center-of-Mass det. time= 97.6 min ( 886.9 - 789.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 897.00' | 178,312 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 897.00 | 17,532 | 0 | 0 |
| 898.00 | 46,772 | 32,152 | 32,152 |
| 899.00 | 72,833 | 59,803 | 91,955 |
| 900.00 | 99,882 | 86,358 | 178,312 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Secondary | 897.75' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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 |
| #2 | Primary | 897.00' | **12.0" Round Culvert** L= 37.0' Ke= 0.500<br>Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |

**Primary OutFlow** Max=2.51 cfs @ 12.12 hrs HW=898.08' TW=897.00' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 2.51 cfs @ 3.70 fps)

**Secondary OutFlow** Max=18.96 cfs @ 12.12 hrs HW=898.08' TW=897.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 18.96 cfs @ 1.45 fps)

## Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 5.52" for 100-Year Bulletin 70 event
Inflow = 34.01 cfs @ 12.08 hrs, Volume= 2.870 af
Outflow = 3.99 cfs @ 13.01 hrs, Volume= 2.829 af, Atten= 88%, Lag= 55.8 min
Primary = 3.99 cfs @ 13.01 hrs, Volume= 2.829 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.66' @ 13.01 hrs Surf.Area= 41,654 sf Storage= 47,765 cf

Plug-Flow detention time= 118.5 min calculated for 2.829 af (99% of inflow)
Center-of-Mass det. time= 110.4 min ( 963.6 - 853.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 895.00' | 194,049 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 895.00 | 931 | 0 | 0 |
| 896.00 | 11,904 | 6,418 | 6,418 |
| 897.00 | 26,038 | 18,971 | 25,389 |
| 898.00 | 49,659 | 37,849 | 63,237 |
| 900.00 | 81,153 | 130,812 | 194,049 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 895.00' | **12.0" Round Culvert** L= 40.0' Ke= 0.500<br>Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 898.00' | **15.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=3.99 cfs @ 13.01 hrs HW=897.66' TW=892.23' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 3.99 cfs @ 5.08 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 3.78" for 100-Year Bulletin 70 event
Inflow = 206.85 cfs @ 12.62 hrs, Volume= 35.908 af
Outflow = 96.82 cfs @ 13.30 hrs, Volume= 29.179 af, Atten= 53%, Lag= 40.8 min
Primary = 3.69 cfs @ 13.30 hrs, Volume= 3.789 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 93.12 cfs @ 13.30 hrs, Volume= 25.390 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.96' @ 13.30 hrs Surf.Area= 526,409 sf Storage= 632,165 cf

Plug-Flow detention time= 168.3 min calculated for 29.179 af (81% of inflow)
Center-of-Mass det. time= 88.3 min ( 940.1 - 851.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 879.00' | 654,217 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 879.00 | 3,000 | 0 | 0 |
| 880.00 | 90,812 | 46,906 | 46,906 |
| 881.00 | 293,662 | 192,237 | 239,143 |
| 882.00 | 536,485 | 415,074 | 654,217 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 879.00' | **12.0" Round Culvert** L= 45.0' Ke= 0.500<br>Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 881.00' | **37.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=3.69 cfs @ 13.30 hrs HW=881.96' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.69 cfs @ 4.70 fps)

**Secondary OutFlow** Max=93.12 cfs @ 13.30 hrs HW=881.96' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 93.12 cfs @ 2.63 fps)

## Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 6.02" for 100-Year Bulletin 70 event
Inflow = 65.84 cfs @ 12.11 hrs, Volume= 5.101 af
Outflow = 4.88 cfs @ 16.30 hrs, Volume= 3.946 af, Atten= 93%, Lag= 251.1 min
Primary = 4.88 cfs @ 16.30 hrs, Volume= 3.946 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.19' Surf.Area= 53,842 sf Storage= 131,454 cf
Peak Elev= 890.74' @ 13.43 hrs Surf.Area= 123,587 sf Storage= 268,693 cf (137,239 cf above start)

Plug-Flow detention time= 700.4 min calculated for 0.928 af (18% of inflow)
Center-of-Mass det. time= 235.4 min ( 1,029.1 - 793.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 886.00' | 525,760 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 886.00 | 30,908 | 0 | 0 |
| 887.00 | 40,872 | 35,890 | 35,890 |
| 889.00 | 45,276 | 86,148 | 122,038 |
| 891.00 | 135,445 | 180,721 | 302,759 |
| 892.10 | 270,011 | 223,001 | 525,760 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 889.18' | **15.0" Round Culvert** L= 138.0' Ke= 0.500<br>Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf |
| #2 | Secondary | 892.00' | **73.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=4.89 cfs @ 16.30 hrs HW=890.56' TW=889.42' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 4.89 cfs @ 4.50 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=889.19' TW=886.93' (Dynamic Tailwater)
**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 5.35" for 100-Year Bulletin 70 event
Inflow = 84.61 cfs @ 12.11 hrs, Volume= 10.213 af
Outflow = 13.40 cfs @ 12.82 hrs, Volume= 9.451 af, Atten= 84%, Lag= 42.6 min
Primary = 13.03 cfs @ 12.82 hrs, Volume= 9.440 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.37 cfs @ 12.82 hrs, Volume= 0.011 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 890.02' @ 12.82 hrs Surf.Area= 96,587 sf Storage= 213,504 cf (145,990 cf above start)

Plug-Flow detention time= 261.6 min calculated for 7.901 af (77% of inflow)
Center-of-Mass det. time= 108.0 min ( 994.4 - 886.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 884.00' | 487,275 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 884.00 | 10,000 | 0 | 0 |
| 885.00 | 16,000 | 13,000 | 13,000 |
| 886.00 | 31,740 | 23,870 | 36,870 |
| 889.00 | 39,548 | 106,932 | 143,802 |
| 891.00 | 150,950 | 190,498 | 334,300 |
| 892.00 | 155,000 | 152,975 | 487,275 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 886.93' | **18.0" Round Culvert** L= 63.0' Ke= 0.500<br>Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf |
| #2 | Secondary | 890.00' | **40.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=13.03 cfs @ 12.82 hrs HW=890.02' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 13.03 cfs @ 7.37 fps)

**Secondary OutFlow** Max=0.37 cfs @ 12.82 hrs HW=890.02' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.37 cfs @ 0.39 fps)

## Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 5.91" for 100-Year Bulletin 70 event
Inflow = 30.42 cfs @ 12.07 hrs, Volume= 2.080 af
Outflow = 19.59 cfs @ 12.20 hrs, Volume= 1.676 af, Atten= 36%, Lag= 7.6 min
Primary = 19.59 cfs @ 12.20 hrs, Volume= 1.676 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.69' @ 12.20 hrs Surf.Area= 69,998 sf Storage= 34,315 cf

Plug-Flow detention time= 135.0 min calculated for 1.675 af (81% of inflow)
Center-of-Mass det. time= 57.9 min ( 851.1 - 793.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 863.00' | 3,373,778 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 863.00 | 29,607 | 0 | 0 |
| 864.00 | 88,227 | 58,917 | 58,917 |
| 895.00 | 125,635 | 3,314,861 | 3,373,778 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 863.40' | **50.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=19.58 cfs @ 12.20 hrs HW=863.69' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 19.58 cfs @ 1.36 fps)

## Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 6.02" for 100-Year Bulletin 70 event
Inflow = 10.31 cfs @ 12.11 hrs, Volume= 0.771 af
Outflow = 7.78 cfs @ 12.22 hrs, Volume= 0.769 af, Atten= 24%, Lag= 6.6 min
Primary = 2.94 cfs @ 12.22 hrs, Volume= 0.676 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 4.84 cfs @ 12.22 hrs, Volume= 0.093 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 864.19' @ 12.22 hrs Surf.Area= 8,878 sf Storage= 7,032 cf

Plug-Flow detention time= 18.7 min calculated for 0.768 af (100% of inflow)
Center-of-Mass det. time= 16.5 min ( 809.2 - 792.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 862.00' | 17,715 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 862.00 | 100 | 0 | 0 |
| 863.00 | 2,048 | 1,074 | 1,074 |
| 864.00 | 6,912 | 4,480 | 5,554 |
| 865.00 | 17,409 | 12,161 | 17,715 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 862.00' | **12.0" Round Culvert** L= 38.0' Ke= 0.500<br>Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 864.00' | **24.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=2.94 cfs @ 12.22 hrs HW=864.19' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.94 cfs @ 3.74 fps)

**Secondary OutFlow** Max=4.84 cfs @ 12.22 hrs HW=864.19' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 4.84 cfs @ 1.08 fps)

## Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 5.67" for 100-Year Bulletin 70 event
Inflow = 163.66 cfs @ 12.37 hrs, Volume= 21.965 af
Outflow = 3.20 cfs @ 24.00 hrs, Volume= 2.966 af, Atten= 98%, Lag= 697.6 min
Primary = 3.20 cfs @ 24.00 hrs, Volume= 2.966 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 892.92' @ 24.00 hrs Surf.Area= 476,888 sf Storage= 1,065,249 cf (827,579 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 254.9 min ( 1,093.8 - 839.0 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 887.00' | 1,151,208 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 887.00 | 21,488 | 0 | 0 |
| 890.00 | 113,506 | 202,491 | 202,491 |
| 893.00 | 486,505 | 900,017 | 1,102,508 |
| 893.10 | 487,505 | 48,701 | 1,151,208 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 890.27' | **12.0" Round Culvert** L= 47.0' Ke= 0.500<br>Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900<br>n= 0.025 Corrugated metal, Flow Area= 0.79 sf |
| #2 | Secondary | 893.00' | **13.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<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=3.20 cfs @ 24.00 hrs HW=892.92' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.20 cfs @ 4.07 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.31% Impervious, Inflow Depth > 4.80" for 100-Year Bulletin 70 event
Inflow = 550.71 cfs @ 12.99 hrs, Volume= 145.750 af
Primary = 550.71 cfs @ 12.99 hrs, Volume= 145.750 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 4L: Proposed Discharge

Inflow Area = 379.969 ac, 4.47% Impervious, Inflow Depth > 4.84" for 100-Year Bulletin 70 event
Inflow = 561.22 cfs @ 12.98 hrs, Volume= 153.316 af
Primary = 561.22 cfs @ 12.98 hrs, Volume= 153.316 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

## Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 8.28% Impervious, Inflow Depth > 5.81" for 100-Year Bulletin 70 event
Inflow = 93.14 cfs @ 12.13 hrs, Volume= 7.566 af
Primary = 93.14 cfs @ 12.13 hrs, Volume= 7.566 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

# Appendix D: AIMA

**STANDARD AGRICULTURAL IMPACT MITIGATION AGREEMENT**
between
**Cortland Illinois Solar LLC**

**and the**
**ILLINOIS DEPARTMENT OF AGRICULTURE**
**Pertaining to the Construction of a Commercial Solar Energy Facility**
**in**
**DeKalb 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).

Cortland Illinois Solar LLC, hereafter referred to as Commercial Solar Energy Facility Owner, or simply as Facility Owner, plans to develop and/or operate a 5MW Commercial Solar Energy Facility in DeKalb County [GPS Coordinates: 41.912139, -88.657194 ], which will consist of up to 35 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 Cortland Illinois Solar 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 DeKalb County within the State of Illinois.

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

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

Jerry Costello II

By: Jerry Costello II, Director

Clay Nordsiek

By Clay Nordsiek, Deputy General Counsel

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

5/15, 2024

**Cortland Illinois Solar LLC**

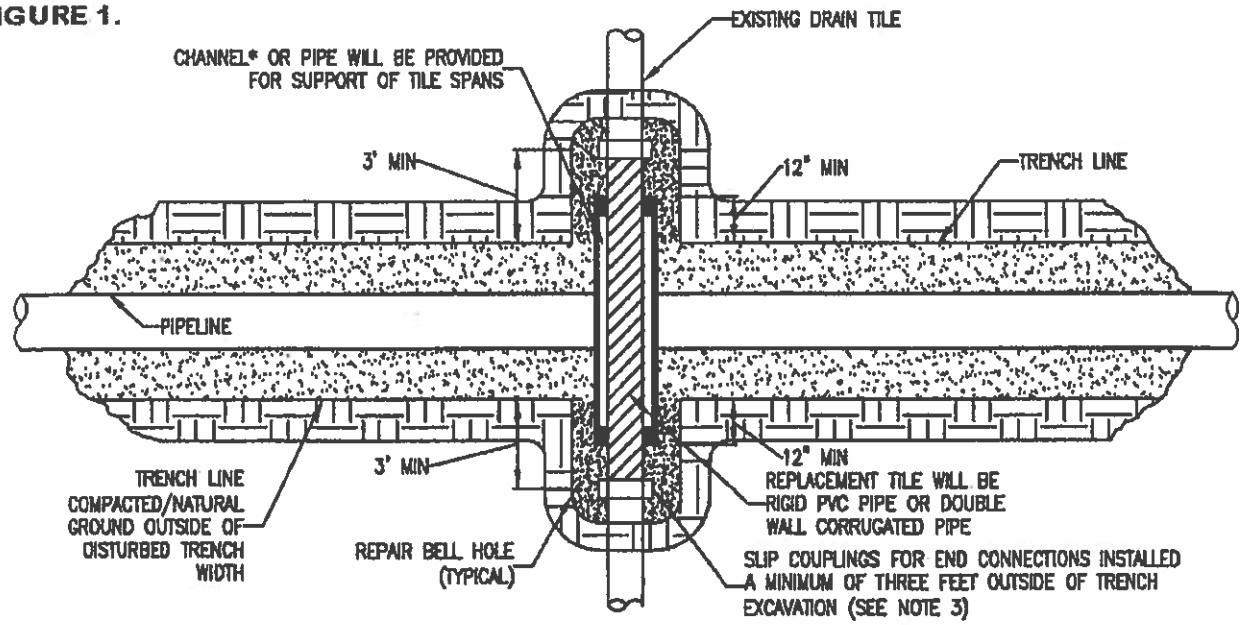
By Kaya Tarhan, CEO

1083 N Collier Blvd #408

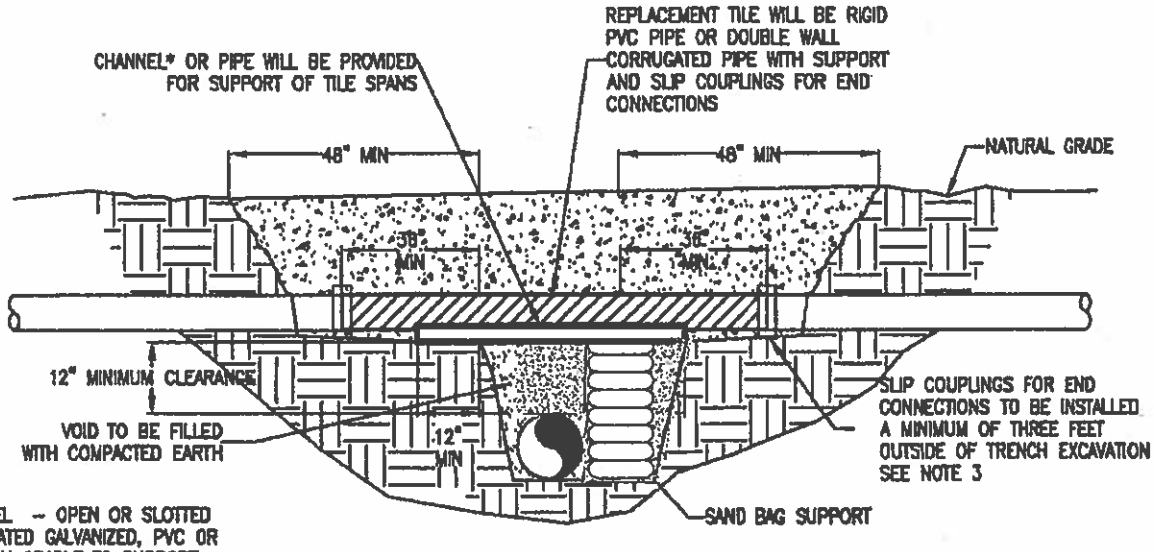
Address

March 28th, 2024

**FIGURE 1.**




PLAN
N.T.S.



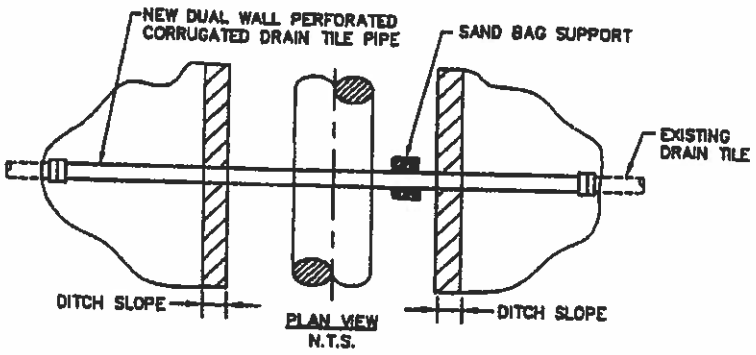

CROSS SECTION
N.T.S.

NOTE:

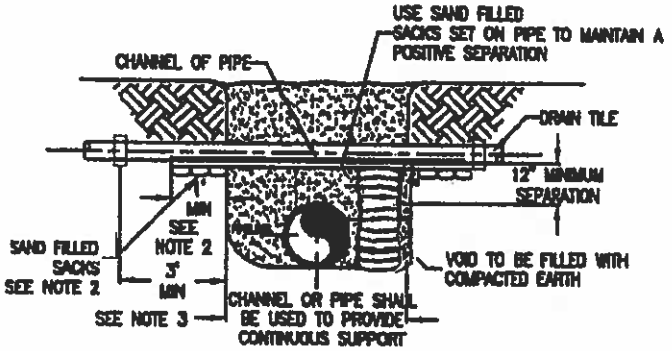
1. IMMEDIATELY REPAIR TILE IF WATER IS FLOWING THROUGH TILE AT TIME OF TRENCHING. IF NO WATER IS FLOWING AND TEMPORARY REPAIR IS DELAYED, OR NOT MADE BY THE END OF THE WORK DAY, A SCREEN OR APPROPRIATE 'NIGHT CAP' SHALL BE PLACED ON OPEN ENDS OF TILE TO PREVENT ENTRAPMENT OF ANIMALS ETC.
2. CHANNEL OR 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.

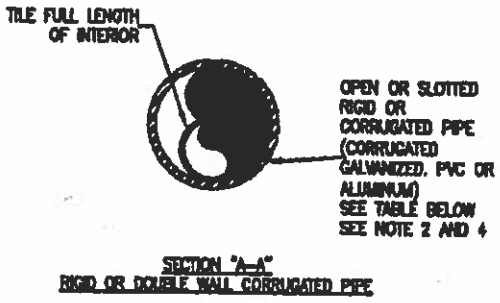
# TEMPORARY DRAIN TILE REPAIR

**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

# Appendix E: Critical Issues Analysis

SOLARSTONE

# CRITICAL ISSUES ANALYSIS
# CORTLAND ILLINOIS SOLAR PROJECT

## CORTLAND ILLINOIS SOLAR

DEKALB COUNTY, ILLINOIS

June 17, 2024

Prepared for:
Cortland Solar LLC

WSB PROJECT NO. 024543-000

wsb

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C – Illinois Department of Natural Resources Ecological Compliance Assessment Tool Results
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# Executive Summary

Seven potential constraints were identified for the project area that may need further assessment or avoidance/minimization measures (**Table 1**). Please note that when a resource is assigned a possible issue designation, it indicates an issue may be present if certain conditions are met (e.g., tree removal, project is federally funded or permitted, et cetera). If those conditions are not met, then no issues are identified for that resource.

**Table 1 -** Critical Issues Analysis Summary

| Resource | Issue Present (Yes, Possible, No) | Comments |
|---|---|---|
| Topography | No | Topographic relief is moderate. |
| Zoning | Yes | The project area is proposed to be annexed into the Town of Cortland in the AG, agricultural district.<br><br>The proposed solar energy facility is permitted in the AG district of the Town of Cortland with a Special Use Permit and subsequent building permit. The town ordinance requires that equipment be set back a minimum of 50 feet (ft) (15.2 meters [m]) from all nonparticipating property lines.<br><br>The height of solar panels, cells, or modules while at full tilt may not exceed 10 ft (3.05 m).<br><br>The site must be enclosed and secured with a fence with a minimum height of 6 ft (1.8 m). Keys shall be provided at locked entrances for access by appropriate emergency personnel.<br><br>The proposed solar energy facility must comply with any applicable state and federal requirements including but not limited to the National Electric Code, Occupational Safety and Health Association regulations, and FAA requirements.<br><br>A building permit is required prior to construction and after Special Use Permit approval. |
| Federal Aviation Administration | No | The Federal Aviation Administration (FAA) Notice Criteria Tool indicates that no further coordination with the FAA is required. |
| Electrical Transmission Lines | No | Based on the U.S. Energy Information Administration mapping system and the U.S. Electric Power Transmission Lines, there were no electric transmission lines (i.e., 69 kilovolts [kV] or more) within the project area or within one mile (1.6 km) of the project area. |

| Resource | Issue Present (Yes, Possible, No) | Comments |
|---|---|---|
| Karst Features, Sinkholes, and Mines | Possible | Based on the U.S. Geological Survey (USGS) USA Karsts, no karst features are within the project area. A carbonate limestone karst feature is within one mile (1.6km) of the project area. No sinkholes or mines were located within the project area or within one mile (1.6 km) of the project area.<br><br>Geotechnical analysis recommended for the project area. The results of the geotechnical analysis will guide further actions, if necessary. |
| Soils | Possible | Based on the U.S. Department of Agriculture Natural Resources Conservation Service Web Soil Service, most soils within the project area were comprised of silt loams (73.3 percent). Approximately 26.7 percent of the project area was comprised of hydric soils. Most of the project area was classified as prime farmland (55.6 percent) followed by prime farmland if drained (44.5 percent).<br><br>A stormwater or groundwater management plan demonstrating best management practices, with erosion and sediment control provisions is recommended.<br><br>Geotechnical analysis recommended for the project area. The results of the geotechnical analysis will guide further actions, if necessary. |
| Surficial Hydrological Resources | Yes | Based on the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory, a riverine wetland (R2UBHx) is mapped within the project area. A USGS National Hydrography Dataset flowline is mapped within the project area, and it corresponds with the riverine wetland within the project area. Also, a 100 Year (Zone A) Federal Emergency Management Agency flood zone was identified within the project area and is associated with the USGS flowline.<br><br>A Level 1 wetland delineation (desktop review) identified three possible wetlands within the project area. A Level 2 wetland delineation (field verification) is recommended to evaluate the potential wetlands within the project area.<br><br>A stormwater or groundwater management plan demonstrating best management practices, with erosion and sediment control provisions is recommended. |

| Resource | Issue Present (Yes, Possible, No) | Comments |
|---|---|---|
| Pipelines | Yes | Based on the U.S. Department of Transportation National Pipeline Mapping System Public Map Viewer, there was a natural gas pipeline (Pipeline ID M500-1) mapped within the project area. The natural gas pipeline is owned by Guardian Pipeline, LLC. No other natural gas pipelines were mapped within one mile (1.6 km) of the project area. There were no hazardous liquid pipelines, liquefied natural gas plants, or breakout tanks within the project area or within one mile (1.6 km) of the project area. |
| Biological Resources | Possible | The Illinois Department of Natural Resources Ecological Compliance Assessment Tool indicated there were no records of state listed species, Illinois Natural Area Inventory sites, dedicated Illinois Nature Preserves, or registered Land and Water Reserves identified in the vicinity of the project location. As such, consultation was terminated. The termination 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 constructed within two years of the date of the termination letter, or any of the above-listed conditions develop, a new consultation is necessary.<br><br>Based on the USFWS Information for Planning and Consultation, the federally endangered Indiana bat (*Myotis sodalis*), federally endangered northern long-eared bat (*Myotis septentrionalis*), federally threatened eastern prairie fringed orchid (*Platanthera leucophaea*), proposed endangered tricolored bat (*Perimyotis subflavus*), non-essential experimental population of whooping crane, and monarch butterfly (*Danaus plexippus*), a candidate for federal listing may occur within the project area or surrounding region. The Indiana bat and eastern prairie fringed orchid are state endangered. The federally endangered rusty patched bumble bee (*Bombus affinis*) is included here due to the proximity of the project area to the USFWS rusty patched bumble bee Low Potential Zone. Also, the bald eagle (*Haliaeetus leucocephalus*) is included here due to being protected under the Bald and Golden Eagle |

| Resource | Issue Present (Yes, Possible, No) | Comments |
|---|---|---|
| | | Protection Act (BGEPA) and the species' range encompasses the project area.<br><br>Although a limited amount of potentially suitable habitat for the monarch butterfly may be available within the project area, its status does not afford them or their habitats legal protection. Also, although there is potentially suitable tricolored bat habitat within the project area, its status does not afford them or their habitats legal protection. Note that the USFWS is expected to decide on the proposed status of the monarch butterfly and tricolored bat in 2024. If they are listed, there may be species specific guidelines. The USFWS released draft tricolored bat guidelines that may be implemented if it is listed.<br><br>Although there appears to be suitable rusty patched bumble bee habitat within the project area, the project area is outside of the USFWS High Potential Zone. As such, no avoidance or minimization measures or surveys are needed for this species.<br><br>Although there is potentially suitable whooping crane stop-over habitat within the project area, the proximity to State Route 38 and the Chicago and North Western railroad suggests that they are unlikely to use it. Also, take prohibitions and USFWS consultation requirements are relaxed for non-essential, experimental populations.<br><br>Potentially suitable habitat for the Indiana bat, bald eagle, and eastern prairie fringed orchid occurs within the project area.<br><br>Potentially suitable habitat for the northern long-eared bat occurs within the project area, but the project does not involve wind turbine operations so USFWS notes the species does not need to be considered.<br><br>If tree removal occurs during project construction within the timelines outlined below, it may require surveys or avoidance windows for nesting birds protected under the Migratory Bird Treaty Act |

| Resource | Issue Present (Yes, Possible, No) | Comments |
|---|---|---|
| | | (MBTA), Bald and Golden Eagle Protection Act, or habitat assessments for the Indiana bat and northern long-eared bat. Also, if impacts to wetlands occur it may require surveys or avoidance windows for the eastern prairie fringed orchid or nesting birds protected under the MBTA. For reference:<br>• the typical nesting season for birds in Illinois is April through August;<br>• the typical nesting season for bald eagles in Illinois is January through August. Please note that this is only a concern if construction activities occur within 660 ft (201 m) of an active bald eagle nest; and<br>• the active season for Indiana bats is April 1 through November 15.<br><br>If tree removal is planned for the project, it is strongly recommended to complete all tree removal between November 16 and March 31, inclusive.<br><br>Overall, if the above-mentioned activities occur outside of these time periods (i.e., October 1 through March 31), surveys and additional approvals or permits should not be needed for migratory birds, eastern prairie fringed orchid, Indiana bats, or bald eagles. |
| Special Management Areas | No | Based on the USGS Protected Areas Database of the U.S., no federal, state, or other public lands were identified within the project area or within one mile (1.6 km) of the project area. Based on the National Conservation Easement Database, no conservation easements were identified within the project area or within one mile (1.6 km) of the project area. |
| Archaeological, Cultural, and Historic Resources | Possible | No historic or archaeological resources were identified within the project area or within one mile (1.6 km) of the project area based on the Illinois Historic Preservation Division Historic and Architectural Resources Geographic Information System database.<br><br>Please note that if the project requires federal permitting, approval, or uses federal funding additional historic and cultural resources studies |

| Resource | Issue Present (Yes, Possible, No) | Comments |
|---|---|---|
| | | may be required to comply with Section 106 of the National Historic Preservation Act. |

# Introduction and Purpose

## 1.1 Project Description

Cortland Solar LLC is proposing to construct a solar energy facility within 79.4 acres in DeKalb County, Illinois (Project Area) (**Figure 1**). Specifically, the project area is in Township 40N Range 5E Sections 27 and 28 immediately adjacent south of the eastern portion of the City of Cortland, Illinois (**Figure 2**). The 79.4-acre project area is generally bounded by the following features (**Figure 2**):

- North: Chicago and North Western railroad and cultivated cropland.
- East: Cultivated cropland and Union Ditch Number 1.
- South: Residences, cultivated cropland, Union Ditch Number 1, and State Route 38.
- West: Cultivated cropland.

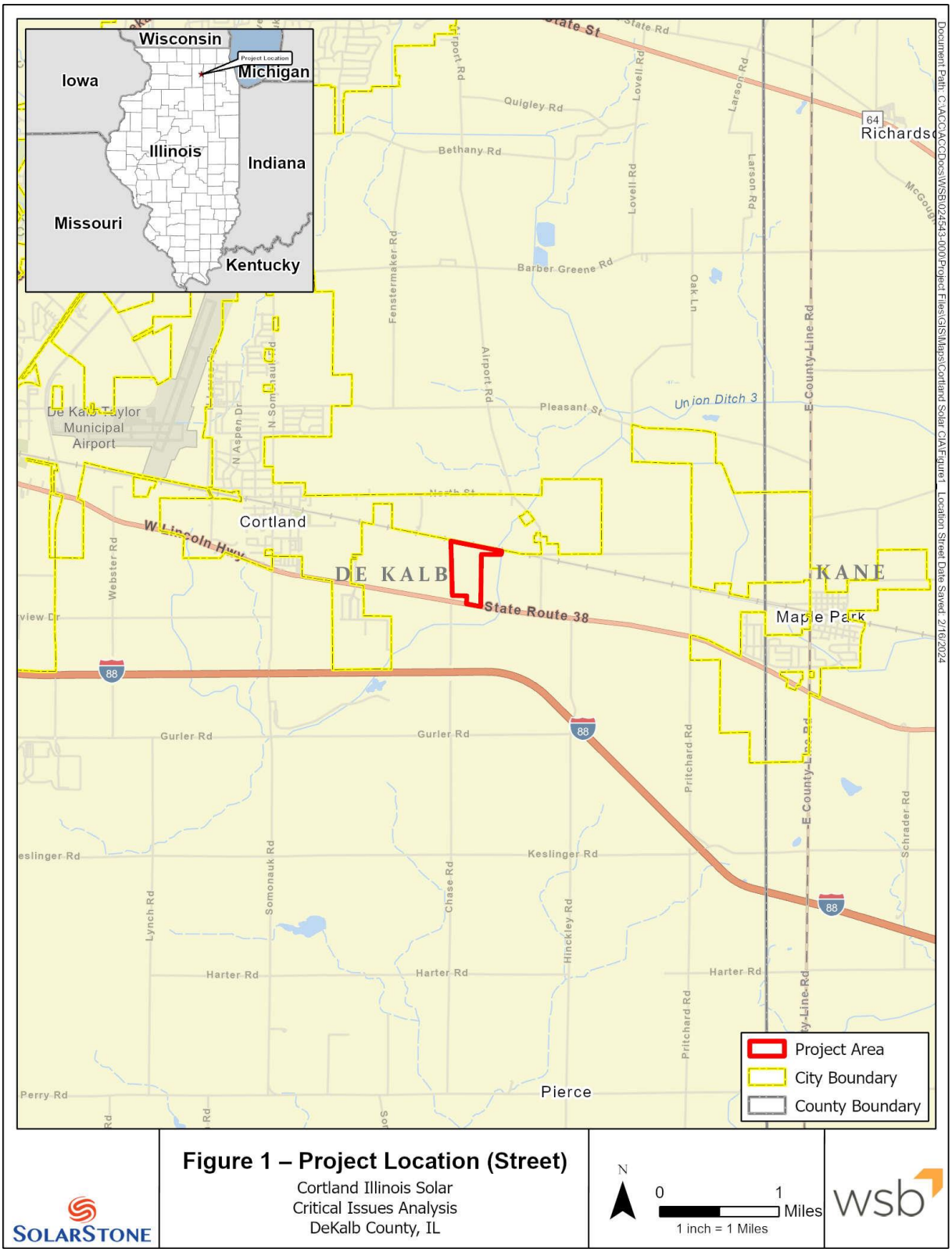



**Figure 1 – Project Location (Street)**
Cortland Illinois Solar
Critical Issues Analysis
DeKalb County, IL

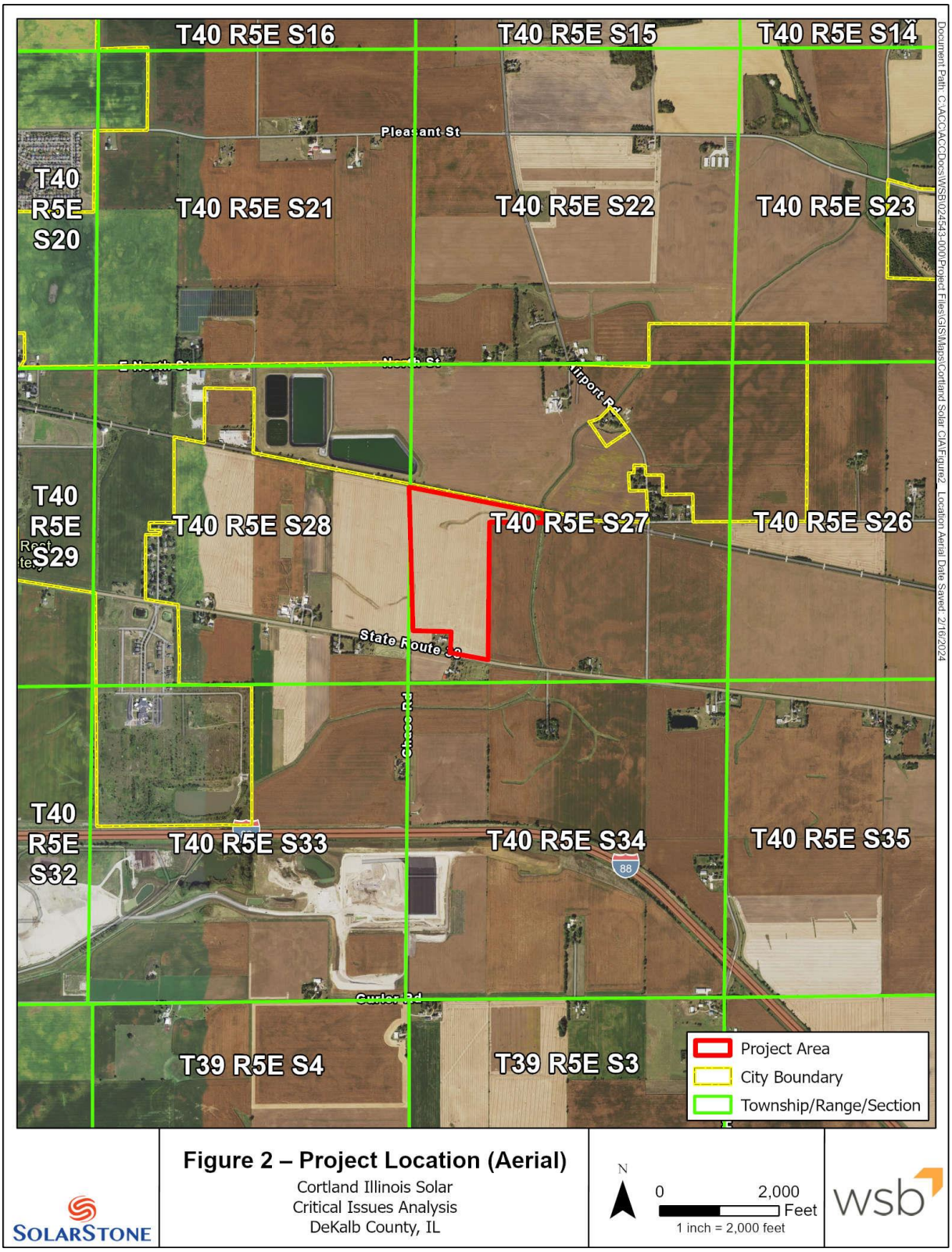



**Figure 2 – Project Location (Aerial)**
Cortland Illinois Solar
Critical Issues Analysis
DeKalb County, IL

## 1.2 Purpose

On behalf of Cortland Solar LLC, WSB completed a desktop-based Critical Issues Analysis for the proposed project. The purpose of this review was to identify if environmental, biological, cultural or historical features occur within or near the project area that may impact the siting or construction of a solar energy facility.

# Methods

Publicly available data were reviewed to identify environmental, biological, cultural, or historical features within or near the project area. Publicly available data reviewed included remote sensing data, geographic information system (GIS) data, historic imagery, and information from local, state or federal departments or agencies. The data collection effort included obtaining information from the following resources:

- Illinois Department of Natural Resources (IDNR) Ecological Compliance Assessment Tool (EcoCAT)
- Illinois Historic Preservation Division (IHPD) Historic and Architectural Resources Geographic Information System (HARGIS)
- Illinois State Geological Survey (ISGS) Coal Mines in Illinois
- ISGS Illinois Sinkhole Areas
- National Conservation Easement Database (NCED)
- U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS)
- U.S. Department of Transportation (USDoT) National Pipeline Mapping System (NPMS)
- U.S. Electric Power Transmission Lines
- U.S. Energy Information Administration Energy Mapping System
- U.S. Federal Aviation Administration (FAA) Notice Criteria Tool
- U.S. Federal Emergency Management Agency (FEMA) flood map
- U.S. Fish and Wildlife Service (USFWS) Critical Habitat for Threatened and Endangered Species
- USFWS Information for Planning and Consultation (IPaC)
- USFWS National Wetland Inventory (NWI)
- U.S. Geological Survey (USGS) National Hydrography Dataset (NHD)
- USGS National Land Cover Database (NLCD)
- USGS Protected Areas Database of the U.S. (PADUS)
- USGS Topographic Maps
- USGS USA Karsts

The results of the desktop review are provided below are provided below.

# Results

## 1.3 Topography

Topography within the project area ranges from 852 feet (ft) (259 meters [m]) above mean sea level (amsl) in the northeastern corner of the project area to 868 ft (264 m) amsl from the southeastern portion of the project area (**Figure 3**). Topographic relief appears to be moderate.

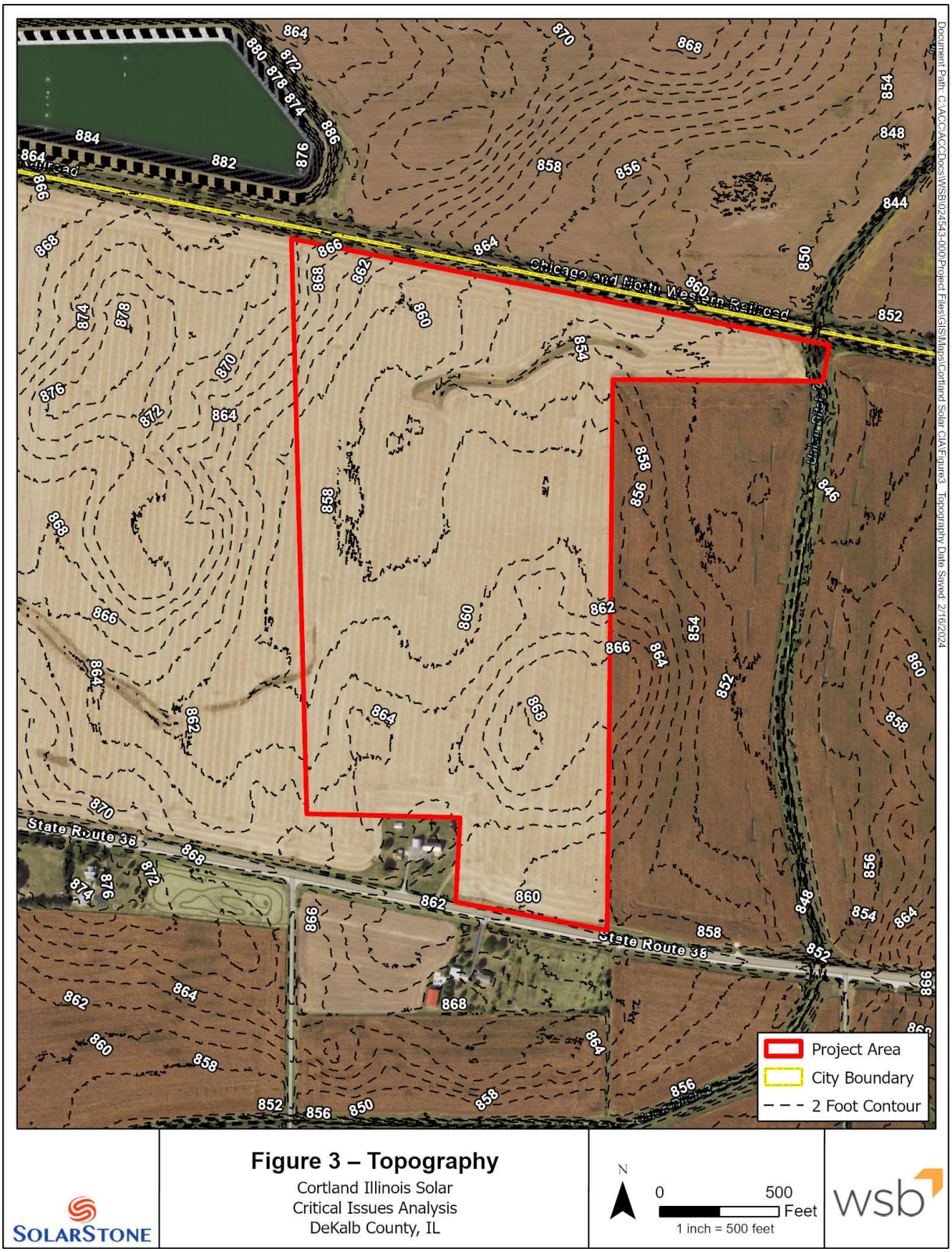


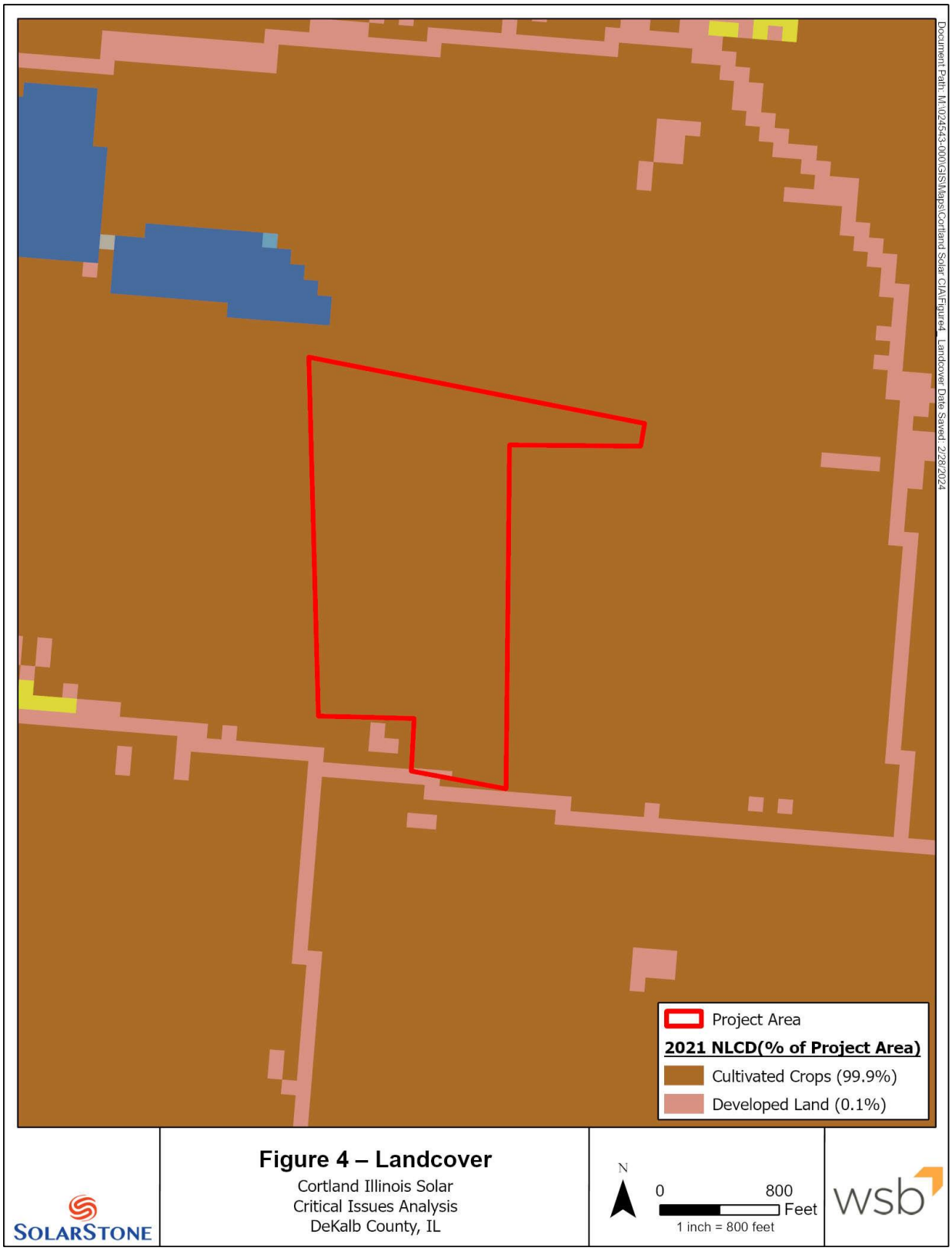

**Figure 3 – Topography**
Cortland Illinois Solar
Critical Issues Analysis
DeKalb County, IL

## 1.4 Land Use

Two land cover types were identified within the project area based on the USGS NLCD. The project area is predominantly comprised of cultivated cropland (99.9 percent) followed by a minor component of developed land (0.1 percent) (**Table 2**) (**Figure 4**).

**Table 2 –** Land cover types and their respective coverages within the project area.

| Land Cover | Acres | Percent of Project Area |
|---|---|---|
| Cultivated Cropland | 79.3 | 99.9 |
| Developed Land | 0.1 | 0.1 |
| **TOTAL** | **79.4** | **100.0** |
| Note: Individual acreages or percentages may not sum to total due to rounding. | | |


Document Path: M:\024543-000\GIS\Maps\Cortland Solar CIA\Figure4_Landcover Date Saved: 2/28/2024
Project Area
2021 NLCD(% of Project Area)
Cultivated Crops (99.9%)
Developed Land (0.1%)
SOLARSTONE
Figure 4 – Landcover
Cortland Illinois Solar
Critical Issues Analysis
DeKalb County, IL
N
0
800
Feet
1 inch = 800 feet
wsb

## 1.5 Zoning and Special Considerations

### Zoning

The project area is proposed to be annexed into the Town of Cortland in the AG, agricultural district.

The proposed solar energy facility is permitted in the AG district of the Town of Cortland with a Special Use Permit and subsequent building permit. The town ordinance requires that equipment be set back a minimum of 50 ft (15.2 m) from all nonparticipating property lines. The height of solar panels, cells, or modules while at full tilt may not exceed 10 ft (3.1 m).

The site must be enclosed and secured with a fence with a minimum height of 6 ft (1.8 m). Keys shall be provided at locked entrances for access by appropriate emergency personnel. Appropriate warning signs must be provided on fences and transformers in accordance with Occupational Safety and Health Association (OSHA) regulations, National Electrical Safety Code, and American National Standards Institute Z535 Safety Sign Standards. Signs at entrances shall include the facility's 911 address and a 24-hour emergency contact number.

Special Use Permit

The following materials must be submitted with the Special Use Permit application:

- Site plan;
- Interconnection status information;
- Ground cover information;
- IDNR EcoCAT results; and a
- Decommissioning plan.

The proposed solar energy facility must comply with any applicable state and federal requirements including the National Electric Code, OSHA regulations, and FAA requirements.

Building Permit

A building permit is required prior to construction and after Special Use Permit approval. Application materials must include:

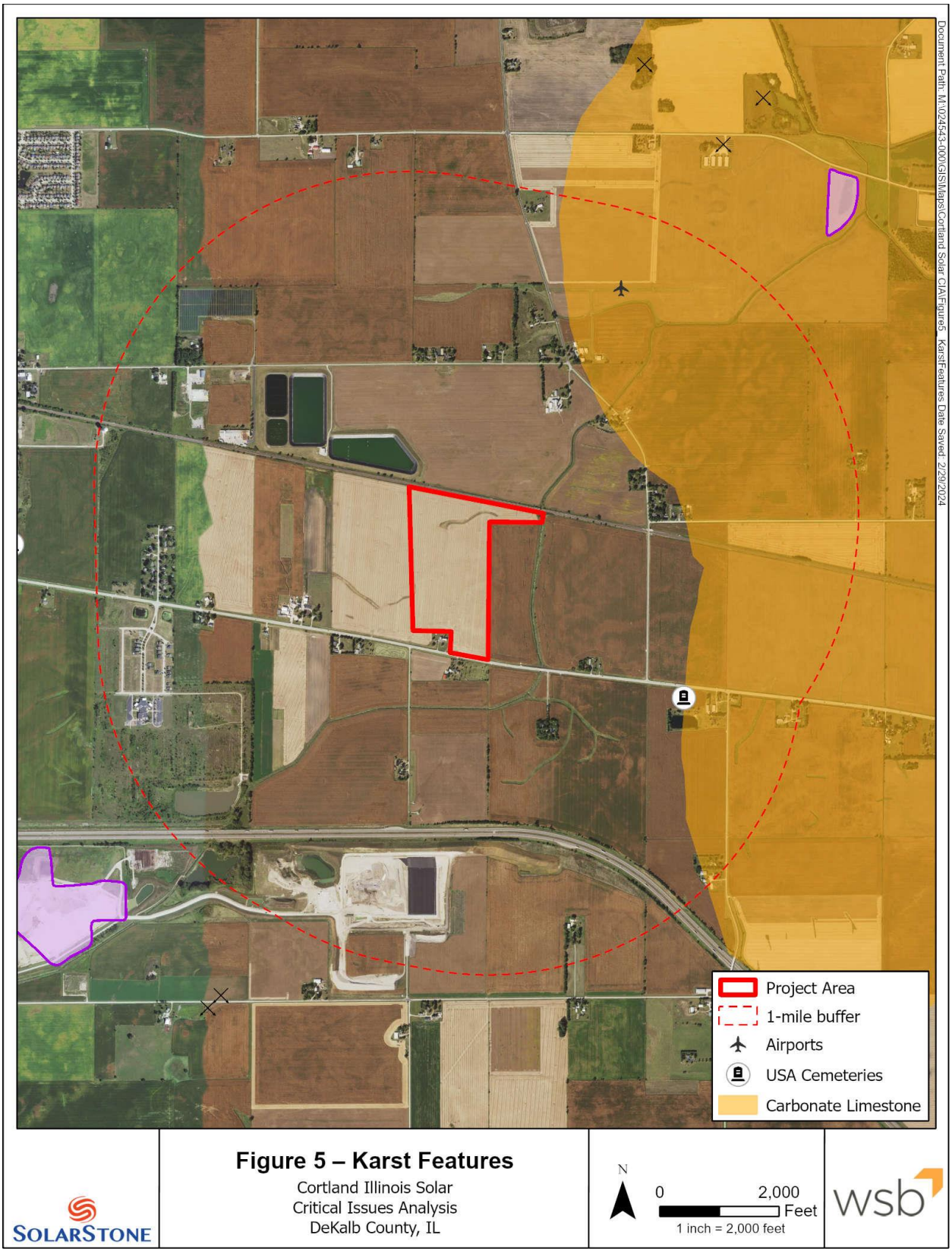
- A decommissioning plan financial surety; and
- Proof of liability insurance commencing with issuance of building permit.

### Special Considerations

There are no airports within the project area. There is one Airport (Ruder) within one mile (1.6 km) of the project area. The FAA Notice Criteria Tool indicates that no further coordination with the FAA is required as the project area does not exceed Notice Criteria (**Appendix A**).

Based on the U.S. Energy Information Administration mapping system and the U.S. Electric Power Transmission Lines, there were no electric transmission lines (i.e., 69 kilovolts [kV] or more) within the project area or within one mile (1.6 km) of the project area.

Based on the USGS USA Karsts, there are no karst features within the project area. There is a carbonate limestone karst feature within one mile (1.6 km) of the project area (**Figure 5**) Based on the ISGS, there are no mines and sinkholes within the project area or within one mile (1.6 km) of the project area.


Document Path: M:\024543-000\GIS\Maps\Cortland Solar CIA\Figure5_KarstFeatures Date Saved: 2/29/2024
Project Area
1-mile buffer
Airports
USA Cemeteries
Carbonate Limestone
SOLARSTONE
Figure 5 – Karst Features
Cortland Illinois Solar
Critical Issues Analysis
DeKalb County, IL
N
0
2,000
Feet
1 inch = 2,000 feet
wsb

## 1.6 Soils

Based on the USDA NRCS WSS, most soils within the project area were comprised of silt loam (73.3 percent of the project area) (**Table 3**) (**Figure 6**). Approximately 26.7 percent of the project area was comprised of hydric soils (**Table 3**) (**Figure 6**).

**Table 3 –** Soil types and their respective coverages within the project area.

| Map Unit Symbol and Map Unit Name | Hydric Rating | Acres | Percent of Project Area |
|---|---|---|---|
| 152A: Drummer silty clay loam, 0 to 2 percent slopes | 100 | 21.2 | 26.7 |
| 667A: Kaneville silt loam, 0 to 2 percent slopes | 8 | 20.9 | 26.3 |
| 104A: Virgil silt loam, 0 to 2 percent slopes | 10 | 14.1 | 17.8 |
| 667B: Kaneville silt loam, 2 to 5 percent slopes | 0 | 10.7 | 13.5 |
| 325C2: Dresden silt loam, 4 to 6 percent slopes, eroded | 4 | 6.4 | 8.1 |
| 154A: Flanagan silt loam, 0 to 2 percent slopes | 4 | 3.1 | 3.9 |
| 512B: Danabrook silt loam, 2 to 5 percent slopes | 8 | 2.1 | 2.6 |
| 171B: Catlin silt loam, 2 to 5 percent slopes | 0 | 0.9 | 1.1 |
| **Total** | **--** | **79.4** | **100.0** |

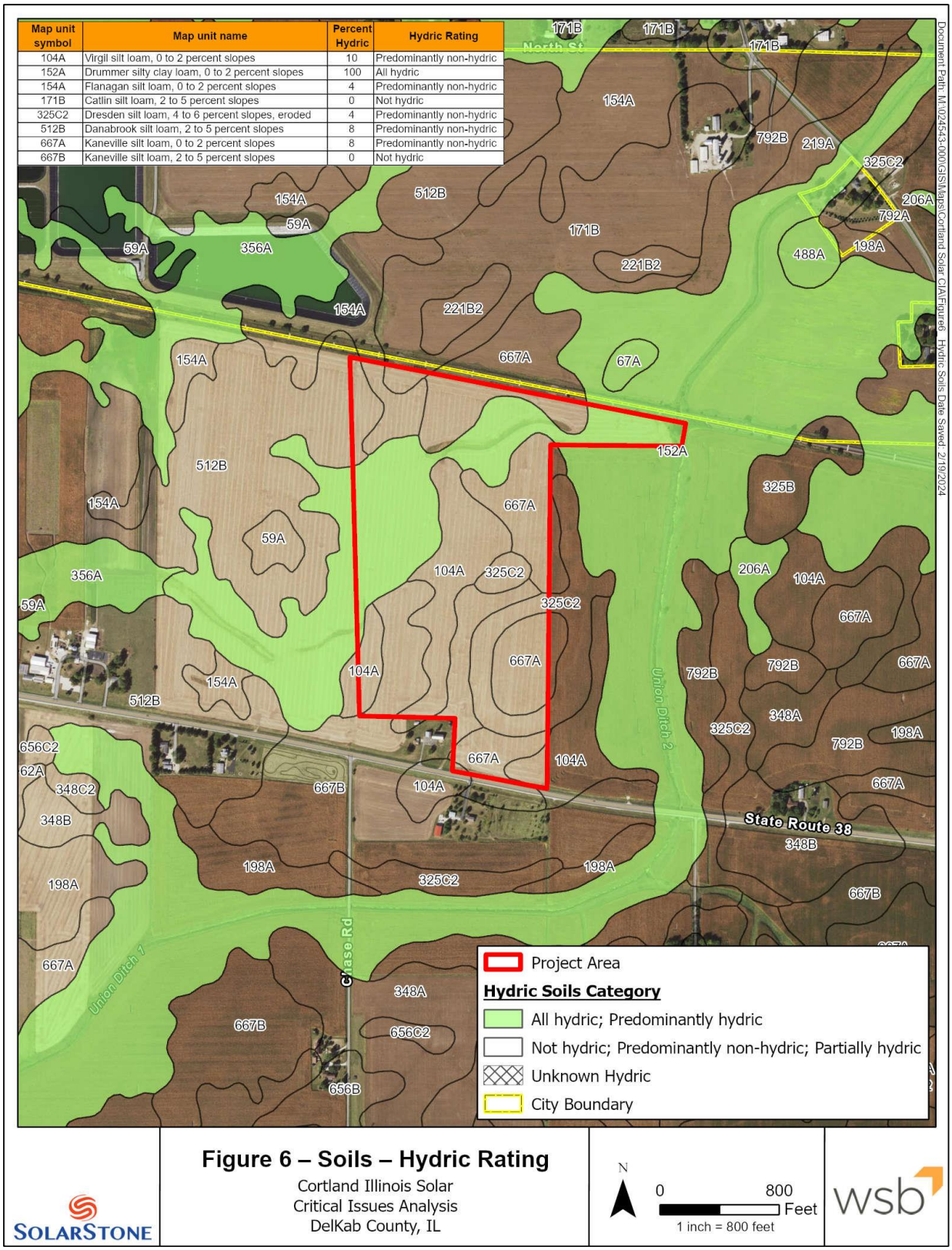



**Figure 6 – Soils – Hydric Rating**

Cortland Illinois Solar
Critical Issues Analysis
DelKab County, IL

Most of the project area was classified as prime farmland (55.5 percent) followed by prime farmland if drained (44.5 percent) (**Table 4**) (**Figure 7**).

**Table 4 –** Farmland classifications and their respective coverages within the project area.

| Map Unit Symbol and Map Unit Name | Acres | Percent of Project Area |
|---|---|---|
| Prime farmland if drained | 44.1 | 55.5 |
| Prime farmland | 35.3 | 44.5 |
| **Total** | **79.4** | **100.0** |

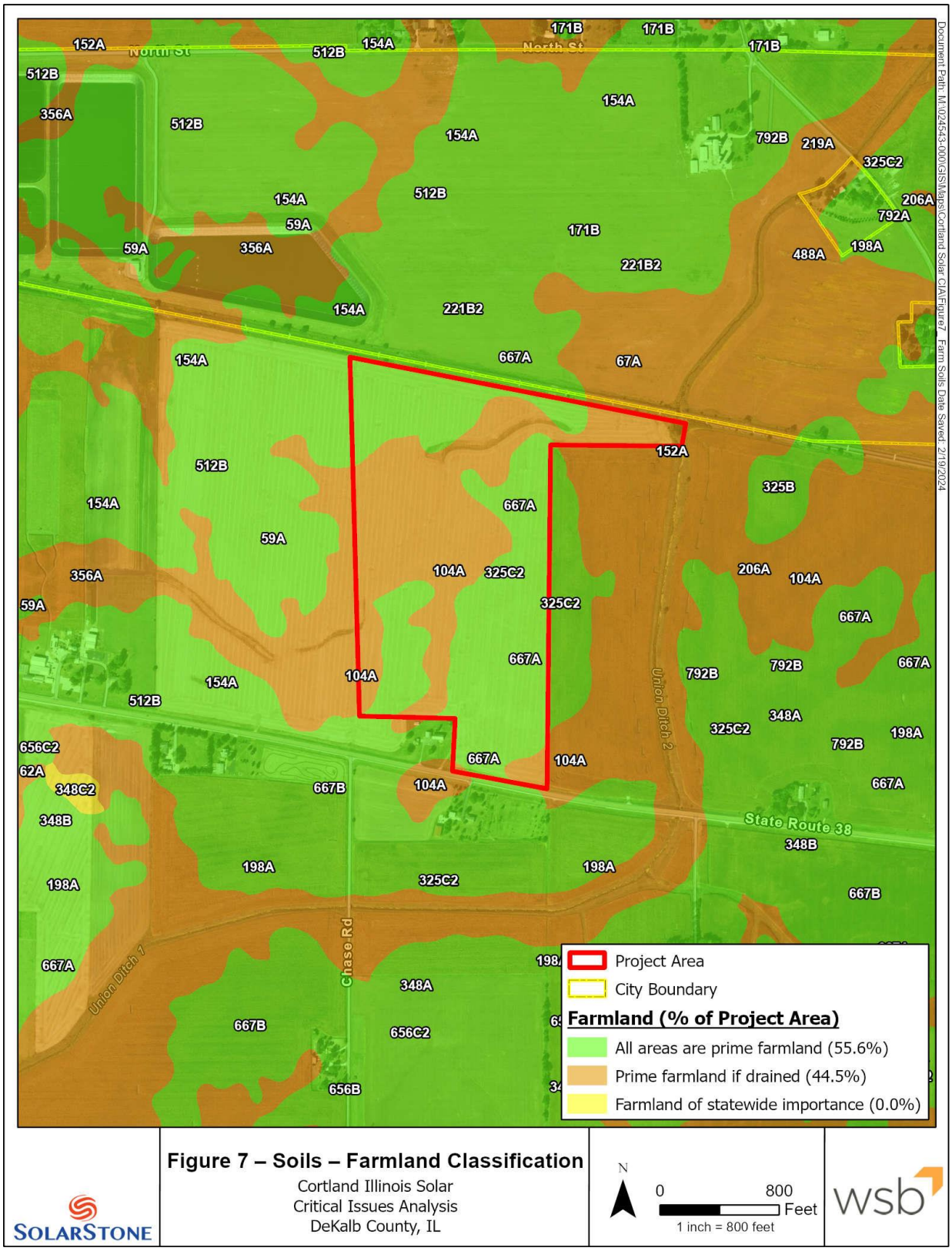



**Figure 7 – Soils – Farmland Classification**
Cortland Illinois Solar
Critical Issues Analysis
DeKalb County, IL

## 1.7 Surficial Hydrological Resources

Based on the USFWS NWI, a riverine wetland (R2UBHx) is mapped within the project area (**Figure 8**). A USGS NHD flowline (Union Ditch Number 1) is mapped within the project area and corresponds with the riverine wetland within the project area. There was a 100-Year (Zone A) FEMA flood zone that is associated with the USGS flowline within the project area (**Figure 8**).

A Level 1 wetland delineation (desktop review) identified three possible wetlands within the project area (**Figure 8**).

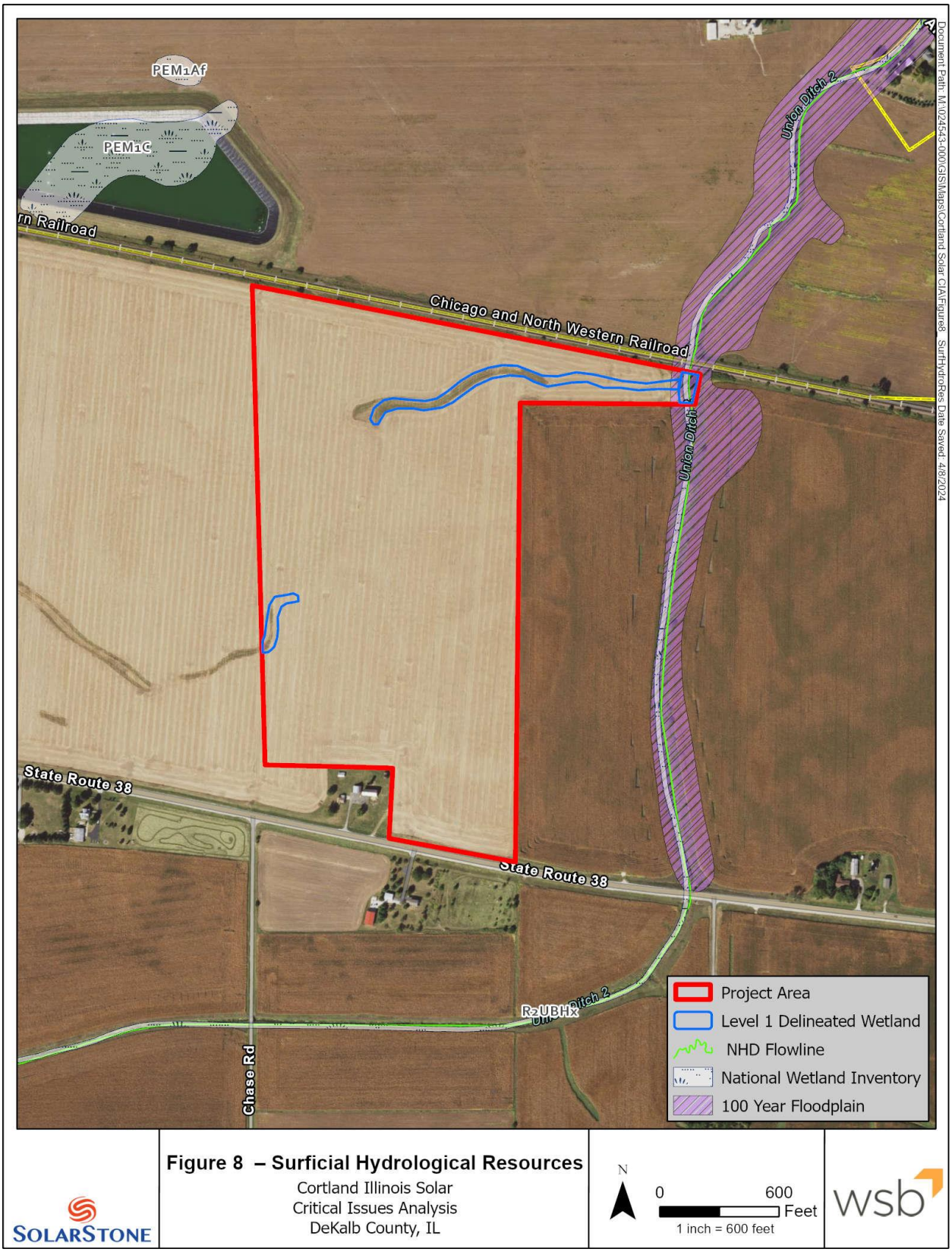



**Figure 8 – Surficial Hydrological Resources**
Cortland Illinois Solar
Critical Issues Analysis
DeKalb County, IL

N
0 600 Feet
1 inch = 600 feet

SOLARSTONE

wsb

## 1.8 National Pipeline Mapping System

Based on the USDOT NPMS Public Map Viewer, there was a natural gas pipeline mapped within the project area. The natural gas pipeline (Pipeline ID M500-1) is owned by Guardian Pipeline, LLC (**Appendix B**). No other natural gas pipelines were mapped within one mile (1.6 km) of the project area. There were no hazardous liquid pipelines, liquefied natural gas plants, or breakout tanks within the project area or within one mile (1.6 km) of the project area.

## 1.9 Biological Resources

### Illinois Department of Natural Resources Ecological Compliance Assessment Tool

The IDNR EcoCAT (Project # 2410685; February 16, 2024) indicated there were no records of state listed species, Illinois Natural Area Inventory sites, dedicated Illinois Nature Preserves, or registered Land and Water Reserves identified in the vicinity of the project location (**Appendix C**). As such, consultation was terminated. The termination 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 constructed within two years of the date of the termination letter, or any of the above-listed conditions develop, a new consultation is necessary.

### Federally Protected Species

Based on the USFWS IPaC, three federally threatened or endangered species, a proposed endangered species, a non-essential experimental population, and a candidate species for federal listing may occur within the project area or surrounding region (**Appendix D**). The six species identified include the federally endangered Indiana bat (*Myotis sodalis*), federally endangered northern long-eared bat (*Myotis septentrionalis*), federally threatened eastern prairie fringed orchid (*Platanthera leucophaea*), proposed endangered tricolored bat (*Perimyotis subflavus*), non-essential experimental population of whooping crane, and monarch butterfly (*Danaus plexippus*), a candidate for federal listing. The Indiana bat and eastern prairie fringed orchid are state endangered. The federally endangered rusty patched bumble bee (*Bombus affinis*) is included here due to the proximity of the project area to the USFWS rusty patched bumble bee Low Potential Zone. Also, the bald eagle (*Haliaeetus leucocephalus*) is included here due to being protected under the Bald and Golden Eagle Protection Act (BGEPA) and the species' range encompasses the project area.

### Indiana bat (*Myotis sodalis*)

The Indiana bat is federally and state endangered. The Indiana bat range extends throughout Illinois. Primary threats to Indiana bat populations include adverse effects from the fungus (*Pseudogymnoascus destructans*) that manifests as white-nose syndrome, human disturbance during hibernation, and loss of summer roosting habitat.

Indiana bats hibernate in caves and mines during the winter. Suitable Indiana bat roosting and foraging habitat includes a variety of forested/wooded areas including fencerows and riparian corridors, where they roost and forage, and may include adjacent and interspersed non-forested habitats such as emergent wetlands and edges of agricultural fields, old fields, or pastures. Suitable forested/wooded areas contain multiple potential roost sites (i.e., living or dead trees) in dense or loose aggregates of trees with variable amounts of canopy closure.

The nearest USFWS designated Indiana bat critical habitat is located approximately 18 miles (29 kilometers) south of the project area. As potentially suitable Indiana bat summer roosting habitat appears to be limited or absent, and foraging habitat appears to be available within the project area, the likelihood of occurrence is considered low to moderate.

### Northern long-eared bat (*Myotis septentrionalis*)

The northern long-eared bat is federally endangered. The northern long-eared bat range extends throughout Illinois. Primary threats to the northern long-eared bat populations include adverse effects from the fungus (*Pseudogymnoascus destructans*) that manifests as white-nose syndrome, human disturbance during hibernation, and loss of summer roosting habitat.

Northern long-eared bats hibernate in caves and mines during the winter. Suitable roosting and foraging habitat includes a variety of forested/wooded areas including fencerows and riparian corridors, and may include adjacent and interspersed non-forested habitats such as emergent wetlands and edges of agricultural fields, old fields, or pastures. Suitable forested/wooded areas may contain multiple potential roost sites (i.e., living or dead trees) in dense or loose aggregates of trees with variable amounts of canopy closure.

No critical habitat is identified for the northern long-eared bat. Potentially suitable northern long-eared bat summer roosting habitat appears to be limited or absent within the project area, though foraging habitat appears to be available. The likelihood of occurrence is considered low to moderate. Additionally, USFWS notes that this bat species only needs to be considered if the project involves wind turbines.

### Tricolored bat (*Perimyotis subflavus*)

Tricolored bats are proposed endangered at the federal level. Tricolored bats occur throughout Illinois. Primary threats to tricolored bats include habitat loss and adverse effects from the fungus that manifests as white-nose syndrome.

Tricolored bats hibernate in caves and mines. In the summer, tricolored bats often roost in trees, but some males and non-reproductive females also roost in their winter hibernaculum. Maternity colonies may be established in trees, rock crevices, or barns and other buildings.

As potentially suitable tricolored bat summer roosting habitat appear to be limited or absent, and foraging habitat appears to be available within the project area, the likelihood of occurrence is considered low to moderate.

### Monarch butterfly (*Danaus plexippus*)

As a candidate species for listing, monarchs are not afforded any legal protective status. Monarch butterflies occur throughout Illinois during the summer and migratory periods. Primary threats to monarchs include habitat loss and the use of herbicides on their host plant, milkweeds (*Asclepias* spp.).

Monarch butterflies use fields and parks where native milkweed, and other flowering plant species are common. Monarch larvae are milkweed obligates, however adults feed on a variety of flowering plants.

Potentially suitable monarch habitat appears to be limited or absent within the project area. As such, the probability of monarch occurrence within the project area is considered low to moderate.

### Rusty patched bumble bee (*Bombus affinis*)

The rusty patched bumble bee is federally and state endangered. The rusty patched bumble bee is distributed throughout northern Illinois and locally throughout central Illinois. Primary threats to rusty patched bumble bees include habitat loss, disease, and pesticides.

Rusty patched bumble bees occur in a variety of habitats including prairies, woodlands, marshes, agricultural landscapes, and residential parks and gardens. Rusty patched bumble bees require areas that support sufficient food (nectar and pollen from diverse and abundant flowers), undisturbed nesting

sites in proximity to floral resources and overwintering sites for hibernating queens. Nesting sites include underground and abandoned rodent cavities or clumps of grass (i.e., bunchgrasses) and overwintering sites include patches of undisturbed soil along woodland edges.

The USFWS adapted a habitat connectivity model to identify the zones around current records (2007-2022) where there is a high potential for rusty patched bumble bees to occur. The zones are referred to as High Potential Zones or Low Potential Zones. Low Potential Zones are areas unlikely to have rusty patched bumble bees present.

There is rusty patched bumble bee Low Potential Zone within one mile (1.6 km) of the project area (**Figure 9**). Although potentially suitable rusty patched bumble bee habitat is available but limited within the project area, the project area is not within a Potential Zone, indicating that the potential for occurrence is low.

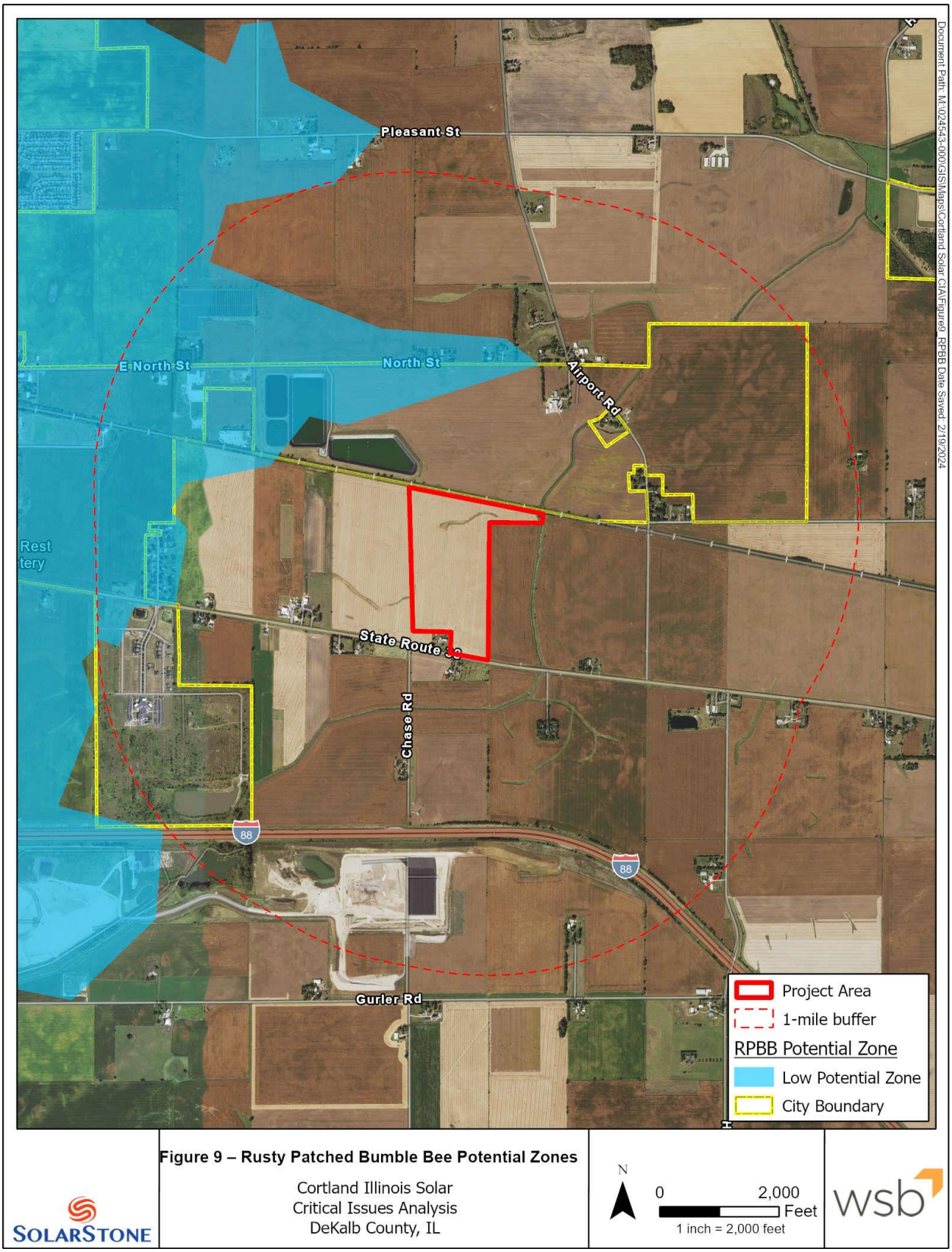



**Figure 9 – Rusty Patched Bumble Bee Potential Zones**

Cortland Illinois Solar
Critical Issues Analysis
DeKalb County, IL

### Whooping crane (*Grus americana*)

The eastern population of whooping crane is considered experimental and non-essential. Non-essential, experimental populations are not considered essential to the continued existence of a species. Take prohibitions and USFWS consultation requirements are relaxed for non-essential, experimental populations. The eastern population of whooping cranes typically occur in northern Illinois during the summer and in southern Illinois during the winter. Primary threats to whooping crane populations include habitat loss and degradation.

During migration, whooping cranes use wetlands with emergent vegetation and shallow water (i.e., < 18 inches [46 cm] deep), including shallow marshes and wet meadows. Whooping cranes also use flooded agricultural fields and shallow river bottoms. Whooping cranes avoid areas with tall structures (e.g., trees, buildings, et cetera).

As there is potentially suitable whooping crane foraging or stop-over habitat within the project area but limited due to the proximity to State Route 38 and the Chicago and North Western railroad, the likelihood of whooping crane occurrence is low to moderate.

### Bald eagle (*Haliaeetus leucocephalus*)

Bald eagles are protected under the BGEPA. The Illinois bald eagle population occurs year-round. Primary threats to bald eagle populations in Illinois include climate change and lead poisoning.

Bald eagles typically nest in mature trees near water sources that support an adequate food supply. Once built, a nest may be reused and added to in subsequent years and alternate nest sites are common. Wintering grounds typically contain open water, food resources, and protective roosting sites. Preferred roost sites are in stands of mature trees with well-developed canopies.

As potentially suitable bald eagle roosting and nesting habitat appears to be limited or absent within the project area, the likelihood of occurrence is considered low to moderate.

### Eastern prairie fringed orchid (*Platanthera leucophaea*)

Eastern prairie fringed orchid are federally threatened and state endangered. Eastern prairie fringed orchids occur in the northern half of Illinois. Threats to eastern prairie fringed orchid populations include the loss and conversion of suitable habitat for agricultural purposes, successional progression, and competition with invasive species.

Eastern prairie fringed orchids occur in mesic prairies, sedge meadows, marsh edges, and bogs. Eastern prairie fringed orchids typically occur in grassy areas devoid of woody encroachment.

As potentially suitable eastern prairie fringed orchid habitat within the project area appears to be available but limited, the potential for occurrence is considered low to moderate.

## 1.10 Special Management Areas

Based on the USGS PADUS, no federal, state, or other public lands occur within the project area or within one mile (1.6km) of the project area. Also, based on the NCED, no conservation easements were identified within the project area or within one mile (1.6 km) of the project area.

## 1.11 Archaeological, Cultural, and Historical Resources

No historic or archaeological resources were identified within the project area or within one mile (1.6 km) of the project area based on the IHPD HARGIS database.

# References

Federal Aviation Administration. Notice Criteria Tool. Available at: Notice Criteria Tool (faa.gov)

Federal Emergency Management Agency. Map Service Center. Available at: https://msc.fema.gov/portal/home.

Illinois Historic Preservation Division. HARGIS. Available at: https://idnr.maps.arcgis.com/apps/webappviewer/index.html?id=fb288126309544878addd6496243fa91.

National Conservation Easement Database. Mapping Application. Available at: NCED Mapping Application (conservationeasement.us).

National Pipeline Mapping System. Public Viewer. Available at: https://pvnpms.phmsa.dot.gov/PublicViewer/.

U.S. Department of Agriculture Natural Resources Conservation Service. Web Soil Survey. Available at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

U.S. Energy Information Administration. Electricity Map Viewer. Available at: https://atlas.eia.gov/apps/electricity/explore.

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_____. Information for Planning and Consultation. Available at: https://ecos.fws.gov/ipac/.

_____. National Wetlands Inventory. Available at: National Wetlands Inventory (usgs.gov)

U.S. Geological Survey. National Hydrography Dataset. Available at: NHDPlus Upper Mississippi Data (Vector Processing Unit 07) | US EPA

_____. Gap Analysis Project (GAP), 2020, Protected Areas Database of the United States (PAD-US) 2.1: U.S. Geological Survey data release. Available at: https://viewer.nationalmap.gov/advanced-viewer/.

_____. USA Karst. Available at: ArcGIS - USA Karst

# Appendix A

## Federal Aviation Administration Notice Criteria Tool Results

# Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2018.2.0

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.

You must file with the FAA at least 45 days prior to construction if:

- your structure will exceed 200ft above ground level
- your structure will be in proximity to an airport and will exceed the slope ratio
- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the FAA Co-location Policy
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

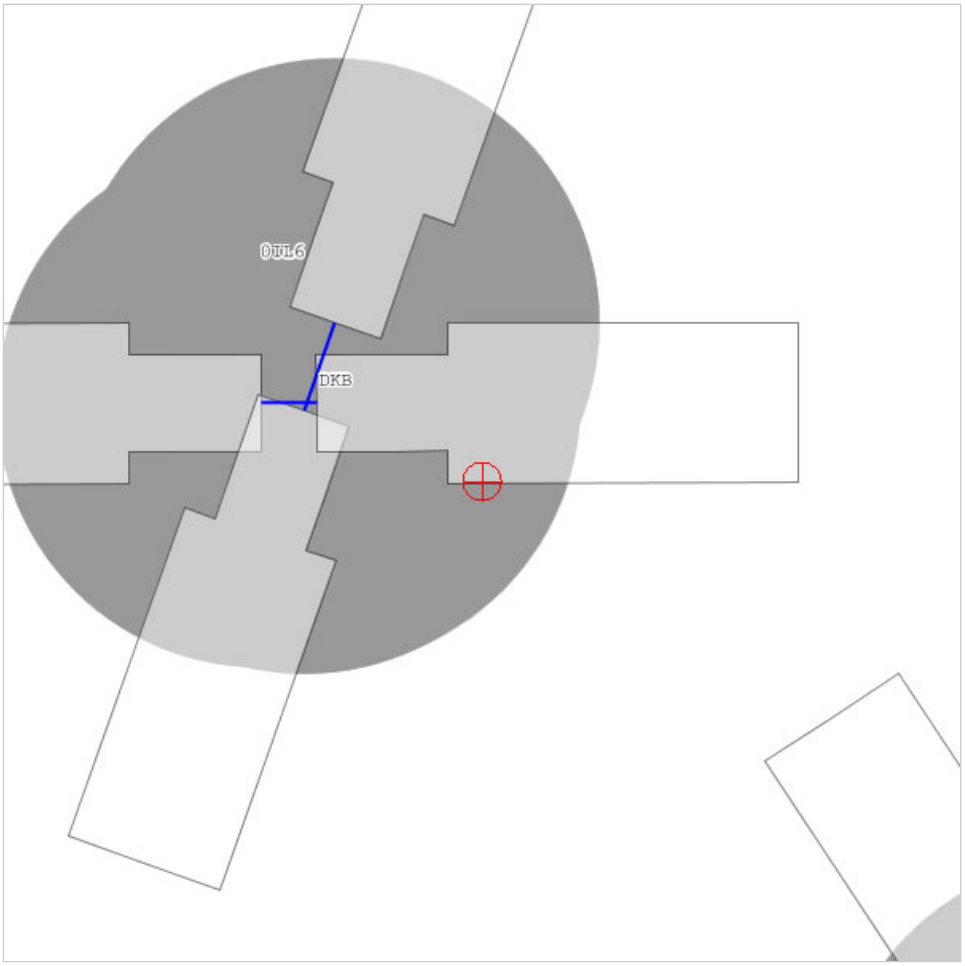
If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

The tool below will assist in applying Part 77 Notice Criteria.

| | |
|---|---|
| * **Structure Type:** | SOLAR \| Solar Panel<br>Please select structure type and complete location point information. |
| **Latitude:** | 41 Deg 54 M 45 S N |
| **Longitude:** | 88 Deg 39 M 26 S W |
| **Horizontal Datum:** | NAD83 |
| **Site Elevation (SE):** | 869 (nearest foot) |
| **Structure Height :** | 40 (nearest foot) |
| **Is structure on airport:** | (●) No<br>( ) Yes |

## Results

You do not exceed Notice Criteria.


DIL6
DKB

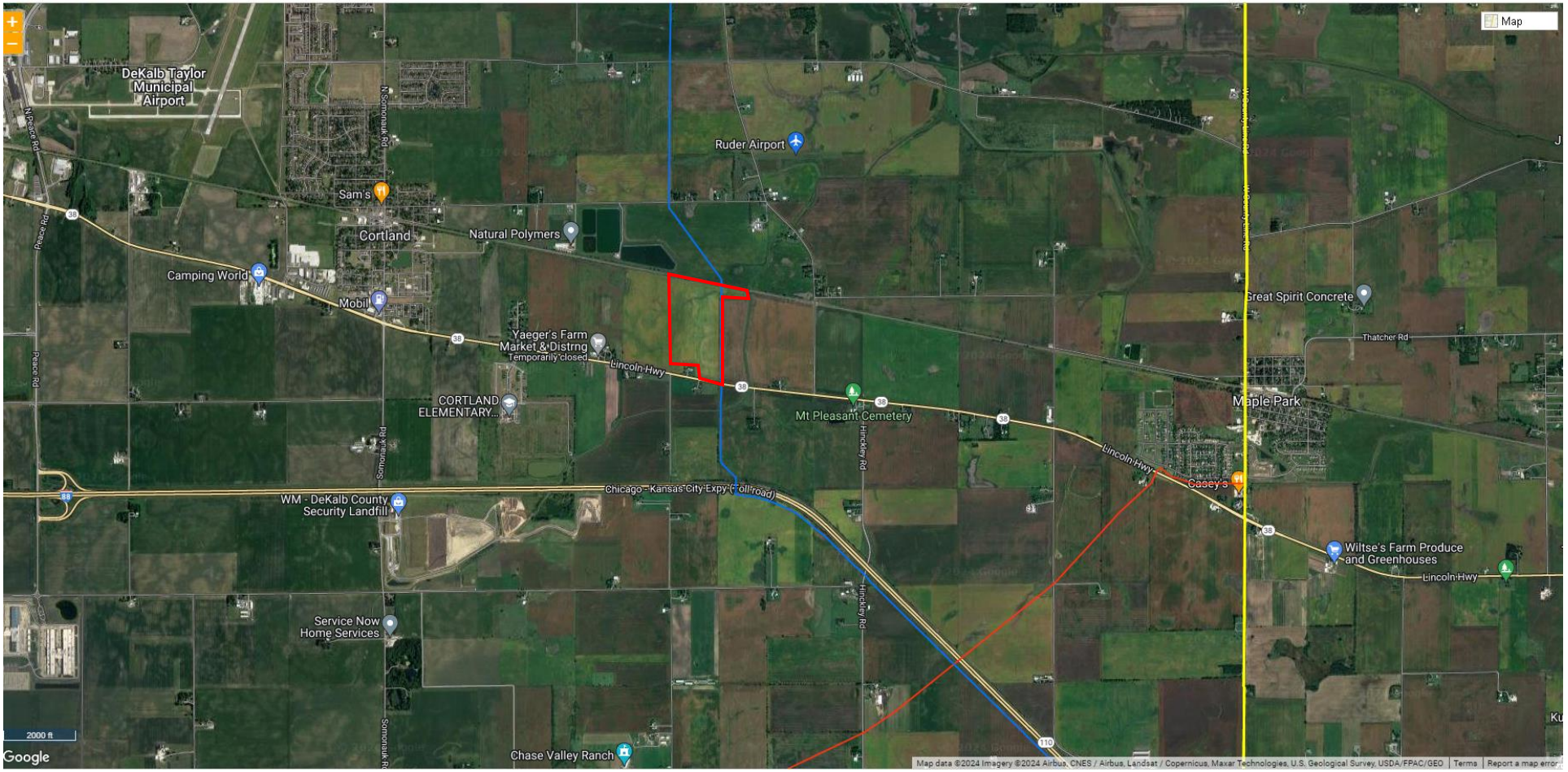
# Appendix B

## National Pipeline Mapping System Results

Public Viewer

Change County Close Public Viewer

Map Layers | Query Tools | Enter search term (min 4 chars) | Help




Ready | Zoom Level: 14 of 19 (1:24,000) Closest Zoom for Pipelines | (lat,long): 41.930874, -88.711468 | Map Showing Pipelines in: DeKalb, IL

Identify - Total 1 record(s) found

31712

| Attribute | Value |
|---|---|
| **Category: PIPELINE ATTRIBUTES** | |
| OPERATOR ID | 31712 |
| OPERATOR NAME | GUARDIAN PIPELINE, LLC |
| SYSTEM NAME | GUARDIAN |
| SUBSYSTEM NAME | UNKNOWN |
| PIPELINE ID | M500-1 |
| MILES | 37.43 |
| COMMODITY CATEGORY | Natural Gas |
| COMMODITY DESCRIPTION | |
| INTERSTATE DESIGNATION | Y |
| PIPELINE STATUS CODE | Active (filled) |
| REVISION DATE | 03/13/2023 |
| FRP SEQUENCE NUMBER | |
| INSPECTION AUTHORITY | PHMSA |
| **Category: GENERAL CONTACT** | |
| FIRST NAME | Donnie |
| LAST NAME | Krumsiek |
| TITLE | Regulatory Compliance Specialist |
| ENTITY | |
| PHONE | (918) 561-8019 |
| EMAIL | pipelineawareness@oneok.com |
| ADDRESS | 100 West Fifth St |
| CITY | Tulsa |
| STATE | OK |
| ZIP | 74103 |
| Public Awareness URL | https://www.oneok.com/public-awaren... |

# Appendix C

## Illinois Department of Natural Resources Ecological Compliance Assessment Tool Results

EcoCAT
Ecological Compliance Assessment Tool

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

*Applicant:* Cortland Solar, LLC
*Contact:* Lucas Wandrie
*Address:* 3822 Zenith Ave S
Minneapolis, MN 55410

*Project:* Cortland Illinois Solar
*Address:* 15110 Lincoln Hwy, DeKalb

*Description:* Solar energy facility

*IDNR Project Number:* 2410685
*Date:* 02/16/2024

## 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:* DeKalb

*Township, Range, Section:*
40N, 5E, 27

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

**Government Jurisdiction**
Planning and Zoning
Derek M. Hiland
Administration Building
110 E Sycamore St
Sycamore, Illinois 60178

**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.

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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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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.

# Appendix D

## U.S. Fish and Wildlife Service Information for Planning and Consultation Report

# 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: 06/17/2024 16:16:07 UTC
Project Code: 2024-0047976
Project Name: Solar CIA - Cortland

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: 2024-0047976
Project Name: Solar CIA - Cortland
Project Type: Power Gen - Solar
Project Description: Proposed solar energy facility
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@41.91284065,-88.65679019384662,14z

Counties: DeKalb 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. Note that 2 of these species should be considered only under certain conditions.

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>This species only needs to be considered under the following conditions:<br>▪ This species only needs to be considered if the project includes wind turbine operations.<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>This species only needs to be considered under the following conditions:<br>▪ This species only needs to be considered if the project includes wind turbine operations.<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 in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

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 likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

| 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 "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper

Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

**Probability of Presence** (■)

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.

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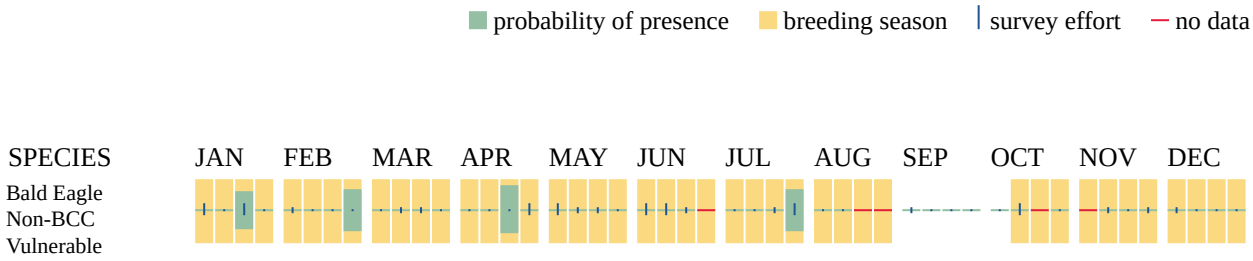



Additional information can be found using the following links:

- 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

# 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 in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

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, see the PROBABILITY OF PRESENCE SUMMARY below 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 |
| 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 |
| 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 |
| 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 |

| NAME | BREEDING SEASON |
|---|---|
| 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 |
| Semipalmated Sandpiper *Calidris pusilla*<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/9603 | Breeds elsewhere |
| Short-billed Dowitcher *Limnodromus griseus*<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/9480 | Breeds elsewhere |
| 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 "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

**Probability of Presence** (■)

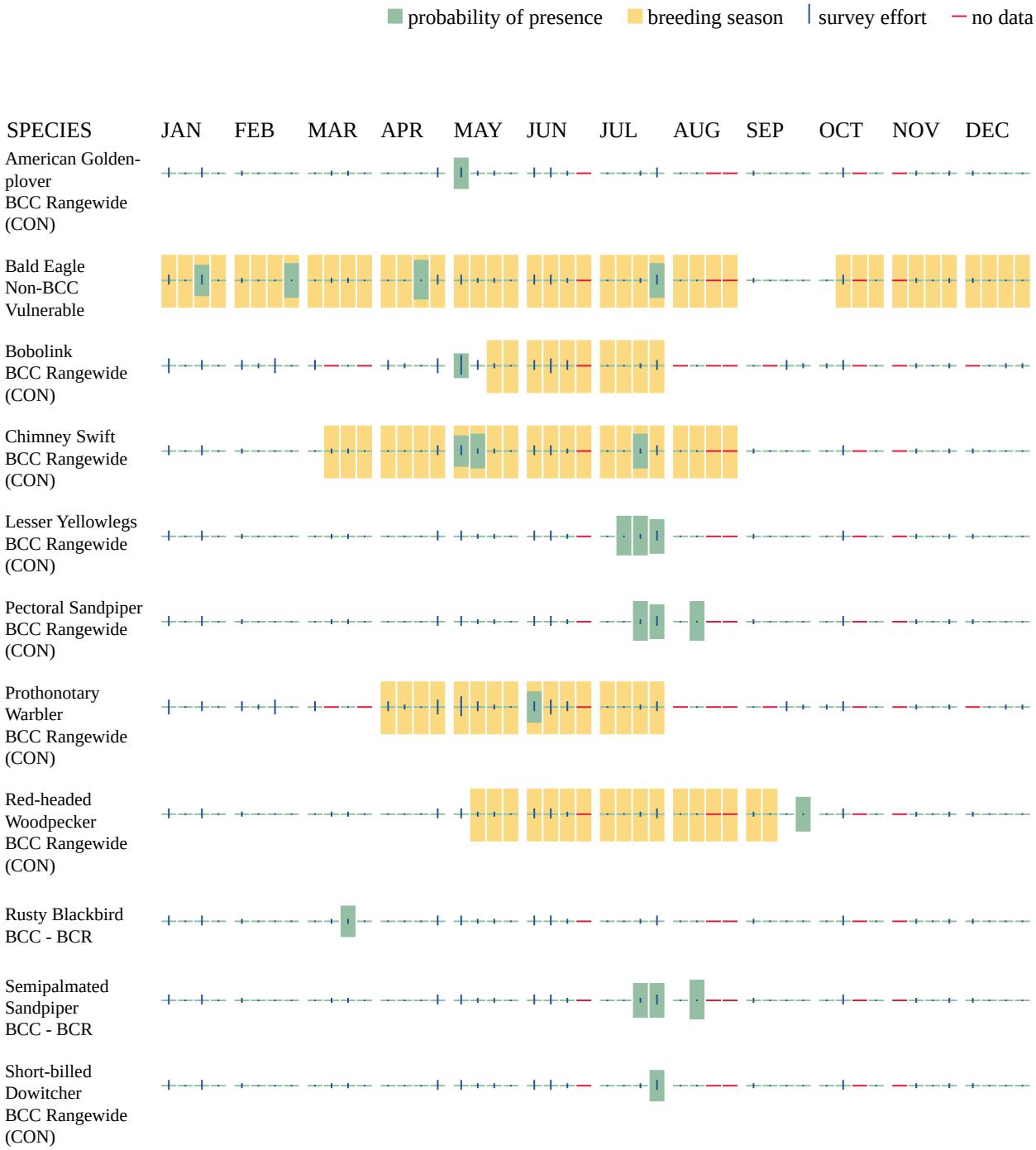
Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

**Breeding Season** (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

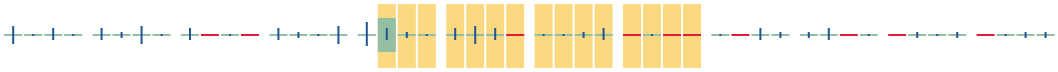
**Survey Effort** (|)

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.



Wood Thrush
BCC Rangewide
(CON)



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

- R2UBHx

# IPAC USER CONTACT INFORMATION


| | |
|---|---|
| Agency: | WSB |
| Name: | Hayden Garza |
| Address: | 2700 La Frontera Blvd |
| Address Line 2: | Suite 110 |
| City: | Round Rock |
| State: | TX |
| Zip: | 78681 |
| Email | hgarza@wsbeng.com |
| Phone: | 5127364511 |

# Appendix F: Decommissioning Plan

# Cortland Solar Site
# Decommissioning Plan

**WSB**

**Project No. 024543-000**

**Engineer Certification**

I hereby certify that this Decommissioning Plan was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Illinois.

| | | |
|---|---|---|
| Jared D. Dummer | 062-071280 | October 21, 2025 |
| Jared D. Dummer, P.E. | IL Registration No. | Date |

# Solar Site Decommissioning Plan

## I) Introduction

All decommissioning and restoration activities will adhere to the requirements of appropriate governing authorities, and in accordance with all federal, state and local permits. The decommissioning and restoration process comprises the removal of above and below ground structures and restoration of topsoil.

## II) Procedures For Decommissioning After Ceasing Operation

The Project consists of numerous recyclable materials, including glass, semiconductor material, steel, wood, aluminum, copper, and plastics. When the Project reaches the end of its operational life, the component parts can be dismantled and recycled. The Project components will be dismantled and removed using minimal impact conventional construction equipment and recycled or disposed of safely.

## III) Conditions of the Agricultural Impact Mitigation Agreement (AIMA)

An Agricultural Impact Mitigation Agreement (AIMA) does apply to this project. Conditions of the AIMA are listed below. The mitigative actions specified in the Construction and Deconstruction Standards and Policies outlined in the AIMA and as set forth below shall be implemented.

A. All Deconstruction activities may be subject to the Town of Cortland and local requirements. However, the specifications outlined in the AIMA shall be the minimum standards applied to all Construction or Deconstruction activities.

B. All mitigative actions are subject to modification through negotiation by Landowners and a representative of the Commercial Solar Energy Facility Owner, provided such changes are negotiated in advance of Deconstruction activities.

C. No later than 45 days prior to the Deconstruction of a Commercial Solar Energy Facility, the Commercial Solar Energy Facility Owner will provide the Landowner(s) with a telephone number the Landowner can call to alert the 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.

D. If there is a change in ownership of the Commercial Solar Energy Facility, the Commercial Solar Energy Facility Owner assuming ownership of the facility shall provide written notice within 90 days to the Town of Cortland and to Landowners of such and the existing Financial Assurance requirements, plus the other terms of the

AIMA, shall apply to the new Owner.

## IV) Deconstruction of Commercial Solar Energy Facilities

A. The Commercial Solar Energy Facility Owner shall, at its expense, complete Deconstruction of a Commercial Solar Energy Facility within six (6) months after the end of the Useful Life of the Commercial Solar Energy Facility.

B. Deconstruction of a Commercial Solar Energy Facility shall include the removal/disposition of all solar related equipment/facilities, including the following utilized for operation of all Commercial Solar Energy 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, electrical collection 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 Roads(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.

## V) Table 1: Equipment Dismantling and Removal

| Structures | Activity |
|---|---|
| Above Ground | |
| PV Arrays | • Disconnect all above ground wirings, cables and electrical interconnections.<br>• Remove PV modules from racks, temporarily store on-site in delineated area before removal by truck to appropriate facility(ies).<br>• Dismantle and remove all racks and support structures, including extraction of in-ground support structures (see below). Temporarily store on-site before removal by truck to recycling facility. |
| Inverter units and transformers | • Disconnect and remove all electrical equipment.<br>• Remove inverters and associated components including combiners, low voltage switchgear |

| | |
|---|---|
| | and medium voltage transformers and transport off-site to appropriate facility.<br><br>• Unbolt substation transformer and remove from the foundation with a crane.<br><br>• If concrete foundations have been used for inverter units or substation, they will be removed (see below). |
| Access roads and other components | • Consult with landowner(s) to determine if access roads should be left in place for their continued use.<br><br>• If one or more access roads are removed after consultation with the landowner(s), the aggregate materials will be excavated by a backhoe/front-end loader, along with any underlying geotextile fabric.<br><br>• All compacted areas will be tilled in a manner adequate to restore the sub-grade material to the proper density and depth, consistent with the surrounding fields. Clean, compatible subgrade material, followed by topsoil will be applied as necessary.<br><br>• Above ground lines and poles will be removed along with associated equipment (isolation switches, fuses, metering) and holes will be filled in with clean fill or onsite fill.<br><br>• Removal of the perimeter fencing, followed by removal of fence pole foundations will be completed. |
| Below-ground Structures | |
| Underground cables | • Underground electrical lines running between inverters and the substation will be removed. |
| Equipment foundations | • The substation, inverter units and steel racking for the solar modules will have foundations that require removal. These<br><br>foundations will likely consist of steel piles but may also include concrete. Other underground infrastructure requiring removal may include concrete protective electrical structures. It is anticipated that structures will be fully removed from the ground and that the affected area shall be backfilled as |

| | |
|---|---|
| | necessary.<br><br>• In the event that a structure breaks during excavation, all broken portions will be removed by the EPC contractor. Waste concrete will be recycled off-site by a concrete recycler or crushed on-site and used as backfill material.<br><br>• All foundation materials will be removed from the site via truck and managed at appropriate facilities. |

## VI) Table 2: Management of Excess Material and Waste

| Material/Waste | Activity |
|---|---|
| PV panels | A. If there is no possibility for reuse of panels will either be returned to the manufacturer for appropriate recycling/disposal or will be transported to a recycling facility where the glass, metal and semiconductor materials will be separated and recycled. Panels will be managed as per best management practices that may be in effect at the time of decommissioning. |
| Metal array mounting racks and steel supports | B. These materials will be recycled off-site at an approved facility. |
| Transformers and substation components | C. Oil from the transformers will be removed on-site to reduce the potential for spills and will be transported to an approved facility for disposal. The substation transformer and step-up transformers in the inverter units will be transported off-site to be sent back to the manufacturer, recycled, reused, or safely disposed off-site in accordance with current standards and best practices. |
| Inverters, fans, fixtures | D. The metal components of the inverters, fans and fixtures will be recycled, where possible. Remaining components will be disposed of in accordance with the standards of the day. |
| Concrete inverter/transformer foundations | E. Concrete foundations will be broken down and transported by certified and licensed contractor to an approved recycling disposal facility. |
| Cables and wiring | F. The electrical line that connects the substation to the point of common coupling |

| | |
|---|---|
| | will be disconnected and recycled, if possible, or disposed of at an approved facility. Support poles, if made of untreated wood, will be chipped for reuse. Associated electronic equipment (isolation switches, fuses, metering) will be transported off-site to be sent back to the manufacturer, recycled, reused, or safely disposed off-site in accordance with current standards and best practices. |
| Fencing | G. Fencing will be removed and recycled at a metal recycling facility. |
| Debris | H. Any remaining debris on the site will be separated into recyclables/residual wastes and will be transported from the site and managed as appropriate. |

## VII) Decommissioning Notification

During the Town of Cortland permit process, the Commercial Solar Energy Facility Owner shall file with the town, a Decommissioning Plan. An updated decommissioning plan will be submitted every three to five years after issuance of the special use permit.

## VIII) Financial Framework and Estimated Cost for Decommissioning

A. The Commercial Solar Energy Facility Owner shall provide the Town of Cortland with Financial Assurance to cover the estimated costs of Deconstruction of the Commercial Solar Energy 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 Commercial Solar Energy Facility Owner shall provide the Town of Cortland with Financial Assurance to cover ten (10) percent of the estimated costs of Deconstruction of the Commercial Solar Energy Facility as determined in the Deconstruction Plan provided during the town permit process.
2. On or before the sixth anniversary of the Commercial Operation Date, the Commercial Solar Energy Facility Owner shall provide the Town of Cortland with Financial Assurance to cover fifty (50) percent of the estimated costs of Deconstruction of the Commercial Solar Energy Facility as determined in the Deconstruction Plan provided during the town permit process.
3. On or before the eleventh anniversary of the Commercial Operation Date, the Commercial Solar Energy Facility Owner shall provide the Town of Cortland with Financial Assurance to cover one hundred (100) percent of the estimated costs of Deconstruction of the commercial Solar Energy Facility as determined in the Deconstruction Plan provided during the tenth year of the Commercial Operation Date.

The Financial Assurance shall not release the surety from liability until the Financial Assurance is replaced. The use of salvage value as a setoff is dependent upon an agreement by the Commercial Solar Facility Owner that all interests in the salvage value are subordinate to that of the Town of Cortland if Abandonment occurs.

B. The Town of Cortland may – but is not required to – reevaluate the estimated costs of Deconstruction of any Commercial Solar Energy Facility after the tenth anniversary and every five years thereafter, of the Commercial Operation Date. Based on any reevaluation, the town may require the changes in the level of Financial Assurance used to calculate the phased coverages described in Section VIII, A. required from the Commercial Solar Energy Facility Owner. If the Town of Cortland is unable to its satisfaction to perform the investigations necessary to approve the Deconstruction Plan filed by the Owner, then the town may select a separate Professional Engineer independent of the Owner to conduct any necessary investigations. The Owner shall be responsible for the cost of any such investigations.

C. Upon Abandonment, the Town of Cortland may take all appropriate actions for Deconstruction, including drawing upon the Financial Assurance.

D. Site specific decommissioning costs for the 5MWac Cortland Illinois Dynamics 1 LLC solar site and the 2MWac Cortland Illinois Dynamics 2 LLC solar site, for a total of 7MWac total on this parcel located in Dekalb County, IL is estimated as follows:

**5MWac Cortland Illinois Dynamics 1 LLC**

| Tasks | Estimated Cost ($) |
|---|---|
| Mobilization | $23,870 |
| SWPPP Prep and Permit | $8,500 |
| Remove Foundation Posts | $16,470 |
| Remove Panels | $57,500 |
| Dismantle Racks | $28,500 |
| Remove Electrical Equipment | $8,520 |
| Remove Racks | $4,500 |
| Remove Cable | $15,000 |
| Remove Poles | $10,500 |
| Remove Fencing | $21,510 |
| Remove Service Roads | $88,490 |
| Site Restoration | $38,800 |
| Estimated Total (2025 Dollars) | $322,160 |

**2MWac Cortland Illinois Dynamics 2 LLC**

| Tasks | Estimated Cost ($) |
|---|---|
| Mobilization | $9,380 |
| SWPPP Prep and Permit | $8,500 |
| Remove Foundation Posts | $7,160 |
| Remove Panels | $25,000 |
| Dismantle Racks | $11,400 |
| Remove Electrical Equipment | $5,920 |
| Remove Racks | $1,800 |
| Remove Cable | $6,000 |
| Remove Poles | $10,500 |
| Remove Fencing | $16,740 |
| Remove Service Roads | $7,000 |
| Site Restoration | $17,130 |
| Estimated Total (2025 Dollars) | $126,530 |

# Appendix G: Level 1 Wetland Analysis

# Memorandum

To: Gordon Simanton, SolarStone Partners

From: Shawn Williams, WSB

Copy: Ed Youngquist, WSB
Tom Santori, WSB
Lillian Prybil, WSB

Date: April 3, 2024

Re: Cortland Solar LLC
Offsite Wetland Hydrology Assessment (Level 1 Wetland Delineation)
Cortland Township, DeKalb County, Illinois
WSB Project No. 024543

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This memorandum and attachments comprise the offsite wetland hydrology assessment for the proposed Cortland Solar LLC Project (project, site), located in Cortland Township, IL. The site is located northeast of the intersection of State Highway 38 and Chase Road. It is approximately 1.7 miles east of Cortland, on the north side of highway 38. The project will be located within County Parcels 0927300004 and 0927100002. The project area is approximately 81 acres.

A Routine Level 1 (desktop) wetland delineation was performed for the Cortland Solar LLC Site (**Figure 1**). A Level 1 wetland delineation is an off-site review of applicable data sources and imagery that helps determine whether wetlands exist within a review area. The US Army Corps of Engineers – Rock Island District requires an offsite wetland hydrology assessment when delineating wetlands in agricultural fields. Wetlands are a protected water resource and are identified by three (3) criteria. Wetlands have:

1. a **dominance of hydrophytic vegetation** (vegetation adapted to wet conditions),
2. **hydric soil** (soils that are associated with low-oxygen/anaerobic conditions due to saturation or inundation), and
3. **wetland hydrology** (the area is inundated either permanently or periodically, or the soil is saturated in the upper 12 inches of the soil profile for 5% of the growing season (about 14 consecutive days) in most years (over 50%) with “normal” precipitation.

## Review Method

WSB reviewed the LiDAR 2-foot contours (**Figure 2**), National Hydrography Dataset (NHD) and FEMA Floodplain (**Figure 3**), USFWS National Wetlands Inventory (NWI) (**Figure 4**), and US Department of Agriculture (USDA) County Soil Survey (**Figure 5**) (**Appendix A**).

WSB reviewed fourteen(14) aerial photos for the years of 1998, 2005, 2006, 2007, 2010, 2011, 2012, 2014, 2015, 2017, 2019, 2020, 2021, and 2023 (NAIP, NAPP) to investigate wetland hydrology in accordance with the US Farm Service Agency (FSA) *Wetland Mapping Conventions for Agricultural Lands*. Available Illinois Geospatial Data Clearing House and Prairie Research Institute and University of Illinois at Urbana-Champaign aerial photography were used for this assessment. Imagery includes the National Agriculture Imagery Program (NAIP) and National Aerial Photography (NAPP) imagery.

701 XENIA AVENUE S | SUITE 300 | MINNEAPOLIS, MN | 55416 | 763.541.4800 | WSBENG.COM

Antecedent precipitation conditions for each year were determined by referencing the WETS table and monthly precipitation records for the DeKalb weather reporting station (**Appendix B**).

## Review Results

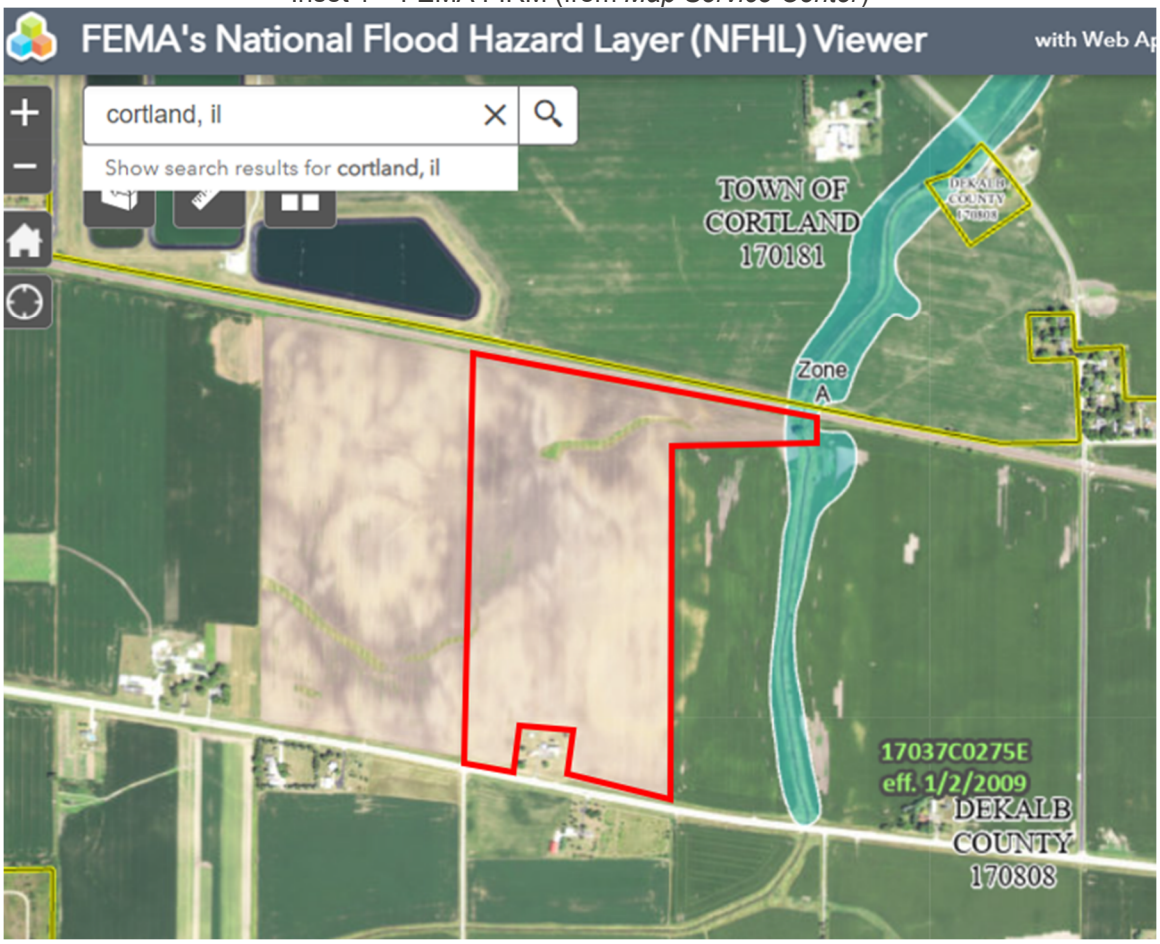
1. *Mapping Results*

The overall topography of the site includes elevations ranging generally between 869 feet above mean sea level (AMSL) at the southeast portion to 845 feet AMSL at the northeast corner, near Union Ditch No. 1. Topographic relief is moderate, with an elevation difference of 24 vertical feet.

One mapped watercourse exists within the site. It is Union Ditch Number 1, a tributary to the South Branch of the Kishwaukee River, which is located 1.6 miles northeast of the site. Water flows from south to north, within the project area.

FEMA FIRM Zone A Flood Hazard Area exists within the project (Inset 1). It is associated with Union Ditch Number 1.

Inset 1 – FEMA FIRM (from *Map Service Center*)




The National Wetlands Inventory map depicts one mapped Riverine Lower Perennial Unconsolidated Bottom Permanently Flooded – Excavated (R2UBHx) watercourse at the northeast corner of the site. It is Union Ditch Number 1.

The mapped soils within the project site show Areas 1, 2 and 3 are located in mapped hydric soil. The soil has a hydric rating of 100 (out of 100) meaning it is poorly drained and likely to support wetlands.

1. *Historic Aerial Review Results*

Three (3) areas of interest were identified within the project site based on review of all aerial photographs, with focus on the wet precipitation year of 2010. The area of review is based on the observation of soil saturation signatures, altered cropping, drainage signatures, and the low area at the northeast associated with Union Ditch Number 1. The areas of interest are indicated on the aerial photographs in **Appendix B**.

Area 1 had wetland hydrology signatures in 5 of 5 normal precipitation years.
Area 2 had wetland hydrology signatures in 5 of 5 normal precipitation years.
Area 3 had wetland hydrology signatures in 4 of 5 normal precipitation years.

Areas 1, 2, and 3 meet the review criteria for wetland hydrology. These three areas should be considered wetland.

Inset 2 – Result Summary
Wetland Determination Matrix

Area 1

Areas 2, 3

| Hydric Soils present[1] | Identified on NWI or other wetland map[2] | Percent with wet signatures from Exhibit 1 | Field verification required[3] | Wetland? |
|---|---|---|---|---|
| Yes | Yes | >50% | No | Yes |
| Yes | Yes | 30-50% | No | Yes |
| Yes | Yes | <30% | Yes | Yes, if other hydrology indicators present |
| Yes | No | >50% | No | Yes |
| Yes | No | 30-50% | Yes | Yes, if other hydrology indicators present |
| Yes | No | <30% | No | No |
| No | Yes | >50% | No | Yes |
| No | Yes | 30-50% | No | Yes |
| No | Yes | <30% | No | No |
| No | No | >50% | Yes | Yes, if other hydrology indicators present |
| No | No | 30-50% | Yes | Yes, if other hydrology indicators present |
| | | | | |
| No | No | <30% | No | No |

[1] The presence of hydric soils can be determined from the "Hydric Rating by Map Unit Feature" under "Land Classifications" from the Web Soil Survey. "Not Hydric" is the only category considered to not have hydric soils. Field sampling for the presence/absence of hydric soil indicators can be used in lieu of the hydric rating if appropriately documented by providing completed field data sheets.

[2] At minimum, the most updated NWI data available for the area must be reviewed for this step. Any and all other local or regional wetland maps that are publically available should be reviewed.

[3] Area should be reviewed in the field for the presence/absence of wetland hydrology indicators per the applicable 87 Manual Regional Supplement, including the D2 indicator (geomorphic position).

**Conclusion**

The offsite wetland hydrology assessment indicates wetland hydrology exists at Areas 1, 2, and 3. A Routine Level 2 (onsite) wetland delineation is not required per the wetland determination matrix, but can be completed if requested.

Official wetland boundary/type approval will require verification and coordination with the US Army Corps of Engineers – Rock Island District.

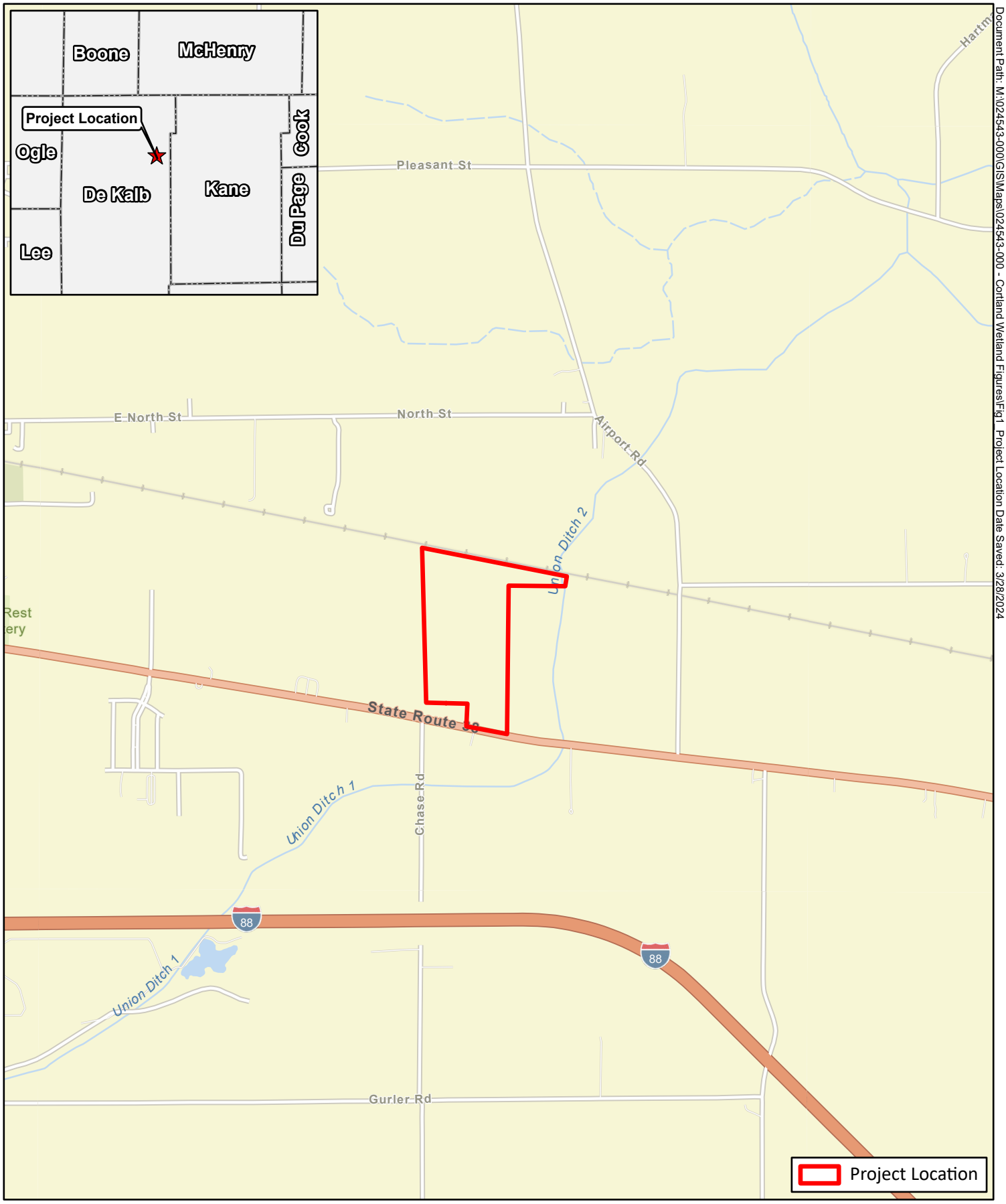
Please contact Shawn Williams at 612-360-1305 or swilliams@wsbeng.com if you have questions or require additional information regarding this offsite wetland hydrology assessment (Level 1 delineation).

Appendix A: Figures

1. Project Location
2. Topography
3. National Hydrography Dataset and FEMA Floodplain
4. National Wetlands Inventory
5. County Soil Survey

Appendix B: Hydrology Assessment Forms and Aerial Photography

# Appendix A
# Figures

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SOLARSTONE

# Figure 1 - Project Location

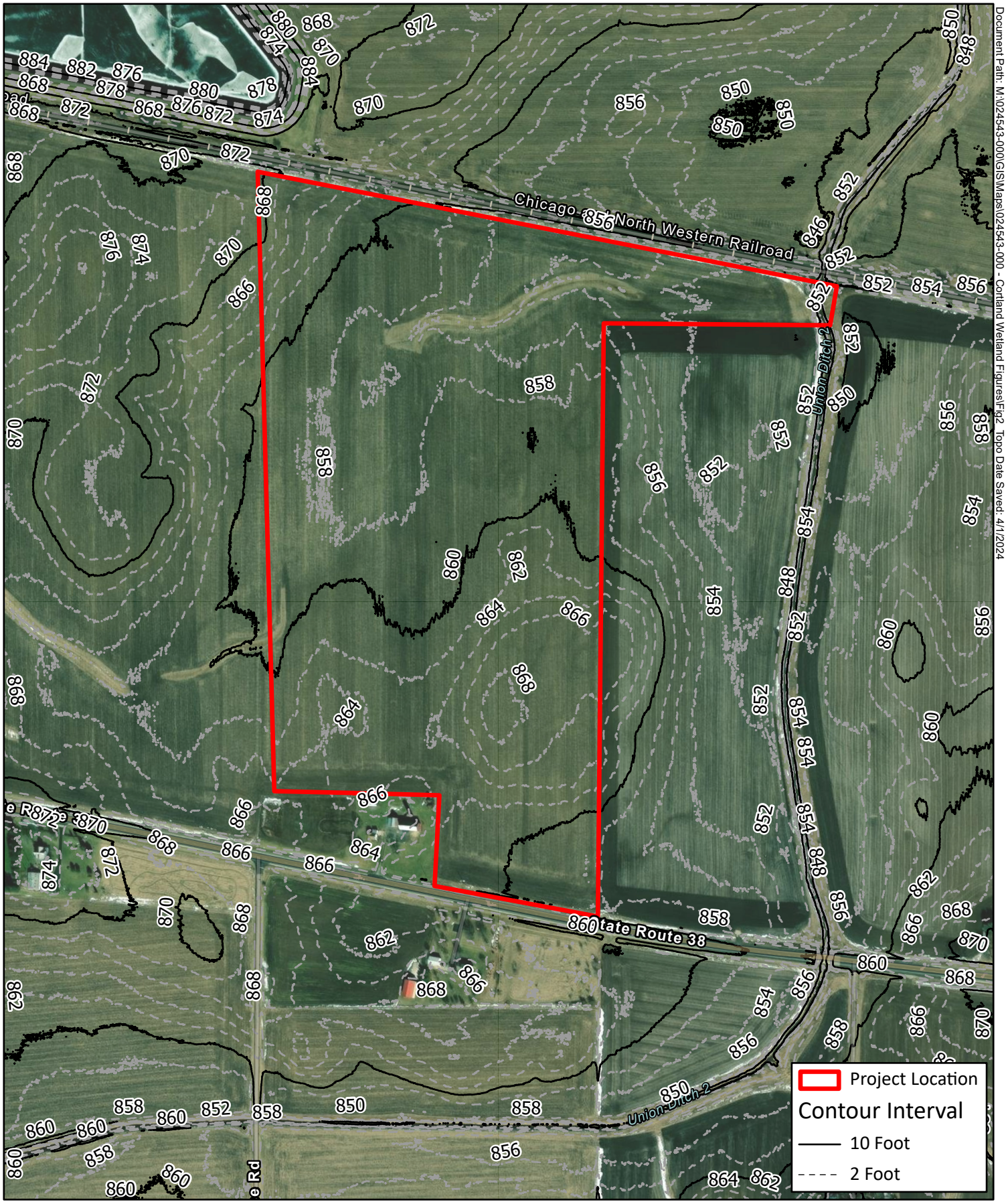
Cortland Solar LLC
DeKalb County, IL

N

0 2,000 Feet

1 inch = 2,000 feet

wsb

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SOLARSTONE

# Figure 2 - Topography

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

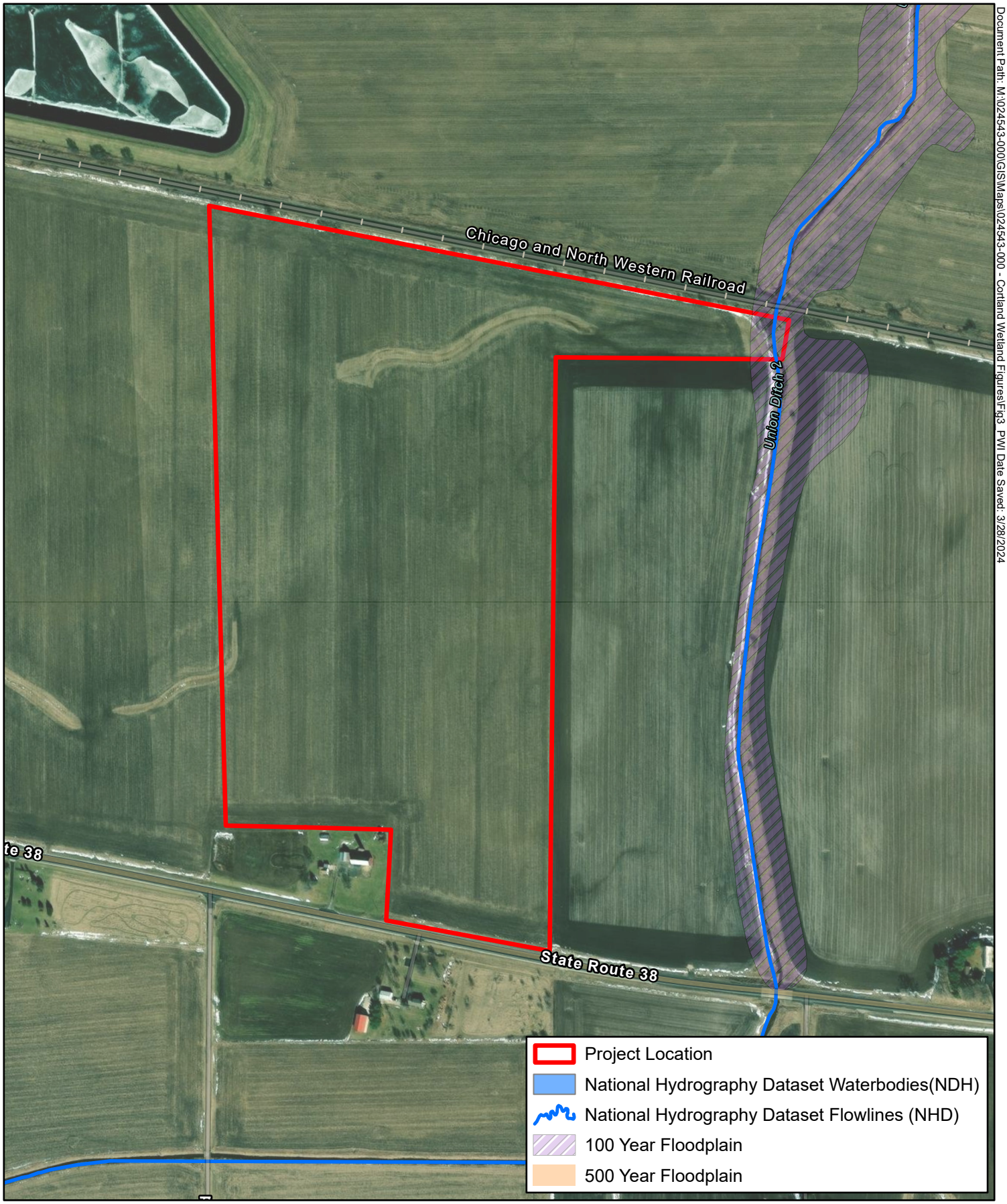


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**Figure 3 - National Hydrography Dataset (NHD) and Floodplain**

SOLARSTONE

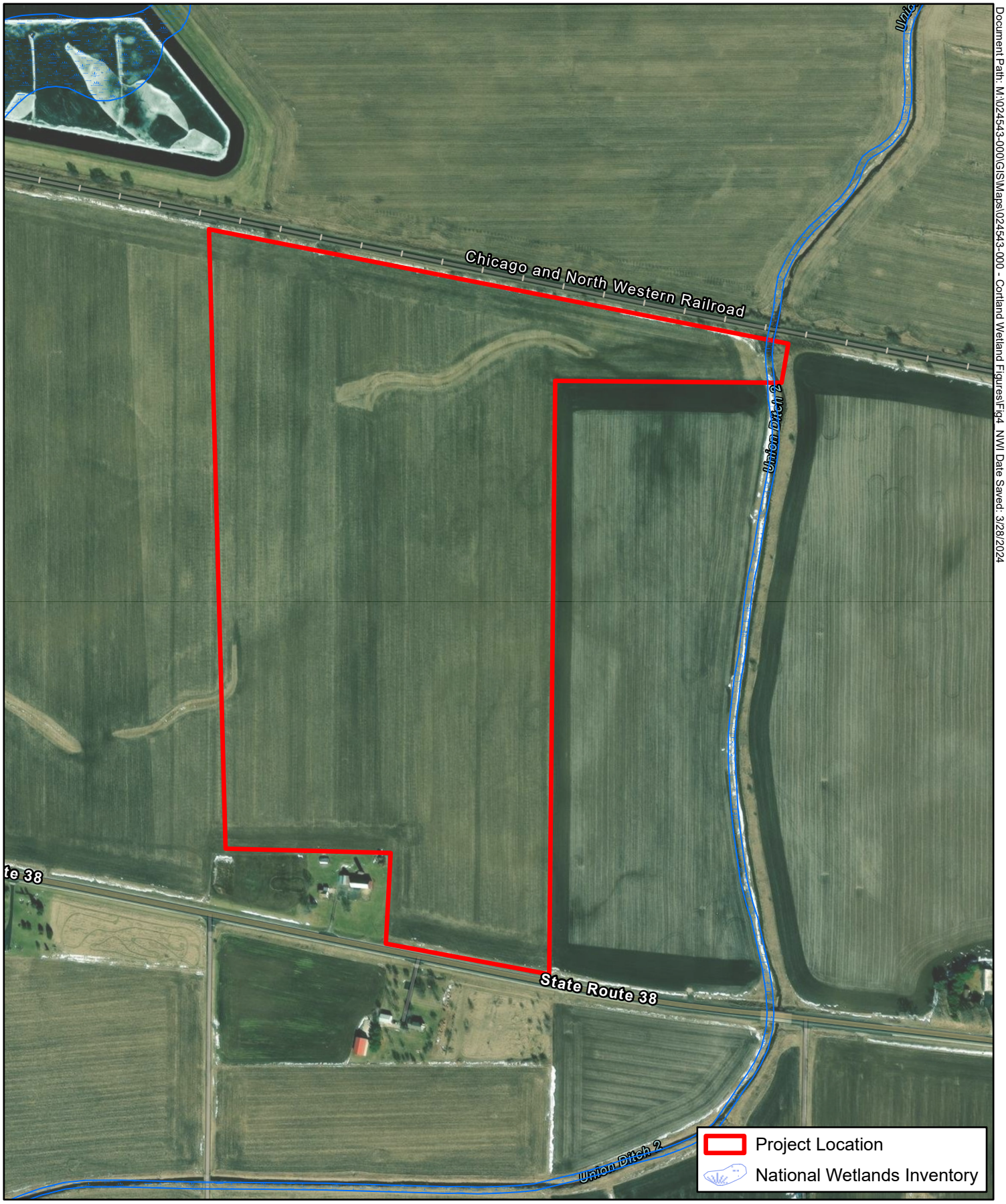
Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

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# Figure 4 - National Wetlands Inventory

SOLARSTONE

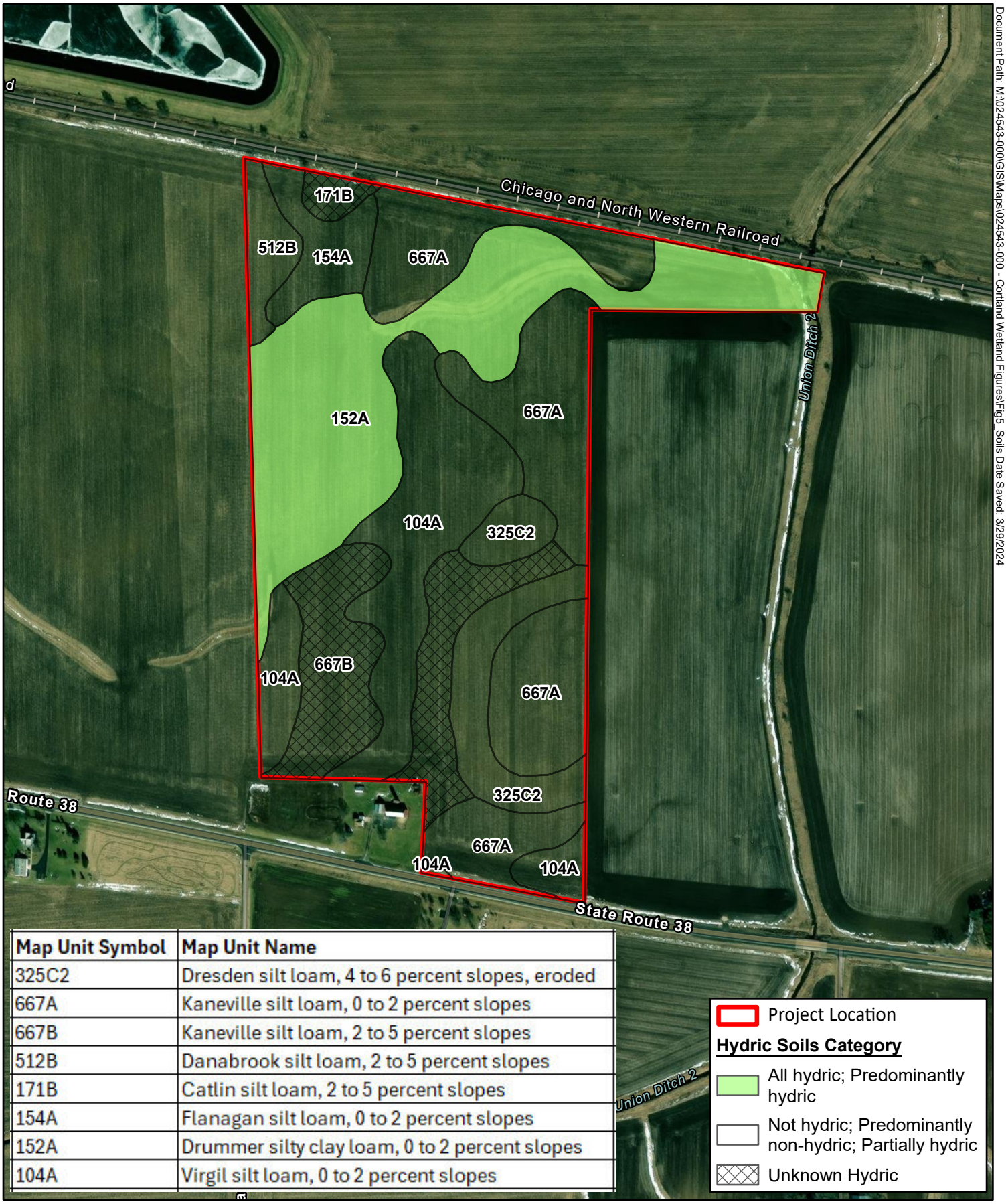
Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb




| Map Unit Symbol | Map Unit Name |
|---|---|
| 325C2 | Dresden silt loam, 4 to 6 percent slopes, eroded |
| 667A | Kaneville silt loam, 0 to 2 percent slopes |
| 667B | Kaneville silt loam, 2 to 5 percent slopes |
| 512B | Danabrook silt loam, 2 to 5 percent slopes |
| 171B | Catlin silt loam, 2 to 5 percent slopes |
| 154A | Flanagan silt loam, 0 to 2 percent slopes |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes |
| 104A | Virgil silt loam, 0 to 2 percent slopes |

SOLARSTONE

# Figure 5 - County Soil Survey

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

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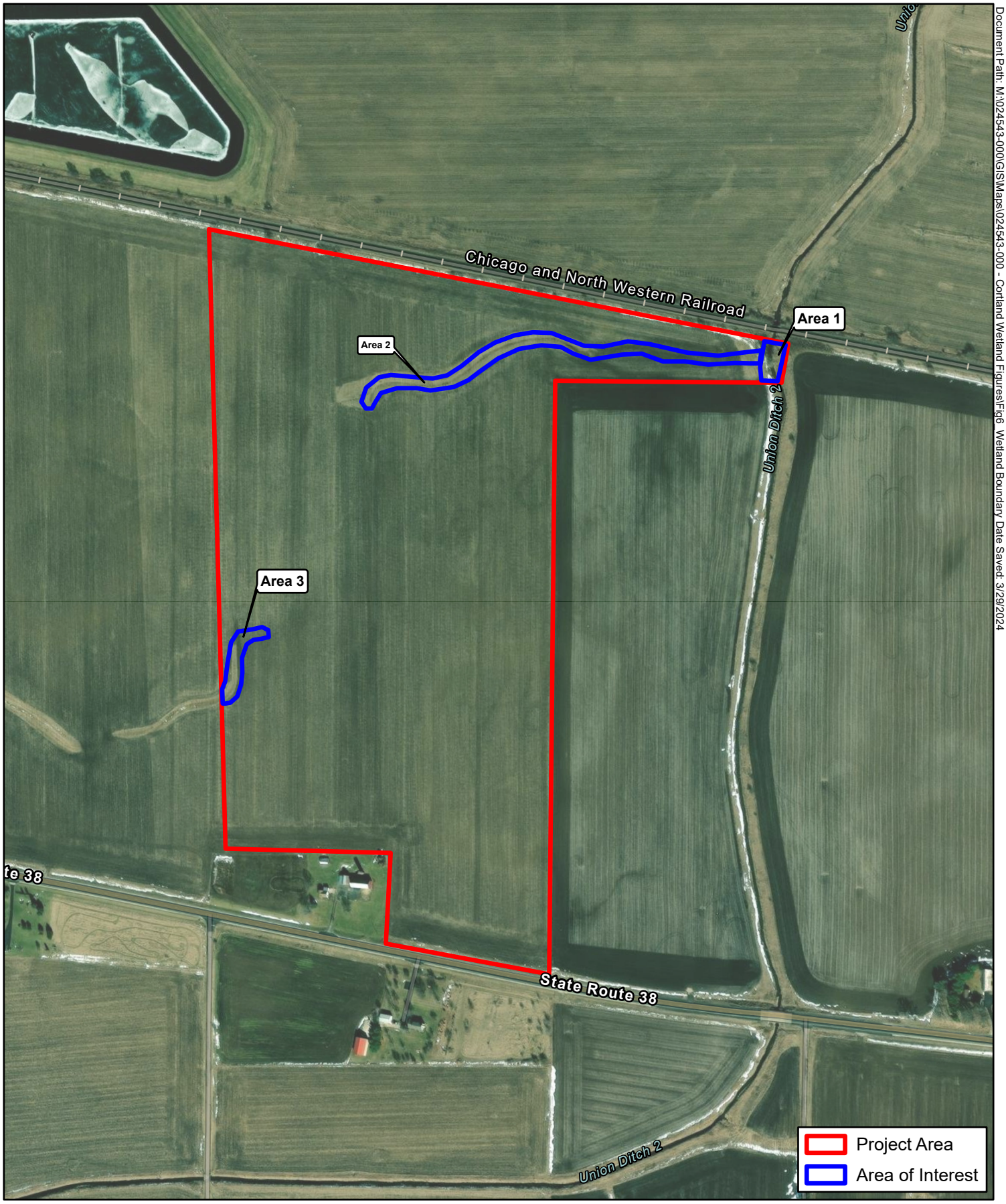


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# Figure 6 - Wetland Delineation

Cortland Solar LLC
DeKalb County, IL

SOLARSTONE

N

0 500 Feet

1 inch = 500 feet

wsb

# Appendix B
# Hydrology Assessment Forms and Aerial Photography

*Exhibit 1*

# Hydrology Assessment with Aerial Imagery – Recording Form

Project Name Cortland Solar LLC  Date 3/1/2024  County DeKalb

Investigator WSB (Shawn Williams)  Legal Description (Sec, T, R) Sec. 27, T40N, R5E

| Year | Image Source | Climate Condition (wet, dry, normal)[1] | Interpretation (list hydrology indicators observed, e.g. crop stress, drowned out, standing water, etc.)[2] | | | |
|---|---|---|---|---|---|---|
| | | | Area 1 | Area 2 | Area 3 | Area |
| 1998 | NAIP | Wet | WS | WS | NV | |
| 2004 | NAIP | | | | | |
| 2005 | NAIP | Dry | WS | WS | NV | |
| 2006 | NAIP | Wet | WS | CS | CS | |
| 2007 | NAIP | Dry | WS | AP | NV | |
| 2008 | NAIP | | | | | |
| 2009 | NAIP | | | | | |
| 2010 | NAIP | Wet | WS | CS | CS | |
| 2011 | NAIP | Wet | WS | CS | NV | |
| 2012 | NAIP | Dry | WS | CS | NV | |
| 2013 | NAIP | | | | | |
| 2014 | NAIP | Dry | WS | NV | NV | |
| 2015 | NAIP | Normal | WS | CS | CS | |
| 2016 | NAIP | | | | | |
| 2017 | NAIP | Normal | WS | CS | CS | |
| 2018 | NAIP | | | | | |
| 2019 | NAIP | Dry | WS | WS | WS | |
| 2020 | NAIP | Normal | WS | DO | DO | |
| 2021 | NAIP | Normal | WS | WS | WS | |
| 2022 | NAIP | | | | | |
| 2023 | NAIP | Normal | WS | WS | NV | |
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## Summary Table

| | Area 1 | Area 2 | Area 3 | Area |
|---|---|---|---|---|
| **# Normal Yrs.** | 5 | 5 | 5 | |
| **# Normal Yrs with wet signatures** | 5 | 5 | 4 | |
| **% Normal Yrs with wet signatures** | 100 | 100 | 80 | |

[1]Use AGACIS website to determine USDA/NRCS climate condition for parcel being investigated.

[2]Use key below to label photo interpretations. It is imperative that the reviewer read and understand the guidance associated with the use of these labels. If alternate labels are used, indicate in box below.

WS – wetland signature
CS – vegetation stress
DO – drowned out
NC – not cropped
SW – standing water
AP – altered pattern
NV – normal vegetative cover

# Wetland Determination Matrix

| Hydric Soils present[1] | Identified on NWI or other wetland map[2] | Percent with wet signatures from Exhibit 1 | Field verification required[3] | Wetland? |
|---|---|---|---|---|
| Yes | Yes | >50% | No | Yes |
| Yes | Yes | 30-50% | No | Yes |
| Yes | Yes | <30% | Yes | Yes, if other hydrology indicators present |
| Yes | No | >50% | No | Yes |
| Yes | No | 30-50% | Yes | Yes, if other hydrology indicators present |
| Yes | No | <30% | No | No |
| No | Yes | >50% | No | Yes |
| No | Yes | 30-50% | No | Yes |
| No | Yes | <30% | No | No |
| No | No | >50% | Yes | Yes, if other hydrology indicators present |
| No | No | 30-50% | Yes | Yes, if other hydrology indicators present |
| | | | | |
| No | No | <30% | No | No |

[1] The presence of hydric soils can be determined from the "Hydric Rating by Map Unit Feature" under "Land Classifications" from the Web Soil Survey. "Not Hydric" is the only category considered to not have hydric soils. Field sampling for the presence/absence of hydric soil indicators can be used in lieu of the hydric rating if appropriately documented by providing completed field data sheets.

[2] At minimum, the most updated NWI data available for the area must be reviewed for this step. Any and all other local or regional wetland maps that are publically available should be reviewed.

[3] Area should be reviewed in the field for the presence/absence of wetland hydrology indicators per the applicable 87 Manual Regional Supplement, including the D2 indicator (geomorphic position).

Monthly Total Precipitation for DE KALB, IL

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1998 | 2.79 | 1.61 | 3.22 | 5.88 | 4.78 | 4.07 | 4.01 | 5.20 | 2.22 | 5.80 | 2.07 | 1.32 | 42.97 |
| 1999 | 3.42 | 1.18 | 0.91 | 5.67 | 4.99 | 6.90 | 4.77 | 2.64 | 5.34 | 0.72 | 0.34 | 2.20 | 39.08 |
| 2000 | 1.59 | 2.00 | 0.91 | 3.46 | 3.38 | 8.79 | 3.33 | M | 4.63 | 1.17 | 2.74 | 1.83 | M |
| 2001 | 1.87 | 2.42 | 1.04 | 3.03 | 3.04 | 4.64 | 0.86 | 3.20 | 8.09 | 5.42 | 1.71 | 0.98 | 36.30 |
| 2002 | 0.74 | 1.24 | 1.90 | 3.76 | 5.48 | 5.03 | 0.65 | 6.74 | 1.62 | 2.31 | 0.49 | 0.84 | 30.80 |
| 2003 | 0.51 | 0.21 | 1.28 | 1.50 | 7.79 | 1.85 | 3.16 | 1.16 | 2.49 | 1.78 | 3.67 | 3.03 | 28.43 |
| 2004 | 0.50 | 0.98 | 4.18 | 1.88 | 10.44 | 2.83 | 3.93 | 3.35 | 0.65 | 2.89 | 2.67 | 1.11 | 35.41 |
| 2005 | 2.53 | 2.75 | 0.68 | 1.72 | 2.75 | 1.13 | 2.83 | 4.15 | 1.53 | 0.53 | 2.29 | 1.12 | 24.01 |
| 2006 | 2.92 | 0.81 | 3.47 | 3.49 | 3.64 | 3.11 | 2.41 | 2.58 | 3.83 | 3.89 | 2.70 | 3.07 | 35.92 |
| 2007 | 1.01 | 1.62 | 3.55 | 3.52 | 2.26 | 4.09 | 8.20 | 12.02 | 0.44 | 2.48 | 0.85 | 3.43 | 43.47 |
| 2008 | 1.59 | 3.88 | 1.64 | 4.37 | 4.95 | 3.26 | 5.76 | 1.95 | 9.39 | 2.71 | 1.11 | 5.85 | 46.46 |
| 2009 | 0.88 | 2.46 | 5.00 | 4.35 | 4.81 | 6.16 | M | 6.22 | 1.18 | 6.40 | 1.24 | 4.26 | M |
| 2010 | 0.87 | 1.02 | 1.69 | 3.46 | 5.67 | 6.53 | 6.92 | 2.96 | 2.04 | 1.74 | 1.06 | 1.32 | 35.28 |
| 2011 | 0.65 | 2.65 | 2.21 | 4.41 | 5.54 | 4.53 | 5.28 | 5.29 | 3.82 | 1.28 | 4.21 | 2.54 | 42.41 |
| 2012 | 1.41 | 1.60 | 1.38 | 2.96 | 1.26 | 2.16 | 3.69 | 1.86 | 2.37 | M | 0.58 | 1.80 | M |
| 2013 | 3.48 | 2.66 | 1.89 | 8.24 | 3.17 | 7.38 | 1.33 | 4.19 | 1.50 | 2.20 | 2.08 | 1.41 | 39.53 |
| 2014 | 1.67 | 2.33 | 0.80 | 2.75 | 3.01 | 8.74 | 3.66 | 5.19 | 3.13 | 2.70 | 1.33 | 0.70 | 36.01 |
| 2015 | 1.09 | 1.02 | 0.55 | 3.80 | 5.82 | 8.20 | 3.20 | 3.04 | 2.74 | 1.45 | 5.43 | 5.46 | 41.80 |
| 2016 | 0.38 | 0.71 | 2.91 | 2.25 | 7.24 | 3.36 | 5.30 | 7.70 | 2.17 | 2.25 | 2.78 | 1.44 | 38.49 |
| 2017 | 2.22 | 0.82 | 4.35 | 5.19 | 4.76 | 3.50 | 7.78 | 1.89 | 0.09 | 8.65 | 1.60 | 0.43 | 41.28 |
| 2018 | 1.32 | 2.76 | 1.50 | M | 7.27 | 8.81 | 2.15 | 3.88 | 2.50 | 3.99 | 2.40 | 1.81 | M |
| 2019 | 2.35 | 2.37 | 2.11 | 4.10 | 7.80 | 2.69 | 1.87 | 3.72 | 9.56 | 5.99 | 1.50 | 1.76 | 45.82 |
| 2020 | 2.68 | 0.58 | 4.18 | 3.40 | 6.22 | 2.48 | 4.43 | 0.70 | 5.36 | 2.35 | M | 1.93 | M |
| 2021 | 1.84 | 0.80 | 2.30 | 1.25 | 2.91 | M | 3.01 | M | M | 6.50 | 0.44 | 1.58 | M |
| 2022 | 0.79 | 1.23 | 2.28 | 4.03 | 4.17 | 3.21 | 4.31 | 9.33 | 2.64 | 2.05 | 0.88 | 2.11 | 37.03 |
| 2023 | 1.95 | 2.78 | 1.97 | 3.04 | 1.44 | 2.19 | 5.61 | 2.10 | 2.68 | 3.22 | 0.54 | 2.46 | 29.98 |
| 2024 | 3.12 | M | M | M | M | M | M | M | M | M | M | M | M |
| Mean | 1.71 | 1.71 | 2.23 | 3.66 | 4.79 | 4.63 | 3.94 | 4.21 | 3.28 | 3.22 | 1.87 | 2.15 | 37.52 |

WETS Table

WETS Station: DE KALB, IL

Requested years: 1991 - 2020

| Month | Avg Max Temp | Avg Min Temp | Avg Mean Temp | Avg Precip | 30% chance precip less than | 30% chance precip more than | Avg number days precip 0.10 or more | Avg Snowfall |
|---|---|---|---|---|---|---|---|---|
| Jan | 28.1 | 13.1 | 20.6 | 1.69 | 1.07 | 1.99 | 5 | 10.2 |
| Feb | 32.5 | 16.6 | 24.6 | 1.71 | 1.02 | 2.07 | 4 | 8.7 |
| Mar | 45.0 | 26.8 | 35.9 | 2.24 | 1.45 | 2.69 | 5 | 4.4 |
| Apr | 58.6 | 37.3 | 48.0 | 3.56 | 2.56 | 4.17 | 7 | 1.3 |
| May | 70.2 | 49.2 | 59.7 | 4.79 | 3.28 | 5.87 | 8 | 0.0 |
| Jun | 79.9 | 59.5 | 69.7 | 4.57 | 2.77 | 5.53 | 7 | 0.0 |
| Jul | 83.1 | 63.3 | 73.2 | 4.00 | 2.49 | 4.80 | 6 | 0.0 |
| Aug | 81.2 | 61.3 | 71.3 | 4.06 | 2.69 | 4.84 | 6 | 0.0 |
| Sep | 74.9 | 53.2 | 64.1 | 3.32 | 1.73 | 4.05 | 6 | 0.0 |
| Oct | 62.0 | 41.0 | 51.5 | 2.96 | 1.76 | 3.58 | 6 | 0.1 |
| Nov | 46.3 | 29.6 | 38.0 | 2.31 | 1.38 | 2.73 | 5 | 1.8 |
| Dec | 33.6 | 19.1 | 26.4 | 2.04 | 1.27 | 2.44 | 5 | 6.6 |
| Annual: | | | | | 33.97 | 40.71 | | |
| Average | 58.0 | 39.2 | 48.6 | - | - | - | - | - |
| Total | - | - | - | 37.25 | | | 70 | 33.1 |

GROWING SEASON DATES

| | | | |
|---|---|---|---|
| Years with missing data: | 24 deg = 3 | 28 deg = 3 | 32 deg = 2 |
| Years with no occurrence: | 24 deg = 0 | 28 deg = 0 | 32 deg = 0 |
| Data years used: | 24 deg = 27 | 28 deg = 27 | 32 deg = 28 |
| Probability | 24 F or higher | 28 F or higher | 32 F or higher |
| 50 percent * | 4/1 to 11/8: 221 days | 4/12 to 10/25: 196 days | 4/23 to 10/16: 176 days |
| 70 percent * | 3/28 to 11/13: 230 days | 4/7 to 10/30: 206 days | 4/18 to 10/21: 186 days |
| * Percent chance of the growing season occurring between the Beginning and Ending dates. | | | |

STATS TABLE - total precipitation (inches)

| Yr | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1966 | | | 1.20 | 3.25 | 3.07 | 2.78 | 1.45 | 2.51 | 2.47 | 2.47 | 4.91 | 2.32 | 26.43 |
| 1967 | 2.75 | 1.17 | 2.07 | 5.09 | 1.46 | 5.14 | 2.76 | 2.60 | 1.81 | 3.62 | 2.00 | 0.96 | 31.43 |
| 1968 | 0.45 | 0.52 | 0.32 | 2.10 | 2.48 | 5.47 | 5.22 | 4.06 | M4.90 | 0.78 | 3.52 | 1.90 | 31.72 |
| 1969 | 1.31 | | M0.04 | 4.33 | 3.48 | 6.38 | 5.28 | 1.45 | 2.85 | 6.75 | 1.32 | 1.47 | 34.66 |
| 1970 | 0.94 | 0.56 | 1.84 | 2.73 | 6.01 | 6.57 | 6.03 | 1.11 | 11.56 | 2.69 | 1.68 | 1.35 | 43.07 |
| 1971 | 1.17 | 2.06 | 1.87 | 1.34 | 1.73 | 2.20 | 2.01 | 3.26 | 2.80 | 2.04 | 2.14 | 4.62 | 27.24 |
| 1972 | 0.91 | 0.86 | 3.95 | 4.57 | 4.00 | 8.81 | 5.33 | 8.34 | 5.08 | 3.86 | 1.83 | 2.10 | 49.64 |
| 1973 | 1.32 | 1.04 | 4.14 | 6.50 | 5.49 | 3.18 | 2.22 | 1.93 | 5.95 | 3.36 | 3.01 | 3.13 | 41.27 |
| 1974 | 4.08 | 1.65 | 2.04 | 3.43 | 6.42 | 6.94 | 2.08 | 2.09 | 0.85 | 2.31 | 2.84 | 1.96 | 36.69 |

Document Path: M:\024543-000\GIS\Maps\024543-000 - Cortland Wetland Figures\Fig6 Wetland Boundary Date Saved: 3/29/2024

SOLARSTONE

# Aerial Map - 1998

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

**NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination**
**NRCS Engineering Field Handbook Chapter 19**

| | | | |
|---|---|---|---|
| **Date** | 3/1/2024 | **Landowner/Project** | Cortland Solar LLC |
| **Weather Station** | DeKalb | **State** | Illinois |
| **County** | DeKalb | **Growing Season** | 1998 |
| **Photo/obs Date** | 4/1/1998 | **Soil Name** | 152A |

shaded cells are locked or calculated

**Long-term rainfall statistics** (from WETS table or State Climatology Office)

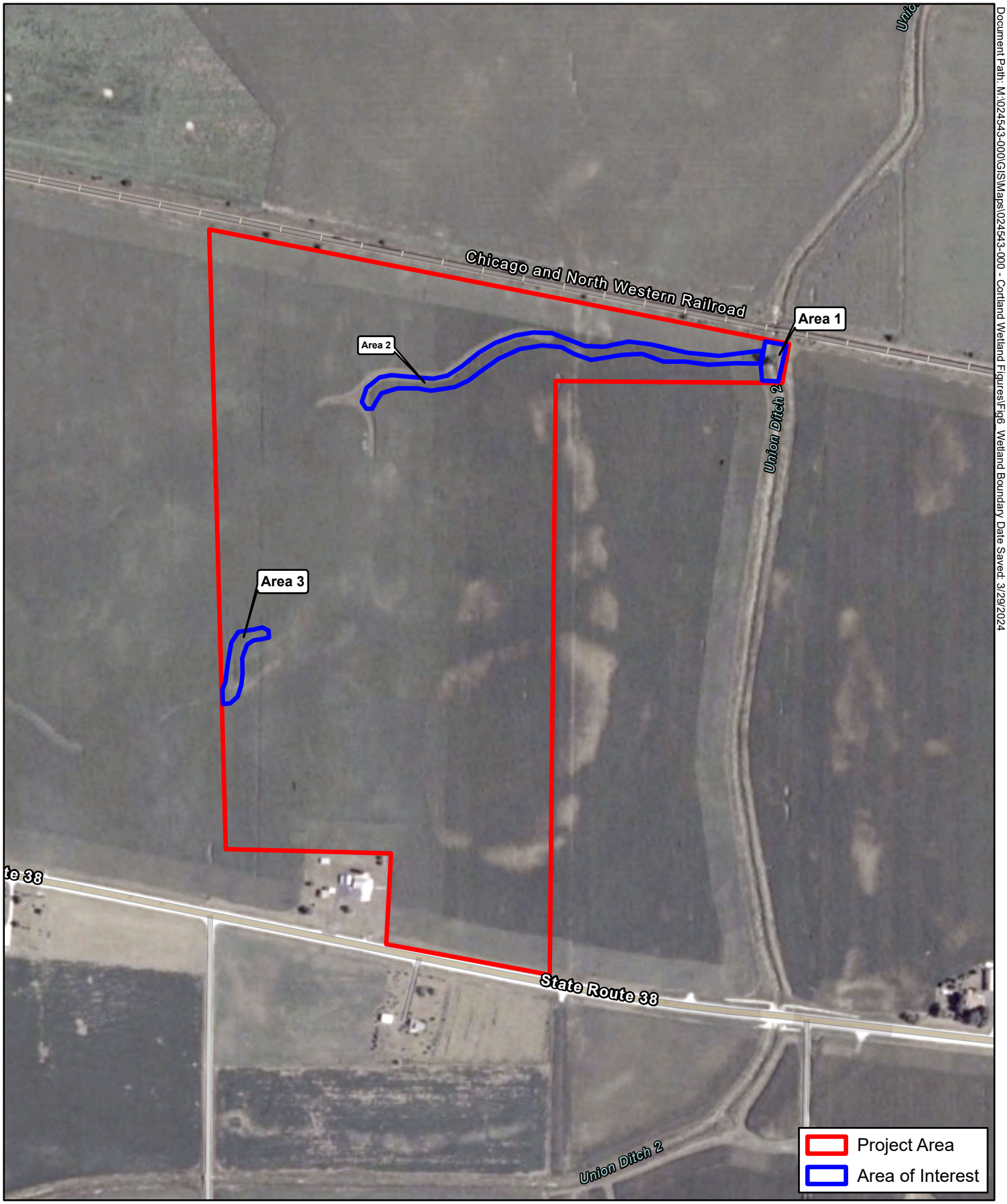
| | Month | 30% chance < | 30% chance > | Precip | Condition Dry, Wet, Normal | Condition Value | Month Weight Value | Product of Previous 2 Columns |
|---|---|---|---|---|---|---|---|---|
| **1st Prior Month*** | March | 1.45 | 2.69 | 3.22 | W | 3 | 3 | 9 |
| **2nd Prior Month*** | February | 1.02 | 2.07 | 1.61 | N | 2 | 2 | 4 |
| **3rd Prior Month*** | January | 1.07 | 1.99 | 2.79 | W | 3 | 1 | 3 |
| | | | | | | | **Sum** | **16** |

*compared to photo/observation date

| **Note: If sum is** | |
|---|---|
| **6 - 9** | prior period has been drier than normal |
| **10 - 14** | prior period has been normal |
| **15 - 18** | prior period has been wetter than normal |

| **Condition value:** |
|---|
| **D**ry =1 |
| **N**ormal =2 |
| **W**et =3 |

**Conclusions:** **prior period has been wetter than normal**

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SOLARSTONE

# Aerial Map - 2005

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

**NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination**
**NRCS Engineering Field Handbook Chapter 19**

| | | | |
|---|---|---|---|
| **Date** | 3/1/2024 | **Landowner/Project** | Cortland Solar LLC |
| **Weather Station** | DeKalb | **State** | Illinois |
| **County** | DeKalb | **Growing Season** | 2005 |
| **Photo/obs Date** | 7/1/2005 | **Soil Name** | 152A |

shaded cells are locked or calculated

**Long-term rainfall statistics** (from WETS table or State Climatology Office)

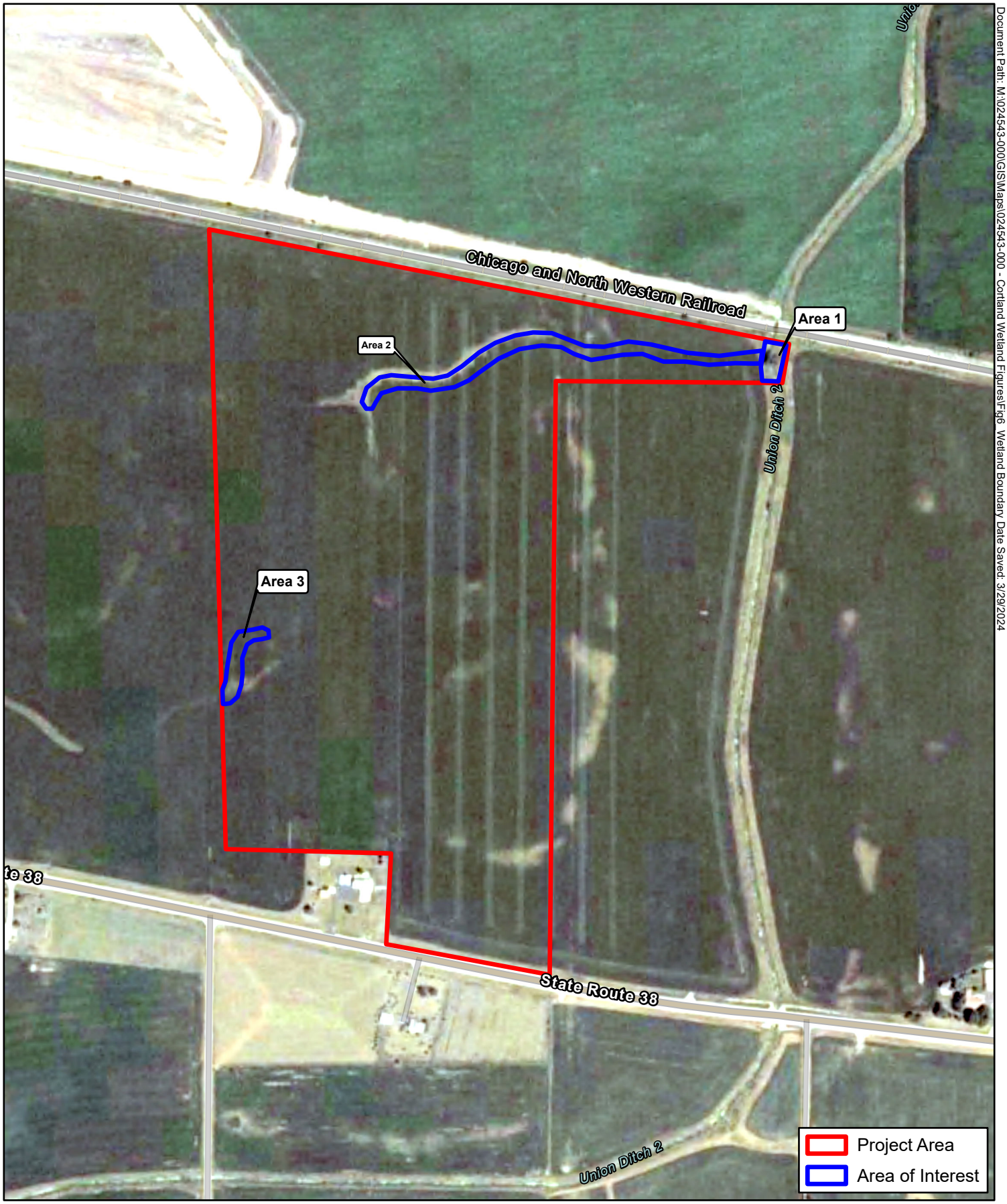
| | Month | 30% chance < | 30% chance > | Precip | Condition Dry, Wet, Normal | Condition Value | Month Weight Value | Product of Previous 2 Columns |
|---|---|---|---|---|---|---|---|---|
| **1st Prior Month*** | June | 2.77 | 5.53 | 1.13 | D | 1 | 3 | 3 |
| **2nd Prior Month*** | May | 3.28 | 5.87 | 2.75 | D | 1 | 2 | 2 |
| **3rd Prior Month*** | April | 2.56 | 4.17 | 1.72 | D | 1 | 1 | 1 |
| | | | | | | | **Sum** | **6** |

*compared to photo/observation date

| **Note: If sum is** | |
|---|---|
| **6 - 9** | prior period has been drier than normal |
| **10 - 14** | prior period has been normal |
| **15 - 18** | prior period has been wetter than normal |

| **Condition value:** |
|---|
| **D**ry =1 |
| **N**ormal =2 |
| **W**et =3 |

**Conclusions:** **prior period has been drier than normal**

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SOLARSTONE

# Aerial Map - 2006

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

**NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination**
**NRCS Engineering Field Handbook Chapter 19**

| | | | |
|---|---|---|---|
| **Date** | 3/1/2024 | **Landowner/Project** | Cortland Solar LLC |
| **Weather Station** | DeKalb | **State** | Illinois |
| **County** | DeKalb | **Growing Season** | 2006 |
| **Photo/obs Date** | 6/1/2006 | **Soil Name** | 152A |

shaded cells are locked or calculated

**Long-term rainfall statistics** (from WETS table or State Climatology Office)

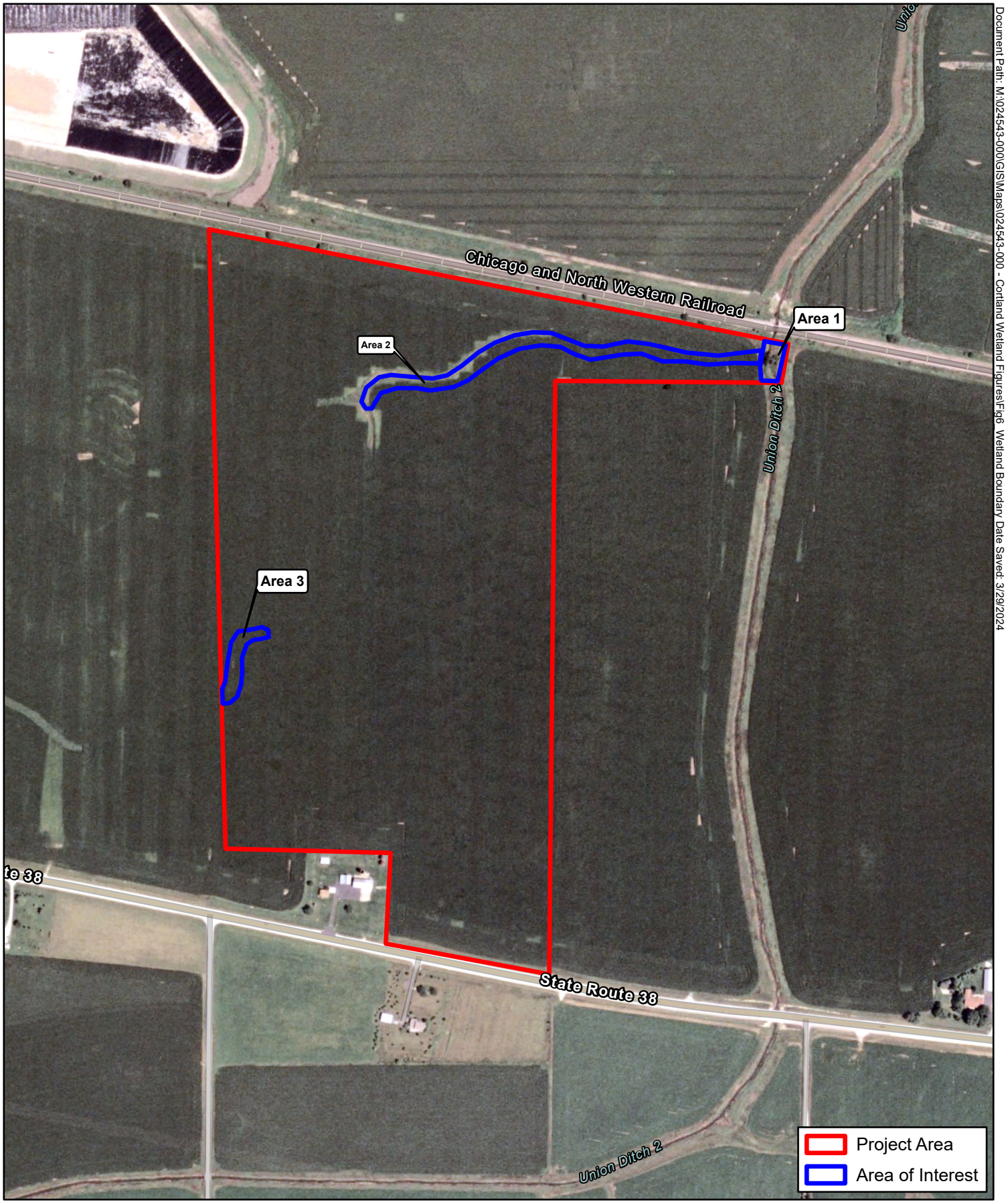
| | Month | 30% chance < | 30% chance > | Precip | Condition Dry, Wet, Normal | Condition Value | Month Weight Value | Product of Previous 2 Columns |
|---|---|---|---|---|---|---|---|---|
| **1st Prior Month*** | May | 3.29 | 5.47 | 3.46 | N | 2 | 3 | 6 |
| **2nd Prior Month*** | April | 2.91 | 5.28 | 6.01 | W | 3 | 2 | 6 |
| **3rd Prior Month*** | March | 2.10 | 4.08 | 6.78 | W | 3 | 1 | 3 |
| | | | | | | | **Sum** | **15** |

*compared to photo/observation date

| **Note: If sum is** | |
|---|---|
| **6 - 9** | prior period has been drier than normal |
| **10 - 14** | prior period has been normal |
| **15 - 18** | prior period has been wetter than normal |

| **Condition value:** |
|---|
| **D**ry =1 |
| **N**ormal =2 |
| **W**et =3 |

**Conclusions:** **prior period has been wetter than normal**

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SOLARSTONE

# Aerial Map - 2007

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

**NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination**
**NRCS Engineering Field Handbook Chapter 19**

| | | | |
|---|---|---|---|
| **Date** | 3/1/2024 | **Landowner/Project** | Cortland Solar LLC |
| **Weather Station** | DeKalb | **State** | Illinois |
| **County** | DeKalb | **Growing Season** | 2007 |
| **Photo/obs Date** | 6/1/2007 | **Soil Name** | 152A |

shaded cells are locked or calculated

**Long-term rainfall statistics** (from WETS table or State Climatology Office)

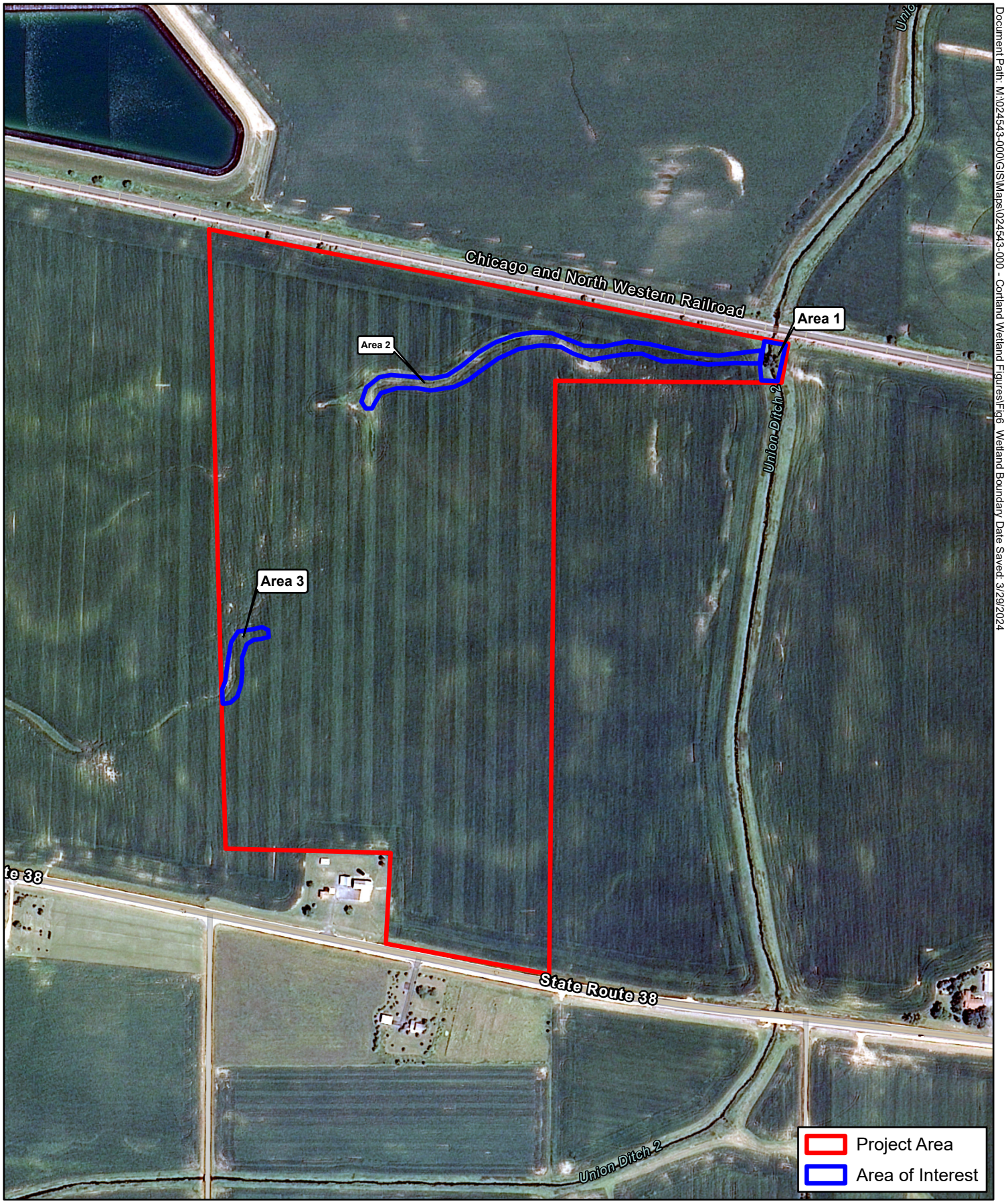
| | Month | 30% chance < | 30% chance > | Precip | Condition Dry, Wet, Normal | Condition Value | Month Weight Value | Product of Previous 2 Columns |
|---|---|---|---|---|---|---|---|---|
| **1st Prior Month*** | May | 3.29 | 5.47 | 2.26 | D | 1 | 3 | 3 |
| **2nd Prior Month*** | April | 2.91 | 5.28 | 3.52 | N | 2 | 2 | 4 |
| **3rd Prior Month*** | March | 2.10 | 4.08 | 3.55 | N | 2 | 1 | 2 |
| | | | | | | | **Sum** | **9** |

*compared to photo/observation date

| **Note: If sum is** | |
|---|---|
| **6 - 9** | prior period has been drier than normal |
| **10 - 14** | prior period has been normal |
| **15 - 18** | prior period has been wetter than normal |

| **Condition value:** |
|---|
| **D**ry =1 |
| **N**ormal =2 |
| **W**et =3 |

**Conclusions:** **prior period has been drier than normal**

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SOLARSTONE

# Aerial Map - 2010

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

**NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination**
**NRCS Engineering Field Handbook Chapter 19**

| | | | |
|---|---|---|---|
| **Date** | 3/1/2024 | **Landowner/Project** | Cortland Solar LLC |
| **Weather Station** | DeKalb | **State** | Illinois |
| **County** | DeKalb | **Growing Season** | 2010 |
| **Photo/obs Date** | 7/1/2010 | **Soil Name** | 152A |

shaded cells are locked or calculated

**Long-term rainfall statistics** (from WETS table or State Climatology Office)

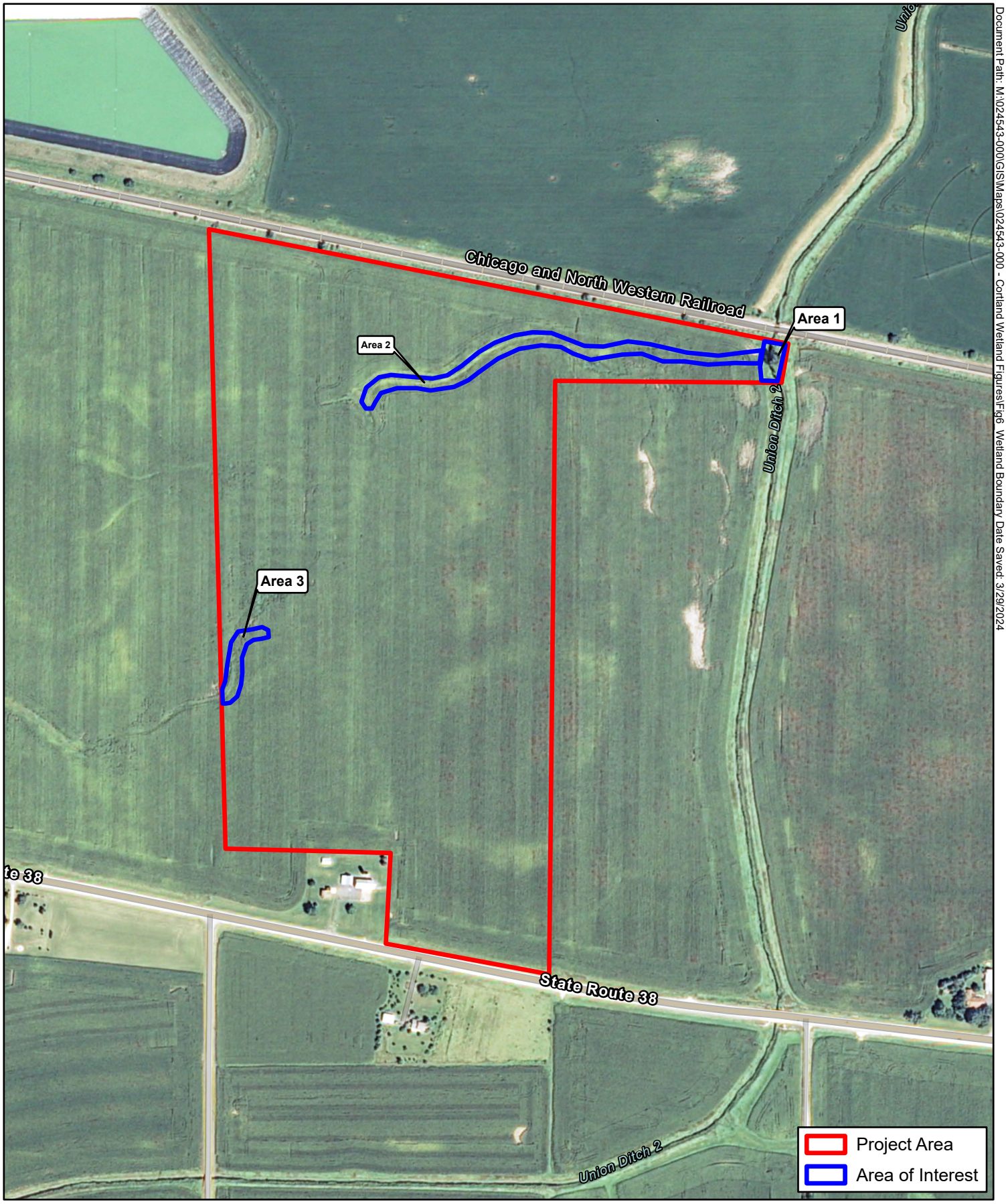
| | Month | 30% chance < | 30% chance > | Precip | Condition Dry, Wet, Normal | Condition Value | Month Weight Value | Product of Previous 2 Columns |
|---|---|---|---|---|---|---|---|---|
| **1st Prior Month*** | June | 2.77 | 5.53 | 6.53 | W | 3 | 3 | 9 |
| **2nd Prior Month*** | May | 3.28 | 5.87 | 5.67 | N | 2 | 2 | 4 |
| **3rd Prior Month*** | April | 2.56 | 4.17 | 3.46 | N | 2 | 1 | 2 |
| | | | | | | | **Sum** | **15** |

*compared to photo/observation date

| **Note: If sum is** | |
|---|---|
| **6 - 9** | prior period has been drier than normal |
| **10 - 14** | prior period has been normal |
| **15 - 18** | prior period has been wetter than normal |

| **Condition value:** |
|---|
| **D**ry =1 |
| **N**ormal =2 |
| **W**et =3 |

**Conclusions:** **prior period has been wetter than normal**

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SOLARSTONE

# Aerial Map - 2011

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

**NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination**
**NRCS Engineering Field Handbook Chapter 19**

| | | | |
|---|---|---|---|
| **Date** | 3/1/2024 | **Landowner/Project** | Cortland Solar LLC |
| **Weather Station** | DeKalb | **State** | Illinois |
| **County** | DeKalb | **Growing Season** | 2011 |
| **Photo/obs Date** | 9/1/2011 | **Soil Name** | 152A |

shaded cells are locked or calculated

**Long-term rainfall statistics** (from WETS table or State Climatology Office)

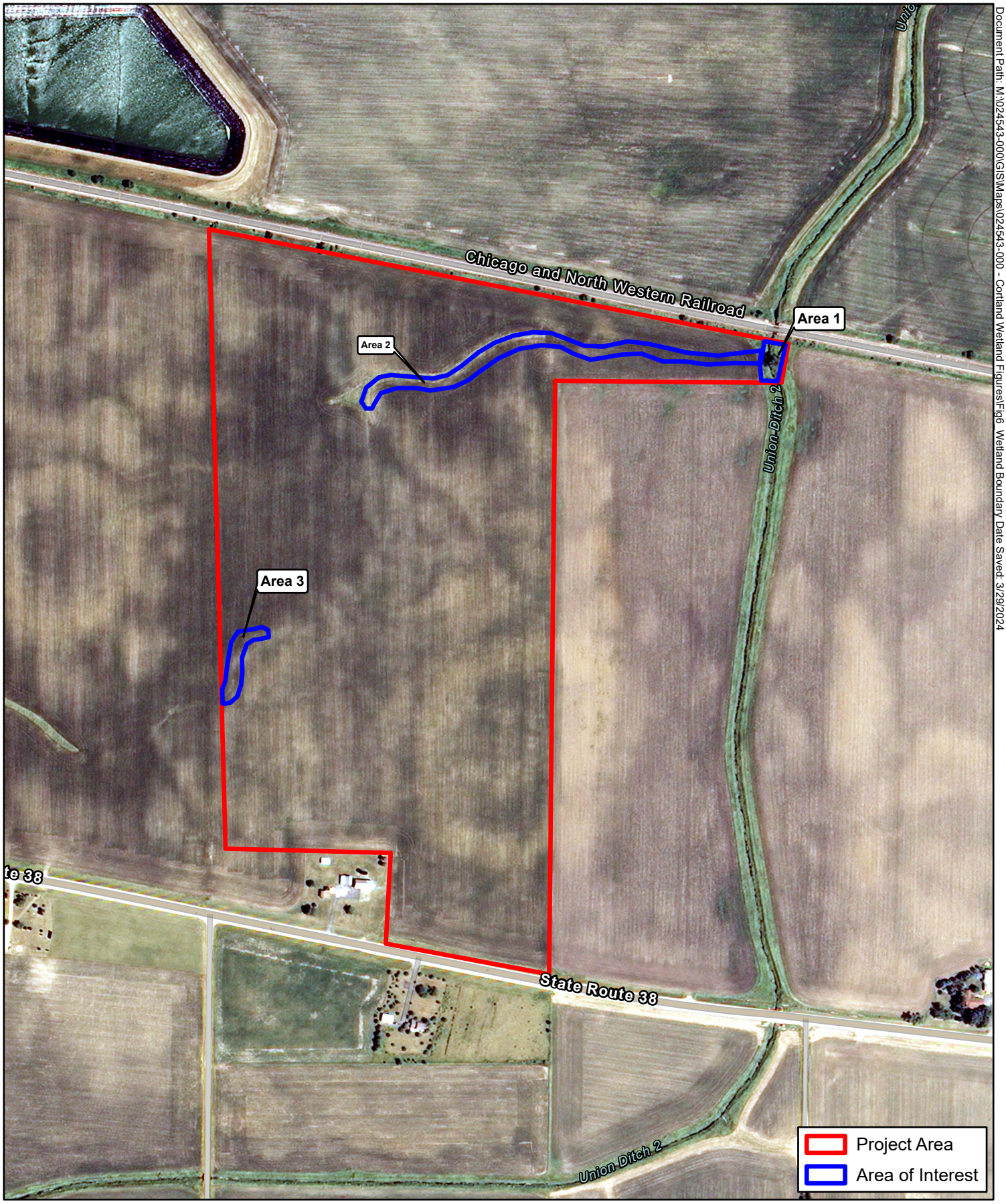
| | Month | 30% chance < | 30% chance > | Precip | Condition Dry, Wet, Normal | Condition Value | Month Weight Value | Product of Previous 2 Columns |
|---|---|---|---|---|---|---|---|---|
| **1st Prior Month*** | August | 2.69 | 4.84 | 5.29 | W | 3 | 3 | 9 |
| **2nd Prior Month*** | July | 2.49 | 4.80 | 5.28 | W | 3 | 2 | 6 |
| **3rd Prior Month*** | June | 2.77 | 5.53 | 4.53 | N | 2 | 1 | 2 |
| | | | | | | | **Sum** | **17** |

*compared to photo/observation date

| **Note: If sum is** | |
|---|---|
| **6 - 9** | prior period has been drier than normal |
| **10 - 14** | prior period has been normal |
| **15 - 18** | prior period has been wetter than normal |

| **Condition value:** |
|---|
| **D**ry =1 |
| **N**ormal =2 |
| **W**et =3 |

**Conclusions:** **prior period has been wetter than normal**

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SOLARSTONE

# Aerial Map - 2012

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

**NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination**
**NRCS Engineering Field Handbook Chapter 19**

| | | | |
|---|---|---|---|
| **Date** | 3/1/2024 | **Landowner/Project** | Cortland Solar LLC |
| **Weather Station** | DeKalb | **State** | Illinois |
| **County** | DeKalb | **Growing Season** | 2012 |
| **Photo/obs Date** | 7/1/2012 | **Soil Name** | 152A |

shaded cells are locked or calculated

**Long-term rainfall statistics** (from WETS table or State Climatology Office)

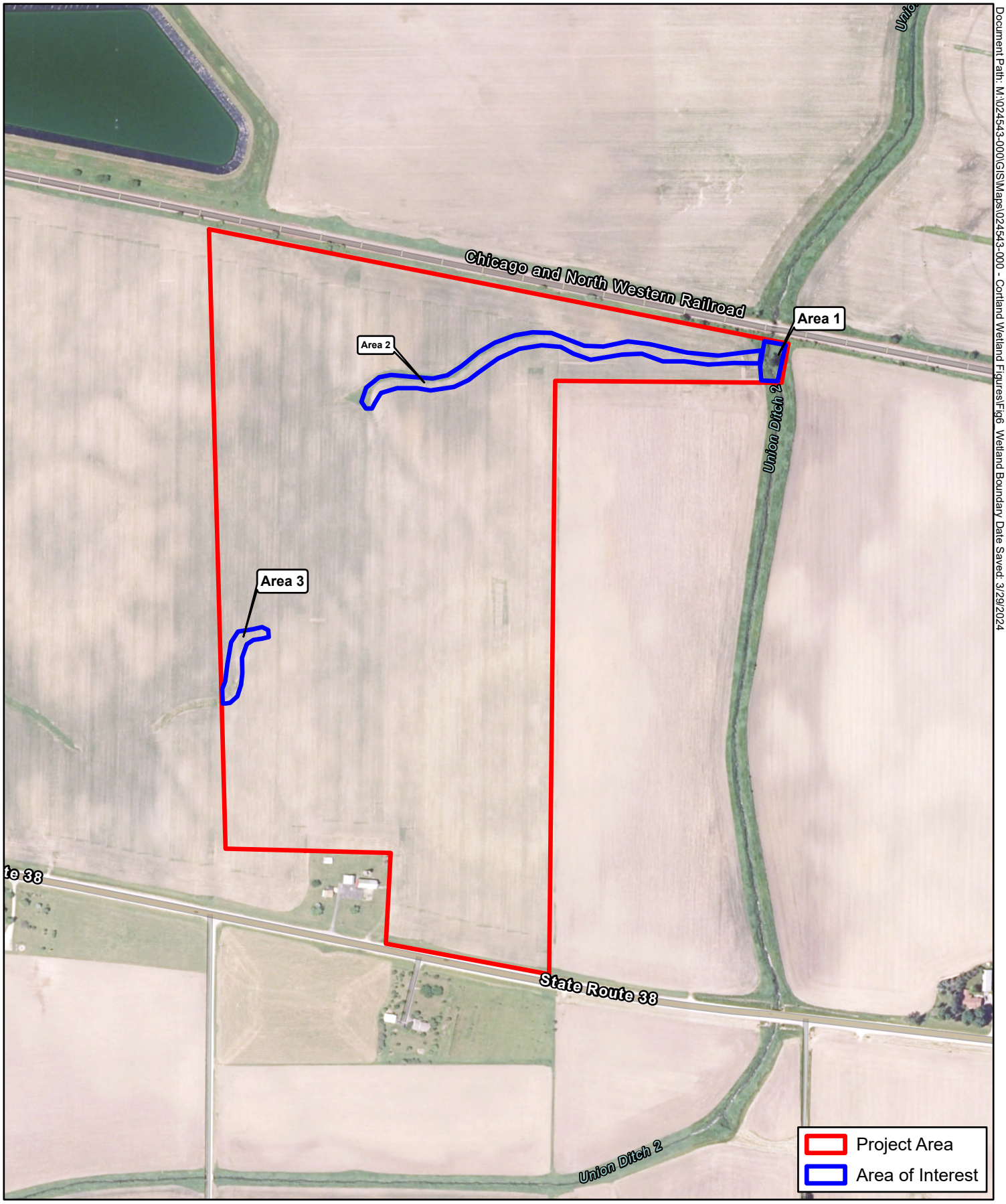
| | Month | 30% chance < | 30% chance > | Precip | Condition **D**ry, **W**et, **N**ormal | Condition Value | Month Weight Value | Product of Previous 2 Columns |
|---|---|---|---|---|---|---|---|---|
| **1st Prior Month*** | June | 2.77 | 5.53 | 2.16 | D | 1 | 3 | 3 |
| **2nd Prior Month*** | May | 3.28 | 5.87 | 1.26 | D | 1 | 2 | 2 |
| **3rd Prior Month*** | April | 2.56 | 4.17 | 2.96 | N | 2 | 1 | 2 |
| | | | | | | | **Sum** | **7** |

*compared to photo/observation date

| **Note: If sum is** | |
|---|---|
| **6 - 9** | prior period has been drier than normal |
| **10 - 14** | prior period has been normal |
| **15 - 18** | prior period has been wetter than normal |

| **Condition value:** |
|---|
| **D**ry =1 |
| **N**ormal =2 |
| **W**et =3 |

**Conclusions:** **prior period has been drier than normal**

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SOLARSTONE

# Aerial Map - 2014

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

**NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination**
**NRCS Engineering Field Handbook Chapter 19**

| | | | |
|---|---|---|---|
| **Date** | 3/1/2024 | **Landowner/Project** | Cortland Solar LLC |
| **Weather Station** | DeKalb | **State** | Illinois |
| **County** | DeKalb | **Growing Season** | 2014 |
| **Photo/obs Date** | 6/1/2014 | **Soil Name** | 152A |

shaded cells are locked or calculated

**Long-term rainfall statistics** (from WETS table or State Climatology Office)

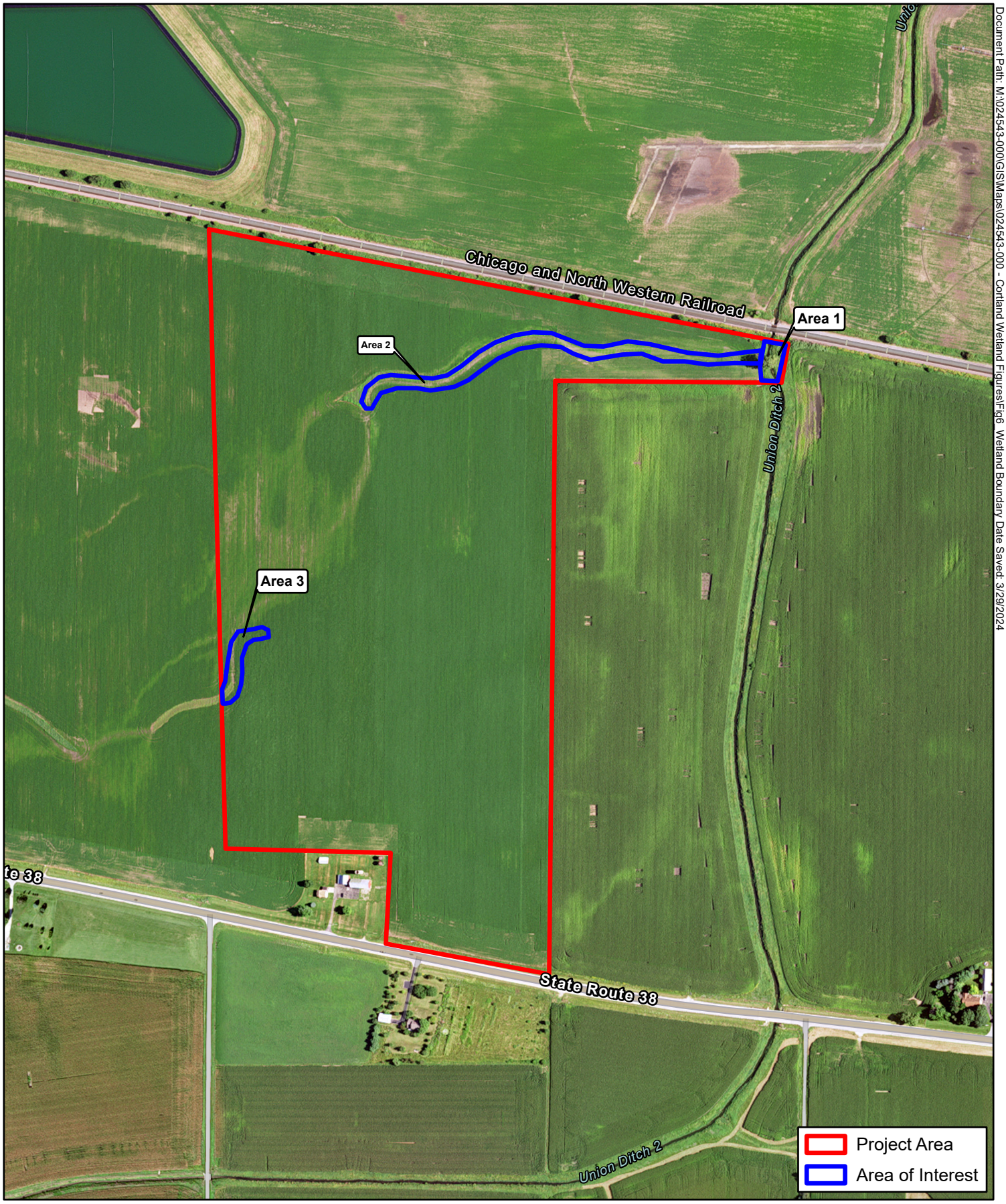
| | Month | 30% chance < | 30% chance > | Precip | Condition Dry, Wet, Normal | Condition Value | Month Weight Value | Product of Previous 2 Columns |
|---|---|---|---|---|---|---|---|---|
| **1st Prior Month*** | May | 3.28 | 5.87 | 3.01 | D | 1 | 3 | 3 |
| **2nd Prior Month*** | April | 2.56 | 4.17 | 2.75 | N | 2 | 2 | 4 |
| **3rd Prior Month*** | March | 1.45 | 2.69 | 0.80 | D | 1 | 1 | 1 |
| | | | | | | | **Sum** | **8** |

*compared to photo/observation date

| **Note: If sum is** | |
|---|---|
| **6 - 9** | prior period has been drier than normal |
| **10 - 14** | prior period has been normal |
| **15 - 18** | prior period has been wetter than normal |

| **Condition value:** |
|---|
| **D**ry =1 |
| **N**ormal =2 |
| **W**et =3 |

**Conclusions:** **prior period has been drier than normal**

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SOLARSTONE

# Aerial Map - 2015

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

**NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination**
**NRCS Engineering Field Handbook Chapter 19**

| | | | |
|---|---|---|---|
| **Date** | 3/1/2024 | **Landowner/Project** | Cortland Solar LLC |
| **Weather Station** | DeKalb | **State** | Illinois |
| **County** | DeKalb | **Growing Season** | 2015 |
| **Photo/obs Date** | 8/1/2015 | **Soil Name** | 152A |

shaded cells are locked or calculated

**Long-term rainfall statistics** (from WETS table or State Climatology Office)

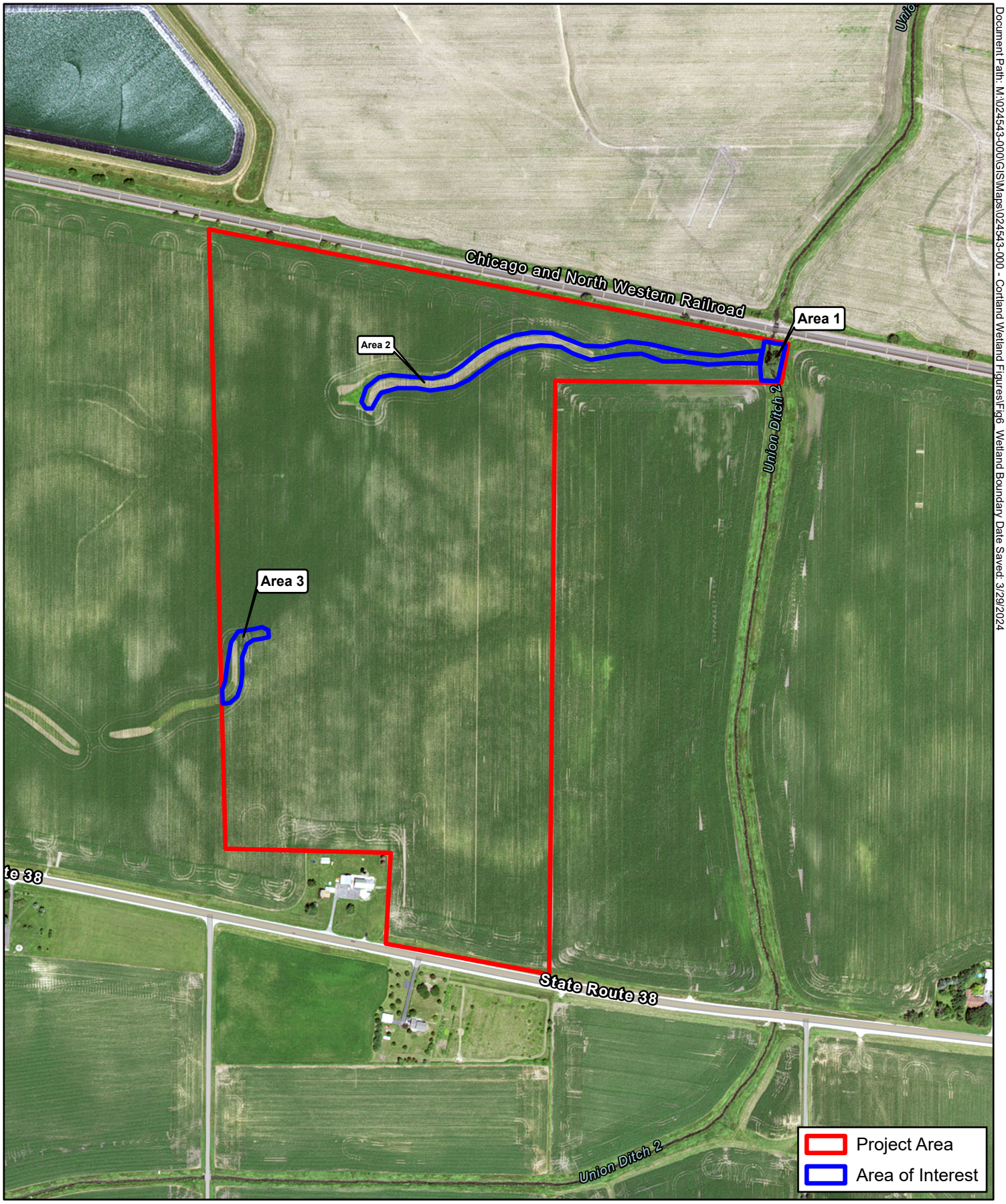
| | Month | 30% chance < | 30% chance > | Precip | Condition **D**ry, **W**et, **N**ormal | Condition Value | Month Weight Value | Product of Previous 2 Columns |
|---|---|---|---|---|---|---|---|---|
| **1st Prior Month*** | July | 2.49 | 4.80 | 3.20 | N | 2 | 3 | 6 |
| **2nd Prior Month*** | June | 2.77 | 5.53 | 8.20 | W | 3 | 2 | 6 |
| **3rd Prior Month*** | May | 3.28 | 5.87 | 5.82 | N | 2 | 1 | 2 |
| | | | | | | | **Sum** | **14** |

*compared to photo/observation date

| **Note: If sum is** | |
|---|---|
| **6 - 9** | prior period has been drier than normal |
| **10 - 14** | prior period has been normal |
| **15 - 18** | prior period has been wetter than normal |

| **Condition value:** |
|---|
| **D**ry =1 |
| **N**ormal =2 |
| **W**et =3 |

**Conclusions:** **prior period has been normal**

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SOLARSTONE

# Aerial Map - 2017

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

**NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination**
**NRCS Engineering Field Handbook Chapter 19**

| | | | |
|---|---|---|---|
| **Date** | 3/1/2024 | **Landowner/Project** | Cortland Solar LLC |
| **Weather Station** | DeKalb | **State** | Illinois |
| **County** | DeKalb | **Growing Season** | 2017 |
| **Photo/obs Date** | 7/1/2017 | **Soil Name** | 152A |

shaded cells are locked or calculated

**Long-term rainfall statistics** (from WETS table or State Climatology Office)

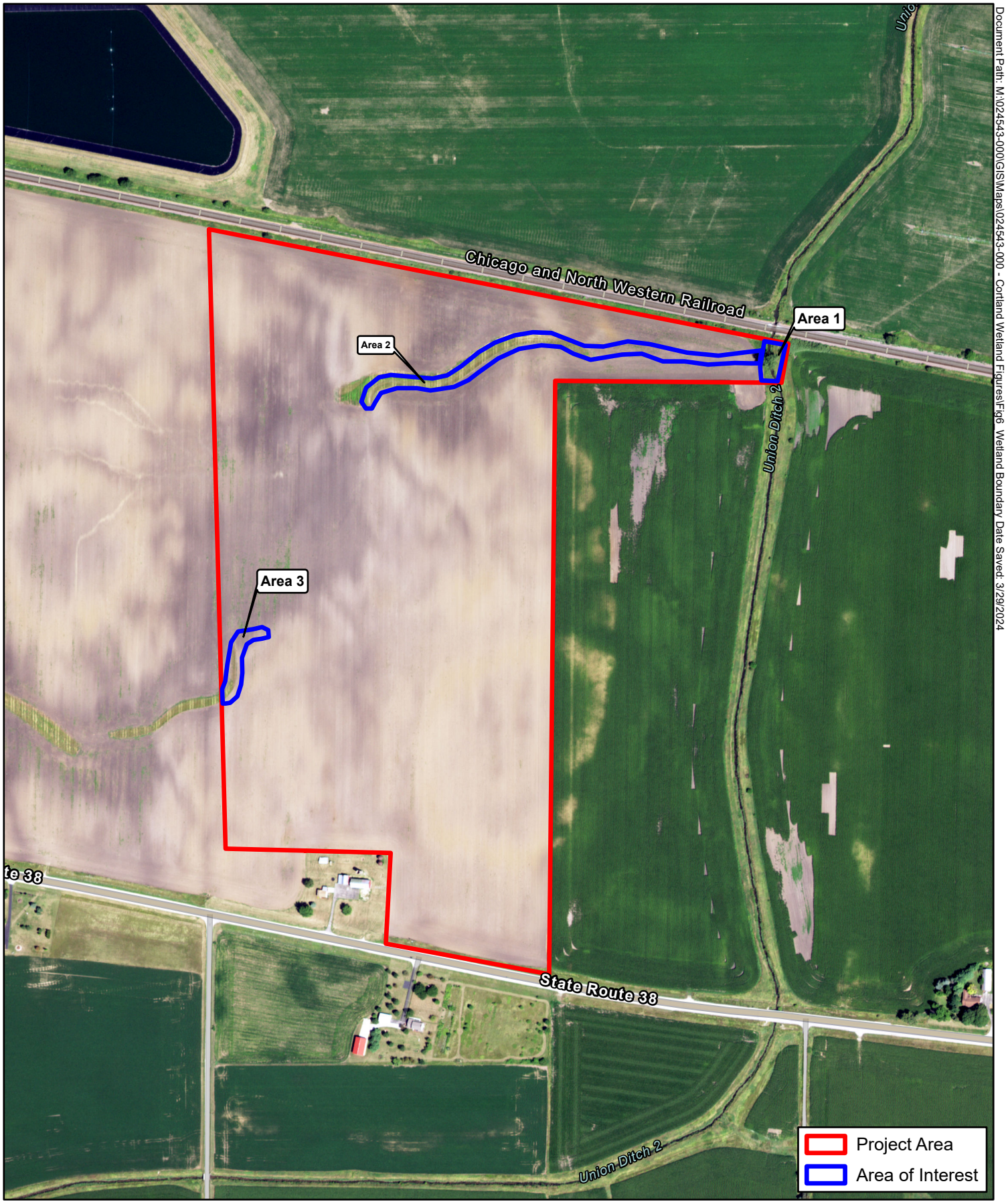
| | Month | 30% chance < | 30% chance > | Precip | Condition Dry, Wet, Normal | Condition Value | Month Weight Value | Product of Previous 2 Columns |
|---|---|---|---|---|---|---|---|---|
| **1st Prior Month*** | June | 2.77 | 5.53 | 3.50 | N | 2 | 3 | 6 |
| **2nd Prior Month*** | May | 3.28 | 5.87 | 4.76 | N | 2 | 2 | 4 |
| **3rd Prior Month*** | April | 2.56 | 4.17 | 5.19 | W | 3 | 1 | 3 |
| | | | | | | | **Sum** | **13** |

*compared to photo/observation date

| **Note: If sum is** | |
|---|---|
| **6 - 9** | prior period has been drier than normal |
| **10 - 14** | prior period has been normal |
| **15 - 18** | prior period has been wetter than normal |

| **Condition value:** |
|---|
| **D**ry =1 |
| **N**ormal =2 |
| **W**et =3 |

**Conclusions:** **prior period has been normal**

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SOLARSTONE

# Aerial Map - 2019

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

**NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination**
**NRCS Engineering Field Handbook Chapter 19**

| | | | |
|---|---|---|---|
| **Date** | 3/1/2024 | **Landowner/Project** | Cortland Solar LLC |
| **Weather Station** | DeKalb | **State** | Illinois |
| **County** | DeKalb | **Growing Season** | 2019 |
| **Photo/obs Date** | 8/1/2019 | **Soil Name** | 152A |

shaded cells are locked or calculated

**Long-term rainfall statistics** (from WETS table or State Climatology Office)

| | Month | 30% chance < | 30% chance > | Precip | Condition Dry, Wet, Normal | Condition Value | Month Weight Value | Product of Previous 2 Columns |
|---|---|---|---|---|---|---|---|---|
| **1st Prior Month*** | July | 2.49 | 4.80 | 1.87 | D | 1 | 3 | 3 |
| **2nd Prior Month*** | June | 2.77 | 5.53 | 2.69 | D | 1 | 2 | 2 |
| **3rd Prior Month*** | May | 3.28 | 5.87 | 7.80 | W | 3 | 1 | 3 |
| | | | | | | | **Sum** | **8** |

*compared to photo/observation date

| **Note: If sum is** | |
|---|---|
| **6 - 9** | prior period has been drier than normal |
| **10 - 14** | prior period has been normal |
| **15 - 18** | prior period has been wetter than normal |

| **Condition value:** |
|---|
| **D**ry =1 |
| **N**ormal =2 |
| **W**et =3 |

**Conclusions:** **prior period has been drier than normal**

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SOLARSTONE

# Aerial Map - 2020

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

**NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination**
**NRCS Engineering Field Handbook Chapter 19**

| | | | |
|---|---|---|---|
| **Date** | 3/1/2024 | **Landowner/Project** | Cortland Solar LLC |
| **Weather Station** | DeKalb | **State** | Illinois |
| **County** | DeKalb | **Growing Season** | 2020 |
| **Photo/obs Date** | 7/1/2020 | **Soil Name** | 152A |

shaded cells are locked or calculated

**Long-term rainfall statistics** (from WETS table or State Climatology Office)

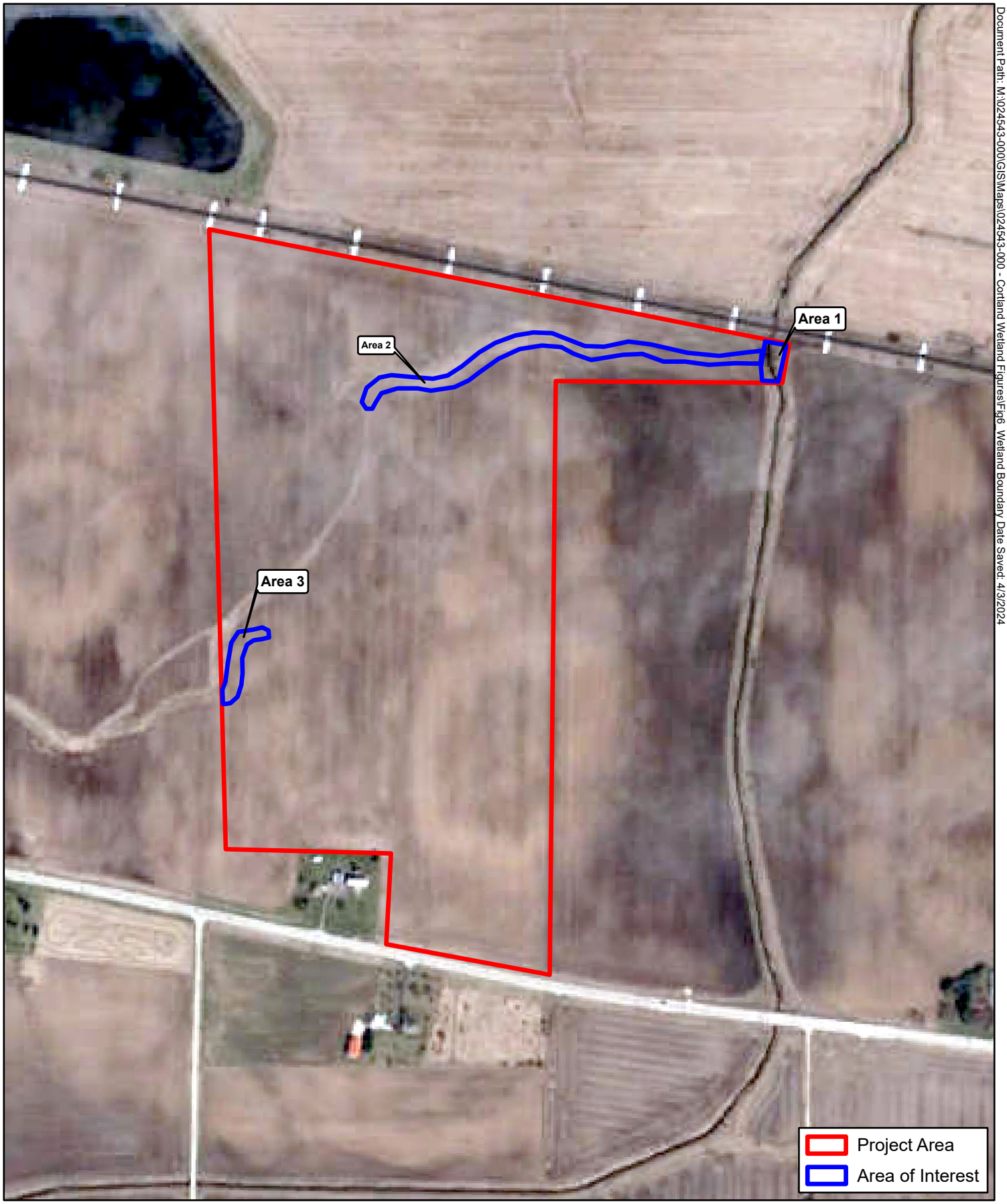
| | Month | 30% chance < | 30% chance > | Precip | Condition **D**ry, **W**et, **N**ormal | Condition Value | Month Weight Value | Product of Previous 2 Columns |
|---|---|---|---|---|---|---|---|---|
| **1st Prior Month*** | June | 2.77 | 5.53 | 2.48 | D | 1 | 3 | 3 |
| **2nd Prior Month*** | May | 3.28 | 5.87 | 6.22 | W | 3 | 2 | 6 |
| **3rd Prior Month*** | April | 2.56 | 4.17 | 3.40 | N | 2 | 1 | 2 |
| | | | | | | | **Sum** | **11** |

*compared to photo/observation date

| **Note: If sum is** | |
|---|---|
| **6 - 9** | prior period has been drier than normal |
| **10 - 14** | prior period has been normal |
| **15 - 18** | prior period has been wetter than normal |

| **Condition value:** |
|---|
| **D**ry =1 |
| **N**ormal =2 |
| **W**et =3 |

**Conclusions:** **prior period has been normal**




# Aerial Map - 2021

Cortland Solar LLC
DeKalb County, IL

SOLARSTONE

N

0 500 Feet

1 inch = 500 feet

wsb

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**NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination**
**NRCS Engineering Field Handbook Chapter 19**

| | | | |
|---|---|---|---|
| **Date** | 3/1/2024 | **Landowner/Project** | Cortland Solar LLC |
| **Weather Station** | DeKalb | **State** | Illinois |
| **County** | DeKalb | **Growing Season** | 2021 |
| **Photo/obs Date** | 4/1/2021 | **Soil Name** | 152A |

shaded cells are locked or calculated

**Long-term rainfall statistics** (from WETS table or State Climatology Office)

| | Month | 30% chance < | 30% chance > | Precip | Condition Dry, Wet, Normal | Condition Value | Month Weight Value | Product of Previous 2 Columns |
|---|---|---|---|---|---|---|---|---|
| **1st Prior Month*** | March | 1.45 | 2.69 | 2.30 | N | 2 | 3 | 6 |
| **2nd Prior Month*** | February | 1.02 | 2.07 | 0.80 | D | 1 | 2 | 2 |
| **3rd Prior Month*** | January | 1.07 | 1.99 | 1.84 | N | 2 | 1 | 2 |
| | | | | | | | **Sum** | **10** |

*compared to photo/observation date

| **Note: If sum is** | |
|---|---|
| **6 - 9** | prior period has been drier than normal |
| **10 - 14** | prior period has been normal |
| **15 - 18** | prior period has been wetter than normal |

| **Condition value:** |
|---|
| **D**ry =1 |
| **N**ormal =2 |
| **W**et =3 |

**Conclusions:** **prior period has been normal**

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SOLARSTONE

# Aerial Map - 2023

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

**NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination**
**NRCS Engineering Field Handbook Chapter 19**

| | | | |
|---|---|---|---|
| **Date** | 3/1/2024 | **Landowner/Project** | Cortland Solar LLC |
| **Weather Station** | DeKalb | **State** | Illinois |
| **County** | DeKalb | **Growing Season** | 2023 |
| **Photo/obs Date** | 5/1/2023 | **Soil Name** | 152A |

shaded cells are locked or calculated

**Long-term rainfall statistics** (from WETS table or State Climatology Office)

| | Month | 30% chance < | 30% chance > | Precip | Condition Dry, Wet, Normal | Condition Value | Month Weight Value | Product of Previous 2 Columns |
|---|---|---|---|---|---|---|---|---|
| **1st Prior Month*** | April | 2.56 | 4.17 | 3.04 | N | 2 | 3 | 6 |
| **2nd Prior Month*** | March | 1.45 | 2.69 | 1.97 | N | 2 | 2 | 4 |
| **3rd Prior Month*** | February | 1.02 | 2.07 | 2.78 | W | 3 | 1 | 3 |
| | | | | | | | **Sum** | **13** |

*compared to photo/observation date

| **Note: If sum is** | |
|---|---|
| **6 - 9** | prior period has been drier than normal |
| **10 - 14** | prior period has been normal |
| **15 - 18** | prior period has been wetter than normal |

| **Condition value:** |
|---|
| **D**ry =1 |
| **N**ormal =2 |
| **W**et =3 |

**Conclusions:** **prior period has been normal**

# Appendix H: Level 2 Wetland Delineation Report

# LEVEL 2 WETLAND DELINEATION REPORT

# CORTLAND SOLAR

## CORTLAND SOLAR LLC

DEKALB COUNTY, ILLINOIS

October 2025

Prepared for:
Cortland Solar LLC

WSB PROJECT NO. 24543

# LEVEL 2 WETLAND DELINEATION REPORT

**Cortland Solar LLC**

**October 15, 2025**

**Prepared by:**

# CERTIFICATION

The report was prepared by:

Shawn Williams, CMWP No.1178

Date: October 15, 2025 Title: Senior Environmental Scientist

I hereby certify that this report was reviewed by me and that I am a Certified Wetland Delineator in the State of Minnesota.

Alison Harwood, CMWP No.1238

Date: October 15, 2025 Title: Director of Natural Resources

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**CERTIFICATION**
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**Appendix A:** Figure 1 – Project Location
Figure 2 – Topography
Figure 3 – National Hydrography Dataset (NHD) and Floodplain
Figure 4 – National Wetlands Inventory
Figure 5 – County Soil Survey

**Appendix B:** Figure 6 – Wetland Delineation
Wetland Determination Data Forms

**Appendix C:** Wetland Photos

**Appendix D:** Antecedent Precipitation Data

# SECTION I

## I. Introduction

### A. Project Location

The project is located in Cortland Township, DeKalb County, IL. The site is located northeast of the intersection of State Highway 38 and Chase Road. The project area consists of approximately 81 acres in Section 27 of Township 40N and Range 5E. (**Figure 1, Appendix A**).

### B. Project Purpose

Cortland Solar LLC is evaluating the site for a potential future solar energy development. This report is intended to address all Section 404 jurisdictional wetlands and/or waters for final design and permitting of this project. This project was authorized by Cortland Solar LLC.

### C. Project Scope

The scope of this project was to delineate all water resources within the outlined project area.

### D. Summary of Findings

A Level 2 wetland delineation was performed on the site. One (1) wetland and one ditched watercourse were identified and delineated in the preparation of this report, as summarized in **Table 1**. For a visual representation of the wetland locations and size, please see **Figure 6**, **Appendix B**. All potential wetland areas (mapped hydric soils, NWI signatures, and low depressional areas) were reviewed on-site and either delineated or determined to be upland.

**Table 1: Summary of Delineated Wetlands, Cortland Solar LLC, DeKalb County, Illinois**

| Wetland ID | Delineation Method | No. Flags/ No. Transects | Wetland Classification | Circular 39 (Cowardin) | NWI | IDNR PWI | County Soil Survey (Hydric/Non-Hydric) | Wetland Size (acres) |
|---|---|---|---|---|---|---|---|---|
| 1 | 1/2 | 8/1 | Seasonally Saturated (farmed) | Type 1 (PEM1Af) | No | No | **152A** | 0.04 |

# SECTION II

## II. Delineation Procedure

### A. Off-Site Determination: Base Map Review

Offsite Wetland Hydrology Assessment (Level 1 Wetland Delineation): Prior to the onsite Level 2 wetland delineation, WSB completed a Level 1 wetland delineation of the property to determine whether wetland hydrology exists within the site.

Based on the Level 1 delineation, three potential wetland areas were identified. One area (Area 1) was concluded to be Union Ditch No. 2, a ditched watercourse. Area 2 and Area 3 required field verification to confirm whether wetland hydrology exists. A portion of Area 2 met wetland criteria and was field-delineated as Wetland 1. A sample point was taken at Area 3 but determined to be upland because hydric soil indicators were not observed. All three areas were investigated as described in this Level 2 wetland delineation report.

Topography: The landform of the site consists of a gentle sloping upland field that leads down to Union Ditch 2, to the east of the parcel. Water flows from west to east, generally (**Figure 2, Appendix A**).

The *National Hydrography Dataset (NHD)* depicts one tributary (Union Ditch No. 2) within the site. The tributary is located at the northeast corner of the parcel. The *FEMA Flood Map* depicts Zone A within the northeast corner of the site (**Figure 3, Appendix A**). It is associated with Union Ditch No. 2.

The *National Wetlands Inventory Map* (US Fish and Wildlife Service) depicts one tributary (Union Ditch No. 2) within the site (**Figure 4, Appendix A**).

The *Soil Survey of DeKalb County, Illinois* (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm) identified the following soils (**Table 2**) within the project area (**Figure 5, Appendix A**):

**Table 2: Soil Survey**

| Map Symbol | Soil Unit Name | Percent Hydric | Rating |
|---|---|---|---|
| 104A | Virgil silt loam, 0 to 2 percent slopes | 10 | Predominantly Non-Hydric |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes | 100 | All Hydric |
| 154A | Flanagan silt loam, 0 to 2 percent slopes | 4 | Predominantly Non-Hydric |
| 171B | Catlin silt loam, 2 to 5 percent slopes | 0 | Not Hydric |
| 325C2 | Dresden silt loam, 4 to 6 percent slopes, eroded | 4 | Predominantly Non-Hydric |
| 512B | Danabrook silt loam, 2 to 5 percent slopes | 8 | Predominantly Non-Hydric |
| 667A | Kaneville silt loam, 0 to 2 percent slopes | 8 | Predominantly Non-Hydric |
| 667B | Kaneville silt loam, 2 to 5 percent slopes | 0 | Not Hydric |

Antecedent Climate Conditions: Historic climate data and WETS data were obtained from the AgACIS precipitation data tool preceding the September 17, 2024 site visit, which fell within the normal precipitation range. Records of the precipitation can be found in **Appendix D**.

### B. On-Site Determination

A Level 2 field investigation was conducted by Shawn Williams (Certified Minnesota Wetland Professional - CMWP No. 1178) of WSB on September 17, 2024 within the project area. No deviation or omissions were undertaken as part of this investigation.

The project area was delineated using the routine methodology described in the *Corps of Engineers Wetlands Delineation Manual* (US Army Corps of Engineers 1987), with additional guidance provided by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0).* Wetlands were classified according to the methodologies set forth in *Wetlands of the United States (Circular 39),* USFWS Shaw and Fredine 1971; *Classification of Wetlands and Deepwater Habitats of the United States*, Cowardin 1979; and *Illinois Wetlands (IDNR).* The wetland types in this report are classified by the Circular 39, Cowardin, and IDNR Classifications.

Soil types were researched prior to the on-site investigation with the assistance of the *Soil Survey of DeKalb County* from the National Resources Conservation Service. All soil test pits were excavated to a minimum depth of 24 inches unless otherwise noted. Soil colors were described on-site per the *Munsell Soil Color Charts* (2009 Revised Edition) from the test pits in and adjacent to the wetlands. Hydric soils were identified using the current technical criteria for hydric soils developed by the NRCS in 2024 (Version 9.0). A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. The presence of water was observed after time was allowed for movement of water through the substrate. This time varied depending upon soil characteristics.

The quadrant sampling method was employed for all sample points unless otherwise noted. Vegetation was measured as actual areal cover and may exceed 100 percent of total area due to overlap. Grasses and herbaceous vegetative cover were measured within a circular plot of a 5-foot-radius, all woody shrubs and saplings were measured within a circular plot with a 15-foot-radius, and trees and woody vines were measured in a 30-foot-radius circular plot. Regional plant identification resources were utilized in the identification of plant species, with indicator status taken from the *2022 National Wetland Plant List* (US Army Corps of Engineers 2022). Plant species dominance was estimated based on the absolute percent coverage for herbaceous, shrub-sapling, and tree strata if present. In addition to the use of indicators of hydrology, hydric soils, and the presence of hydrophytic vegetation, other evidence such as topographic breaks and watershed characteristics were used to determine the wetland boundary.

Midwest Regional Supplement Routine Wetland Delineation data forms were used to record vegetation, hydrology, and soil characteristics at sample points in and adjacent to the wetland (**Appendix B**). Sampling transects were taken along the wetland-upland boundary of the wetland. Transects and delineated wetland boundaries were field surveyed using a sub-meter accuracy hand-held GPS unit. Approximate sampling points and delineated wetland edges are shown on **Figure 6, Appendix B**. Pictures of each wetland can be found in **Appendix C**.

# SECTION III

## III. Results and Wetland Information

The wetland delineation data forms (**Appendix B**) and photos (**Appendix C**) are attached. A summary of the delineation is below.

### A. Wetland 1

**Circular 39:** Type 1
**Cowardin:** PEM1Af
**Classification:** Seasonally Saturated
**Soil mapping unit:** Drummer silty clay loam, 0 to 2 percent slopes (152A)
**No. Transects:** 1 **No. Additional Sample Points:** 0
**Wetland Flags:** 8
**Wetland Size (within Project Area):** 0.04 acre
**Anticipated USACE Jurisdiction:** Likely because of surface hydric soil connection with Union Ditch No. 2.

Wetland 1 is positioned in a sloped depression that has been historically disturbed by agricultural land use. The wetland is characterized as Type 1 seasonally saturated – farmed. The wetland boundary is outlined in **Figure 6, Appendix B**.

Dominant vegetation in the wetland consisted of yellow foxtail (*Setaria pumila*), yellow nutsedge (*Cyperus esculentus*), and marsh milkweed (*Asclepias incarnata*) in the herb stratum. Hydric soil indicators consisted of Depleted Matrix (F3). Hydrology indicators included Drainage Patterns (B10), Saturation Visible on Aerial Imagery (C9), Geomorphic Position (D2), and FAC-Neutral Test (D5).

Dominant vegetation in the upland consisted of nodding fescue (*Festuca subverticillata*) and soybean (*Glycine max*) in the herb stratum. Hydric soil indicators included Depleted Matrix (F3). No wetland hydrology indicators were observed. Soybean fields exist in the surrounding upland.

The wetland boundary was placed along a slight topographic break where wetland hydrology was no longer observed and the hydrophytic vegetation diminished.

### B. Additional Sampled Areas

Two additional sample points were taken. Sample point 2 Up was located in a sloped flat area near the west property boundary, which corresponds to Area 3 of the Level 1 delineation. 2Up is effectively drained and does not retain wetland hydrology.

Sample Point 3 Up was also effectively drained by nearby Union Ditch No.2, and did not have hydrophytic vegetation or wetland hydrology.

### C. Additional Water Resources

Union Ditch No. 2 extends through the very northeast portion of the site. It conveys water from south to north. Union Ditch No. 2 is a tributary to the South Branch of the Kishwaukee River, which is located 1.6 miles northeast of the site.

# SECTION IV

## IV. Summary and Closing Statements

One (1) wetland was delineated within the project area using the Level 2 method. One named tributary, Union Ditch No. 2, extends through the northeast part of the site.

The wetland delineation report was completed by Shawn Williams of WSB. This delineation report is being submitted as a request for approval of Wetland Type and Boundary of the wetlands described herein.

# SECTION V

## V. References

The following sources of information were reviewed to assist in performing the wetland delineation.

Literature Sources


Cowardin L.M. USFWS. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Government Printing Office, Carver, D.C. 131 pp.

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United States Army Corps of Engineers. 1987. 2014. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Version 2.0 Waterways Experiment Station.

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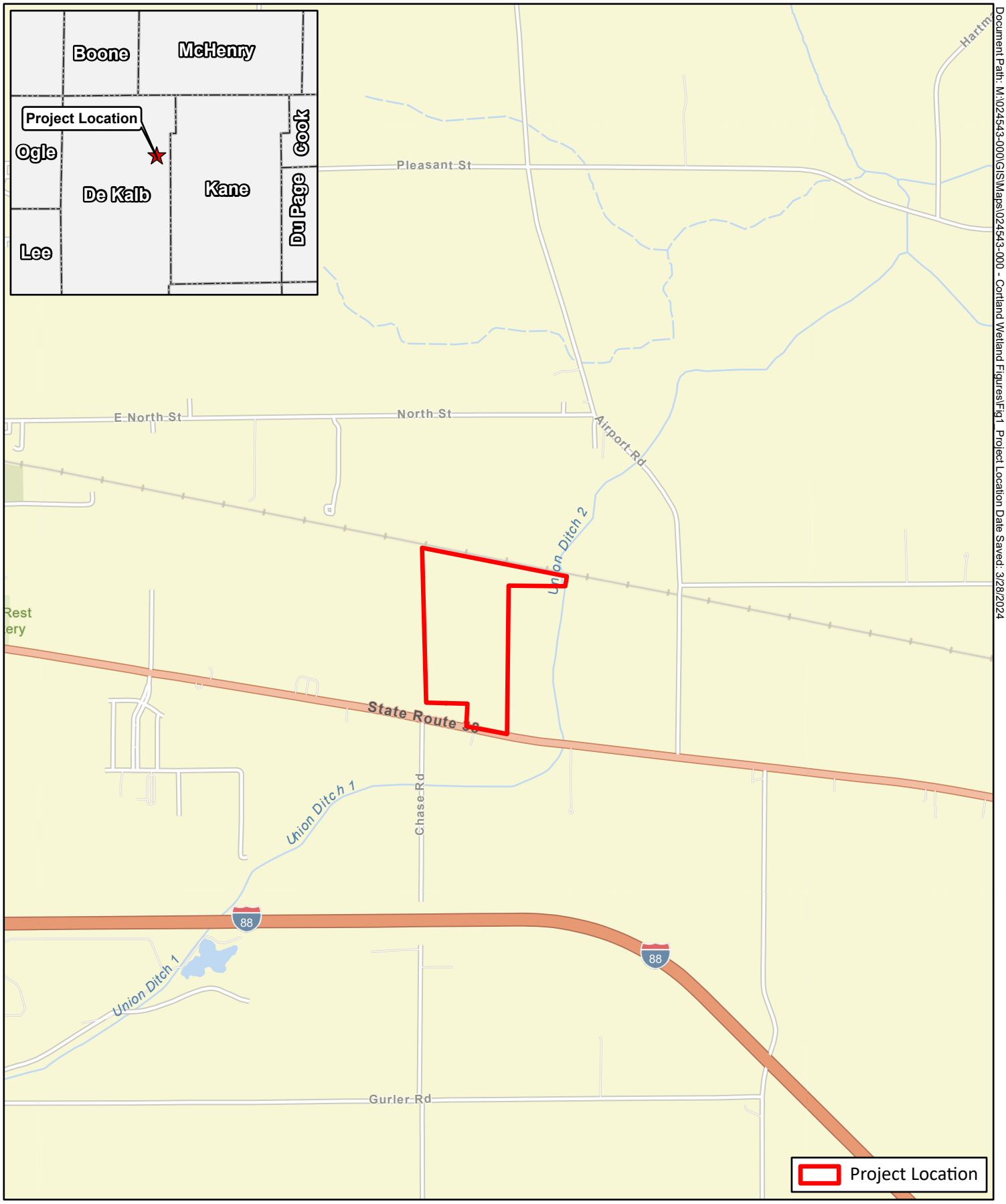
Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Webs Soil Survey, Illinois. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed September 16, 2024

# APPENDIX

## APPENDIX A

Figure 1: Project Location
Figure 2: Topography
Figure 3: National Hydrography Dataset and Floodplain
Figure 4: National Wetlands Inventory
Figure 5: County Soil Survey

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SOLARSTONE

# Figure 1 - Project Location

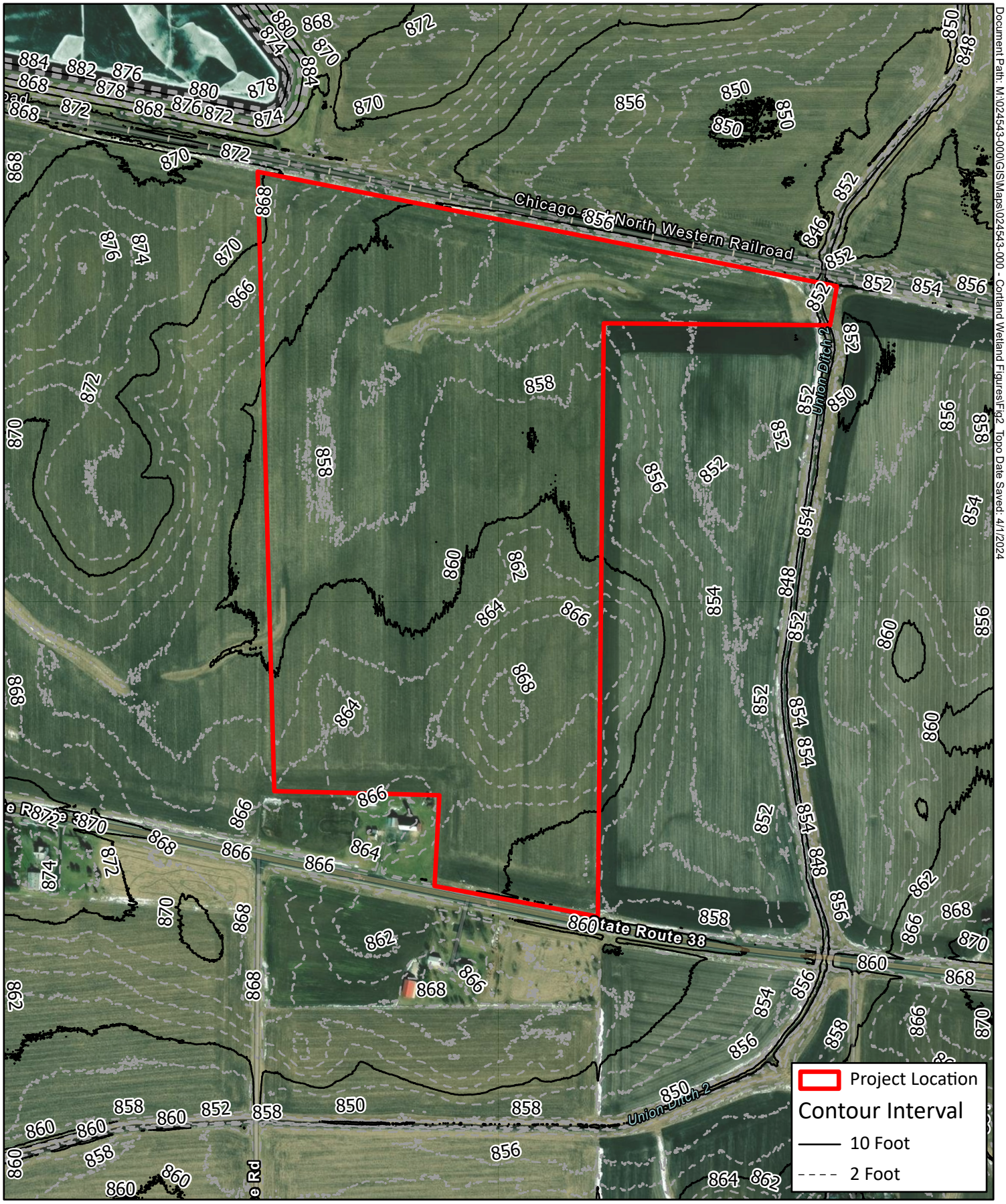
Cortland Solar LLC
DeKalb County, IL

N

0 2,000 Feet

1 inch = 2,000 feet

wsb

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SOLARSTONE

# Figure 2 - Topography

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

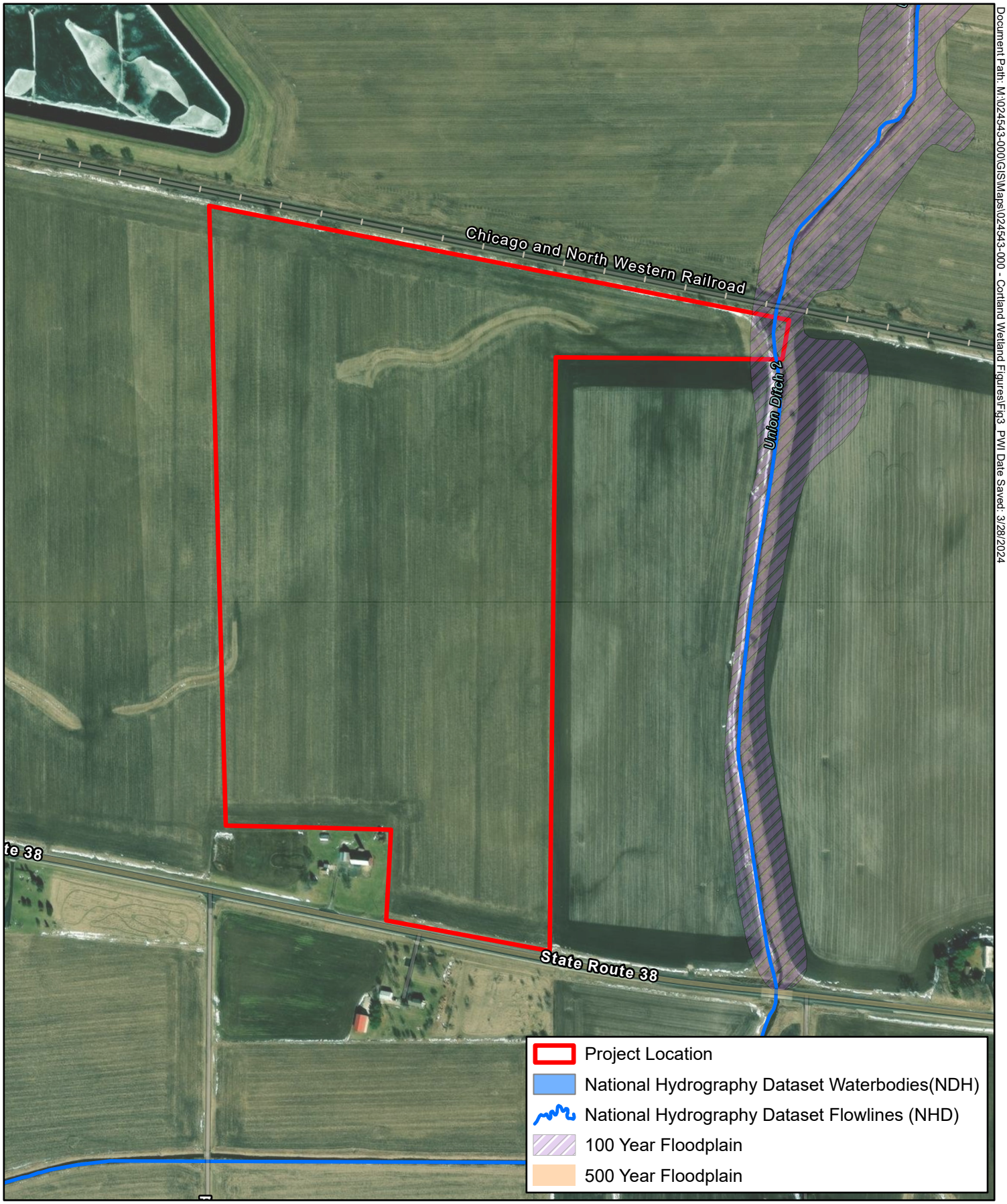


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**Figure 3 - National Hydrography Dataset (NHD) and Floodplain**

SOLARSTONE

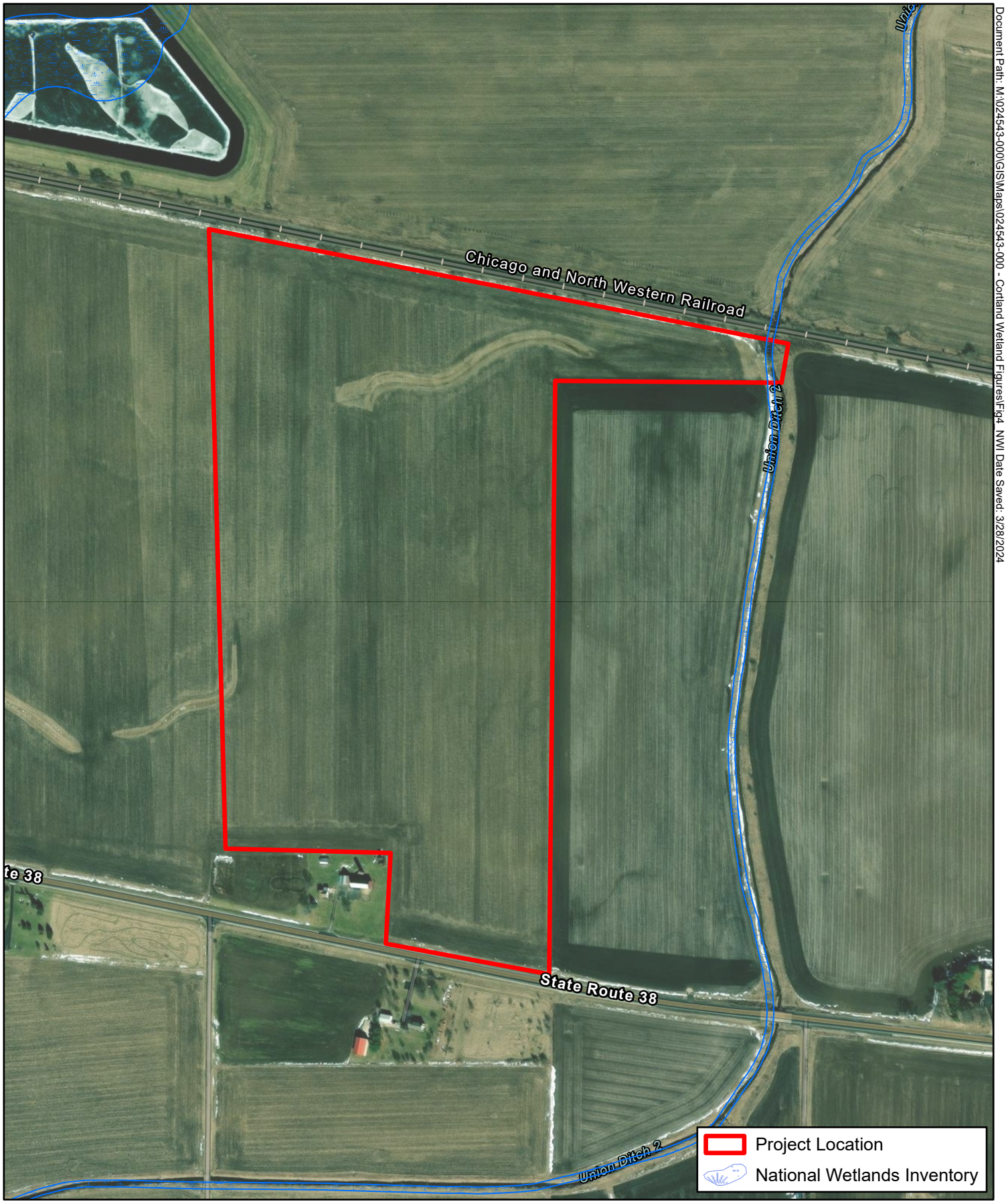
Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

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# Figure 4 - National Wetlands Inventory

SOLARSTONE

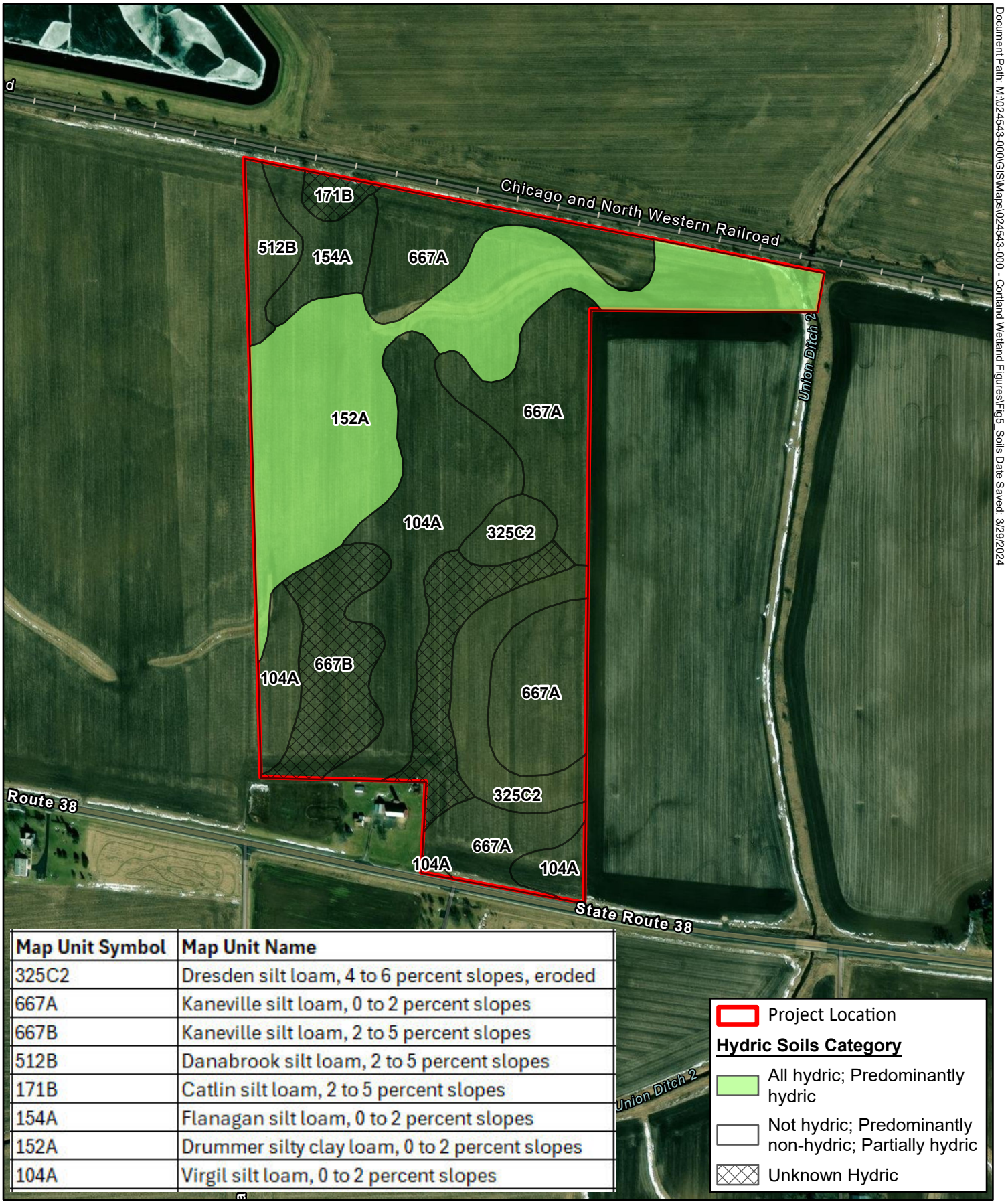
Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb




| Map Unit Symbol | Map Unit Name |
|---|---|
| 325C2 | Dresden silt loam, 4 to 6 percent slopes, eroded |
| 667A | Kaneville silt loam, 0 to 2 percent slopes |
| 667B | Kaneville silt loam, 2 to 5 percent slopes |
| 512B | Danabrook silt loam, 2 to 5 percent slopes |
| 171B | Catlin silt loam, 2 to 5 percent slopes |
| 154A | Flanagan silt loam, 0 to 2 percent slopes |
| 152A | Drummer silty clay loam, 0 to 2 percent slopes |
| 104A | Virgil silt loam, 0 to 2 percent slopes |

SOLARSTONE

# Figure 5 - County Soil Survey

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

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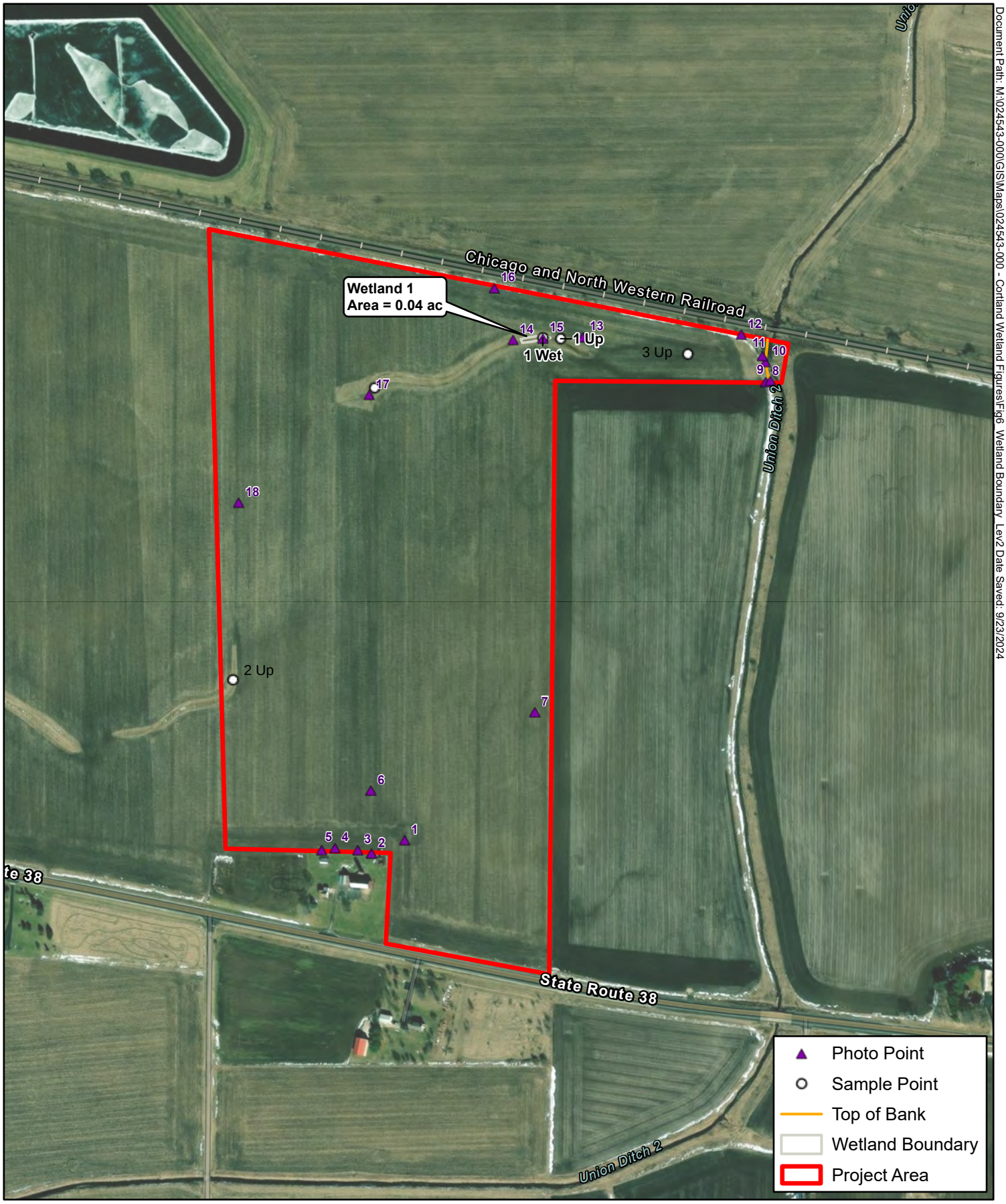
## APPENDIX B

Figure 6: Wetland Delineation
Wetland Determination Data Forms

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# Figure 6 - Wetland Delineation

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

# WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Cortland Solar LLC | City/County: DeKalb County | Sampling Date: 9/17/2024
Applicant/Owner: Cortland Solar LLC | State: IL | Sampling Point: 1 Wet
Investigator(s): WSB (Shawn Williams) | Section, Township, Range: Sec. 27, T40N, R5E
Landform (hillslope, terrace, etc.): depression | Local relief (concave, convex, none): concave
Slope (%): 3 | Lat: 41.915451 | Long: -88.656082 | Datum: WGS 84
Soil Map Unit Name: Drummer silty clay loam , 0-2 percent slopes (152A) | NWI Classification:
Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)
Are vegetation X, soil X, or hydrology ___ significantly disturbed? Are "normal circumstances"
Are vegetation ___, soil ___, or hydrology ___ naturally problematic? present? No

## SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

| | | | |
|---|---|---|---|
| Hydrophytic vegetation present? | Y | | |
| Hydric soil present? | Y | **Is the sampled area within a wetland?** | Y |
| Indicators of wetland hydrology present? | Y | If yes, optional wetland site ID: | |

Remarks: (Explain alternative procedures here or in a separate report.)

Soil and vegetation disturbed by agricultural land use.

## VEGETATION -- Use scientific names of plants.

| Tree Stratum (Plot size: 30' radius) | Absolute % Cover | Dominant Species | Indicator Staus |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| | 0 | = Total Cover | |

| Sapling/Shrub stratun (Plot size: 15' radius) | | | |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| | 0 | = Total Cover | |

| Herb stratum (Plot size: 5' radius) | | | |
|---|---|---|---|
| 1 *Setaria pumila* | 50 | Y | FAC |
| 2 *Cyperus esculentus* | 35 | Y | FACW |
| 3 *Asclepias incarnata* | 2 | N | OBL |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| | 87 | = Total Cover | |

| Woody vine stratum (Plot size: 30' radius) | | | |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| | 0 | = Total Cover | |

**Dominance Test Worksheet**

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across all Strata: 2 (B)
Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

**Prevalence Index Worksheet**

Total % Cover of:

| | | | |
|---|---|---|---|
| OBL species | 2 | x 1 = | 2 |
| FACW species | 35 | x 2 = | 70 |
| FAC species | 50 | x 3 = | 150 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 0 | x 5 = | 0 |
| Column totals | 87 (A) | | 222 (B) |

Prevalence Index = B/A = 2.55

**Hydrophytic Vegetation Indicators:**

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic vegetation present?** Y

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

## SOIL

**Sampling Point:** 1 Wet

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (Inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type* | Loc** | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-8 | 10Y 2/1 | 100 | | | | | silty clay loam | |
| 8-14 | 10YR 4/1 | 90 | 10YR 4/6 | 10 | C | M | silty clay loam | |
| 14-24 | 10YR 5/1 | 95 | 10YR 4/6 | 5 | C | M | silty clay | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

**Hydric Soil Indicators:**

- ___ Histisol (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)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils:**

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric soil present?** Y

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 (B13)
- ___ 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)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

**Field Observations:**

| | | | | | |
|---|---|---|---|---|---|
| Surface water present? | Yes ___ | No | X | Depth (inches): | ___ |
| Water table present? | Yes ___ | No | X | Depth (inches): | ___ |
| Saturation present? (includes capillary fringe) | Yes ___ | No | X | Depth (inches): | ___ |

**Indicators of wetland hydrology present?** Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Cortland Solar LLC | City/County: DeKalb County | Sampling Date: 9/17/2024

Applicant/Owner: Cortland Solar LLC | State: IL | Sampling Point: 1 Up

Investigator(s): WSB (Shawn Williams) | Section, Township, Range: Sec. 27, T40N, R5E

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): none

Slope (%): 2 | Lat: 41.915451 | Long: -88.656082 | Datum: WGS 84

Soil Map Unit Name: Drummer silty clay loam , 0-2 percent slopes (152A) | NWI Classification:

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation X, soil X, or hydrology ____ significantly disturbed? Are "normal circumstances" present? No

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

## SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

| | | | |
|---|---|---|---|
| Hydrophytic vegetation present? | N | **Is the sampled area within a wetland?** | N |
| Hydric soil present? | Y | If yes, optional wetland site ID: | |
| Indicators of wetland hydrology present? | N | | |

Remarks: (Explain alternative procedures here or in a separate report.)

Soil and vegetation disturbed by agricultural land use.

## VEGETATION -- Use scientific names of plants.

| Tree Stratum (Plot size: 30' radius) | Absolute % Cover | Dominant Species | Indicator Staus |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| | 0 = Total Cover | | |

| Sapling/Shrub stratur (Plot size: 15' radius) | | | |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| | 0 = Total Cover | | |

| Herb stratum (Plot size: 5' radius) | | | |
|---|---|---|---|
| 1 *Festuca subverticillata* | 90 | Y | FACU |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| | 90 = Total Cover | | |

| Woody vine stratum (Plot size: 30' radius) | | | |
|---|---|---|---|
| 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: 0.00% (A/B)

**Prevalence Index Worksheet**

Total % Cover of:

| | | | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 0 | x 2 = | 0 |
| FAC species | 0 | x 3 = | 0 |
| FACU species | 90 | x 4 = | 360 |
| UPL species | 0 | x 5 = | 0 |
| Column totals | 90 (A) | | 360 (B) |

Prevalence Index = B/A = 4.00

**Hydrophytic Vegetation Indicators:**

- ____ Rapid test for hydrophytic vegetation
- ____ Dominance test is >50%
- ____ Prevalence index is ≤3.0*
- ____ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic vegetation present?** N

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

## SOIL

**Sampling Point:** 1 Up

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (Inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type* | Loc** | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-8 | 10Y 2/1 | 100 | | | | | silty clay loam | |
| 8-14 | 10YR 3/1 | 90 | 10YR 4/6 | 10 | C | M | silty clay loam | |
| | | | | | | | silty clay | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

**Hydric Soil Indicators:**

- ___ Histisol (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)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils:**

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric soil present?** Y

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 (B13)
- ___ 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 | X | Depth (inches): | ___ |
| Water table present? | Yes ___ | No | X | Depth (inches): | ___ |
| Saturation present? (includes capillary fringe) | Yes ___ | No | X | Depth (inches): | ___ |

**Indicators of wetland hydrology present?** N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Cortland Solar LLC | City/County: DeKalb County | Sampling Date: 9/17/2024

Applicant/Owner: Cortland Solar LLC | State: IL | Sampling Point: 2 Up

Investigator(s): WSB (Shawn Williams) | Section, Township, Range: Sec. 27, T40N, R5E

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): none

Slope (%): 1 | Lat: 41.912001 | Long: -88.659502 | Datum: WGS 84

Soil Map Unit Name: Drummer silty clay loam , 0-2 percent slopes (152A) | NWI Classification:

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation X, soil X, or hydrology ____ significantly disturbed? Are "normal circumstances" present? No

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

## SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

| | |
|---|---|
| Hydrophytic vegetation present? | N |
| Hydric soil present? | Y |
| Indicators of wetland hydrology present? | N |

**Is the sampled area within a wetland?** N

If yes, optional wetland site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

Soil and vegetation disturbed by agricultural land use.

## VEGETATION -- Use scientific names of plants.

| Tree Stratum (Plot size: 30' radius) | Absolute % Cover | Dominant Species | Indicator Staus |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| | 0 | = Total Cover | |

| Sapling/Shrub stratur (Plot size: 15' radius) | | | |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| | 0 | = Total Cover | |

| Herb stratum (Plot size: 5' radius) | | | |
|---|---|---|---|
| 1 *Festuca subverticillata* | 90 | Y | FACU |
| 2 *Bromus inermis* | 10 | N | FACU |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| | 100 | = Total Cover | |

| Woody vine stratum (Plot size: 30' radius) | | | |
|---|---|---|---|
| 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: 0.00% (A/B)

**Prevalence Index Worksheet**

Total % Cover of:

| | | | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 0 | x 2 = | 0 |
| FAC species | 0 | x 3 = | 0 |
| FACU species | 100 | x 4 = | 400 |
| UPL species | 0 | x 5 = | 0 |
| Column totals | 100 (A) | | 400 (B) |

Prevalence Index = B/A = 4.00

**Hydrophytic Vegetation Indicators:**

- ____ Rapid test for hydrophytic vegetation
- ____ Dominance test is >50%
- ____ Prevalence index is ≤3.0*
- ____ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic vegetation present?** N

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

## SOIL

**Sampling Point:** 2 Up

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (Inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type* | Loc** | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-7 | 10YR 3/2 | 100 | | | | | silty clay loam | |
| 7-15 | 10YR 3/1 | 60 | 10YR 4/6 | 20 | C | M | silty clay loam | |
| | 10YR 4/1 | 20 | | | | | silty clay | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

**Hydric Soil Indicators:**

- ___ Histisol (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)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils:**

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric soil present?** Y

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 (B13)
- ___ 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 | X | Depth (inches): | ___ |
| Water table present? | Yes ___ | No | X | Depth (inches): | ___ |
| Saturation present? (includes capillary fringe) | Yes ___ | No | X | Depth (inches): | ___ |

**Indicators of wetland hydrology present?** N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Cortland Solar LLC | City/County: DeKalb County | Sampling Date: 9/17/2024

Applicant/Owner: Cortland Solar LLC | State: IL | Sampling Point: 3 Up

Investigator(s): WSB (Shawn Williams) | Section, Township, Range: Sec. 27, T40N, R5E

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): none

Slope (%): 1 | Lat: 41.915495 | Long: -88.652972 | Datum: WGS 84

Soil Map Unit Name: Drummer silty clay loam , 0-2 percent slopes (152A) | NWI Classification:

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation X, soil X, or hydrology ____ significantly disturbed? Are "normal circumstances" present? No

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

### SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

| | | | |
|---|---|---|---|
| Hydrophytic vegetation present? | N | | |
| Hydric soil present? | Y | **Is the sampled area within a wetland?** | N |
| Indicators of wetland hydrology present? | N | If yes, optional wetland site ID: | |

Remarks: (Explain alternative procedures here or in a separate report.)

Soil and vegetation disturbed by agricultural land use.

### VEGETATION -- Use scientific names of plants.

| Tree Stratum (Plot size: 30' radius) | Absolute % Cover | Dominant Species | Indicator Staus |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| | 0 = Total Cover | | |

| Sapling/Shrub stratur (Plot size: 15' radius) | | | |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| | 0 = Total Cover | | |

| Herb stratum (Plot size: 5' radius) | | | |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| | 0 = Total Cover | | |

| Woody vine stratum (Plot size: 30' radius) | | | |
|---|---|---|---|
| 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: 0.00% (A/B)

**Prevalence Index Worksheet**

Total % Cover of:

| | | | | |
|---|---|---|---|---|
| OBL species | 0 | x 1 = | 0 | |
| FACW species | 0 | x 2 = | 0 | |
| FAC species | 0 | x 3 = | 0 | |
| FACU species | 0 | x 4 = | 0 | |
| UPL species | 0 | x 5 = | 0 | |
| Column totals | 0 | (A) | 0 | (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

- ____ Rapid test for hydrophytic vegetation
- ____ Dominance test is >50%
- ____ Prevalence index is ≤3.0*
- ____ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic vegetation present?** N

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

soybean stubble

## SOIL

**Sampling Point:** 3 Up

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (Inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type* | Loc** | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-9 | 10YR 3/1 | 100 | | | | | silty clay loam | |
| 9-17 | 10YR 4/1 | 95 | 10YR 4/6 | 5 | C | M | silty clay loam | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

**Hydric Soil Indicators:**

- ___ Histisol (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)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils:**

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric soil present?** Y

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 (B13)
- ___ 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 | X | Depth (inches): | ___ |
| Water table present? | Yes ___ | No | X | Depth (inches): | ___ |
| Saturation present? (includes capillary fringe) | Yes ___ | No | X | Depth (inches): | ___ |

**Indicators of wetland hydrology present?** N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## APPENDIX C

Wetland Photos

# APPENDIX

Select Site Photos (9/17/2024)

| | |
|---|---|
| | **Photo 1:** Wetland 1, Sample Point 1 Wet<br><br>Direction Photo is Taken: West<br><br>Photo Location: Photo ID 15. Within Wetland 1 |
| | **Photo 2:** Sample Point 2 Up<br><br>Direction Photo is Taken: North<br><br>Photo Location: Photo ID 2 Up |
| | **Photo 3:** Sample Point 2 Up<br><br>Direction Photo is Taken: North<br><br>Photo Location: Photo ID 2 Up |

| | |
|---|---|
| | **Photo 4:** Sample Point 3 Up<br><br>Direction Photo is Taken: West<br><br>Photo Location: Photo ID 3 Up |
| | **Photo 5:** Union Ditch No. 2<br><br>Direction Photo is Taken: North<br><br>Photo Location: Photo ID 11. west bank of ditch |
| | **Photo 6:** Overall site – Upland Field<br><br>Direction Photo is Taken: North<br><br>Photo Location: Photo ID 1. |

## APPENDIX D

Antecedent Precipitation Data

**NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination**
**NRCS Engineering Field Handbook Chapter 19**

| | | | |
|---|---|---|---|
| **Date** | 10/3/2025 | **Landowner/Project** | Cortland Solar LLC |
| **Weather Station** | DeKalb | **State** | Illinois |
| **County** | DeKalb | **Growing Season** | 1998 |
| **Photo/obs Date** | 9/1/2024 | **Soil Name** | 152A |

shaded cells are locked or calculated

**Long-term rainfall statistics** (from WETS table or State Climatology Office)

| | **Month** | **30% chance <** | **30% chance >** | **Precip** | Condition **D**ry, **W**et, **N**ormal | Condition Value | Month Weight Value | Product of Previous 2 Columns |
|---|---|---|---|---|---|---|---|---|
| **1st Prior Month*** | August | 2.69 | 4.84 | 2.12 | D | 1 | 3 | 3 |
| **2nd Prior Month*** | July | 2.49 | 4.80 | 6.71 | W | 3 | 2 | 6 |
| **3rd Prior Month*** | June | 2.77 | 5.53 | 4.81 | N | 2 | 1 | 2 |
| | | | | | | | **Sum** | **11** |

*compared to photo/observation date

| **Note: If sum is** | |
|---|---|
| **6 - 9** | prior period has been drier than normal |
| **10 - 14** | prior period has been normal |
| **15 - 18** | prior period has been wetter than normal |

| **Condition value:** |
|---|
| **D**ry =1 |
| **N**ormal =2 |
| **W**et =3 |

**Conclusions:** **prior period has been normal**

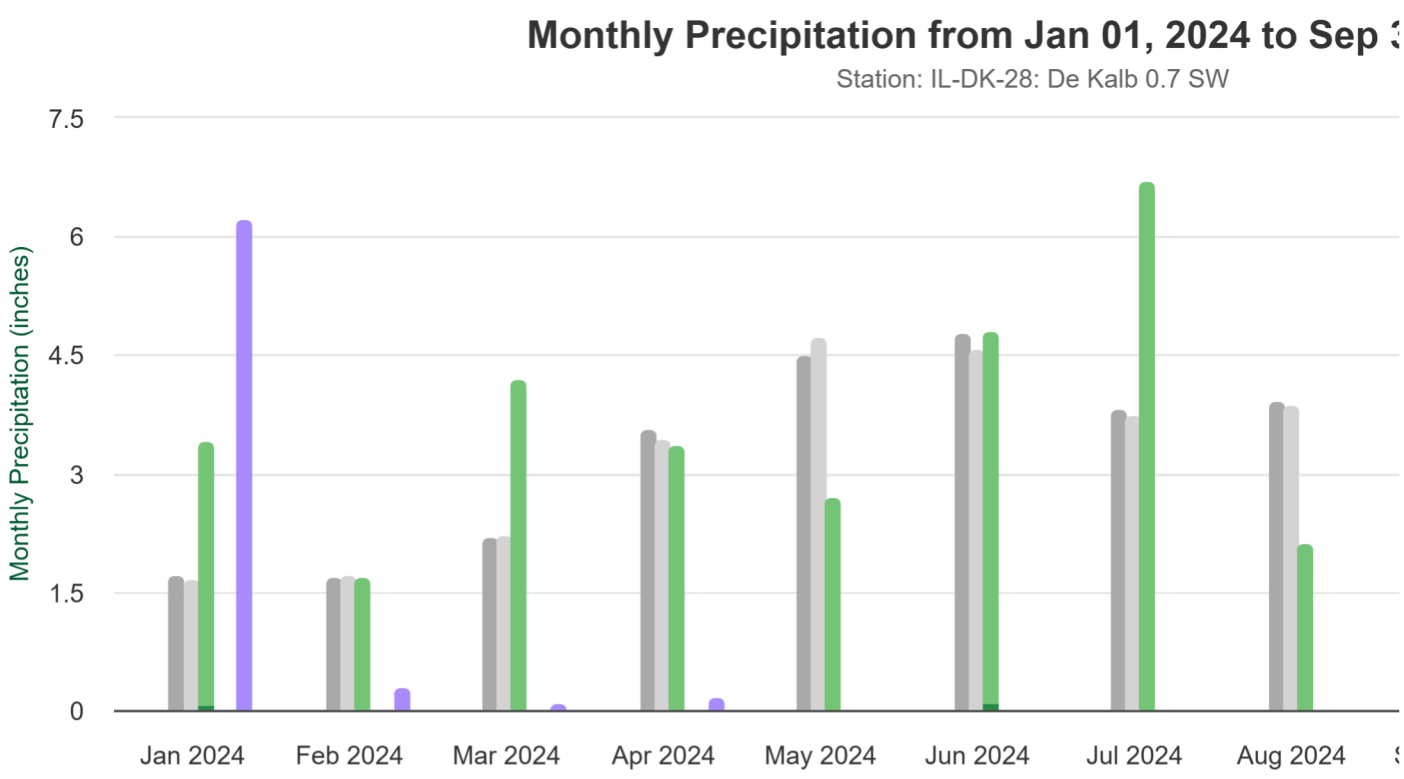
Viewing Station: **IL-DK-28 : De Kalb 0.7 SW** Jul 7, 2016 - Oct 3, 2025 3,136 Total Observations

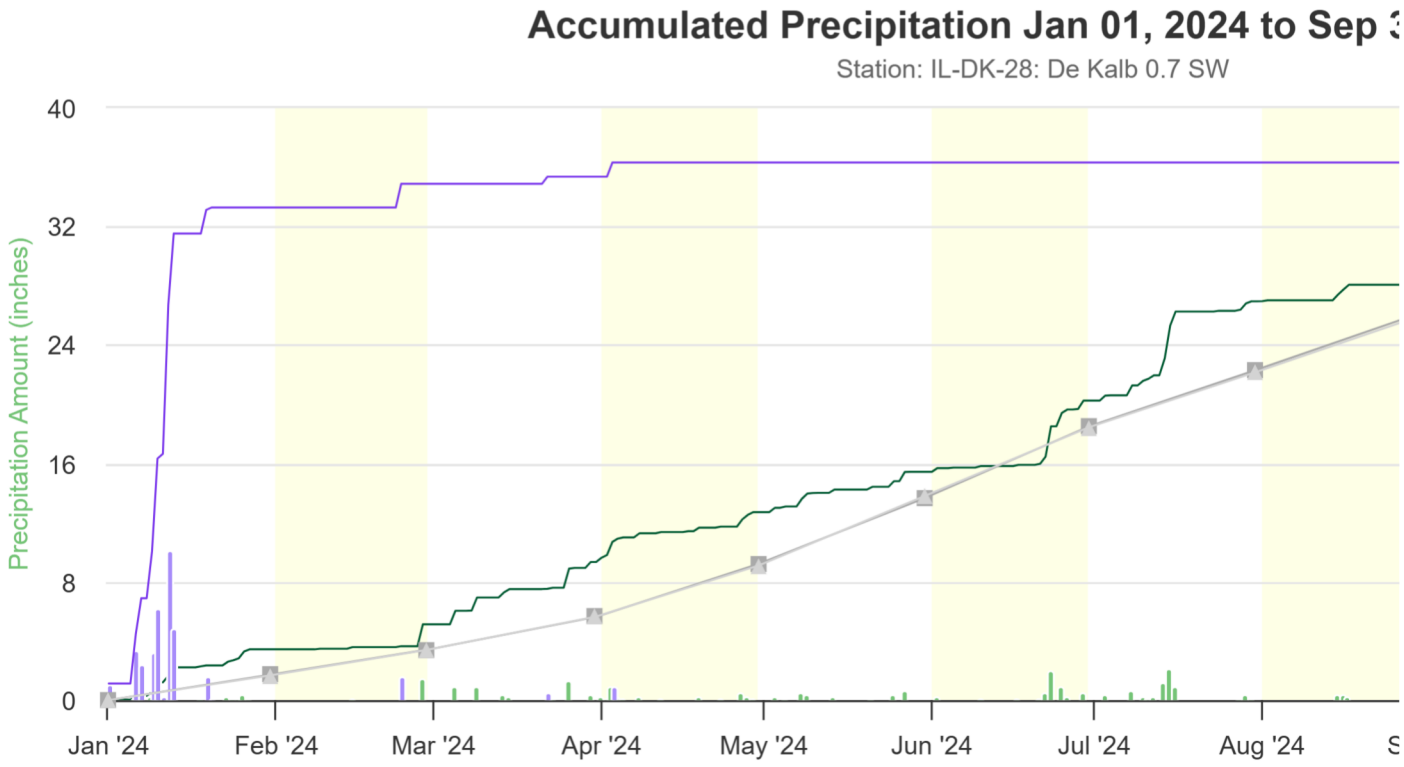
View: Station Overview

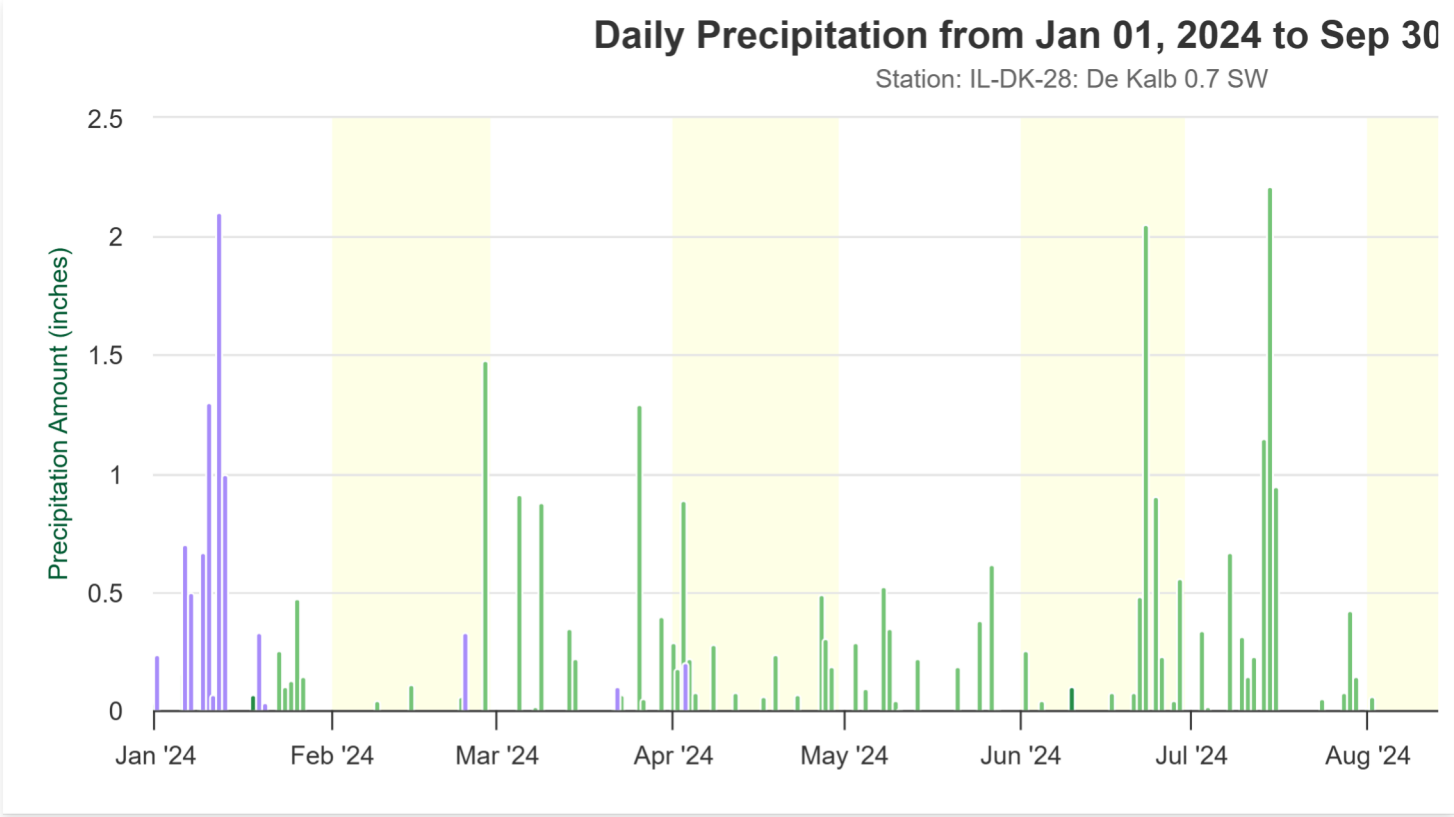
## Precipitation Summary

Date Range to Display Shortcuts 1/1/2024 9/30/2024 Update

| Month | Daily Prec... | Multiday ... | Total Preci... | NOAA No... | PRISM No... | Snowfall (i... |
|---|---|---|---|---|---|---|
| Jan 2024 | 3.36 | 0.07 | 3.43 | 1.73 | 1.68 | 20.8 |
| Feb 2024 | 1.69 | 0.00 | 1.69 | 1.69 | 1.73 | 1.0 |
| Mar 2024 | 4.21 | 0.00 | 4.21 | 2.2 | 2.23 | 0.3 |
| Apr 2024 | 3.37 | 0.00 | 3.37 | 3.58 | 3.45 | 0.6 |
| May 2024 | 2.72 | 0.00 | 2.72 | 4.5 | 4.75 | 0.0 |
| Jun 2024 | 4.71 | 0.10 | 4.81 | 4.79 | 4.59 | 0.0 |
| Jul 2024 | 6.71 | 0.00 | 6.71 | 3.83 | 3.75 | 0.0 |
| Aug 2024 | 2.12 | 0.00 | 2.12 | 3.93 | 3.88 | 0.0 |
| Sep 2024 | 1.61 | 0.00 | 1.61 | 3.44 | 3.33 | 0.0 |
| **Totals for Period Selected** | **30.50** | **0.17** | **30.67** | **29.69** | **29.39** | **22.7** |


Monthly Precipitation from Jan 01, 2024 to Sep 3
Station: IL-DK-28: De Kalb 0.7 SW
Monthly Precipitation (inches)
7.5
6
4.5
3
1.5
0
Jan 2024
Feb 2024
Mar 2024
Apr 2024
May 2024
Jun 2024
Jul 2024
Aug 2024


Accumulated Precipitation Jan 01, 2024 to Sep 3
Station: IL-DK-28: De Kalb 0.7 SW
Precipitation Amount (inches)
40
32
24
16
8
0
Jan '24
Feb '24
Mar '24
Apr '24
May '24
Jun '24
Jul '24
Aug '24


Daily Precipitation from Jan 01, 2024 to Sep 30
Station: IL-DK-28: De Kalb 0.7 SW
Precipitation Amount (inches)
2.5
2
1.5
1
0.5
0
Jan '24
Feb '24
Mar '24
Apr '24
May '24
Jun '24
Jul '24
Aug '24

WETS Table

WETS Station: DE KALB, IL

Requested years: 1991 - 2020

| Month | Avg Max Temp | Avg Min Temp | Avg Mean Temp | Avg Precip | 30% chance precip less than | 30% chance precip more than | Avg number days precip 0.10 or more | Avg Snowfall |
|---|---|---|---|---|---|---|---|---|
| Jan | 28.1 | 13.1 | 20.6 | 1.69 | 1.07 | 1.99 | 5 | 10.2 |
| Feb | 32.5 | 16.6 | 24.6 | 1.71 | 1.02 | 2.07 | 4 | 8.7 |
| Mar | 45.0 | 26.8 | 35.9 | 2.24 | 1.45 | 2.69 | 5 | 4.4 |
| Apr | 58.6 | 37.3 | 48.0 | 3.56 | 2.56 | 4.17 | 7 | 1.3 |
| May | 70.2 | 49.2 | 59.7 | 4.79 | 3.28 | 5.87 | 8 | 0.0 |
| Jun | 79.9 | 59.5 | 69.7 | 4.57 | 2.77 | 5.53 | 7 | 0.0 |
| Jul | 83.1 | 63.3 | 73.2 | 4.00 | 2.49 | 4.80 | 6 | 0.0 |
| Aug | 81.2 | 61.3 | 71.3 | 4.06 | 2.69 | 4.84 | 6 | 0.0 |
| Sep | 74.9 | 53.2 | 64.1 | 3.32 | 1.73 | 4.05 | 6 | 0.0 |
| Oct | 62.0 | 41.0 | 51.5 | 2.96 | 1.76 | 3.58 | 6 | 0.1 |
| Nov | 46.3 | 29.6 | 38.0 | 2.31 | 1.38 | 2.73 | 5 | 1.8 |
| Dec | 33.6 | 19.1 | 26.4 | 2.04 | 1.27 | 2.44 | 5 | 6.6 |
| Annual: | | | | | 33.97 | 40.71 | | |
| Average | 58.0 | 39.2 | 48.6 | - | - | - | - | - |
| Total | - | - | - | 37.25 | | | 70 | 33.1 |

GROWING SEASON DATES

| | | | |
|---|---|---|---|
| Years with missing data: | 24 deg = 3 | 28 deg = 3 | 32 deg = 2 |
| Years with no occurrence: | 24 deg = 0 | 28 deg = 0 | 32 deg = 0 |
| Data years used: | 24 deg = 27 | 28 deg = 27 | 32 deg = 28 |
| Probability | 24 F or higher | 28 F or higher | 32 F or higher |
| 50 percent * | 4/1 to 11/8: 221 days | 4/12 to 10/25: 196 days | 4/23 to 10/16: 176 days |
| 70 percent * | 3/28 to 11/13: 230 days | 4/7 to 10/30: 206 days | 4/18 to 10/21: 186 days |
| * Percent chance of the growing season occurring between the Beginning and Ending dates. | | | |

STATS TABLE - total precipitation (inches)

| Yr | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1966 | | | 1.20 | 3.25 | 3.07 | 2.78 | 1.45 | 2.51 | 2.47 | 2.47 | 4.91 | 2.32 | 26.43 |
| 1967 | 2.75 | 1.17 | 2.07 | 5.09 | 1.46 | 5.14 | 2.76 | 2.60 | 1.81 | 3.62 | 2.00 | 0.96 | 31.43 |
| 1968 | 0.45 | 0.52 | 0.32 | 2.10 | 2.48 | 5.47 | 5.22 | 4.06 | M4.90 | 0.78 | 3.52 | 1.90 | 31.72 |
| 1969 | 1.31 | | M0.04 | 4.33 | 3.48 | 6.38 | 5.28 | 1.45 | 2.85 | 6.75 | 1.32 | 1.47 | 34.66 |
| 1970 | 0.94 | 0.56 | 1.84 | 2.73 | 6.01 | 6.57 | 6.03 | 1.11 | 11.56 | 2.69 | 1.68 | 1.35 | 43.07 |
| 1971 | 1.17 | 2.06 | 1.87 | 1.34 | 1.73 | 2.20 | 2.01 | 3.26 | 2.80 | 2.04 | 2.14 | 4.62 | 27.24 |
| 1972 | 0.91 | 0.86 | 3.95 | 4.57 | 4.00 | 8.81 | 5.33 | 8.34 | 5.08 | 3.86 | 1.83 | 2.10 | 49.64 |
| 1973 | 1.32 | 1.04 | 4.14 | 6.50 | 5.49 | 3.18 | 2.22 | 1.93 | 5.95 | 3.36 | 3.01 | 3.13 | 41.27 |
| 1974 | 4.08 | 1.65 | 2.04 | 3.43 | 6.42 | 6.94 | 2.08 | 2.09 | 0.85 | 2.31 | 2.84 | 1.96 | 36.69 |

# Appendix I: IDOT Access Driveway Feasibility Response

# Feasibility Request for Access Driveway off Route 38

Harsted, Joshua M. <Joshua.Harsted@illinois.gov>

Tue 4/30/2024 11:53 AM

To:Lillian Prybil <LPrybil@wsbeng.com>

3 attachments (692 KB)

NonCommercial Rural detail.pdf; D3 Access Form (Fillable Form) (003).pdf; New Access Permit Letter.pdf;

**EXTERNAL EMAIL**

The location of the entrance is feasible to construct. It should be constructed following the attached detail for a rural non-commercial entrance in addition to the following . The entrance shall be a minimum of 50' from the edge of any intersecting road.
Please use the Access Permit Letter and the D3 Access form to guide you in the permitting process.

Thanks!

Joshua Harsted
ET V Permits Section Chief
ILLINOIS DEPARTMENT OF TRANSPORTATION
DISTRICT 3

State of Illinois - CONFIDENTIALITY NOTICE: The information contained in this communication is confidential, may be attorney-client privileged or attorney work product, may constitute inside information or internal deliberative staff communication, and is intended only for the use of the addressee. Unauthorized use, disclosure or copying of this communication or any part thereof is strictly prohibited and may be unlawful. If you have received this communication in error, please notify the sender immediately by return e-mail and destroy this communication and all copies thereof, including all attachments. Receipt by an unintended recipient does not waive attorney-client privilege, attorney work product privilege, or any other exemption from disclosure.

CITY OF SYCAMORE

CITY OF DEKALB

CITY OF DEKALB

DeKalb-Taylor Municipal Airport

BETHANY ROAD

BETHANY ROAD

BARBER GREENE ROAD

CORTLAND - DEKALB BOUNDARY AGREEMENT

CORTLAND - SYCAMORE BOUNDARY AGREEMENT

SOMONAUK ROAD

N. LOVES ROAD

FENSTERMAKER ROAD

PLEASANT STREET

AIRPORT ROAD

NORTH AVENUE

UNION PACIFIC RAILROAD

MAPLE PARK ROAD

UNION PACIFIC RAILROAD

IL ROUTE 38

IL ROUTE 38

W. FAIRVIEW DRIVE

SOMONAUK ROAD

CHASE ROAD

HINCKLEY ROAD

I-88

GURLER ROAD

Ohio Grove Cemetery

East Branch Kishwaukee River

OUT

McPHILLIPS PARK

TALLGRASS PARKWAY

W. LINCOLN HIGHWAY

E. LINCOLN HIGHWAY

WEST CORTLAND CENTER RD

E. CORTLAND CENTER RD

## LEGEND

- R-1 Single-Family Residence
- R-2 High Density Single-Family Residence
- R-3 Two-Family Residence
- R-4 Multiple-Family Residence
- C-1 Limited Retail Business
- C-2 General Commercial
- I-1 Light Industrial
- P-1 Recreation & Open Space
- AG Agricultural
- AO Aspen Drive Overlay
- Special Use

Official Zoning Map of Town of Cortland illustrating existing zoning districts, regulations, and classifications of the Town of Cortland in effect on and prior to December 31, 2024, is available for public inspection at the Town Hall, 59 S. Somonauk Road, Cortland, Illinois, during business hours. This is provided in accordance with the requirements of Chapter 65 ILCS 5/11-13-19 of the Illinois Complied Statutes.

N

W E

S

1000 0 1000 2000 3000 FEET

# 2024 Official Zoning Map

## Town Of Cortland, Illinois

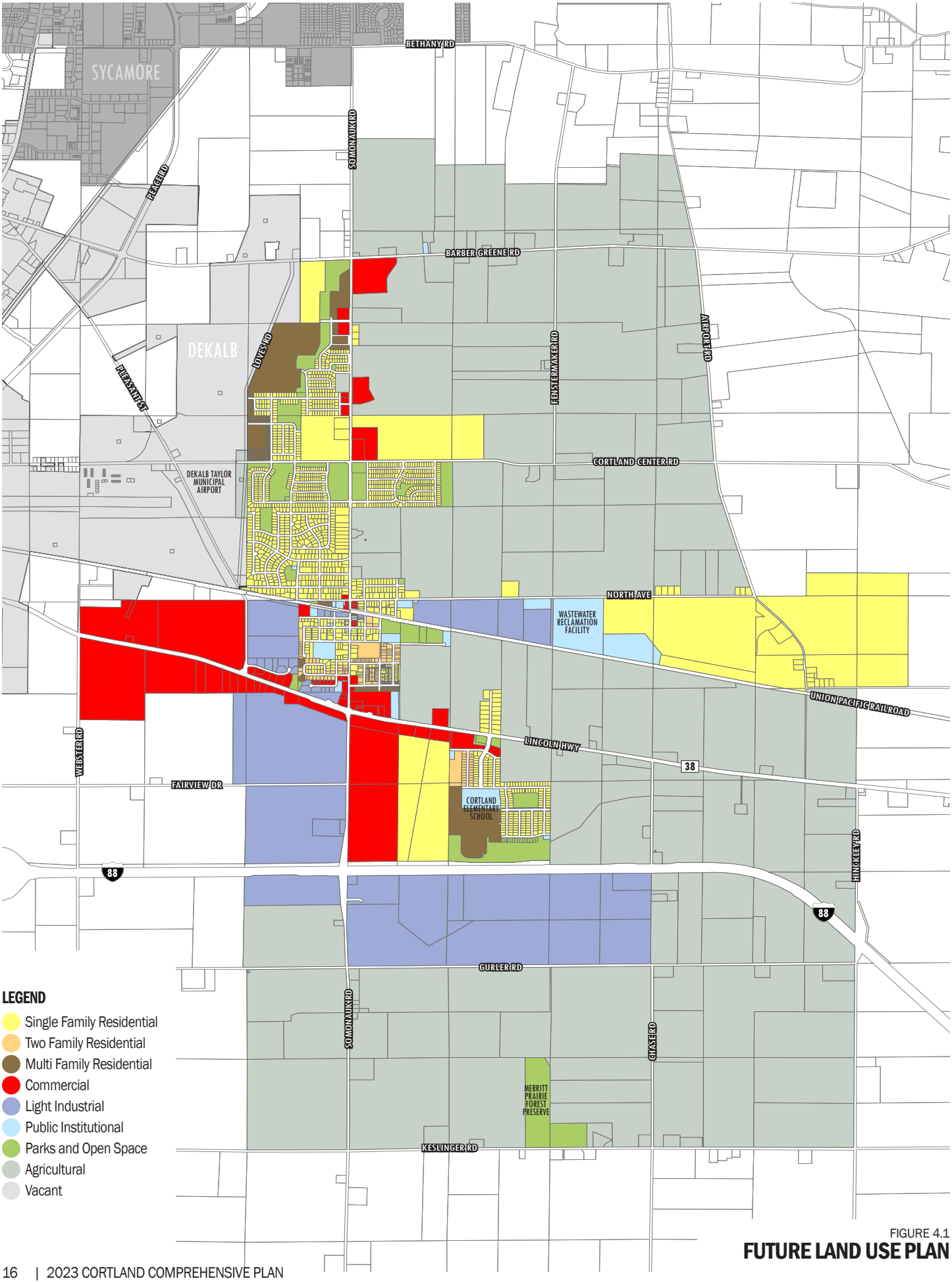



FIGURE 4.1
**FUTURE LAND USE PLAN**

In accordance with 9-10-6. – Procedures, C. Report of Hearing; Within thirty (30) days following the hearing, the plan commission shall transmit to the town board a written report giving its findings as to compliance of the proposed special use with the standards governing special uses and giving its recommendation for action to be taken by the town board.

## 9-10-3. – Standards

A special use permit shall be granted only if evidence is presented to establish that:

A. The proposed structure or use at the particular location requested is necessary or desirable to provide a service or a facility which is in the interest of the public and will contribute to the general welfare of the neighborhood or community;

B. The proposed structure or use will not have a substantial adverse effect upon the adjacent property, the character of the neighborhood, traffic conditions, utility facilities and other matters affecting the public health, safety and general welfare;

C. The proposed structure or use will be designed, arranged and operated so as to permit the development and use of neighboring property in accordance with the applicable district regulations.

D. Such other standards and criteria as are established by the ordinance for a particular special use as set forth in section 9-10-4 of this chapter and as applied to planned developments as set forth in chapter 7 of this title (Ord. 2008-03, 1-28-2008) – **NOT APPLICABLE**

## 9-10-5. – Conditions

The plan commission may recommend and the town board may impose such conditions or restrictions upon the location, construction, design and operation of a special use including, but not limited to, provisions for off street parking spaces and the duration of such permit, as they shall respectively find necessary or appropriate to secure compliance with the purpose an intent of this title and other standards set forth herein. (Ord. 2008-03, 1-28-2008)