KENDALL COUNTY
ZONING AND PLATTING ADVISORY COMMITTEE

111 West Fox Street • Rooms 209 and 210 • Yorkville, IL • 60560
(630) 553-4141 Fax (630) 553-4179

AGENDA

May 1, 2018 - 9:00 a.m.

CALL TO ORDER

ROLL CALL: **County Board:** Robert Davidson, PBZ Committee Chair; **County Highway Department:** Fran Klaas, County Engineer; **Wills Burke Kelsey:** Greg Chismark, Stormwater Consultant; **County Health Department:** Aaron Rybski, Director Environmental Health; **Forest Preserve District:** David Guritz, Director; **SWCD:** Megan Andrews, Resource Conservationist; **Sheriff's Office:** Commander Jason Langston; **GIS**: Don Clayton; **PBZ:** Brian Holdiman, Code Official; Matt Asselmeier, Senior Planner

APPROVAL OF AGENDA

APPROVAL OF MINUTES: Approval of the April 3, 2018 ZPAC Meeting Minutes (Pages 2-4)

PETITIONS:

1.	**18 – 14 – Michael and Dayle Saar (Pages 5-20)**
Request:	Map Amendment Rezoning Subject Property from A-1 to R-1
PIN:	05-07-328-003
Location:	East Side of Route 71 Approximately 0.06 Miles Southwest of Timbercreek Drive, Kendall Township
Purpose:	Petitioner would like the Ability to Market and Sell the Property for a Single-Family Home.
2.	**18 – 15 – Nancy Harazin on Behalf of Nancy L. Harazin Trust Number 101 (Pages 21-267)**
Request:	Special Use Permit for a Public or Private Utility-Other (Solar Panels)
PIN:	07-05-400-003
Location:	16400 Newark Road, Approximately 0.2 Mile East of Route 71 on the South Side of Newark Road, Big Grove Township
Purpose:	Petitioner would like to Install Solar Panels on the Property; Energy Generated from the Solar Panels would be Consumed Off-Site.
3.	**18 – 16 – Lawrence Slattery on Behalf of R.Y. Property Management, Corp. (Owner) and Jorge Ramirez a/k/a Rancho La Purisima Corp (Prospective Buyer) (Pages 268-316)**
Request:	Special Use Permit for a Banquet Facility
PIN:	02-03-200-001
Location:	8218 Route 30, Bristol Township
Purpose:	Prospective Buyer would like to Operate a Banquet Facility at the Subject Property.

REVIEW OF PETITIONS THAT WENT TO COUNTY BOARD

1. Petition 17-33 – Transferring Certain Powers and Duties of the Hearing Officer to the Zoning Board of Appeals

2. Petition 17-29 – Special Use Permit Notification Requirements

OLD BUSINESS/ NEW BUSINESS
None

PUBLIC COMMENT

ADJOURNMENT- **Next meeting on June 5, 2018**

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

ZONING, PLATTING & ADVISORY COMMITTEE (ZPAC)
April 3, 2018 – Unapproved Meeting Minutes

Senior Planner Matt Asselmeier called the meeting to order at 9:00 a.m.

Present:
Aaron Rybski – Health Department
Don Clayton – GIS
Fran Klaas – Highway Department
David Guritz – Forest Preserve (Arrived at 9:05 a.m.)
Megan Andrews – Soil and Water Conservation District
Brian Holdiman – PBZ Department
Matt Asselmeier – PBZ Department

Absent:
Greg Chismark – WBK Engineering, LLC
Deputy Commander Jason Langston – Sheriff's Department
Robert Davidson – PBZ Committee Chair

Audience:
None

AGENDA

Mr. Klaas made a motion, seconded by Mr. Rybski, to approve the agenda as proposed. With a voice vote of all ayes the motion carried.

MINUTES

Mr. Klaas made a motion, seconded by Mr. Rybski, to approve the March 6, 2018 meeting minutes with a correction to Petition 18-05 that an alternative sewer system "may" not "will" be required at the site. With a voice vote of all ayes the motion carried.

PETITION

Petition 18-13 Kendall County Planning, Building and Zoning Committee – Text Amendments to Sections 3.02 4.18, 7.01.D, 8.02.C, 8.03.H.1, 8.09.B, 9.02.C, 9.03.C, 9.04.C, 9.05.C, 9.06.F, 9.07.C, and 10.03.B of the Kendall County Zoning Ordinance by Amending Kendall County's Solar Panel Zoning Regulations

Mr. Asselmeier summarized the request. In recent months, the Kendall County Planning, Building and Zoning Department has received inquiries from solar energy consultants and property owners desiring to place solar panels on properties throughout the County. These solar panels would be used to generate power offsite from the location where the solar panels are placed. Kendall County adopted solar panel zoning regulations in 2010 and 2011, but these regulations focused on generating solar energy and using that energy onsite. The County also has zoning regulations for power plants, but many solar energy consultants were uncomfortable with a "power plant" classification.

Earlier in 2018, the Planning, Building and Zoning Committee instructed Staff to study the solar panel regulations of several counties. The proposed regulations of Boone, DeKalb, Grundy, Kankakee, Tazewell, and Will Counties were examined.

Mr. Guritz arrived at this time (9:05 a.m.)

At their meeting on March 12, 2018, the Planning, Building and Zoning Committee approved initiating text amendments to the Kendall County Zoning Ordinance incorporating DeKalb County's proposed regulations into the Kendall County Zoning Ordinance. DeKalb County adopted their regulations in March 2018.

The proposal states that solar farms are greater than twenty (20) acres in size; solar gardens are a maximum twenty (20) acres, and solar panels are considered accessory if they produce not greater than one hundred twenty (120%) of the solar need for onsite consumption of energy. Solar gardens would be special uses in all zoning classifications. However, the special use permit could be waived if adjoining property owners sign affidavits agreeing to the placement of the solar garden. Solar farms are special uses in the A-1 district.

Mr. Holdiman previously suggested that 4.18.O.2 be removed from the proposal because the County currently does not require insurance for existing solar panels.

The Kendall County Farm Bureau was sent the proposal in March. They questioned why the bonding requirement was "may" and not "shall" (4.18.P.6).

The townships were mailed the proposal on March 22nd. To date, no townships have submitted comments.

Ms. Andrews suggested that 4.18.D.10 should be removed because the same language is found in 4.18.Q.3.

Ms. Andrews asked when an NRI would occur. Mr. Asselmeier responded that an NRI would occur as part of the application in the same way as other special use permit applications.

Ms. Andrews suggested requiring a more detailed contour map with existing vegetation, waterways, wetland boundaries, and FEMA FIRM information in a manner described in the Boone County ordinance.

Mr. Holdiman noted that 4.18.C.8 references a "State of Illinois Uniform Building Code". This code does not exist and he recommended that the reference to such code be removed.

Mr. Klaas questioned allowing solar gardens by special use in all districts, particularly residential districts. Mr. Holdiman noted that most of the homeowners' associations will restrict the placement of solar panels within the subdivisions. Mr. Klaas questioned whether or not enough space existed on residential lots to make the placement of solar gardens worthwhile or practical in most cases.

Mr. Rybski expressed a concern that solar panels not be installed in such a manner that negatively impacts septic fields or the function of septic fields. The area of the septic field should be kept free of structures for functioning and maintenance purposes. Ms. Andrews noted Boone County's requirements related to abandoned wells. Mr. Holdiman noted that, at the time of building permit submittal, the Health Department should catch the location of wells and septic systems in relation to solar panels and related solar panel infrastructure.

Ms. Andrews suggest that the word "crops" found in line 7 of 4.18.C.4 be replaced with "vegetation" because crops probably will not be the only plants growing around the solar panels. Crops probably will not grow around the solar panels.

Mr. Guritz asked about the lot size in Henneberry Woods as it relates to this proposal. Mr. Holdiman noted that the new single-family home in Henneberry Woods was on twenty (20) acres.

Mr. Andrews made a motion, seconded by Mr. Guritz, to recommend approval of the proposed text amendment with the following amendments:

1. Section 4.18.D.10 should be removed because the same language is found in 4.18.Q.3.

2. A more detailed contour map with existing vegetation, waterways, wetland boundaries, and FEMA FIRM information in a manner described in the Boone County ordinance should be added to the proposal.

3. The reference to the State of Illinois Uniform Building Code found in Section 4.18.C.8 should be removed.

4. Greater discussion should occur regarding the desire to have solar gardens in residential zoned districts.

5. The word "crops" found in line 7 of 4.18.C.4 should be replaced with the word "vegetation" because crops probably will not be the only plants growing around the solar panels and crops probably will not grow around the solar panels.

Ayes (7): Klaas, Guritz, Rybski, Andrews, Clayton, Holdiman, and Asselmeier
Nays (0): None
Absent: (3) Langston, Chismark, and Davidson

The motion passed unanimously. This matter will go before the Kendall County Regional Planning Commission on April 25th.

REVIEW OF PETITIONS THAT WENT TO COUNTY BOARD

Mr. Asselmeier reported that Petition 17-33 transferring special use hearings from the Hearing Officer to the Zoning Board

of Appeals was approved by the County Board.

Mr. Asselmeier also reported that Petition 17-29 regarding distance notification requirements for special use applicants was sent back to the Planning, Building, and Zoning Committee by the Committee of the Whole.

Petition 18-03 regarding the items that ZPAC and Kendall County Regional Planning Commission reviews will have a public hearing on April 30th.

OLD BUSINESS/NEW BUSINESS

Mr. Asselmeier reported that the Illinois Department of Transportation recorded a document withdrawing the centerline protection for the Prairie Parkway.

PUBLIC COMMENT

None

ADJOURNMENT

Mr. Klaas made a motion, seconded by Ms. Andrews to adjourn. With a voice vote of all ayes, the motion carried. The ZPAC, at 9:39 a.m., adjourned.

Respectfully Submitted,
Matthew H. Asselmeier, AICP
Senior Planner

DEPARTMENT OF PLANNING, BUILDING & ZONING
111 West Fox Street • Room 203
Yorkville, IL • 60560
(630) 553-4141 Fax (630) 553-4179

Petition 18-14
Michael and Dayle Saar
Map Amendment Rezoning Property from A-1 to R-1

INTRODUCTION

Michael and Dayle Saar are requesting a map amendment rezoning the majority of the subject property from A-1 to R-1 in order to have the ability to sell the property and market the property as a single-family home site.

The petitioners own one (1) of the houses northeast of the subject parcel. They would like to divide a portion of the northeast corner off of the subject property and merge it with their property in the Timber Creek Subdivision and rezone the northeast corner to R-3 at some point in the future.

SITE INFORMATION

PETITIONER: Michael and Dayle Saar

ADDRESS: Between 11614 and 11571 Route 71 on the East Side of the Road

LOCATION: 0.06 Miles Southwest of Timbercreek Drive on the East Side of Route 71



TOWNSHIP: Kendall

PARCEL #: 05-07-328-003

LOT SIZE: 4.2302 acres

EXITING LAND USE: Agricultural

ZONING: A-1 Agricultural District

LRMP:

Land Use	Agricultural
Roads	Route 71 is a State maintained highway
Trails	Trails are planned along Route 71
Floodplain/ Wetlands	There are no floodplains or wetlands in the area. A stream runs along the southern boundary of the property.

REQUESTED ACTION: Map Amendment Rezoning Property from A-1 to R-1

APPLICABLE REGULATIONS: Section 13.07 – Map Amendment Procedures

SURROUNDING LAND USE

Location	Adjacent Land Use	Adjacent Zoning	Land Resource Management Plan	Zoning within ½ Mile
North	Single-Family Residential	R-1 and R-3	Rural Residential	A-1, R-1, and R-3 (County) R-2 (Yorkville)
South	Agricultural/Residential	R-2 (Yorkville)	Estate Res (Yorkville)	R-2 (Yorkville)
East	Single-Family Residential	R-3	Rural Residential	A-1, R-1, R-2, R-3 RPD-3, and A-1 SU
West	Agricultural/Residential	A-1	Rural Residential	A-1 and R-1 (County) A-1 and R-2 (Yorkville)

The Timber Creek Subdivision is located to the north and east of the subject property.

The A-1 special use permit located east of the subject property is for boarding horses.

PHYSICAL DATA

ENDANGERED SPECIES REPORT

EcoCAT Report submitted and consultation was terminated.

NATURAL RESOURCES INVENTORY

The application for NRI was submitted on April 12, 2018.

ACTION SUMMARY

KENDALL TOWNSHIP

Petition information was sent to Kendall Township on April 20, 2018.

UNITED CITY OF YORKVILLE

Petition information was sent to the United City of Yorkville on April 20, 2018.

GENERAL INFORMATION
The petitioner desires the map amendment in order to have the ability to market and sell the property for single-family use. The subject property does not have an allocation for the construction of a home and does not possess forty (40) acres. Therefore, a map amendment is required in order to construct a home onsite.

The petitioner does not believe that the property is large enough for farming. Pictures of the property are included.

The Land Resource Management Plan calls for this area to be rural residential in the future. Existing single-family homes are located to the north and east of the subject property. For these reasons, Staff does not believe that the approval of this request would constitute spot zoning.

BUILDING CODES
Any new homes or accessory structures would be required to meet applicable building codes.

ACCESS
The property fronts Route 71. Staff has no concerns regarding the ability of Route 71 to support a proposed home at this location.

ODORS
No new odors are foreseen.

LIGHTING
Any new lighting would be for residential use only. Staff does not foresee any concerns regarding lighting.

SCREENING
No fencing or buffer is presently planned for the property. Any new fences or plantings would be for a residential use. Any new fences would have to follow applicable regulations.

STORMWATER
Any new homes would have to be constructed per Kendall County's Stormwater Management Ordinance.

UTILITIES
Electricity is near the property. A new well and septic system would have to obtain applicable permits.

RECOMMENDATION
Staff recommends approval of the proposed map amendment.

ATTACHMENTS
1. Application Materials (Including the Petitioner's Findings of Fact, Plat, and EcoCat)
2. Aerial
3. Looking East from Route 71
4. Looking South
5. South Property Line and Stream
6. Petitioner's Boundary Line

DEPARTMENT OF PLANNING, BUILDING & ZONING
111 West Fox Street • Yorkville, IL • 60560 1621
(630) 553-4141 Fax (630) 553-4179

APPLICATION

PROJECT NAME Saar Map Amendment **FILE #:** 18-14

NAME OF APPLICANT
Michael Saar

CURRENT LANDOWNER/NAME(s)
Michael O. Saar and Dayle E. Saar

SITE INFORMATION

ACRES	SITE ADDRESS OR LOCATION	ASSESSOR'S ID NUMBER (PIN)
4.2302	05-07-328-003	05-07-328-003

EXISTING LAND USE	CURRENT ZONING	LAND CLASSIFICATION ON LRMP
Agricultural	A-1	Rural Residential

REQUESTED ACTION (Check All That Apply):

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

[1]PRIMARY CONTACT	PRIMARY CONTACT MAILING ADDRESS	PRIMARY CONTACT EMAIL
Michael O. Saar	[redacted]	

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

[2]ENGINEER CONTACT	ENGINEER MAILING ADDRESS	ENGINEER EMAIL

ENGINEER PHONE #	ENGINEER FAX #	ENGINEER OTHER # (Cell, etc.)

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

I CERTIFY THAT THE INFORMATION AND EXHIBITS SUBMITTED ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND THAT I AM TO FILE THIS APPLICATION AND ACT ON BEHALF OF THE ABOVE SIGNATURES.

SIGNATURE OF APPLICANT [redacted] **DATE** 4/12/2018

FEE PAID:$ 500
CHECK #: [redacted]

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

Last Revised: 9.18.12
Map Amendment

Date Stamp Here If Checklist Is Complete

ZONING PLAT OF
PART OF SECTION 7, T36N–R7E, 3rd PM
KENDALL TOWNSHIP KENDALL COUNTY ILLINOIS

DEVELOPER:
Michael O. & Dayle E. Saar
14 Timbercreek Drive
Yorkville, Illinois 60560

AREA TO BE REZONED:
184269 Sq.Ft. = 4.2302 Acres

PRESENT ZONING:
A–1 (Agricultural District)

PROPOSED ZONING:
R–1 (Residential District)

P.I.N.
05–07–328–003

FLOODPLAIN STATEMENT:
The Subject Property is located in Zone X (areas determined to be outside the 0.2% annual chance floodplain) as depicted on FEMA Flood Insurance Rate Map Number 17093C0125G with an effective date of February 4, 2009.

SOILS (USDA/NRCS – Kendall County, 2015)

356A	Elpaso Silty Clay Loam, 0%–2% slopes
145B	Saybrook Silt Loam, 2%–5% slopes

N

SCALE
1"=30'

- ● Indicates Iron Stake Found
- ■ Indicates Concrete Monument Found
- ○ Indicates Iron Stake Set
- 12"△ Indicates Tree and Size
- Indicates Line of Fence
- +719.14 Indicates Existing Spot Elevation
- —719— Indicates Existing Contour Elevation
- Indicates Soil Type Boundary

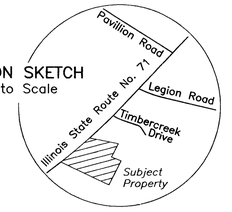
NOTE: This property is vacant.

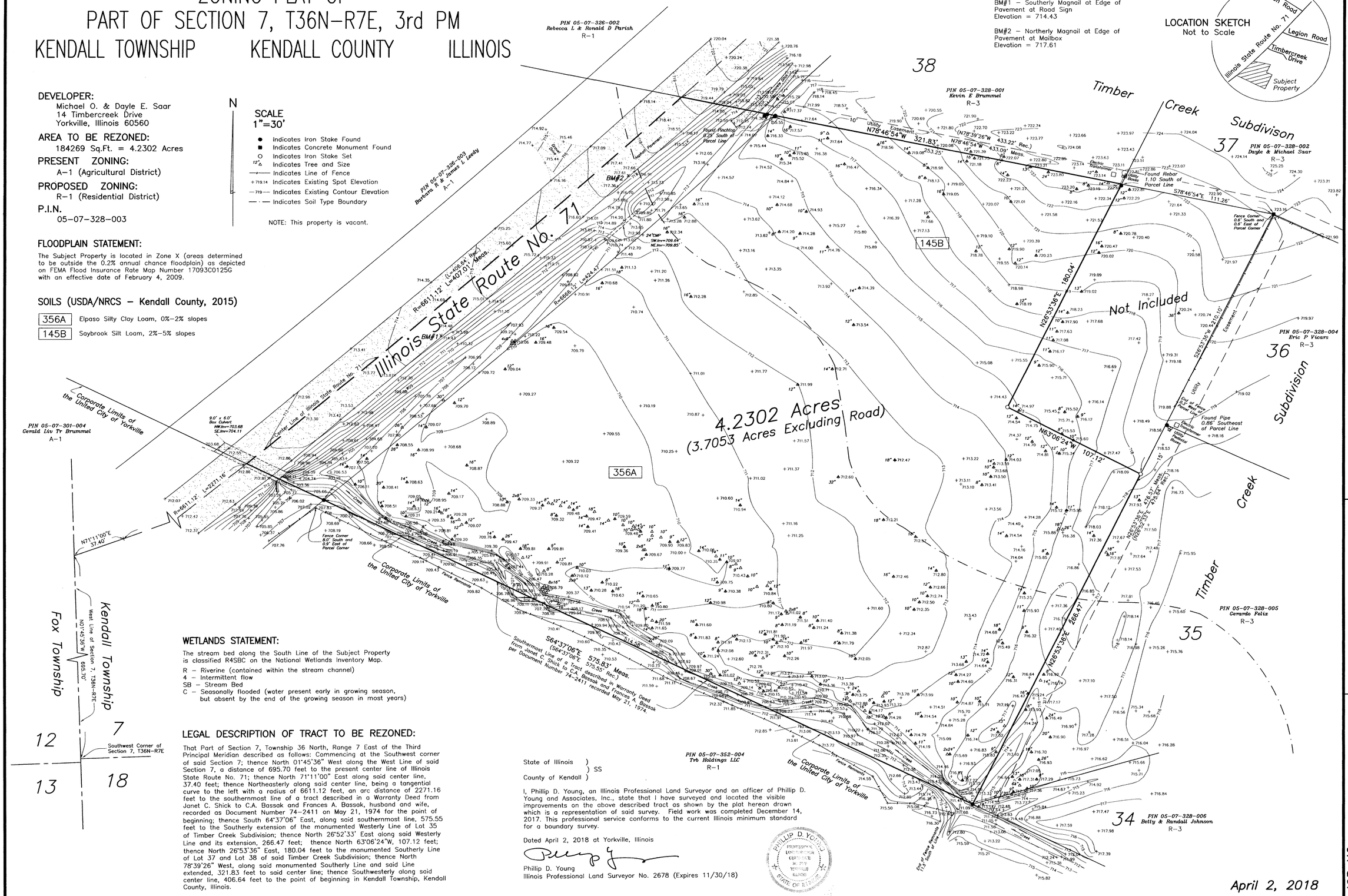
BENCHMARKS -- (NGVD1929)

BM#1 – Southerly Magnail at Edge of Pavement at Road Sign
Elevation = 714.43

BM#2 – Northerly Magnail at Edge of Pavement at Mailbox
Elevation = 717.61

LOCATION SKETCH
Not to Scale





WETLANDS STATEMENT:
The stream bed along the South Line of the Subject Property is classified R4SBC on the National Wetlands Inventory Map.

R – Riverine (contained within the stream channel)
4 – Intermittent flow
SB – Stream Bed
C – Seasonally flooded (water present early in growing season, but absent by the end of the growing season in most years)

LEGAL DESCRIPTION OF TRACT TO BE REZONED:
That Part of Section 7, Township 36 North, Range 7 East of the Third Principal Meridian described as follows: Commencing at the Southwest corner of said Section 7; thence North 01°45'36" West along the West Line of said Section 7, a distance of 695.70 feet to the present center line of Illinois State Route No. 71; thence North 71°11'00" East along said center line, 37.40 feet; thence Northeasterly along said center line, being a tangential curve to the left with a radius of 6611.12 feet, an arc distance of 2271.16 feet to the southernmost line of a tract described in a Warranty Deed from Janet C. Shick to C.A. Bassak and Frances A. Bassak, husband and wife, recorded as Document Number 74–2411 on May 21, 1974 for the point of beginning; thence South 64°37'06" East, along said southernmost line, 575.55 feet to the Southerly extension of the monumented Westerly Line of Lot 35 of Timber Creek Subdivision; thence North 26°52'33" East along said Westerly Line and its extension, 266.47 feet; thence North 63°06'24"W, 107.12 feet; thence North 26°53'36" East, 180.04 feet to the monumented Southerly Line of Lot 37 and Lot 38 of said Timber Creek Subdivision; thence North 78°39'26" West, along said monumented Southerly Line and said Line extended, 321.83 feet to said center line; thence Southwesterly along said center line, 406.64 feet to the point of beginning in Kendall Township, Kendall County, Illinois.

State of Illinois)
) SS
County of Kendall)

I, Phillip D. Young, an Illinois Professional Land Surveyor and an officer of Phillip D. Young and Associates, Inc., state that I have surveyed and located the visible improvements on the above described tract as shown by the plat hereon drawn which is a representation of said survey. Field work was completed December 14, 2017. This professional service conforms to the current Illinois minimum standard for a boundary survey.

Dated April 2, 2018 at Yorkville, Illinois

Phillip D. Young
Illinois Professional Land Surveyor No. 2678 (Expires 11/30/18)

PHILLIP D YOUNG
PROFESSIONAL LAND SURVEYOR
CERTIFICATE NO. 2678
YORKVILLE ILLINOIS
STATE OF ILLINOIS

April 2, 2018

Phillip D. Young and Associates, Inc.
LAND SURVEYING - TOPOGRAPHIC MAPPING - Lic.#184-002775
1107B South Bridge Street
Yorkville, Illinois 60560
Telephone (630)553-1580

JOB NO.	17312
JOB NAME	SAAR
DWG FILE	17312B
REVISION DATE	

Kendall County Soil & Water Conservation District

7775A Route 47, Yorkville, Illinois 60560 • (630)553-5821 extension 3

www.kendallswcd.org

NATURAL RESOURCE INFORMATION (NRI) REPORT APPLICATION

COPY

Petitioner: MICHAEL SAAR **Contact Person:** MICHAEL SAAR

Address: [redacted]

City, State,

Phone Num

Email:

Please select: How would you like to receive a copy of the NRI Report? ☐ Email ☒ Mail

Site Location & Proposed Use

Township Name KENDALL Township 36 N, Range 7 E, Section(s) 7

Parcel Index Number(s) 05-07-328-003

Project or Subdivision Name _____ Number of Acres 4.2302

Current Use of Site AGRICULTURAL Proposed Use RESIDENTIAL

Proposed Number of Lots 1 Proposed Number of Structures 1

Proposed Water Supply WELL Proposed type of Wastewater Treatment SEPTIC

Proposed type of Storm Water Management N/A

Type of Request

☒ Change in Zoning from A-1 to R-1

☐ Variance (Please describe fully on separate page)

☐ Special Use Permit (Please describe fully on separate page)

Name of County or Municipality the request is being filed with: Kendall County

In addition to this completed application form, please including the following to ensure proper processing:

☒ **Plat of Survey/Site Plan** – showing location, legal description and property measurements

☐ **Concept Plan** - showing the locations of proposed lots, buildings, roads, stormwater detention, open areas, etc.

☐ If available: topography map, field tile map, copy of soil boring and/or wetland studies

☐ **NRI fee** (Please make checks payable to Kendall County SWCD)

The NRI fees, as of July 1, 2010, are as follows:

Full Report: $375.00 for five acres and under, plus $18.00 per acre for each additional acre or any fraction thereof over five.

Executive Summary Report: $300.00 (KCSWCD staff will determine when a summary or full report will be necessary.)

Fee for first five acres and under	$ 375.00
0 Additional Acres at $18.00 each	$ 0
Total NRI Fee	$ 375.00

NOTE: Applications are due by the 1st of each month to be on that month's SWCD Board Meeting Agenda. Once a completed application is submitted, please allow 30 days for inspection, evaluation and processing of this report.

I (We) understand the filing of this application allows the authorized representative of the Kendall County Soil and Water Conservation District (SWCD) to visit and conduct an evaluation of the site described above. The completed NRI report expiration date will be 3 years after the date reported.

[redacted] April 12, 2018

Petitioner or Authorized Agent **Date**

This report will be issued on a nondiscriminatory basis without regard to race, color, religion, national origin, age, sex, handicap or marital status.

FOR OFFICE USE ONLY

NRI# 1802 Date initially rec'd 4/11/18 Date all rec'd 4/11/18 Board Meeting MAY 2018

Fee Due $ 375.00 Fee Paid $ 375.00 Check # [redacted] Over/Under Payment _____ Refund Due _____

EcoCAT
Ecological Compliance Assessment Tool

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

Applicant: Michael O. Saar
Contact: Michael O. Saar
Address: [redacted]

IDNR Project Number: 1809867
Date: 04/11/2018

Project: Saar-rezoning
Address: site number 05-07-328-003, Yorkville

Description: Rezone from A-1 to R-1.

Natural Resource Review Results

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

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

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

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

County: Kendall

Township, Range, Section:
36N, 7E, 7



IL Department of Natural Resources Contact
Natalia Jones
217-785-5500
Division of Ecosystems & Environment

Government Jurisdiction
Kendall County Building and Zoning
Matt Asselmeir
111 W. Fox Street
Yorkville, Illinois 60560 -1621

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.

JUSTIFICATION FOR REQUESTED REZONING AND INTENDED USES

Michael O. Saar

The land parcel is too small for farming (4.2302 acres ±) and has large trees. It would be better utilized for residential purposes.

Please fill out the following findings of fact to the best of your capabilities. § 13.07.F of the Zoning Ordinance lists the Finding of Fact criteria the Zoning Board of Appeals must answer in order to make a recommendation to the County Board on any **map amendment** request. They are as follows:

Existing uses of property within the general area of the property in question.

AGRICULTURE
RESIDENTAL

The Zoning classification of property within the general area of the property in question.

A-1
R-1
R-3

The suitability of the property in question for the uses permitted under the existing zoning classification.

TO SMALL FOR AGRICULTURE, ALSO TO MANY TREES,
MOST SUITABLE FOR RESIDENTAL

The trend of development, if any, in the general area of the property in question, including changes, if any, which may have taken place since the day the property in question was in its present zoning classification. The Zoning Board of Appeals shall not recommend the adoption of a proposed amendment unless it finds that the adoption of such an amendment is in the public interest and is not solely for the interest of the applicant. The Zoning Board of Appeals may recommend the adoption of an amendment changing the zoning classification of the property in question to any higher classification than that requested by the applicant. For the purpose of this paragraph the R-1 District shall be considered the highest classification and the M-2 District shall be considered the lowest classification.

THE TREND IS TO RESIDENTAL USES

Consistency with the purpose and objectives of the Land Resource Management Plan and other adopted County or municipal plans and policies.

IT IS CONSISTENT.

GEORGE E. COLE®
LEGAL FORMS

No. 810
September, 1975

215431

WARRANTY DEED

Joint Tenancy Illinois Statutory

(Individual to Individual)

890496
FILED FOR RECORD
KENDALL COUNTY ILL.
DOC # 890496
4:02 P.M.
JAN 24 1989
RECORDER OF DEEDS

BK 188 PG 251

COUNTY OF KENDALL
REAL ESTATE TRANSFER TAX
$ 8.00

(The Above Space For Recorder's Use Only)

STATE OF ILLINOIS
REAL ESTATE TRANSFER TAX
JAN 24'89
★★★ 08.00
DEPT. OF REVENUE
P.B. 10692

025245
KENDALL
047

THE GRANTOR C. A. BASSAK AND FRANCES A. BASSAK, HIS WIFE

of the CITY of SARASOTA County of SARASOTA State of FLORIDA
for and in consideration of TEN ($10.00)---------- DOLLARS,
in hand paid,

CONVEY___and WARRANT___,to MICHAEL O. SAAR & DAYLE E. SAAR,
(NAMES AND ADDRESS OF GRANTEES)
HUSBAND AND WIFE 14 TIMBERCREEK DRIVE, YORKVILLE, ILLINOIS 60560

not in Tenancy in Common, but in JOINT TENANCY, the following described Real Estate situated in the County of KENDALL in the State of Illinois, to wit:

THAT PART OF THE SOUTH 1/2 OF SECTION 7, TOWNSHIP 36 NORTH, RANGE 7 EAST OF THE THIRD PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS: COMMENCING AT THE SOUTH WEST CORNER OF SAID SECTION 7; THENCE NORTH 01 DEGREES 45 MINUTES, 36 SECONDS WEST ALONG THE WEST LINE OF SAID SECTION 7, A DISTANCE OF 695.70 FEET TO THE PRESENT CENTER LINE OF ILLINOIS STATE ROUTE 71; THENCE NORTH 71 DEGREES, 11 MINUTES, 00 SECONDS EAST ALONG SAID CENTER LINE, 37.40 FEET; THENCE NORTHEASTERLY ALONG SAID CENTER LINE, BEING A TANGENTIAL CURVE TO THE LEFT WITH A RADIUS OF 6611.12 FEET, AN ARC DISTANCE OF 2271.16 FEET TO THE SOUTHERNMOST LINE OF A TRACT DECRIBED IN A WARRANTY DEED FROM JANET C. SHICK TO C.A. BASSAK AND FRANCES A. BASSAK, HUSBAND AND WIFE, RECORDED AS DOCUMENT 74-2411 ON MAY 21, 1974 FOR THE POINT OF BEGINNING; THENCE SOUTH 64 DEGREES, 37 MINUTES, 06 SECONDS EAST, ALONG SAID SOUTHERNMOST LINE 575.55 FEET TO THE SOUTHERLY EXTENTION OF THE MONUMENTED WESTERLY LINE OF LOT 35 OF TIMBER CREEK SUBDIVISION; THENCE NORTH 26 DEGREES, 52 MINUTES, 33 SECONDS EAST ALONG SAID WESTERLY LINE AND ITS EXTENTION AND ALONG THE WESTERLY LINE OF LOT 36 OF SAID SUBDIVISION, 475.64 FEET TO THE NORTHERNMOST CORNER OF SAID LOT 36, THENCE NORTH 78 DEGREES, 39 MINUTES, 26 SECONDS WEST ALONG THE MONUMENTED SOUTHERLY LINE OF LOT 37 AND LOT 38 OF SAID SUBDIVISION AND SAID LINE EXTENDED, 433.22 FEET TO SAID CENTER LINE; THENCE SOUTHWESTERLY ALONG SAID CENTER LINE 406.64 FEET FEET TO THE POINT OF BEGINNING, IN KENDALL TOWNSHIP, KENDALL COUNTY, ILLINOIS.

AFFIX "RIDERS" OR REVENUE STAMPS HERE

[redacted] (Seal) [redacted] (Seal)

PLEASE PRINT OR TYPE NAME(S) BELOW SIGNATURE(S)

C. A. BASSAK

~~FRANCIS A. BASSAK~~
FRANCES A. BASSAK

(Seal) (Seal)

State of ~~Illinois~~ FLORIDA, County of SARASOTA ss. I, the undersigned, a Notary Public in and for said County, in the State aforesaid, DO HEREBY CERTIFY that C. A. BASSAK and FRANCES A. BASSAK personally known to me to be the same person s whose name s subscribed to the foregoing instrument, appeared before me this day in person, and acknowledged that they signed, sealed and delivered the said instrument as their free and voluntary act, for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

IMPRESS SEAL HERE

Given under my hand and official seal, this 9th day of January 1989

NOTARY PUBLIC, STATE OF FLORIDA;
MY COMMISSION EXPIRES: MAR. 16, 1992;
BONDED THRU NOTARY PUBLIC UNDERWRITERS.

Commission expires ____ 19__

[redacted]
NOTARY PUBLIC

This instrument was prepared by ANTHONY J. BASSAK 1737 W. HOWARD SUITE 404
(NAME AND ADDRESS) CHICAGO, ILL. 60626

MAIL TO: MICHAEL O. SAAR (Name)
14 TIMBERCEEK DRIVE (Address)
YORKVILLE, ILLINOIS 60560 (City, State and Zip)

OR RECORDER'S OFFICE BOX NO. ____

ADDRESS OF PROPERTY:
RT. 71
YORKVILLE, ILLINOIS

THE ABOVE ADDRESS IS FOR STATISTICAL PURPOSES ONLY AND IS NOT A PART OF THIS DEED.

SEND SUBSEQUENT TAX BILLS TO:
MICHAEL O. SAAR
14 TIMBERCREEK DRIVE
YORKVILLE, ILLINOIS 60560
(Address)

CHICAGO TITLE INSURANCE CO.
Kane County Office
Geneva, Illinois 60134
Phone 232-2750

Mike Saar

DOCUMENT NUMBER

BK 188 PG 202

ELEANOR E. JUNGELS - RECORDER OF DEEDS OF KANE COUNTY

AFFIDAVIT - PLAT ACT

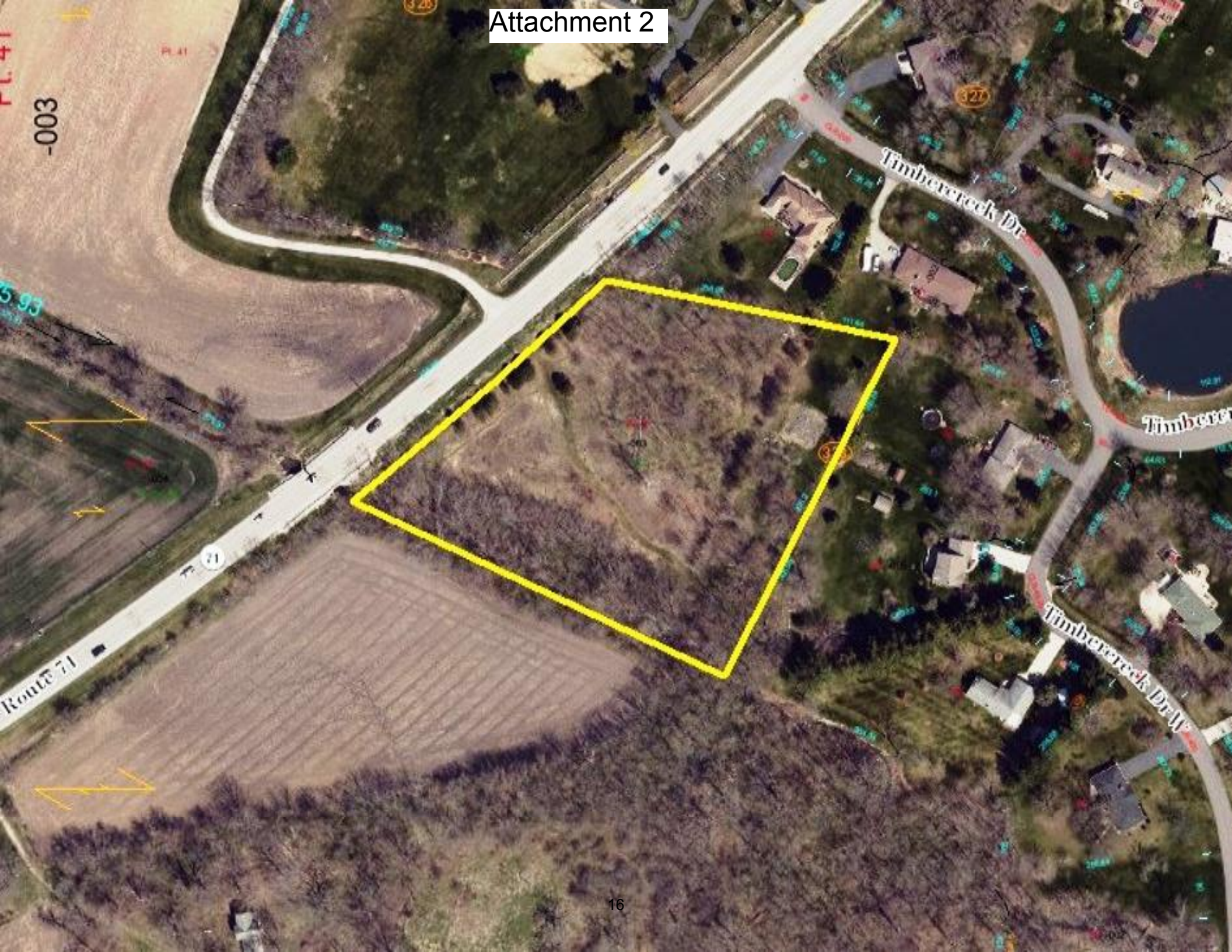
STATE OF ILLINOIS)
) SS.
COUNTY OF KANE)

Kathleen J. Bentley, being duly sworn on oath, states that she resides at 1919 Pepper Valley Drive Geneva, IL 60134. That the attached deed is not in violation of Section 1 of Chapter 109 of the Illinois Revised Statutes for one of the following reasons:

1. The sale or exchange is of an entire tract of land not being a part of a larger tract of land.
2. The division or subdivision of land is into parcels or tracts of 5 acres or more in size which does not involve any new streets or easements of access.
3. The division is of lots or blocks of less than 1 acre in any recorded subdivision which does not involve any new streets or easements of access.
4. The sale or exchange of parcels of land is between owners of adjoining and contiguous land.
5. The conveyance is of parcels of land or interests therein for use as right-of-way for railroads or other public utility facilities, which does not involve any new streets or easements of access.
6. The conveyance is of land owned by a railroad or other public utility which does not involve any new streets or easements of access.
7. The conveyance is of land for highway or other public purpose or grants or conveyances relating to the dedication of land for public use or instruments relating to the vacation of land impressed with a public use.
8. The conveyance is made to correct descriptions in prior conveyances.
9. The sale or exchange is of parcels or tracts of land following the division into no more than two parts of a particular parcel or tract of land existing on July 17, 1959, and not involving any new streets or easements of access.
10. The sale is of a single lot of less than 5 acres from a larger tract, the dimensions and configurations of said larger tract having been determined by the dimensions and configuration of said larger tract on October 1, 1973, and no sales, prior to this sale, of any lot or lots from said larger tract having taken place since October 1, 1973, and a survey of said single lot having been made by a registered land surveyor.

CIRCLE NUMBER ABOVE WHICH IS APPLICABLE TO ATTACHED DEED.

AFFIANT further states that she makes this affidavit for the purpose of inducing the Recorder of Deeds of Kane County, Illinois, to accept the attached deed for recording, and that all local requirements applicable to the subdivision of land are met by the attached deed and the tract described therein.


Attachment 2
Timbercreek Dr
Route 71

Attachment 3 Looking East from Route 71



Attachment 4 Looking South



Attachment 5 South Property Line and Stream



Attachment 6 Petitioner's Boundary Line



DEPARTMENT OF PLANNING, BUILDING & ZONING
111 West Fox Street • Room 203
Yorkville, IL • 60560
(630) 553-4141 Fax (630) 553-4179

Petition 18-15
Nancy Harazin on Behalf of
Nancy L. Harazin Trust Number 101
A-1 Special Use – Public or Private
Utility – Other (Solar Panels)

INTRODUCTION

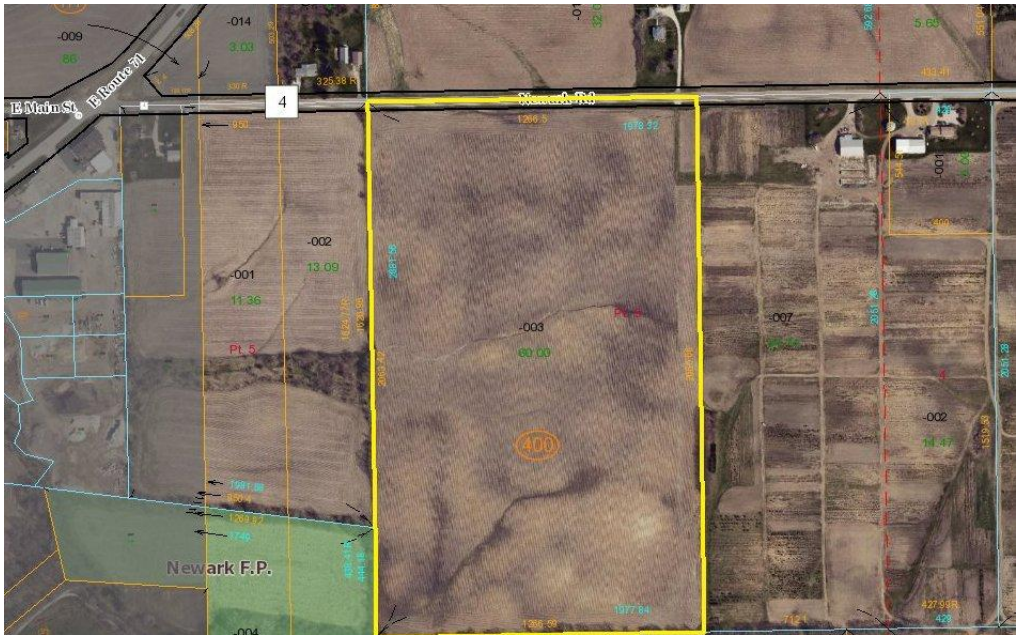
Nancy Harazin, on behalf of Nancy L. Harazin Trust Number 101, submitted a petition for a special use permit to operate a public or private utility system – other on her property at 16400 Newark Road. Specifically, the Petitioner would like to contract with Borrengo Solar Systems, Inc. for the installation and operation of a solar energy system. The energy generated from the system will be fed into Ameren's system and consumed offsite.

SITE INFORMATION

PETITIONER Nancy Harazin on Behalf of Nancy L. Harazin Trust Number 101

ADDRESS 16400 Newark Road, Newark

LOCATION Approximately 0.2 Miles East of Route 71 on the South Side of Newark Road



TOWNSHIP Big Grove

PARCEL # 07-05-400-003

LOT SIZE 60 Acres (Project Size – 22 Acres +/-; Fenced Area of Project 12.1 Acres +/-)

EXITING LAND USE: Agricultural

ZONING: A-1 Agricultural District

LRMP

Land Use	Agricultural
Roads	Newark Road is County Maintained Road and is a Major Collector
Trails	None
Floodplain/ Wetlands	No Floodplains Present. Site Plan (Attachment 7, Page 3) Indicates 2 Wetlands and 2 Farmed Wetlands. Proposed Project Has a 50' Wetland Buffer at the Wetlands Near the Site.

REQUESTED ACTION: A-1 Special Use to Operate a Public or Private Utility – Other (Solar Panels)

APPLICABLE REGULATIONS: Section 7.01 D.39.e – A-1 Special Uses – Public or Private Utilities and Services – Other Similar Uses

Section 13.08 – Special Use Procedures

SURROUNDING LAND USE

Location	Adjacent Land Use	Adjacent Zoning	Land Resource Management Plan	Zoning within ½ Mile
North	Agricultural/Farmsteads	A-1 (Agricultural)	Agricultural	A-1
South	Agricultural/Forest Preserve	A-1 (Agricultural)	Agricultural and Forest Preserve	A-1
East	Agricultural/Farmsteads	A-1 (Agricultural)	Agricultural	A-1 and R-1
West	Agricultural	A-1 (Agricultural)	Agricultural	A-1 and Village of Newark

A farmstead is currently located across the street from the subject property. The driveway of the house lines up with the existing farm entrance to the subject property.

PHYSICAL DATA

ENDANGERED SPECIES REPORT

EcoCAT Report submitted and consultation was terminated; see Attachment 1.

NATURAL RESOURCES INVENTORY

Application was submitted on April 6, 2018.

ACTION SUMMARY

BIG GROVE TOWNSHIP

Petition information was sent to Big Grove Township on April 24, 2018.

VILLAGE OF NEWARK
Petition information was sent to the Village of Newark April 24, 2018.

BUSINESS OPERATION
According to the information provided by the Petitioner, the Petitioner would like to lease approximately twenty-three (23) acres to 312 Solar Development, LLC c/o Borrengo Solar Systems, Inc. for an initial period of twenty (20) years. The lease could be renewed up to four (4) additional periods of five (5) years (Attachment 6, Page 1). If approved, Borrengo Solar Systems, Inc. would install and maintain six thousand, nine hundred twelve (6,912) solar panels on the north side of the subject property. The solar panels would be seven feet (7') in height at maximum tilt and three to four feet (3'-4') off of the ground. The panels would rotate with the sun. The system would connect to Ameren's system at the northeast corner of the property at Newark Road. The system is planned to generate two mega-watts (2MW) of energy. If approved, the system would be operation by approximately July 31, 2019 (Attachment 6, Page 30).

Other than periodic mowing and maintenance, no personnel will be onsite and no parking is required.

The construction process is estimated to take between four and six (4-6) months.

SITE PLAN
The solar panels will be located at their closest point approximately one hundred seventy-five feet (175') from Newark Road and approximately one hundred forty-seven feet (147') from the nearest neighboring property line. The solar panels shall not be closer than fifty feet (50') from the identified wetlands.

The laydown area indicated on Page 3 of Attachment 7 will be used for the placement of equipment during construction, decommissioning, and maintenance activities.

LANDSCAPING
The Landscaping Plan can be found on Pages 7 and 8 of Attachment 7. The plan calls for the planting of eighteen (18) Black Chokeberries, eighteen (18) Sea Green Junipers, twenty-nine (29) Spiraea, and thirty (30) Woodward Arborvitae. The shrubs would grow to approximately thirty inches (30) inches in height maximum. Several existing trees shall remain on the west side of the property.

A lawn seed mix will be planted under and around the solar panels. The growth would require mowing three (3) or four (4) times per year.

Vegetation would be planted when the panels are in place.

DRAINAGE and WETLAND STUDY
As mentioned previously, two (2) wetlands and two (2) farmed wetlands are located on the property. The proposed solar panels should be located away from these areas. The Petitioner submitted a wetland study (see Attachment 9) that verified these areas will not be negatively impacted by the placement of solar panels.

Several drain tiles were located on the property (see Attachments 10 and 11). Any drain tiles impacted by the placement of the solar panels shall be relocated.

STORMWATER
The project will be required to meet Kendall County's Stormwater Management Ordinance. Greg Chismark submitted comments and questions on the proposal (see Attachment 14).

BUILDING CODES
The proposed solar panels shall be required to meet all applicable building codes.

The supports would be buried approximately twelve to thirteen feet (12'-13') in the ground depending on soil conditions. The supports would not be encased in concrete.

Electric lines will be buried inside the fence. On Attachment 7, Page 3, there is a utility pole indicated east of the access drive. The electric lines will go above ground at that point and connect to the Ameren system at the point on connection on the northeast corner of the site.

ACCESS
A fourteen foot (14) wide gravel access from Newark Road will be installed. The property already possesses a field access at this location. The access is across the street from the driveway of 16295 Newark Road.

LIGHTING AND SECURITY
Per the Site Plan (Attachment 7, Page 4), a seven foot (7') high chained link fence shall surround the solar panels. The fence shall have a sixteen foot (16') wide vehicle access gate on the east side and a four (4') wide man gate on the south side. The fence will be installed approximately one (1) week after construction starts.

A light will be installed for security reasons at the electrical equipment area.

SIGNAGE
Approximately eight (8) signs will be placed around the property along the fence and anywhere required by the NEC. A "Danger High Voltage" sign will be placed around the fence every two hundred feet (200'). A sign will also be placed on the vehicle gate entrance. There will be plaques stating emergency contact information and a site key.

ODORS
No new odors are foreseen.

PROPERTY VALUES
The Petitioner supplied a report (Attachment 13) outlining that solar panels do not cause damage to neighboring property value or harm the environment.

DECOMMISSIONING
The solar panels have life expectancy of thirty (30) years (Attachment 13, Page 3).

Decommission is estimated to take between two and three (2-3) months.

RELATION TO OTHER PROPOSED ORDINANCES
As noted on Pages 4 and 5 of Attachment 13, the Future Energy Jobs Act set a goal of between two thousand five hundred and three thousand mega-watts (2,500-3,000 MW) of solar in Illinois by 2030. Based on the information provided by the Petitioner, most of these projects will be around two mega-watts (2 MW) and use between twelve to twenty (12-20) acres of land. The information provided by the Petitioner estimates that between fifteen and twenty (15-20) solar projects may occur in Kendall County.

Kendall County is currently in the process of adopting solar panel regulations for offsite usage of energy. Some of the proposed language is included in the proposed recommendations.

RECOMMENDATION

Proposed Special Use Conditions and Restrictions
1. The site will be developed in accordance with the Site Plan, (Attachment 7, Pages 3-5).

2. Lighting will be installed in accordance with the Site Plan (Attachment 7, Pages 3-5).

3. The landscaping shall occur in accordance with the Landscaping Plan (Attachment 7, Pages 7-8).

4. Replacement of dead and/or damaged vegetation shall occur on a timetable agreed to between the property owner and the Kendall County Planning, Building and Zoning Department.

5. Signage shall be installed as described in the Sheet Notes (Attachment 7, Page 9). In addition, at least one (1) sign shall be placed at the vehicle access gate stating emergency contact information.

6. The site shall be decommissioned in accordance with the Decommissioning Plan (Attachment 7, Page 6). In the event the Decommissioning Plan changes, the property owner shall supply the Kendall County Planning, Building and Zoning Department with revised plans as soon as they are available.

7. The Decommissioning Plan shall be initiated if the solar panels are not used for ninety (90) consecutive days. This condition shall not apply if maintenance on the impacted solar panel(s) is occurring.

8. The property owner shall have six (6) months to complete the Decommissioning Plan and remove the solar panels and related equipment from the property.

9. In addition to other applicable fees, the following fees should be paid to the County prior to the installation of the solar panels:

Building Permit Fees	
0-10 KW	$150
51-100	$300
101-500	$600
501-1000	$1200
1001-2000	$2750
1001-2000	$6000
Over 2000 KW	$200 for Each Additional 0-100 KW

Fees Double if Construction Commences before Obtaining Building Permit

10. The property owner or operator shall maintain current liability policy covering bodily injury and property damage at least Three Million Dollars per occurrence and Five Million Dollars in aggregate and must have policy for the duration of the special use permit, such insurance may be provided pursuant to a plan of self-insurance by a party with a net worth of Twenty Million Dollars or more and the County shall be named as additional insured to the extent that the County is entitled to indemnification.

11. The property owner shall indemnify, and hold harmless the County and its officials, employees, and agents (collectively and individually, the "Indemnified Parties") from and against any and all claims, demands, losses, suits, causes of actions, damages, injuries, costs, expenses, and liabilities whatsoever, including reasonable attorney's fees, except to the extent arising in whole or part out of negligence or intentional acts of such Indemnified Parties (such liabilities together known as "liability") arising out of Applicant, Owner, or Operators selection, construction, operation, and removal of the solar energy system and affiliated equipment including, without limitation, liability for property damage or personal injury (including death), whether said liability is premised on contract or on tort (including without limitation strict liability or negligence). This general indemnification shall not be construed as limited or qualifying the County's other indemnification rights available under the law.

12. The property owner shall be responsible for ensuring that the operations of the solar panels allowed by this special use permit comply with all applicable Federal, State, and Local laws.

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

ATTACHMENTS

1. Applications Materials
2. Property Aerial
3. Legal Description Aerial
4. Project Area Exhibit
5. Project Area Legal Description
6. Redacted Lease and Interconnection Agreement
7. Site Plan
8. Adjacent Zoning
9. Wetland Study
10. Drain Tile – Alta Survey
11. Drain Tile Information from Huddleston McBride
12. Decommissioning Costs
13. Supporting Documents
14. 4-18-18 Chismark Letter
15. Road In

16. Property to North
17. Looking West
18. Looking Southwest
19. Looking Southeast
20. Looking East

GreenbergFarrow

21 South Evergreen Avenue
Suite 200
Arlington Heights, IL 60005
847.788.9200
www.greenbergfarrow.com
We Are Global

April 12, 2018

Matt Asselmeier
Senior Planner
Kendall County Planning, Building & Zoning
111 West Fox Street
Yorkville, IL 60560

Re: Special Use Permit
Proposed Ground-Mounted Solar Farm
16400 Newark Road,

Dear Mr. Asselmeier, Members of the Zoning and Platting Advisory Committee, Kendall County Regional Planning Commission, Zoning Board of Appeals, Planning Board & Zoning Committee and Members of the County Board:

On behalf of our client Borrego Solar Systems, Inc. (BSSI), enclosed and below please find our completed, project narrative description, application fee and supporting documents as required for Special Use Permit request.

Project Narrative:

Borrego Solar Systems, Inc. is requesting a Special Use Permit to allow for development of a, 2MW ground-mounted distributed generation solar farm facility on an existing farmland parcel of approximately 66.0-acres located at 16400 Newark Road. The project area requested for Special Use Permit approval is approximately 22.8-acres. The property lies within the County's AG Zoning District.

It is our understanding that the solar industry is currently working with the Illinois County Assessors Association to create a standardized way in which a separate tax lot can be created for purposes of property assessment for solar. It is further understood that, similar to existing wind statute legislation, the development of this anticipated statutory text will provide a mechanism for creation of a tax lot that does not constitute a "subdivision" per the Illinois Plat Act. We are therefore not anticipating the need for subdivision of the property.

Matt Asselmeier
Kendall County PBZ Dept.
SUP Request
16400 Newark Road

In your review of this Special Use Permit request, we ask that staff, the Committees, Commissions and Boards consider the following:

I. **Project improvements**:

- Solar panel arrays with trackers/racking/string inverters;
- Concrete pad-mounted transformers/switch gear;
- Data Acquisition System (DAS) for remote monitoring;
- Underground trenching/cabling for the entire project with exception of a series of poles along the proposed driveway necessary to interconnection with the Ameren grid along Newark Road;
- Perimeter security fencing at 7 ft. height as required per National Electric Code (NEC). The fenced area is approximately 12.1 acres and will include a gated main entry with three additional man-door access points;
- Location of proposed structures is in compliance with County setback requirements;
- Limited area of gravel/paved drive for site access and maintenance;
- Drainage flow through the site will be maintained;
- Post-construction site area to be seeded with low-mow seed mix;
- Decommissioning of the project upon completion of the lease term has been contemplated by the lease agreement. Additionally, we have included with our submission a decommissioning plan and a decommissioning estimate that includes information regarding salvage value.

Additionally:

- The location for the solar farm improvements has been selected to avoid any impacts to potential farmed wetlands located on the east of the project area. An "*Wetland Determination Report*" was prepared by a Wetland Consultant that provides evidence the project area is well outside of any potential wetlands or wetland buffer areas - report attached. A request for a letter of no objection will be submitted to the Army Corp of Engineers in the spring of 2018.
- Initial Endangered and Threatened Species investigation has indicated the project area does not contain suitable habitat for potential Endangered and Threatened Species. A termination letter was received from the Illinois Department of Natural Resources indicating there are no records of State-listed threatened or endangered species – letter is enclosed.
- An Archeological Phase I survey was prepared and indicated no archaeological material is on-site. The Archeological Phase I report was submitted to the State Historic Preservation Office for concurrence.
- NRI/LESA application and request was submitted to Kendall County Soil & Water Conservation District concurrently with this SUP submission – the report will be submitted under a separate cover once completed.
- A highly reputable drain tile consultant has been engaged to map the drain tiles as shown on the enclosed plan set. The consultant's qualification has been enclosed for reference.

II. **Compliance with Standards for Special Uses (Sec. 13.08 (J))**:

Regarding Sec. 13.08, I., it is our opinion that granting of a Special Use Permit for the proposed project will not be injurious to the neighborhood, detrimental to the public welfare, or in conflict with the County's Comprehensive Plan for development.

Matt Asselmeier
Kendall County PBZ Dept.
SUP Request
16400 Newark Road

Additionally, it is our hope that the Commissions, Committees and Boards will find that granting of this Special Use request:

1. Will not be detrimental to or endanger the public's health, safety, morals, comfort, or general welfare of the inhabitants of Kendall County nor will it otherwise create a nuisance. Solar systems are composed of non-toxic materials that do not produce emissions and do not leach or erode. The entire solar array will be secured with a 7-foot fence to provide safety and prevent unintended access to the project area. The inverter is the greatest source of noise on the property. The inverter is centrally located, ensuring the minimum distance from a property line is more than 350 feet. At this distance the noise generated by the inverter will not be above the existing ambient noise and would be comparable to the sound of rustling leaves and a whisper. While some upward reflections occur from the panels, the panels are treated with an anti-reflective coating to ensure that minimal glare occurs.
2. Will not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted by the zoning standards, nor substantially diminish or impair property values. Although solar farms are relatively new to Illinois, studies in other states have shown no decrease in adjacent property values due to solar land use. The nearest residential structure is over 375 feet to the west of the proposed system. Additionally, the system has been setback in excess of the County setback requirements. While not required, landscape screening has been added to soften views of the system.
3. Adequate utilities, access roads, drainage, and/or other necessary facilities have been or will be provided to serve the proposed use. Generally, the proposed solar development does not require access to traditional utilities such as natural gas, water or sanitary sewer. The routing of the electrical infrastructure required to connect to the Ameren electric system is shown on the enclosed plans. A driveway has been proposed to access the development and there is very little impervious surface proposed and existing drainage flows will be maintained. In addition, the introduction of low-mow seeding in the development areas (versus seasonal agricultural planting) will reduce run-off rates in the project area. Through the Driveway Permit and Building Permit processes the applicant will comply with the requirements of the Kendall County DOT and Fire Protection District.
4. The proposed use and enclosed plans conform to the applicable regulations of the AG zoning district and Kendall County Ordinances.
5. We feel that the special use would be consistent with the purpose and objectives of the Land Resource Management Plan, the Zoning Code and the draft Solar Ordinance.

On behalf of Borrego Solar Systems, Inc., we thank you in advance for your consideration of our request for approval. We look forward to review of our submittal at the ZPAC meeting on May 1st, 2018. In the interim, please contact us with any questions regarding our submittal or if any additional information is required.

Sincerely,

Jason Bolling
Due Diligence Coordinator

Enclosures: per the attached Transmittal;

1117 DOGLAS AVE AURORA I 1117 DOGLAS AVE AURORA IL 60505S

THE COUNTY OF KENDALL
FEBRUARY 19, 1841

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

APPLICATION

PROJECT NAME Rancho La Purisima **FILE #:**_____

NAME OF APPLICANT
Jorge Ramirez a/k/a Rancho La Purisima Corp

CURRENT LANDOWNER/NAME(s)
Lawrence Slattery, R.Y. Property Management Corp.

SITE INFORMATION

ACRES	SITE ADDRESS OR LOCATION	ASSESSOR'S ID NUMBER (PIN)
5	8218 Route 30, Bristol, IL 60512	02-03-200-001

EXISTING LAND USE	CURRENT ZONING	LAND CLASSIFICATION ON LRMP
AG/Farm	A1	Suburban Residential

REQUESTED ACTION (Check All That Apply):

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

[1]PRIMARY CONTACT	PRIMARY CONTACT MAILING ADDRESS	PRIMARY CONTACT EMAIL
Stuart A. Petersen	[redacted]	
PRIMARY CONTACT PHONE #	**PRIMARY CONTACT FAX #**	**PRIMARY CONTACT OTHER #**(Cell, etc.)
[redacted]		

[2]ENGINEER CONTACT	ENGINEER MAILING ADDRESS	ENGINEER EMAIL
Harold Beron	[redacted]	
ENGINEER PHONE #	**ENGINEER FAX #**	**ENGINEER OTHER #** (Cell, etc.)
[redacted]		

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

I CERTIFY THAT THE INFORMATION AND EXHIBITS SUBMITTED ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND THAT I AM TO FILE THIS APPLICATION AND ACT ON BEHALF OF THE ABOVE SIGNATURES.

SIGNATURE OF APPLICANT [redacted] **DATE** 4-17-18

FEE PAID:$_____
CHECK #:_____

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

RUDDY, KING & PETERSEN

2631 Ginger Woods Parkway, Suite 101
Aurora, IL 60502-7429
Phone: (630) 820-0333
Fax: (630) 820-0594
Email: info@ruddyking.com
www.ruddyking.com

John C. Ruddy
Lincoln M. King
Stuart A. Petersen

April 17, 2018

Laurence Slattery

VIA Email at [redacted]

RE: Special use Permit/Zoning application for Jorge Ramirez and property known as 8218 Route 30, Bristol IL 60512.

Dear Mr. Slattery:

Per our discussion please execute below acknowledging your consent and authorization on behalf of yourself and the entity known as R.Y. Property Management, Corp. the owner of record for the property known as 8218 Route 30, Bristol Illinois and party to an Article of Agreement for Deed for the property with the Buyer known as Jorge Ramirez and recorded as a Memorandum of Agreement Kendall County Recorder document # 201600005721 that Attorney Stuart A. Petersen is authorized to place your/my signature on any Petition for Special use or any other required Petition or document required by Kendall County Illinois to allow Jorge Ramirez to apply for all required special use permits or zoning variances. Subject to the Articles for Agreement for Deed.

I, Laurence Slattery, individually and authorized agent for R.Y. Property Management Corp. hereby authorize Attorney Stuart A. Petersen to execute my signature on any Petition for Special Use or [redacted]tion for Kendall County Illinois as indicated hereinabove.

[redacted] Date 4/17/18

Laurence Slattery, Individually and as Authorized Agent for R.Y. Property Management Corp.

Thank you for your assistance in this matter.

[redacted]

201600005721

DEBBIE GILLETTE
KENDALL COUNTY, IL

RECORDED: 4/27/2016 8:40 AM
AGR: 49.00 RHSPS FEE: 10.00
PAGES: 3

Debbie Gillette

Kendall County Recorder
111 W Fox St.
Yorkville IL 60560

Recording Cover Page

This page added for the purposes of affixing Recording Information

- ○ **Deed** _____
- ○ **Lien** _____
- ☒ **Other** Agreement _____
- ○ **UCC**
- ○ **Plat**

Remarks:
Prepared by: NAME: The G.I.L Law Group
ADDRESS: 605 N. Broadway
Aurora IL 60505

RETURN TO: NAME: The G.I.L Law Group
ADDRESS: 605 N. Broadway
Aurora, IL 60505

MEMORANDUM OF AGREEMENT

This Memorandum of Agreement relates to an Articles of Agreement for Deed dated March 30, 2016 between R.Y. Property Management, Corp. (the "Buyer") and Lawrence and Kathleen Slattery (the "Sellers") under which the Buyer agreed to purchase from the Sellers, and the Sellers agreed to sell to the Buyer, according to the terms of the Articles of Agreement for Deed, the following property:

Common Address: 8218 Route 30, Bristol, Illinois 60512
Parcel Number: 02-03-200-001
Legal Description: Attached

For good and valuable consideration, the Sellers covenant and agree to convey to the Buyer the above referenced property under the provisions contained in the above mentioned unrecorded Articles of Agreement for Deed, which is incorporated into this memorandum by reference. The terms of said Agreement shall last through and including September 30, 2019, or until such date contained in any written extension thereof, agreed to and executed by all parties.

This memorandum is not intended to be a complete summary of the Articles of Agreement for Deed. Provisions in this Memorandum shall not be used for interpreting the said Articles of Agreement for Deed terms. In the event of a conflict between this Memorandum and unrecorded Articles of Agreement for Deed, the terms of the unrecorded Articles of Agreement for Deed shall control.

IN WITNESS WHEREOF, the parties have executed this memorandum this 30th day of March, 2016.

[redacted]

SELLER Lawrence Slattery

[redacted]

SELLER Kathleen Slattery

by [redacted] atty-in-fact

Jorge Ramirez

BUYER

OFFICIAL SEAL
JENIFFER A SMUTZER
Notary Public - State of Illinois
My Commission Expires Feb 1, 2019

Sworn to and Subscribed to Before Me
This 30th day of March, 2016

[redacted]

NOTARY PUBLIC
My commission expires: 2-1-19


OFFICIAL SEAL
JENNIFER A SMUTZER
Notary Public - State of Illinois
My Commission Expires Feb 1, 2019

LEGAL DESCRIPTION

THAT PART OF THE NORTHEAST 1/4 OF SECTION 3, TOWNSHIP 37 NORTH, RANGE 7 EAST OF THE THIRD PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS: COMMENCING AT THE NORTHWEST CORNER OF SAID NORTHEAST 1/4; THENCE EASTERLY ALONG THE NORTH LINE OF SAID NORTHEAST 1/4, 1,119.50 FEET TO THE LINE OF A FENCE EXTENDED FROM THE SOUTH FOR THE POINTOF BEGINNING; THENCE SOUTHERLY ALONG SAID EXTENDED FENCE LINE WHICH FORMS AN ANGLE OF 91 DEGREES, 29 MINUTES, 13 SECONDS WITH THE CENTER LINE OF U.S. ROUTE NO. 30 (MEASURED FROM WEST TO SOUTH), 57.27 FEET TO THE SOUTHERLY RIGHT OF WAY LINE OF SAID ROUTE 30; THENCE SOUTHERLY ALONG THE LAST DESCRIBED COURSE , 305.85 FEET; THENCE EASTERLY ALONG A LINE WHICH FORMS AN ANGLE OF 91 DEGREES, 30 MINUTES, 0 SECONDS WITH THE LAST DESCRIBED COURSE, (MEASURED CLOCKWISE THEREFROM), 600.0 FEET; THENCE NORTHERLY ALONG A LINE WHICH FORMS AN AGGLE OF 88 DEGREES, 30 MIUTES, 0 SECONDS WITH THE LAST DESCRIBED COURSE, (MEASURED CLOCKWISE THEREFROM), 363.12 FEET TO SAID NORTH LINE; THENCE WESTERLY ALONG SAID NORTH LINE, 600.0 FEET TO THE POINT OF BEGINNING; IN THE TOWNSHIP OF BRISTOL, KENDALL COUNTY, ILLINOIS.

Commonly Known as: **8218 ROUTE 30 BRISTOL, IL 60512**

TAX ID #: **02-03-200-001**

Prepared By: The Gil Law Group
605 N. Broadway
Aurora, Illinois 60505

Return To: Law Office of Richard C. Claahsen
215 Hillcrest Ave. Suite C
Yorkville, IL 60560

FORM **BCA 2.10**
ARTICLES OF INCORPORATION
Business Corporation Act

Filing Fee: $150
Franchise Tax: $ 25
Total: $175

File #: **71797856**

Approved By: JXR

FILED
APR 17 2018
Jesse White
Secretary of State

1. Corporate Name: RANCHO LA PURISIMA, CORP.

2. Initial Registered Agent: ATTORNEY STUART A. PETERSEN
(First Name / Middle Initial / Last Name)

Initial Registered Office: 2631 GINGER WOODS PKWY STE 101
(Number / Street / Suite No.)

AURORA (City) IL 60502-7429 (ZIP Code) KANE (County)

3. Purposes for which the Corporation is Organized:
The transaction of any or all lawful businesses for which corporations may be incorporated under the Illinois Business Corporation Act.

4. Authorized Shares, Issued Shares and Consideration Received:

Class	Number of Shares Authorized	Number of Shares Proposed to be Issued	Consideration to be Received Therefor
COMMON	10000	1000	$ 1000

NAME & ADDRESS OF INCORPORATOR

5. The undersigned incorporator hereby declares, under penalties of perjury, that the statements made in the foregoing Articles of Incorporation are true.

Dated APRIL 17 (Month & Day), 2018 (Year) 8218 ROUTE 30 (Street)

JORGE RAMIREZ (Name) BRISTOL (City/Town) IL (State) 60512 (ZIP Code)

This document was generated electronically at www.cyberdriveillinois.com

KENDALL COUNTY
DISCLOSURE OF BENEFICIARIES FORM

1. Applicant JORGE RAMIREZ a/k/a RANCHO LA PURISIMA CORO.

   Address 8218 Route 30

   City Bristol State IL Zip 60560

2. Nature of Benefit Sought Special Use Permit banquet hall liqour license

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

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

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

NAME	ADDRESS	INTEREST
JORGE RAMIREZ	8218 ROUTE 30 BRISTOL IL	100%

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

   JORGE RAMIREZ INDIVIDUALLY AND AUTHRIZED AGET OF CORPOTRATION

VERIFICATION

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

Subscribed and sworn to before me this 17th day of April, A.D. 2018

(seal)

LINCOLN M KING
Official Seal
Notary Public - State of Illinois
My Commission Expires Mar 3, 2020

[redacted]
Notary Public

Kendall County Soil & Water Conservation District

7775A Route 47, Yorkville, Illinois 60560 • (630)553-5821 extension 3

www.kendallswcd.org

NATURAL RESOURCE INFORMATION (NRI) REPORT APPLICATION

Petitioner: Jorge Ramirez Contact Person: Attorney Stewart Peterson

Address: [redacted]

City, State, Zi[redacted]

Phone Numb[redacted]

Email: [redacted]

Please select: How would you like to receive a copy of the NRI Report? ☑ Email ☑ Mail

Site Location & Proposed Use

Township Name Bristol Township 37 N, Range 7 E, Section(s) _____

Parcel Index Number(s) 07-03-200-001

Project or Subdivision Name Banquet Hall Number of Acres 5

Current Use of Site Farmette Proposed Use Banquet Hall Event Barn

Proposed Number of Lots 1 No Subdivision Proposed Number of Structures _____

Proposed Water Supply well Proposed type of Wastewater Treatment Septic/Portable Bathrooms

Proposed type of Storm Water Management _____

Type of Request

☐ Change in Zoning from _____ to _____

☐ Variance (Please describe fully on separate page)

☒ Special Use Permit (Please describe fully on separate page)

Name of County or Municipality the request is being filed with: Kendall County see attached letter to DOR for explanation

In addition to this completed application form, please including the following to ensure proper processing:

☒ **Plat of Survey/Site Plan** – showing location, legal description and property measurements

☒ **Concept Plan** - showing the locations of proposed lots, buildings, roads, stormwater detention, open areas, etc.

☑ If available: topography map, field tile map, copy of soil boring and/or wetland studies

☐ **NRI fee** (Please make checks payable to Kendall County SWCD)

The NRI fees, as of July 1, 2010, are as follows:

Full Report: $375.00 for five acres and under, plus $18.00 per acre for each additional acre or any fraction thereof over five.

Executive Summary Report: $300.00 (KCSWCD staff will determine when a summary or full report will be necessary.)

Fee for first five acres and under	$ 375.00
_____ Additional Acres at $18.00 each	$ _____
Total NRI Fee	$ _____

NOTE: Applications are due by the 1st of each month to be on that month's SWCD Board Meeting Agenda. Once a completed application is submitted, please allow 30 days for inspection, evaluation and processing of this report.

I (We) understand the filing of this application allows the authorized representative of the Kendall County Soil and Water Conservation District (SWCD) to visit and conduct an evaluation of the site described above. The completed NRI report expiration date will be 3 years after the date reported.

Jorge Ramirez. 4-16-18

Petitioner or Authorized Agent **Date**

This report will be issued on a nondiscriminatory basis without regard to race, color, religion, national origin, age, sex, handicap or marital status.

FOR OFFICE USE ONLY

NRI# 1803 Date initially rec'd 4/16/18 Date all rec'd _____ Board Meeting May 2018

Fee Due $_____ Fee Paid $ 375.00 Check #[redacted] Over/Under Payment _____ Refund Due_____

RUDDY, KING & PETERSEN
LAW GROUP, LLC

2631 Ginger Woods Parkway, Suite 101
Aurora, IL 60502-7429
Phone: (630) 820-0333
Fax: (630) 820-0594
Email: info@ruddyking.com
www.ruddyking.com

John C. Ruddy
Lincoln M. King
Stuart A. Petersen

April 11, 2018

IDNR

Division of Ecosystems and Environment

One Natural Resources Way

Springfield, IL. 62702

RE: 8218 Route 30 Bristol Illinois Endangered Species Consultation Report.

Dear IDNR:

Enclosed please find the request for an Illinois Endangered Species Consultation Report. I attached to the request a copy of a site plan along with a full survey of the property, which includes a full legal description. Note the framed barn on the property is being converted into a banquet hall and no buildings are being demolished on the property nor are any new buildings being erected. If you have any questions please contact my office.

[redacted]

Stuart A. Petersen

Endangered Species Consultation Agency Action Report

(Illinois Administrative Code Title 17 Part 1075)
Division of Ecosystems and Environment

Date 4-11-18

1. Indicate the government unit and type of action requiring consultation.

☒ Local Government ☐ State Agency

- ○ Authorization (a unit of state or local government must issue a permit or other authorization)
- ○ Funding (a unit of state or local government will provide a grant, loan, or other direct support)
- ○ Performance (a unit of state or local government is performing the action, such as construction)

Name of government unit Kendall County, Zoning Dept.
Government contact name Matt Asselmeier
Address 111 west Fox St., Yorkville IL. 60560
Phone 630-553-4141 Fax 630-553-4179

If local government, is it a county highway or local roads department? ☐ Yes ☒ No

2. Will the project receive technical assistance or funding from the state of Illinois? ☐ Yes ☒ No

If yes, indicate the state agency providing support N/A

Projects receiving state assistance (including federal funding through a state agency) must comply with the Interagency Wetland Policy Act. These projects will be reviewed for wetland impacts.

3. Applicant information

Applicant name Jorge Ramirez
Conta[redacted]
Addre[redacted]
Phone[redacted]

4. Project information and location *(a map showing the location of the proposed action is required)*

Project name Bristol Banquet Hall County Kendall
Address 8218 Rt. 30 Bristol IL.
City and zip Bristol IL 60560
Township/Range/Section (e.g., T45N,R9E,S2) T37N R7E section 3 Legal Attached to survey Boundl
(Projects cannot be reviewed without the TRS)

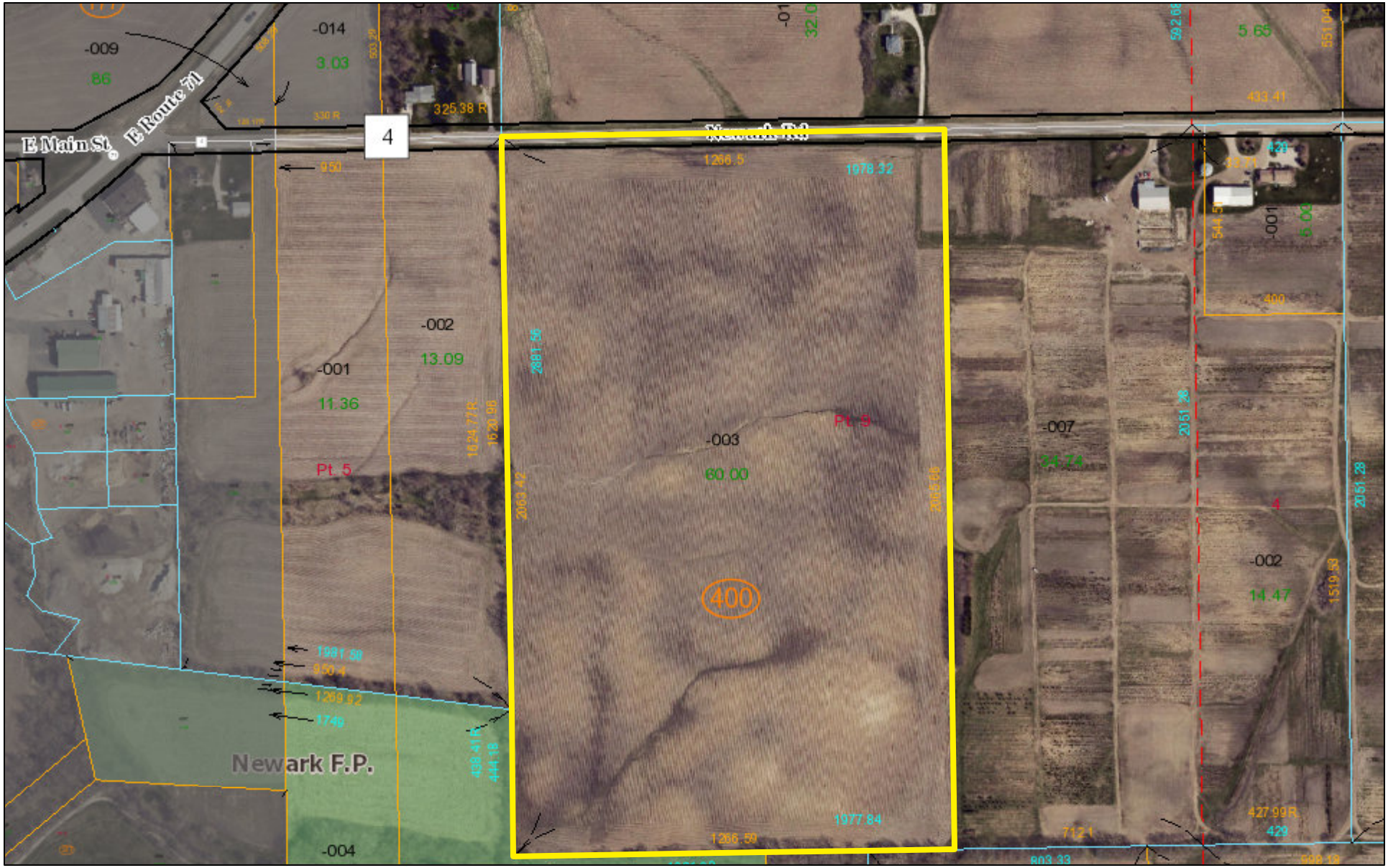
Project description Conversion of existing Framed Barn into Banquet Hall All Food and Beverages Brought in by Renters, No Buildings will be Demolished or any new Buildings will be erected, Survey and Building parking Plan Attached.

If this is a resubmittal, please provide previous IDNR Project Code _____

Mail completed form and map of project location to:
Illinois Department of Natural Resources
Division of Ecosystems and Environment
One Natural Resources Way
Springfield, IL 62702

IDNR Use Only
Project Code: _____

Attachment 2 Aerial



April 18, 2018

1:6,350

0 0.05 0.1 0.2 mi

0 0.075 0.15 0.3 km

- Agricultural
- Agricultural-Building Permit
- Agricultural-Special Use
- Agricultural-Special Use-Planned Unit Development

Attachment 3 Legal Description Aerial



0 110 220 330 440

Feet

N W E S

1 inch = 100 feet

Part of 07-05-400-003
Big Grve Twp.
Kendall County Illinois

This work is provided as is, without warranty of any kind, either expressed or implied. The information represented may contain proprietary and confidential property of Kendall County Illinois. Under United States Copyright protection laws you may not use, reproduce, or distribute any part of this document without prior written permission. To obtain written permission please contact Kendall County GIS at 111 W Fox St, Yorkville, IL 60560.

Created: 04/16/2018

THE COUNTY OF KENDALL
FEBRUARY 19, 1841

Kendall County GIS
111 West Fox Street - Room 309
Yorkville , Illinois 60560-1498
630.553.4030

PROJECT AREA EXHIBIT

LEGAL DESCRIPTION OF PROJECT AREA

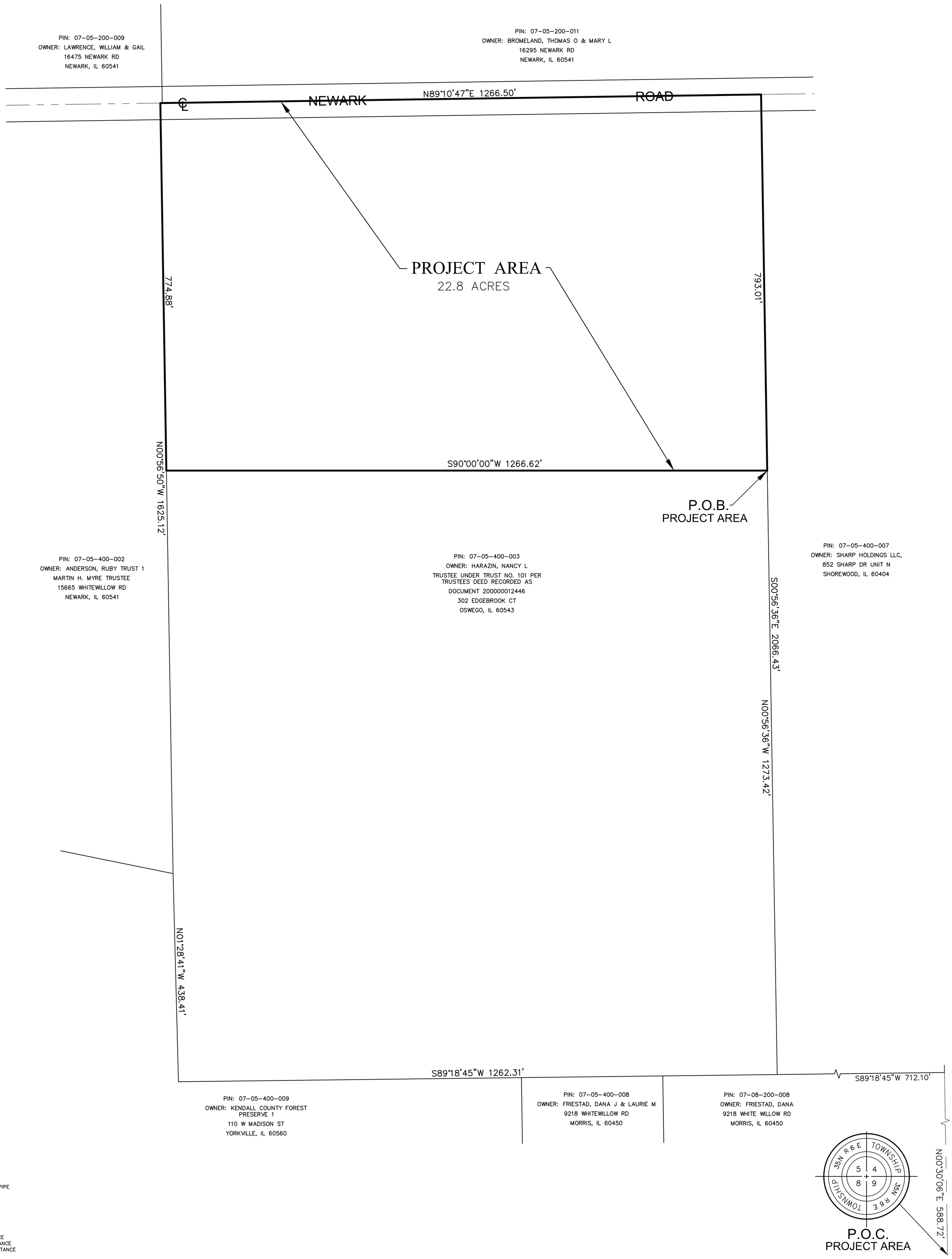
THAT PART OF THE EAST HALF OF SECTION 5, TOWNSHIP 35 NORTH, RANGE 6 EAST OF THE THIRD PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS: COMMENCING AT THE SOUTHEAST CORNER OF SAID SECTION 5; THENCE NORTH 00 DEGREES 30 MINUTES 06 SECONDS EAST, ALONG THE EAST LINE OF THE SOUTHEAST QUARTER OF SAID SECTION 5, A DISTANCE OF 588.72 FEET TO AN EXISTING FENCE LINE; THENCE SOUTH 89 DEGREES 18 MINUTES 45 SECONDS WEST, ALONG SAID FENCE LINE, 712.10 FEET; THENCE NORTH 00 DEGREES 56 MINUTES 36 SECONDS WEST, 1273.42 FEET TO THE POINT OF BEGINNING; THENCE SOUTH 90 DEGREES 00 MINUTES 00 SECONDS WEST, 1266.62 FEET; THENCE NORTH 00 DEGREES 56 MINUTES 50 SECONDS WEST, 774.88 FEET TO THE CENTER LINE OF NEWARK ROAD; THENCE NORTH 89 DEGREES 10 MINUTES 47 SECONDS EAST ALONG SAID CENTER LINE, 1266.50 FEET; THENCE SOUTH 00 DEGREES 56 MINUTES 36 SECONDS EAST, 793.01 FEET TO THE POINT OF BEGINNING; IN BIG GROVE TOWNSHIP, KENDALL COUNTY, ILLINOIS.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

GRID NORTH



ABBREVIATIONS

O.D.I.P. = OUTSIDE DIAMETER IRON PIPE
TF = TOP OF FOUNDATION
FF = FINISHED FLOOR
FES = FLARED END SECTION
VCP = VITRIFIED CLAY PIPE
DIP = DUCTILE IRON PIPE
PVC = POLYVINYL CHLORIDE
RCP = REINFORCED CONCRETE PIPE
CMP = CORRUGATED METAL PIPE
(R) = RECORD BEARING OR DISTANCE
(M) = MEASURED BEARING OR DISTANCE
(C) = CALCULATED BEARING OR DISTANCE
(D) = DEED BEARING OR DISTANCE
A = ARC LENGTH
R = RADIUS
CH = CHORD
CB = CHORD BEARING
B.S.L. = BUILDING SETBACK LINE
U.E. = UTILITY EASEMENT
D.E. = DRAINAGE EASEMENT
P.U.E. = PUBLIC UTILITY EASEMENT
P.O.C. = POINT OF COMMENCEMENT
P.O.B. = POINT OF BEGINNING
P.U. & D.E. = PUBLIC UTILITY AND DRAINAGE EASEMENT

LINE LEGEND

ADJACENT LAND PARCEL LINE
PROJECT AREA
CENTERLINE
BUILDING SETBACK LINE
SECTION LINE

K:\PSDATA\2018 PROJECTS\18.0028\18.0028-01 LTS\18.0028-01EXHIBIT.DWG

PROJ. NO.: 18.0028-01EX

1 OF 1

SCALE: 1" = 100'

COMPASS SURVEYING LTD
ALTA SURVEYS ● TOPOGRAPHY ● CONSTRUCTION STAKING
2631 GINGER WOODS PARKWAY, STE. 100
AURORA, IL 60502
PHONE: (630) 820-9100 FAX: (630) 820-7030 EMAIL: ADMIN@CLSURVEYING.COM

PROJECT
Solar Project
16400 Newark Road
Newark (Kendall County), Illinois

CLIENT
Greenberg Farrow Architects
1430 West Peachtree Street NW, Suite 200
Atlanta GA 30309

DATE: 4-11-18 | PC | DRAWN BY TFS | CHECKED BY DW | BOOK 530 PG 33-35

NO.	REVISIONS	DATE	BY

Attachment 5 Project Area Legal Description

K:\Psdata\2018 Projects\18.0028\18.0028-01 LTS\Legal Descriptions\2018-02-01 Project Area Legal.docx

THAT PART OF THE EAST HALF OF SECTION 5, TOWNSHIP 35 NORTH, RANGE 6 EAST OF THE THIRD PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS: COMMENCING AT THE SOUTHEAST CORNER OF SAID SECTION 5; THENCE NORTH 00 DEGREES 30 MINUTES 06 SECONDS EAST, ALONG THE EAST LINE OF THE SOUTHEAST QUARTER OF SAID SECTION 5, A DISTANCE OF 588.72 FEET TO AN EXISTING FENCE LINE; THENCE SOUTH 89 DEGREES 18 MINUTES 45 SECONDS WEST, ALONG SAID FENCE LINE, 712.10 FEET; THENCE NORTH 00 DEGREES 56 MINUTES 36 SECONDS WEST, 1273.42 FEET TO THE POINT OF BEGINNING; THENCE SOUTH 90 DEGREES 00 MINUTES 00 SECONDS WEST, 1266.62 FEET; THENCE NORTH 00 DEGREES 56 MINUTES 50 SECONDS WEST, 774.88 FEET TO THE CENTER LINE OF NEWARK ROAD; THENCE NORTH 89 DEGREES 10 MINUTES 47 SECONDS EAST ALONG SAID CENTER LINE, 1266.50 FEET; THENCE SOUTH 00 DEGREES 56 MINUTES 36 SECONDS EAST, 793.01 FEET TO THE POINT OF BEGINNING; IN BIG GROVE TOWNSHIP, KENDALL COUNTY, ILLINOIS.

COVER SHEET

OPTION AND LEASE AGREEMENT

Effective Date	February 9, 2018	
Lease Commencement Date		
Lessor	Nancy L. Harazin, Trustee of Nancy L. Harazin Trust #101	
Lessee	312 Solar Development, LLC	
Property Address	Newark Road, Newark, IL (Parcel No. 07-05-400-003)	
Option Payment	[redacted]	
First Additional Option Payment		
Rent		
Lease Term	The term commencing on the date of delivery of the Exercise Notice and ending on the Expiration Date, subject to Lessee's option to extend the Lease Term for up to four (4) additional and successive periods of five (5) years each.	
Expiration Date	The date that is twenty (20) years from the Commercial Operation Date, as may be extended pursuant to this Agreement.	
Addresses for Notices	Lessee: 312 Solar Development, LLC c/o Borrego Solar Systems, Inc. 360 22nd Street, Suite 600 Oakland, CA 94612 Attn: CFO With a copy to: Borrego Solar Systems, Inc. 360 22nd Street, Suite 600 Oakland, CA 94612 Attn: General Counsel	Lessor: Nancy L. Harazin, Trustee of Nancy L. Harazin Trust #101 302 Edgebrook Ct. Oswego, IL 60543

OPTION AND LEASE AGREEMENT

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

RECITALS

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

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

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

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

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

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

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

(b) Time and Manner of Exercise of the Option. The Option shall be for an initial term of five hundred forty (540) days after the Effective Date (as it may be extended, the "***Option Term***"). The Option Term may be extended by Lessee for one (1) additional three hundred sixty-five (365) day period upon notice to Lessor within thirty (30) days of the end of the then-current Option Term.

(c) Option Payment. Lessee shall pay to Lessor the Option Payment within forty-five (45) Business Days after the Effective Date of this Agreement, and any Option extension payments are to be paid within thirty (30) days of the end of the then-current Option Term; provided that Lessor, its successors, assigns and/or designee, if any, has submitted to Lessee any documents reasonably required by

Lessee in connection with the payment of the Option Payment, including, without limitation, an IRS Form W-9. The Option Payment and any Option extension payments shall be credited against Rent.

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

(e) Use of the Property. Lessor shall have the right to lease the Property to a third party during the Option Term. However, if requested by Lessee prior to November 1st of any year during the Option Term, any such lease shall be terminable upon thirty (30) days' notice during the following calendar year such that upon notice from Lessee that it will exercise the Option ("***Pre-Exercise Notice***") and/or start construction, Lessor shall terminate any lease on the Property and such termination shall be effective in no more than thirty (30) daysbe effective . If crops have been planted on the Property by Lessor or Lessor's tenant, and such crops will not be harvested within thirty (30) days of receiving the Pre-Exercise Notice, Lessee shall reimburse Lessor or Lessor's tenant for the value of the crops located within the Premises ("Crop Compensation"). Crop Compensation will be calculated by multiplying the acreage of crop land within the Premises by the Fair Market Price per acre of such crop. The "Fair Market Price" shall

[redacted]

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

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

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

(c) Easement. If noted on Exhibit B, Lessor hereby grants to Lessee a non-exclusive,

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

(d) Utilities. At Lessee's request and expense, Lessor shall provide or cooperate with the provision of electric current and water to the perimeter of the Premises; *provided, however*, separate meters for such utilities shall be installed at Lessee's expense and Lessee shall be responsible for all utility expenses. Lessor grants Lessee the right to install, use, modify, and remove water lines, sewer lines, storm water lines, overhead, and/or underground power lines, fuel lines, telephone and communication lines, pipelines, conveyors, and drainage ditches and/or canal systems within the Premises as are reasonably required for operation of the System, and use or modify the existing lines, ditches, and canal systems as may be reasonably required subject to Lessor's prior consent, which shall not be unreasonably delayed, conditioned, or withheld and given within ten (10) days of notification or otherwise deemed approved.

(e) The Parties recognize that the descriptions of the Premises are based on preliminary site discovery information, and that these descriptions shall be modified via amendment prior to construction. As such, Lessor hereby agrees to execute any amendment to this Agreement proposed by Lessee which modifies the Premises, including reducing the size of the Premises and/or splitting the Premises into two or more to accommodate two or more systems and entering into multiple leases, but in no event shall the acreage of the Premises be less than 15 acres, provided that such amendment is reasonably necessary to accommodate (i) the System as designed, or (ii) the System as modified by Lessee to comply with the requirements of any Governmental Authority or the Local Electric Utility, including, but not limited to, entering into an amendment in the form attached hereto as **Exhibit G**. For the avoidance of doubt, under no circumstances shall Lessor be entitled to any increase in Rent or other additional compensation under this Agreement as a result of an amendment to the description of the Premises.

5. **Rents & Payments**.

(a) Intentionally Omitted.

(b) Rent. Lessee shall pay to Lessor Rent during the period commencing on the Exercise Notice and ending on the Expiration Date (the "***Operation Term***"). Rent shall be due annually beginning on the Lease Commencement Date and on every one (1) year anniversary thereof during the Operation Term. In the event this Agreement is terminated by Lessee in accordance with this Agreement prior to the Expiration Date, pre-paid Rent shall be non-refundable, unless Lessee terminates the Agreement pursuant to Section 18 or Section 22. Each Party, its successors, assigns and/or designee, if any, shall submit to the other Party any documents reasonably required by the other Party in connection with the payment of Rent, including, without limitation, an IRS Form W-9.

(c) Late Payments. If any payment is not paid when due under this Agreement, it shall earn interest at the rate of the lesser of (i) one percent (1%) per month (and pro-rated for a partial month) and (ii) the maximum amount allowed by law from the time when the payment was due until the time it is paid.

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

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

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

(c) Except in the event of a termination by Lessee for an uncured Event of Default by the Lessor, if this Agreement expires or is terminated, Lessee shall decommission and remove the System and any ancillary structures and repair any damage caused to the Premises by the installation or removal of the System or any ancillary structures ("System Removal"). Lessor agrees that Lessee's obligation of System Removal constitutes removal of all above-ground improvements, including all roads installed by Lessee and screws connecting the System to the ground, and repair of any damage caused to the Premises by Lessee, but does not include removal of below-ground improvements or an obligation to grade the Premises or alter the contour of the land. Lessee shall perform System Removal on or before the Removal Date at Lessee's sole expense. In connection with the System Removal, Lessor shall continue to provide Lessee and its Affiliates and subcontractors with access to the Premises until the Removal Date. In the event Lessee fails to complete the System Removal by the Removal Date, Lessor may provide notice to Lessee stating that Lessee has failed to complete System Removal (the "***Abandonment Notice***"). If Lessee fails to complete the System Removal within sixty (60) days after receipt of the Abandonment Notice, Lessor shall have the right, at its option, in its sole discretion, to complete System Removal by a qualified licensed contractor, in which case Lessee shall reimburse Lessor for all actual and reasonable costs of such System Removal and Lessee waives all rights and interest whatsoever in the System with said ownership transferring to Lessor subject to any third party liens.

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

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

9. **Permits; Lessor Cooperation.** Prior to commencement of construction of the System by Lessee, Lessee shall obtain the necessary Permits. In the event Lessee, in its sole discretion, shall determine

that the Premises should be subdivided to accommodate the construction, operation and/or maintenance of the Systems or to comply with Permits and Applicable Laws, Lessor shall fully cooperate with Lessee to facilitate and cause any application for subdivision of the Premises to be approved, provided that Lessee shall pay all costs and expenses, including attorney's fees, related thereto.

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

11. **Lessee's Ownership of Systems and Output.** The Systems are personal property, whether or not the same is deemed real or personal property under Applicable Law, and shall not attach to or be deemed a part of, or a fixture to, the Premises or Property. Lessee or its designees shall be the legal and beneficial owners of the applicable Systems at all times and Lessor shall have no right, title or interest in any of the Systems or any component thereof, notwithstanding that any such Systems may be physically mounted or adhered to the Premises or Property. Lessor covenants that it will use commercially reasonable efforts to place all parties having an interest in or lien upon the Property or the Premises on notice of the ownership of the System and the legal status or classification of the System as personal property. If there is any mortgage or fixture filing against the Property or Premises which could reasonably be construed as attaching to the Systems as a fixture of the Property or Premises, Lessor shall provide a disclaimer or release from such lien holder in form and substance reasonably satisfactory to Lessee and any Financing Party. Lessor, as the fee owner of the Property, consents to the filing by Lessee, on behalf of Lessor or its designees, as applicable, of a disclaimer of the Systems as a fixture of the Property or Premises in the office where real estate records are customarily filed in the jurisdiction of the Property. Further, Lessor acknowledges and agrees that Lessee or its designees, as applicable, are the exclusive owners of all electricity and all utility credits generated by the System and owners of all Environmental Attributes and Incentives attributable to the System. In the absence of an additional agreement to the contrary, all electricity generated by the Systems will be connected to the distribution grid and sold by Lessee to third parties and will not be available to Lessor or any other occupant at the Property. Without the express consent of Lessee, Lessor shall not make or publish any public statement or notice regarding any Environmental Attributes and Incentives relating to the System or the electricity generated by the System. The Parties acknowledge and agree that the System shall not be considered an electric public utility, an investor owned utility, a municipal utility, or a merchant power plant otherwise known as an exempt wholesale generator.

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

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

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

or perform this Agreement. Each Person signing this Agreement on behalf of Lessor is authorized to do so.

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

(c) Defects. Lessee has the right to obtain a title report or commitment for a leasehold title policy from a title insurance company of its choice. Lessor shall fully cooperate with Lessee at no cost to Lessor to enable Lessee to obtain a standard policy of title insurance insuring the property interests granted hereunder (including such endorsements as Lessee shall reasonably request). Lessor agrees that Lessor will execute and deliver to Lessee any documents reasonably required by the title insurance company within five (5) Business Days after presentation of said documents by Lessee; *provided, however*, in no event will such documents materially increase any obligation or materially decrease any right of Lessor hereunder.

(d) Transfers. Lessor shall not sell, lease, assign, mortgage, pledge or otherwise alienate or encumber the Property unless Lessor shall have given Lessee at least thirty (30) days' prior notice thereof, which notice shall identify the transferee, the area of the Property to be so transferred and the proposed date of transfer. Lessor agrees that this Agreement and the lease and the Easements granted hereunder shall run with the Property and/or the Premises and survive any transfer of all or any portion of the Property and/or the Premises. In furtherance of the foregoing, Lessor shall cause any purchaser, lessee, assignee, mortgagee, pledge, secured party or party to whom a lien on the Premises or Property has been granted to execute and deliver to Lessee a commercially reasonable document pursuant to which such party acknowledges and consents to the Lessee's rights in the Premises as set forth herein including, without limitation, an acknowledgement by the transferee that it has no interest in the Systems, or any work related to such Systems, and shall not gain any interest in the Systems by virtue of the Lessor's transfer.

(e) No Interference With and Protection of System. Lessor will not conduct activities on, in or about the Property or Premises that have a reasonable likelihood of causing damage, impairment or otherwise adversely affecting the System or operation thereof. Lessor shall take all reasonable actions to limit access to the Premises to Lessee and Lessee Parties. The System shall be operated, maintained and repaired by Lessee at its sole cost and expense; provided, that any repair or maintenance costs incurred by Lessee as a result of Lessor's negligence, misconduct or breach of its obligations hereunder shall be promptly reimbursed to Lessee by Lessor. Lessor shall implement guidelines and appropriate security procedures on the Property to prevent its employees, invitees, agents and representatives, and other unrelated third parties, from having access to the Premises or the System, and to prevent any theft, vandalism or other actions that have a reasonable likelihood of causing damage, impairment or otherwise adversely affecting the System.

(f) Non-Disturbance Agreements. Lessor shall, at its sole effort and expense, obtain a non-disturbance agreement ("***NDA***") in favor of Lessee from any third party who now has or may in the

future obtain an interest in the Property or Premises, including, without limitation, any lenders to Lessor, in a form acceptable to Lessee, which NDA shall: (i) acknowledge and consent to Lessee's rights to the Premises and the Systems under this Agreement; (ii) acknowledge that the third party has no interest in the Systems and shall not gain any interest in the Systems by virtue of the Parties' performance or breach of this Agreement; (iii) acknowledge that the third party's interest in the Premises (if any) is subject to Lessee's interest under this Agreement; (iv) waives any lien the third party may have in and to the Systems; and (v) agrees not to disturb Lessee's possession of the Premises.

(g) Insolation. Lessor acknowledges and agrees that access to sunlight ("***Insolation***") is essential to the value to Lessee of the leasehold interest granted hereunder and is a material inducement to Lessee in entering into this Agreement. Accordingly, Lessor shall not permit any interference on the Property (exclusive of the Premises) or any neighboring property under Lessor's control which interferes with Insolation on and at the Premises. Without limiting the foregoing, Lessor shall not construct or permit to be constructed on the Property or any adjoining property under Lessor's control any structure on or adjacent to the Premises or on any adjacent property owned by any Affiliate of Lessor that could adversely affect Insolation levels on the Premises, shall not permit the growth of foliage on the Property (exclusive of the Premises) or any neighboring property under Lessor's control that could adversely affect Insolation levels on the Premises, or directly emit or permit the emission of suspended particulate matter, smoke, fog or steam or other air-borne impediments to Insolation on the Premises. If Lessor becomes aware of any potential development or other activity on adjacent or nearby properties that could diminish the Insolation to the Premises, Lessor shall promptly advise Lessee of such information and reasonably cooperate with Lessee in taking measures to preserve average levels of Insolation at the Premises as they existed as of the Lease Commencement Date. Such measures may include, but not be limited to, obtaining a solar insolation easement. In the event any such obstruction occurs and is not promptly removed, Lessee shall have the right to terminate this Agreement without penalty or further liability, upon notice to Lessor. Notwithstanding any other provision of this Agreement, the Parties agree that (i) Lessee would be irreparably harmed by a breach of the provisions of this Section 13(g), (ii) an award of damages might be inadequate to remedy such a breach, and (iii) Lessee shall be entitled to equitable relief, including specific performance, to compel compliance with the provisions of this Section 13(g). Lessor further represents and warrants that, to the best of its knowledge, there are no developments pending or in progress on adjacent or nearby properties that could diminish the Insolation to the Premises.

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

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

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

(k) Liens and Tenants. Except as may be disclosed in the real property records of the County, Lessor represents there are no encumbrances, leases, mortgages, deeds of trust, deeds to secure debt, or similar liens or security interests encumbering all or any portion of the Property and/or the Premises

that could interfere with Lessee's operations on the Premises, including mechanic's liens. Lessor shall not directly or indirectly cause, create, incur, assume or suffer to exist any mortgage, pledge, lien (including mechanics', labor or materialman's lien), charge, security interest, encumbrance or claim on or with respect to the Systems, the Premises, or any interest therein. Lessor shall provide Lessee with notice if it receives notice of any such claims. Lessor further agrees to discharge or bond, at its sole expense, any such encumbrance or interest that attaches to the Systems and to indemnify, defend and hold harmless Lessee from any costs, losses, expenses or liabilities arising from the same, including, without limitation, Lessee's attorneys' fees and court costs. Lessor waives any and all lien rights it may have, statutory or otherwise, concerning the System or any portion thereof.

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

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

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

14. **Hazardous Substances.** Neither Party shall introduce or use any Hazardous Substances on, in or under the Premises or Property in violation of any Applicable Law. If a Party becomes aware of any Hazardous Substances on, in, or under the Premises or Property, it shall promptly notify the other Party of the type and location of such Hazardous Substances in writing. Each Party agrees to indemnify, defend and hold harmless the other Party from and against any and all Environmental Claims including, but not limited to, damages, costs, expenses, assessments, penalties, fines, losses, judgments and reasonable attorney fees that such Party may suffer or incur due to any actions that relate to or arise from such Party's activities on the Premises or Property, except to the extent directly attributable to the negligent acts or omissions or willful misconduct of the other Party. The indemnifications in this Section 14 specifically include, without limitation, costs incurred in connection with any investigation of site conditions or any cleanup, remedial, removal or restoration work required by any Governmental Authority. Lessor shall be responsible for, and shall promptly conduct any investigation and remediation as required by any

Applicable Law, all spills or other releases of any Hazardous Substances to the extent not caused by Lessee, that have occurred or which may occur on the Property. This Section 14 shall survive the termination or expiration of this Agreement.

15. **Insurance.**

(a) Generally. Lessor and Lessee shall each maintain the insurance coverages set forth in **Exhibit D** in full force and effect throughout the Option Term, Lease Term and through the Removal Date through insurance policies, reasonably acceptable to the other Party. Each Party, upon request, but not more than twice in any twelve (12) month period, shall furnish current certificates evidencing that the coverage required is being maintained.

(b) Waiver of Subrogation. Each Party hereby waives any right of recovery against the other for injury or loss to personal property due to hazards covered by insurance obtained with respect to the Property or Premises, including the improvements and installations thereon.

16. **Taxes**. Lessee shall pay, when due, any real estate or personal property taxes, possessory interest taxes, business or license taxes or fees, service payments in lieu of such taxes or fees, annual or periodic license or use fees, excises, assessments, bonds, levies, fees or charges of any kind which are assessed, levied, charged, confirmed, or imposed by any public authority directly resulting from assessments upon the value of the Systems installed on the Premises ("***Personal Property Taxes***"). Lessor shall pay all (i) taxes, assessments or other impositions which may be levied, assessed or imposed upon or with respect to the Property ("***Taxes and Assessments***"), including any annual increases thereon, except those that are the responsibility of Lessee, (ii) any transfer or conveyance tax arising out of this Agreement, (iii) inheritance or estate taxes imposed upon or assessed against the Property, or any part thereof or interest therein, (iv) income and other taxes computed upon the basis of the rental payments paid under this Agreement. Lessee shall pay any increase in Taxes and Assessments accruing during the Lease Term to the extent resulting from the presence of the System on the Premises. ("***Lessee Real Property Taxes***" and together with Personal Property Taxes, "***Lessee Taxes***"). To the extent the applicable taxing authority provides a separate tax bill for the Lessee Taxes to Lessee, Lessee will pay such Lessee Taxes directly to the applicable taxing authorities prior to the date such Lessee Taxes become delinquent. If a separate tax bill for the Lessee Taxes is not provided to Lessee, Lessee shall pay the Lessee Taxes within thirty (30) days following receipt of written demand from Lessor of the amount of the Lessee Taxes with a copy of the applicable tax bill. In the event that Lessor fails to pay any such taxes or other fees and assessments for which it is responsible under this Agreement, Lessee shall have the right, but not the obligation, to pay such owed amounts and deduct them from Rent amounts due under this Agreement. If Lessor receives notice of any new Lessee Taxes, Lessor shall provide timely notice of the assessment to Lessee sufficient to allow Lessee to consent to or challenge such Lessee Taxes, whether in a court, administrative proceeding, or other venue, on behalf of Lessor and/or Lessee. Further, Lessor shall provide to Lessee any and all documentation associated with the Lessee Taxes and shall execute any and all documents reasonably necessary to effectuate the intent of this Section 16.

17. **Liability and Indemnity**.

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

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

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

18. **Casualty/System Loss**.

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

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

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

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

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

21. **Assignment**.

(a) Lessor shall not assign any of its rights, duties or obligations under this Agreement without the prior consent of Lessee, which consent shall not be unreasonably withheld, conditioned, or delayed. Notwithstanding the foregoing, prior consent of Lessee is not required for an assignment of this

Agreement in connection with a sale or other disposition of the Property pursuant to Section 13(d), provided that Lessor has given Lessee notice thereof at least thirty (30) days prior to the disposition.

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

(c) Notwithstanding anything herein to the contrary, Lessee may collaterally assign this Agreement and the System to a Financing Party without the need for consent from Lessor. Upon receipt of notice of the name and address of the Financing Party, Lessor agrees to deliver any notices of default to the Financing Party simultaneously with the delivery of such notices of default to Lessee. The Financing Party will have the right to cure any defaults or breaches by Lessee within the time periods provided hereunder for Lessee plus an additional sixty (60) days in the case of an Event of Default under Section 22, and in order to succeed to the rights and obligations of Lessee under this Agreement shall not be required to cure any defaults by Lessee under Section 22 that by their nature are not capable of being cured by the Financing Party. Any such notices shall be sent to the Financing Party at the address specified in writing to Lessor by Lessee or any Financing Party. Failure by Lessor to give the Financing Party such notice shall not diminish the Financing Party's rights against Lessee, but shall preserve all rights of the Financing Party to cure any default and to remove any property of Lessee located on the Premises.

(d) If Lessor has been notified of the existence of a Financing Party, Lessor will not agree to any amendment, modification or voluntary termination of this Agreement without the prior written consent of the Financing Party. Upon receipt of a written request from any Financing Party, Lessor shall make any and all payments due and owing by Lessor under this Agreement, if any, to an account designated by Financing Party, and Lessee agrees that such payment by Lessor will fully satisfy Lessor's payment obligations with respect to this Agreement to the extent of such payment. Lessor agrees that, upon foreclosure (or assignment in lieu of foreclosure) of its mortgage or security interest in the System, the Financing Party may succeed to the rights and obligations of Lessee under this Agreement. The Financing Party will be responsible for performance of Lessee's obligations after it succeeds to Lessee's interests under this Agreement, but shall have no further liability hereunder after it assigns such interests to a third party.

(e) If this Agreement is rejected or disaffirmed by Lessee pursuant to bankruptcy law or other law affecting creditor's rights and within ninety (90) days after such event any Financing Party shall have arranged to the reasonable satisfaction of Lessor for performance of Lessee's obligations under this Agreement, then Lessor shall execute and deliver to such Financing Party or to a designee of such Financing Party a new agreement which (i) shall be for a term equal to the remainder of the Lease Term before giving effect to such rejection or termination; and (ii) shall contain the same covenants, agreements, terms, provisions and limitations as this Agreement.

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

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

22. **Defaults and Remedies.**

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

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

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

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

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

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

27. **Invalid Term.** If any provision of this Agreement is declared or determined by any court of competent jurisdiction to be illegal, invalid or unenforceable, the legality, validity or enforceability of

the remaining parts, terms and provisions shall not be affected thereby, and said illegal, unenforceable or invalid part, term or provision will be deemed not to be a part of this Agreement; *provided*, *however*, that the Parties shall work together in good faith to modify this Agreement as necessary to retain the intent of any such severed clause.

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

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

30. **Attorney's Fees**. In the event there is a lawsuit, action, arbitration, or other proceeding between Lessee and Lessor, which arises from or concerns this Agreement, whether that lawsuit, action, arbitration, or other proceeding involves causes of action in contract or in tort, at law or in equity, the substantially prevailing party shall be entitled to recover all costs and expenses, including its actual attorneys' and expert or consultants' fees and court costs, in such lawsuit, action, arbitration, or other proceeding.

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

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

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

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

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

36. **Force Majeure**. Except as otherwise specifically provided in the Agreement, neither Party shall be considered in breach of the Agreement or liable for any delay or failure to comply with the

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

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

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

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

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

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

42. **Public Officials.** Lessor acknowledges that its receipt of monetary and other good and valuable consideration hereunder may represent a conflict of interest if Lessor is a government employee or otherwise serves on a governmental entity with decision-making authority (a "***Public Official***") as to any rights Lessee may seek, or as to any obligations that may be imposed upon Lessee in order to develop and/or operate the Systems ("***Development Rights***"), and Lessor hereby agrees to (1) recuse him/herself from all such decisions related to Lessee's Development Rights unless such recusal is prohibited by law or is not reasonably practicable considering the obligations of such Public Official's position and (2) recuse him/herself from all such decisions related to Lessee's Development Rights if such recusal is required by law. If Lessor is not required pursuant to (1) or (2) above to recuse him/herself from a decision related to Lessee's Development Rights, Lessor will, in advance of any vote or other official action on the

Development Rights, disclose the existence of this Agreement (but not the financial terms therein) at an open meeting of the relevant governmental entity Lessor serves on as a Public Official. Additionally, if Lessor is a Public Official and any of Lessor's spouse, child or other dependent has a financial interest in the Systems, Lessor shall disclose such relationship (but not the financial terms thereof) at an open meeting of the relevant governmental entity Lessor serves on as a Public Official, prior to participation in any decision related to Lessee's Development Rights.

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

REMAINDER OF PAGE INTENTIONALLY LEFT BLANK – SIGNATURE PAGE FOLLOWS

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

LESSOR:

NANCY L. HARAZIN TRUST #101

By: [redacted]

Name: Nancy L. Harazin

Title: Trustee

LESSEE:

312 SOLAR DEVELOPMENT, LLC

BY: BORREGO SOLAR SYSTEMS, INC.
its sole member and manager

By: [redacted]

Name: BRENDAN NEAGLE

Title: EVP

EXHIBIT A

DESCRIPTION OF PROPERTY

SEC. 5-35-6, COM SE COR SEC 5, NE 588.72', NW 712.10' FOR POB, NW 1266.59', NE 438.41', NE 1624.77' TO CTR LN OF SE 1/4 1266.50' TO LN NLY, SLY 2065.66' TO POB

Parcel No. 07-05-400-003

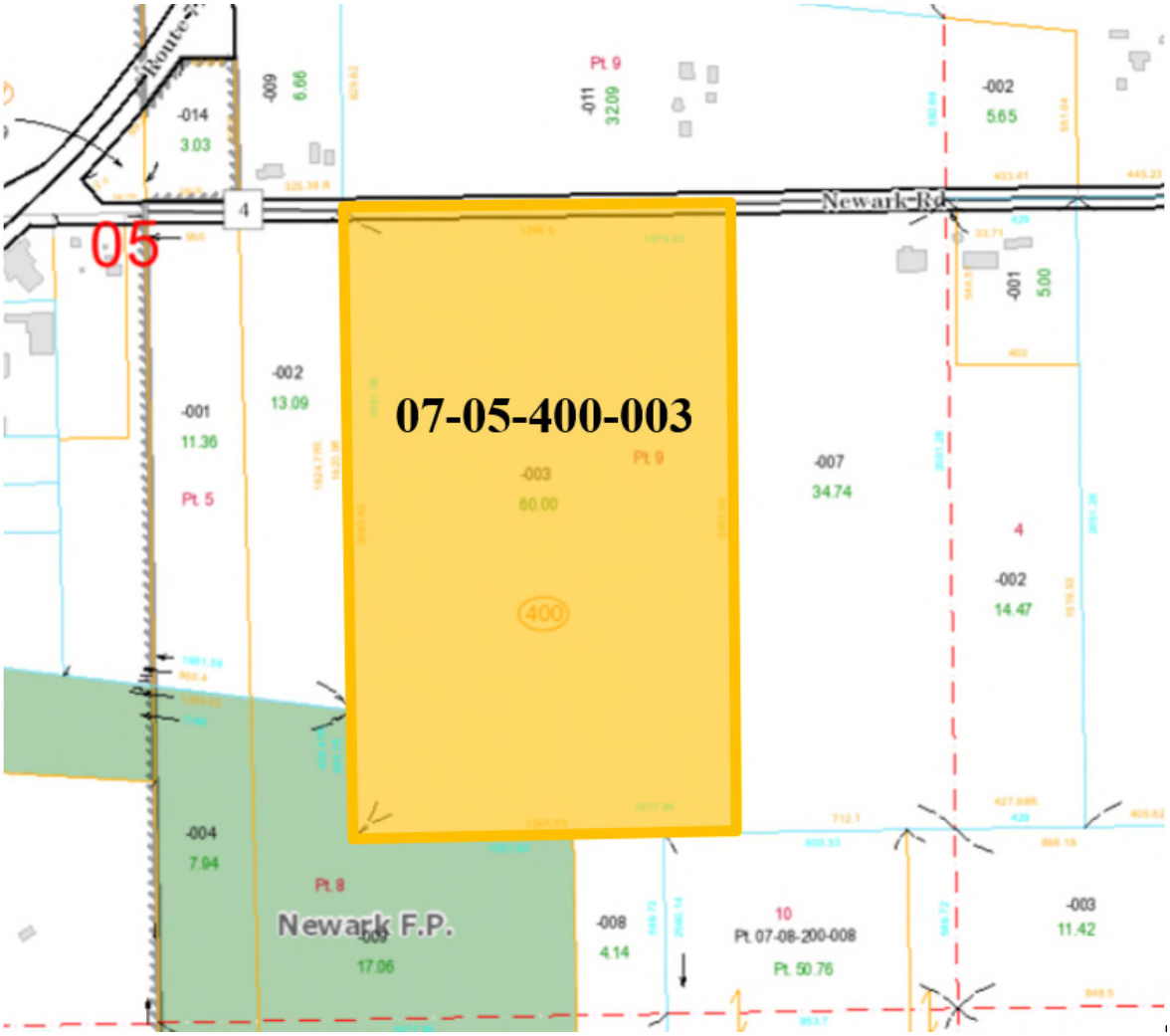


EXHIBIT B

DESCRIPTION OF PREMISES AND EASEMENTS

The Premises consists of approximately 20 acres located at the Property owned by Lessor and commonly known as 16400 Newark Road, Newark, IL (Parcel No. 07-05-400-003) as described and/or depicted below.

Lessor agrees that the Description of the Premises and Easements will be replaced with actual metes and bounds upon completion of System design and site survey.

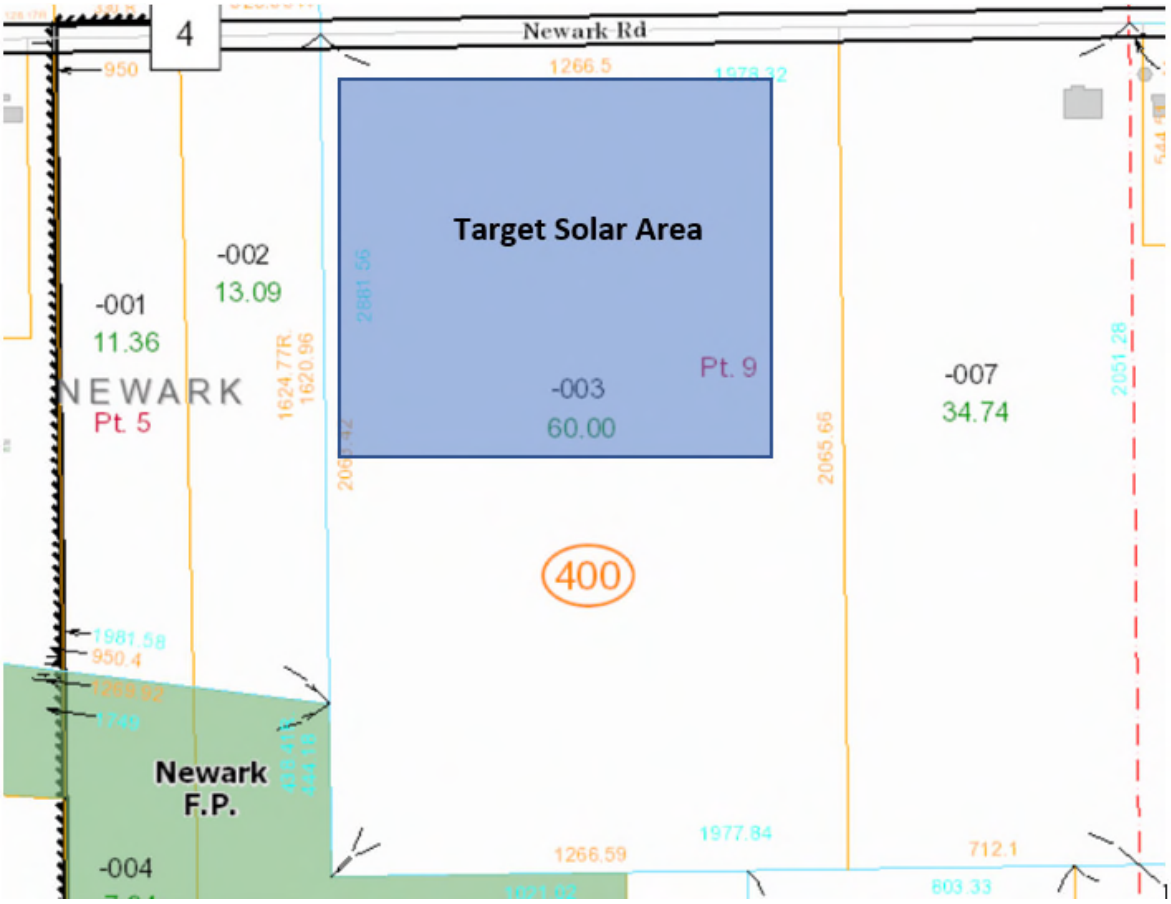


EXHIBIT C

DEFINITIONS

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

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

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

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

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

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

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

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

"***Commercial Operation Date***" means the date on which the System(s) are ready for commercial operation after required testing.

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

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

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

"***Dispute"*** has the meaning set forth in Section 29 of this Agreement.

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

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

"***Environmental Claims***" means any and all administrative and judicial actions and rulings, claims, causes of action, demands and liability, including, but not limited to, damages, costs, expenses, assessments, penalties, fines, losses, judgments, and reasonable attorney fees that any Party may suffer or incur due to the existence of any Hazardous Substances on the Property or the migration of any Hazardous Substance to other properties or the release of any Hazardous Substance into the environment, that relate to or arise from such Party's activities on the Property.

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

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

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

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

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

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

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

"***Financing Party***" means, as applicable (i) any Person (or its agent) from whom Lessee (or an Affiliate of Lessee) leases the System or (ii) any Person (or its agent) who has made or will make a loan to or otherwise provide capital to Lessee (or an Affiliate of Lessee) with respect to the System. Lessee shall give Lessor notice of and the contact information for any such Financing Party within one hundred twenty (120) days after the Lease Commencement Date and shall confirm any change in such contact information upon request of Lessor.

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

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

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

"***Hazardous Substances***" means and includes, without limitation any substance, chemical, material or waste: (i) the presence of which causes a nuisance or trespass of any kind under any applicable Environmental Law; (ii) which is regulated by any Governmental Authority; (iii) is likely to create liability under any Environmental Law because of its toxic, flammable, corrosive, reactive, carcinogenic, mutagenic, infectious, radioactive, or other hazardous property or because of its effect on the environment,

natural resources or human health and safety, including but not limited to, flammables and explosives, gasoline, petroleum and petroleum products, asbestos containing materials, polychlorinated biphenyls, lead and lead-based paint, radon, radioactive materials, microbial matter, biological toxins, mylotoxins, mold or mold spores or any hazardous or toxic material, substance or waste which is defined by those or similar terms or is regulated as such by any Governmental Authority; or (iv) which is designated, classified, or regulated as being a hazardous or toxic substance, material, pollutant, waste (or a similar such designation) under any federal, state or local law, regulation or ordinance, including under any Environmental Law.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

"***Removal Date***" means the date not be later than one hundred eighty (180) days after either the Expiration Date or the date of earlier termination of this Agreement, if applicable, when Lessee shall complete the removal of all of its tangible property comprising the System from the Premises.

"***Rent***" has the meaning set forth in Section 5(a) of this Agreement.

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

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

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

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

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

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

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

EXHIBIT D

INSURANCE

The Parties shall maintain the following insurance coverages in full force and effect throughout the Option Term and Lease Term:

Lessor: Commercial General Liability Coverage (Occurrence Form) with limits of not less than $2,000,000.00 general aggregate, $1,000,000.00 per occurrence.

Lessee: (i) Workers' Compensation at statutory limits and Employer's Liability Coverage of at least $1,000,000.00 per occurrence, (ii) Commercial General Liability Coverage (Occurrence Form) with limits of not less than $2,000,000.00 general aggregate, $1,000,000.00 per occurrence, and (iii) Automobile Liability Coverage of at least $1,000,000.00 per occurrence for bodily injury and property damage. For any claims resulting from the operation, maintenance and repair of the System, Lessee's insurance coverage shall be primary. Subject to the mutual waivers granted in Section 15 of this Agreement, any insurance maintained by Lessor shall be in excess of Lessee's insurance and shall not contribute with it.

EXHIBIT E

MEMORANDUM OF OPTION AND LEASE

After recording return to:
_____
_____
_____
_____

MEMORANDUM OF OPTION AND LEASE

THIS MEMORANDUM OF OPTION AND LEASE (the "***Memorandum***"), is made as of _____, 20_, by and between [_____], [a _____ having its principal place of business located at] [an individual with an address of] _____ _____, Illinois ("***Lessor***") and **312 Solar Development, LLC**, a Delaware limited liability company with its principal place of business located at 360 22nd Street, Suite 600, Oakland, California 94612 ("***Lessee***").

1. Lessor and Lessee are parties to that certain Option and Lease Agreement (the "***Option and Lease***"), dated as of_____ (the "***Effective Date***") covering a portion of that certain parcel of land and the improvements thereon identified in the deed dated _____ and recorded in the Official Records of _____ County at Book _____, Page ____ in the City of_____, County of_____, State of Illinois (the "***Property***").
2. Under the Option and Lease, Lessee has an option to lease a portion of the Property as described in **Schedule A** annexed hereto (the "***Premises***"), which option commences on the Effective Date and lasts for 540 days thereafter. The option term may be extended for additional one term of 365 days each.
3. The commencement date of Lessor's lease of the Premises shall be the date of Lessor's exercise of the option.
4. If the option is exercised, the initial term of the lease will be for twenty (20) years, and Lessee shall have the option to extend the lease for up to four (4) additional five (5)-year terms, subject to earlier termination or extension pursuant to the terms of the Option and Lease or applicable law.
5. All of the terms, covenants and conditions of the Option and Lease are incorporated herein and made a part hereof. The purpose of this Memorandum is to give notice of the existence of the tenancy and Easements created by the Option and Lease; and shall not be construed to vary or otherwise affect the rights or obligations of the parties under the Option and Lease as it may be amended.

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

LESSOR: NANCY L. HARAZIN TRUST #101

By: [redacted]
Name: Nancy L. Harazin
Title: Trustee

LESSEE: 312 SOLAR DEVELOPMENT, LLC

By: Borrego Solar Systems, Inc.,
its sole member and manager

By: [redacted]
Name: BRENDAN NEAGLE
Title: EVP

LESSOR ACKNOWLEDGMENT

STATE OF ILLINOIS)
: ss.
COUNTY OF KENDALL)

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

[redacted]
Notary Public

OFFICIAL SEAL
MADONNA KULPIT-BIALEK
NOTARY PUBLIC
STATE OF ILLINOIS
My Commission Expires January 6, 2020

LESSEE ACKNOWLEDGEMENT

Commonwealth
~~STATE~~ OF Massachusetts)
: ss.
COUNTY OF Middlesex)

This instrument was acknowledged before me on 3/12/18 (date) by Brendan Nagle (name of person) as EVP (type of authority, e.g., officer, trustee, etc.) of EVP (name of company).

[redacted]
Notary Public

PATRICK L. RETELLE
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
October 26, 2018

Section 466.APPENDIX C Levels 2 to 4 Application

Level 2, Level 3 & Level 4
Interconnection Request Application Form
(Greater than 25 kW to 10 MVA or less)

Interconnection Customer Contact Information

Name: 312 Solar Development, LLC/attn: Robert Tompkins

Mailing Address: 55 TECHNOLOGY DRIVE Suite 102

City: LOWELL State: MA Zip Code: 01851

Telephone (Daytime): 978 221 3084 (Evening): _____

Facsimile Number: _____ E-Mail Address: intx@borregosolar.com

Alternative Contact Information (if different from Customer Contact Information)

Name: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

Telephone (Daytime): _____ (Evening): _____

Facsimile Number: _____ E-Mail Address: _____

Facility Address (if different from above): 16400 NEWARK ROAD

City: BIG GROVE TOWNSHIP (Newark) State: IL Zip Code: 60541

Electric Distribution Company (EDC) Serving Facility Site: AMEREN

Electric Supplier (if different from EDC): _____

Account Number of Facility Site (existing EDC customers): TBD

Inverter Manufacturer: SunGrow Model: SG125HV

Equipment Contractor

Name: 312 Solar Development, LLC

Mailing Address: Same as Above

City: _____ State: _____ Zip Code: _____

Telephone (Daytime): _____ (Evening): _____

Facsimile Number: _____ E-Mail Address: _____

1

Electrical Contractor (if different from Equipment Contractor)

Name: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

Telephone (Daytime): _____ (Evening): _____

Facsimile Number: _____ E-Mail Address: _____

License Number: TBD

Electric Service Information for Customer Facility Where Generator Will Be Interconnected

Capacity: 93 (Amps) Voltage: 12,500 (Volts)

Type of Service: ☐ Single Phase ■ Three Phase

If 3 Phase Transformer, Indicate Type:

Primary Winding ■ Wye ☐ Delta

Secondary Winding ■ Wye ☐ Delta

Transformer Size: 2MVA Impedance: Z = 6%

Intent of Generation

☐ Offset Load (Unit will operate in parallel, but will not export power to EDC)

■ Net Meter (Unit will operate in parallel and will export power pursuant to Illinois Net Metering or other filed tariffs) Community Distributed Generation

☐ Wholesale Market Transaction (Unit will operate in parallel and participate in PJM or MISO markets pursuant to a PJM Wholesale Market Participation Agreement or MISO equivalent)

☐ Back-up Generation (Units that temporarily operate in parallel with the electric distribution system for more than 100 milliseconds)

Note: Backup units that do not operate in parallel for more than 100 milliseconds do not need an interconnection agreement.

Generator & Prime Mover Information

ENERGY SOURCE (Hydro, Wind, Solar, Process Byproduct, Biomass, Oil, Natural Gas, Coal, etc.): SOLAR PHOTOVOLTAIC		
ENERGY CONVERTER TYPE (Wind Turbine, Photovoltaic Cell, Fuel Cell, Steam Turbine, etc.): PHOTOVOLTAIC CELL		
GENERATOR SIZE: 125 ■ kW or ■ kVA	NUMBER OF UNITS: 16	TOTAL CAPACITY: 2000 ■ kW or ■ kVA
GENERATOR TYPE (Check one): ☐ Induction ■ Inverter ☐ Synchronous ☐ Other _____		

Requested Procedure Under Which to Evaluate Interconnection Request[1]

Please indicate below which review procedure applies to the interconnection request. The review procedure used is subject to confirmation by the EDC.

☐ **Level 2** – Lab-certified interconnection equipment with an aggregate electric nameplate capacity not exceeding the specifications in Section 466.90(b)(2). Lab-certified is defined in Section 466.30. (Application fee is $100 plus $1.00 per kVA.)

☐ **Level 3** – Distributed generation facility does not export power. Nameplate capacity rating is less than or equal to 50 kW if connecting to area network or less than or equal to 10 MW if connecting to a radial distribution feeder. (Application fee amount is $500 plus $2.00 per kVA.)

■ **Level 4** – Nameplate capacity rating is less than or equal to 10 MVA and the distributed generation facility does not qualify for a Level 1, Level 2 or Level 3 review, or the distributed generation facility has been reviewed but not approved under a Level 1, Level 2 or Level 3 review. (Application fee amount is $1,000 plus $2.00 per kVA, to be applied toward any subsequent studies related to this application.)

[1] **Note:** Descriptions for interconnection review categories do not list all criteria that must be satisfied. For a complete list of criteria, please refer to 83 Ill. Adm. Code 466, Electric Interconnection of Distributed Generation Facilities.

Distributed Generation Facility Information

Commissioning Date: 7/31/19 (estimate)

List interconnection components/systems to be used in the distributed generation facility that are lab-certified.

	Component/System	NRTL Providing Label & Listing
1.	MODULES JA350 UL1703	
2.	INVERTERS SUNGROW SG125HV UL1741	
3.	GSU TRANSFORMERS, EATON POWER, PADMOUNT ANSI C57	
4.	PROTECTIVE RELAY SCHWEITZER SEL-651R ANSI C37.90, C37.90.1	
5.		

Please provide copies of manufacturer brochures or technical specifications.

Energy Production Equipment/Inverter Information:

☐ Synchronous ☐ Induction ■ Inverter ☐ Other _____

Rating: 125 kW Rating: 125 kVA

Rated Voltage: 600 Volts

Rated Current: 120 Amps

System Type Tested (Total System): ☐ Yes ■ No; attach product literature

For Synchronous Machines:

Note: Contact EDC to determine if all the information requested in this section is required for the proposed distributed generation facility.

Manufacturer: _____

Model No.: _____ Version No.: _____

Submit copies of the Saturation Curve and the Vee Curve

☐ Salient ☐ Non-Salient

Torque: _____ lb/ft Rated RPM: _____ Field Amperes: _____ at rated generator voltage and current and _____ % PF over-excited

Type of Exciter: _____

Output Power of Exciter: _____

Type of Voltage Regulator: _____ Locked Rotor Current: _____ Amps Synchronous Speed: _____ RPM

Winding Connection: _____ Min. Operating Freq./Time: _____

Generator Connection: ☐ Delta ☐ Wye ☐ Wye Grounded

Direct-axis Synchronous Reactance: (Xd) _____ ohms

Direct-axis Transient Reactance: (X'd) _____ ohms

Direct-axis Sub-transient Reactance: (X"d) _____ ohms

Negative Sequence Reactance: _____ ohms

Zero Sequence Reactance: _____ ohms

Neutral Impedance or Grounding Resister (if any): _____ ohms

For Induction Machines:

Note: Contact EDC to determine if all the information requested in this section is required for the proposed distributed generation facility.

Manufacturer: _____

Model No.: _____ Version No.: _____

Locked Rotor Current: _____ Amps

Rotor Resistance (Rr): _____ ohms Exciting Current: _____ Amps

Rotor Reactance (Xr): _____ ohms Reactive Power Required: _____

Magnetizing Reactance (Xm): _____ ohms _____ VARs (No Load)

Stator Resistance (Rs): _____ ohms _____ VARs (Full Load)

Stator Reactance (Xs): _____ ohms

Short Circuit Reactance (X"d): _____ ohms

Phases: ☐ Single ☐ Three Phase

Frame Size: _____ Design Letter: _____ Temp. Rise: _____ °C.

Reverse Power Relay Information (Level 3 Review Only)

Manufacturer: _____

Relay Type: _____ Model Number: _____

Reverse Power Setting: _____

Reverse Power Time Delay (if any): _____

Additional Information For Inverter-Based Facilities

Inverter Information:

Manufacturer: SunGrow Model: SG125HV

Type: ☐ Forced Commutated ☐ Line Commutated

Rated Output: 125000 Watts 600 Volts

Efficiency: _____ % Power Factor: 80 %

Inverter UL 1741 Listed: ■ Yes ☐ No

DC Source / Prime Mover:

Rating: 350W kW Rating: 350W kVA

Rated Voltage: 38.58 Volts

Open Circuit Voltage (if applicable): 47.24 Volts

Rated Current: 9.61 Amps

Short Circuit Current (if applicable): 9.07 Amps

Other Facility Information:

One Line Diagram attached: ■ Yes

Plot Plan attached: ■ Yes

Customer Signature

I hereby certify that all of the information provided in this Interconnection Request Application Form is true.

Applicant Signature: Robert Tompkins Digitally signed by Robert Tompkins DN: cn=Robert Tompkins, o=Borrego Solar, ou, email=rtompkins@borregosolar.com, c=US Date: 2018.01.22 15:44:21 -05'00'

Title: Senior Interconnection Coordinator Date: 1/22/18

An application fee is required before the application can be processed. Please verify that the appropriate fee is included with the application:

Amount: _____

EDC Acknowledgement

Receipt of the application fee is acknowledged and this interconnection request is complete.

EDC Signature: _____ Date: _____

Printed Name: _____ Title: _____

Source: Amended at 41 Ill. Reg. 862, effective January 20, 2017)

Section 466.APPENDIX D Levels 1 to 4 Contract

STANDARD AGREEMENT FOR INTERCONNECTION OF DISTRIBUTED GENERATION FACILITIES WITH A CAPACITY LESS THAN OR EQUAL TO 10 MVA

This agreement ("Agreement") is made and entered into this _____ day of _____ , by and between _____ ("interconnection customer"), as an individual person, or as a _____ organized and existing under the laws of the State of _____ and _____, ("Electric Distribution Company" (EDC)), a _____ existing under the laws of the State of Illinois. Interconnection customer and EDC each may be referred to as a "Party," or collectively as the "Parties."

Recitals:

Whereas, interconnection customer is proposing to install or direct the installation of a distributed generation facility, or is proposing a generating capacity addition to an existing distributed generation facility, consistent with the interconnection request application form completed by interconnection customer on _____; and

Whereas, the interconnection customer will operate and maintain, or cause the operation and maintenance of, the distributed generation facility; and

Whereas, interconnection customer desires to interconnect the distributed generation facility with EDC's electric distribution system.

Now, therefore, in consideration of the premises and mutual covenants set forth in this Agreement, and other good and valuable consideration, the receipt, sufficiency and adequacy of which are hereby acknowledged, the Parties covenant and agree as follows:

Article 1. Scope and Limitations of Agreement

1.1 This Agreement shall be used for all approved interconnection requests for distributed generation facilities that fall under Levels 1, 2, 3 and 4 according to the procedures set forth in Part 466 of the Commission's rules (83 Ill. Adm. Code 466) (referred to as the Illinois Distributed Generation Interconnection Standard).

1.2 This Agreement governs the terms and conditions under which the distributed generation facility will interconnect to, and operate in parallel with, the EDC's electric distribution system.

1.3 This Agreement does not constitute an agreement to purchase or deliver the interconnection customer's power.

1.4 Nothing in this Agreement is intended to affect any other agreement between the EDC and the interconnection customer.

1.5 Terms used in this Agreement are defined as in Section 466.30 of the Illinois Distributed Generation Interconnection Standard unless otherwise noted.

1.6 Responsibilities of the Parties

1.6.1 The Parties shall perform all obligations of this Agreement in accordance with all applicable laws and regulations.

1.6.2 The EDC shall construct, own, operate, and maintain its interconnection facilities in accordance with this Agreement.

1.6.3 The interconnection customer shall construct, own, operate, and maintain its distributed generation facility and interconnection facilities in accordance with this Agreement.

1.6.4 Each Party shall operate, maintain, repair, and inspect, and shall be fully responsible for, the facilities that it now or subsequently may own unless otherwise specified in the attachments to this Agreement. Each Party shall be responsible for the safe installation, maintenance, repair and condition of its respective lines and appurtenances on its respective sides of the point of interconnection.

1.6.5 The interconnection customer agrees to design, install, maintain and operate its distributed generation facility so as to minimize the likelihood of causing an adverse system impact on the electric distribution system or any other electric system that is not owned or operated by the EDC.

1.7 Parallel Operation Obligations
Once the distributed generation facility has been authorized to commence parallel operation, the interconnection customer shall abide by all operating procedures established in IEEE Standard 1547 and any other applicable laws, statutes or guidelines, including those specified in Attachment 4 of this Agreement.

1.8 Metering
The interconnection customer shall be responsible for the cost to purchase, install, operate, maintain, test, repair, and replace metering and data acquisition equipment specified in Attachments 5 and 6 of this Agreement.

1.9 Reactive Power

1.9.1 Interconnection customers with a distributed generation facility larger than or equal to 1 MVA shall design their distributed generation facilities to maintain a power factor at the point of interconnection between .95 lagging and .95 leading

at all times. Interconnection customers with a distributed generation facility smaller than 1 MVA shall design their distributed generation facility to maintain a power factor at the point of interconnection between .90 lagging and .90 leading at all times.

1.9.2 Any EDC requirements for meeting a specific voltage or specific reactive power schedule as a condition for interconnection shall be clearly specified in Attachment 4. Under no circumstance shall the EDC's additional requirements for voltage or reactive power schedules exceed the normal operating capabilities of the distributed generation facility.

1.9.3 If the interconnection customer does not operate the distributed generation facility within the power factor range specified in Attachment 4, or does not operate the distribute generation facility in accordance with a voltage or reactive power schedule specified in Attachment 4, the interconnection customer is in default, and the terms of Article 6.5 apply.

1.10 Standards of Operations

The interconnection customer must obtain all certifications, permits, licenses and approvals necessary to construct, operate and maintain the facility and to perform its obligations under this Agreement. The interconnection customer is responsible for coordinating and synchronizing the distributed generation facility with the EDC's system. The interconnection customer is responsible for any damage that is caused by the interconnection customer's failure to coordinate or synchronize the distributed generation facility with the electric distribution system. The interconnection customer agrees to be primarily liable for any damages resulting from the continued operation of the distributed generation facility after the EDC ceases to energize the line section to which the distributed generation facility is connected. In Attachment 4, the EDC shall specify the shortest reclose time setting for its protection equipment that could affect the distributed generation facility. The EDC shall notify the interconnection customer at least 10 business days prior to adopting a faster reclose time on any automatic protective equipment, such as a circuit breaker or line recloser, that might affect the distributed generation facility.

Article 2. Inspection, Testing, Authorization, and Right of Access

2.1 Equipment Testing and Inspection

The interconnection customer shall test and inspect its distributed generation facility including the interconnection equipment prior to interconnection in accordance with IEEE Standard 1547 (2003) and IEEE Standard 1547.1 (2005). The interconnection customer shall not operate its distributed generation facility in parallel with the EDC's electric distribution system without prior written authorization by the EDC as provided for in Articles 2.1.1-2.1.3.

2.1.1 The EDC shall perform a witness test after construction of the distributed generation facility is completed, but before parallel operation, unless the EDC specifically waives the witness test. The interconnection customer shall provide the EDC

at least 15 business days' notice of the planned commissioning test for the distributed generation facility. If the EDC performs a witness test at a time that is not concurrent with the commissioning test, it shall contact the interconnection customer to schedule the witness test at a mutually agreeable time within 10 business days after the scheduled commissioning test designated on the application. If the EDC does not perform the witness test within 10 business days after the commissioning test, the witness test is deemed waived unless the Parties mutually agree to extend the date for scheduling the witness test, or unless the EDC cannot do so for good cause, in which case, the Parties shall agree to another date for scheduling the test within 10 business days after the original scheduled date. If the witness test is not acceptable to the EDC, the interconnection customer has 30 business days to address and resolve any deficiencies. This time period may be extended upon agreement between the EDC and the interconnection customer. If the interconnection customer fails to address and resolve the deficiencies to the satisfaction of the EDC, the applicable cure provisions of Article 6.5 shall apply. The interconnection customer shall, if requested by the EDC, provide a copy of all documentation in its possession regarding testing conducted pursuant to IEEE Standard 1547.1.

2.1.2 If the interconnection customer conducts interim testing of the distributed generation facility prior to the witness test, the interconnection customer shall obtain permission from the EDC before each occurrence of operating the distributed generation facility in parallel with the electric distribution system. The EDC may, at its own expense, send qualified personnel to the distributed generation facility to observe such interim testing, but it cannot mandate that these tests be considered in the final witness test. The EDC is not required to observe the interim testing or precluded from requiring the tests be repeated at the final witness test.

2.1.3 After the distributed generation facility passes the witness test, the EDC shall affix an authorized signature to the certificate of completion and return it to the interconnection customer approving the interconnection and authorizing parallel operation. The authorization shall not be conditioned or delayed.

2.2 Commercial Operation
The interconnection customer shall not operate the distributed generation facility, except for interim testing as provided in Article 2.1, until such time as the certificate of completion is signed by all Parties.

2.3 Right of Access
The EDC must have access to the disconnect switch and metering equipment of the distributed generation facility at all times. When practical, the EDC shall provide notice to the customer prior to using its right of access.

Article 3. Effective Date, Term, Termination, and Disconnection

3.1 Effective Date
This Agreement shall become effective upon execution by all Parties.

3.2 Term of Agreement

This Agreement shall become effective on the effective date and shall remain in effect unless terminated in accordance with Article 3.3 of this Agreement.

3.3 Termination

3.3.1 The interconnection customer may terminate this Agreement at any time by giving the EDC 30 calendar days prior written notice.

3.3.2 Either Party may terminate this Agreement after default pursuant to Article 6.5.

3.3.3 The EDC may terminate, upon 60 calendar days' prior written notice, for failure of the interconnection customer to complete construction of the distributed generation facility within 12 months after the in-service date as specified by the Parties in Attachment 2, which may be extended by agreement between the Parties.

3.3.4 The EDC may terminate this Agreement, upon 60 calendar days' prior written notice, if the interconnection customer has abandoned, cancelled, permanently disconnected or stopped development, construction, or operation of the distributed generation facility, or if the interconnection customer fails to operate the distributed generation facility in parallel with the EDC's electric system for three consecutive years.

3.3.5 Upon termination of this Agreement, the distributed generation facility will be disconnected from the EDC's electric distribution system. Terminating this Agreement does not relieve either Party of its liabilities and obligations that are owed or continuing when the Agreement is terminated.

3.3.6 If the Agreement is terminated, the interconnection customer loses its position in the interconnection queue.

3.4 Temporary Disconnection

A Party may temporarily disconnect the distributed generation facility from the electric distribution system in the event one or more of the following conditions or events occurs:

3.4.1 Emergency conditions – shall mean any condition or situation: (1) that in the judgment of the Party making the claim is likely to endanger life or property; or (2) that the EDC determines is likely to cause an adverse system impact, or is likely to have a material adverse effect on the EDC's electric distribution system, interconnection facilities or other facilities, or is likely to interrupt or materially interfere with the provision of electric utility service to other customers; or (3) that is likely to cause a material adverse effect on the distributed generation facility or the interconnection equipment. Under emergency conditions, the EDC or the interconnection customer may suspend interconnection service and temporarily disconnect the distributed generation facility from the electric distribution system. The EDC must notify the interconnection customer when it becomes aware of any conditions that might affect the interconnection customer's

operation of the distributed generation facility. The interconnection customer shall notify the EDC when it becomes aware of any condition that might affect the EDC's electric distribution system. To the extent information is known, the notification shall describe the condition, the extent of the damage or deficiency, the expected effect on the operation of both Parties' facilities and operations, its anticipated duration, and the necessary corrective action.

3.4.2 Scheduled maintenance, construction, or repair – the EDC may interrupt interconnection service or curtail the output of the distributed generation facility and temporarily disconnect the distributed generation facility from the EDC's electric distribution system when necessary for scheduled maintenance, construction, or repairs on EDC's electric distribution system. To the extent possible, the EDC shall provide the interconnection customer with notice five business days before an interruption. The EDC shall coordinate the reduction or temporary disconnection with the interconnection customer; however, the interconnection customer is responsible for out-of-pocket costs incurred by the EDC for deferring or rescheduling maintenance, construction or repair at the interconnection customer's request.

3.4.3 Forced outages – The EDC may suspend interconnection service to repair the EDC's electric distribution system. The EDC shall provide the interconnection customer with prior notice, if possible. If prior notice is not possible, the EDC shall, upon written request, provide the interconnection customer with written documentation, after the fact, explaining the circumstances of the disconnection.

3.4.4 Adverse system impact – the EDC must provide the interconnection customer with written notice of its intention to disconnect the distributed generation facility, if the EDC determines that operation of the distributed generation facility creates an adverse system impact. The documentation that supports the EDC's decision to disconnect must be provided to the interconnection customer. The EDC may disconnect the distributed generation facility if, after receipt of the notice, the interconnection customer fails to remedy the adverse system impact, unless emergency conditions exist, in which case, the provisions of Article 3.4.1 apply. The EDC may continue to leave the generating facility disconnected until the adverse system impact is corrected.

3.4.5 Modification of the distributed generation facility – The interconnection customer must receive written authorization from the EDC prior to making any change to the distributed generation facility, other than a minor equipment modification. If the interconnection customer modifies its facility without the EDC's prior written authorization, the EDC has the right to disconnect the distributed generation facility until such time as the EDC concludes the modification poses no threat to the safety or reliability of its electric distribution system.

3.4.6 The EDC is not responsible for any lost opportunity or other costs incurred by the interconnection customer as a result of an interruption of service under Article 3.

Article 4. Cost Responsibility for Interconnection Facilities and Distribution Upgrades

4.1 Interconnection Facilities

4.1.1 The interconnection customer shall pay for the cost of the interconnection facilities itemized in Attachment 3. The EDC shall identify the additional interconnection facilities necessary to interconnect the distributed generation facility with the EDC's electric distribution system, the cost of those facilities, and the time required to build and install those facilities, as well as an estimated date of completion of the building or installation of those facilities.

4.1.2 The interconnection customer is responsible for its expenses, including overheads, associated with owning, operating, maintaining, repairing, and replacing its interconnection equipment.

4.2 Distribution Upgrades

The EDC shall design, procure, construct, install, and own any distribution upgrades. The actual cost of the distribution upgrades, including overheads, shall be directly assigned to the interconnection customer whose distributed generation facility caused the need for the distribution upgrades.

Article 5. Billing, Payment, Milestones, and Financial Security

5.1 Billing and Payment Procedures and Final Accounting (Applies to supplemental reviews conducted under Level Level 1, 2 or 3 review with EDC construction necessary for accommodating the distributed generation facility, and Level 4 reviews)

5.1.1 The EDC shall bill the interconnection customer for the design, engineering, construction, and procurement costs of EDC-provided interconnection facilities and distribution upgrades contemplated by this Agreement as set forth in Attachment 3. The billing shall occur on a monthly basis, or as otherwise agreed to between the Parties. The interconnection customer shall pay each bill within 30 calendar days after receipt, or as otherwise agreed to between the Parties.

5.1.2 Within 90 calendar days after completing the construction and installation of the EDC's interconnection facilities and distribution upgrades described in Attachments 2 and 3 to this Agreement, the EDC shall provide the interconnection customer with a final accounting report of any difference between (1) the actual cost incurred to complete the construction and installation of the EDC's interconnection facilities and distribution upgrades; and (2) the interconnection customer's previous deposit and aggregate payments to the EDC for the interconnection facilities and distribution upgrades. If the interconnection customer's cost responsibility exceeds its previous deposit and aggregate payments, the EDC shall invoice the interconnection customer for the amount due and the interconnection customer shall make payment to the EDC within 30 calendar days. If the interconnection customer's previous deposit and aggregate payments exceed its cost responsibility under this Agreement, the EDC shall refund to the interconnection customer an amount equal to the difference within

30 calendar days after the final accounting report. Upon request from the interconnection customer, if the difference between the budget estimate and the actual cost exceeds 20%, the EDC will provide a written explanation for the difference.

5.1.3 If a Party disputes any portion of its payment obligation pursuant to this Article 5, the Party shall pay in a timely manner all non-disputed portions of its invoice, and the disputed amount shall be resolved pursuant to the dispute resolution provisions contained in Article 8. A Party disputing a portion of an Article 5 payment shall not be considered to be in default of its obligations under this Article.

5.2 Interconnection Customer Deposit
At least 20 business days prior to the commencement of the design, procurement, installation, or construction of the EDC's interconnection facilities and distribution upgrades, the interconnection customer shall provide the EDC with a deposit equal to 100% of the estimated, non-binding cost to procure, install, or construct any such facilities. However, when the estimated date of completion of the building or installation of facilities exceeds three months from the date of notification, pursuant to Article 4.1.1 of this Agreement, this deposit may be held in escrow by a mutually agreed-upon third-party, with any interest to inure to the benefit of the interconnection customer.

Article 6. Assignment, Limitation on Damages, Indemnity, Force Majeure, and Default

6.1 Assignment
This Agreement may be assigned by either Party. If the interconnection customer attempts to assign this Agreement, the assignee must agree to the terms of this Agreement in writing and such writing must be provided to the EDC. Any attempted assignment that violates this Article is void and ineffective. Assignment shall not relieve a Party of its obligations, nor shall a Party's obligations be enlarged, in whole or in part, by reason of the assignment. An assignee is responsible for meeting the same obligations as the assignor.

6.1.1 Either Party may assign this Agreement without the consent of the other Party to any affiliate (including mergers, consolidations or transfers, or a sale of a substantial portion of the Party's assets, between the Party and another entity), of the assigning Party that has an equal or greater credit rating and the legal authority and operational ability to satisfy the obligations of the assigning Party under this Agreement.

6.1.2 The interconnection customer can assign this Agreement, without the consent of the EDC, for collateral security purposes to aid in providing financing for the distributed generation facility.

6.2 Limitation on Damages
Except for cases of gross negligence or willful misconduct, the liability of any Party to this Agreement shall be limited to direct actual damages and reasonable attorney's fees,

and all other damages at law are waived. Under no circumstances, except for cases of gross negligence or willful misconduct, shall any Party or its directors, officers, employees and agents, or any of them, be liable to another Party, whether in tort, contract or other basis in law or equity for any special, indirect, punitive, exemplary or consequential damages, including lost profits, lost revenues, replacement power, cost of capital or replacement equipment. This limitation on damages shall not affect any Party's rights to obtain equitable relief, including specific performance, as otherwise provided in this Agreement. The provisions of this Article 6.2 shall survive the termination or expiration of the Agreement.

6.3 Indemnity

6.3.1 This provision protects each Party from liability incurred to third parties as a result of carrying out the provisions of this Agreement. Liability under this provision is exempt from the general limitations on liability found in Article 6.2.

6.3.2 The interconnection customer shall indemnify and defend the EDC and the EDC's directors, officers, employees, and agents, from all damages and expenses resulting from a third party claim arising out of or based upon the interconnection customer's (a) negligence or willful misconduct or (b) breach of this Agreement.

6.3.3 The EDC shall indemnify and defend the interconnection customer and the interconnection customer's directors, officers, employees, and agents from all damages and expenses resulting from a third party claim arising out of or based upon the EDC's (a) negligence or willful misconduct or (b) breach of this Agreement.

6.3.4 Within 5 business days after receipt by an indemnified Party of any claim or notice that an action or administrative or legal proceeding or investigation as to which the indemnity provided for in this Article may apply has commenced, the indemnified Party shall notify the indemnifying Party of such fact. The failure to notify, or a delay in notification, shall not affect a Party's indemnification obligation unless that failure or delay is materially prejudicial to the indemnifying Party.

6.3.5 If an indemnified Party is entitled to indemnification under this Article as a result of a claim by a third party, and the indemnifying Party fails, after notice and reasonable opportunity to proceed under this Article, to assume the defense of such claim, that indemnified Party may, at the expense of the indemnifying Party, contest, settle or consent to the entry of any judgment with respect to, or pay in full, the claim.

6.3.6 If an indemnifying Party is obligated to indemnify and hold any indemnified Party harmless under this Article, the amount owing to the indemnified person shall be the amount of the indemnified Party's actual loss, net of any insurance or other recovery.

6.4 Force Majeure

6.4.1 As used in this Article, a force majeure event shall mean any act of God, labor disturbance, act of the public enemy, war, acts of terrorism, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment through no direct, indirect, or contributory act of a Party, any order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or any other cause beyond a Party's control. A force majeure event does not include an act of gross negligence or intentional wrongdoing by the Party claiming force majeure.

6.4.2 If a force majeure event prevents a Party from fulfilling any obligations under this Agreement, the Party affected by the force majeure event ("Affected Party") shall notify the other Party of the existence of the force majeure event within one business day. The notification must specify the circumstances of the force majeure event, its expected duration, and the steps that the Affected Party is taking and will take to mitigate the effects of the event on its performance. If the initial notification is verbal, it must be followed up with a written notification within one business day. The Affected Party shall keep the other Party informed on a continuing basis of developments relating to the force majeure event until the event ends. The Affected Party may suspend or modify its obligations under this Agreement (other than the obligation to make payments) only to the extent that the effect of the force majeure event cannot be otherwise mitigated.

6.5 Default

6.5.1 No default shall exist when the failure to discharge an obligation (other than the payment of money) results from a force majeure event as defined in this Agreement, or the result of an act or omission of the other Party.

6.5.2 A Party shall be in default ("Default") of this Agreement if it fails in any material respect to comply with, observe or perform, or defaults in the performance of, any covenant or obligation under this Agreement and fails to cure the failure within 60 calendar days after receiving written notice from the other Party. Upon a default of this Agreement, the non-defaulting Party shall give written notice of the default to the defaulting Party. Except as provided in Article 6.5.3, the defaulting Party has 60 calendar days after receipt of the default notice to cure the default; provided, however, if the default cannot be cured within 60 calendar days, the defaulting Party shall commence the cure within 20 calendar days after original notice and complete the cure within six months from receipt of the default notice; and, if cured within that time, the default specified in the notice shall cease to exist.

6.5.3 If a Party has assigned this Agreement in a manner that is not specifically authorized by Article 6.1, fails to provide reasonable access pursuant to Article 2.3, and is in default of its obligations pursuant to Article 7, or if a Party is in default of its payment obligations pursuant to Article 5 of this Agreement, the defaulting Party has 30 days from receipt of the default notice to cure the default.

6.5.4 If a default is not cured as provided for in this Article, or if a default is not capable of being cured within the period provided for in this Article, the non-defaulting Party shall have the right to terminate this Agreement by written notice, and be relieved of any further obligation under this Agreement and, whether or not that Party terminates this Agreement, to recover from the defaulting Party all amounts due under this Agreement, plus all other damages and remedies to which it is entitled at law or in equity. The provisions of this Article shall survive termination of this Agreement.

Article 7. Insurance

For distributed generation facilities with a nameplate capacity of 1 MVA or above, the interconnection customer shall carry sufficient insurance coverage so that the maximum comprehensive/general liability coverage that is continuously maintained by the interconnection customer during the term shall be not less than $2,000,000 for each occurrence, and an aggregate, if any, of at least $4,000,000. The EDC, its officers, employees and agents shall be added as an additional insured on this policy. The interconnection customer agrees to provide the EDC with at least 30 calendar days advance written notice of cancellation, reduction in limits, or non-renewal of any insurance policy required by this Article.

Article 8. Dispute Resolution

8.1 Parties shall attempt to resolve all disputes regarding interconnection as provided in this Article in a good faith manner.

8.2 If there is a dispute between the Parties about an interpretation of the Agreement, the aggrieved Party shall issue a written notice to the other Party to the Agreement that specifies the dispute and the Agreement articles that are disputed.

8.3 A meeting between the Parties shall be held within ten days after receipt of the written notice. Persons with decision-making authority from each Party shall attend the meeting. If the dispute involves technical issues, persons with sufficient technical expertise and familiarity with the issue in dispute from each Party shall also attend the meeting. The meeting may be conducted by teleconference.

8.4 After the first meeting, each Party may seek resolution through complaint or mediation procedures available at the Commission. The Commission may designate an engineer from the Commission's Energy Division to assist in resolving the dispute. Dispute resolution shall be conducted in a manner designed to minimize costs and delay. Dispute resolution may be conducted by phone.

8.5 Pursuit of dispute resolution may not affect an interconnection request or an interconnection applicant's position in the EDC's interconnection queue.

8.6 If the Parties fail to resolve their dispute under the dispute resolution provisions of this Article, nothing in this Article shall affect any Party's rights to obtain equitable relief, including specific performance, as otherwise provided in this Agreement.

Article 9. Miscellaneous

9.1 Governing Law, Regulatory Authority, and Rules
The validity, interpretation and enforcement of this Agreement and each of its provisions shall be governed by the laws of the State of Illinois, without regard to its conflicts of law principles. This Agreement is subject to all applicable laws and regulations. Each Party expressly reserves the right to seek change in, appeal, or otherwise contest any laws, orders or regulations of a governmental authority. The language in all parts of this Agreement shall in all cases be construed as a whole, according to its fair meaning, and not strictly for or against the EDC or interconnection customer, regardless of the involvement of either Party in drafting this Agreement.

9.2 Amendment
Modification of this Agreement shall be only by a written instrument duly executed by both Parties.

9.3 No Third-Party Beneficiaries
This Agreement is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations in this Agreement assumed are solely for the use and benefit of the Parties, their successors in interest and, where permitted, their assigns.

9.4 Waiver

9.4.1 Except as otherwise provided in this Agreement, a Party's compliance with any obligation, covenant, agreement, or condition in this Agreement may be waived by the Party entitled to the benefits thereof only by a written instrument signed by the Party granting the waiver, but the waiver or failure to insist upon strict compliance with the obligation, covenant, agreement, or condition shall not operate as a waiver of, or estoppel with respect to, any subsequent or other failure.

9.4.2. Failure of any Party to enforce or insist upon compliance with any of the terms or conditions of this Agreement, or to give notice or declare this Agreement or the rights under this Agreement terminated, shall not constitute a waiver or relinquishment of any rights set out in this Agreement, but the same shall be and remain at all times in full force and effect, unless and only to the extent expressly set forth in a written document signed by that Party granting the waiver or relinquishing any such rights. Any waiver granted, or relinquishment of any right, by a Party shall not operate as a relinquishment of any other rights or a waiver of any other failure of the Party granted the waiver to comply with any obligation, covenant, agreement, or condition of this Agreement.

9.5 Entire Agreement
Except as provided in Article 9.1, this Agreement, including all attachments, constitutes the entire Agreement between the Parties with reference to the subject matter of this Agreement, and supersedes all prior and contemporaneous understandings or agreements, oral or written, between the Parties with respect to the subject matter of this Agreement. There are no other agreements, representations, warranties, or covenants that constitute

any part of the consideration for, or any condition to, either Party's compliance with its obligations under this Agreement.

9.6 Multiple Counterparts
This Agreement may be executed in two or more counterparts, each of which is deemed an original, but all constitute one and the same instrument.

9.7 No Partnership
This Agreement shall not be interpreted or construed to create an association, joint venture, agency relationship, or partnership between the Parties, or to impose any partnership obligation or partnership liability upon either Party. Neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

9.8 Severability
If any provision or portion of this Agreement shall for any reason be held or adjudged to be invalid or illegal or unenforceable by any court of competent jurisdiction or other governmental authority, (1) that portion or provision shall be deemed separate and independent, (2) the Parties shall negotiate in good faith to restore insofar as practicable the benefits to each Party that were affected by the ruling, and (3) the remainder of this Agreement shall remain in full force and effect.

9.9 Environmental Releases
Each Party shall notify the other Party of the release of any hazardous substances, any asbestos or lead abatement activities, or any type of remediation activities related to the distributed generation facility or the interconnection facilities, each of which may reasonably be expected to affect the other Party. The notifying Party shall (1) provide the notice as soon as practicable, provided that Party makes a good faith effort to provide the notice no later than 24 hours after that Party becomes aware of the occurrence, and (2) promptly furnish to the other Party copies of any publicly available reports filed with any governmental authorities addressing such events.

9.10 Subcontractors
Nothing in this Agreement shall prevent a Party from using the services of any subcontractor it deems appropriate to perform its obligations under this Agreement; provided, however, that each Party shall require its subcontractors to comply with all applicable terms and conditions of this Agreement in providing services and each Party shall remain primarily liable to the other Party for the performance of the subcontractor.

9.10.1 A subcontract relationship does not relieve any Party of any of its obligations under this Agreement. The hiring Party remains responsible to the other Party for the acts or omissions of its subcontractor. Any applicable obligation imposed by this Agreement upon the hiring Party shall be equally binding upon, and shall be construed as having application to, any subcontractor of the hiring Party.

9.10.2 The obligations under this Article cannot be limited in any way by any limitation of subcontractor's insurance.

Article 10. Notices

10.1 General

Unless otherwise provided in this Agreement, any written notice, demand, or request required or authorized in connection with this Agreement ("Notice") shall be deemed properly given if delivered in person, delivered by recognized national courier service, or sent by first class mail, postage prepaid, to the person specified below:

If to Interconnection Customer:

Interconnection Customer: _____

Attention: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____ E-Mail: _____

If to EDC:

EDC: _____

Attention: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____ E-Mail: _____

Alternative Forms of Notice

Any notice or request required or permitted to be given by either Party to the other Party and not required by this Agreement to be in writing may be given by telephone, facsimile or e-mail to the telephone numbers and e-mail addresses set out above.

10.2 Billing and Payment

Billings and payments shall be sent to the addresses set out below:

If to Interconnection Customer:

Interconnection Customer: _____

Attention: _____

Address: _____

City: _____ State: _____ Zip: _____

If to EDC:

EDC: _____

Attention: _____

Address: _____

City: _____ State: _____ Zip: _____

10.3 Designated Operating Representative

The Parties may also designate operating representatives to conduct the communications that may be necessary or convenient for the administration of this Agreement. This person will also serve as the point of contact with respect to operations and maintenance of the Party's facilities.

Interconnection Customer's Operating Representative: _____

Attention: _____

Address: _____

City: _____ State: _____ Zip: _____

EDC's Operating Representative: _____

Attention: _____

Address: _____

City: _____ State: _____ Zip: _____

10.4 Changes to the Notice Information

Either Party may change this notice information by giving five business days written notice before the effective date of the change.

Article 11. Signatures

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their respective duly authorized representatives.

For the Interconnection Customer:

Name: _____

Title: _____

Date: _____

For EDC:

Name: _____

Title: _____

Date: _____

Attachment 1

Definitions

Adverse system impact – A negative effect that compromises the safety or reliability of the electric distribution system or materially affects the quality of electric service provided by the electric distribution company (EDC) to other customers.

Applicable laws and regulations – All duly promulgated applicable federal, State and local laws, regulations, rules, ordinances, codes, decrees, judgments, directives, or judicial or administrative orders, permits and other duly authorized actions of any governmental authority, having jurisdiction over the Parties.

Commissioning test – Tests applied to a distributed generation facility by the applicant after construction is completed to verify that the facility does not create adverse system impacts. At a minimum, the scope of the commissioning tests performed shall include the commissioning test specified IEEE Standard 1547 Section 5.4 "Commissioning tests."

Distributed generation facility – The equipment used by an interconnection customer to generate or store electricity that operates in parallel with the electric distribution system. A distributed generation facility typically includes an electric generator, prime mover, and the interconnection equipment required to safely interconnect with the electric distribution system or a local electric power system.

Distribution upgrades – A required addition or modification to the EDC's electric distribution system at or beyond the point of interconnection to accommodate the interconnection of a distributed generation facility. Distribution upgrades do not include interconnection facilities.

Electric distribution company or EDC – Any electric utility entity subject to the jurisdiction of the Illinois Commerce Commission.

Electric distribution system – The facilities and equipment used to transmit electricity to ultimate usage points such as homes and industries from interchanges with higher voltage transmission networks that transport bulk power over longer distances. The voltage levels at which electric distribution systems operate differ among areas but generally carry less than 100 kilovolts of electricity. Electric distribution system has the same meaning as the term Area EPS, as defined in 3.1.6.1 of IEEE Standard 1547.

Facilities study – An engineering study conducted by the EDC to determine the required modifications to the EDC's electric distribution system, including the cost and the time required to build and install the modifications, as necessary to accommodate an interconnection request.

Force majeure event – Any act of God, labor disturbance, act of the public enemy, war, acts of terrorism, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment through no direct, indirect, or contributory act of a Party, any order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or any other cause beyond a Party's control. A force majeure event does not include an act of gross negligence or intentional wrongdoing.

Governmental authority – Any federal, State, local or other governmental regulatory or administrative agency, court, commission, department, board, other governmental subdivision, legislature, rulemaking board, tribunal, or other governmental authority having jurisdiction over the Parties, their respective facilities, or the respective services they provide, and exercising or entitled to exercise any administrative, executive, police, or taxing authority or power; provided, however, that this term does not include the interconnection customer, EDC or any affiliate of either.

IEEE Standard 1547 – The Institute of Electrical and Electronics Engineers, Inc. (IEEE), 3 Park Avenue, New York NY 10016-5997, Standard 1547 (2003), "Standard for Interconnecting Distributed Resources with Electric Power Systems."

IEEE Standard 1547.1 – The IEEE Standard 1547.1 (2005), "Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems."

Interconnection agreement or Agreement – The agreement between the interconnection customer and the EDC. The interconnection agreement governs the connection of the distributed generation facility to the EDC's electric distribution system and the ongoing operation of the distributed generation facility after it is connected to the EDC's electric distribution system.

Interconnection customer – The entity entering into this Agreement for the purpose of interconnecting a distributed generation facility to the EDC's electric distribution system.

Interconnection equipment – A group of components or an integrated system connecting an electric generator with a local electric power system or an electric distribution system that includes all interface equipment, including switchgear, protective devices, inverters or other interface devices. Interconnection equipment may be installed as part of an integrated equipment package that includes a generator or other electric source.

Interconnection facilities – Facilities and equipment required by the EDC to accommodate the interconnection of a distributed generation facility. Collectively, interconnection facilities include all facilities, and equipment between the distributed generation facility and the point of interconnection, including modification, additions, or upgrades that are necessary to physically and electrically interconnect the distributed generation facility to the electric distribution system. Interconnection facilities are sole use facilities and do not include distribution upgrades.

Interconnection request – An interconnection customer's request, on the required form, for the interconnection of a new distributed generation facility, or to increase the capacity or change the operating characteristics of an existing distributed generation facility that is interconnected with the EDC's electric distribution system.

Interconnection study – Any of the following studies, as determined to be appropriate by the EDC: the interconnection feasibility study, the interconnection system impact study, and the interconnection facilities study.

Illinois standard distributed generation interconnection rules – The most current version of the procedures for interconnecting distributed generation facilities adopted by the Illinois Commerce Commission. See 83 Ill. Adm. Code 466.

Parallel operation or Parallel – The state of operation that occurs when a distributed generation facility is connected electrically to the electric distribution system.

Point of interconnection – The point where the distributed generation facility is electrically connected to the electric distribution system. Point of interconnection has the same meaning as the term "point of common coupling" defined in 3.1.13 of IEEE Standard 1547.

Witness test – For lab-certified equipment, verification (either by an on-site observation or review of documents) by the EDC that the interconnection installation evaluation required by IEEE Standard 1547 Section 5.3 and the commissioning test required by IEEE Standard 1547 Section 5.4 have been adequately performed. For interconnection equipment that has not been lab-certified, the witness test shall also include verification by the EDC of the on-site design tests required by IEEE Standard 1547 Section 5.1 and verification by the EDC of production tests required by IEEE Standard 1547 Section 5.2. All tests verified by the EDC are to be performed in accordance with the test procedures specified by IEEE Standard 1547.1.

Attachment 2

Construction Schedule, Proposed Equipment & Settings

This attachment is to be completed by the interconnection customer and shall include the following:

1. The construction schedule for the distributed generation facility.

2. A one-line diagram indicating the distributed generation facility, interconnection equipment, interconnection facilities, metering equipment, and distribution upgrades.

3. Component specifications for equipment identified in the one-line diagram.

4. Component settings.

5. Proposed sequence of operations.

6. A three line diagram showing current potential circuits for protective relays.

7. Relay tripping and control schematic diagram.

Attachment 3

Description, Costs and Time Required to Build and Install the EDC's Interconnection Facilities

This attachment is to be completed by the EDC and shall include the following:

1. Required interconnection facilities, including any required metering.

2. An estimate of itemized costs charged by the EDC for interconnection, including overheads, based on results from prior studies.

3. An estimate for the time required to build and install the EDC's interconnection facilities based on results from prior studies and an estimate of the date upon which the facilities will be completed.

Attachment 4

Operating Requirements for Distributed Generation Facilities Operating in Parallel

The EDC shall list specific operating practices that apply to this distributed generation interconnection and the conditions under which each listed specific operating practice applies.

Attachment 5

Monitoring and Control Requirements

This attachment is to be completed by the EDC and shall include the following:

1. The EDC's monitoring and control requirements must be specified, along with a reference to the EDC's written requirements documents from which these requirements are derived.

2. An internet link to the requirements documents.

Attachment 6

Metering Requirements

This attachment is to be completed by the EDC and shall include the following:

1. The metering requirements for the distributed generation facility.

2. Identification of the appropriate tariffs that establish these requirements.

3. An internet link to these tariffs.

Attachment 7

As Built Documents

This attachment is to be completed by the interconnection customer and shall include the following:

When it returns the certificate of completion to the EDC, the interconnection customer shall provide the EDC with documents detailing the as-built status of the following:

1. A one-line diagram indicating the distributed generation facility, interconnection equipment, interconnection facilities, and metering equipment.

2. Component specifications for equipment identified in the one-line diagram.

3. Component settings.

4. Proposed sequence of operations.

5. A three-line diagram showing current potential circuits for protective relays.

6. Relay tripping and control schematic diagram.

(Source: Amended at 41 Ill. Reg. 862, effective January 20, 2017)

Section 466.APPENDIX E Interconnection Feasibility Study Agreement

Interconnection Feasibility Study Agreement

This agreement ("Agreement") is made and entered into this _____ day of _____ by and between _____ ("interconnection customer"), as an individual person, or as a _____ organized and existing under the laws of the State of _____, and _____ ("Electric Distribution Company" (EDC)), a _____ existing under the laws of the State of Illinois. Interconnection customer and EDC each may be referred to as a "Party", or collectively as the "Parties".

Recitals:

Whereas, interconnection customer is proposing to develop a distributed generation facility or modifying to an existing distributed generation facility consistent with the interconnection request application form submitted by interconnection customer on _____; and
(Date)

Whereas, interconnection customer desires to interconnect the distributed generation facility with EDC's electric distribution system; and

Whereas, interconnection customer has requested EDC to perform an interconnection feasibility study to assess the feasibility of interconnecting the proposed distributed generation facility to EDC's electric distribution system;

Now, therefore, in consideration of and subject to the mutual covenants contained herein the Parties agree as follows:

1. All terms defined in Section 466.30 of the Illinois Distributed Generation Interconnection Standard shall have the meanings indicated in that Section when used in this Agreement.

2. Interconnection customer elects and EDC shall cause to be performed an interconnection feasibility study consistent with Section 466.120 of the Illinois Distributed Generation Interconnection Standard.

3. The scope of the interconnection feasibility study shall be based upon the information set forth in the interconnection request application form and Attachment A to this Agreement.

4. The interconnection feasibility study shall be based on the technical information provided by interconnection customer in the interconnection request application form, as modified with the agreement of the Parties. EDC has the right to request additional technical information from interconnection customer during the course of the interconnection feasibility study. If the interconnection customer modifies its interconnection request, the time to complete the interconnection feasibility study may be extended by the EDC.

5. In performing the study, EDC shall rely on existing studies of recent vintage to the extent practical. The interconnection customer will not be charged for such existing studies; however, interconnection customer is responsible for the cost of applying any existing study to the interconnection customer specific requirements and for any new study that the EDC performs.

6. The interconnection feasibility study report must provide the following information:

   6.1 Identification of any equipment short circuit capability limits exceeded as a result of the interconnection,

   6.2 Identification of any thermal overload or voltage limit violations resulting from the interconnection, and

   6.3 A description and non-binding estimated cost of facilities required to interconnect the distributed generation facility to EDC's electric distribution system as required under Section 466.120(e)(1).

7. Interconnection customer shall provide a study deposit equal to 100% of the estimated non-binding study costs at least 20 business days prior to the date upon which the study commences.

8. The interconnection feasibility study shall be completed and the results shall be transmitted to interconnection customer within 25 business days after this Agreement is signed by the Parties.

9. Study fees shall be based on actual costs and will be invoiced to interconnection customer after the study is transmitted to interconnection customer. The invoice must include an itemized listing of employee time and costs expended on the study.

10. Interconnection customer shall pay any actual study costs that exceed the deposit without interest within 30 calendar days on receipt of the invoice. EDC shall refund any excess deposit amount without interest within 30 calendar days after the invoice.

In witness whereof, the Parties have caused this Agreement to be duly executed by their duly authorized officers or agents on the day and year first above written.

[Insert name of interconnection customer]

Signed: _____

Name (Printed): _____ Title: _____

[Insert name of EDC]

Signed: _____

Name (Printed): _____ Title: _____

Attachment A to Interconnection System Impact Study Agreement
Assumptions Used in Conducting the Interconnection System Impact Study

The interconnection feasibility study will be based upon the information in the interconnection request application form and agreed upon on _____:
Date

1. Point of interconnection and configuration to be studied.

_____

_____

_____

2. Alternative points of interconnection and configurations to be studied.

_____

_____

_____

Note: 1 and 2 are to be completed by the interconnection customer. Any additional assumptions (explained below) may be provided by either the interconnection customer or the EDC.

_____

_____

_____

_____

_____

Section 466.APPENDIX F Interconnection System Impact Study Agreement

Interconnection System Impact Study Agreement

This agreement ("Agreement") is made and entered into this _____ day of _____ by and between _____ ("interconnection customer"), as an individual person, or as a _____ organized and existing under the laws of the State of _____, and _____ ("Electric Distribution Company" (EDC)), a _____ existing under the laws of the State of Illinois. Interconnection customer and EDC each may be referred to as a "Party", or collectively as the "Parties".

Recitals:

Whereas, interconnection customer is proposing to develop a distributed generation facility or modifying an existing distributed generation facility consistent with the interconnection request application form completed by interconnection customer on _____; and
(Date)

Whereas, interconnection customer desires to interconnect the distributed generation facility to EDC's electric distribution system; and

Whereas, EDC has completed an interconnection feasibility study and provided the results of said study to interconnection customer (this recital to be omitted if the Parties have agreed to forego the interconnection feasibility study); and

Whereas, interconnection customer has requested EDC to perform an interconnection system impact study to assess the impact of interconnecting the distributed generation facility to EDC's electric distribution system;

Now, therefore, in consideration of and subject to the mutual covenants contained herein the Parties agree as follows:

1. All terms defined in Section 466.30 of the Illinois Distributed Generation Interconnection Standard shall have the meanings indicated in that Section when used in this Agreement.

2. Interconnection customer elects and EDC shall cause to be performed an interconnection system impact study consistent with Section 466.120 of the Illinois Distributed Generation Interconnection Standard.

3. The scope of the interconnection system impact study shall be based upon the information set forth in the interconnection request application form and in Attachment A to this Agreement.

4. The interconnection system impact study shall be based upon the interconnection feasibility study and the technical information provided by interconnection customer in the interconnection request application form. EDC reserves the right to request additional technical information from interconnection customer. If interconnection customer modifies its proposed point of interconnection, interconnection request, or the technical

information provided therein is modified, the time to complete the interconnection system impact study may be extended.

5. The interconnection system impact study report shall provide the following information:

   5.1 Identification of any equipment short circuit capability limits exceeded as a result of the interconnection,

   5.2 Identification of any thermal overload or voltage limit violations resulting from the interconnection,

   5.3 Identification of any instability or inadequately damped response to system disturbances resulting from the interconnection, and

   5.4 Description and non-binding estimated cost of facilities required to interconnect the distributed generation facility to EDC's electric distribution system and to address the identified short circuit, thermal overload, voltage and instability issues as required under Section 466.120(e)(2).

6. Interconnection customer shall provide a study deposit equal to 100% of the estimated non-binding study costs at least 20 business days prior to the date upon which the study commences.

7. The interconnection system impact study, if required, shall be completed and the results transmitted to interconnection customer within 25 business days after this Agreement is signed by the Parties.

8. Study fees shall be based on actual costs and shall be invoiced to interconnection customer after the study is transmitted to interconnection customer. The invoice shall include an itemized listing of employee time and costs expended on the study.

9. Interconnection customer shall pay any study costs that exceed the deposit within 30 calendar days after receipt of the invoice. EDC shall refund any excess deposit amount within 30 calendar days of the invoice.

In witness thereof, the Parties have caused this Agreement to be duly executed by their duly authorized officers or agents on the day and year first above written.

[Insert name of interconnection customer]

Signed: _____

Name (Printed): _____ Title: _____

[Insert name of EDC]

Signed: _____

Name (Printed): _____ Title: _____

Attachment A to Interconnection System Impact Study Agreement

Assumptions Used in Conducting the Interconnection System Impact Study

The interconnection system impact study shall be based upon the results of the interconnection feasibility study, subject to any modifications in accordance with Section 466.120 of the Illinois Distributed Generation Interconnection Standard, and the following assumptions:

1. Point of interconnection and configuration to be studied.

2. Alternative Points of interconnection and configurations to be studied.

Note: 1 and 2 are to be completed by the interconnection customer. Any additional assumptions (explained below) may be provided by either the interconnection customer or the EDC.

Section 466.APPENDIX G Interconnection Facilities Study Agreement

Interconnection Facilities Study Agreement

This agreement ("Agreement") is made and entered into this _____ day of _____ by and between _____ ("interconnection customer"), as an individual person, or as a _____ organized and existing under the laws of the State of _____, and _____ ("Electric Distribution Company" (EDC)), a _____ existing under the laws of the State of Illinois. Interconnection customer and EDC each may be referred to as a "Party", or collectively as the "Parties".

Recitals:

Whereas, interconnection customer is proposing to develop a distributed generation facility or modifying an existing distributed generation facility consistent with the interconnection request application form completed by interconnection customer on _____ (Date); and

Whereas, interconnection customer desires to interconnect the distributed generation facility with EDC's electric distribution system; and

Whereas, EDC has completed an interconnection system impact study and provided the results of said study to interconnection customer (unless proceeding directly from Level 1, 2 or 3 review); and

Whereas, interconnection customer has requested EDC to perform an interconnection facilities study to specify and estimate the cost of the equipment, engineering, procurement and construction work needed to interconnect the distributed generation facility;

Now, therefore, in consideration of and subject to the mutual covenants contained in this Agreement, the Parties agree as follows:

1. All terms defined in Section 466.30 of the Illinois Distributed Generation Interconnection Standard shall have the meanings indicated in that Section when used in this Agreement.

2. Interconnection customer elects and EDC shall cause an interconnection facilities study consistent with Section 466.120 of the Illinois Distributed Generation Interconnection Standard.

3. The scope of the interconnection facilities study shall be determined by the information provided in Attachment A to this Agreement.

4. An interconnection facilities study report (1) shall provide a description, estimated cost of distribution upgrades, and a schedule for required facilities to interconnect the distributed generation facility to EDC's electric distribution system; and (2) shall address all issues identified in the interconnection system impact study (or identified in this study if the system impact study is combined herein).

5. Interconnection customer shall provide a study deposit of 100% of the estimated non-binding study costs at least 20 business days prior to the date upon which the study commences.

6. In cases where no distribution upgrades are required, the interconnection facilities study shall be completed and the results shall be transmitted to interconnection customer within 15 business days after this Agreement is signed by the Parties. In cases where distribution upgrades are required, the interconnection facilities study shall be completed and the results shall be transmitted to interconnection customer within 30 business days after this Agreement is signed by the Parties.

7. Study fees shall be based on actual costs and will be invoiced to interconnection customer after the study is transmitted to interconnection customer. The invoice shall include an itemized listing of employee time and costs expended on the study.

8. Interconnection customer shall pay any actual study costs that exceed the deposit within 30 calendar days on receipt of the invoice. EDC shall refund any excess deposit amount within 30 calendar days after the invoice.

In witness whereof, the Parties have caused this Agreement to be duly executed by their duly authorized officers or agents on the day and year first above written.

[Insert name of interconnection customer]

Signed: _____

Name (Printed): _____ Title: _____

[Insert name of EDC]

Signed: _____

Name (Printed): _____ Title: _____

Attachment A to Interconnection Facilities Study Agreement

Minimum Information That Interconnection Customer Must Provide With the Interconnection Facilities Study Agreement.

Provide location plan and simplified one-line diagram of the distributed generation facilities.

For staged projects, please indicate size and location of planned additional future generation. On the one-line diagram, indicate the generation capacity attached at each metering location. (Maximum load on CT/PT).

On the one-line diagram, indicate the location of auxiliary power. (Minimum load on CT/PT) Amps.

One set of metering is required for each generation connection to the EDC's electric distribution system.

Number of generation connections:_____

Will an alternate source of auxiliary power be available during CT/PT maintenance?

☐ Yes ☐ No

Will a transfer bus on the generation side of the metering require that each meter set be designed for the total distributed generation capacity?

☐ Yes ☐ No (Please indicate on the one-line diagram).

What type of control system or PLC will be located at the distributed generation facility?

_____

What protocol does the control system or PLC use?_____

Please provide a scale drawing of the site. Indicate the point of common coupling, distribution line, and property lines.

Number of third party easements required for EDC's interconnection facilities: _____

To be completed in coordination with EDC.

Is the distributed generation facility located in EDC's service area?

☐ Yes ☐ No

If No, please provide name of local provider: _____

Please provide the following proposed schedule dates below:

Begin construction date: _____

Generator step-up transformers receive back feed power date: _____

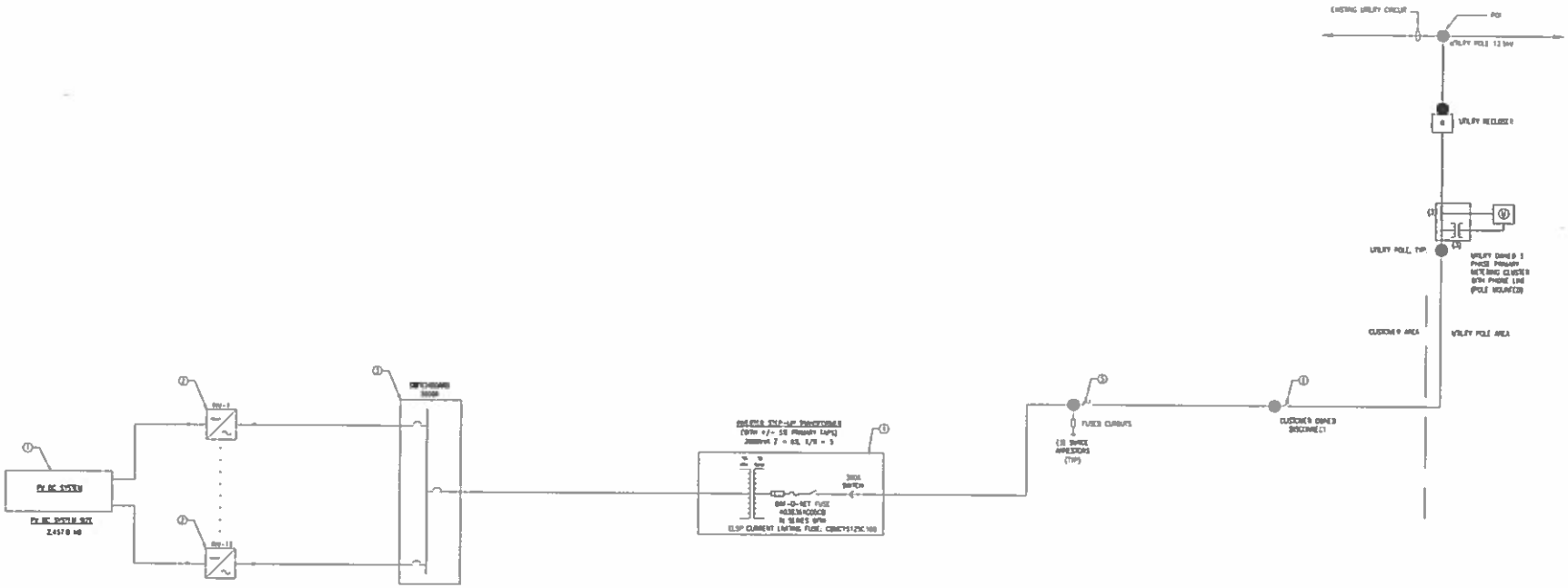
Generation testing date: _____

Commercial operation date: _____

(Source: Amended at 41 Ill. Reg. 862, effective January 20, 2017)

PRESALE AC SINGLE LINE DIAGRAM - NEWARK ROAD - KENDALL COUNTY - 2MWAC

SCALE: NTS



ELECTRICAL EQUIPMENT SCHEDULE

REF. #	TOTAL	DESCRIPTION
①	7020	JA SOLAR JAM60 MODULES (27 MODULES PER STRING)
②	16	SUNGROW SG125 STRING INVERTER
③	1	3000A SWITCHBOARD, 600VAC
④	1	2000KVA TRANSFORMER, 3 PHASE
⑤	3	FUSED CUTOUTS
⑥	1	15kV POLE MOUNTED, 600A, 65kAIC, DISCONNECT LOAD BREAK SWITCH, GANG OPERATED, LOCKABLE

PROPOSED INVERTER SETTINGS

DEVICE	PICKUP	UNITS	TIME DELAY	DESCRIPTION	NOTE
27-1	300	VOLTS	1.5	UNDERVOLTAGE RELAY	
27-2	420	VOLTS	11		
27-3	528	VOLTS	21		
59-1	660	VOLTS	13	OVERVOLTAGE RELAY	
59-2	720	VOLTS	0.16		
81U-1	57	HZ	0.16	UNDERFREQUENCY	
81U-2	58.5	HZ	300		
81O-1	60.5	HZ	300	OVERFREQUENCY	
81O-1	62	HZ	0.16		

THIS DOCUMENT IS PROVIDED BY BORREGO SOLAR SYSTEMS INC. TO FACILITATE THE SALE AND INSTALLATION OF A SOLAR POWER SYSTEM FROM BORREGO SOLAR SYSTEMS. THIS IS A PRELIMINARY LAYOUT BASED ON AERIAL IMAGERY. THE ACTUAL PARAMETERS OF THE PV SYSTEM MAY VARY BASED ON A SITE SPECIFIC SURVEY AND THE COMPLETION OF SOLAR ACCESS REPORTS. THESE DRAWINGS ARE NOT FOR CONSTRUCTION. REPRODUCTION, RELEASE OR UTILIZATION FOR ANY OTHER PURPOSE, WITHOUT PRIOR WRITTEN CONSENT IS STRICTLY PROHIBITED

BORREGO SOLAR
55 TECHNOLOGY DR. SUITE 102
LOWELL, MA 01851
PHONE (888) 898-6273
FAX (888) 843-6779
WWW.BORREGOSOLAR.COM

NEWARK ROAD - KENDALL CO - 2MWAC
16400 NEWARK ROAD
BIG GROVE, IL 60541

PROJECT NUMBER:
XXX-XXXX

REV.	DATE	DRAWN	CHECKED	RELEASE LEVEL
1	1/17/2018	JB		INTX APP

SCALE
VALID ONLY WHEN PLOTTED
ANSI FULL BLEED B 11" X 17"

E-0.0
INTERCONNECTION SINGLE LINE

NEWARK ROAD - KENDALL CO - 2MWAC - PV PROJECT



PROJECT INFORMATION



PROPOSAL SPECIFICATION

SYSTEM SIZE DC (kW)	2 457 000		
SYSTEM SIZE AC (kW)	2000		
DC TO AC RATIO	1 2		
MODULE INFORMATION	(7020) JA SOLAR JA350		
STRING INFORMATION	(260) PARALLELED STRINGS OF (27)		
INVERTER INFORMATION	(16) SUNGROW SG125		
TRANSFORMER INFORMATION	2000kVA		
INTERCONNECTION VOLTAGE	12 5kV		
RACKING DETAILS	GROUND ATI SINGLE-AXIS TRACKER		
ARRAY PITCH (METER)	29 72	SITE LATITUDE	42 35 N
ASCE7-05 WIND SPEED (MPH)	100	GROUND SNOW LOAD (PSF)	50

ARRAY INFORMATION

ARRAY NO	AZIMUTH	TILT ANGLE	NO OF MODULES	NO OF STRINGS	kW DC	INV - # CONNECTED
ARY-1	180°	8°	7,020	260	2,457 000	(16) SG125
TOTAL	-	-	7,020	260	2,457 000	-

THIS DOCUMENT IS PROVIDED BY BORREGO SOLAR SYSTEMS INC TO FACILITATE THE SALE AND INSTALLATION OF A SOLAR POWER SYSTEM FROM BORREGO SOLAR SYSTEMS THIS IS A PRELIMINARY LAYOUT BASED ON AERIAL IMAGERY THE ACTUAL INSTALLATION OF THE SYSTEM MAY VARY BASED ON A SITE SPECIFIC SURVEY AND THE COMPLETION OF DUE DILIGENCE EFFORTS THESE DRAWINGS ARE NOT FOR CONSTRUCTION REPRODUCTION RELEASE OR UTILIZATION FOR ANY OTHER PURPOSE, WITHOUT PRIOR WRITTEN CONSENT IS STRICTLY PROHIBITED

BORREGO SOLAR
55 TECHNOLOGY DR, SUITE 102
LOWELL, MA 01851
PHONE (888) 898-6273
FAX (888) 843-6778
WWW BORREGOSOLAR COM

NEWARK ROAD - KENDALL CO - 2MWAC
16400 NEWARK ROAD
BIG GROVE, IL 60541

PROJECT NUMBER:
XXX-XXXX

REV	DATE	DRAWN	CHECKED	RELEASE LEVEL
1	6/17/18	AMV	JI	PROPOSAL LAYOUT

SCALE 1"=40'
VALID ONLY WHEN PLOTTED
ANSI FULL BLEED B 11" X 17"

PV-L1
PROPOSAL LAYOUT

SUNGROW

SG125HV NEW

String Inverter for 1500 Vdc Systems



High Yield

- Patented five-level topology, 98.8% CEC efficiency, 98.5% Euro efficiency
- Full power operation without derating up to 50 ℃

Higher ROI

- World's highest output string inverter at 125kW (1500Vdc/600Vac)
- 2 to 5 MW power block design for lower total installed costs
- DC/AC ratio up to 1.5

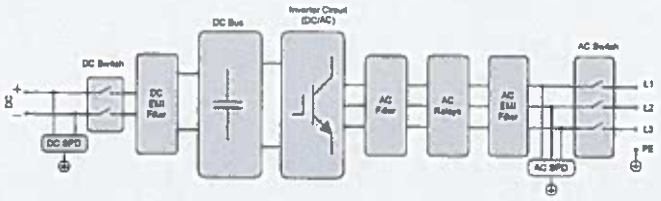
Easy O&M

- Virtual central inverter design concept enables easy O&M
- Compact design and light weight (68kg) for easy installation

Grid Support

- Certifications: UL 1741/1741 SA, IEEE 1547/1547.1, CSA C22.2 107.1-01-2001, FCC Part 15 Sub-part B Class A Limits, California Rule 21
- Low/High voltage ride through (L/HVRT)
- Active & reactive power control, power ramp rate control

Circuit Diagram



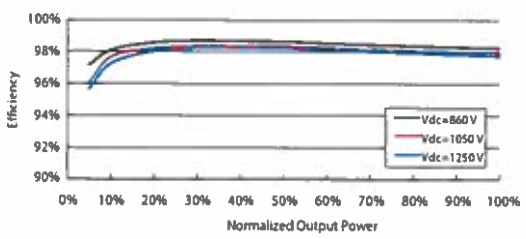
© 2017 Sungrow Power Supply Co., Ltd. All rights reserved.
Subject to change without Notice. Version #1.1

SUNGROW
www.sungrowpower.com

SG125HV

Input (DC)	SG125HV
Max. PV input voltage	1500 V
Min. PV input voltage / Startup input voltage	860 V / 860 V
Nominal input voltage	1050 V
MPP voltage range	860 - 1450 V
MPP voltage range for nominal power	860 - 1250 V
No. of independent MPP inputs	1
Max. number of PV strings per MPPT	1
Max. DC short circuit current	240 A
Output (AC)	
Nominal AC power (at 50 °C)	125000 W
Max. AC output at PF=1 (at 50 °C)	125000 W
Max. AC apparent power (at 50 °C)	125000 VA
Max. AC output current	120 A
Nominal AC voltage	3 / PE, 600 V
AC voltage range	480 - 690 V
Nominal grid frequency / Grid frequency range	50 Hz / 45 - 55 Hz, 60 Hz / 55 - 65 Hz
THD	< 3 % (at nominal power)
DC current injection	< 0.5 % In
Power factor at nominal powe / Adjustable power factor	> 0.99 / 0.8 leading - 0.8 lagging
Feed-in phases / Connection phases	3 / 3
Efficiency	
CEC efficiency / Euro efficiency	98.8 % / 98.5 %
Protection	
DC reverse connection protection	Yes
AC short-circuit protection	Yes
Leakage current protection	Yes
Grid monitoring	Yes
DC switch / AC switch	Yes / Yes
DC fuse	No
PV string current monitoring	No
Anti-PID function	Optional
Overvoltage protection	DC Type II / AC Type II
General Data	
Dimensions (W*H*D)	670*810*294 mm
Weight	68 kg (150 lbs)
Isolation method	Transformerless
Degree of protection	IP65
Night power consumption	< 2 W
Operating ambient temperature range	-25 to 60 °C (> 50 °C derating)
Allowable relative humidity range (non-condensing)	0 - 100 %
Cooling method	Smart forced air cooling
Max. operating altitude	4000 m (> 3000 m derating)
Communication	RS485, PLC Optional
DC connection type	Screw Clamp terminal (Max. 120 mm²)
AC connection type	Screw Clamp terminal (Max. 120 mm²)
Certifications/Compliance	UL 1741/1741 SA, IEEE 1547/1547.1, CSA C22.2 107.1-01-2001, FCC Part 15 Sub-part B Class A Limits, California Rule 21
Grid Support	LVRT, HVRT, active & reactive power control and power ramp rate control

Efficiency Curve



CSA Group

Certificate of Compliance

Certificate: 70116160 **Master Contract:** 253758

Project: 70116160 **Date Issued:** 2017-03-13

Issued to: **SUNGROW POWER SUPPLY CO.,LTD**
No. 1699 Xiyou Rd.
New & High Technology
Industrial Dev Zone
Hefei,
CHINA
Attention: Shandong Cao

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.

C US

Issued by: [redacted]
Michael Tong

PRODUCTS

CLASS - C531109 - POWER SUPPLIES-Distributed Generation Power Systems Equipment
CLASS - C531189 - POWER SUPPLIES - Distributed Generation-Power Systems Equipment - Certified to U.S. Standards

Transformerless Utility Interactive Inverter, Model SG125HV, permanently connected.

For details related to rating, size, configuration, etc., reference should be made to the CSA Certification Record, Certificate of Compliance Annex A, or the Descriptive Report.

APPLICABLE REQUIREMENTS

CSA C22.2 No. 107.1-01 - General Use Power Supplies

*UL Std. No.1741-Second Edition - Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources(January 28, 2010)

*Note: Conformity to UL 1741-Second Edition (January 28, 2010) includes compliance with applicable requirements of IEEE 1547-2003 (R2008) and IEEE 1547.1-2005(R2011).

CSA Group

Supplement to Certificate of Compliance

Certificate: 70116160 **Master Contract:** 253758

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
70116160	2017-03-13	Transformerless Utility Interactive Inverter, Model SG125HV, permanently connected(C/US).

SITE USE PLANS

16400 NEWARK ROAD, NEWARK, IL 60541

2488.320 kW DC STC RATED SOLAR ELECTRIC SYSTEM

GENERAL NOTES

1. AS CONTAINED HEREIN, "CONTRACTOR" IS ASSUMED TO BE BORREGO SOLAR SYSTEMS, INC AND "SUBCONTRACTOR" IS BORREGO'S INSTALLATION SUBCONTRACTOR.
2. THESE NOTES SET MINIMUM STANDARDS FOR CONSTRUCTION. THE DRAWINGS GOVERN OVER THESE NOTES TO THE EXTENT SHOWN.
3. ALL WORK SHALL CONFORM TO THE MINIMUM STANDARDS OF THE FOLLOWING: LOCAL BUILDING CODE, LOCAL ELECTRICAL CODE, ANY OTHER REGULATING AGENCIES WHICH HAVE AUTHORITY OVER ANY PORTION OF THE WORK AND THOSE CODES AND STANDARDS LISTED IN THESE DRAWINGS AND IN THE SUBCONTRACTOR AGREEMENT.
4. EXCEPTIONS TO THE CONTRACT DOCUMENTS ARE PERMITTED ONLY WITH THE APPROVAL OF BORREGO.
5. COORDINATE THESE DRAWINGS WITH SPECIFICATIONS AND MANUFACTURER INSTALLATION AND OPERATION MANUALS AND NOTIFY BORREGO OF ANY DISCREPANCIES PRIOR TO BEGINNING WORK.
6. DRAWINGS HAVE BEEN DETAILED IN COMPLIANCE WITH U.L. LISTING REQUIREMENTS AND THE BUILDING CODE FOR THE MATERIALS SPECIFIED. IF AN ALTERNATE OR SUBSTITUTED MATERIAL IS ACCEPTED AS AN EQUAL BY BORREGO, THE SUBCONTRACTOR WILL ASSUME THE RESPONSIBILITY FOR WHATEVER CONSTRUCTION MODIFICATION AND/OR ADDITIONAL COST THAT IS REQUIRED BY REASON OF THIS ACCEPTANCE.
7. PRIOR TO THE COMMENCEMENT OF ANY WORK, EACH TRADE SHALL VERIFY EXISTING CONDITIONS AND NOTIFY BORREGO OF ANY DISCREPANCIES TO THAT WHICH IS SHOWN IN THESE DRAWINGS, INCLUDING BUT NOT LIMITED TO DIMENSIONS OF THE WORK AREA, STRUCTURE, EXISTING ELECTRICAL SERVICE, CONDUIT PATHS, OBSTRUCTIONS, ACCESSIBILITY ISSUES, AND WORKING CLEARANCES. ANY WORK PERFORMED IN CONFLICT WITH THE CONTRACT DOCUMENTS OR ANY CODE REQUIREMENTS SHALL BE CORRECTED BY THE SUBCONTRACTOR AT HIS OWN EXPENSE.
8. SUBCONTRACTOR INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO BORREGO FOR APPROVAL PRIOR TO MAKING ANY CHANGES. APPROVED CHANGES REQUIRE A DRAWING REVISION TO MAINTAIN CONTROL OVER THE APPROVED DESIGN. DEVIATION FROM THESE PLANS PRIOR TO BORREGO APPROVAL PLACES ALL LIABILITY ON THE SUBCONTRACTOR.
9. UNLESS INDICATED AS EXISTING (E), ALL PROPOSED MATERIALS AND EQUIPMENT ARE NEW.
10. ALL ITEMS TO BE REMOVED AND RELOCATED OR REPLACED SHALL BE HANDLED WITH PROPER CARE AND STORED IN A SAFE PLACE TO PREVENT DAMAGE; OR BE REPLACED AT THE SUBCONTRACTOR'S EXPENSE.
11. ALL EQUIPMENT SHALL BE MOUNTED AS SHOWN. WHERE DETAILS ARE NOT PROVIDED, THE SUBCONTRACTOR SHALL USE DILIGENT EFFORTS TO MOUNT EQUIPMENT SUCH THAT IT WILL BE CLEAN, LEVEL AND SOLID.
12. ALL SURFACES SHALL BE PATCHED AND PAINTED AROUND NEW DEVICES AND EQUIPMENT TO MATCH EXISTING FINISHES.
13. ANY METAL SHAVINGS RESULTING FROM SITE WORK SHALL BE CLEANED FROM SURFACES, ENCLOSURES AND ANY ADDITIONAL AREAS WHERE OXIDIZED OR CONDUCTIVE METAL SHAVINGS MAY CAUSE RUST, ELECTRICAL SHORT CIRCUITS OR OTHER DAMAGE.
14. NO STRUCTURAL MEMBER SHALL BE DRILLED UNLESS SPECIFICALLY AUTHORIZED BY BORREGO.
15. SUBCONTRACTOR ACKNOWLEDGES THAT THE SYSTEM AS INDICATED ON THE PLANS REQUIRES ALL COMPONENTS TO BE INSTALLED TO PROPERLY RESIST WIND LOADS, SUCH AS BALLAST, WIND DEFLECTORS, ETC. IT IS THE RESPONSIBILITY OF THE SUBCONTRACTOR TO PROVIDE TEMPORARY MEANS TO RESIST WIND LOADS FOR ALL COMPONENTS NOT YET INSTALLED DURING AND AFTER REGULAR WORKING HOURS. THIS MAY INCLUDE TEMPORARY TIE DOWNS, COVERING, BALLAST OR ANY OTHER MEANS. DAMAGE TO ANY INSTALLED SYSTEM COMPONENT OR THE EXISTING FACILITY AS A RESULT OF THE UNFINISHED CONDITION NOT ADEQUATELY RESISTING WIND SHALL BE THE RESPONSIBILITY OF THE SUBCONTRACTOR TO REPAIR OR REPLACE AT THE SUBCONTRACTOR'S COST.
16. TREES MAY GROW DURING THE LIFE OF THE SYSTEM AND IMPACT THE PRODUCTION.

V.7

APPLICABLE CODES AND STANDARDS

2008 NATIONAL ELECTRICAL CODE
2012 INTERNATIONAL BUILDING CODE
UL–1703 – SOLAR MODULES
UL–1741 – INVERTERS, COMBINER BOXES
UL–2703 – RACKING MOUNTING SYSTEMS AND CLAMPING DEVICES FOR PV MODULES

PROJECT SCOPE

THIS PROJECT CONSISTS OF THE INSTALLATION OF SOLAR MODULES PER THE SYSTEM DESCRIPTION, BELOW. THE MODULES WILL BE INSTALLED ON A GROUND – SINGLE AXIS TRACKER MOUNTED RACKING SYSTEM. THE MODULES WILL BE WIRED IN SERIES STRINGS AND CONNECTED IN PARALLEL TO THE INVERTERS, WHICH CONVERT THE PHOTOVOLTAIC OUTPUT POWER FROM DC TO AC. THE SOLAR ELECTRIC SYSTEM WILL BE INTERCONNECTED WITH THE EXISTING SITE ELECTRICAL SYSTEM IN ACCORDANCE WITH THE APPLICABLE ELECTRIC CODE AND AMEREN REQUIREMENTS.

SYSTEM DESCRIPTION

SYSTEM SIZE (DC STC)	2,488.320 KW	SYSTEM SIZE (AC)	2,000 KW
MODULES	(6912) JA SOLAR JAM72S01–360/PR		
MODULES PER STRING	27	# OF STRINGS	256
RACKING	ARRAY TECH – DURATRACKHZ –V3	TILT ANGLE	–52 / 52°
INVERTER(S)	(16) SUNGROW SG125HV	CEC EFFICIENCY	98.5% %
AZIMUTH	180° (SOUTH = 180°)		

PROJECT DIRECTORY

LANDOWNER
NANCY HARAZIN
32 SEDGEWICK LANE
OSWEGO, IL 60543
(630)–554–9232

AUTHORITY HAVING JURISDICTION
KENDALL COUNTY PBZ DEPARTMENT
MATT ASSELMEIER – SENIOR PLANNER
111 WEST FOX STREET
YOURKVILLE, IL 60560
(630)–553–4141
MASSELMEIER@CO.KENDALL.IL.US

UTILITY
AMEREN

PROJECT MANAGER
FIRM: BORREGO SOLAR
CONTACT: MIKE DAUGHERTY
PHONE: (619)–961–4538

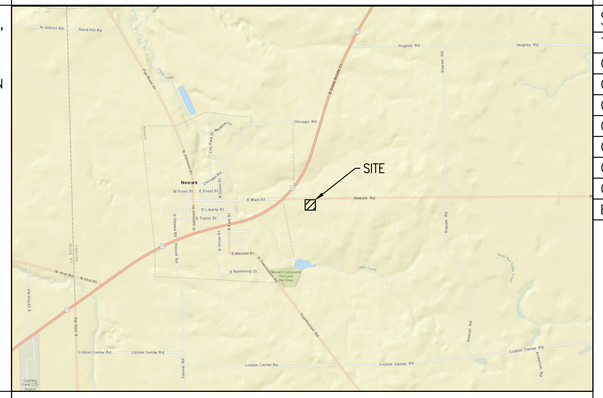
CIVIL ENGINEER
FIRM: GREENBERGFARROW
CONTACT: KERI WILLIAMS
PHONE: (781)–929–1651

STRUCTURAL ENGINEER
FIRM: BORREGO SOLAR SYSTEMS, INC.
CONTACT: MICHAEL KLUG
PHONE: (978)–221–3099

ELECTRICAL ENGINEER
FIRM: BORREGO SOLAR SYSTEMS, INC.
CONTACT: PAT RETELLE, P.E., PMP
PHONE: (978)–610–2864

DESIGN ENGINEER
FIRM: BORREGO SOLAR
CONTACT: JOHN LAGASSE
PHONE: (978)–973–5022

LOCATION MAP



AERIAL VIEW



DRAWING LIST

Sheet Number	Sheet Title
T–1	TITLE PAGE
C–1.0	EXISTING CONDITIONS PLAN
C–2.0	LAYOUT AND MATERIALS PLAN
C–3.0	GRADING AND EROSION CONTROL PLAN
C–4.0	CIVIL DETAILS
C–5.0	DECOMMISSIONING PLAN
C–6.0	LANDSCAPE PLAN
C–6.1	LANDSCAPE NOTES AND DETAILS
E–6.0	PLACARDS

GENERAL ABBREVIATIONS

(E)	EXISTING
AHJ	AUTHORITY HAVING JURISDICTION
AL	ALUMINUM
APPROX	APPROXIMATE
ARY	ARRAY
BLDG	BUILDING
BSS	BORREGO SOLAR SYSTEM
CL	CENTERLINE
DAS	DATA ACQUISITION SYSTEM
DIA	DIAMETER
DO	DITTO
EW	EAST–WEST
FBO	FURNISHED BY OTHERS
FF	FORWARD FACING
GALV	GALVANIZED
HDG	HOT DIP GALVANIZED
HVAC	HEATING VENTILATION AND AIR CONDITIONING
ID	INSIDE DIAMETER
MFR	MANUFACTURER
MOD	SOLAR MODULE
NS	NORTH–SOUTH
NTS	NOT TO SCALE
OAE	OR APPROVED EQUAL
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
PV	PHOTOVOLTAIC
PVC	POLY VINYL CHLORIDE
SCH	SCHEDULE
SS	STAINLESS STEEL
SSS	SOLAR SUPPORT STRUCTURE
STC	STANDARD TEST CONDITIONS
TBD	TO BE DETERMINED
TP	TAMPER PROOF
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
VIF	VERIFY IN FIELD
WP	WEATHER PROOF

REV 1.0

THIS DOCUMENT IS PROVIDED BY BORREGO SOLAR SYSTEMS, INC. TO FACILITATE THE SALE AND INSTALLATION OF A SOLAR POWER SYSTEM FROM BORREGO SOLAR SYSTEMS, INC. REPRODUCTION, RELEASE OR UTILIZATION FOR ANY OTHER PURPOSE, WITHOUT PRIOR WRITTEN CONSENT IS STRICTLY PROHIBITED.

BORREGO SOLAR
55 TECHNOLOGY DRIVE, SUITE 102
LOWELL, MA 01851
PHONE: (888) 898–6273
FAX: (888) 843–6778
WWW.BORREGOSOLAR.COM

GreenbergFarrow
21 SOUTH EVERGREEN AVENUE
SUITE 200
ARLINGTON HEIGHTS, IL 60005
t: 847 788 9200 f: 847 788 9537

NOT FOR CONSTRUCTION

LICENSED PROFESSIONAL ENGINEER
KERI L. WILLIAMS
062–058662
STATE OF ILLINOIS

PROFESSIONAL IN CHARGE
KERI WILLIAMS
PROFESSIONAL ENGINEER
LICENSE NO. 062–058662

SITE USE PLANS
16400 NEWARK ROAD
16400 NEWARK ROAD, NEWARK, IL 60541

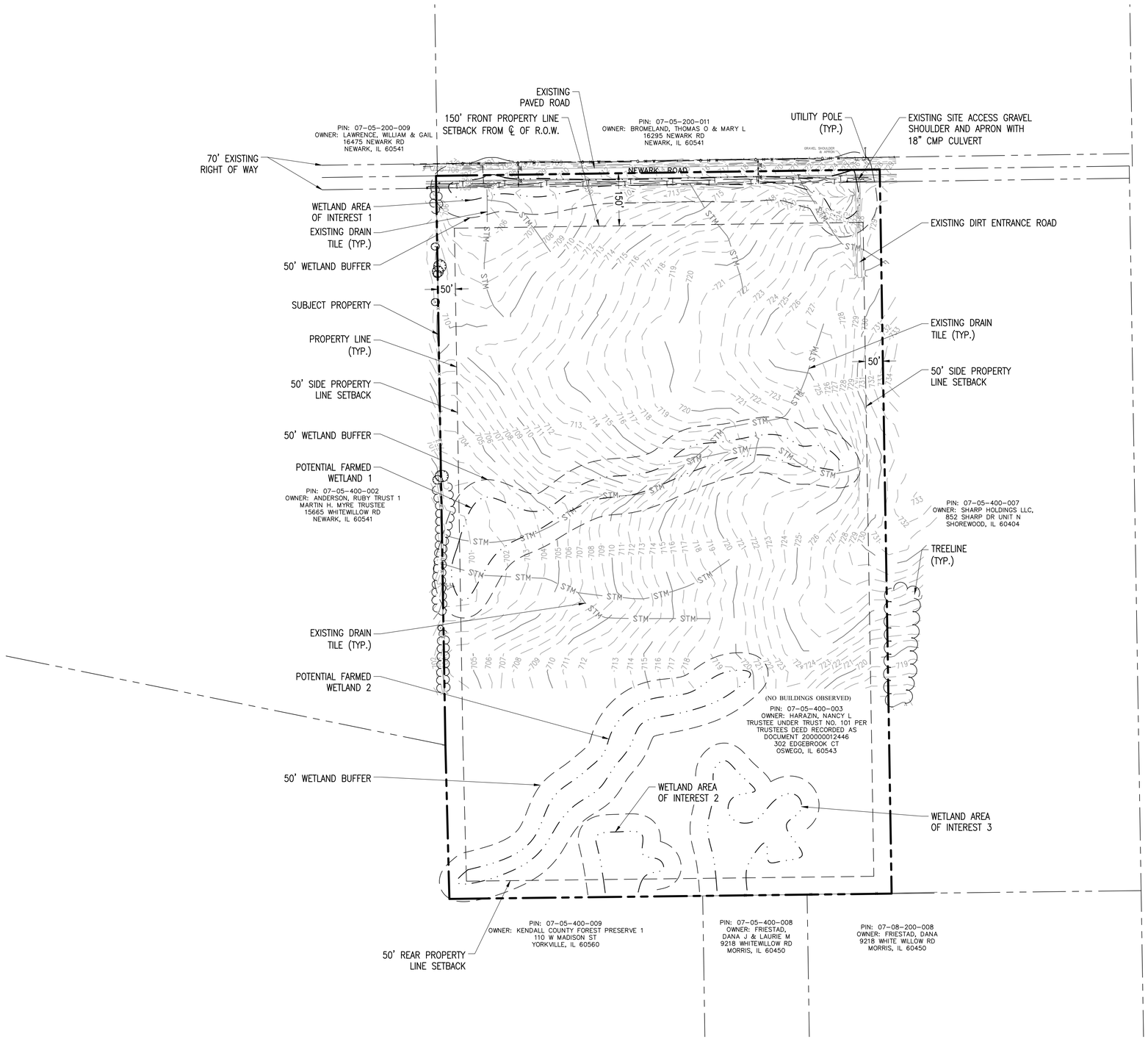
PROJECT NUMBER:
907–0142

REV	DATE	DRAWN	CHECKED	RELEASE LEVEL
	04/12/18	TB	JC	SITE USE PLAN SET

SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

T-1
TITLE PAGE

P:\2018\201801170\800 Civil_Current Drawings\16400 Newark Road – SUP _041018_TB



EXISTING CONDITIONS PLAN

SCALE: 1" = 150'

0 150' 300'

THIS DOCUMENT IS PROVIDED BY BORREGO SOLAR SYSTEMS, INC. TO FACILITATE THE SALE AND INSTALLATION OF A SOLAR POWER SYSTEM FROM BORREGO SOLAR SYSTEMS, INC. REPRODUCTION, RELEASE OR UTILIZATION FOR ANY OTHER PURPOSE, WITHOUT PRIOR WRITTEN CONSENT IS STRICTLY PROHIBITED.

BORREGO SOLAR
55 TECHNOLOGY DRIVE, SUITE 102
LOWELL, MA 01851
PHONE: (888) 898-6273
FAX: (888) 843-6778
WWW.BORREGOSOLAR.COM

GreenbergFarrow
21 SOUTH EVERGREEN AVENUE
SUITE 200
ARLINGTON HEIGHTS, IL 60005
t: 847 788 9200 f: 847 788 9537

NOT FOR CONSTRUCTION

LICENSED PROFESSIONAL ENGINEER
KERI L. WILLIAMS
062-058662
STATE OF ILLINOIS
4/12/18
EXPIRES: 11/30/19

PROFESSIONAL IN CHARGE
KERI WILLIAMS
PROFESSIONAL ENGINEER
LICENSE NO. 062-058662

SITE USE PLANS
16400 NEWARK ROAD
16400 NEWARK ROAD, NEWARK, IL 60541

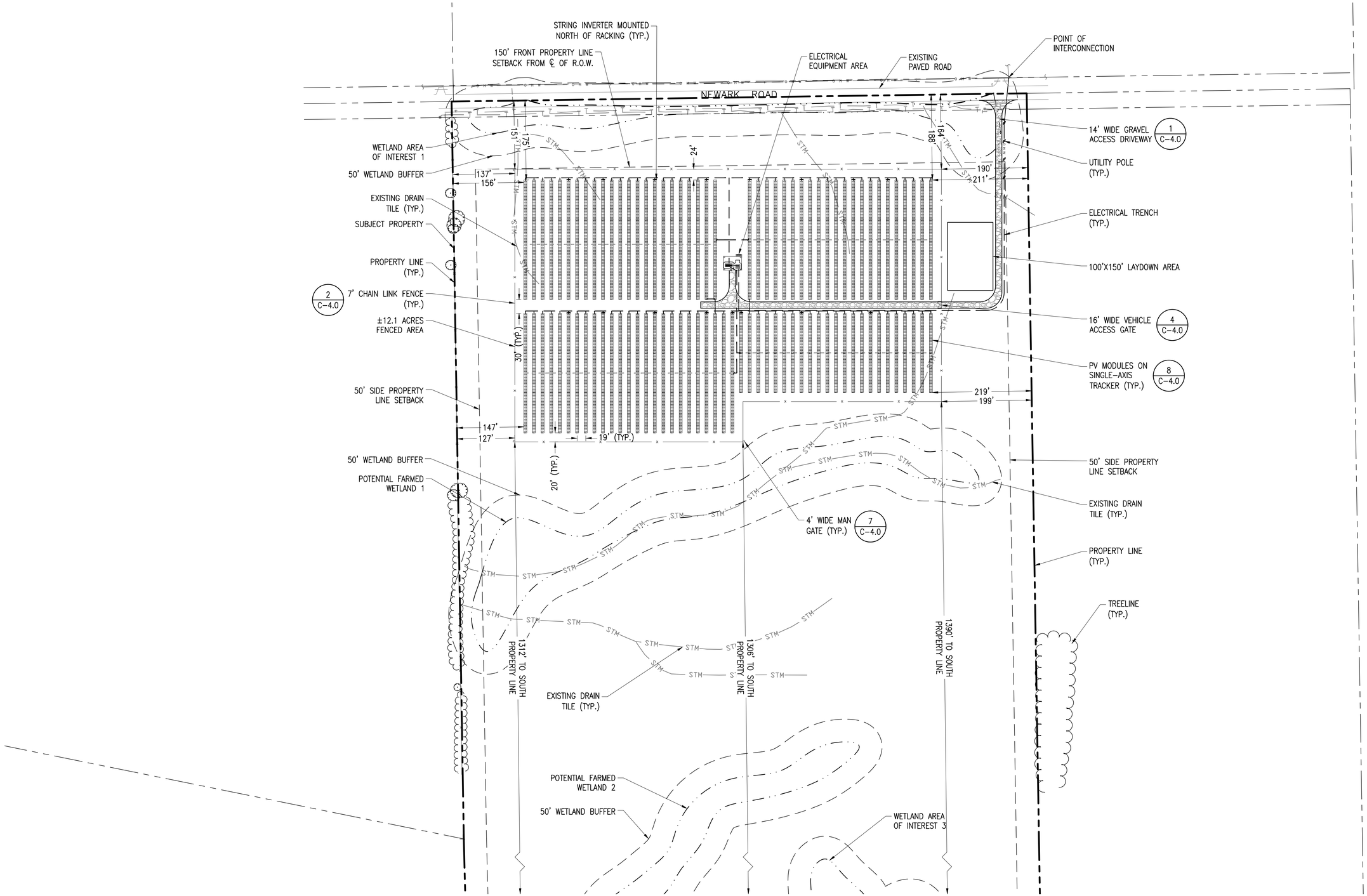
PROJECT NUMBER: 907-0142

REV	DATE	DRAWN	CHECKED	RELEASE LEVEL
	04/12/18	TB	JC	SITE USE PLAN SET

SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

C-1.0
EXISTING CONDITIONS PLAN

P:\2018\201801170\800 Civil_Current Drawings\16400 Newark Road - SUP _041018_TB



LAYOUT AND MATERIALS PLAN

SCALE: 1" = 100'

0 100' 200'

THIS DOCUMENT IS PROVIDED BY BORREGO SOLAR SYSTEMS, INC. TO FACILITATE THE SALE AND INSTALLATION OF A SOLAR POWER SYSTEM FROM BORREGO SOLAR SYSTEMS, INC. REPRODUCTION, RELEASE OR UTILIZATION FOR ANY OTHER PURPOSE, WITHOUT PRIOR WRITTEN CONSENT IS STRICTLY PROHIBITED.

BORREGO SOLAR
55 TECHNOLOGY DRIVE, SUITE 102
LOWELL, MA 01851
PHONE: (888) 898-6273
FAX: (888) 843-6778
WWW.BORREGOSOLAR.COM

GreenbergFarrow
21 SOUTH EVERGREEN AVENUE
SUITE 200
ARLINGTON HEIGHTS, IL 60005
t: 847 788 9200 f: 847 788 9537

NOT FOR CONSTRUCTION

LICENSED PROFESSIONAL ENGINEER
KERI L. WILLIAMS
062-058662
STATE OF ILLINOIS
11/30/19

PROFESSIONAL IN CHARGE
KERI WILLIAMS
PROFESSIONAL ENGINEER
LICENSE NO. 062-058662

SITE USE PLANS
16400 NEWARK ROAD
16400 NEWARK ROAD, NEWARK, IL 60541

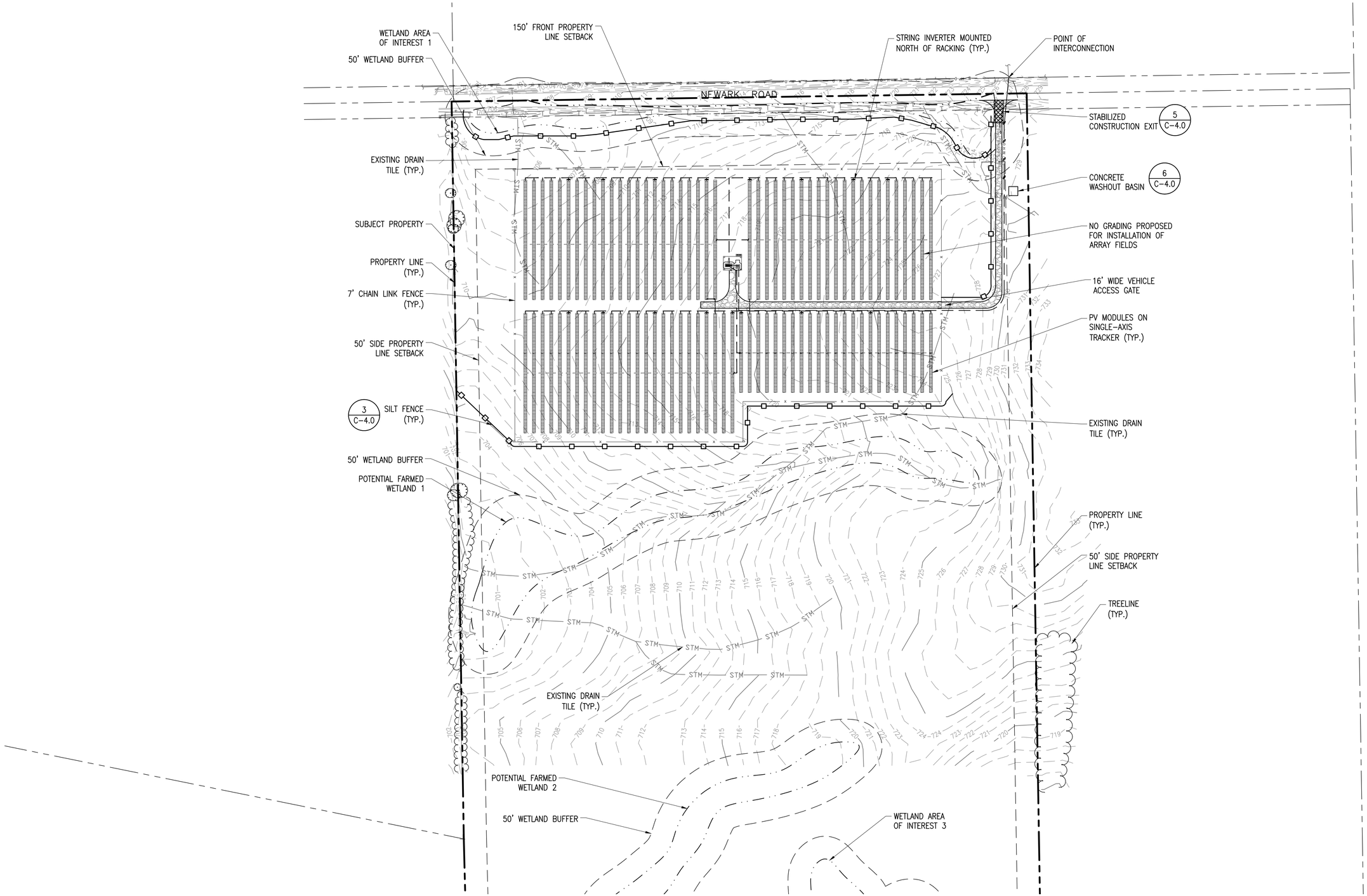
PROJECT NUMBER: 907-0142

REV	DATE	DRAWN	CHECKED	RELEASE LEVEL
	04/12/18	TB	JC	SITE USE PLAN SET

SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

C-2.0
LAYOUT AND MATERIALS PLAN

P:\2018\201801170\800 Civil_Current Drawings\16400 Newark Road - SUP _041018_TB



GRADING AND EROSION CONTROL PLAN

SCALE: 1" = 100'

0 100' 200'

THIS DOCUMENT IS PROVIDED BY BORREGO SOLAR SYSTEMS, INC. TO FACILITATE THE SALE AND INSTALLATION OF A SOLAR POWER SYSTEM FROM BORREGO SOLAR SYSTEMS, INC. REPRODUCTION, RELEASE OR UTILIZATION FOR ANY OTHER PURPOSE, WITHOUT PRIOR WRITTEN CONSENT IS STRICTLY PROHIBITED.

BORREGO SOLAR
55 TECHNOLOGY DRIVE, SUITE 102
LOWELL, MA 01851
PHONE: (888) 898-6273
FAX: (888) 843-6778
WWW.BORREGOSOLAR.COM

GreenbergFarrow
21 SOUTH EVERGREEN AVENUE
SUITE 200
ARLINGTON HEIGHTS, IL 60005
t: 847 788 9200 f: 847 788 9537

NOT FOR CONSTRUCTION

LICENSED PROFESSIONAL ENGINEER
KERI L. WILLIAMS
062-058662
STATE OF ILLINOIS

PROFESSIONAL IN CHARGE
KERI WILLIAMS
PROFESSIONAL ENGINEER
LICENSE NO. 062-058662

SITE USE PLANS
16400 NEWARK ROAD
16400 NEWARK ROAD, NEWARK, IL 60541

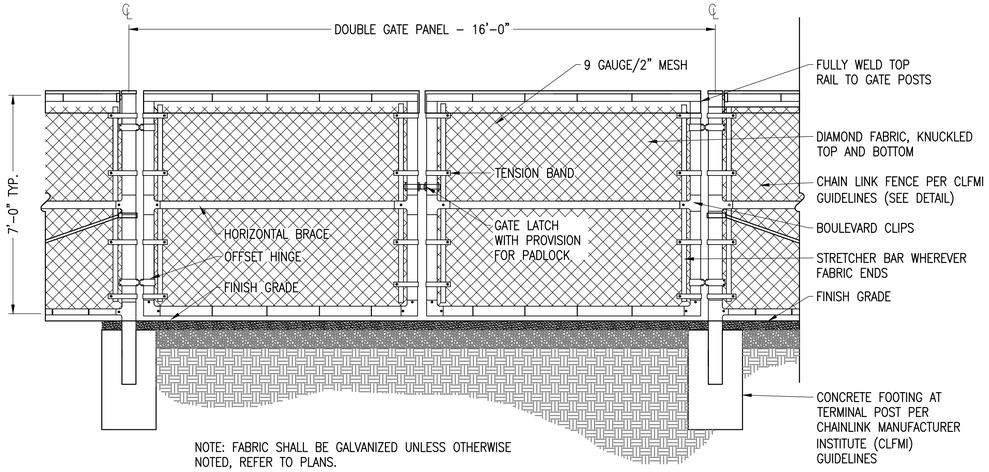
PROJECT NUMBER:
907-0142

REV	DATE	DRAWN	CHECKED	RELEASE LEVEL
	04/12/18	TB	JC	SITE USE PLAN SET

SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

C-3.0
GRADING AND EROSION CONTROL PLAN

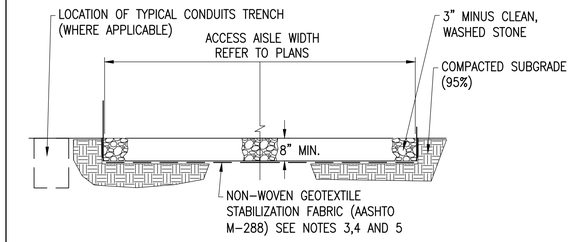
P:\2018\20180117\00 Civil_Current Drawings\16400 Newark Road - SUP _041018_TB



4 VEHICLE GATE

SCALE: NTS

XD_CIVIL_FENCE_VEHICLE GATE_7' OR 8' 07–25–2017



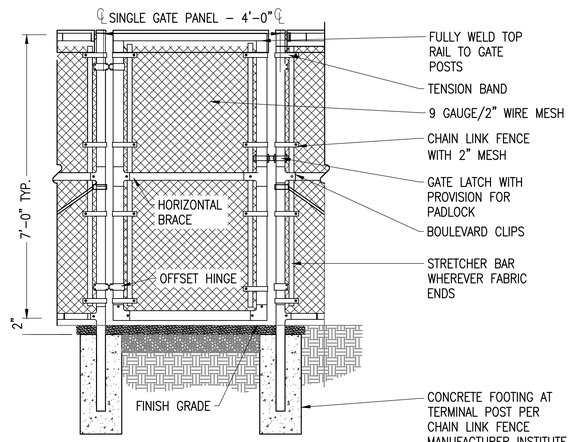
NOTES:

1. SUBCONTRACTOR SHALL EXCAVATE TO SUITABLE MATERIAL FOR SUBGRADE.
2. SUBCONTRACTOR SHALL COMPACT SUBGRADE TO PROVIDE SUITABLE SURFACE TO PLACE ROAD.
3. GEOTEXTILE FABRIC SHALL MEET THE FOLLOWING REQUIREMENTS:
   - TENSILE STRENGTH: 150 LB MIN.
   - ELONGATION: 50%
   - CBR PUNCTURE: 400 LB MIN.
   - MINIMUM WATER FLOW RATE: 120 GPM / FT²
4. SUBCONTRACTOR SHALL FOLLOW GEOTEXTILE FABRIC MANUFACTURER INSTALLATION PROCEDURES.
5. WHERE OVERLAPPING OF GEOTEXTILE FABRIC IS REQUIRED, SUBCONTRACTOR SHALL OVERLAP A MINIMUM OF 24".
6. SUBCONTRACTOR SHALL REMOVE TEMPORARY CONSTRUCTION ACCESS ROADS, AND RESTORE TO PRE–CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE CEOR AND THE GOVERNING AGENCIES.

1 GRAVEL ACCESS ROAD

SCALE: NTS

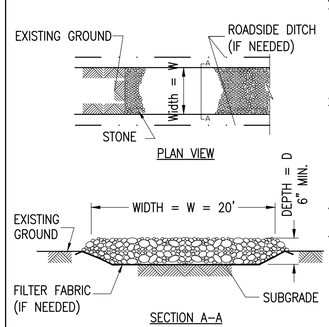
XD_CIVIL_GRAVEL_ROAD_NY 07–24–2017



7 4' MAN GATE

SCALE: NTS

XD_CIVIL_SITE CONSTRUCTION_4' WALK THROUGH GATE 07–25–2017

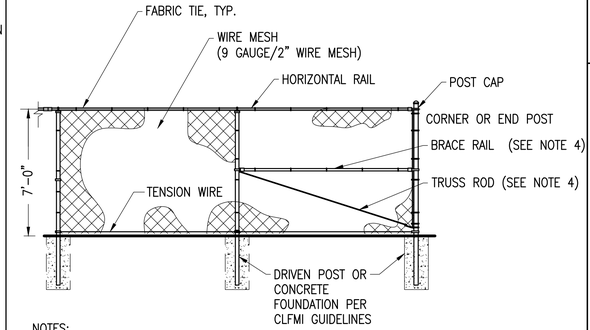


NOTES:

1. FILTER FABRIC SHALL MEET THE REQUIREMENTS OF MATERIAL SPECIFICATION 592 GEOTEXTILE, TABLE 1 OR 2, CLASS I, II OR IV AND SHALL BE PLACED OVER THE CLEARED AREA PRIOR TO THE PLACING OF ROCK.
2. STONE SHALL MEET ONE OF THE FOLLOWING IDOT COARSE AGGREGATE GRADATIONS, CA–1, CA–2, CA–3, OR CA–4 AND BE PLACED ACCORDING TO CONSTRUCTION SPECIFICATION 25 ROCKFILL USING PLACEMENT METHOD 1 AND CLASS III COMPACTION.
3. SEE PLANS FOR CONSTRUCTION ROAD LOCATION, D AND W DIMENSIONS.
4. MINIMUM WIDTH IS 14 FEET FOR ONE–WAY TRAFFIC AND 20 FEET FOR TWO–WAY TRAFFIC. TWO–WAY TRAFFIC WIDTHS SHALL BE INCREASED A MINIMUM OF 4 FEET FOR TRAILER TRAFFIC. DEPENDING ON THE TYPE OF VEHICLE OR EQUIPMENT, SPEED, LOADS, CLIMATIC AND OTHER CONDITIONS UNDER WHICH VEHICLES AND EQUIPMENT OPERATE AN INCREASE IN THE MINIMUM WIDTHS MAY BE REQUIRED.
5. ROADWAY SHALL FOLLOW THE CONTOUR OF THE NATURAL TERRAIN TO THE EXTENT POSSIBLE.

5 STABILIZED CONSTRUCTION ENTRANCE

SCALE: NTS



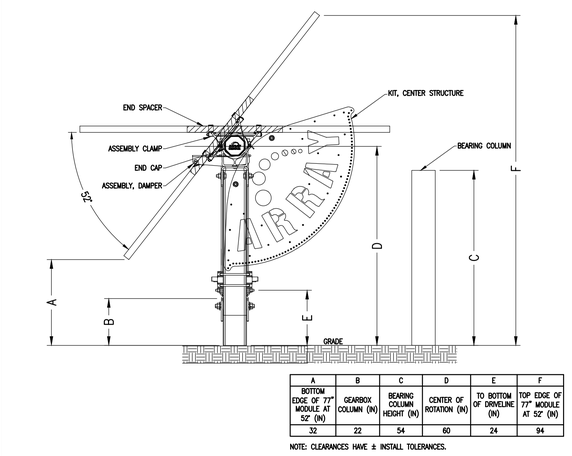
NOTES:

1. THE FENCE SHALL MEET OR EXCEED THE CHAIN LINK FENCE MANUFACTURER INSTITUTE (CLFMI) GUIDELINES AND RELATED FEDERAL SPECIFICATIONS FOR SECURITY CHAIN LINK FENCE MATERIALS AND INSTALLATION.
2. ALL FENCE MATERIAL AND COMPONENTS SHALL BE GALVANIZED, UNLESS OTHERWISE NOTED.
3. THIS DETAIL NOT APPLICABLE FOR PRIVACY FENCE OR FENCE WITH SLATS.
4. ADJUSTABLE TRUSS ROD AND BRACE RAIL AT CORNER OR END POSTS ONLY, IF REQUIRED BY CLFMI GUIDELINES.

2 CHAIN LINK FENCE

SCALE: NTS

XD_CIVIL_FENCE_7'_CHAIN_LINK 06–10–2016



A	B	C	D	E	F
BOTTOM EDGE OF 77" MODULE AT 52" (IN)	GEARBOX COLUMN (IN)	BEARING COLUMN HEIGHT (IN)	CENTER OF ROTATION (IN)	TO BOTTOM OF DRIVELINE (IN)	TOP EDGE OF 77" MODULE AT 52" (IN)
32	22	54	60	24	94

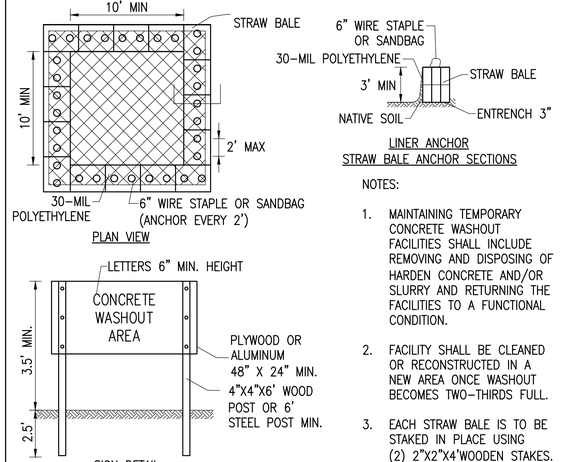
NOTE: CLEARANCES HAVE ± INSTALL TOLERANCES.

8 VERTICAL MOUNT MOTOR CLEARANCES

ATI

SCALE: N.T.S.

XD_STRUC_ATI_ARRAY_ELEVATION 2018–02–15

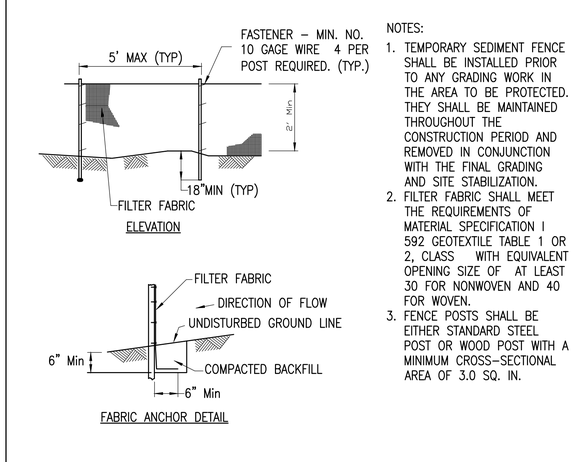


NOTES:

1. MAINTAINING TEMPORARY CONCRETE WASHOUT FACILITIES SHALL INCLUDE REMOVING AND DISPOSING OF HARDEN CONCRETE AND/OR SLURRY AND RETURNING THE FACILITIES TO A FUNCTIONAL CONDITION.
2. FACILITY SHALL BE CLEANED OR RECONSTRUCTED IN A NEW AREA ONCE WASHOUT BECOMES TWO–THIRDS FULL.
3. EACH STRAW BALE IS TO BE STAKED IN PLACE USING (2) 2"X2"X4'WOODEN STAKES.

6 CONCRETE WASHOUT

SCALE: NTS



NOTES:

1. TEMPORARY SEDIMENT FENCE SHALL BE INSTALLED PRIOR TO ANY GRADING WORK IN THE AREA TO BE PROTECTED. THEY SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD AND REMOVED IN CONJUNCTION WITH THE FINAL GRADING AND SITE STABILIZATION.
2. FILTER FABRIC SHALL MEET THE REQUIREMENTS OF MATERIAL SPECIFICATION I 592 GEOTEXTILE TABLE 1 OR 2, CLASS WITH EQUIVALENT OPENING SIZE OF AT LEAST 30 FOR NONWOVEN AND 40 FOR WOVEN.
3. FENCE POSTS SHALL BE EITHER STANDARD STEEL POST OR WOOD POST WITH A MINIMUM CROSS–SECTIONAL AREA OF 3.0 SQ. IN.

3 SILT FENCE

SCALE: NTS

THIS DOCUMENT IS PROVIDED BY BORREGO SOLAR SYSTEMS, INC. TO FACILITATE THE SALE AND INSTALLATION OF A SOLAR POWER SYSTEM FROM BORREGO SOLAR SYSTEMS, INC. REPRODUCTION, RELEASE OR UTILIZATION FOR ANY OTHER PURPOSE, WITHOUT PRIOR WRITTEN CONSENT IS STRICTLY PROHIBITED.

BORREGO SOLAR
55 TECHNOLOGY DRIVE, SUITE 102
LOWELL, MA 01851
PHONE: (888) 898–6273
FAX: (888) 843–6778
WWW.BORREGOSOLAR.COM

GreenbergFarrow
21 SOUTH EVERGREEN AVENUE
SUITE 200
ARLINGTON HEIGHTS, IL 60005
t: 847 788 9200 f: 847 788 9537

NOT FOR CONSTRUCTION

LICENSED PROFESSIONAL ENGINEER
KERI L. WILLIAMS
062-058662
4/10/18
STATE OF ILLINOIS

PROFESSIONAL IN CHARGE
KERI WILLIAMS
PROFESSIONAL ENGINEER
LICENSE NO. 062–058662

SITE USE PLANS
16400 NEWARK ROAD
16400 NEWARK ROAD, NEWARK, IL 60541

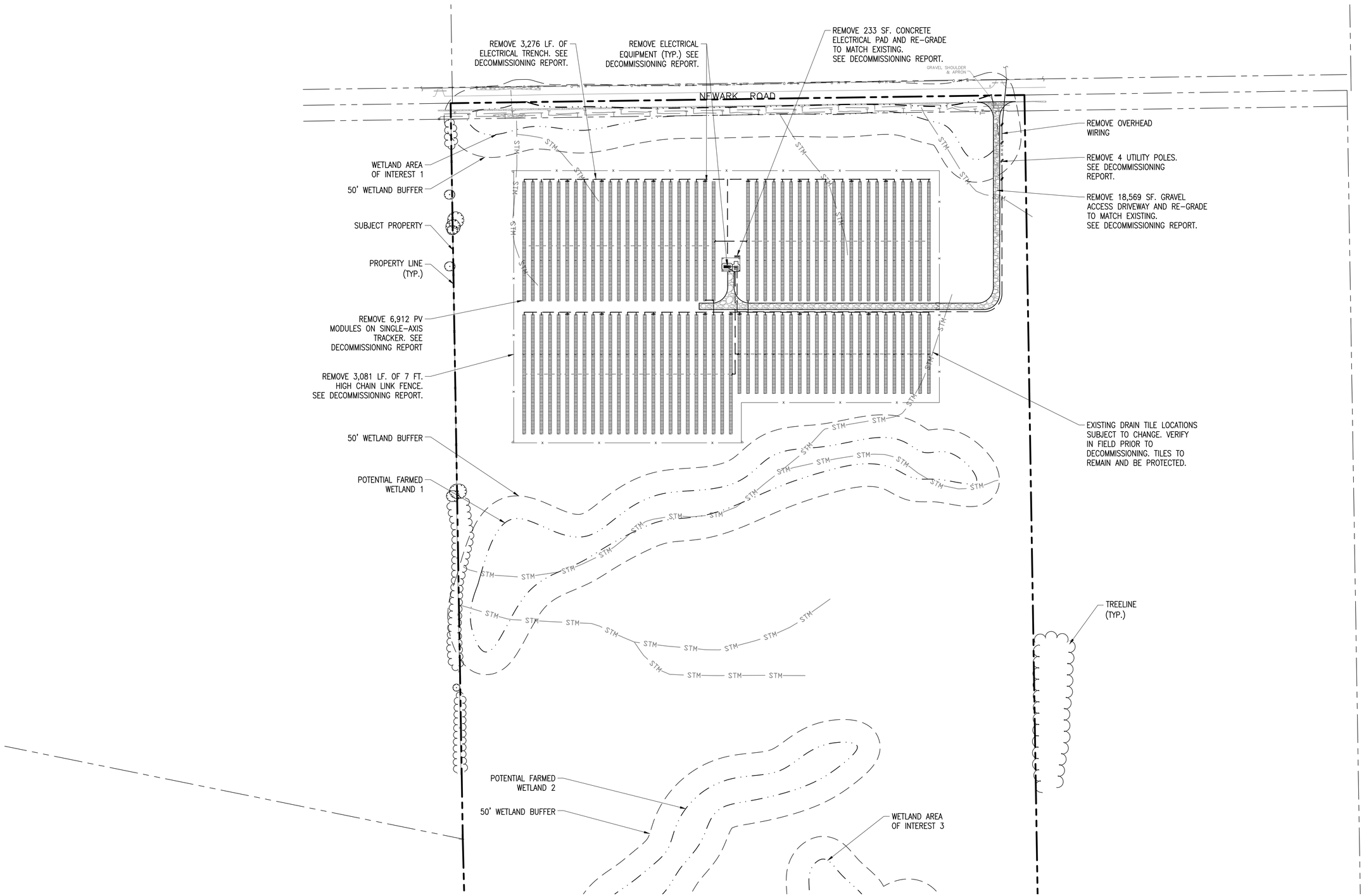
PROJECT NUMBER: 907–0142

REV	DATE	DRAWN	CHECKED	RELEASE LEVEL
	04/12/18	TB	JC	SITE USE PLAN SET

SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

C-4.0
CIVIL DETAILS

P:\2018\20180117\000 Civil_Current Drawings\16400 Newark Road – SUP _041018_TB



DECOMMISSIONING PLAN

SCALE: 1" = 100'

0 100' 200'

THIS DOCUMENT IS PROVIDED BY BORREGO SOLAR SYSTEMS, INC. TO FACILITATE THE SALE AND INSTALLATION OF A SOLAR POWER SYSTEM FROM BORREGO SOLAR SYSTEMS, INC. REPRODUCTION, RELEASE OR UTILIZATION FOR ANY OTHER PURPOSE, WITHOUT PRIOR WRITTEN CONSENT IS STRICTLY PROHIBITED.

BORREGO SOLAR
55 TECHNOLOGY DRIVE, SUITE 102
LOWELL, MA 01851
PHONE: (888) 898-6273
FAX: (888) 843-6778
WWW.BORREGOSOLAR.COM

GreenbergFarrow
21 SOUTH EVERGREEN AVENUE
SUITE 200
ARLINGTON HEIGHTS, IL 60005
t: 847 788 9200 f: 847 788 9537

NOT FOR CONSTRUCTION

LICENSED PROFESSIONAL ENGINEER
KERI L. WILLIAMS
062-058662
STATE OF ILLINOIS
11/30/19

PROFESSIONAL IN CHARGE
KERI WILLIAMS
PROFESSIONAL ENGINEER
LICENSE NO. 062-058662

SITE USE PLANS
16400 NEWARK ROAD
16400 NEWARK ROAD, NEWARK, IL 60541

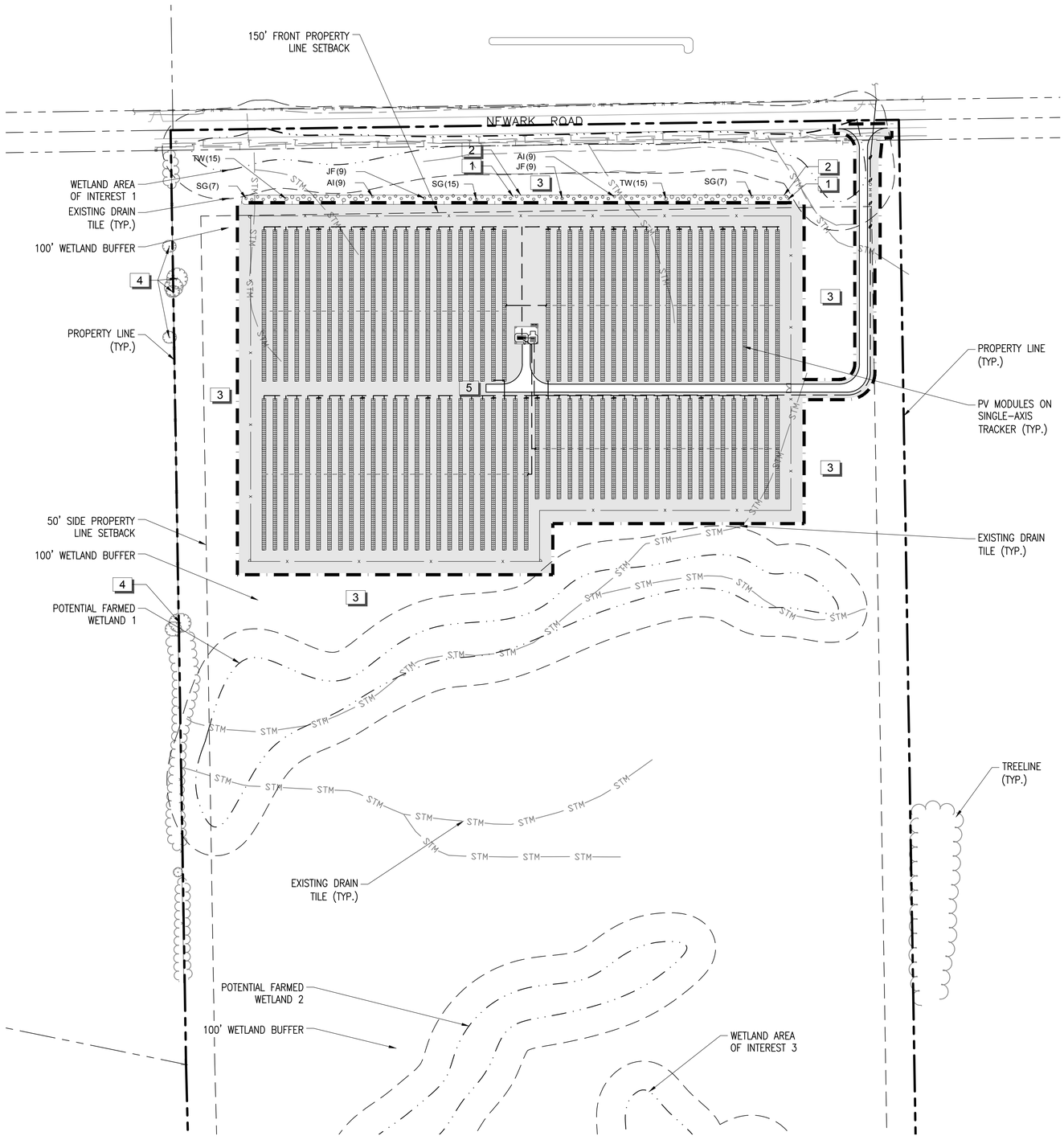
PROJECT NUMBER:
907-0142

REV	DATE	DRAWN	CHECKED	RELEASE LEVEL
	04/12/18	TB	JC	SITE USE PLAN SET

SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

C-5.0
DECOMMISSIONING PLAN

P:\2018\20180117\00 Civil_Current Drawings\16400 Newark Road - SUP _041018_TB



REFERENCE NOTES SCHEDULE

SYMBOL	DESCRIPTION
1	3" DEPTH SHREDDED BARK MULCH IN ALL PLANTING BEDS TYPICAL UNLESS OTHERWISE NOTED ON PLAN.
2	CULTIVATED BEDLINE 4" DEPTH. SEE DETAIL.
3	EXISTING AREA TO REMAIN. (TYP.) CONTRACTOR SHALL PROTECT DURING CONSTRUCTION. ANY DAMAGE TO THIS AREA SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER.
4	EXISTING TREE TO REMAIN. (TYP.) PROTECT DURING CONSTRUCTION. ANY DAMAGE TO THE EXISTING PLANT MATERIAL SHALL BE REPLACED WITH LIKE SPECIES AT NO ADDITIONAL COST TO THE OWNER.
5	CONTRACTOR TO INSTALL NO MOW LAWN SEED MIX PROVIDED BY PRAIRIE NURSERY. (TYP.) INSTALL PER SUPPLIERS' SEEDING RATE SPECIFICATIONS.

PLANT SCHEDULE

SHRUBS	CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT	HEIGHT
	AI	18	Aronia melanocarpa `Iroquois Beauty` TM	Black Chokeberry	#05/5 gal	30" Ht.
	JF	18	Juniperus chinensis `Sea Green`	Sea Green Juniper	#05/5 gal	24"-30" Ht. Min.
	SG	29	Spiraea x cinerea `Grefsheim`	Spiraea	#05/5 gal	24"-30" Ht. Min.
	TW	30	Thuja occidentalis `Woodwardii`	Woodward Arborvitae	#05/5 gal	24"-30" Ht. Min.

SHRUB HEIGHT MEASUREMENTS ARE TO BE AS MEASURED FROM TOP OF ROOTBALL (TYP.)

SEED LIST

NO MOW LAWN SEED MIX WITH EROSION CONTROL BLANKET (±13.52 ac)

CONTACT INFORMATION FOR NO MOW LAWN SEED MIX ONLY:
Prairie Nursery, Inc.
P.O Box 306
Westfield, WI 53964
1-800-476-9453

LANDSCAPE PLAN

SCALE: 1" = 100'

0 100' 200'

THIS DOCUMENT IS PROVIDED BY BORREGO SOLAR SYSTEMS, INC. TO FACILITATE THE SALE AND INSTALLATION OF A SOLAR POWER SYSTEM FROM BORREGO SOLAR SYSTEMS, INC. REPRODUCTION, RELEASE OR UTILIZATION FOR ANY OTHER PURPOSE, WITHOUT PRIOR WRITTEN CONSENT IS STRICTLY PROHIBITED.

BORREGO SOLAR
55 TECHNOLOGY DRIVE, SUITE 102
LOWELL, MA 01851
PHONE: (888) 898-6273
FAX: (888) 843-6778
WWW.BORREGOSOLAR.COM

GreenbergFarrow
21 SOUTH EVERGREEN AVENUE
SUITE 200
ARLINGTON HEIGHTS, IL 60005
t: 847 788 9200 f: 847 788 9537

NOT FOR CONSTRUCTION

PROFESSIONAL IN CHARGE
LORI VERROW
PROFESSIONAL LANDSCAPE ARCHITECT
LICENSE NO. 157-001163

SITE USE PLANS
16400 NEWARK ROAD
16400 NEWARK ROAD, NEWARK, IL 60541

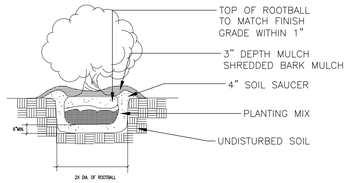
PROJECT NUMBER:
907-0142

REV	DATE	DRAWN	CHECKED	RELEASE LEVEL
	04/12/18	AW	LV	SITE USE PLAN SET

SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

C-6.0
LANDSCAPE PLAN

P:\2018\2018011701\800 Civil_Current Drawings\16400 Newark Road - SUP _041018_TB



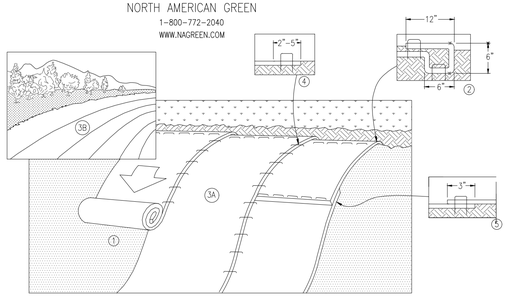
1 SHRUB PLANTING DETAIL

NOT TO SCALE

NOTES:

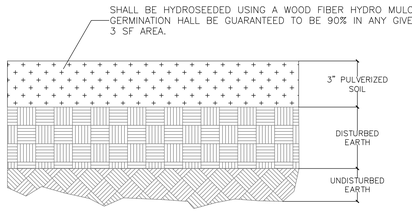
1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED (NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN).
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP's.
3. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2"-5" (5 CM-12.5 CM) OVERLAP DEPENDING ON RECP's TYPE.
5. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP's WIDTH.
6. ONLY BIODEGRADABLE STAPLES SHALL BE USED (NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's).

NORTH AMERICAN GREEN
1-800-772-2040
WWW.NAGREEN.COM



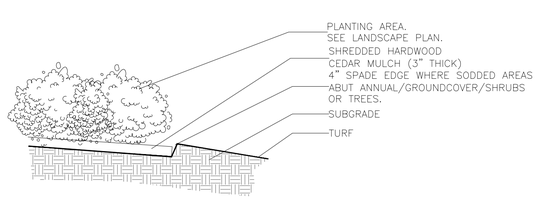
2 EROSION CONTROL BLANKET (ONLY IF ALONG STEEP SLOPES)

NOT TO SCALE



3 SEEDING

1/2" = 1'-0" DETAIL-FILE



4 NATURAL SPADE EDGE

NOT TO SCALE

LANDSCAPE PLAN GENERAL NOTES

1. GRAPHIC SYMBOLS TAKE PRECEDENCE OVER WRITTEN QUANTITIES AND KEYS ON PLAN.
2. CONTRACTOR SHALL REPAIR AND REPLACE ANY PLANT MATERIAL AND EXISTING LAWN AREA DAMAGED BY THIS CONSTRUCTION OUTSIDE PROJECT LIMITS. ANY EXISTING PLANT MATERIAL OR LAWN AREA DAMAGED BY CONTRACTOR DURING CONSTRUCTION SHALL BE REPLACED WITH LIKE MATERIAL OF SIMILAR SPECIES AND SIZE AT THE CONTRACTOR'S EXPENSE WITH NO ADDITIONAL COST TO OWNER OR TENANT.
3. TWO WEEKS PRIOR TO PLANTING, THE CONTRACTOR SHALL SUBMIT TO THE OWNER / OWNER'S REPRESENTATIVE SEED MIX TAGS FOR APPROVAL. NO PARTIAL OR INCOMPLETE SUBMITTAL WILL BE ACCEPTED FOR REVIEW. ANY SUBSTITUTIONS WILL BE SUBJECT TO APPROVAL BY THE LANDSCAPE ARCHITECT.
4. THE LANDSCAPE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE SITE CONDITIONS AND VERIFY THEM TO THEIR SATISFACTION. THE LANDSCAPE CONTRACTOR SHALL ACCEPT THE SITE CONDITIONS AND DO THE WORK SPECIFIED WITHOUT ADDITIONAL COMPENSATION FOR POSSIBLE VARIATION FROM GRADES AND CONDITIONS SHOWN.
5. PRIOR TO CONSTRUCTION THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND SHALL AVOID DAMAGE TO ALL UTILITIES DURING CONSTRUCTION. SHOULD THE LANDSCAPE CONTRACTOR CAUSE DAMAGE TO ANY UTILITIES THEY SHALL MAKE NECESSARY REPAIRS AS QUICKLY AS POSSIBLE WITHOUT ADDITIONAL COMPENSATION TO THE OWNER.
6. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING, IN FULL, ALL LANDSCAPE PLANTING WORK (INCLUDING WATERING, SPRAYING FOR INSECTS AND DISEASE, MULCHING, MOWING, FERTILIZING, CULTIVATING, EDGING AND WEEDING) FOR A PERIOD OF 90 DAYS AFTER ACCEPTANCE BY THE OWNER.
7. TOPSOIL SHALL BE FERTILE, FRIABLE AND REPRESENTATIVE OF LOCAL PRODUCTIVE SOIL, CAPABLE OF SUSTAINING VIGOROUS PLANT GROWTH AND FREE OF CLAY LUMPS, SUBSOIL, NOXIOUS WEEDS OR OTHER FOREIGN MATTER SUCH AS STONES, ROOTS, STICKS AND OTHER EXTRANEOUS MATERIALS: NOT FROZEN OR MUDDY. PH OF TOPSOIL TO RANGE BETWEEN 5.5 AND 7.5.
8. ALL PLANT MATERIAL SIZES AND MEASUREMENTS, INCLUDING TRUNK, HEAD, AND SPREAD SIZES, CONTAINER AND ROOTBALL SIZES, QUALITY AND CONDITION SHALL CONFORM TO THE STANDARDS SET FORTH IN THE CURRENT ISSUE OF, "AMERICAN STANDARDS FOR NURSERY STOCK" (ANSI.Z60.1).
9. ALL PLANTING AREAS, SHRUB BEDS AND TREES SHALL BE MULCHED WITH A MINIMUM COMPACTED DEPTH OF THREE (3) INCHES OF MULCH AS SPECIFIED. PRIOR TO MULCHING APPLY A PRE-EMERGENT HERBICIDE (APPROVED BY OWNER) AS RECOMMENDED BY THE MANUFACTURER, TO PREVENT RECURRING WEED AND GRASS GROWTH.
10. ALL TREES LOCATED IN GRASSED AREAS SHALL BE PLANTED AS PER DETAIL AND MULCHED WITH AT LEAST FOUR (4) FOOT DIAMETER OF SHREDDED BARK MULCH, TO A MINIMUM 3" DEPTH.
11. ALL TREE PROTECTION DEVICES ARE TO BE INSTALLED PRIOR TO START OF LAND DISTURBANCE AND MAINTAINED UNTIL FINAL LANDSCAPING IS INSTALLED.
12. ALL TREES ARE TO BE STAKED AND GUYED PER PLANTING DETAILS.
13. THE CONTRACTOR SHALL FINE GRADE AND SEED DISTURBED AREAS WITH NO MOW LAWN SEED MIX SUPPLIED BY PRAIRIE NURSERY. CONTRACTOR SHALL INSTALL EROSION CONTROL BLANKET. SEE EROSION CONTROL BLANKET DETAIL.
14. CONTRACTOR SHALL PLANT NO MOW LAWN SEED MIX BETWEEN THE FOLLOWING TIME PERIODS:
    - 14.1. FALL: (AUGUST 20 TO OCTOBER 20)
    - 14.2. SPRING: (MARCH 15 TO MAY 15)
    - 14.3. IT IS RECOMMENDED TO PLANT DURING FALL DUE TO COOL TEMPERATURES, GENTLE RAINS AND LOWER WEED GERMINATION.

    - 14.1. CULTIVATING OPTION
      - 14.1.1. IF PERENNIAL WEEDS ARE PRESENT, CULTIVATE AT A DEPTH OF FOUR TO FIVE INCHES EVERY TWO TO THREE WEEKS FROM SPRING THROUGH FALL. THIS SHOULD KILL ALL WEEDS ON SITE.

      - 14.1.2. PLANT IN FALL BETWEEN AUGUST 20 AND OCTOBER 20 FOR BEST RESULTS.

15. CONTRACTOR SHALL GUARANTEE THE SEEDING FOR A PERIOD OF ONE GROWING SEASON FROM THE DATE OF SUBSTANTIAL COMPLETION OF TOTAL PROJECT FOR ANY LOSS DUE TO FAULTY MATERIALS, WORKMANSHIP, OR PROCEDURES.
16. THE LANDSCAPE CONTRACTOR SHALL COMPLETELY GUARANTEE ALL LANDSCAPE PLANTING WORK AND MATERIALS FOR A PERIOD OF ONE (1) FULL YEAR FROM THE DATE THE WORK HAS BEEN APPROVED BY THE OWNER AS INSTALLED. ALL PLANT MATERIAL NOT HEALTHY GROWING CONDITION SHALL BE REMOVED IMMEDIATELY AND REPLACED AS SOON AS POSSIBLE WITH LIKE KIND AND SIZE AT NO CHARGE TO THE OWNER.
17. IF ANY SEEDING MUST BE PERFORMED LATER THAN THE SCHEDULED PERIODS THE CONTRACTOR SHALL ALSO GUARANTEE THESE SEEDED AREAS FOR A PERIOD OF ONE GROWING SEASON FROM THE DATE OF SUBSTANTIAL COMPLETION FROM LOSS DUE TO WEATHER CONDITIONS.
18. CONTRACTOR SHALL REFER TO THE LATEST CIVIL PLANS FOR DISTURBED AREAS TO BE RESTORED. ADDITIONAL RESTORATION MAY BE NEEDED DUE TO FIELD CONDITIONS. SEE CIVIL SITE PLAN.

THIS DOCUMENT IS PROVIDED BY BORREGO SOLAR SYSTEMS, INC. TO FACILITATE THE SALE AND INSTALLATION OF A SOLAR POWER SYSTEM FROM BORREGO SOLAR SYSTEMS, INC. REPRODUCTION, RELEASE OR UTILIZATION FOR ANY OTHER PURPOSE, WITHOUT PRIOR WRITTEN CONSENT IS STRICTLY PROHIBITED.

BORREGO SOLAR
55 TECHNOLOGY DRIVE, SUITE 102
LOWELL, MA 01851
PHONE: (888) 898-6273
FAX: (888) 843-6778
WWW.BORREGOSOLAR.COM

GreenbergFarrow
21 SOUTH EVERGREEN AVENUE
SUITE 200
ARLINGTON HEIGHTS, IL 60005
t: 847 788 9200 f: 847 788 9537

NOT FOR CONSTRUCTION

PROFESSIONAL IN CHARGE
LORI VERCH
PROFESSIONAL LANDSCAPE ARCHITECT
LICENSE NO. 157-001163

SITE USE PLANS
16400 NEWARK ROAD
16400 NEWARK ROAD, NEWARK, IL 60541

PROJECT NUMBER:
907-0142

REV	DATE	DRAWN	CHECKED	RELEASE LEVEL
	04/12/18	AW	LV	SITE USE PLAN SET

SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

C-6.1
LANDSCAPE NOTES AND DETAILS

P:\2018\20180117\00_800 Civil_Current Drawings\16400 Newark Road - SUP _041018_TB

P1: DIRECTORY MAP
LOCATION: EQUIPMENT PAD
BACKGROUND COLOR: RED; TEXT COLOR: WHITE

CAUTION
POWER TO THIS SITE IS SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTING MEANS LOCATED AS SHOWN
8" x 8"

P1: DIRECTORY MAP
LOCATION: AC DISCONNECT
BACKGROUND COLOR: RED; TEXT COLOR: WHITE

CAUTION
POWER TO THIS SITE IS SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTING MEANS LOCATED AS SHOWN
8" x 8"

P1: DIRECTORY MAP
LOCATION: UTILITY METER
BACKGROUND COLOR: RED; TEXT COLOR: WHITE

CAUTION
POWER TO THIS SITE IS SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTING MEANS LOCATED AS SHOWN
8" x 8"

P1: DIRECTORY MAP
LOCATION: MAIN GATE
BACKGROUND COLOR: RED; TEXT COLOR: WHITE

CAUTION
POWER TO THIS SITE IS SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTING MEANS LOCATED AS SHOWN
8" x 8"

P2: BORREGO O&M CONTACT INFO
LOCATION: UTILITY ACSW, POI, INV-#, DAS
BACKGROUND COLOR: RED
TEXT COLOR: WHITE

PHOTOVOLTAIC INSTALLATION BY BORREGO SOLAR SYSTEMS INC.
(888) 898-6273
www.borregosolar.com
4" x 1 1/2"

P3: ROOF ARRAY STORAGE PREVENTION
LOCATION: ALL ENTRY POINTS TO THE ROOF
BACKGROUND COLOR: ORANGE
TEXT COLOR: BLACK

WARNING: STORAGE OF ANY AND ALL MATERIAL WITHIN THE PV ARRAY FOOTPRINT IS STRICTLY PROHIBITED
5" x 2"

ARRAY AND EQUIPMENT ID
BACKGROUND COLOR: RED; TEXT COLOR: WHITE

ARY-1	JB-1	INV-1	XFMR-1	PNL-1	RECT-1	MPC-1
CBR-1	DCSW-1	DAS-1	SWGR-1	METER-1A	RPVT-1	PVCB-1
PB-1	ACSW-1	RCBR-1		STATCOM-1	CPT-1	

PAC1: UTILITY PHOTOVOLTAIC DISCONNECTING MEANS
LOCATION: ACSW-X
NEC: 690.54
BACKGROUND COLOR: RED; TEXT COLOR: WHITE

PV SYSTEM DISCONNECT FOR UTILITY OPERATION
AC OUTPUT CURRENT: XXX (A)
NOMINAL AC VOLTAGE: YYY (V)
6" x 2"

PAC2: AC PHOTOVOLTAIC DISCONNECTING MEANS
LOCATION: ACSW-X OR PVCB-X (ONLY IF DC CONDUCTORS ENTER BUILDING)
NEC: 690.13(B), 690.15
BACKGROUND COLOR: RED
TEXT COLOR: WHITE

PHOTOVOLTAIC AC DISCONNECT X OF (X)
6" x 1 1/2"

PAC3: SITE ADDRESS
LOCATION: UTILITY ACSW-X
BACKGROUND COLOR: RED
TEXT COLOR: WHITE

16400 NEWARK ROAD
NEWARK, IL 60541
6" x 1"

PAC7: ADDITIONAL SOURCE
LOCATION: PNL-X, MAIN SERVICE
NEC: 705.12(D)(3)
BACKGROUND COLOR: ORANGE; TEXT COLOR: BLACK

WARNING
DUAL POWER SOURCE SECOND SOURCE IS PHOTOVOLTAIC SYSTEM
6" x 2"

PAC8: DEDICATED SOLAR PANELBOARD
LOCATION: PNL-X
NEC: 705.12(D)(2)(3)(C)
BACKGROUND COLOR: ORANGE
TEXT COLOR: BLACK

WARNING
THIS EQUIPMENT IS FED BY MULTIPLE SOURCES. TOTAL RATING OF ALL OVERCURRENT DEVICES, EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR.
6" x 4"

PAC9: BACKFED BREAKER
LOCATION: PVCB-X
BACKGROUND COLOR: RED TEXT COLOR: WHITE

WARNING
INVERTER OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE
1 1/4" x 2"

PAC10: AC EQUIPMENT DISCONNECTING MEANS
LOCATION: ACSW-X OR INV-# (IF INTEGRAL ACSW)
BACKGROUND COLOR: RED
TEXT COLOR: WHITE

INV - # AC EQUIPMENT DISCONNECTING MEANS
6" x 2"

PAC11: AC DISCONNECT MEANS ENERGIZED
LOCATION: ACSW-X, PNL-X
NEC: 690.17(E)
BACKGROUND COLOR: ORANGE AND WHITE
TEXT COLOR: BLACK

WARNING
ELECTRICAL SHOCK HAZARD DO NOT TOUCH TERMINALS. TERMINALS ON BOTH LINE AND LOAD SIDE MAY BE ENERGIZED IN THE OPEN POSITION
6" x 2 1/2"

PAC12: RAPID SHUTDOWN
LOCATION: RAPID SHUTDOWN SWITCH
NEC: 690.56(C)
BACKGROUND COLOR: RED, REFLECTIVE
TEXT COLOR: WHITE, REFLECTIVE

PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN
6" x 2"

PDC1: DC PHOTOVOLTAIC DISCONNECTING MEANS
LOCATION: DCSW-X
NEC: 690.13(B), 690.15
BACKGROUND COLOR: RED
TEXT COLOR: WHITE

PHOTOVOLTAIC DC DISCONNECT X OF (X)
6" x 2"

PDC2: DC DISCONNECTS
LOCATION: CBR-1 THRU CBR-X
NEC: 690.53
BACKGROUND COLOR: RED
TEXT COLOR: WHITE

PHOTOVOLTAIC DC DISCONNECT
RATED MAX. POWER-POINT CURRENT: XXX (A)
RATED MAX. POWER-POINT VOLTAGE: XXX (V)
MAXIMUM SYSTEM VOLTAGE: XXX (V)
MAXIMUM CURRENT: XXX (A)
7 1/2" x 2 1/2"

PDC2: DC DISCONNECTS
LOCATION: DCSW-X, RCBR-X, DCCT-X, MDSS-X
NEC: 690.53
BACKGROUND COLOR: RED
TEXT COLOR: WHITE

PHOTOVOLTAIC DC DISCONNECT
RATED MAX. POWER-POINT CURRENT: XXX (A)
RATED MAX. POWER-POINT VOLTAGE: XXX (V)
MAXIMUM SYSTEM VOLTAGE: XXX (V)
MAXIMUM CURRENT: XXX (A)
7 1/2" x 2 1/2"

PDC3: DC ENERGIZED CONNECTION
LOCATION: ALL DC JB'S
NEC: 690.33(E)(2)
BACKGROUND COLOR: RED
TEXT COLOR: WHITE

DANGER
DO NOT DISCONNECT UNDER LOAD
ISOLATE CIRCUITS FROM SOURCES AND PARALLEL CONNECTED SOURCES PRIOR TO SERVICING
4" x 1 1/2"

PDC5: DC EQUIPMENT DISCONNECTING MEANS
LOCATION: DCSW-X OR INV-X
BACKGROUND COLOR: RED
TEXT COLOR: WHITE

INV - # DC EQUIPMENT DISCONNECTING MEANS
6" x 2"

PDC6: FUSE SERVICING DISCONNECTING MEANS
LOCATION: DCSW-X, RCBR-X, MDSS-X, DCCT-X
BACKGROUND COLOR: RED
TEXT COLOR: WHITE

INV - # FUSE SERVICING DISCONNECTING MEANS X OF (X)
6" x 2"

PDC8: FUSE SERVICE WARNING
LOCATION: INV-X
BACKGROUND COLOR: ORANGE AND WHITE
TEXT COLOR: BLACK

WARNING
PRIOR TO SERVICING ANY FUSES, DISCONNECT ALL INCOMING SOURCES FROM INVERTER'S DC BUS VIA XXXX-X
6" x 2 1/2"

PDC7: DIRECTORY FOR FUSE SERVICING
LOCATION: INV-X WHERE ACSW IS >6FT AWAY
ALSO PROVIDE A POUCH AND FULL SIZE COPY OF THE MAP BELOW INSIDE THIS PIECE OF EQUIPMENT.

DIRECTORY FOR FUSE SERVICING
DISCONNECTING MEANS FOR SERVICING FUSES IN THIS PIECE OF EQUIPMENT ARE LOCATED PER THE MAP BELOW. A COPY OF THIS MAP IS LOCATED INSIDE THIS PIECE OF EQUIPMENT
8" x 7"

PDC11: DC DISCONNECT MEANS ENERGIZED
LOCATION: DCSW-X, CBR-X, RCBR-X
NEC: 690.17(E)
BACKGROUND COLOR: ORANGE AND WHITE
TEXT COLOR: BLACK

WARNING
ELECTRICAL SHOCK HAZARD DO NOT TOUCH TERMINALS. TERMINALS ON BOTH LINE AND LOAD SIDE MAY BE ENERGIZED IN THE OPEN POSITION
6" x 2 1/2"

FS1: GENERAL DC
LOCATION: ALL EXPOSED DC RACEWAYS, CABLE TRAYS, PB-X, JB-X, EVERY 10', WITHIN 1' OF BENDS, ON CONDUITS BETWEEN ALL ENCLOSURES, AND ABOVE/BELOW PENETRATIONS OF ROOF/CEILING, WALLS OR BARRIERS
NEC: 690.31(G)(3), 690.31(G)(4)
BACKGROUND COLOR: RED REFLECTIVE
TEXT: WHITE REFLECTIVE

WARNING: PHOTOVOLTAIC POWER SOURCE
10" x 1"

FS2: MAIN SERVICE DISCONNECT
LOCATION: ACSW-X
CALFIRE REQUIREMENT
BACKGROUND COLOR: RED, REFLECTIVE
TEXT COLOR: WHITE, REFLECTIVE

CAUTION: SOLAR ELECTRIC SYSTEM
9" x 1"

P4: DANGEROUS VOLTAGE
LOCATION: ALL ACCESS POINTS TO THE SITE AND EVERY 250' AROUND THE PERIMETER (ON FENCES AS NECESSARY)
BACKGROUND COLOR: ORANGE; TEXT COLOR: BLACK

WARNING
DANGEROUS VOLTAGE
KEEP OUT
QUALIFIED PERSONNEL ONLY
10" x 7"

SHEET NOTES

GENERAL PLACARD NOTES:
1. NOT ALL PLACARDS DESCRIBED IN THESE NOTES MAY APPLY TO THIS PROJECT.
2. ELECTRICAL SUBCONTRACTOR SHALL PROVIDE ALL PLACARDS AS REQUIRED BY THE NEC, LOCAL FIRE DEPARTMENT, THE AUTHORITY HAVING JURISDICTION, AND LOCAL UTILITY REQUIREMENTS. PLACARDS IN ADDITION TO THOSE SHOWN HERE MAY BE REQUIRED BY THE NEC AND ARE THE RESPONSIBILITY OF THE ELECTRICAL SUBCONTRACTOR.
3. PLACARDS SHALL USE ARIAL OR SIMILAR FONT, NON-BOLD.
4. FONT SIZES SHALL BE THE MINIMUM SHOWN IN THESE DRAWINGS.
5. PLACARDS SHALL HAVE LETTERING IN CAPITAL LETTERS.
6. PLACARDS SHALL BE WEATHER RESISTANT AND SUITABLE FOR THE ENVIRONMENT AND COMPLY WITH ANSI Z535.4-2011.
7. PLACARDS SHALL BE ADHERED WHEN POSSIBLE AND MEET WITH UL969 STANDARDS. IF MECHANICALLY AFFIXED TO EQUIPMENT, USE RIVETS OR SCREWS. SEALANTS AND GASKETED HARDWARE SHALL BE USED TO MAINTAIN EQUIPMENT LISTINGS WHERE REQUIRED. NEMA 4R EQUIPMENT SHALL NOT BE DRILLED.
8. SUBMITTALS REQUIRED FOR PLACARDS AND FOR ADHESIVES USED TO SECURE PLACARDS TO EQUIPMENT.
9. PLACARDS WITH MOUNTING HOLES SHOULD BE 1/8" THICKNESS AND HOLES SHOULD BE 1/2" INSIDE FROM THE EDGE.

EQUIPMENT ID PLACARDS:
1. SUBCONTRACTOR SHALL LABEL ALL ARRAYS, PULL BOXES, JUNCTION BOXES, COMBINER BOXES, DC SAFETY SWITCHES, CIRCUIT BREAKER SAFETY SWITCHES, MULTIPLE DISCONNECT SAFETY SWITCHES, DC CONTACTOR DISCONNECTS, REMOTE PV TIES, BI-POLAR ARRAY COMBINERS, INVERTERS, AC SAFETY SWITCHES, TRANSFORMERS, PANELBOARDS, CIRCUIT BREAKERS, SWITCHGEAR, RECTIFIERS, DATA MONITORING ENCLOSURES, AND METERING CABINETS. A PARTIAL LIST OF PLACARDS IS SHOWN HERE.
2. EQUIPMENT ID PLACARDS – THE FIRST TYPE OF EACH REQUIRED EQUIPMENT ID PLACARD IS SHOWN HERE. ELECTRICAL SUBCONTRACTOR SHALL GENERATE PLACARDS FOR EACH PIECE OF EQUIPMENT AND NUMBER ALL EQUIPMENT PER THE NAMING AND NUMBERING CONVENTION DEFINED IN THESE PLANS.
3. ARRAY ID PLACARD – SHALL BE AFFIXED TO THE REAR CORNERS OF EACH ARRAY AND NUMBERED PER PLANS. IF ATTACHING TO MODULE FRAME ADHESIVE SHALL BE USED; DO NOT DRILL OR RIVET THE MODULE FRAMES.

V17

THIS DOCUMENT IS PROVIDED BY BORREGO SOLAR SYSTEMS, INC. TO FACILITATE THE SALE AND INSTALLATION OF A SOLAR POWER SYSTEM FROM BORREGO SOLAR SYSTEMS, INC. REPRODUCTION, RELEASE OR UTILIZATION FOR ANY OTHER PURPOSE, WITHOUT PRIOR WRITTEN CONSENT IS STRICTLY PROHIBITED.

BORREGO SOLAR
55 TECHNOLOGY DRIVE, SUITE 102
LOWELL, MA 01851
PHONE: (888) 898-6273
FAX: (888) 843-6778
WWW.BORREGOSOLAR.COM

GreenbergFarrow
21 SOUTH EVERGREEN AVENUE
SUITE 200
ARLINGTON HEIGHTS, IL 60005
t: 847 788 9200 f: 847 788 9537

NOT FOR CONSTRUCTION

PROFESSIONAL IN CHARGE
KERI WILLIAMS
PROFESSIONAL ENGINEER
LICENSE NO. 062-058662

SITE USE PLANS
16400 NEWARK ROAD
16400 NEWARK ROAD, NEWARK, IL 60541

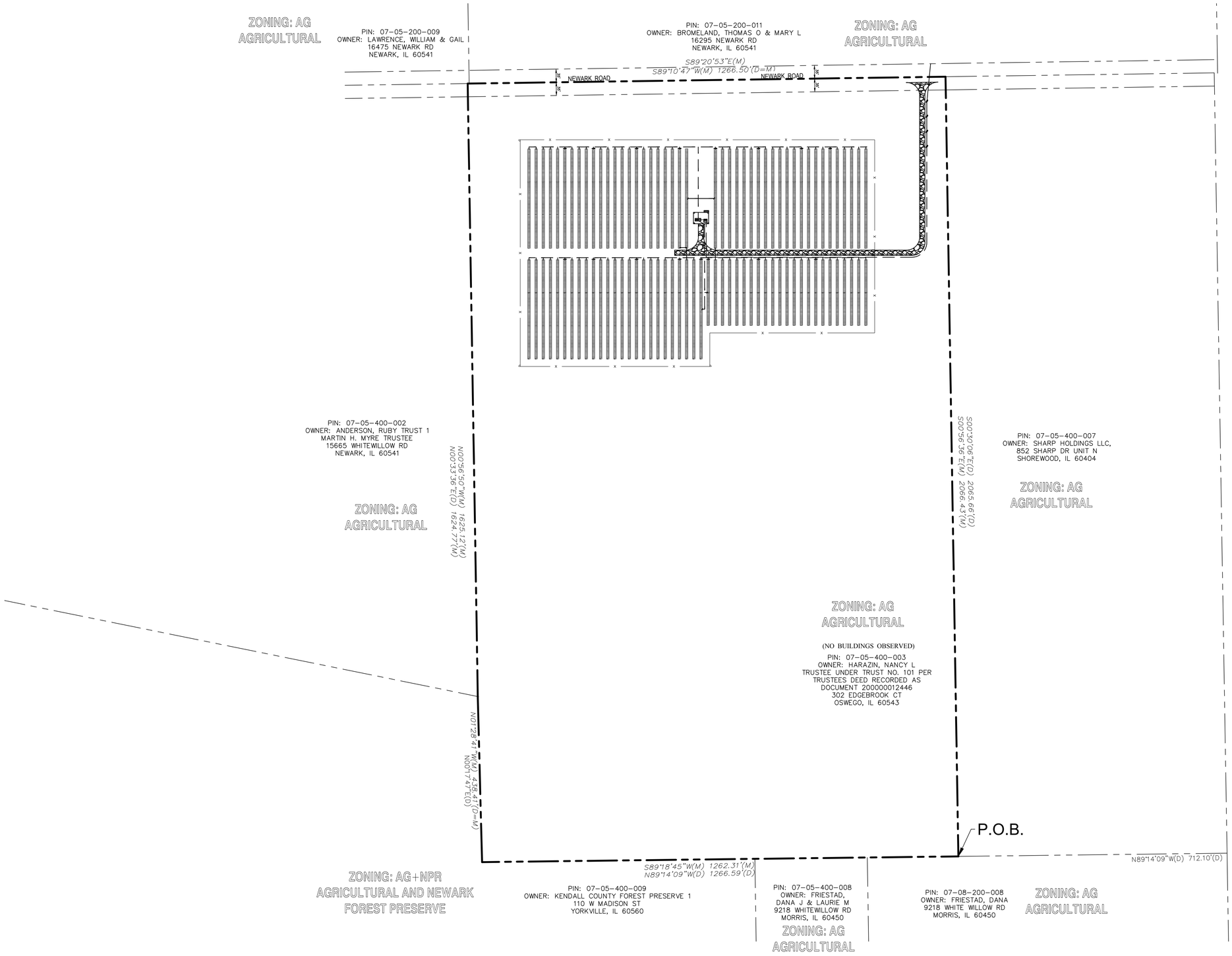
PROJECT NUMBER:
907-0142

REV	DATE	DRAWN	CHECKED	RELEASE LEVEL
	04/12/18	TB	JC	SITE USE PLAN SET

SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

E-6.0
PLACARDS

P:\2018\20180117O\80D Civil_Current Drawings\16400 Newark Road - SUP_041018_TB



GreenbergFarrow

21 South Evergreen Avenue, Suite 200
Arlington Heights, Illinois 60005
t: 847 788 9200 f: 847 788 9536

BORREGO SOLAR | **ZONING EXHIBIT**

16400 NEWARK ROAD, NEWARK IL 60541

20180117.0 | **EX-01**

DATE: 03/30/2018

ENCAP INCORPORATED

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

TRANSMITTAL LETTER

TO:	**GreenbergFarrow**	**DATE:**	February 14, 2018
	21 South Evergreen Avenue Suite 200	**PROJECT:**	16400 Newark Road, Newark
	Arlington Heights, Illinois 60005		
ATTN:	**Ms. Margaret A. Blum**	**ENCAP Project #**	18-0115B

We are sending you:	**Date of Enclosed Materials**	**# of Copies**
Wetland Determination – Jan/Feb 2018	February 14, 2018	PDF

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

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

THESE ARE TRANSMITTED AS CHECKED BELOW:

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

REMARKS: _____

Signed: Paul Meuer

ENCAP INCORPORATED

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

February 14, 2018

Ms. Margaret A. Blum
GreenbergFarrow
21 South Evergreen Avenue, Suite 200
Arlington Heights, Illinois 60005

Re: 16400 Newark Road – Wetland Determination
Location: Illinois, Kendall County, Big Grove Township, Newark
T35N R6E, Section 5; Latitude 41.534736 Longitude -89.263117
ENCAP, Inc. # 18-0115B

Dear Ms. Blum,

ENCAP, Inc. has been retained to perform a wetland determination on the above subject property. A site investigation and desk review on the approximately 61-acre site occurred on January 26, 2018. Attachment 5: Aerial Photograph identifies two potential farmed wetlands and three areas of interest within the project area. Potential farmed wetland areas featured significant evidence of potential wetland hydrology, including soil saturation, drainage patterns, and saturation visible on historical imagery. Areas of interest featured less significant indicators, and are therefore considered less likely to meet wetland criteria. The following findings are considered preliminary at this time. A more comprehensive field investigation during the growing season will need to be completed to confirm or deny these preliminary results. The location, possible jurisdiction, buffer requirements, and regulations for each are discussed below. The potential for habitat for federally and state listed endangered and threatened species was also investigated and results are discussed below.

The project area is generally bounded by Newark Road to the north, agricultural land to the east and west, and Newark Forest Preserve to the south. The project area consists of agricultural land currently in production. Additionally, thin wooded corridors are present along the southern extent of the property and portions of the western project boundary. Topographically, the site is highest along the eastern property boundary and falls towards Clear Creek southwest of the project boundary.

Methods

A wetland determination includes a preliminary site evaluation using available aerial photography and natural resource mapping as well as a surface inspection of the site. Potential wetland areas are identified through these methods and evaluated in the field to determine whether or not they will likely meet the requirements for a wetland based on the U.S. Army Corps of Engineers (USACE) parameters of wetland vegetation and hydrology. USACE soil parameters are not reviewed during a wetland determination.

The desk review determination on the farmed portion of the project area was completed using National Food Security Act Manual (NFSAM) methodology. Farm Service Agency (FSA) aerial photographs were reviewed using NRCS wetland signature criteria in order to identify potential farmed wetlands. Copies of the aerial photographs used in identifying farmed wetlands and WETS Station data from Aurora, Illinois (closest location available) have been included with this letter. Potential farmed wetlands must exhibit wetland signatures in 50% or more of the available historic aerial photographs from years with normal precipitation or exhibit hydric conditions during the field investigation. A field confirmation for hydric soils is also needed to verify farmed wetland status. If any areas are confirmed to be farmed wetlands after further field investigation, their location and acreage will be determined through aerial photograph interpretation.

Potential wetlands identified within the project area

The field investigation of the project area indicated two potential farmed wetlands and three additional areas of interest throughout the project area and each area is summarized below.

Potential Farmed Wetland 1 - Potential Farmed Wetland 1 (approximately 1.98 acres onsite) is located within the central portion of the project area. This potential farmed wetland consists of a slightly eroded drainage swale (Photographs 1-4) that appears to receive discharge from the adjacent property to the east, which then flows westward through the project area and extends nearly to the western project boundary.

Herbaceous vegetation in Potential Farmed Wetland 1 was very limited during the field investigation due to the time of year, however, evidence of soybean and upland grasses were documented. Potential Farmed Wetland 1 indicated potential wetland hydrology during the field investigation that included: soil saturation, drainage patterns, and saturation visible on historical imagery. Historic Aerials indicate wetland signatures in 4 out of 5 (80%) reviewed historical aerial images from years with normal precipitation (Attachment 4: Historic Aerial Slides). Further investigation of this area during the growing season is required to confirm or deny wetland status and hydric soils criteria for this potential wetland. Potential Farmed Wetland 1 may be considered to be isolated, and therefore not under the jurisdiction of the USACE; however, the USACE must make a final determination regarding jurisdictional status. If this area is determined to be a wetland and a significant nexus to a jurisdictional waterway can be documented by the USACE; the USACE may enforce a 50 to 100-foot buffer surrounding this wetland if impacts to the wetland are proposed during project development. In Kendall County, isolated wetlands are regulated through implementation of a countywide stormwater ordinance.

Potential Farmed Wetland 2 – Potential Farmed Wetland 2 (approximately 1.24 acres onsite) is located within the southern portion of the project area. This potential farmed wetland consists of a slightly eroded drainage swale (Photographs 5-10) that appears to receive discharge from the adjacent property to the east, which then flows westward through the project area and appears to exit the project area in the south west corner of the site.

Herbaceous vegetation in Potential Farmed Wetland 2 was very limited during the field investigation due to the time of year, however, evidence of soybean and upland grasses were documented. Potential Farmed Wetland 2 indicated potential wetland hydrology during the field investigation that included: soil saturation, drainage patterns, and saturation visible on historical imagery. Historic Aerials indicate wetland signatures in 3 out of 5 (60%) reviewed historical aerial images from years with normal precipitation (Historic Aerial Slides). Further investigation of this area during the growing season is required to confirm or deny wetland status and hydric

soils criteria for this potential wetland. Potential Farmed Wetland 2 may be considered to be isolated, and therefore not under the jurisdiction of the USACE; however, its boundaries are in close proximity to Clear Creek. The USACE must make a final determination regarding jurisdictional status. If this area is determined to be a wetland and a significant nexus to a jurisdictional waterway can be documented by the USACE; the USACE may enforce a 50 to 100-foot buffer surrounding this wetland if impacts to the wetland are proposed during project development. In Kendall County, isolated wetlands are regulated through implementation of a countywide stormwater ordinance.

Area of Interest 1 - Area of Interest 1 (approximately 0.98 acres onsite) consists of a highly eroded drainage swale along Newark Road (Photographs 12-14), and appears to receive discharge from the adjacent property to the east of the project area, which flows west into a culvert structure near the northwest corner of the project area. The culvert includes extensive riprap and crosses under Newark Road, discharging off-site to the north.

Herbaceous vegetation in Area of Interest 1 was dominated by non-native upland grasses and evidence of previously planted Soybeans were documented. Historic Aerials indicated wetland signatures in 3 of 5 (60%) reviewed aerials from years with normal precipitation. In addition, potential wetland hydrology including: soil saturation, drainage patterns, and saturation visible on historical imagery was documented during the field investigation. Further investigation of this area during the growing season is required to confirm or deny wetland status and hydric soils criteria for this area. This area appears to be isolated, however, if this area is determined to be a wetland and a significant nexus to a jurisdictional waterway can be documented by the USACE; the USACE may enforce a 50 to 100-foot buffer surrounding this wetland if impacts to the wetland are proposed during project development. In Kendall County, isolated wetlands are regulated through implementation of a countywide stormwater ordinance.

Area of Interest 2 & 3 - Area of Interest 2 (approximately 0.53 acres onsite), and Area of Interest 3 (approximately 1.18 acres onsite) are located within the southern portion of the project area and both consist similarly of tiled and tilled agricultural field (Photographs 15-18). Both areas appear to receive discharge through overland flows from the surrounding area, including possibly broken drainage tiles.

Herbaceous vegetation in Area of Interest 2 and 3 was dominated primarily by Soybeans. Historic Aerials did not indicate wetland signatures in any reviewed aerials from years with normal precipitation, however, potential wetland hydrology including: soil saturation, drainage patterns, and saturation visible on historical imagery were documented. Further investigation of these areas during the growing season is required to confirm or deny wetland status and hydric soils criteria for these areas. These areas appear to be isolated, however, if either of these areas are determined to be a wetland and a significant nexus to a jurisdictional waterway can be documented by the USACE; the USACE may enforce a 50 to 100-foot buffer surrounding either area if impacts to the wetland are proposed during project development. In Kendall County, isolated wetlands are regulated through implementation of a countywide stormwater ordinance.

Several areas exhibited potential wetland signatures, and evidence of hydrology was observed during the field investigation. However, the herbaceous layer was either largely un-vegetated, making it difficult to assess without a soil sample, or consisted almost entirely of upland vegetation (see Attachment 2: 2018 Site Photographs). Further investigation of these areas during the growing season is required to confirm or deny wetland hydrology and hydric soils criteria. If any of these areas are determined to be Farmed Wetlands, they may be considered isolated and non-jurisdictional; however, the USACE must make a final determination regarding

jurisdictional status. In Kendall County, isolated wetlands are regulated through implementation of a countywide stormwater ordinance (see below).

Endangered & Threatened Resources Review

Based on a January 22, 2018 review of the U.S. Fish and Wildlife Service (USFWS) technical assistance website, the following federally endangered or threatened species that may be located in Kendall County include: Indiana bat (*Myotis sodalist*), Northern long-eared bat (*Myotis septentrionalis*), and Eastern prairie fringed orchid (*Platanthera leucophaea*).

The project area does not contain suitable habitat for either of the two bat species, as very few trees were present during the field investigation. Additionally, it is unlikely the orchid may be present on the site because the entirety of the project area was recently tilled for agricultural production, however, a field investigation during the growing season and an inventory of each confirmed wetland is required to confirm or deny this initial review. Further consultation with this agency is likely not required for a Section 404 Permit from the USACE.

Preliminary IDNR Natural Resource Review identified 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 (see Attachment 1). If the project moves forward into permitting stages, formal consultation with the IDNR may be necessary. The State charges a minimum of $500.00 for this service.

Map Review

Additional natural resource maps were also studied for this wetland determination. Individual results are below.

- The **National Wetlands Inventory** does not identify any wetland resources within the project area. However, Palustrine Forested Broad-Leaved Deciduous Temporary Flooded Diked/Impounded Wetland (PFO1Ah) is located off-site of the southern portion of the project area (Exhibit B).

- The **Soil Map** identifies the following soils within the project area: Lisbon silt loam (59A), La Rose silt loam (60B2, 60C2, 60C3), Saybrook silt loam (145B, 145C2), and Elburn silt loam (198A). None of the soils within the project area are considered hydric in Kendall County (Exhibit C).

- The **2016 United States Geologic Survey (USGS) Topographic Map** does not identify any water features within the project area (Exhibit D).

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

Regulations

The deposition of dredge or fill materials into federally jurisdictional wetlands or Waters of the United States is regulated by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act.

The project area is within the jurisdiction of the Rock Island District of the USACE. The USACE takes jurisdiction of wetlands that are connected/associated with current or historically navigable waterways. After a formal delineation is completed, a jurisdictional determination (JD) from the USACE may be requested to determine the formal jurisdiction over Potential Farmed Wetlands 1 + 2. A formal JD will likely take between 3-5 months to receive from this agency.

The USACE Nationwide Permit (NWP) 51 authorizes wetland impact less than 0.5 acre for the construction of Land-Based Renewable Energy Generation Facilities and their attendant features. NWP 51 authorizes 0.1 acre or less of low quality wetlands to be filled without mitigation compensation. If over 0.1 acre is proposed for filling or is subject to secondary impacts, in-kind mitigation will be required at a minimum ratio of 1:1, and often greater (1.5:1.0). The aggregate total loss of waters of the U.S. authorized by NWP 51 cannot exceed **0.5 acre** or 300 linear feet of streambed for each project. The time frame for obtaining a nationwide permit is generally between three and six months.

The Nationwide Permit Program does not explicitly regulate wetland buffers, however, buffers may be enforced at the discretion of the appointed USACE Project Manager. Buffers for low quality jurisdictional wetlands do not often exceed 50 feet and buffers for high quality wetlands do not exceed 100 feet. USACE buffer widths may only be enforced after initial jurisdictional wetland impact.

Under the existing regulations, secondary impacts (both on-site and off-site) from construction/ development also must be evaluated. Mitigation may be required at a higher rate if a project will significantly alter wetland functions such as stormwater detention, water filtration, sediment trapping, and/or wildlife habitat. Before mitigation will be approved, reasonable proof that avoidance or minimization of wetland impacts has been attempted must be provided to the USACE.

A USACE permit is not required if the wetlands are avoided and construction erosion near a wetland is controlled; however, it is highly recommended to submit for and receive a Letter of No Objection (LONO) from the USACE to ensure project compliance with federal regulations.

If impacts to jurisdictional wetlands total more than 0.5 acre, an individual permit from the USACE will be required. Individual permits are subject to more rigorous review by the USACE and submittals are subject to a joint review by the Illinois Environment Protection Agency (IEPA), U.S. Fish and Wildlife Service (USFWS), and Illinois Department of Natural Resources (IDNR). A Section 401 Water Quality Certification must also be obtained by the IEPA concurrently with the USACE permit. Additionally, a significant Alternatives Analysis must be prepared. The Individual Permit Process includes two 30-day public comment periods that are not issued concurrently. These public comment periods can typically be expected to generate several response submittals. The typical review period can be expected to last between one and two years.

<u>Kendall County Stormwater Management Ordinance:</u>

Wetlands deemed isolated by the USACE will be subject to local regulations. Kendall County regulates wetlands through their Stormwater Management Ordinance: In September 2002 Kendall County adopted a Stormwater Management Ordinance. The ordinance provides for the protection of wetlands and other depressional storage areas from damaging modifications and adverse changes in runoff quality and quantity associated with land developments. Specifically, the ordinance requires the following:

1. Existing wetlands shall not be modified for the purposes of stormwater detention unless it is demonstrated that the existing wetland is low in quality and the proposed modifications will maintain or improve its habitat and ability to perform beneficial functions.
2. Existing storage and release rate characteristics of wetlands and other depressional storage areas shall be maintained and the volume of detention storage provided to meet the requirements of the ordinance shall be in addition to this existing storage.
3. The existing wetland shall be protected during construction by appropriate soil erosion and sediment control measures and shall not be filled.
4. Site drainage patterns shall not be altered to substantially decrease or increase the existing area tributary to the wetland.
5. All runoff from the development shall be routed through a preliminary detention/sedimentation basin designed to provide a minimum 24-hour hydraulic detention time, before being discharged to the wetland. This basin shall be constructed before property grading begins.
6. A buffer strip of at least 25 feet in width, preferably vegetated with native plant species, shall be maintained or restored around the periphery of the wetland.

In addition, the Kendall County Stormwater Management Ordinance discourages the placement of detention basins in floodplains and streams. However, detention in these areas is allowed if certain requirements are met. We recommend reviewing the ordinance for further information. Coordination with County officials during the planning phase of the project to ensure compliance is recommended.

Conclusions

In summary, two potential farmed wetlands and three additional areas of interest were identified within the project area. These areas will need to be field verified to confirm or deny wetland status during the growing season. A formal wetland delineation will need to be completed during the growing season (typically March/April through November). After a formal delineation is completed, ENCAP, Inc. recommends that a request for a jurisdictional determination or Letter of No Objection (LONO) be sent to the U.S. Army Corps of Engineers for review and approval.

If you have any questions regarding this review, please contact me at (815) 748-4500 or pmeuer@encapinc.net.

Sincerely,
ENCAP, Inc.



Paul Meuer
Junior Ecological Consultant

Attachments:

1. IDNR EcoCAT Natural Resource Review Results
2. 2018 Site Photographs
3. WETS Station Data (Aurora, IL)

4. Historic Aerial Slides (1991, 1993, 1994, 1995, 1996, 1998 (WET))
5. Exhibits A-F
    - Exhibit A: Location Map
    - Exhibit B: National Wetlands Inventory Map
    - Exhibit C: Soil Map
    - Exhibit D: 2016 Topographic Map
    - Exhibit E: FEMA Flood Insurance Rate Map
    - Exhibit F: Aerial Photograph

IDNR EcoCAT Natural Resources Review Results

EcoCAT
Ecological Compliance Assessment Tool

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

Applicant: ENCAP, Inc.
Contact: Paul Meuer
Address: 2585 Wagner Court
DeKalb, IL 60115

Project: 16400 Newark Road
Address: 16400 Newark Road, Newark

IDNR Project Number: 1806711
Date: 01/26/2018
Alternate Number: 18-0115B

Description: Wetland determination for project planning purposes.

Natural Resource Review Results

This project was submitted for information only. It is not a consultation under 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.

Location

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

County: Kendall

Township, Range, Section:
35N, 6E, 5



IL Department of Natural Resources Contact
Impact Assessment Section
217-785-5500
Division of Ecosystems & Environment

Disclaimer

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

Terms of Use

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

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

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

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

Security

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

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

Privacy

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

2018 Site Photographs

PHOTOGRAPH 1	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Potential Farmed Wetland 1 - Overview Facing West	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 2	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Potential Farmed Wetland 1 - Overview Facing East	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 3	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Potential Farmed Wetland 1 - Overview Facing North	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 4	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Potential Farmed Wetland 1 - Overview Facing North	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 5	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Potential Farmed Wetland 2 - Overview Facing Northeast	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 6	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Potential Farmed Wetland 2 - Overview Facing Northwest	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 7	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Potential Farmed Wetland 2 - Overview Facing North	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 8	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Potential Farmed Wetland 2 – Drainage Patterns Facing North	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 9	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Potential Farmed Wetland 2 - Overview Facing East	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 10	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Potential Farmed Wetland 2 - Overview Facing Northeast	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 11	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Area of Interest 1 - Overview Facing East	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 12	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Area of Interest 1 - Overview Facing West	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 13	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Area of Interest 1 - Overview Facing Southwest	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 14	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Area of Interest 1 – Newark Road Culvert Facing North	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 15	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Area of Interest 2 - Overview Facing East	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 16	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Area of Interest 2 - Overview Facing West	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 17	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Area of Interest 3 - Overview Facing Northwest	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 18	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Area of Interest 3 - Overview Facing East	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 19	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Site Overview – Newark Road Facing West	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 20	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Site Overview – Newark Road Facing East	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 21	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Site Overview – Western Project Boundary Facing South	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 22	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Site Overview Facing East	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 23	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Site Overview – Offsite Southern Project Boundary Facing South	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 24	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Site Overview Facing North	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 25	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Site Overview Facing Northwest	
DATE PHOTO TAKEN: January 26, 2018	

PHOTOGRAPH 26	
DESCRIPTION: 16400 Newark Road / GreenbergFarrow Site Overview – Offsite Residence Facing North	
DATE PHOTO TAKEN: January 26, 2018	

WETS Station Data (Aurora, IL)

WETS Station: IL0338

	Average	<30%	>30%
April	3.88	2.79	4.59
May	3.91	2.7	4.65
June	4.34	3.04	5.14
July	4.39	2.76	5.3

CLIMATIC EVALUATION OF PRECIPITATION
3 MONTHS BEFORE AERIAL CROP
HISTORY SLIDES

DATE:
COUNTY:
LANDOWNER:
TRACT NO.
PREPARED BY:

Year	April Percip-itation	Type of Month	May Percip-itation	Type of Month	June Percip-itation	Type of Month	July* Percip-itation	Type of Month	April Score 1X	May Score 2X	June Score 3X	Score for Year	Type of Year	Year	Best Years	RECORD OF WETLAND SIGNATURES OBSERVED ON AERIAL PHOTOGRAPHY
78	5.14	Wet	4.85	Wet	3.65	Normal	8.56	Wet	3	6	6	15	WET	78		
79	6.06	Wet	2.6	Dry	5.34	Wet	3.68	Normal	3	2	9	14	NORMAL	79	79	
80	3.26	Normal	2.7	Normal	3.2	Normal	3.81	Normal	2	4	6	12	NORMAL	80	80	
81	5.82	Wet	5.09	Wet	6.44	Wet	3.97	Normal	3	6	9	18	WET	81		
82	3.25	Normal	3.64	Normal	2.96	Dry	6.34	Wet	2	4	3	9	DRY	82		
83	6.59	Wet	4.22	Normal	4.98	Normal	6.97	Wet	3	4	6	13	NORMAL	83	83	
84	4.02	Normal	4.12	Normal	5.78	Wet	1.83	Dry	2	4	9	15	WET	84		
85	1.93	Dry	2.63	Dry	2.7	Dry	3.26	Normal	1	2	3	6	DRY	85		
86	1.75	Dry	3.23	Normal	4.19	Normal	3.25	Normal	1	4	6	11	NORMAL	86	86	
87	2.49	Dry	5.14	Wet	5.83	Wet	3.78	Normal	1	6	9	16	WET	87		
88	3.18	Normal	1.86	Dry	0.95	Dry	3.4	Normal	2	2	3	7	DRY	88		
89	1.12	Dry	1.94	Dry	4.29	Normal	6.63	Wet	1	2	6	9	DRY	89		
90	1.89	Dry	8	Wet	6.31	Wet	4.41	Normal	1	6	9	16	WET	90		
91	4.47	Normal	5.8	Wet	1	Dry	1.45	Dry	2	6	3	11	NORMAL	91	91	
92	3.31	Normal	0.75	Dry	2.22	Dry	4.45	Normal	2	2	3	7	DRY	92		
93	4.66	Wet	2.03	Dry	9.56	Wet	2.34	Dry	3	2	9	14	NORMAL	93	93	
94	1.98	Dry	1.57	Dry	6.03	Wet	2.46	Dry	1	2	9	12	NORMAL	94	94	
95	5.8	Wet	4.54	Normal	3.01	Dry	3.73	Normal	3	4	3	10	NORMAL	95	95	
96	2.69	Dry	4.64	Normal	5.63	Wet	21.5	Wet	1	4	9	14	NORMAL	96	96	
97	2.59	Dry	3.96	Normal	2.25	Dry	1.53	Dry	1	4	3	8	DRY	97		
98	5.6	Wet	3.08	Normal	5.31	Wet	3.24	Normal	3	4	9	16	WET	98		
99	5.74	Wet	4.21	Normal	4.67	Normal	3.57	Normal	3	4	6	13	NORMAL	99	99	
0	5	Wet	3.76	Normal	5.59	Wet	4.47	Normal	3	4	9	16	WET	0		
1	3.63	Normal	3.15	Normal	3.29	Normal	2.13	Dry	2	4	6	12	NORMAL	1	1	
2	4.94	Wet	4.62	Normal	3.09	Normal	2.34	Dry	3	4	6	13	NORMAL	2	2	
3	2.52	Dry	7.91	Wet	1.99	Dry	7.83	Wet	1	6	3	10	NORMAL	3	3	
4	0.94	Dry	6.6	Wet	6.19	Wet	2.7	Dry	1	6	9	16	WET	4		
5	2.12	Dry	2.65	Dry	1.11	Dry	2.36	Dry	1	2	3	6	DRY	5		
6	4.23	Normal	3.89	Normal	3.76	Normal	1.31	Dry	2	4	6	12	NORMAL	6	6	
7	3.86	Normal	1.19	Dry	2.92	Dry	5.02	Normal	2	2	3	7	DRY	7		
8	3.22	Normal	5.17	Wet	3.63	Normal	3.36	Normal	2	6	6	14	NORMAL	8	8	
9	5.68	Wet	4.22	Normal	3.89	Normal	2.12	Dry	3	4	6	13	NORMAL	9	9	
10	2.31	Dry	6.61	Wet	7.75	Wet	6.45	Wet	1	6	9	16	WET	10		
11	5.26	Wet	5.13	Wet	5.89	Wet	4.57	Normal	3	6	9	18	WET	11		
12	2.29	Dry	1.98	Dry	1.75	Dry	2.35	Dry	1	2	3	6	DRY	12		
13	10.44	Wet	4.77	Wet	6.04	Wet	1.74	Dry	3	6	9	18	WET	13		
14	3.23	Normal	5.35	Wet	8.16	Wet	4.82	Normal	2	6	9	17	WET	14		

SCORE
Dry = 1
Normal = 2
Wet = 3

TYPE OF YEAR
Dry = 6 to 9
Normal = 10 to 14
Wet = 15 to 18

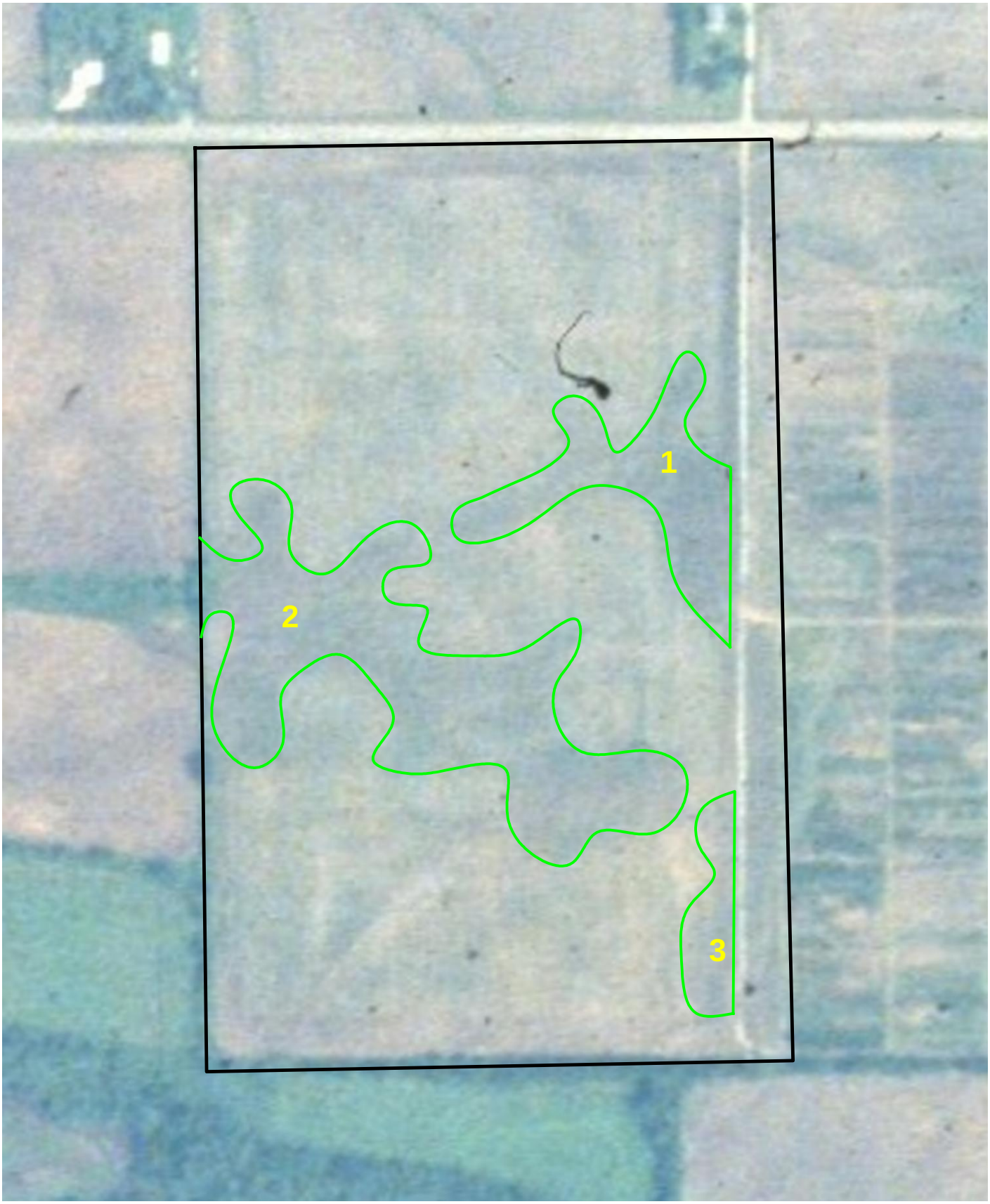
* July data is only used if the photo appears to have an unusually high number of surface water signatures indicating that the photo was taken soon after an unusally wet period. Otherwise it is assumed that the photo was taken in late June or early July before most of July's precipitation.

COMMENTS:

	Next 1	Wheaton 3 SE IL9221 DuPage County
	Next 2	Elgin_IL2736_Kane County
	Next 3	Joliet Brandon RD DAM_IL4530_Will County
Next Closest Site	Next 4	

Historical Farmed Aerials (1991, 1993, 1994, 1995, 1996, 1998 (WET))

Year: 1991



0 150 300 600

SCALE: 1"=300'

N

Year: 1993



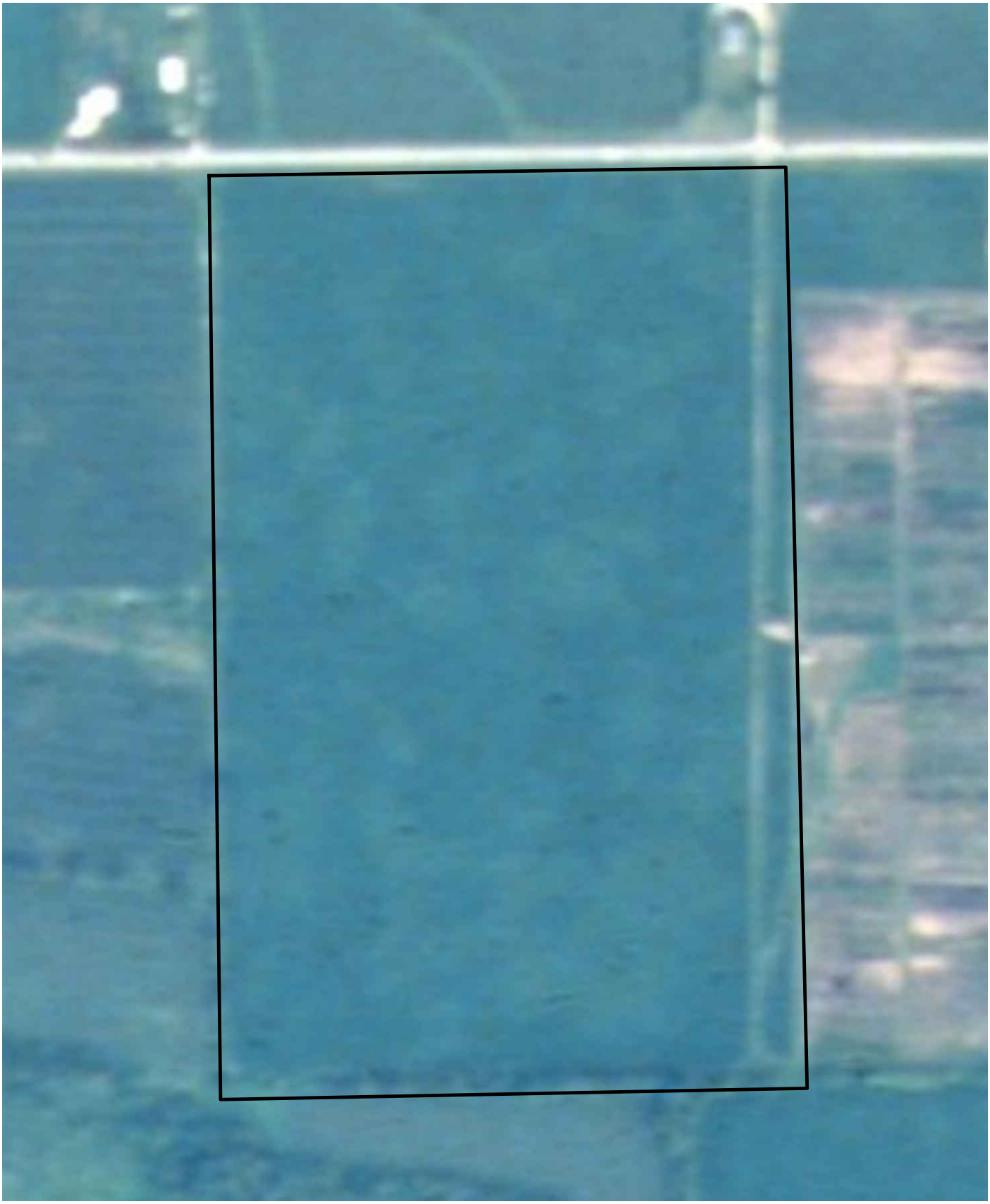
0 150 300 600

SCALE: 1"=300'

N

30

Year: 1994

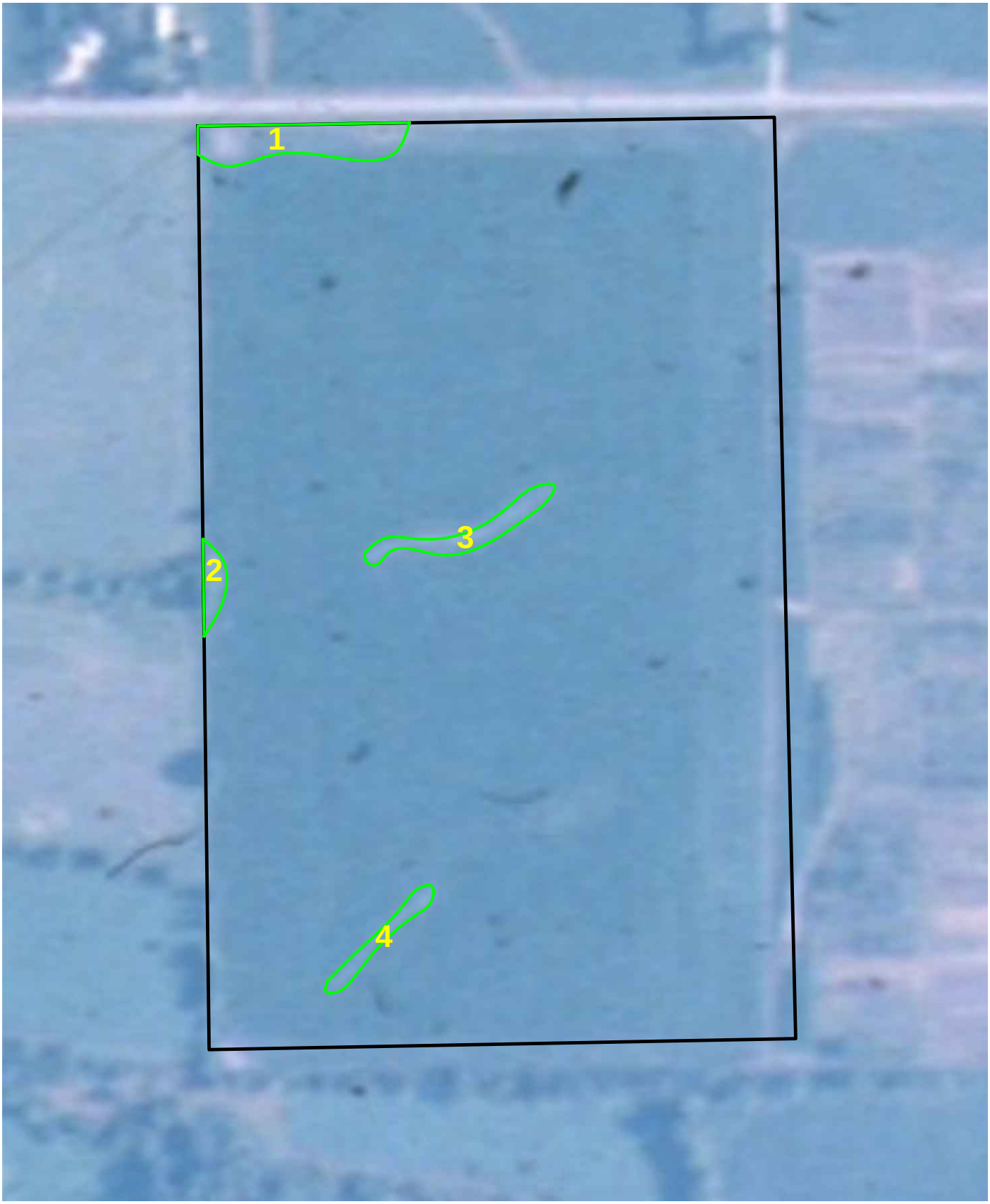


0 150 300 600

SCALE: 1"=300'

N

Year: 1995



0 150 300 600

SCALE: 1"=300'

N

Year: 1996

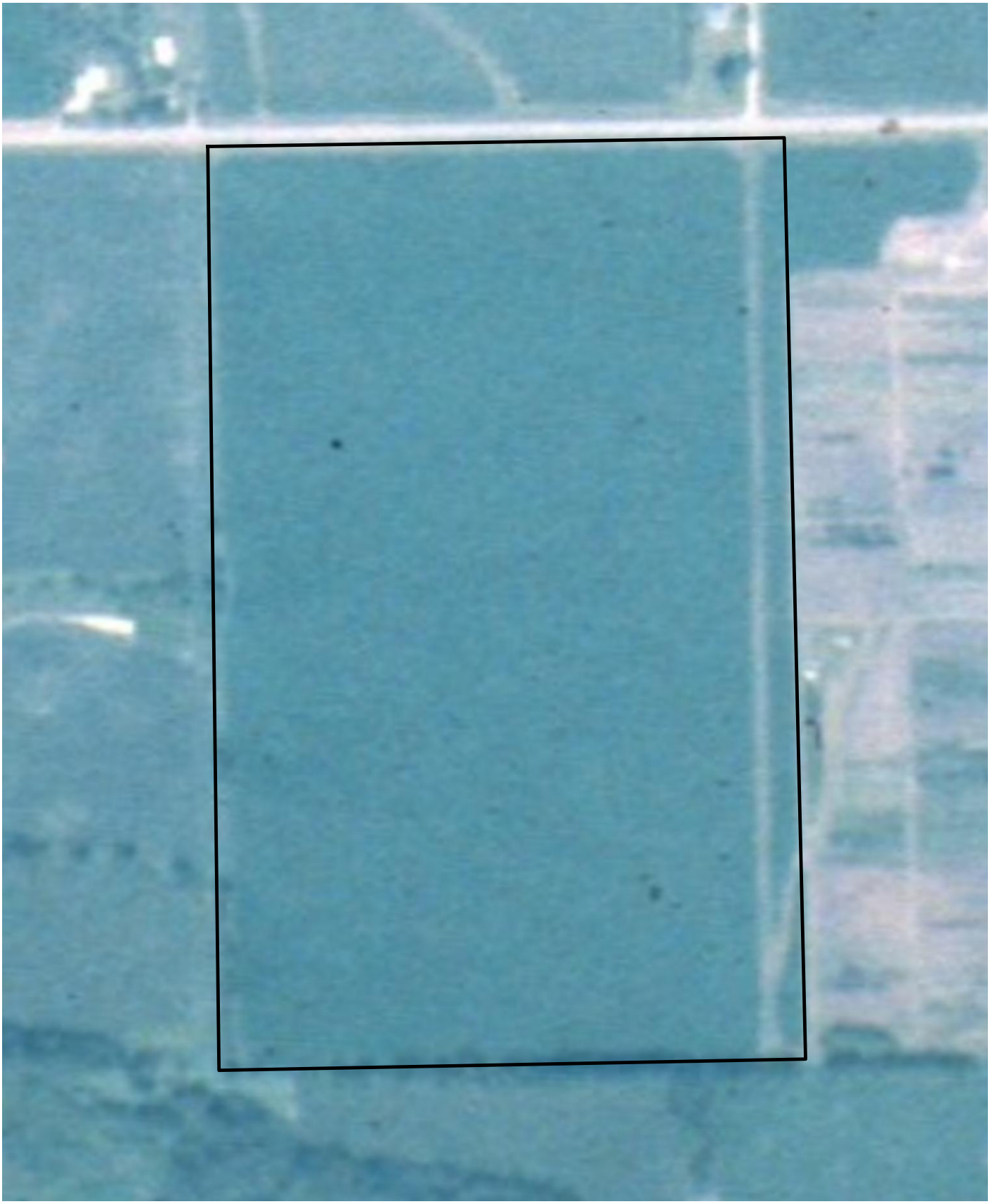


0 150 300 600

SCALE: 1"=300'

N

Year: 1998 WET

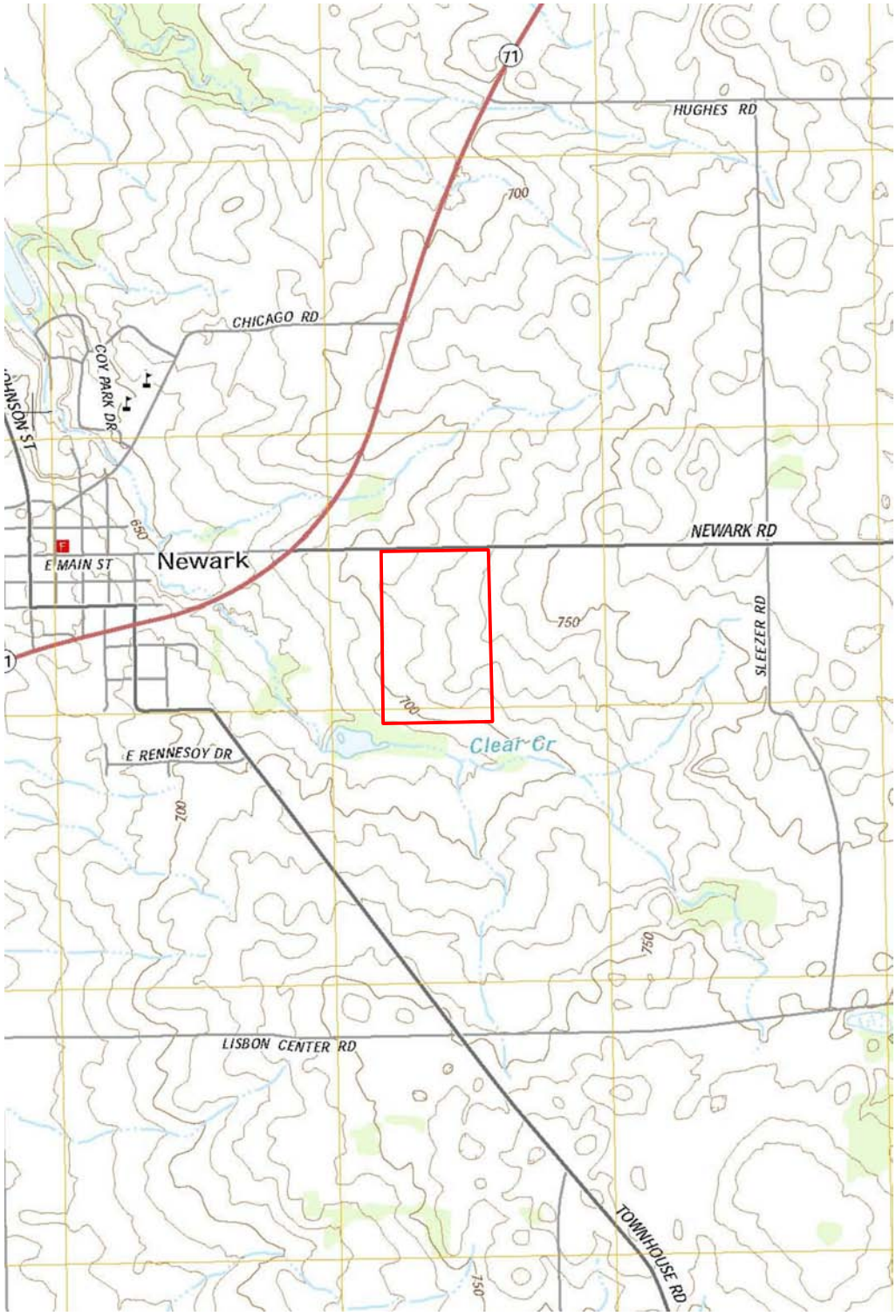


0 150 300 600

SCALE: 1"=300'

N

Exhibits A - F



ENCAP INCORPORATED

LEGEND:

Project Area

Location Map

Source: U.S. Geologic Survey
Section 5 T35N R6E
Latitude: 41.534736 Longitude: -88.565952

16400 Newark Road

Project Number: 18-0115B

GreenbergFarrow

0 1000 2000 4000

SCALE: 1"= 2000'

NORTH

Exhibit A



ENCAP INCORPORATED

LEGEND:

Project Area

Wetlands

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

National Wetlandd Inventory

Source: U.S. Fish & Wildlife Service

0 150 300 600

SCALE: 1"=300'

NORTH

16400 Newark Road

Project Number: 18-0115B

GreenbergFarrow

Exhibit B



ENCAP INCORPORATED

LEGEND:

Project Area

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

Soil Map

Source: U.S. Department of Agriculture
Natural Resources Conservation Service
Web Soil Survey 3.1

0 150 300 600

SCALE: 1"=300'

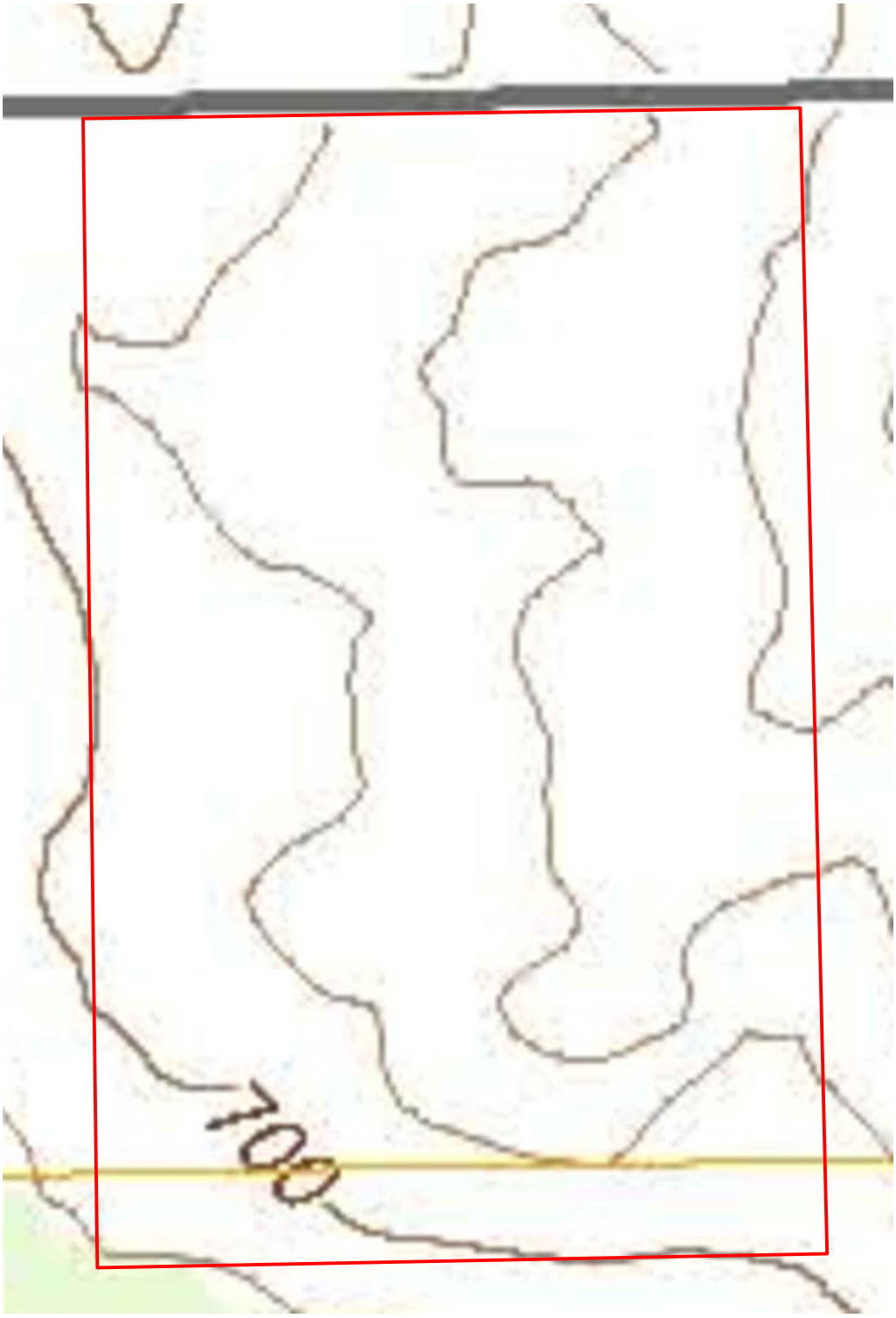
NORTH

16400 Newark Road

Project Number: 18-0115B

GreenbergFarrow

Exhibit C



ENCAP INCORPORATED

LEGEND:

Project Area

2016 USGS Topographic Map

Source: U.S. Geologic Survey
Newark Quadrangle

0 150 300 600

SCALE: 1"=300'

NORTH

16400 Newark Road

Project Number: 18-0115B

GreenbergFarrow

Exhibit D



ENCAP INCORPORATED

LEGEND:

Project Area

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A — No Base Flood Elevations determined.

ZONE AE — Base Flood Elevations determined.

ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR — Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

513 — Base Flood Elevation line and value; elevation in feet*

(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A — Cross section line

23 — 23 — Transect line

Culvert

Bridge

45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere

3100000 FT — 5000-foot ticks: Wisconsin State Plane Central Zone (FIPS Zone 4802), Lambert Conformal Conic projection

1000-meter Universal Transverse Mercator grid values, zone 15

DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)

M1.5 — River Mile

Flood Insurance Rate Map

Source: Federal Emergency Management Agency (FEMA)
Panel Numbers: 0087G & 0089G
Effective Date: February 4, 2009

16400 Newark Road

Project Number: 18-0115B

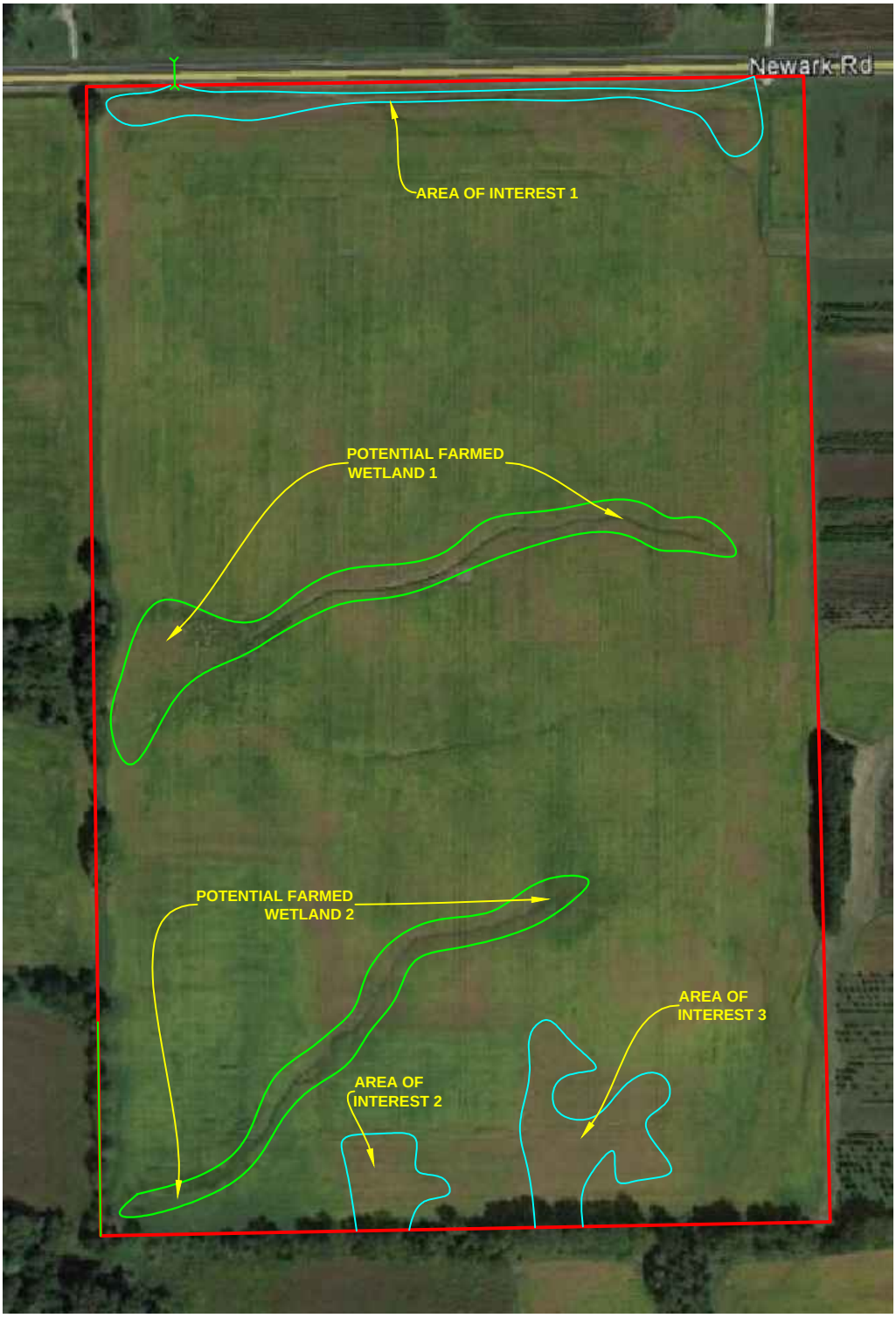
GreenbergFarrow

0 150 300 600

SCALE: 1"=300'

NORTH

Exhibit E



ENCAP INCORPORATED

LEGEND:

- Project Area
- On-site Potential Farmed Wetland Boundary
- Area of Interest Boundary
- Culvert

Aerial Photograph

Image Courtesy of Google Earth
2016

0 150 300 600
SCALE: 1"=300'

NORTH

16400 Newark Road

Project Number: 18-0115B

GreenbergFarrow

Exhibit F

ALTA/NSPS LAND TITLE SURVEY



VICINITY MAP
NO SCALE

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

LEGAL DESCRIPTIONS

THAT PART OF THE EAST HALF OF SECTION 5, TOWNSHIP 35 NORTH, RANGE 6 EAST OF THE THIRD PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS: COMMENCING AT THE SOUTHEAST CORNER OF SAID SECTION 5; THENCE NORTH 0 DEGREES 30 MINUTES 06 SECONDS EAST, ALONG THE EAST LINE OF THE SOUTHEAST QUARTER OF SAID SECTION 5, A DISTANCE OF 588.72 FEET TO AN EXISTING FENCE LINE; THENCE NORTH 89 DEGREES 14 MINUTES 09 SECONDS WEST, ALONG SAID FENCE LINE, 712.10 FEET FOR THE POINT OF BEGINNING; THENCE NORTH 89 DEGREES 14 MINUTES 09 SECONDS WEST, ALONG SAID FENCE LINE, 1266.59 FEET TO AN IRON PIPE AT A FENCE CORNER; THENCE NORTH 0 DEGREES 17 MINUTES 47 SECONDS EAST, ALONG A FENCE LINE, 438.41 FEET TO AN IRON PIPE AT A FENCE CORNER; THENCE NORTH 0 DEGREES 33 MINUTES 36 SECONDS EAST, ALONG A FENCE LINE AND SAID FENCE LINE EXTENDED NORTHERLY, 1624.77 FEET TO THE CENTERLINE OF NEWARK ROAD; THENCE SOUTH 89 DEGREES 20 MINUTES 53 SECONDS EAST, ALONG SAID CENTERLINE WHICH ALSO RUNS THROUGH THE NORTHEAST CORNER OF SAID SOUTHEAST QUARTER, 1266.50 FEET TO A LINE DRAWN NORTHERLY, PARALLEL WITH THE EAST LINE OF SAID SOUTHEAST QUARTER FROM THE POINT OF BEGINNING; THENCE SOUTHERLY ALONG SAID PARALLEL LINE 2065.66 FEET TO THE POINT OF BEGINNING, IN BIG GROVE TOWNSHIP, KENDALL COUNTY, ILLINOIS.

SCHEDULE B EXCEPTIONS

19. RIGHTS OF THE PUBLIC, THE STATE OF ILLINOIS AND THE MUNICIPALITY IN AND TO THAT PART OF THE LAND, IF ANY, TAKEN OR USED FOR ROAD PURPOSES, INCLUDING BUT NOT LIMITED TO THAT PART DEDICATED FOR S.A. ROUTE 4 BY DEDICATION RECORDED APRIL 12, 1956 AS DOCUMENT 114960.

20. RIGHTS OF WAY FOR DRAINAGE TILES, DITCHES, FEEDERS, LATERALS AND UNDERGROUND PIPES, IF ANY.

* 21. RIGHTS OF ADJOINING AND CONTIGUOUS OWNERS TO HAVE MAINTAINED THE UNINTERRUPTED FLOW OF THE WATERS OF ANY STREAM WHICH MAY FLOW ON OR THROUGH THE LAND.

22. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:

GRANTED TO: NORTHERN ILLINOIS GAS COMPANY, DBA NICOR GAS COMPANY

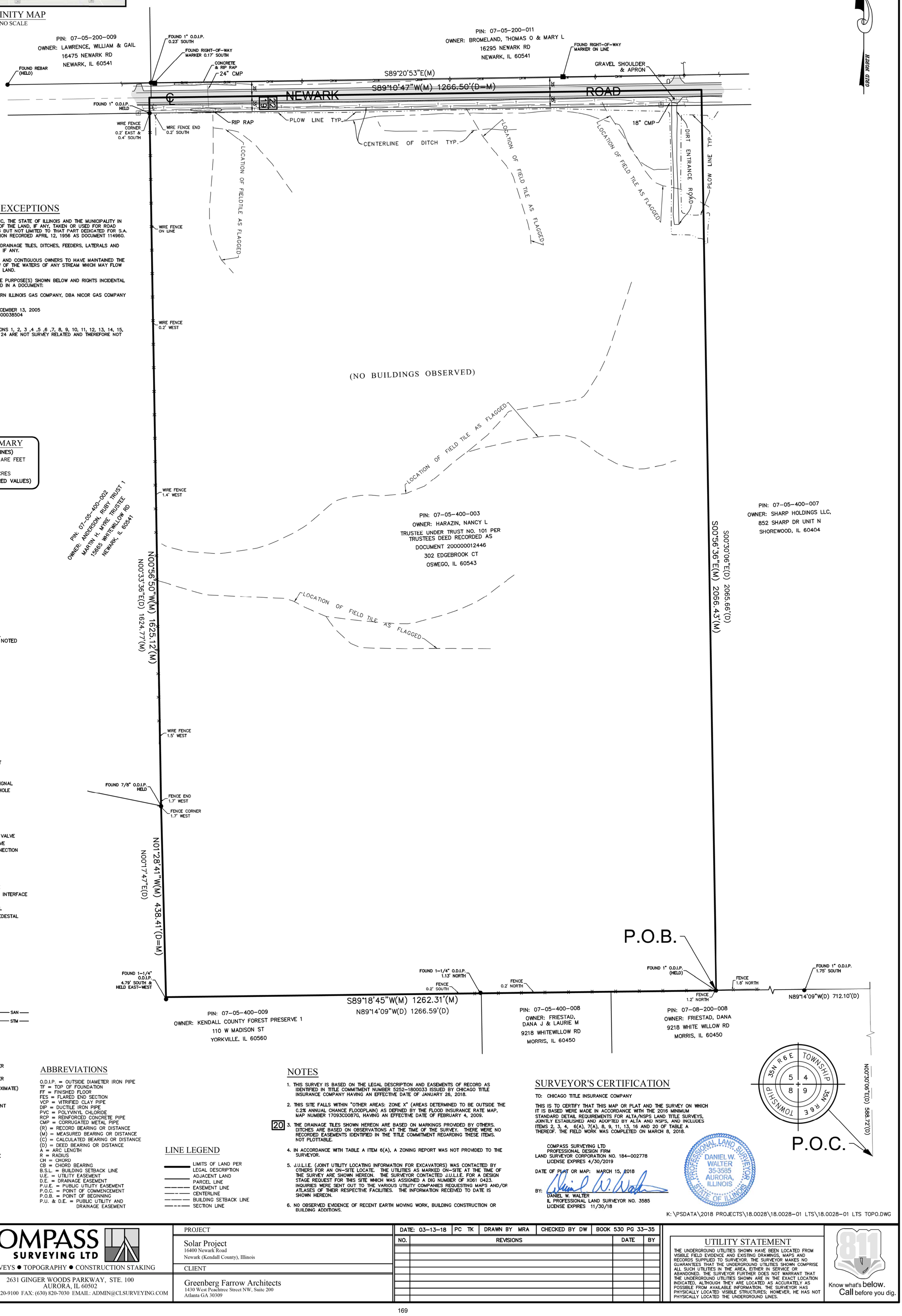
PURPOSE: UTILITIES
RECORDING DATE: DECEMBER 13, 2005
RECORDING NO: 200500038504

SCHEDULE B EXCEPTIONS 1, 2, 3 ,4 ,5 ,6 ,7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 23 AND 24 ARE NOT SURVEY RELATED AND THEREFORE NOT SHOWN.

* NOT PLOTTABLE

AREA SUMMARY

(TO HEAVY LINES)
2,614,236 SQUARE FEET
OR
60.015 ACRES
(BASED ON MEASURED VALUES)



LEGEND

- FOUND 7/8" O.D.I.P. UNLESS OTHERWISE NOTED (HELD LOCATION)
- CONCRETE MONUMENT
- CROSS IN CONCRETE
- MANHOLE
- STORM STRUCTURE
- SANITARY MANHOLE
- CLEANOUT
- FLARED END SECTION
- TRANSFORMER PAD
- ELECTRIC MANHOLE
- ELECTRIC BOX
- ELECTRIC PEDESTAL
- ELECTRIC MARKER
- ELECTRIC METER
- UTILITY POLE
- UTILITY POLE W/LIGHT
- UTILITY POLE W/TSF
- GUY POLE
- OVERHEAD TRAFFIC SIGNAL
- TRAFFIC SIGNAL MANHOLE
- LIGHT
- LIGHT POLE
- HAND HOLE
- VALVE VAULT
- FIRE HYDRANT
- IRRIGATION CONTROL VALVE
- POST INDICATOR VALVE
- SIAMESE WATER CONNECTION
- WATER MARKER
- WATER METER
- VALVE BOX
- B/BOX
- TELEPHONE MANHOLE
- TELEPHONE NETWORK INTERFACE
- TELEPHONE MARKER
- TELEPHONE PEDESTAL
- CABLE TELEVISION PEDESTAL
- GAS METER
- GAS VALVE
- GAS MARKER
- DOWN SPOUT
- BORING HOLE
- MONITORING WELL
- GATE POST
- BOLLARD POLE
- SIGN
- FLAG POLE
- MAILBOX
- SANITARY SEWER — SAN —
- STORM SEWER — STM —
- WATER MAIN
- GAS MAIN
- ELECTRIC LINE
- OVERHEAD WIRES
- TELEPHONE LINE
- CONIFEROUS TREE W/APPROX. DIAMETER
- DECIDUOUS TREE W/APPROX. DIAMETER MS=MULTI-STEM (DRIP LINE SHOWN IS APPROXIMATE)
- + ELEVATION
- BITUMINOUS PAVEMENT
- CONCRETE SURFACE
- DEPRESSED CURB
- GRAVEL SURFACE
- LANDSCAPE AREA
- STONE SURFACE
- DETECTABLE TACTILE WARNING SURFACE
- WOOD FENCE
- CHAIN LINK FENCE
- METAL FENCE
- METAL GUARDRAIL
- OVERHEAD TRAFFIC ARM

ABBREVIATIONS

O.D.I.P. = OUTSIDE DIAMETER IRON PIPE
TF = TOP OF FOUNDATION
FF = FINISHED FLOOR
FES = FLARED END SECTION
VCP = VITRIFIED CLAY PIPE
DIP = DUCTILE IRON PIPE
PVC = POLYVINYL CHLORIDE
RCP = REINFORCED CONCRETE PIPE
CMP = CORRUGATED METAL PIPE
(R) = RECORD BEARING OR DISTANCE
(M) = MEASURED BEARING OR DISTANCE
(C) = CALCULATED BEARING OR DISTANCE
(D) = DEED BEARING OR DISTANCE
A = ARC LENGTH
R = RADIUS
CH = CHORD
CB = CHORD BEARING
B.S.L. = BUILDING SETBACK LINE
U.E. = UTILITY EASEMENT
D.E. = DRAINAGE EASEMENT
P.U.E. = PUBLIC UTILITY EASEMENT
P.O.C. = POINT OF COMMENCEMENT
P.O.B. = POINT OF BEGINNING
P.U. & D.E. = PUBLIC UTILITY AND DRAINAGE EASEMENT

LINE LEGEND

- LIMITS OF LAND PER LEGAL DESCRIPTION
- ADJACENT LAND PARCEL LINE
- EASEMENT LINE
- CENTERLINE
- BUILDING SETBACK LINE
- SECTION LINE

NOTES

1. THIS SURVEY IS BASED ON THE LEGAL DESCRIPTION AND EASEMENTS OF RECORD AS IDENTIFIED IN TITLE COMMITMENT NUMBER 5252-1800033 ISSUED BY CHICAGO TITLE INSURANCE COMPANY HAVING AN EFFECTIVE DATE OF JANUARY 26, 2018.
2. THIS SITE FALLS WITHIN "OTHER AREAS: ZONE X" (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) AS DEFINED BY THE FLOOD INSURANCE RATE MAP, MAP NUMBER 17093C0087G, HAVING AN EFFECTIVE DATE OF FEBRUARY 4, 2009.
20. 3. THE DRAINAGE TILES SHOWN HEREON ARE BASED ON MARKINGS PROVIDED BY OTHERS. DITCHES ARE BASED ON OBSERVATIONS AT THE TIME OF THE SURVEY. THERE WERE NO RECORDED EASEMENTS IDENTIFIED IN THE TITLE COMMITMENT REGARDING THESE ITEMS. NOT PLOTTABLE.
4. IN ACCORDANCE WITH TABLE A ITEM 6(A), A ZONING REPORT WAS NOT PROVIDED TO THE SURVEYOR.
5. J.U.L.I.E. (JOINT UTILITY LOCATING INFORMATION FOR EXCAVATORS) WAS CONTACTED BY OTHERS FOR AN ON-SITE LOCATE. THE UTILITIES AS MARKED ON-SITE AT THE TIME OF THE SURVEY ARE SHOWN HEREON. THE SURVEYOR CONTACTED J.U.L.I.E. FOR A DESIGN STAGE REQUEST FOR THIS SITE WHICH WAS ASSIGNED A DIG NUMBER OF X061 0423. INQUIRIES WERE SENT OUT TO THE VARIOUS UTILITY COMPANIES REQUESTING MAPS AND/OR ATLASES OF THEIR RESPECTIVE FACILITIES. THE INFORMATION RECEIVED TO DATE IS SHOWN HEREON.
6. NO OBSERVED EVIDENCE OF RECENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS.

SURVEYOR'S CERTIFICATION

TO: CHICAGO TITLE INSURANCE COMPANY

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 2, 3, 4, 6(A), 7(A), 8, 9, 11, 13, 16 AND 20 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON MARCH 8, 2018.

COMPASS SURVEYING LTD
PROFESSIONAL DESIGN FIRM
LAND SURVEYOR CORPORATION NO. 184-002778
LICENSE EXPIRES 4/30/2019

DATE OF PLAT OR MAP: MARCH 15, 2018

BY:
DANIEL W. WALTER
IL PROFESSIONAL LAND SURVEYOR NO. 3585
LICENSE EXPIRES 11/30/18

PROFESSIONAL LAND SURVEYOR DANIEL W. WALTER 35-3585 AURORA, ILLINOIS STATE OF ILLINOIS

K:\PSDATA\2018 PROJECTS\18.0028\18.0028-01 LTS\18.0028-01 LTS TOPO.DWG

PROJ. NO.: 18.0028-01
1 OF 1
SCALE: 1" = 100'

COMPASS SURVEYING LTD
ALTA SURVEYS ● TOPOGRAPHY ● CONSTRUCTION STAKING
2631 GINGER WOODS PARKWAY, STE. 100
AURORA, IL 60502
PHONE: (630) 820-9100 FAX: (630) 820-7030 EMAIL: ADMIN@CLSURVEYING.COM

PROJECT
Solar Project
16400 Newark Road
Newark (Kendall County), Illinois

CLIENT
Greenberg Farrow Architects
1430 West Peachtree Street NW, Suite 200
Atlanta GA 30309

DATE: 03-13-18 | PC TK | DRAWN BY MRA | CHECKED BY DW | BOOK 530 PG 33-35

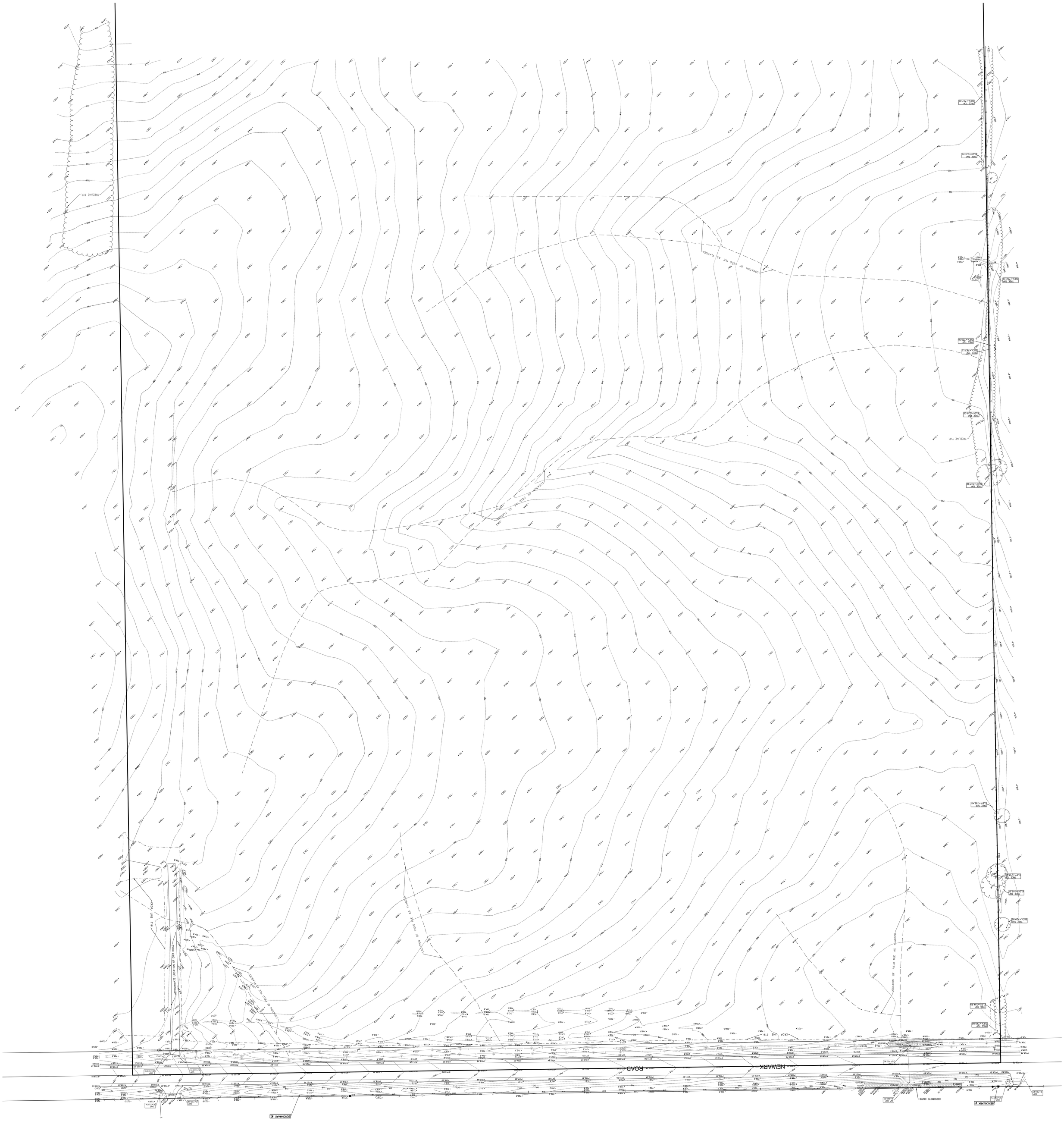
NO.	REVISIONS	DATE	BY

UTILITY STATEMENT

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM VISIBLE FIELD EVIDENCE AND EXISTING DRAWINGS, MAPS AND RECORDS SUPPLIED TO SURVEYOR. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM AVAILABLE INFORMATION. THE SURVEYOR HAS PHYSICALLY LOCATED VISIBLE STRUCTURES; HOWEVER, HE HAS NOT PHYSICALLY LOCATED THE UNDERGROUND LINES.

811 Know what's below. Call before you dig.

K:\Psdata\2018 Projects\18.0028\18.0028-01 LTS\18.0028-01 LTS TOPO.dwg, 3/21/2018 4:04:00 PM, DWG To PDF.pc3


GRAPHIC SCALE
1 inch = 60 ft.
(IN FEET)
LEGEND
ABBREVIATIONS
BENCHMARKS
SITE BENCHMARK #1
SITE BENCHMARK #2
LINE LEGEND
NEWARK ROAD
CONCRETE CURB
LOCATION OF FIELD TILE AS FLAGGED
APPROXIMATE LOCATION OF DIRT ROAD
CROP LINE TYP.
BENCHMARK #1
BENCHMARK #2

EXISTING AGRICULTURAL DRAIN TILE INVESTIGATION PLAN

16400 NEWARK RD - KENDALL

PREPARED FOR **GreenbergFarrow**

SECTION NO. 5, BIG GROVE TWP., KENDALL CO., IL.

EXISTING SUBSURFACE AGRICULTURAL DRAIN TILE INVESTIGATION REPORT

16400 NEWARK RD - KENDALL

GreenbergFarrow

16400 NEWARK RD - KENDALL / GreenbergFarrow , FIELD FILE NO. 8-1-5 , DATE: 2/28/18 .

IN ACCORDANCE WITH KENDALL COUNTY EXISTING DRAIN TILE INVESTIGATION AND LOCATION STANDARDS

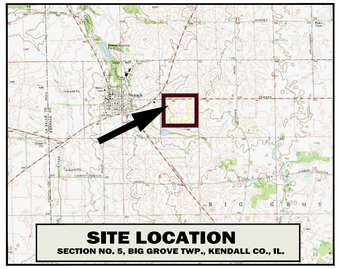
COPYRIGHT © 2018, BY HUDDLESTON MCBRIDE LAND DRAINAGE COMPANY

DESCRIPTION CHART NO. 1A : INVESTIGATION SLIT TRENCH LOCATIONS

ID NO.	SZ.	TYPE / QUALITY	FLOW %	SILT %	DEPTH GRD./INV.	FIELD NOTES:
A1	4"	CLAY / GOOD	15%	CLEAN	56"	ACTIVE FLOW RATE AND CAPACITY
A2	4"	CLAY / GOOD	SLIGHT	CLEAN	54"	ACTIVE FLOW RATE AND CAPACITY
B	---	NO DRAIN TILE	---	---	---	NO DRAIN TILE LOCATED
C	---	NO DRAIN TILE	---	---	---	NO DRAIN TILE LOCATED
D	---	NO DRAIN TILE	---	---	---	NO DRAIN TILE LOCATED
E1	5"	CLAY / GOOD	20%	CLEAN	41"	ACTIVE FLOW RATE AND CAPACITY
F1	5"	CLAY / GOOD	FLOODED	CLEAN	62"	RESTRICTED FLOW AND SURCHARGED
G1	4"	CLAY / GOOD	15%	CLEAN	51"	ACTIVE FLOW RATE AND CAPACITY
H1	4"	CLAY / GOOD	SLIGHT	CLEAN	44"	ACTIVE FLOW RATE AND CAPACITY
H2	4"	CLAY / GOOD	10%	CLEAN	38"	ACTIVE FLOW RATE AND CAPACITY
I	---	NO DRAIN TILE	---	---	---	NO DRAIN TILE LOCATED
J	---	NO DRAIN TILE	---	---	---	NO DRAIN TILE LOCATED
K	---	NO DRAIN TILE	---	---	---	NO DRAIN TILE LOCATED
L1	4"	CLAY / GOOD	10%	CLEAN	33"	ACTIVE FLOW RATE AND CAPACITY
M1	4"	CLAY / GOOD	SLIGHT	CLEAN	37"	ACTIVE FLOW RATE AND CAPACITY
N	---	NO DRAIN TILE	---	---	---	NO DRAIN TILE LOCATED
O1	4"	CLAY / GOOD	10%	CLEAN	42"	ACTIVE FLOW RATE AND CAPACITY
P	---	NO DRAIN TILE	---	---	---	NO DRAIN TILE LOCATED
Q1	4"	CLAY / GOOD	FLOODED	CLEAN	37"	RESTRICTED FLOW AND SURCHARGED
R	---	NO DRAIN TILE	---	---	---	NO DRAIN TILE LOCATED
S	---	NO DRAIN TILE	---	---	---	NO DRAIN TILE LOCATED

DESCRIPTION CHART NO. 1B : SURVEY DATA POINT LOCATIONS

DATA POINT	SZ.	TYPE / QUALITY	FLOW %	SILT %	DEPTH HUB/INV	FIELD NOTES:
1	4"	CLAY / GOOD	SLIGHT	CLEAN	48"	LATERAL AT PROPERTY INGRESS
2	4"	CLAY / GOOD	SLIGHT	CLEAN	42"	LATERAL AT PROPERTY EGRESS
3	4"	CLAY / GOOD	SLIGHT	10%	33"	LATERAL AT PROPERTY EGRESS
4	8"	CLAY / GOOD	SLIGHT	CLEAN	69"	LATERAL AT PROPERTY EGRESS
5	5"	CLAY / GOOD	FLOODED	CLEAN	41"	MAINLINE AT PROPERTY EGRESS
6	4"	CLAY / GOOD	15%	CLEAN	60"	MAINLINE AT PROPERTY EGRESS



SITE LOCATION
SECTION NO. 5, BIG GROVE TWP., KENDALL CO., IL.

MAP LEGEND :

- EXIST. DRAIN TILE COVER MEASUREMENT, TOP OF TILE TO SURFACE
- EX. POLYETHYLENE MAINLINE OR SYSTEM PART
- EX. CLAY DRAIN TILE MAINLINE OR SYSTEM PARTS
- EX. CONCRETE DRAIN TILE MAINLINE OR SYSTEM PART
- EXISTING DRAIN TILE CONTINUES TO UPLAND WATERSHED
- EXISTING DRAIN TILE OUTLETS TO SURFACE
- EXIST. DRAIN TILE (1) INSPECTION STRUCTURE / (2) CATCH BASIN
- EXIST. DRAIN TILE (1) LOCATED END / (2) ASSUMED END
- EXISTING DRAIN TILE CONTINUES TO OFF-SITE OUTLET SYSTEM
- EXISTING DRAIN TILE FAILURE / FLOW SURCHARGE TO SURFACE
- EXISTING DRAIN TILE MAPPED BY SPECULATION AND ASSUMPTION
- EXISTING DRAIN TILE ABANDONED (NOT FUNCTIONAL)
- EXISTING DRAIN TILE "BLOWOUT" OR FAILURE
- HAND PROBE OR ELECTRONIC SCAN FOR DRAIN TILE LOCATION
- INVESTIGATION SLIT TRENCH FOR INVESTIGATION
- SPECIFIC PIT EXCAVATION FOR INVESTIGATION
- SURVEY DATA POINTS
- REPORT IDENTIFICATION NUMBER

REPORT LEGEND :

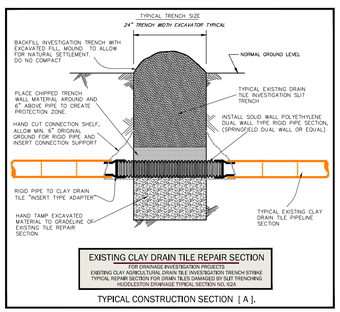
ID NO. ..... POINT OF EXCAVATION FOR SPECIFIC DRAIN TILE INVESTIGATION.
SZ. (SIZE). ..... DRAIN TILE INTERNAL DIAMETER IN INCHES.
MATERIAL / QUALITY..... TYPE OF TILE MATERIALS, PIPE QUALITY - GOOD, FAIR & POOR.
FLOW % ..... PERCENTAGE OF TILE DIAMETER OCCUPIED BY ACTIVE FLOW.
(R) ..... RESTRICTED OR BACKED UP FLOW, SURCHARGED CONDITION
SILT % ..... PERCENTAGE OF TILE DIAMETER OCCUPIED BY RESTRICTIVE SILT.
(A) ..... ABANDONED, FILLED WITH SILT BLOCKAGE, NO FLOW POTENTIAL
DEPTH ..... MEASUREMENT FROM EXISTING GROUND LEVEL TO PIPE INVERT.

(GENERAL NOTES)
MAINLINE TILE ..... TRUNK LINE OR MUTUAL DRAIN, COLLECTOR OF SUB-SYSTEMS.
SUB-MAIN TILE ..... SECONDARY TRUNK LINE OR RANDOM SYSTEM COLLECTOR.
LATERAL TILE ..... FEEDER LINE, SERVICE TILE OR SYSTEM SPUR.
"BLOWOUT" ..... EXISTING SYSTEM PIPE FAILURE OR RESTRICTION.
DRAIN TILE ENDS ..... MAINLINE, SUB-MAIN OR LATERAL PLANNED TERMINATION,
SLIT TRENCH ..... INVESTIGATION TRENCH, TYPICAL 2'- 0" WIDE x 6'- 0" DEPTH.

SPECIAL NOTES :

- *ALL EXISTING AGRICULTURAL DRAIN TILES LOCATED DURING THIS INVESTIGATION SURVEY HAVE BEEN IDENTIFIED ON THIS PLAN AND FIELD STAKED AT < 50' INTERVALS, IN SOME OCCASIONS CERTAIN EXISTING LOCAL DRAIN TILE SECTIONS MAY BE SPECULATED AND CONSIDERED AS AN ASSUMED ROUTE WHICH SHALL BE DELINEATED ON THIS PLAN.*
- *ALL EXISTING DRAIN TILES DAMAGED DURING THE INVESTIGATION PROCESS SHALL BE REPAIRED TO THEIR ORIGINAL STATE IN ACCORDANCE WITH NATURAL RESOURCE CONSERVATION SERVICE STANDARDS FOR DRAIN TILE INSTALLATION AND REPAIR. (HUDDLESTON DRAINAGE (62A) TYPICAL STANDARD "A")*
- *ALL EXISTING DRAIN TILE LOCATION DIMENSIONS HAVE BEEN SURVEYED BY AGRICULTURAL GRADE GPS SURVEY SYSTEMS AND INCLUDE SUB METER ACCURACY, ALL LOCATIONS PERTINENT TO FINAL DESIGN SHALL BE VERIFIED BY THE PROJECT SURVEYOR.*
- *THIS DRAIN TILE INVESTIGATION REPORT IS INTENDED TO IDENTIFY EXISTING DRAIN TILE MAINLINE SYSTEMS ONLY WITH ADDITIONAL PRIORITY ON DRAIN TILES WHICH MAY SERVICE THE UPLAND PROPERTY OF OTHERS OR WITH MUTUAL DRAINAGE STATUS.*
- *THIS DRAIN TILE INVESTIGATION REPORT SHALL BE FILED WITH HUDDLESTON DRAINAGE LAND DRAINAGE CO., AND WILL BE REPRODUCED AND DISBURSED ONLY BY PERMISSION OF THE CONTRACT PRINCIPALS.*

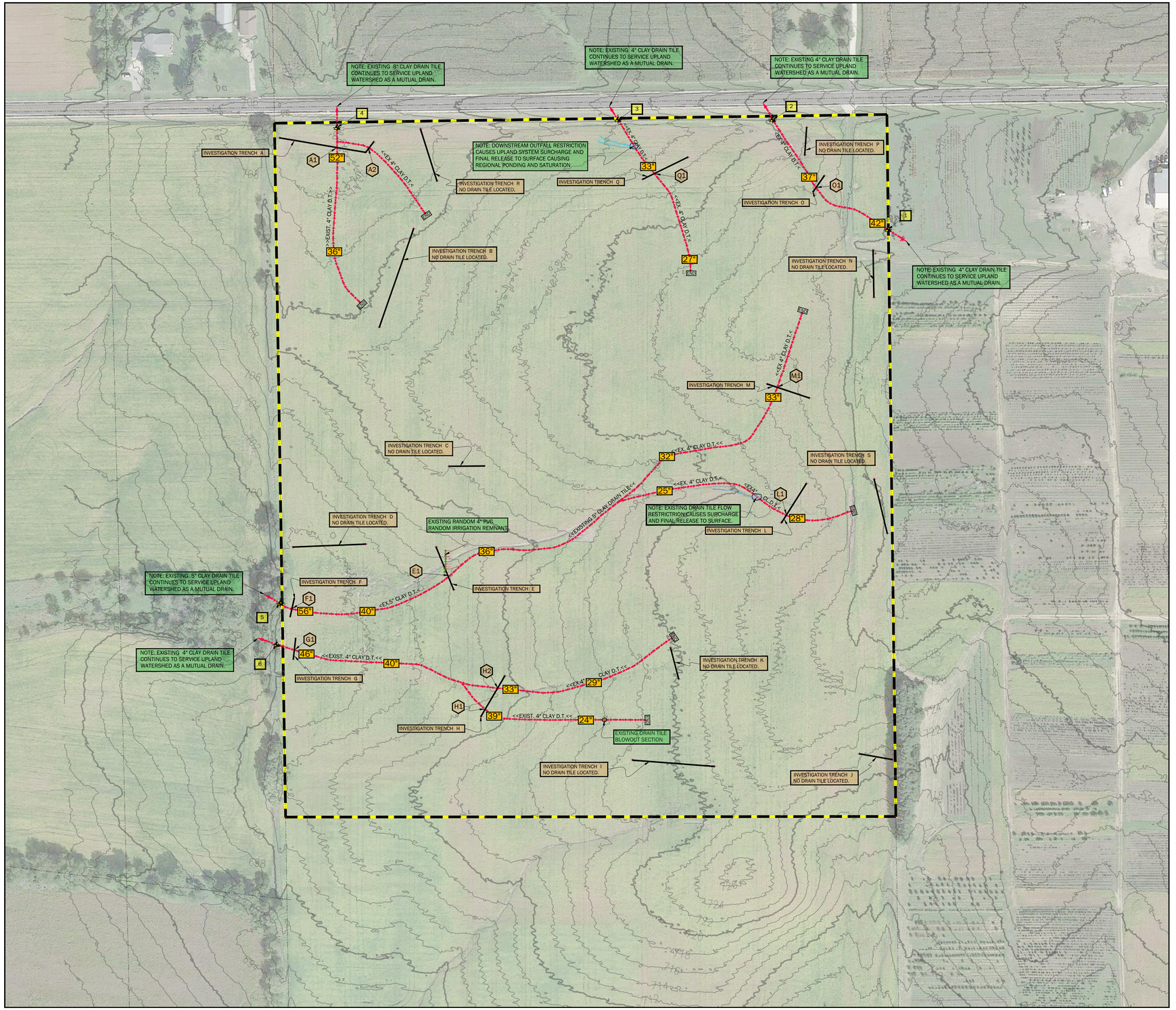
TOM HUDDLESTON, HUDDLESTON McBRIDE DRAINAGE CO.



EXISTING CLAY DRAIN TILE REPAIR SECTION
FOR DRAINAGE INVESTIGATION PROJECTS
EXISTING CLAY DRAIN TILES DAMAGED BY SLIT TRENCH STRIKE
TYPICAL REPAIR SECTION FOR DRAIN TILES DAMAGED BY SLIT TRENCHING
HUDDLESTON DRAINAGE TYPICAL SECTION NO. 62A

TYPICAL CONSTRUCTION SECTION [A].

THESE SYMBOLS REPRESENT SURVEY DATA POINTS WHICH HAVE BEEN STAKED IN THE FIELD FOR THE SPECIFIC PURPOSE OF ELECTRONIC LOCATION AND ELEVATION DETERMINATION BY THE PROJECT SURVEYOR.
THESE DATA POINTS CONSIST OF A 2" X 2" GROUND HUB AND A 3'-0" ON-LINE LOCATION STAKE WHICH INCLUDES DATA POINT IDENTIFICATION NUMBER, SEPARATION MEASUREMENT FROM HUB TO PIPE INVERT, AND PIPE SIZE.
ALL EXISTING DRAIN TILE ROUTES HAVE BEEN FIELD STAKED WITH "EXISTING DRAIN TILE" PIN FLAGS AT 50' INTERVALS AND DOUBLE FLAGS AT INTERSECTIONS.


NOTE: EXISTING 8" CLAY DRAIN TILE CONTINUES TO SERVICE UPLAND WATERSHED AS A MUTUAL DRAIN.
NOTE: EXISTING 4" CLAY DRAIN TILE CONTINUES TO SERVICE UPLAND WATERSHED AS A MUTUAL DRAIN.
NOTE: EXISTING 4" CLAY DRAIN TILE CONTINUES TO SERVICE UPLAND WATERSHED AS A MUTUAL DRAIN.
NOTE: EXISTING 5" CLAY DRAIN TILE CONTINUES TO SERVICE UPLAND WATERSHED AS A MUTUAL DRAIN.
NOTE: EXISTING 4" CLAY DRAIN TILE CONTINUES TO SERVICE UPLAND WATERSHED AS A MUTUAL DRAIN.
NOTE: DOWNSTREAM OUTFALL RESTRICTION CAUSES UPLAND SYSTEM SURCHARGE AND FINAL RELEASE TO SURFACE CAUSING REGIONAL PONDING AND SATURATION.
NOTE: EXISTING DRAIN TILE FLOW RESTRICTION CAUSES SURCHARGE AND FINAL RELEASE TO SURFACE.
EXISTING DRAIN TILE BLOWOUT SECTION
EXISTING RANDOM 4" PVC RANDOM IRRIGATION REMNANT
INVESTIGATION TRENCH A
INVESTIGATION TRENCH B NO DRAIN TILE LOCATED.
INVESTIGATION TRENCH C NO DRAIN TILE LOCATED.
INVESTIGATION TRENCH D NO DRAIN TILE LOCATED.
INVESTIGATION TRENCH E
INVESTIGATION TRENCH F
INVESTIGATION TRENCH G
INVESTIGATION TRENCH H
INVESTIGATION TRENCH I NO DRAIN TILE LOCATED.
INVESTIGATION TRENCH J NO DRAIN TILE LOCATED.
INVESTIGATION TRENCH K NO DRAIN TILE LOCATED.
INVESTIGATION TRENCH L
INVESTIGATION TRENCH M
INVESTIGATION TRENCH N NO DRAIN TILE LOCATED.
INVESTIGATION TRENCH O
INVESTIGATION TRENCH P NO DRAIN TILE LOCATED.
INVESTIGATION TRENCH Q
INVESTIGATION TRENCH R NO DRAIN TILE LOCATED.
INVESTIGATION TRENCH S NO DRAIN TILE LOCATED.
<<EXIST. 4" CLAY D.T.<<
<<EXIST. 5" CLAY D.T.<<
<<EXIST. 8" CLAY D.T.<<
<<EX. 4" CLAY D.T.<<
<<EXISTING 5" CLAY DRAIN TILE<<
<<EXIST. 4" CLAY D.T.<<
<<EX. 4" CLAY D.T.<<
<<EXIST. 4" CLAY D.T.<<
<<EXIST. 4" CLAY D.T.<<
<

• 116 W. Main St., No. 208, St. Charles, Il., 60174
• **9504 East Fowler Rd., Rochelle, Il., 61068**
Phone 815-562-6007 Fax 815-562-6557
T. Huddleston mobile 815-757-6007
Email: huddmac@aol.com

HUDDLESTON - MCBRIDE LAND DRAINAGE CO.
STATEMENT OF QUALIFICATIONS
March 15, 2018

1. Company Summary

ESTABLISHED: MAY 1, 1976 **(By Tom Huddleston & Fred McBride)**

ADDRESS: Rt. 1, 9605 Fowler Road, Rochelle, Il. 61068
Phone - 815-562-6007 Fax - 815-562-6007

116 W. Main St., #208, St. Charles, Il. 60174
Phone 630-513-0757 Fax - 630-584-0591

Huddleston - Mcbride Land Drainage Co. (Hudmac) has been actively involved in providing subsurface Agricultural drainage, Natural area restoration, Existing drain tile investigations and Consulting services for over 42 years.

Hudmac provides complete design, materials furnish and construction services for environmental restoration, commercial, agricultural and municipal underdrain projects. We also have developed methodology for the identification and assessment of existing subsurface drainage tile systems including specific location and hydrologic evaluation. Our research projects include evaluation and testing in efforts to improve solutions for watertable management, hydrology restoration, soil permeability, water quality, drainage system abandonment and construction procedures.

Hudmac owns and operates a complete construction equipment fleet and support. Our construction crews maintain existing drainage systems on over 350 farms and install over 950,000 feet of new agricultural drainage tile annually. Existing drain tile investigation services include approximately 240 individual parcels ranging from 10 to 7,000 acres in size and totaling over 26,000 acres annually. Hudmac also owns and operates Cooprider Drainage Co., Rochelle, Il. (established November 1930), and Countryside Drainage, Rochelle, Il., (established 2005) which exclusively designs, constructs and maintains agricultural and horticultural drainage systems.

PRINCIPALS OF HUDDLESTON MCBRIDE LAND DRAINAGE CO.

Thomas L. Huddleston
Frederick J. Mc Bride

TOTAL PERSONAL: 11 .

1 Administrative
1 Cadd Drafter
2 Field Operations Managers
4 Operating Engineers
4 Labors

2. Typical Drainage Services, Sample Projects:
(completed within the last 5 years)

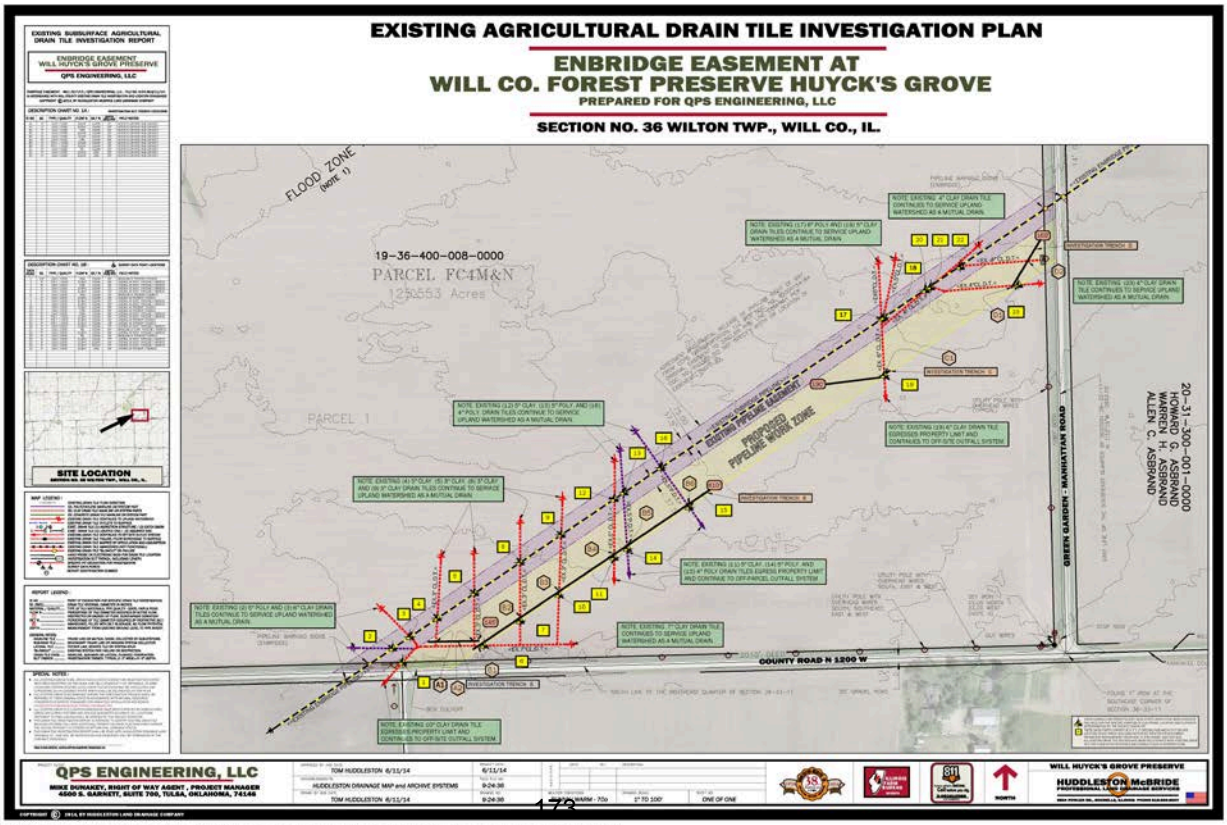
2.a Drainage Tile Investigation Services for Linear projects:

Huddleston McBride Land Drainage Co. (Huddmac) provides existing drain tile location mapping and condition evaluations for lineal projects such as pipelines and subsurface utility projects. Our consulting service includes existing drainage tile location, gps survey, video inspection, repair recommendation, and public presentations. Tom Huddleston provides land owner consultation and assistance to right of way agents during acquisition negotiations.
Our company completes more than 20 mutual drainage planning and coordination projects annually within the northern Illinois area.
Listed below is a typical land drainage consulting project completed within the past year:

Enbridge Energy, New pipeline construction:

Client: Enbridge Energy and QPS Engineering, Mike Dunakey
Project Cost: $ 25,200.00 (for this specific parcel)
Contractor: Huddleston McBride (no sub-contractors)
Location: Will County, Illinois

Purpose: This project included the location, staking, gps location and evaluation of all agricultural drain tile system impacted by proposed pipeline construction project within random sections of Will County Forest Preserve. These drain tile investigation projects were completed as part of the landowner requirement for right of way acquisition. Additional consulting services where provided to the Embridge right of way agents during negotiations. This is an example of a plan prepared for Embridge in efforts to assure existing drain tile protection and identification.



2.b Agricultural Drainage Consulting, Design, and Construction Services:

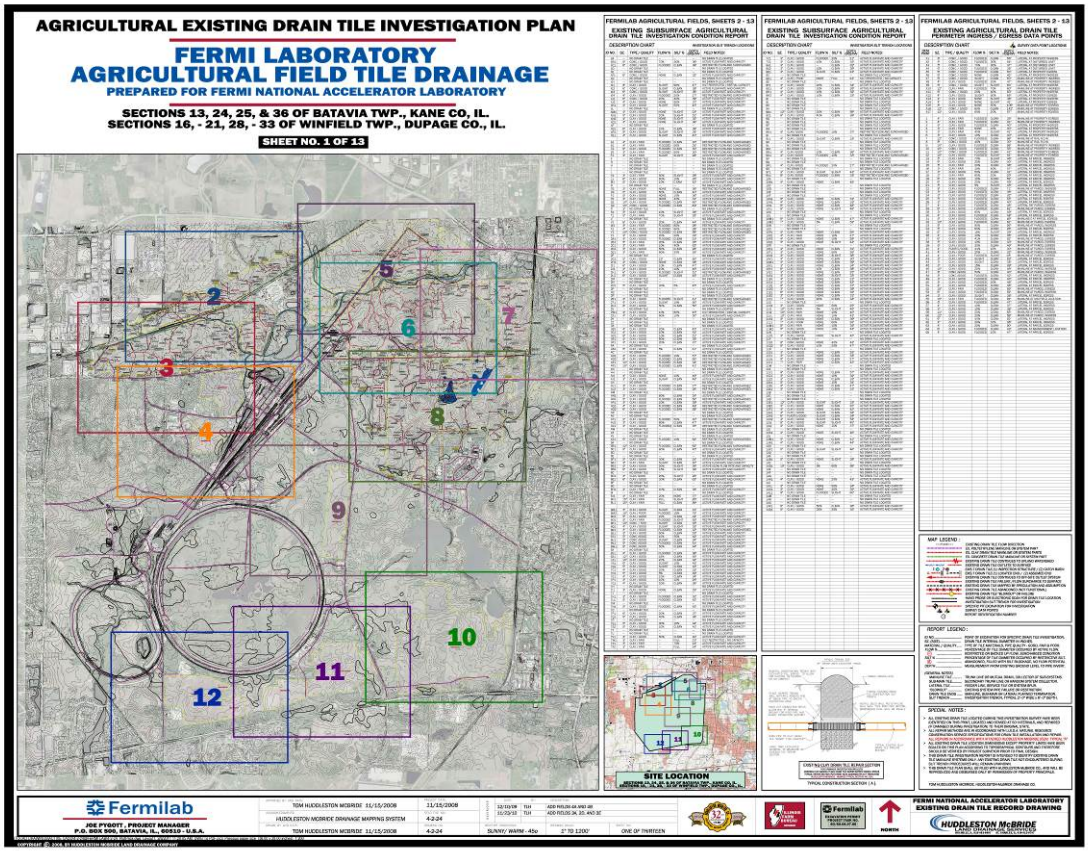
Cooprider Agri Drainage Co.-1930 (Coop) and Huddleston McBride Land Drainage Co.-1976 (Huddmac) are third generation companies and have over 75 years of experience in agricultural drainage tile planning, repair and construction services. Countryside Drainage-2005 (Cd) which is our newest company specializes in advanced precision construction including gps / laser drain tile installation. Our ongoing farm relationships include agricultural land owners, farm managers, corporate producers, government land agencies, active farm operators, bank held assets and drainage districts. Our companies maintain existing drainage systems on over 250 farms parcels and install over 750,000 of new drain tile annually.
Listed below is a typical agricultural drain tile evaluation and repair project recently completed:

FERMI Agricultural Parcels,

Fermi National Accelerator Laboratory, U.S.Department of Energy

Client: Fermi National Accelerator Laboratory, Mike Becker, grounds & maintenance
Project Cost: $ 360,000.00
Contractor: Huddleston McBride Land Drainage Co.
Location: Sections no. 13, 24, 25, & 36, Batavia Township, Kane Co., IL.

Purpose: This project included the location, staking, gps location and evaluation of all agricultural drain tile system within the 4600+ acres of agricultural production areas. Following the location process, consulting services were provided in regard to existing drain tile modification, maintenance and new drain tile construction. This project is a multi-phase project, phase 8 of 12 was recently completed in December of 2016, phase no. 9 will start in Fall of 2017.



2.c. Drainage Tile Mapping and Hydrology Restoration Services:

Huddleston McBride Land Drainage Co. (Huddmac) has 35 years of experience in existing drainage tile evaluation, planning, abandonment and modification implementation procedures for natural area restoration. Our services include existing drainage tile mapping, gps location, benefit assessment, recommendations for modification or abandonment, legal drain protection,public presentations and construction implementation.

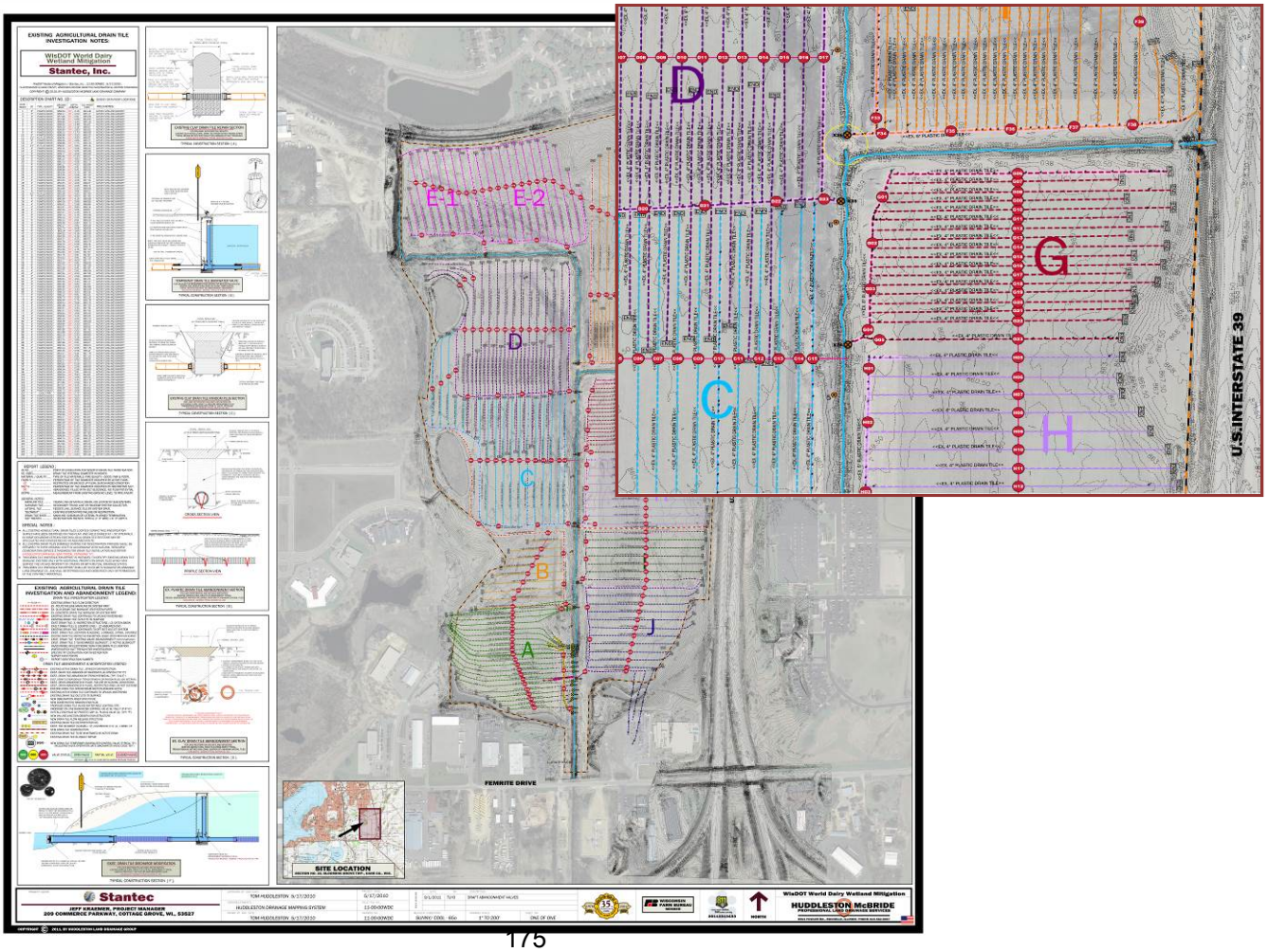
Our company completes more than 35 natural hydrology and water quality restoration projects within northern Illinois, Indiana and Wisconsin annually.

Listed below is a typical drainage evaluation and modification project which has been recently completed:

WisDot Wetland Bank, Wisconsin Department of Transportation.

Client: Wisconsin Department of Transportation
Project Cost: $ 152,000.00
Contractor: Huddleston McBride (no sub-contractors)
Location: Madison, Wisconsin

Purpose: This project included the location, staking, gps location and evaluation of all agricultural drain tile system within the 564 acres of prior agricultural production areas. This project will be used for wetland mitigation for Interstate 39 improvement from the Illinois to Madison. Following the location process, consulting and construction services were provided regarding existing drain tile modification for wetland enhancement. Valve construction was completed I summer 2017



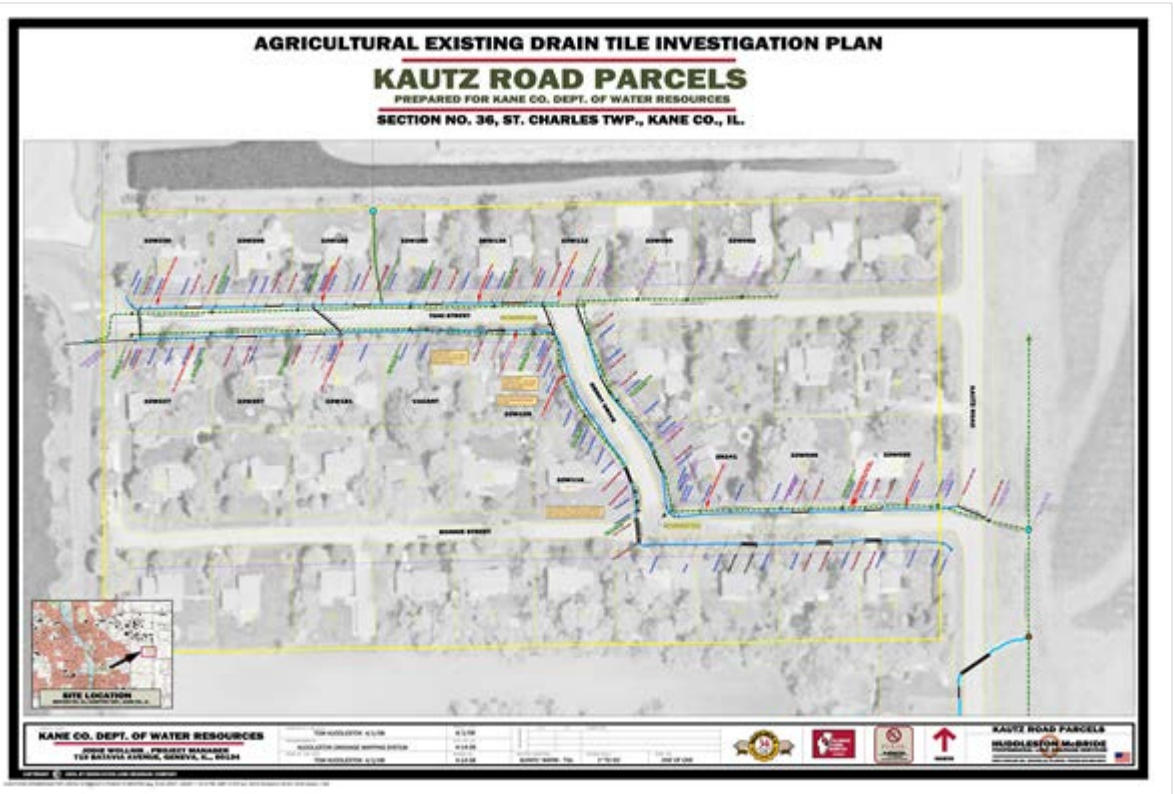
2.d Land Drainage Consulting Services

Huddleston McBride Land Drainage Co. (Huddmac) provides existing condition evaluations and failure analysis for existing drainage deficiencies. Our consulting services include existing drainage tile location, gps survey, video inspection, coordination between landowners, and recommendations for improvement, public presentations and construction implementation. Our company completes more than 50 mutual drainage planning and coordination projects annually within the northern Illinois area.
Listed below is a typical land drainage consulting project completed within the past year:

Countyline Subdivision, Kane Co. Water Resource Division

Client: Kane County Department of Water Resources, Paul Schuch, P.E.,
Project Cost: $ 42,000.00 (under retainment contract)
Contractor: Huddleston McBride Land Drainage Co.
Location: Section no. 36, St. Charles Township, Kane Co., IL., Kautz Road

Purpose: This project included site reconnaissance, on-site main drain tile investigation, pipeline video inspection, gps location, staking and evaluation. Following the location process our services included meeting with homeowners, Kane Co. Water Resources and St. Charles Twp. Road District regarding existing conditions and recommendations for repair. Following municipal acceptance, funding and contract approval, failed systems were repaired by our company in accordance with design documents.



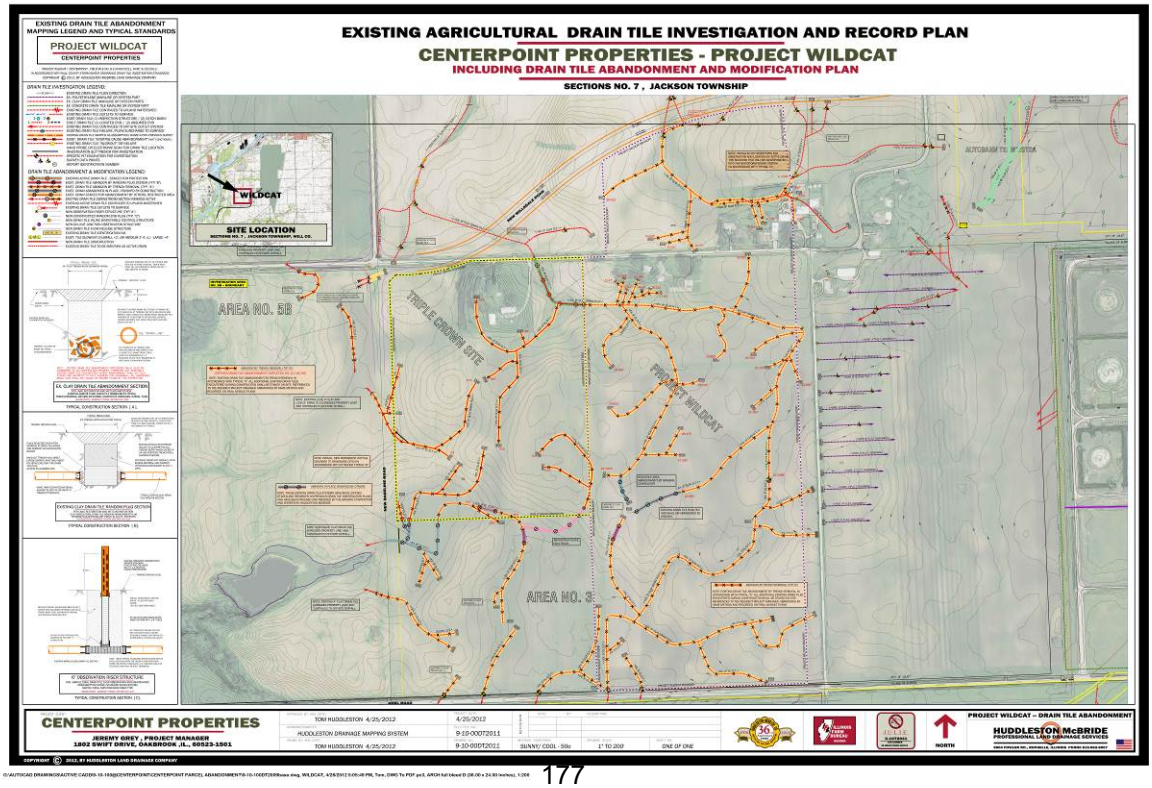
2.e Drainage Tile Investigation Services for Land Use Change:

Huddleston McBride Land Drainage Co. (Huddmac) owns and maintains an extensive electronic record archive of Existing Agricultural Drain Tile Historic Mapping Records. This mapping system is based upon geographic parcel location including record information from Huddleston-Mcbride Land Drainage Co.(1975) , Cooprider Farm Drainage Co. (1930), Elbridge F. Ball & Sons, (drainage engr.) Survey notes (1940), and Countryside Drainage (2005). These record files include historic farm parcel notes, active / inactive drainage district maps and documents, conservation resource mapping, agricultural drain tile contractor records, aerial photo delineation, S.C.S./ N.R.C.S design notes and soil maps, typical drain tile investigation reports, record construction drawings, estate records, and land owner sketch drawings.
Our drainage tile inventory services include complete location, gps survey, evaluation, consulting, modification and abandonment services.
Listed below is a typical land drainage investigation project completed within the past year:

Home Depot Regional Warehouse, Centerpoint Development

Client: Jeremy Grey, Centerpoint Intermodal and City of Joliet,
Project Cost: $ 176,000.00
Contractor: Huddleston McBride Land Drainage Co.
Location: Section no. 7, Jackson Township, City of Joliet, Will Co., Il.

Purpose: This project included the location, staking, gps location and evaluation of all agricultural mainline drainage tiles within the 4860 acres of agri land and natural areas for the construction of an intermodal center. Following the location process, consulting services were provided regarding existing drain tile evaluation and the protection of the rights of others to drain. Our consulting services included meeting with adjacent landowners, city officials, private ecologist , and review engineers regarding abandonment of existing system and the construction of replacement systems. *(listed below is an individual development parcel plan for Home Depot)*



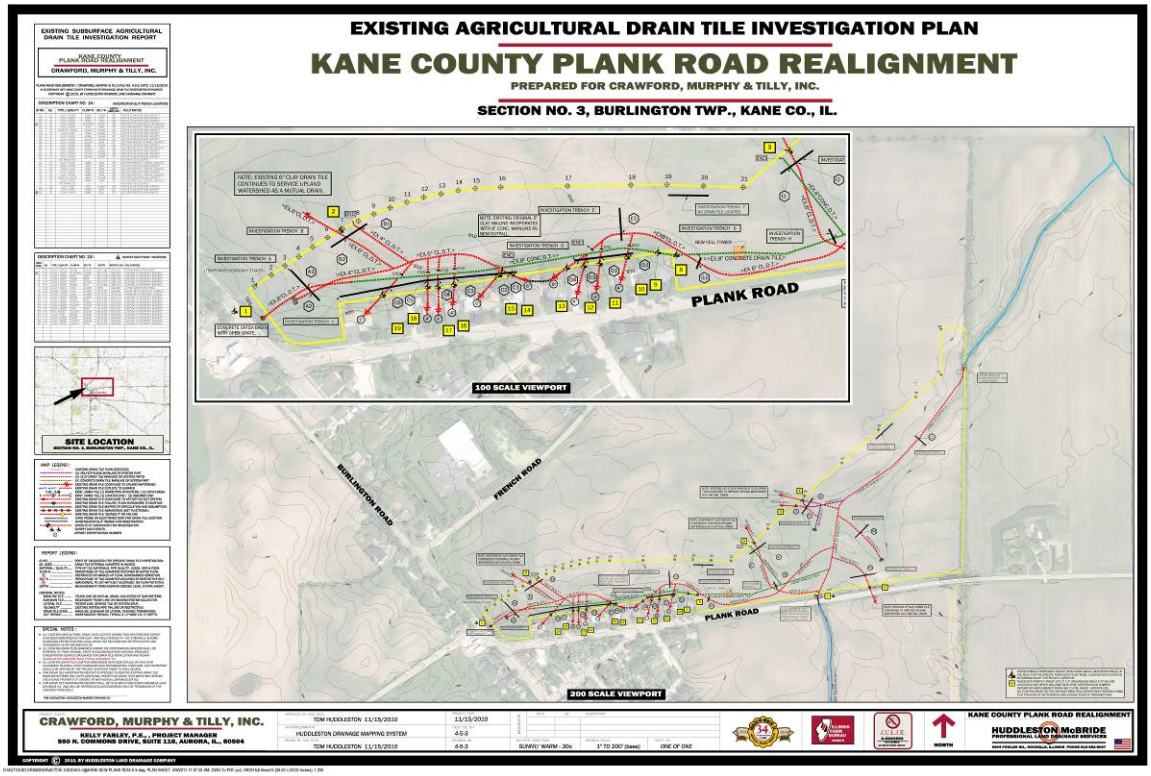
2.f Drainage Tile Investigation Services for Transportation:

Plank Road Realignment, New public road improvements:

Huddleston McBride Land Drainage Co. (Huddmac) provides existing drain tile location mapping and condition evaluations for lineal transportation projects including, railroads, state / local roads, intersection improvement and related structures. Our consulting service includes existing drainage tile location, gps survey, video inspection, repair recommendation, and public presentations.
Our company completes more than 25 roadway planning and construction projects annually within the northern Illinois area.
Listed below is a typical land drainage consulting project completed within the past year:

Kane County Transportation, New roadway construction:

Client: Kane County Department of Transportation
Project Cost: > $ 25,000.00
Contractor: Huddleston McBride (no sub-contractors)
Location: Kane County, Illinois



3. Recent Project References:

EXISTING DRAIN TILE INVESTIGATIONS, CONSTRUCTION AND CONSULTING SERVICES

1. **Spring Creek U.S. Army Corp. of Engineers Wetland Project**
   Reference Person: Robbie Sliwinski, U.S.ARMY CORPS.
   Project Description: *Provide existing drain tile investigation and evaluation services on approx. 2,600 acres of prior agricultural lands, consult, design and implement the construction of a subsurface valve system for hydro restoration.*
2. **Sauer Farm Wetland Violation Mitigation**
   Reference Person: Mike Machalek, U.S.ARMY CORPS.
   Project Description: *Provide existing drain tile investigation and evaluation of drainage violation activity within a jurisdictional farmed wetland area. Continue to provide a mitigation plan for U.S.Army Corp. and Natrual Resource Conservation Service authorization. Proceed with abandonment and modification construction for compliance.*
3. **Morton Arboretum New Tree Nursery Development**
   Reference Person: Kris Bachtell, MORTON ARBORETUM
   Project Description: *Furnish land drainage consulting services, complete site analysis, consulting services, construction plans and furnish materials and construction of complete subsurface water control system for a new tree research nursery.*
4. **Midewin Tallgrass Prairie, Drummond & Grant Creek Wetland Mitigation Project**
   Reference Person: Bill Glass, U.S.FOREST SERVICE
   Project Description: *Complete existing drain tile inventory and evaluation, including design plans, consulting services, construction typicals. Continue with construction of a subsurface valve system for hydrology restoration.*
5. **Deer Grove Wetland Mitigation for Ohare Airfield Improvements**
   Reference Person: Joe Roth, OPENLANDS
   Project Description: *Complete existing drain tile investigation and the installation of a valve testing system for hydrology measurement. Continue with design plans, consulting services, construction typicals and final construction of a subsurface valve system for hydrology restoration.*
6. **Orland Park Ecosystem Restoration Project**
   Reference Person: Brook Herman, U.S.ARMY CORPS
   Project Description: *Provide existing drain tile investigation and evaluation services on approx. 950 acres of prior agricultural lands, including consulting and abandonment plans. Continue with existing drain tile modification construction and abandonment by trench removal methods.*
7. **Bartell Grassland & Tinley Creek Restoration Areas**
   Reference Person: Joe Roth & Linda Masters OPENLANDS
   Project Description: *Complete existing drain tile investigation and the installation of a valve testing system for hydrology measurement. Continue with design plans, consulting services, construction typicals and final construction of a subsurface valve system for hydrology restoration. Final abandon valve system by bentonite slurry injection.*
8. **Wisconsin Department of Resources, Hertzberg Wetland Mitigation Area**
   Reference Person: Kathie Van Price, WISCONSIN DEPT. OF TRANSPORTATION
   Project Description: *Complete existing drain tile inventory and evaluation, including design plans, consulting services and construction typicals for awetland mitigation bank.*

4. Personal References:

RESTORATION PROJECT PLANNERS, MANAGERS, ENGINEERS, AND SUPERVISORS

Kathy Chernich, U.S. Army Corps of Engineers
111 N. Canal Street, Suite600
Chicago, Il.,
Phone No. 312-846-5531

Bill Glass, U.S.Forest Service, Midewin Tallgrass Prairie
30238 S. State Route 53
Wilmington, IL 60481
815/423-2129

Joe Pygott, Fermi Lab, Agricultural Services
Fermi National Accelerator Laboratory
Kirk Road and Pine Street, P. O. Box 500
Batavia, Il., 60510

Joseph Roth, Openlands
25 East Washington Street, Suite 1650
Chicago, Il. 60602
Phone No. 312-863-6275

Mike Machalek, , U.S. Army Corps of Engineers
111 N. Canal Street, Suite600
Chicago, Il.,
Phone No. 312-846-5531

Kris Bachtell, Morton Arboretum
4100 IL. Rte. 53
Lisle, Il., 60532
Phone No. 630-968-0074

Dave Kircher, Forest Preserve District of Cook County
236 N. Harlem Avenue
River Forest, Il., 60305
Phone No. 800-870-3666

Jerry Culp, Forest Preserve District of Kane County
1996 South Kirk Road, Suite 320
Geneva, Illinois 60134
Phone No. 630-232-5980

Erik Neidy, Forest Preserve District of Dupage County
3 S. 580 Naperville Road
Wheaton, Il. 60187-8761
Phone No. 630-933-7675

Andrew J. Hawkins, Forest Preserve District of Will County
17540 West Laraway Road
Joliet, Illinois 60433
Phone No. 815-722-9425

Ken Anderson, Kane County Dept of Water Resources (5 year retainer contract)
719 Batavia Avenue
Geneva, Il., 60134
Phone No. 630-232-3499

Steve Packard, National Audubon Society- Chicago Region
1718 Sherman Ave., Suite 210,
Evanston IL 60201
Phone No. 847-328-1250

5. Key Staff Resume:

Tom Huddleston is a qualified technical specialist in subsurface land drainage including existing conditions evaluation, improvement design, construction implementation and project oversight. His expertise and experience continue to provide urban and rural hydrology failure assessment and improvement services.

He is a third generation (1929 to present) drain tile contractor and has been personally involved in subsurface drainage services since 1970. Huddleston presently owns and supervises three drainage construction companies which operate within the mid-west and are annually responsible for >920,000 feet of new drain tile construction, >26,000 acres of investigation services , and existing system maintenance /repair.

Tom Huddleston looks forward to this opportunity and is personally committed to provide skillful and professional drainage consulting services.

Title:
Partner / owner, Huddleston-Mcbride Land Drainage Co.
Partner / owner, Cooprider Farm Drainage Co.
Partner/ owner, Countryside Farm Drainage Co.

Areas of specialization:
Subsurface land drainage design, construction and consulting, Existing agricultural drain tile investigations and research services since 1970.

Education:
Louisiana State University, Agri-Engineering
Baton Rouge, Louisiana 1974 to 1980

Research experience:
Kane County Development Department, subdivision control ordinance advisory committee.
Kane County Dept. of Water Resources, stormwater ordinance advisory committee.

Illinois cooperative extension service subsurface land drainage conference, 1996 - present.

Ogle county soil conservation service soil erosion and land improvement advisory committee

Independent study in subsurface irrigation, University of Illinois Department of Agriculture and Ayers and Associates Engineering, subsurface irrigation construction procedures, drain mode water table control management, and subsurface drainage modification.

I.L.C.A., Illinois chapter of land improvement contractor's association active member and subsurface drainage presenter, 1978 - present.

Natural resource conservation services, contractor conference on soil erosion and land improvement design and construction procedures,
1986 - present

Independent study in applications and operations of subsurface interface radar systems, Geophysical Survey Systems, Inc. Hudson, New Hampshire finding and mapping buried subsurface pipes, ducts. Cables and other natural and manmade objects, 1983 - present

Independent study and test contractor in construction procedures, materials design and watertable control management, Springfield Plastic Pipe Manufacturing, Auburn, Il. 1985 – present

6. Contact information:

Key persons who will administrate these projects are listed below:

Tom Huddleston, Consulting service and administration
Cell phone no. 815-757-6007

or

Fred McBride, Crew leader and field services
Cell phone no. 815-757-6008

Solar Decommissioning Estimate/Plan

Key assumptions in this decommissioning estimate include the fact that the fencing, electrical cabinetry, solar racks, solar panels, and wiring are all recyclable, therefore, the primary cost of decommissioning is the labor to dismantle and load as well as the cost of trucking. The concrete pads will be broken up at the site and hauled to Republic Services Illiana Crown Point Transfer Station where it will be accepted without a charge. Salvage values for the racking, foundation screws, and electrical wiring have been included in this estimate. Solar modules will be recyclable at the time of decommissioning, but currently no adequate recycling values are available and so have been omitted from this estimate.

The following items from the 2488.32 kilowatt (kW) array will be recycled:

- 6912 solar panels
- 3276 linear feet of electrical wiring
- Racking
- 3081 linear feet of fencing

This decommissioning estimate is based on the following costs:

Labor rate = 35.6/hour
Bobcat cost = 195/hour
Trucking cost = 130/hour
Backhoe cost = 245/hour
Grader cost = 1800/day
Front End Loader/Excavator cost = 2000/day

Labor / Materials / Equipment Costs:

1 . Remove Panels:

The panels are clamped in. They slide in a track. A laborer needs only unclamp the panel and reach over and slide the panel out of the track.

$$Panel\ Removal\ Rate \cdot Total\ Number\ of\ Solar\ Panels \cdot Labor\ Rate = Panel\ Removal\ Cost$$

1 min/panel * 6,912 solar panels * 1hr/60min * $35.6/hr = $4,101

Total = $4,101

2 . Remove Rack Wiring:

The panels are plugged together in the same manner as an electrical cord from a light is plugged into a wall socket. A laborer needs only reach over and pull the plug. The string wires lie in a tray. A laborer needs only reach into the tray and remove the strands of wire.

$$Wire\ Removal\ Rate \cdot Total\ Number\ of\ Solar\ Panels \cdot Labor\ Rate = Rack\ Wiring\ Removal\ Cost$$

0.25 min/panel * 6,912 solar panels * 1hr/60min * $35.6/hr = $1,025

Total = $1,025

3 . Dismantle Racks:

Tracker module racking primarily consists of a torque tube and a driveline. These are supported on driven piles.

$$Total\ Number\ of Racks \cdot Rack\ Removal\ Rate \cdot Labor\ Rate = Rack\ Dismantling\ Cost$$

1,317 racks * 20 min/rack * 1hr/60min * $35.6/hr = $15,628

Total = $15,628

4 . Load Racks:

$$Number\ of\ Racks \cdot Rack\ Loading\ Rate\ (Labor\ Cost + Front\ End\ Loader\ Cost + Trucking\ Cost) = Total\ \ Rack\ Removal\ Cost$$

1,317 racks * 1 min/rack * 1hr/60min * [$35.6/hr + ($2000/day * 1day/8hrs) + $130/hr] = $7,915

Total = $7,915

5 . Remove and Load Electrical Equipment (includes transformer, inverters, drive motors, and controllers): Inverters are smaller and easier to remove and so take less time than the other electrical components.

Number of units: 1 transformers + 16 inverters + 0 batteries + 4 motors + 1 controller

$$(Inverter\ Removal\ Rate * Number\ of\ Inverters + Elec.\ Equip.\ Removal\ rate \cdot Number\ of\ Units) \cdot (Labor\ Rate + Bobcat\ Cost + Trucking\ Cost) = Total\ Elec.Equip.Removal\ Cost$$

(0.5 hr/inverter * 16 inverters + 1 hr/unit * 6 units) * [$35.6/hr + $195/hr + $130/hr] = $5,048

Total = $5,048

6 . Break Up Concrete Pads:

Using an excavator and jackhammer:

$$\#\ of\ days \cdot (\ Front\ end\ loader\ and\ excavator\ cost + Labor\ Cost) = Total\ Concrete\ Pad\ Removal$$

1 day * [$2000/day * [1day/8hr] + $35.6/hr = $2,285

Total = $2,285

7 . Remove Cable:

$$Total\ Cable\ Linear\ Footage \cdot Cable\ Removal\ Rate \cdot (Labor\ Cost + Backhoe\ Cost) = Total\ Cable\ Removal\ Cost$$

3,276 ft * 3min/ft * 1hr/60min * [$35.6/hr + $245/hr] = $45,962

Total = $45,962

8 . Remove Piles and Power Poles:

$$\left[\frac{Total\ Number\ of\ Piles}{Daily\ Pile\ Removal\ Rate} \cdot (Labor\ Cost + Excavator\ Cost)\right] + [Total\ Number\ of\ Poles \cdot Pole\ Removal\ Rate] = Total\ Screw\ and\ Power\ Pole\ Removal\ Cost$$

1317 piles / 100 piles/day * [$35.6/hr + ($2000/day * 1day/8hr)] + [4 poles * $1500/pole] = $36,091

Total = $36,091

9 . Remove Fence: 1 min/LF

$$Total\ Fence\ Length \cdot Fence\ Removal\ Rate \cdot [Labor\ Cost + Bobcat\ Cost + Trucking\ Cost] = Total\ Fence\ Removal\ Cost$$

3,081 ft * 1 min/ft * 1hr/60min * [$35.6/hr + $195/hr + $130/hr] = $18,517

Total = $18,517

10 . Grading:

$$Rough\ Grading\ (days \cdot Grader\ Cost) + Fine\ Grading\ (days \cdot Grader\ Cost) = Total\ Grading\ Cost$$

[1 day * $1800/day] + [1 day * $1800/day] = $3,600

Total = $3,600

11 . Truck to Republic Services Illiana Crown Point Transfer Station

$$Total\ Truckloads \cdot Round\ trip - Site\ to\ Transfer\ Station\ Distance\ \cdot (Fuel\ Cost)\ + Total\ Truckloads \cdot Round\ Trip\ Time \cdot Trucking\ Cost = Total\ Trucking\ to\ Transfer\ Cost$$

[17 trips * 31 miles/trip * $5/mile] + [17 trips * 1 hrs * $130/hr] = $4,845

Total = $4,845

12 . Remove Gravel Road / Equipment Area

$$Road\ Width * Road\ Length/EquipmentArea * Road\ Depth * Gravel\ Export\ Cost = Total\ Removal\ Cost$$

14ft * 1327ft * (10in *1ft/12in)*(1 cu ft/27cu yd) * $10/cu yd = $5,732

Total = $5,732

13 . Reclamation of Disturbed Areas (gravel road)

$$Road\ Width * Road\ Length * Road\ Depth * Loam\ Import\ Cost = Total\ Reclamation\ Cost$$

14ft * 1327ft * (10in *1ft/12in)*(1 cu ft/27cu yd) * $25/cu yd = $14,329

Total = $14,329

14 . Seed Disturbed Areas:

$$Re - seeding\ time \cdot Labor\ Cost + Hydroseeding\ Cost\ * Disturbed\ Area = Total\ Seeding\ Disturbed\ Area\ Cost$$

16 hr * $35.6/hr + $0.1/square foot * 18578 square feet = $2,427

Total = $2,427

15 . Fencing, Racking, and Foundation Pile Recycling Value

$$Total\ Fencing\ Weight * Total\ Racking\ Weight * Total\ Foundation\ Pile\ Weight * Galvanized\ Steel\ Salvage\ Value = Total\ Steel\ Salvage\ Value$$

[2,188 lbs + 276,480 lbs + 177,795 lbs] * $0.05/lb = $-22,823

Total = ($22,823)

16 Copper Wire Recycling Cost

$$Total\ Copper\ Wire\ Weight * Insulated\ Copper\ Wire\ Salvage\ Value = Total\ Copper\ Salvage\ Value$$

511 lbs * $0.5/lb = $-256

Total = ($256)

17 Aluminum Wire Recycling Cost

$$Total\ Aluminum\ Wire\ Weight * Insulated\ Aluminum\ Wire\ Salvage\ Value = Total\ Aluminum\ Salvage\ Value$$

2,703 lbs * $0.25/lb = $-676

Total = ($676)

18 Panel Recycling Cost

$$Total\ Number\ of\ Panels * Panel\ Salvage\ Value = Total\ Panel\ Salvage\ Value$$

6,912 panels * $5.33/panel = $-36,841

Total = ***($36,841)***

The resultant projected costs:

Task		Cost
Remove Panels	$	4,101
Remove Rack Wiring	$	1,025
Dismantle Racks	$	15,628
Load Racks	$	7,915
Remove and Load Electrical Equipment	$	5,048
Break up concrete pad	$	2,285
Remove cable	$	45,962
Remove screws and power poles	$	36,091
Remove fence	$	18,517
Grading	$	3,600
Truck to Transfer station	$	4,845
Remove Gravel Road	$	5,732
Reclaim Disturbed Areas	$	14,329
Seed Disturbed Areas	$	2,427
Steel Recycling Value	$	(22,823)
Copper Recycling Value	$	(256)
Aluminum Recycling Value	$	(676)
Panel Recylcing Value	$	(36,841)
Total Cost	$	106,911

Total Cost after 20 Years (2% inflation rate) = **$158,864**

21 South Evergreen Avenue
Suite 200
Arlington Heights, IL 60005
847.788.9200
www.greenbergfarrow.com
We Are Global

Memorandum

April 11, 2018

To: Matt Asselmeier
Senior Planner
Kendall County PBZ Department
111 West Fox Street
Yorkville, IL 60560

Project	Special Use Request – 16400 Newark Road
Project #	20180117.0
From	Jason Bolling
Re	Additional Support Documents
Copies	Justin Hardt, BSSI Melissa Samaroo, BSSI Alex Farkes, BSSI Sarah Wochos, BSSI

01 Kendall County-Solar Expectations Letter

The attached letter provides a brief summary to explain the recent increase in solar farm applications the County may be experiencing and also provides State-wide context as relates to the expectation for future solar farm applications in the County.

02 ISEA Zoning & Regulation Document

The attached *Illinois Solar Energy Association* document provides information related to solar development in Illinois and also addresses anticipated impacts of solar development. Highlights include:

- Solar development has a very low-impact on the land that is hosting the equipment and the surrounding area.
- Solar projects provide local clean energy generation.
- Solar projects will have a positive impact on jobs, tax revenue and other forms of direct and indirect economic activity in local communities.
- Solar system developers and owners have a vested interest in making sure that projects are constructed in an efficient manner and that the systems operate for the full life of the panels.
- Building solar is no more disruptive than any other typical development, and in many cases, is less impactful.
- Ground-mount systems are hard to see beyond the borders of the property. Neighboring properties are unlikely to even notice the system on a daily basis, and it will have no impact on property values or quality of life.

03 NC Appraisal – Oakwood Solar Impact Study

This 2016 study was completed by Kirkland Appraisals, LLC. The purpose of the analysis was to determine whether a proposed solar farm would maintain or enhance adjoining or contiguous property values and whether the location and character of the use would be in harmony with the area in which it was to be located. Analysis was prepared using several existing NC solar farms to determine the impact on the value of adjoining property. Findings are as follows:

- Market analysis concluded there had been no impact on sale price for residential, agricultural, or vacant residential land that adjoined the existing solar farms included in the study.
- The price per square foot for finished homes was not being impacted negatively by the presence of the solar farms.
- The solar farm use presents no potential hazardous waste byproduct as part of normal operation. Any fertilizer, weed control, vehicular traffic, or construction will be significantly less than typically applied in a residential development or even most agricultural uses.
- The solar farms inspected produced no noticeable odor.
- Regarding noise, the solar farms inspected were inaudible from the roadways.
- Visual impact of the solar panels will be similar in height to a typical greenhouse and lower than a single story residential dwelling.

Conclusion: Analysis shows no impact in home values due to the adjacency to the solar farm as well as no impact to adjacent vacant residential or agricultural land. The criteria for making downward adjustments on property values such as appearance, noise, odor, and traffic all indicate that a solar farm is a compatible use for rural/residential transition areas.

04 Article: No Evidence of Residential Property Value Impacts Near U.S. (Wind)

The 2013 Berkeley Lab study found no statistical evidence that operating wind turbines have had any measurable impact on home sales prices.

- Per the study, "Findings comport with the large set of studies that have investigated other potentially similar disamenities, such as high voltage transmission lines, land-fills, and noisy roads, which suggest that widespread impacts from wind turbines would be either relatively small or nonexistent."
- We would offer the opinion that solar farm projects are significantly less impacting than the other uses studied.

05 NC State White Paper: Health & Safety Impacts of Solar Photovoltaics

This 2017 paper provides detailed analysis of health and safety impacts of solar project materials and dispels many commonly held misconceptions. Highlights include the following:

- PV technology and its potential impacts have been studied since the 1950s.
- The technology and the solar inverters are not known to pose any significant health dangers to their neighbors.
- Risks of site contamination are much less than for most other industrial uses because PV technologies employ few toxic chemicals and those used are used in very small quantities.
- Due to the reduction in the pollution from fossil-fuel-fired electric generators, the overall impact of solar development on human health is overwhelmingly positive.
- The system installation, or construction, process does not require toxic chemicals or processes.
- Solar PV panels typically consist of glass, polymer, aluminum, copper, and semiconductor materials that can be recovered and recycled at the end of their useful life.

- The vertical post portion of the racking is galvanized steel and the remaining above-ground racking components are either galvanized steel or aluminum, which are both extremely common and benign building materials.
- Concern over solar fire hazards should be limited because only a small portion of materials in the panels are flammable, and those components cannot self-support a significant fire.

Conclusion: The purpose of the paper was to address and alleviate concerns of public health and safety for utility-scale solar PV projects. Concerns of public health and safety were divided and discussed in four sections: (1) Toxicity, (2) Electromagnetic Fields, (3) Electric Shock and Arc Flash, and (4) Fire. In each of these sections, the negative health and safety impacts of utility-scale PV development were shown to be negligible, while the public health and safety benefits of installing these facilities are significant and far outweigh any negative impacts.

06 BSSI Proposed Panel – Material Data Safety Sheet

The attached 2017 MDSD sheet is provided for your reference. It outlines the materials that comprise the proposed panels and also addresses potential health and environmental hazards: Little to none.

07 BSSI Transformer Fluid

The attached data sheet provides information on the type of fluid that will be used in the proposed project's transformers.

- It is a renewable, bio-based coolant specially formulated to minimize health and environmental risks.
- The fluid is non-toxic and thoroughly biodegrades in the environment.
- It is UL-classified as Less-Flammable with an exceptionally high flash/fire point.

08 Solar PV Recycling – Untapped Business Opportunity

Recycling of PV panels is in its' infancy in Illinois. This 2017 article outlines the anticipated business opportunity for PV recycling with projections extended to 2050. Established Solar PV Recycling businesses and/or programs should be readily available by the time currently proposed solar projects reach their roughly 30-year lifetime expectancy.

End of Memorandum

GreenbergFarrow

21 South Evergreen Avenue
Suite 200
Arlington Heights, IL 60005
847.788.9200
www.greenbergfarrow.com
We Are Global

April 12, 2018

To Matt Asselmeier
Senior Planner
Kendall County PBZ Department
111 West Fox Street
Yorkville, IL 60560

Project Special Use Request – 16400 Newark Road
Project # 20180117.0
Re Projected Solar Projects in Kendall County

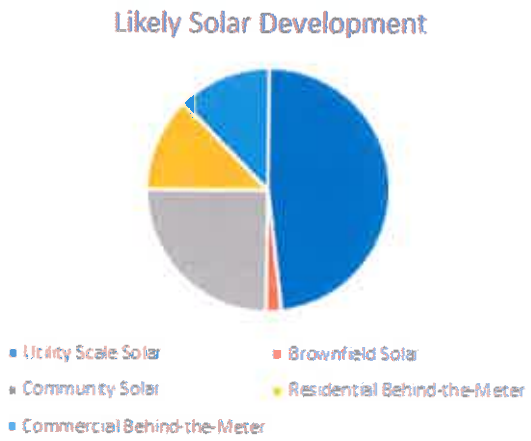
Dear Matt & Members of the County Board:

On behalf of our client, Borrego Solar Systems, Inc., we thought it might be helpful to provide background information regarding the volume of Community Solar projects like ours. While we feel the County is on the very cusp of a very exciting and active time in the development and maturation of Illinois solar industry, we feel it is important to keep this brief but fast paced expansion of the industry in context. As such, we offer the following synopsis.

Solar development is a result of the passage of the Future Energy Jobs Act (FEJA), which revised Illinois' Renewable Portfolio Standard. The RPS has been around since 2007, but the recent revisions focus the policy on solar development whereas in the past it has been focused on wind.

FEJA has a goal of developing at least 2,500-3,000 MW of solar in Illinois by 2030, with the bulk of that development happening by 2021.

There are several different types of solar that will be developed across Illinois:



Roughly 25% of development (or 625-750 MW) will be rooftop solar, either residential or commercial, across the state. These projects range in size from 3 kilowatts for a residential system, to 2 MW for a larger industrial system. These systems are for use to offset the property's energy use. Kendall County can expect to see applications for these types of systems, but the full 750 MW will be spread throughout the State of Illinois, so the number of applications shouldn't be overwhelming.

Another 50% (1,500 MW) will be utility scale solar. These projects can range in size from 10 MW to 100s of MW and are ground mounted. The total acreage needed to develop all these utility scale projects is approximately 9,000 acres. These projects do not have to be in any specific part of the state. These projects participate in the program by answering an RFP, and the lowest price bidders in the RFP win the contract. So, some of the projects being developed and being permitted in this category may never be built because they will not win the RFP. There has been one RFP so far for this category and the 100 MW project that won will be built in Perry County. There are two open RFPs right now and we will see who wins. Kendall County may or may not see any projects of this size built within its borders

The most likely category of projects that Kendall County will see built are *community solar projects*. These projects are 2 MW in size, or 12-20 acres of land each. We expect that the total amount of community solar developed by 2030 will be 625-750 MW. Some of these projects must be built in ComEd territory, and some must be built in Ameren territory. The most that will be built in Ameren under this program is 425-525 MW. Each of these projects is likely to be the maximum size of 2 MW, so the total number of projects is 212-262 projects. The community solar projects will be spread across the 30 or so counties in the ComEd territory. **If development is split evenly among those counties, Kendall County could see 6-9 projects.** If development isn't split evenly, Kendall could see more projects. Our company is actively pursuing development throughout the entire Ameren footprint. We already know that Stephenson County has approved 5 projects, LaSalle County has approved 2 projects, and there are several more projects awaiting permitting approval in those counties. Similar dynamics are playing out in the remaining northern counties.

Taking all of this into consideration Kendall County may see 15-20 community solar projects, not 100s.

Sincerely,

Jason Bolling
Due Diligence Coordinator

Illinois Solar Energy Association

Local Zoning and Building Regulation of Solar in Illinois

As a result of the Future Energy Jobs Act, local government in Illinois can expect to see increased interest in solar development. By 2025, the demand for solar will result in the development of over 2,000 MW of solar. Solar development will provide many new jobs as well as hundreds of millions of dollars in new investment into the state. This amount of development will require between 10,000-15,000 acres of land or rooftop, which represents only a small fraction of Illinois' overall area. Projects will come in a variety of forms, and local governments should plan to see interest from solar developers in all of these categories. Short descriptions of the different types of solar that will be built are in the table below, as well as the amount of MW that is likely to be developed by 2025 because of the Future Energy Jobs Act.

Generally, solar development has a very low-impact on the land that is hosting the equipment and the surrounding area. While local officials may have had experience with wind development in Illinois, these two clean, these two clean energy sources have very different impacts on land and land use and should be regulated differently.

The Illinois Solar Energy Association has developed this set of comments and principles as guidance for local governments that are confronted with the prospect of increased development. This document is the result of industry collaboration and is fully endorsed by members of the Illinois Solar Energy Association.

	Description	**Probable MW of Development by 2025**	**Size Limit per Project, per the Future Energy Jobs Act**
Residential Rooftop Solar	System is on the customer's roof (main building or accessory structure). In rare instances, a residential customer may want to put solar on the ground.	300	All behind-the-meter projects are limited to 2 MW in size, but each must be sized to appropriately meet the owner's electric need. A typical residential project is between 3-10 kW, whereas a commercial project could be 10 kW – 2 MW depending on the size of the business.
Commercial & Industrial Solar	System is on the customer's property (main building or accessory structure), either on the roof or the ground.	300	
Community Solar	Generally, a larger system where a combination of several entities (residents, businesses, governments) have a partial interest (subscription) in the output of a system. Systems can be located on a roof or on the ground, but do not have to be located near the subscribers. Projects are limited to 2 MW in size (10-12 acres).	275-325	The Future Energy Jobs Act limits each community solar project to 2 MW (10-12 acres), however developers may be allowed to locate more than one project at the same site (co-locate). Final rules on this provision are expected in early 2018.

Illinois Solar Energy Association

Brownfield Solar	System is located on blighted land that is not suitable for redevelopment, such as closed landfills or Superfund sites.	35-50	There is no minimum or maximum size for brownfield projects.
Utility Scale Solar	Large systems (2 MW-200 MW) that generally do not serve an individual customer and are located near electrical infrastructure.	750-1000	Systems must be larger than 2 MW, but have no upward limit. These projects could use anywhere from 10 acres to 100s of acres for a single project.

General Principles:

1. Solar projects provide local clean energy generation as well as local investment. Projects of all sizes will have a positive impact on jobs, tax revenue and other forms of direct and indirect economic activity in local communities
2. Solar developers will look to develop projects in areas where projects are encouraged and where the permitting process is clear and straightforward. Solar developers and solar owners want to work with communities in which they build and operate systems. Developers are interested in partnering with communities where their systems are installed and are ready to address any concerns that communities or local authorities may have with the construction or operation of those systems.
3. Solar system developers and owners have a vested interest in making sure that the project is constructed in an efficient manner and that the system operates for the full life of the panels. For developers to get financing for the construction and operation of the system, they need to prove that the system is not at risk of impacting endangered species and other wildlife and that the system isn't at risk for flooding. Protecting the system from property damage and maintaining the site are key parts of maintenance that contribute to the continued efficient operation of the system.
4. Building solar is no more disruptive than any other typical development, and in many cases, is less impactful. Unlike other large-scale energy developments, solar has minimal impact on land, roads, water, and neighboring properties. The most significant disturbance is during construction, but the equipment needed is no different than equipment needed for other types of general construction. Residential rooftop solar can be installed in several days, and large-scale ground-mount systems can be installed in 6-9 months.
5. Solar systems operate with minimal impact to the area and minimal maintenance. Once constructed, solar systems tend to blend into the surroundings and are a positive compliment to agricultural and other existing land uses. Ground-mount systems sit between 10-20 feet tall, and are hard to see beyond the borders of the property. Neighboring properties are unlikely to even notice the system on a daily basis, and it will have no impact on property values or quality of life. Once operational, solar systems provide energy without any pollution, minimal noise, and few, if any, moving parts.

Specific Recommendations:

Applicability: Solar should be permitted in all zones (accessory use for behind-the-meter systems and principle use for other systems) as "by-right" if it meets certain requirements.

Process: Authorities should distinguish between projects. Smaller projects (behind-the-meter or community solar) should be evaluated separately from larger projects. Preferably, all projects would be allowed "by-right" through administrative review if they meet the requirements and subject to special use permit if not.

System Size: Authorities should distinguish between types of systems and have those systems track the size requirements in the Future Energy Jobs Act (see the table above). In this Act, distributed (roof-top or ground-mount behind-the-meter) solar is limited to 2 MW AC. Community solar is also limited to 2 MW AC, though projects may be able to co-locate. Utility scale solar must be bigger than 2 MW AC, but has no upward limit. Brownfield solar has no size limit.

Lot Size: If systems meet the other requirements in the regulation and conform to the project size outlined in the regulation, there should be no limit (minimum or maximum) on the size of the lot or the number of parcels or lots the project covers. Community solar projects can be as small as 100 kW, which would take approximately 1/2 an acre of space, or may be able to co-located, thereby using upwards of 20 acres.

System Height: For ground-mount systems, a 20' limit is appropriate, however the authority should have a waiver or variance process for unique situations.

Setbacks: As discussed in the general principles above, ground-mount solar projects have minimal impact on the land used for development as well as surrounding properties, therefore setbacks should be minimal. At most, ground-mount solar projects should be subject to the same setbacks as other standard structures in the same zone or twenty-five (25) feet, whichever is less. It is appropriate to limit roof-mounted systems to the size of the roof with appropriate room for fire-fighting purposes.

Fencing: The owner of the ground-mount system has a vested interest in making sure the system is secure. In most instances, an 8' fence is appropriate, though the authority should allow for some waivers if there are natural borders or surrounding neighbors approve.

Equipment: Developers should use UL approved equipment for all projects.

Glare/Visibility: The majority of panel technology is antireflective, so glare risk is minimal to non-existent. If the authority wants to include glare guidance, it should be minimal but should provide clear requirements; open-ended requirements provide risk to the developer. Per federal regulations, projects around airports need approval from the FAA.

Airport: Projects developed near airports are subject to approval from the FAA. Any additional regulation at the local level is unnecessary.

Installers: The Illinois Power Agency Act requires that all systems (utility-scale, distributed and community solar) are installed by qualified installers. This requirement is regulated by the Illinois Commerce Commission. Any additional requirements are unnecessary and burdensome.

Site Plan: A site plan is appropriate for all systems, and systems that meet the plan requirements should not need Planning Commission or Zoning Board approval.

Environmental Impact: For large solar systems to secure financing, the developer will have to show that the system does not have an endangered species impact, wetland impact or historical places impact. This is standard practice, and the developer should be able to provide the authority with this information.

Floodplain: All ground-mount systems will have a topographical and hydro analysis that will be completed prior to issuance of a building permit. Additional requirements are unnecessary.

Storm water/Drainage: Ground-mount systems should be exempt from impervious surface requirements if the developer is doing minimal grading (i.e. less than 1 acre of soil disturbance) and will maintain vegetation or other regulatory approved surface application (i.e. gravel or synthetic surface liners) under and around the system. There will be some impact through pier placement and conduit trenching, but overall the impact is minimal. Impact to drainage tiles and other subsurface utility concerns are addressed in the arrangement with the landowner and does not require additional oversight at the local level.

Landscaping: For ground-mount systems, native vegetation is typical, and mowing maintenance is common. In most instances topsoil will be minimally impacted during construction. There should not be additional requirements, and a clear path for variances if the development is atypical.

Transportation: In general, solar projects do not need the same level of heavy equipment as wind projects, and in most instances roads and access roads will only need to bear, at maximum, a 60,000-pound wheel load for construction. Developers will follow load limits for local roads and will apply for permits to use overweight vehicles if necessary, but road commissioner approval for general construction is unnecessary and burdensome.

Interconnection: Systems should show proof of application for interconnection, but not a final agreement with the utility. Developers will not go through the entire interconnection process before starting the local permitting process; these processes generally happen in parallel.

Transmission: In most instances, developers will bury many of the interior lines associated with the project. But it is impractical and, in most cases, impossible to bury the lines related to interconnection with the utility. If the authority requires interior lines to be buried, the developer should be able to apply for a waiver.

Operations and Maintenance: Solar system owners have a vested interest in making sure the system is operating efficiently. Many systems have ongoing O&M contracts that include system maintenance, mowing, etc. Proof of this maintenance is unnecessary.

Decommissioning: System owners have a vested interest in making sure the system operates for the full life of the panels, which are warrantied for 25 years, but can often be much longer. Solar system owners will decommission the sites after they are no longer productive, and in most cases, developers include this provision in the agreement with the landowner. Therefore, it is duplicative to have this provision in the permitting process. If the authority decides to nonetheless require a decommissioning plan, a letter of credit or bond as well as an engineering cost estimate of decommissioning demonstrating feasibility should be required after 10-15 years, not at the outset, and cash should not be required. Requiring a bond at the beginning of the project is unnecessary and will only deter development. If the system is found to be inoperable, which is unlikely, there should be a limited amount of time for system owners to get the system back online before the authority forces decommissioning.

Property Value: Solar will not have an adverse effect on neighboring properties. Any requirement to protect neighboring properties will completely prevent development. If a LESA evaluation is required, it should be clear how the county will use the LESA score.

Illinois Solar Energy Association

Complaint Resolution: Many solar developers are members of the Illinois Solar Energy Association, and as such are required to comply with the association' codes of conduct. Solar systems should not be subject to any more stringent complaint processes than other types of development.

Fees: If the authority requires a fee for permit application, the industry prefers a clear delineation of such fees.

For more information, please contact Lesley McCain, Executive Director, Illinois Solar Energy Association at Lesley.mccain@illinoissolar.org.

Kirkland Appraisals, LLC

Richard C. Kirkland, Jr., MAI
9408 Northfield Court
Raleigh, North Carolina 27603
Phone (919) 414-8142
rkirkland2@gmail.com
www.kirklandappraisals.com

February 12, 2016

Ms. Jessica Galloza
ESA Renewables, LLC
4150 St. Johns Parkway, Suite 1000
Sanford, F32771

RE: Oakwood Solar Impact Study

Dear Ms. Galloza:

At your request, I have considered the likely impact of solar farms proposed to be constructed on 53.74 acres of land located at 6517 US Highway 70, in Mebane, North Carolina. Specifically, I have been asked to give my professional opinion on whether the proposed solar farm will "maintain or enhance adjoining or contiguous property values" and whether "the location and character of the use, if developed according to the plan as submitted and approved, will be in harmony with the area in which it is to be located."

To form an opinion on these issues, I have researched and visited existing and proposed solar farms in North Carolina, researched articles through the Appraisal Institute and other studies, and discussed the likely impact with other real estate professionals. I have not been asked to assign any value to any specific property.

This letter is a limited report of a real property appraisal consulting assignment and subject to the limiting conditions attached to this letter. My client is ESA Renewables, LLC, represented to me by Ms. Jessica Galloza. My findings support the Conditional/Special Use Permit application. The effective date of this consultation is February 12, 2016.

Proposed Use Description

The proposed solar farm will be constructed on 53.74 acres of land located at 6517 US Highway 70, in Mebane, North Carolina.

Adjoining land is primarily residential low density and agricultural uses, which is common for solar farms as detailed later in this report. The solar farm will consist of fixed solar panels that will generate no noise, no odor, and less traffic than a residential subdivision. The panels will be less than 15 feet in height and located behind a chain link fence.

I have considered adjoining uses and included a map to identify each parcel's location. The breakdown of those uses by acreage and number of parcels is summarized below.

Adjoining Use Breakdown

	Acreage	**Parcels**
Residential	71.98%	96.77%
Agricultural	28.02%	3.23%
Total	**100.00%**	**100.00%**

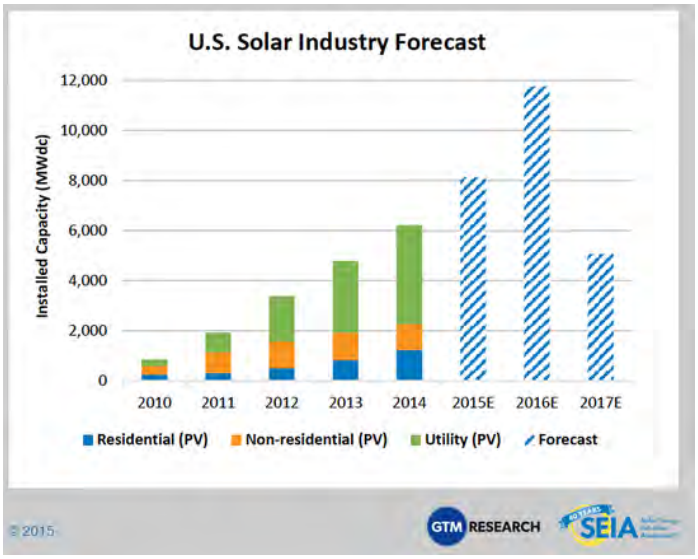

WOODLAND DR
MACE RD
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31

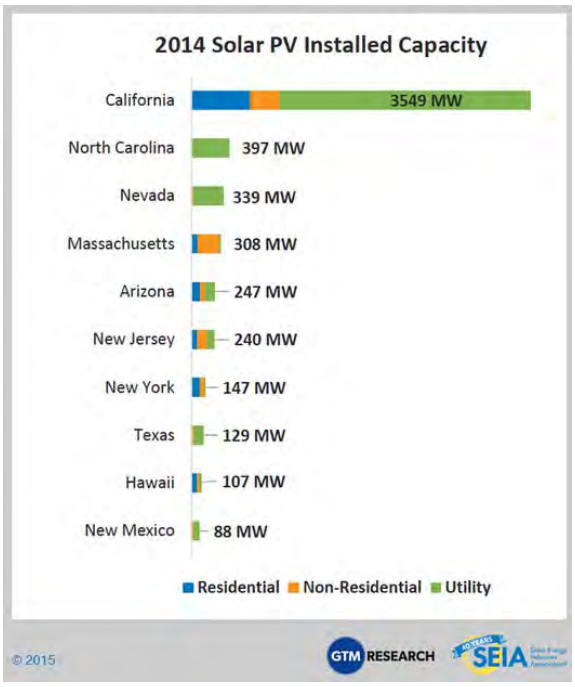
Surrounding Uses

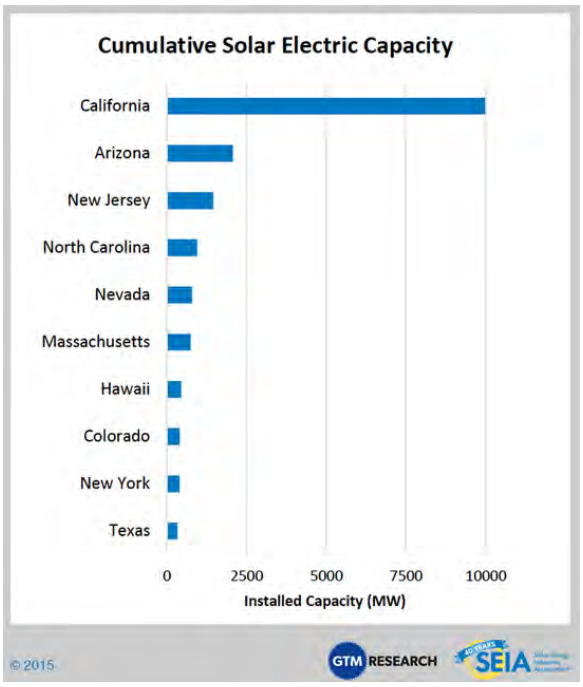
#	MAP ID	Owner	GIS Data Acres	Present Use	% Adjoining Acres	% Adjoining Parcels	Distance in Feet: Home to Panels
1	9825948348	Curtis	52.66	Agricultural	28.02%	3.23%	N/A
2	9835037821	Beaver HOA	6.30	Residential	3.35%	3.23%	N/A
3	9835130411	Curtis	2.71	Residential	1.44%	3.23%	N/A
4	9835131231	Ivey	1.02	Residential	0.54%	3.23%	460
5	9835132079	Ivey	0.59	Residential	0.31%	3.23%	N/A
6	9835134009	Ivey	0.48	Residential	0.26%	3.23%	590
7	9835135019	Ivey	0.47	Residential	0.25%	3.23%	N/A
8	9835136180	James	0.82	Residential	0.44%	3.23%	790
9	9835129681	Rhodes	12.33	Residential	6.56%	3.23%	730
10	9835220129	Gilmore	2.29	Residential	1.22%	3.23%	605
11	9835210959	Morgan	2.40	Residential	1.28%	3.23%	835
12	9835210868	Lawson	2.50	Residential	1.33%	3.23%	830
13	9835210575	Foster	2.61	Residential	1.39%	3.23%	855
14	9835210672	Douglas	2.66	Residential	1.42%	3.23%	920
15	9835210582	Riley	2.84	Residential	1.51%	3.23%	1010
16	9835210367	Cordero	2.49	Residential	1.32%	3.23%	1020
17	9835212233	Seifts	3.16	Residential	1.68%	3.23%	1090
18	9835105787	Mace	2.20	Residential	1.17%	3.23%	N/A
19	9835103858	Mace	5.17	Residential	2.75%	3.23%	715
20	9835101614	Hobbey	1.31	Residential	0.70%	3.23%	970
21	9835009723	Murdock	1.34	Residential	0.71%	3.23%	930
22	9835007790	Horne	0.92	Residential	0.49%	3.23%	950
23	9835007703	Mace	0.89	Residential	0.47%	3.23%	N/A
24	9835006716	Ellis	0.90	Residential	0.48%	3.23%	1030
25	9835016318	Mace	4.81	Residential	2.56%	3.23%	N/A
26	9835013165	Najera	5.81	Residential	3.09%	3.23%	710
27	9835011302	Herbert	6.35	Residential	3.38%	3.23%	1250
28	9825918836	Southard	14.82	Residential	7.88%	3.23%	805
29	9825924159	Adams	12.84	Residential	6.83%	3.23%	1950
30	9825926712	Hoover	19.05	Residential	10.13%	3.23%	1165
31	9825937298	Tsiapera	13.23	Residential	7.04%	3.23%	1200
		Total	**187.970**		**100.00%**	**100.00%**	931

I. Overview of Solar Farms Development in North Carolina

Across the nation the number of solar installations has dramatically increased over the last few years as changes in technology and the economy made these solar farms more feasible. The charts below show how this market has grown and is expected to continue to grow from 2010 to 2017, the drop off in 2017 is expected due to the expiration of tax credits for solar installations. The U.S. Solar Market Insight Reports for 2010 and 2011 which is put out by the Solar Energy Industries Association note that 2010 was a "breakout" year for solar energy. The continued boom of solar power is shown in the steady growth. North Carolina was ranked as having the second most active photovoltaic installed capacity in 2014.







As shown in the charts above, North Carolina ranked second in installed solar energy in 2014. North Carolina ranked fifth in cumulative installed solar energy in the United States.

II. Market Analysis of the Impact on Value from Solar Farms

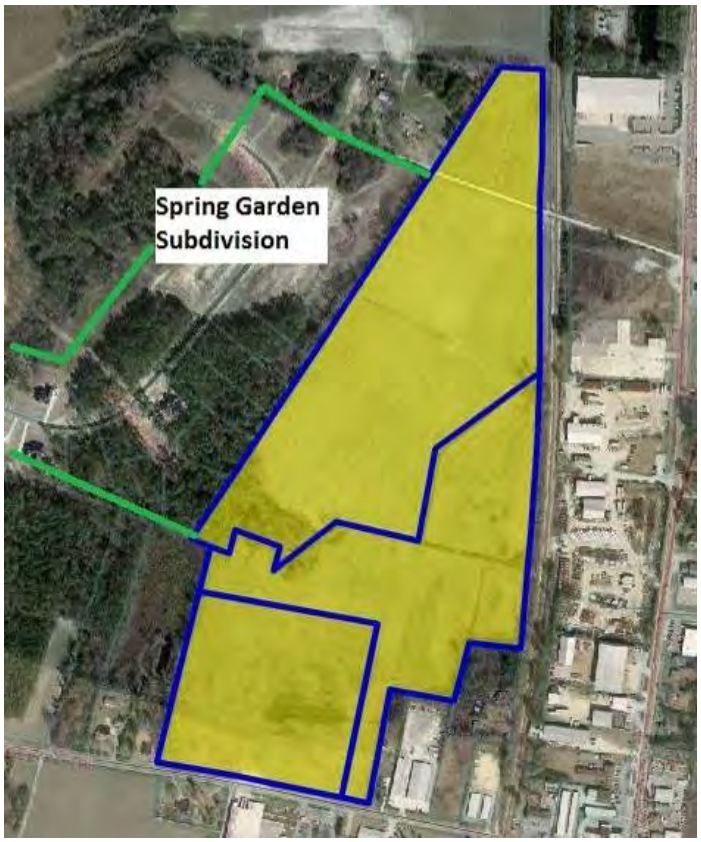
I have researched a number of solar farms in North Carolina to determine the impact of these facilities on the value of adjoining property. I have provided a breakdown of the adjoining uses to show what adjoining uses are typical for solar farms and what uses would likely be considered consistent with a solar farm use. This breakdown is included in the Harmony of Use section of this report.

I also conducted a series of matched pair analyses. A matched pair analysis considers two similar properties with only one difference of note to determine whether or not that difference has any impact on value. Within the appraisal profession, matched pair analysis is a well-recognized method of measuring impact on value. In this case, I have considered residential properties adjoining a solar farm versus similar residential properties that do not adjoin a solar farm. I have also considered matched pairs of vacant residential and agricultural land.

As outlined in the discussion of each matched pair, I concluded from the data and my analysis that there has been no impact on sale price for residential, agricultural, or vacant residential land that adjoins the existing solar farms included in my study.

1. Matched Pair – AM Best Solar Farm, Goldsboro, NC

This solar farm adjoins Spring Garden Subdivision which had new homes and lots available for new construction during the approval and construction of the solar farm. The recent home sales have ranged from $200,000 to $250,000. This subdivision sold out the last homes in late 2014. The solar farm is clearly visible particularly along the north end of this street where there is only a thin line of trees separating the solar farm from the single-family homes.

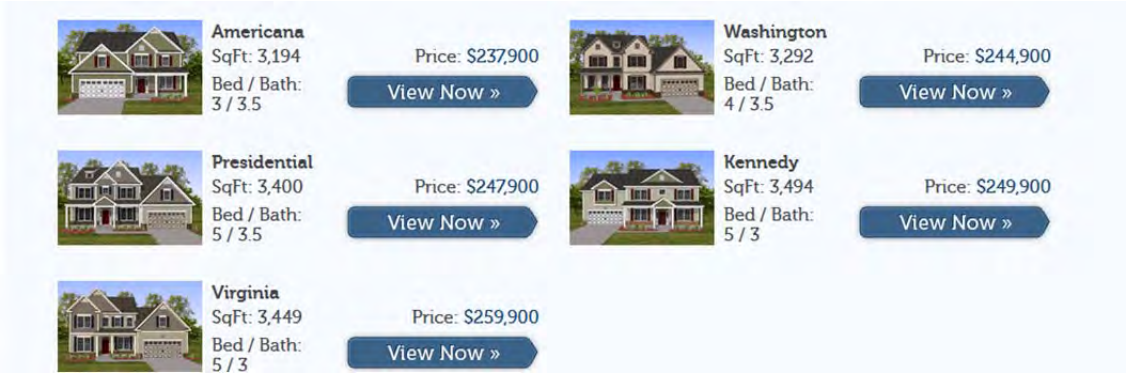


Homes backing up to the solar farm are selling at the same price for the same floor plan as the homes that do not back up to the solar farm in this subdivision. According to the builder, the solar farm has been a complete non-factor. Not only do the sales show no difference in the price paid for the various homes adjoining the solar farm versus not adjoining the solar farm, but there are actually more recent sales along the solar farm than not. There is no impact on the sellout rate, or time to sell for the homes adjoining the solar farm.

I spoke with a number of owners who adjoin the solar farm and none of them expressed any concern over the solar farm impacting their property value.

The data presented on the following page shows multiple homes that have sold in 2013 and 2014 adjoining the solar farm at prices similar to those not along the solar farm. These series of sales indicate that the solar farm has no impact on the adjoining residential use.

The homes that were marketed at Spring Garden are shown below.



AM Best Solar Farm, Goldsboro, NC

Matched Pairs
As of Date: 9/3/2014

Adjoining Sales After Solar Farm Completed

TAX ID	Owner	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	Style
3600195570	Helm	0.76	Sep-13	$250,000	2013	3,292	$75.94	2 Story
3600195361	Leak	1.49	Sep-13	$260,000	2013	3,652	$71.19	2 Story
3600199891	McBrayer	2.24	Jul-14	$250,000	2014	3,292	$75.94	2 Story
3600198632	Foresman	1.13	Aug-14	$253,000	2014	3,400	$74.41	2 Story
3600196656	Hinson	0.75	Dec-13	$255,000	2013	3,453	$73.85	2 Story
	Average	1.27		$253,600	2013.4	3,418	$74.27	
	Median	1.13		$253,000	2013	3,400	$74.41	

Adjoining Sales After Solar Farm Announced

TAX ID	Owner	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	Style
0	Feddersen	1.56	Feb-13	$247,000	2012	3,427	$72.07	Ranch
0	Gentry	1.42	Apr-13	$245,000	2013	3,400	$72.06	2 Story
	Average	1.49		$246,000	2012.5	3,414	$72.07	
	Median	1.49		$246,000	2012.5	3,414	$72.07	

Adjoining Sales Before Solar Farm Announced

TAX ID	Owner	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	Style
3600183905	Carter	1.57	Dec-12	$240,000	2012	3,347	$71.71	1.5 Story
3600193097	Kelly	1.61	Sep-12	$198,000	2012	2,532	$78.20	2 Story
3600194189	Hadwan	1.55	Nov-12	$240,000	2012	3,433	$69.91	1.5 Story
	Average	1.59		$219,000	2012	2,940	$74.95	
	Median	1.59		$219,000	2012	2,940	$74.95	

Nearby Sales After Solar Farm Completed

TAX ID	Owner	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	Style
3600193710	Barnes	1.12	Oct-13	$248,000	2013	3,400	$72.94	2 Story
3601105180	Nackley	0.95	Dec-13	$253,000	2013	3,400	$74.41	2 Story
3600192528	Mattheis	1.12	Oct-13	$238,000	2013	3,194	$74.51	2 Story
3600198928	Beckman	0.93	Mar-14	$250,000	2014	3,292	$75.94	2 Story
3600196965	Hough	0.81	Jun-14	$224,000	2014	2,434	$92.03	2 Story
3600193914	Preskitt	0.67	Jun-14	$242,000	2014	2,825	$85.66	2 Story
3600194813	Bordner	0.91	Apr-14	$258,000	2014	3,511	$73.48	2 Story
3601104147	Shaffer	0.73	Apr-14	$255,000	2014	3,453	$73.85	2 Story
	Average	0.91		$246,000	2013.625	3,189	$77.85	
	Median	0.92		$249,000	2014	3,346	$74.46	

Nearby Sales Before Solar Farm Announced

TAX ID	Owner	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	Style
3600191437	Thomas	1.12	Sep-12	$225,000	2012	3,276	$68.68	2 Story
3600087968	Lilley	1.15	Jan-13	$238,000	2012	3,421	$69.57	1.5 Story
3600087654	Burke	1.26	Sep-12	$240,000	2012	3,543	$67.74	2 Story
3600088796	Hobbs	0.73	Sep-12	$228,000	2012	3,254	$70.07	2 Story
	Average	1.07		$232,750	2012	3,374	$69.01	
	Median	1.14		$233,000	2012	3,349	$69.13	

Matched Pair Summary

	Adjoins Solar Farm		Nearby Solar Farm	
	Average	**Median**	**Average**	**Median**
Sales Price	$253,600	$253,000	$246,000	$249,000
Year Built	2013	2013	2014	2014
Size	3,418	3,400	3,189	3,346
Price/SF	$74.27	$74.41	$77.85	$74.46

Percentage Differences

Median Price	-2%
Median Size	-2%
Median Price/SF	0%

I note that 2308 Granville Drive sold again in November 2015 for $267,500, or $7,500 more than when it was purchased new from the builder two years earlier (Tax ID 3600195361, Owner: Leak). The neighborhood is clearly showing appreciation for homes adjoining the solar farm.

The Median Price is the best indicator to follow in any analysis as it avoids outlying samples that would otherwise skew the results. The median sizes and median prices are all consistent throughout the sales both before and after the solar farm whether you look at sites adjoining or nearby to the solar farm. The average for the homes nearby the solar farm shows a smaller building size and a higher price per square foot. This reflects a common occurrence in real estate where the price per square foot goes up as the size goes down. This is similar to the discount you see in any market where there is a discount for buying larger volumes. So when you buy a 2 liter coke you pay less per ounce than if you buy a 16 oz. coke. So even comparing averages the indication is for no impact, but I rely on the median rates as the most reliable indication for any such analysis.

AM Best Solar Farm, Goldsboro, NC



View of home in Spring Garden with solar farm located through the trees and panels – photo taken on 9/23/15.



View from vacant lot at Spring Garden with solar farm panels visible through trees taken in the winter of 2014 prior to home construction. This is the same lot as the photo above.

2. Matched Pair – White Cross Solar Farm, Chapel Hill, NC

A new solar farm was built at 2159 White Cross Road in Chapel Hill, Orange County in 2013. After construction, the owner of the underlying land sold the balance of the tract not encumbered by the solar farm in July 2013 for $265,000 for 47.20 acres, or $5,606 per acre. This land adjoins the solar farm to the south and was clear cut of timber around 10 years ago. I compared this purchase to a nearby transfer of 59.09 acres of timber land just south along White Cross Road that sold in November 2010 for $361,000, or $6,109 per acre. After purchase, this land was divided into three mini farm tracts of 12 to 20 acres each. These rates are very similar and the difference in price per acre is attributed to the timber value and not any impact of the solar farm.

Type	TAX ID	Owner	Acres	Date	Price	$/Acre	Notes	Conf By
Adjoins Solar	9748336770	Haggerty	47.20	Jul-13	$265,000	$5,614	Clear cut	Betty Cross, broker
Not Near Solar	9747184527	Purcell	59.09	Nov-10	$361,000	$6,109	Wooded	Dickie Andrews, broker

The difference in price is attributed to the trees on the older sale.
No impact noted for the adjacency to a solar farm according to the broker.
I looked at a number of other nearby land sales without proximity to a solar farm for this matched pair, but this land sale required the least allowance for differences in size, utility and location.

Matched Pair Summary

	Adjoins Solar Farm		Nearby Solar Farm	
	Average	Median	Average	Median
Sales Price	$5,614	$5,614	$6,109	$6,109
Adjustment for Timber	$500	$500		
Adjusted	$6,114	$6,114	$6,109	$6,109
Tract Size	47.20	47.20	59.09	59.09

Percentage Differences

Median Price Per Acre	0%

This matched pair again supports the conclusion that adjacency to a solar farm has no impact on adjoining residential/agricultural land.

3. Matched Pair – Wagstaff Farm, Roxboro, NC

This solar farm is located at the northeast corner of a 594-acre farm with approximately 30 acres of solar farm area. This solar farm was approved and constructed in 2013.

After approval, 18.82 acres were sold out of the parent tract to an adjoining owner to the south. This sale was at a similar price to nearby land to the east that sold in the same time from for the same price per acre as shown below.

Type	TAX ID	Owner	Acres	Present Use	Date Sold	Price	$/AC
Adjoins Solar	0918-17-11-7960	Piedmont	18.82	Agriculatural	8/19/2013	$164,000	$8,714
Not Near Solar	0918-00-75-9812 et al	Blackwell	14.88	Agriculatural	12/27/2013	$130,000	$8,739

Matched Pair Summary

	Adjoins Solar Farm		Nearby Solar Farm	
	Average	**Median**	**Average**	**Median**
Sales Price	$8,714	$8,714	$8,739	$8,739
Tract Size	18.82	18.82	14.88	14.88

Percentage Differences

Median Price Per Acre	0%

This matched pair again supports the conclusion that adjacency to a solar farm has no impact on adjoining residential/agricultural land.

4. Matched Pair – Mulberry, Selmer, TN

This solar farm adjoins two subdivisions with Central Hills having a mix of existing and new construction homes. Lots in this development have been marketed for $15,000 each with discounts offered for multiple lots being used for a single home site. I spoke with the agent with Rhonda Wheeler and Becky Hearnsberger with United County Farm & Home Realty who noted that they have seen no impact on lot or home sales due to the solar farm in this community.

I have included a map below as well as data on recent sales activity on lots that adjoin the solar farm or are near the solar farm in this subdivision both before and after the announced plan for this solar farm facility. I note that using the same method I used to breakdown the adjoining uses at the subject property I show that the predominant adjoining uses are residential and agricultural, which is consistent with the location of most solar farms.



Adjoining Use Breakdown

	Acreage	Parcels
Commercial	3.40%	0.034
Residential	12.84%	79.31%
Agri/Res	10.39%	3.45%
Agricultural	73.37%	13.79%
Total	**100.00%**	**100.00%**

From the above map, I identified four recent sales of homes that occurred adjoining the solar farm both before and after the announcement of the solar farm. I have adjusted each of these for differences in size and age in order to compare these sales among themselves. As shown below after adjustment, the median value is $130,776 and the sales prices are consistent with one outlier which is also the least comparable home consisered. The close grouping and the similar price per point overall as well as the similar price per square foot both before and after the solar farm.

Matched Pairs

#	TAX ID	Owner	Date Sold	Sales Price	Acres	Built	GBA	$/GBA	Style	Parking
6&7	0900 A 011.00	Henson	Jul-14	$130,000	2.65	2007	1,511	$86.04	1 Story	2 Garage
12	0900 A 003.00	Amerson	Aug-12	$130,000	1.20	2011	1,586	$81.97	1 Story	2 Garage
15	099C A 003.00	Smallwood	May-12	$149,900	1.00	2002	1,596	$93.92	1 Story	4 Garage
16	099C A 002.00	Hessing	Jun-15	$130,000	1.00	1999	1,782	$72.95	1 Story	2 Garage
		Average		$134,975	1.46	2005	1,619	$83.72		
		Median		$130,000	1.10	2005	1,591	$84.00		

					Adjustments*					
#	TAX ID	Owner	Date Sold	Sales Price	Acres	Built	GBA	Style	Parking	Total
6&7	0900 A 011.00	Henson	Jul-14	$130,000	-$7,500	$2,600	$6,453	$0	$0	$131,553
12	0900 A 003.00	Amerson	Aug-12	$130,000	$0	$0	$0	$0	$0	$130,000
15	099C A 003.00	Smallwood	May-12	$149,900	$0	$6,746	-$939	$0	-$15,000	$140,706
16	099C A 002.00	Hessing	Jun-15	$130,000	$0	$7,800	-$14,299	$0	$0	$123,501
		Average		$134,975	-$1,875	$4,286	-$2,196	$0	-$3,750	$131,440
		Median		$130,000	$0	$4,673	-$470	$0	$0	$130,776

* I adjusted all of the comparables to a base line 2011 Year Built and 1,586 s.f. based on Lot 12

I also considered a number of similar home sales nearby that were both before and after the solar farm was announced as shown below. These homes are generally newer in construction and include a number of larger homes but show a very similar price point per square foot.

Nearby Sales Before Solar Farm Announced

TAX ID	Owner	Date Sold	Sales Price	Acres	Built	GBA	$/GBA	Style	Parking
099B A 019	Durrance	Sep-12	$165,000	1.00	2012	2,079	$79.37	1 Story	2 Garage
099B A 021	Berryman	Apr-12	$212,000	2.73	2007	2,045	$103.67	1 Story	2 Garage
090O A 060	Nichols	Feb-13	$165,000	1.03	2012	1,966	$83.93	1 Story	2 Garage
	Average		$180,667	1.59	2010	2,030	$88.99		
	Median		$165,000	1.03	2012	2,045	$83.93		

Nearby Sales After Solar Farm Announced

TAX ID	Owner	Date Sold	Sales Price	Acres	Built	GBA	$/GBA	Style	Parking
090N A 040	Carrithers	Mar-15	$120,000	1.00	2010	1,626	$73.80	1 Story	2 Garage
099C A 043	Cherry	Feb-15	$148,900	2.34	2008	1,585	$93.94	1 Story	2 Garage
	Average		$134,450	1.67	2009	1,606	$83.87		
	Median		$134,450	1.67	2009	1,606	$83.87		

I then adjusted these nearby sales using the same criteria as the adjoining sales to derive the following breakdown of adjusted values based on a 2011 year built 1,586 square foot home. The adjusted values are consistent with a median rate of $128,665, which is actually lower than the values for the homes that back up to the solar farm.

Nearby Sales Adjusted				Adjustments*					
TAX ID	Owner	Date Sold	Sales Price	Acres	Built	GBA	Style	Parking	Total
099B A 019	Durrance	Sep-12	$165,000	$0	-$825	-$39,127	$0	$0	$125,048
099B A 021	Berryman	Apr-12	$212,000	-$7,500	$4,240	-$47,583	$0	$0	$161,157
090O A 060	Nichols	Feb-13	$165,000	$0	-$825	-$31,892	$0	$0	$132,283
090N A 040	Carrithers	Mar-15	$120,000	$0	$600	-$2,952	$0	$0	$117,648
099C A 043	Cherry	Feb-15	$148,900	-$7,500	$2,234	$94	$0	$0	$143,727
	Average		$165,500	-$1,875	$798	-$30,389	$0	$0	$134,034
	Median		$165,000	$0	-$113	-$35,510	$0	$0	$128,665

* I adjusted all of the comparables to a base line 2011 Year Built and 1,586 s.f. based on Lot 12

If you consider just the 2015 nearby sales, the range is $117,648 to $143,727 with a median of $130,688. If you consider the recent adjoining sales the range is $123,501 to $131,553 with a median of $127,527.

This difference is less than 3% in the median and well below the standard deviation in the sales. The entire range of the adjoining sales prices is overlapped by the range from the nearby sales. These are consistent data sets and summarized below.

Matched Pair Summary

	Adjoins Solar Farm		Nearby After Solar Farm	
	Average	Median	Average	Median
Sales Price	$134,975	$130,000	$134,450	$134,450
Year Built	2005	2005	2009	2009
Size	1,619	1,591	1,606	1,606
Price/SF	$83.72	$84.00	$83.87	$83.87

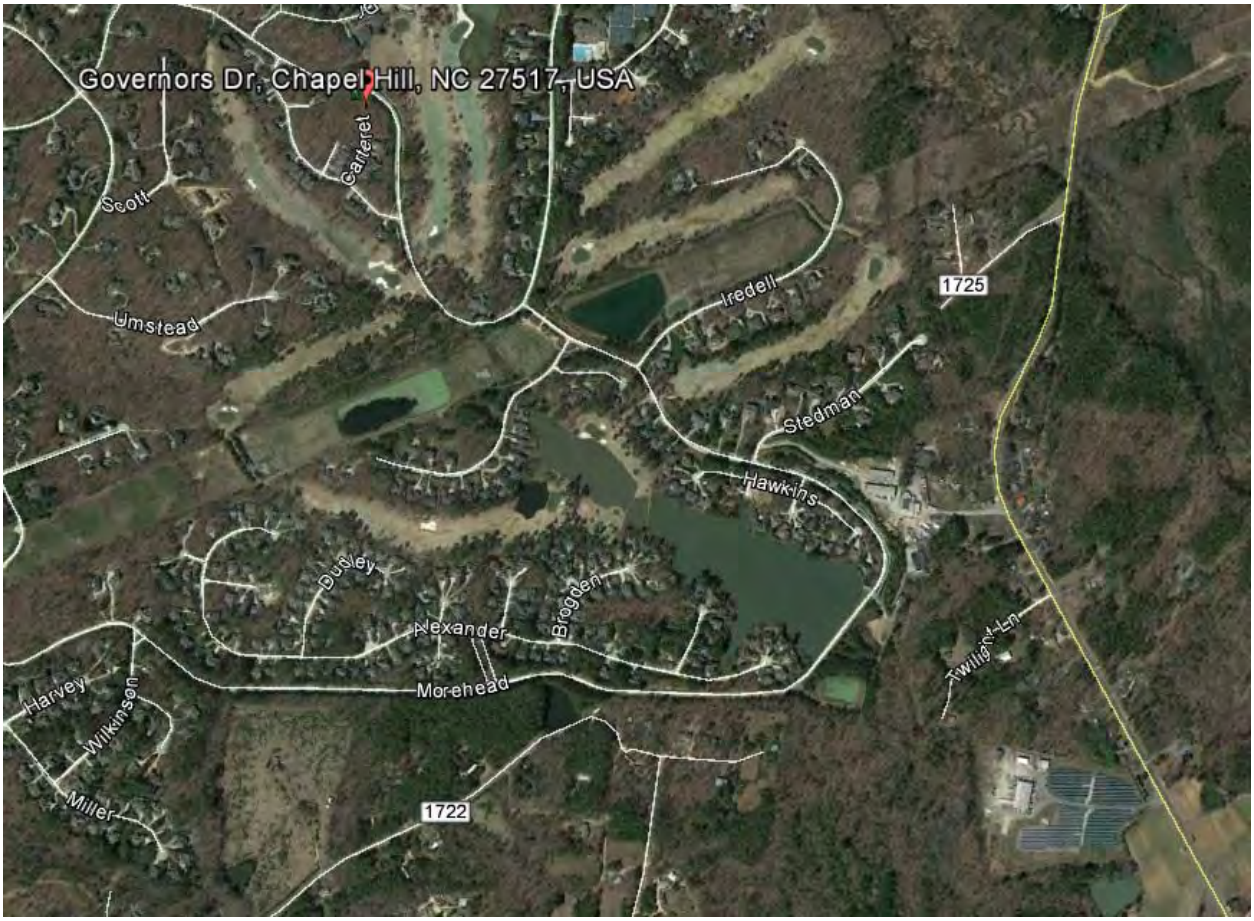
Percentage Differences

Median Price	3%
Median Size	1%
Median Price/SF	0%

Based on the data presented above, I find that the price per square foot for finished homes are not being impacted negatively by the presence of the solar farm. The difference in pricing in homes in the neighborhood is accounted for by differences in size, building age, and lot size. The median price for a home after those factors are adjusted for are consistent throughout this subdivision and show no impact due to the proximity of the solar farm. This is consistent with the comments from the broker I spoke with for this subdivision as well.

III. Harmony of Use/Compatability

I have visited over 170 solar farms and sites on which solar farms are proposed in North Carolina to determine what uses are compatible with a solar farm. The data I have collected and provide in this report strongly supports the compatibility of solar farms with adjoining agricultural and residential uses. While I have focused on adjoining uses, I note that there are many examples of solar farms being located within a quarter mile of residential developments, including such notable developments as Governor's Club in Chapel Hill, which has a solar farm within a quarter mile as you can see on the following aerial map. Governor's Club is a gated golf community with homes selling for $300,000 to over $2 million.



The subdivisions included in the matched pair analysis also show an acceptance of residential uses adjoining solar farms as a harmonious use.

Beyond these anecdotal references, I have quantified the adjoining uses for a number of solar farm comparables to derive a breakdown of the adjoining uses for each solar farm. The chart below shows the breakdown of adjoining or abutting uses by total acreage. While most of these solar farms were located in North Carolina, the breakdown of adjoining uses is very similar to that shown for Oregon as shown earlier in this report.

Percentage By Adjoining Acreage									
Total Solar Farms Reviewed		173							
	Res	Ag	Res/AG	Park	Sub	Comm	Ind	All Res Uses	All Comm Uses
Average	13%	57%	22%	1%	0%	0%	5%	94%	5%
Median	6%	63%	7%	0%	0%	0%	0%	100%	0%

Res = Residential, Ag = Agriculture, Sub = Substation, Com = Commercial, Ind = Industrial.

I have also included a breakdown of each solar farm by number of adjoining parcels rather than acreage. Using both factors provides a more complete picture of the neighboring properties.

Percentage By Total Number of Adjoining Parcels									
Total Solar Farms Reviewed		173							
	Res	Ag	Res/AG	Park	Sub	Comm	Ind	All Res Uses	All Comm Uses
Average	58%	27%	9%	0%	0%	2%	4%	94%	5%
Median	63%	25%	4%	0%	0%	0%	0%	100%	0%

Res = Residential, Ag = Agriculture, Sub = Substation, Com = Commercial, Ind = Industrial.

Both of the above charts show a marked residential and agricultural adjoining use for most solar farms. Every single solar farm considered included an adjoining residential use except for one, which included an adjoining residential/agricultural use. These comparable solar farms clearly support a compatibility with adjoining residential uses along with agricultural uses.

IV. Specific Factors on Harmony of Use

I have completed a number of Impact Studies related to a variety of uses and I have found that the most common areas for impact on adjoining values typically follow the following hierarchy with descending levels of potential impact. I will discuss each of these categories and how they relate to a solar farm.

1. Hazardous material
2. Odor
3. Noise
4. Traffic
5. Stigma
6. Appearance

1. Hazardous material

The solar farm presents no potential hazardous waste byproduct as part of normal operation. Any fertilizer, weed control, vehicular traffic, or construction will be significantly less than typically applied in a residential development or even most agricultural uses.

The various solar farms that I have inspected and identified in the addenda have no known pending environmental impacts associated with the development and operation.

2. Odor

The various solar farms that I have inspected produced no noticeable odor.

3. Noise

These are passive solar panels with no associated noise beyond a barely audible sound during daylight hours. The transformer reportedly has a hum similar to a fluorescent light in an office building that can only be heard in close proximity to this transformer and the buffers on the property are sufficient to make emitted sounds inaudible from the adjoining properties. No sound is emitted from the facility at night.

The various solar farms that I have inspected were inaudible from the roadways. I heard nothing on any of these sites associated with the solar farm.

4. Traffic

The solar farm will have no onsite employee's or staff. The site requires only minimal maintenance. Relative to other potential uses of the site (such as a residential subdivision), the additional traffic generated by a solar farm use on this site is insignificant.

5. Stigma

There is no stigma associated with solar farms and solar farms and people generally respond favorably towards such a use. While an individual may express concerns about proximity to a solar farm, there is no specific stigma associated with a solar farm. Stigma generally refers to things such as adult establishments, prisons, rehabilitation facilities, and so forth.

Solar panels have no associated stigma and in smaller collections are found in yards and roofs in many residential communities. Solar panels on a roof are often cited as an enhancement to the property in marketing brochures.

I see no basis for an impact from stigma due to a solar farm.

6. Appearance

Larger solar farms using fixed panels are a passive use of the land that is considered in keeping with a rural/residential area. As shown below, solar farms are comparable to larger greenhouses. This is not surprising given that a greenhouse is essentially another method for collecting passive solar energy. The greenhouse use is well received in residential/rural areas and has a similar visual impact as a solar farm.









The fixed solar panels are all less than 15 feet high, which means that the visual impact of the solar panels will be similar in height to a typical greenhouse and lower than a single story residential dwelling. Were the subject property developed with single family housing, it would have a much greater visual impact on the surrounding area given that a two-story home with attic could be three to four times as high as these proposed panels. The panels will be located behind a chain link fence.

7. Conclusion

On the basis of the factors described above, it is my professional opinion that the proposed solar farm will be in harmony with the area in which it is to be developed. The breakdown of adjoining uses is similar to the other solar farms tracked.

V. Market Commentary

I have surveyed a number of builders, developers and investors regarding solar farms over the last year. I have received favorable feedback from a variety of sources; below are excerpts from my conversations with different clients or other real estate professionals.

I spoke with Betty Cross with Keller Williams Realty in Chapel Hill, who sold the tract of land adjoining the White Cross Road solar farm. She indicated that the solar farm was not considered a negative factor in marketing the property and that it had no impact on the final price paid for the land.

I spoke with Lynn Hayes a broker with Berkshire Hathaway who sold a home at the entrance to Pickards Mountain where the home exits onto the Pickard Mountain Eco Institute's small solar farm. This property is located in rural Orange County west of Chapel Hill. This home closed in January 2014 for $735,000. According to Ms. Hayes the buyer was excited to be living near the Eco Institute and considered the solar farm to be a positive sign for the area. There are currently a number of 10 acre plus lots in Pickards Meadow behind this house with lots on the market for $200,000 to $250,000.

A new solar farm was built on Zion Church Road, Hickory at the Two Lines Solar Farm on the Punch property. After construction of the solar farm in 2013, an adjoining tract of land with 88.18 acres sold for $250,000, or $2,835 per acre. This was a highly irregular tract of land with significant tree cover between it and the solar farm. I have compared this to a current listing of 20.39 acres of land that is located southeast just a little ways from this solar farm. This land is on the market for $69,000, or $3,428 per acre. Generally, a smaller tract of land would be listed for more per acre. Considering a size adjustment of 5% per doubling in size, and a 10% discount for the likely drop in the closed price off of the asking price, I derive an indicated value per acre of the smaller tract of $2,777 per acre. This is very similar to the recently closed sale adjoining the solar farm, which further supports the matched pair analysis earlier in this report.

Rex Vick with Windjam Developers has a subdivision in Chatham County off Mt. Gilead Church Road known as The Hamptons. Home prices in The Hamptons start at $600,000 with homes over $1,000,000. Mr. Vick expressed interest in the possibility of including a solar farm section to the development as a possible additional marketing tool for the project.

Mr. Eddie Bacon, out of Apex North Carolina, has inherited a sizeable amount of family and agricultural land, and he has expressed interest in using a solar farm as a method of preserving the land for his children and grandchildren while still deriving a useful income from the property. He believes that solar panels would not in any way diminish the value for this adjoining land.

I spoke with Carolyn Craig, a Realtor in Kinston, North Carolina who is familiar with the Strata Solar Farms in the area. She noted that a solar farm in the area would be positive: "A solar farm is color coordinated and looks nice." "A solar farm is better than a turkey farm," which is allowed in that area. She would not expect a solar farm will have any impact on adjoining home prices in the area.

Mr. Michael Edwards, a broker and developer in Raleigh, indicated that a passive solar farm would be a great enhancement to adjoining property: "You never know what might be put on that land next door. There is no noise with a solar farm like there is with a new subdivision."

These are just excerpts I've noted in my conversations with different clients or other real estate participants that provided other thoughts on the subject that seemed applicable.

VI. Conclusion

The matched pair analysis shows no impact in home values due to the adjacency to the solar farm as well as no impact to adjacent vacant residential or agricultural land. The criteria for making downward adjustments on property values such as appearance, noise, odor, and traffic all indicate that a solar farm is a compatible use for rural/residential transition areas.

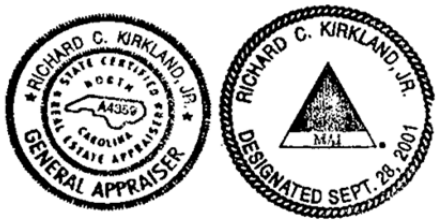
Similar solar farms have been approved adjoining agricultural uses, schools and residential developments. Industrial uses rarely absorb negative impacts from adjoining uses. The adjoining residential uses to other solar farms have included single family homes up to $260,000 on lots as small as 0.74 acres. The solar farm at the Pickards Mountain Eco Institute adjoins a home that sold in January 2014 for $735,000 and in proximity to lots being sold for $200,000 to $250,000 for homes over a million dollars.

Based on the data and analysis in this report, it is my professional opinion that the solar farm proposed at the subject property will maintain or enhance the value of adjoining or abutting property and that the proposed use is in harmony with the area in which it is located.

If you have any further questions please call me any time.

Sincerely,





Richard C. Kirkland, Jr., MAI
State Certified General Appraiser

Limiting Conditions and Assumptions

Acceptance of and/or use of this report constitutes acceptance of the following limiting conditions and assumptions; these can only be modified by written documents executed by both parties.

- The basic limitation of this and any appraisal is that the appraisal is an opinion of value, and is, therefore, not a guarantee that the property would sell at exactly the appraised value. The market price may differ from the market value, depending upon the motivation and knowledge of the buyer and/or seller, and may, therefore, be higher or lower than the market value. The market value, as defined herein, is an opinion of the probable price that is obtainable in a market free of abnormal influences.

- I do not assume any responsibility for the legal description provided or for matters pertaining to legal or title considerations. I assume that the title to the property is good and marketable unless otherwise stated.

- I am appraising the property as though free and clear of any and all liens or encumbrances unless otherwise stated.

- I assume that the property is under responsible ownership and competent property management.

- I believe the information furnished by others is reliable, but I give no warranty for its accuracy.

- I have made no survey or engineering study of the property and assume no responsibility for such matters. All engineering studies prepared by others are assumed to be correct. The plot plans, surveys, sketches and any other illustrative material in this report are included only to help the reader visualize the property. The illustrative material should not be considered to be scaled accurately for size.

- I assume that there are no hidden or unapparent conditions of the property, subsoil, or structures that render it more or less valuable. I take no responsibility for such conditions or for obtaining the engineering studies that may be required to discover them.

- I assume that the property is in full compliance with all applicable federal, state, and local laws, including environmental regulations, unless the lack of compliance is stated, described, and considered in this appraisal report.

- I assume that the property conforms to all applicable zoning and use regulations and restrictions unless nonconformity has been identified, described and considered in this appraisal report.

- I assume that all required licenses, certificates of occupancy, consents, and other legislative or administrative authority from any local, state, or national government or private entity or organization have been or can be obtained or renewed for any use on which the value estimate contained in this report is based.

- I assume that the use of the land and improvements is confined within the boundaries or property lines of the property described and that there is no encroachment or trespass unless noted in this report.

- I am not qualified to detect the presence of floodplain or wetlands. Any information presented in this report related to these characteristics is for this analysis only. The presence of floodplain or wetlands may affect the value of the property. If the presence of floodplain or wetlands is suspected the property owner would be advised to seek professional engineering assistance.

- For this appraisal, I assume that no hazardous substances or conditions are present in or on the property. Such substances or conditions could include but are not limited to asbestos, urea-formaldehyde foam insulation, polychlorinated biphenyls (PCBs), petroleum leakage or underground storage tanks, electromagnetic fields, or agricultural chemicals. I have no knowledge of any such materials or conditions unless otherwise stated. I make no claim of technical knowledge with regard to testing for or identifying such hazardous materials or conditions. The presence of such materials, substances or conditions could affect the value of the property. However, the values estimated in this report are predicated on the assumption that there are no such materials or conditions in, on or in close enough proximity to the property to cause a loss in value. The client is urged to retain an expert in this field, if desired.

- Unless otherwise stated in this report the subject property is appraised without a specific compliance survey having been conducted to determine if the property is or is not in conformance with the requirements of the

Americans with Disabilities Act (effective 1/26/92). The presence of architectural and/or communications barriers that are structural in nature that would restrict access by disabled individuals may adversely affect the property's value, marketability, or utility.

- Any allocation of the total value estimated in this report between the land and the improvements applies only under the stated program of utilization. The separate values allocated to the land and buildings must not be used in conjunction with any other appraisal and are invalid if so used.

- Possession of this report, or a copy thereof, does not carry with it the right of publication.

- I have no obligation, by reason of this appraisal, to give further consultation or testimony or to be in attendance in court with reference to the property in question unless further arrangements have been made regarding compensation to Kirkland Appraisals, LLC.

- Neither all nor any part of the contents of this report (especially any conclusions as to value, the identity of the appraiser, or the firm with which the appraiser is connected) shall be disseminated to the public through advertising, public relations, news, sales, or other media without the prior written consent and approval of Kirkland Appraisals, LLC, and then only with proper qualifications.

- Any value estimates provided in this report apply to the entire property, and any proration or division of the total into fractional interests will invalidate the value estimate, unless such proration or division of interests has been set forth in the report.

- Any income and expenses estimated in this report are for the purposes of this analysis only and should not be considered predictions of future operating results.

- This report is not intended to include an estimate of any personal property contained in or on the property, unless otherwise state.

- This report is subject to the Code of Professional Ethics of the Appraisal Institute and complies with the requirements of the State of North Carolina for State Certified General Appraisers. This report is subject to the certification, definitions, and assumptions and limiting conditions set forth herein.

- The analyses, opinions and conclusions were developed based on, and this report has been prepared in conformance with, our interpretation of the guidelines and recommendations set forth in the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA).

- This is a Real Property Appraisal Consulting Assignment.

Certification – Richard C. Kirkland, Jr., MAI

I certify that, to the best of my knowledge and belief:

1. The statements of fact contained in this report are true and correct;

2. The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are my personal, unbiased professional analyses, opinions, and conclusions;

3. I have no present or prospective interest in the property that is the subject of this report and no personal interest with respect to the parties involved;

4. I have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment;

5. My engagement in this assignment was not contingent upon developing or reporting predetermined results;

6. My compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of the appraisal;

7. The reported analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the requirements of the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute;

8. The reported analyses, opinions and conclusions were developed, and this report has been prepared, in conformity with the Uniform Standards of Professional Appraisal Practice.

9. The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives;

10. I have not made a personal inspection of the property that is the subject of this report, and;

11. No one provided significant real property appraisal assistance to the person signing this certification.

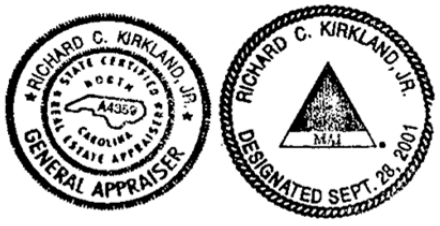
12. As of the date of this report I have completed the requirements of the continuing education program of the Appraisal Institute;

13. I have not appraised this property within the last three years.

Disclosure of the contents of this appraisal report is governed by the bylaws and regulations of the Appraisal Institute and the National Association of Realtors.

Neither all nor any part of the contents of this appraisal report shall be disseminated to the public through advertising media, public relations media, news media, or any other public means of communications without the prior written consent and approval of the undersigned.





Richard C. Kirkland, Jr., MAI
State Certified General Appraiser

Kirkland Appraisals, LLC

Richard C. Kirkland, Jr., MAI
9408 Northfield Court
Raleigh, North Carolina 27603
Mobile (919) 414-8142
rkirkland2@gmail.com
www.kirklandappraisals.com

Professional Experience

Kirkland Appraisals, LLC, Raleigh, N.C. — 2003 – Present
Commercial appraiser
Hester & Company, Raleigh, N.C.
Commercial appraiser — 1996 – 2003

Professional Affiliations

MAI (Member, Appraisal Institute) designation #11796 — 2001
NC State Certified General Appraiser # A4359 — 1999
VA State Certified General Appraiser # 4001017291
OR State Certified General Appraiser # C001204
SC State Certified General Appraiser # 6209

Education

Bachelor of Arts in English, University of North Carolina, Chapel Hill — 1993

Continuing Education

Uniform Standards of Professional Appraisal Practice Update	2016
Forecasting Revenue	2015
Wind Turbine Effect on Value	2015
Supervisor/Trainee Class	2015
Business Practices and Ethics	2014
Subdivision Valuation	2014
Uniform Standards of Professional Appraisal Practice Update	2014
Introduction to Vineyard and Winery Valuation	2013
Appraising Rural Residential Properties	2012
Uniform Standards of Professional Appraisal Practice Update	2012
Supervisors/Trainees	2011
Rates and Ratios: Making sense of GIMs, OARs, and DCFs	2011
Advanced Internet Search Strategies	2011
Analyzing Distressed Real Estate	2011
Uniform Standards of Professional Appraisal Practice Update	2011
Business Practices and Ethics	2011
Appraisal Curriculum Overview (2 Days – General)	2009
Appraisal Review - General	2009
Uniform Standards of Professional Appraisal Practice Update	2008
Subdivision Valuation: A Comprehensive Guide	2008
Office Building Valuation: A Contemporary Perspective	2008
Valuation of Detrimental Conditions in Real Estate	2007
The Appraisal of Small Subdivisions	2007
Uniform Standards of Professional Appraisal Practice Update	2006
Evaluating Commercial Construction	2005

Conservation Easements	2005
Uniform Standards of Professional Appraisal Practice Update	2004
Condemnation Appraising	2004
Land Valuation Adjustment Procedures	2004
Supporting Capitalization Rates	2004
Uniform Standards of Professional Appraisal Practice, C	2002
Wells and Septic Systems and Wastewater Irrigation Systems	2002
Appraisals 2002	2002
Analyzing Commercial Lease Clauses	2002
Conservation Easements	2000
Preparation for Litigation	2000
Appraisal of Nonconforming Uses	2000
Advanced Applications	2000
Highest and Best Use and Market Analysis	1999
Advanced Sales Comparison and Cost Approaches	1999
Advanced Income Capitalization	1998
Valuation of Detrimental Conditions in Real Estate	1999
Report Writing and Valuation Analysis	1999
Property Tax Values and Appeals	1997
Uniform Standards of Professional Appraisal Practice, A & B	1997
Basic Income Capitalization	1996

No Evidence of Residential Property Value Impacts Near U.S. Wind Turbines, a New Berkeley Lab Study Finds

News Release Allan Chen 510-486-4210 • **AUGUST 27, 2013**

135 4 139 SHARES

Lawrence Berkeley National Laboratory (Berkeley Lab) analyzed more than 50,000 home sales near 67 wind facilities in 27 counties across nine U.S. states, yet was unable to uncover any impacts to nearby home property values.

“This is the second of two major studies we have conducted on this topic [the first was published in 2009 – see below], and in both studies [using two different datasets] we find no statistical evidence that operating wind turbines have had any measureable impact on home sales prices,” says Ben Hoen, the lead author of the new report.

Hoen is a researcher in the Environmental Energy Technologies Division of Berkeley Lab.



The new study used a number of sophisticated techniques to control for other potential impacts on home prices, including collecting data that spanned well before the wind facilities’ development was announced to after they were constructed and operating. This allowed the researchers to control for any pre-existing differences in home sales prices across their sample and any changes that occurred due to the housing bubble.

This study, the most comprehensive to-date, builds on both the previous Berkeley Lab study as well a number of other academic and published U.S. studies, which also generally find no measureable impacts near operating turbines.

"Although there have been claims of significant property value impacts near operating wind turbines that regularly surface in the press or in local communities, strong evidence to support those claims has failed to materialize in all of the major U.S. studies conducted thus far", says Hoen. "Moreover, our findings comport with the large set of studies that have investigated other potentially similar disamenities, such as high voltage transmission lines, land fills, and noisy roads, which suggest that widespread impacts from wind turbines would be either relatively small or non-existent."

The report was authored by Ben Hoen (Berkeley Lab), Jason P. Brown (formerly USDA now Federal Reserve Bank of Kansas City), Thomas Jackson (Texas A & M and Real Property Analytics), Ryan Wiser (Berkeley Lab), Mark Thayer (San Diego State University) and Peter Cappers (Berkeley Lab). The research was supported by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy.

Lawrence Berkeley National Laboratory addresses the world's most urgent scientific challenges by advancing sustainable energy, protecting human health, creating new materials, and revealing the origin and fate of the universe. Founded in 1931, Berkeley Lab's scientific expertise has been recognized with 13 Nobel prizes. The University of California manages Berkeley Lab for the U.S. Department of Energy's Office of Science. For more, visit www.lbl.gov.

Additional Information:

Download the new 2013 report "A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States"

Download the 2009 LBNL Report "The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis"

More information about DOE's Wind Program

For more information on the report, contact Ben Hoen (bhoen@lbl.gov, 845-758-1896), or Ryan Wiser (RHWiser@lbl.gov, 510-486-5474).

135 4 in G+ 139 SHARES

Updated: June 1, 2015

TAGS: clean energy

NC CLEAN ENERGY TECHNOLOGY CENTER

NC STATE UNIVERSITY

Health and Safety Impacts of Solar Photovoltaics

The increasing presence of utility-scale solar photovoltaic (PV) systems (sometimes referred to as solar farms) is a rather new development in North Carolina's landscape. Due to the new and unknown nature of this technology, it is natural for communities near such developments to be concerned about health and safety impacts. Unfortunately, the quick emergence of utility-scale solar has cultivated fertile grounds for myths and half-truths about the health impacts of this technology, which can lead to unnecessary fear and conflict.

Photovoltaic (PV) technologies and solar inverters are not known to pose any significant health dangers to their neighbors. The most important dangers posed are increased highway traffic during the relative short construction period and dangers posed to trespassers of contact with high voltage equipment. This latter risk is mitigated by signage and the security measures that industry uses to deter trespassing. As will be discussed in more detail below, risks of site contamination are much less than for most other industrial uses because PV technologies employ few toxic chemicals and those used are used in very small quantities. Due to the reduction in the pollution from fossil-fuel-fired electric generators, the overall impact of solar development on human health is overwhelmingly positive. This pollution reduction results from a partial replacement of fossil-fuel fired generation by emission-free PV-generated electricity, which reduces harmful sulfur dioxide (SO_2), nitrogen oxides (NO_x), and fine particulate matter ($PM_{2.5}$). Analysis from the National Renewable Energy Laboratory and the Lawrence Berkeley National Laboratory, both affiliates of the U.S. Department of Energy, estimates the health-related air quality benefits to the southeast region from solar PV generators to be worth 8.0 ¢ per kilowatt-hour of solar generation.[1] This is in addition to the value of the electricity and suggests that the air quality benefits of solar are worth more than the electricity itself.

Even though we have only recently seen large-scale installation of PV technologies, the technology and its potential impacts have been studied since the 1950s. A combination of this solar-specific research and general scientific research has led to the scientific community having a good understanding of the science behind potential health and safety impacts of solar energy. This paper utilizes the latest scientific literature and knowledge of solar practices in N.C. to address the health and safety risks associated with solar PV technology. These risks are extremely small, far less than those associated with common activities such as driving a car, and vastly outweighed by health benefits of the generation of clean electricity.

This paper addresses the potential health and safety impacts of solar PV development in North Carolina, organized into the following four categories:

(1) Hazardous Materials
(2) Electromagnetic Fields (EMF)
(3) Electric Shock and Arc Flash
(4) Fire Safety

1. Hazardous Materials

One of the more common concerns towards solar is that the panels (referred to as “modules” in the solar industry) consist of toxic materials that endanger public health. However, as shown in this section, solar energy systems may contain small amounts of toxic materials, but these materials do not endanger public health. To understand potential toxic hazards coming from a solar project, one must understand system installation, materials used, the panel end-of-life protocols, and system operation. This section will examine these aspects of a solar farm and the potential for toxicity impacts in the following subsections:

(1.2) Project Installation/Construction
(1.2) System Components
- 1.2.1 Solar Panels: Construction and Durability
- 1.2.2 Photovoltaic technologies
  - (a) Crystalline Silicon
  - (b) Cadmium Telluride (CdTe)
  - (c) CIS/CIGS
- 1.2.3 Panel End of Life Management
- 1.2.4 Non-panel System Components

(1.3) Operations and Maintenance

1.1 Project Installation/Construction

The system installation, or construction, process does not require toxic chemicals or processes. The site is mechanically cleared of large vegetation, fences are constructed, and the land is surveyed to layout exact installation locations. Trenches for underground wiring are dug and support posts are driven into the ground. The solar panels are bolted to steel and aluminum support structures and wired together. Inverter pads are installed, and an inverter and transformer are installed on each pad. Once everything is connected, the system is tested, and only then turned on.



Figure 1: Utility-scale solar facility (5 MW_{AC}) located in Catawba County. Source: Strata Solar

1.2 System Components

1.2.1 Solar Panels: Construction and Durability

Solar PV panels typically consist of glass, polymer, aluminum, copper, and semiconductor materials that can be recovered and recycled at the end of their useful life.[2] Today there are two PV technologies used in PV panels at utility-scale solar facilities, silicon, and thin film. As of 2016, all thin film used in North Carolina solar facilities are cadmium telluride (CdTe) panels from the US manufacturer First Solar, but there are other thin film PV panels available on the market, such as Solar Frontier's CIGS panels. Crystalline silicon technology consists of silicon wafers which are made into cells and assembled into panels, thin film technologies consist of thin layers of semiconductor material deposited onto glass, polymer or metal substrates. While there are differences in the components and manufacturing processes of these two types of solar technologies, many aspects of their PV panel construction are very similar. Specifics about each type of PV chemistry as it relates to toxicity are covered in subsections a, b, and c in section 1.2.2; on crystalline silicon, cadmium telluride, and CIS/CIGS respectively. The rest of this section applies equally to both silicon and thin film panels.

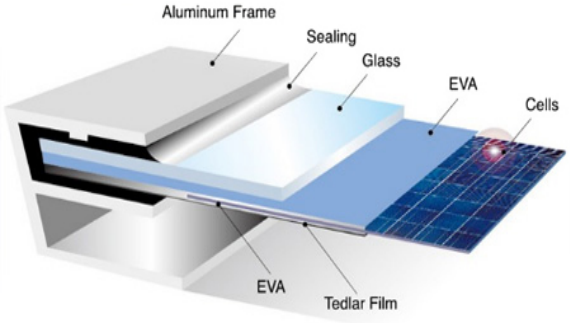


Figure 2: Components of crystalline silicon panels. The vast majority of silicon panels consist of a glass sheet on the topside with an aluminum frame providing structural support. Image Source: www.riteksolar.com.tw

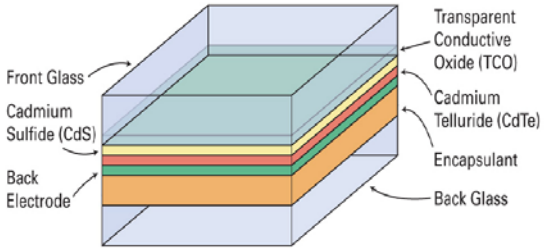


Figure 3: Layers of a common frameless thin-film panel (CdTe). Many thin film panels are frameless, including the most common thin-film panels, First Solar's CdTe. Frameless panels have protective glass on both the front and back of the panel. Layer thicknesses not to scale. Image Source: www.homepower.com

To provide decades of corrosion-free operation, PV cells in PV panels are encapsulated from air and moisture between two layers of plastic. The encapsulation layers are protected on the top with a layer of tempered glass and on the backside with a polymer sheet. Frameless modules include a protective layer of glass on the rear of the panel, which may also be tempered. The plastic ethylene-vinyl acetate (EVA) commonly provides the cell encapsulation. For decades, this same material has been used between layers of tempered glass to give car windshields and hurricane windows their great strength. In the same way that a car windshield cracks but stays intact, the EVA layers in PV panels keep broken panels intact (see Figure 4). Thus, a damaged module does not generally create small pieces of debris; instead, it largely remains together as one piece.



Figure 4: The mangled PV panels in this picture illustrate the nature of broken solar panels; the glass cracks but the panel is still in one piece. Image Source: http://img.alibaba.com/photo/115259576/broken_solar_panel.jpg

PV panels constructed with the same basic components as modern panels have been installed across the globe for well over thirty years.[3] The long-term durability and performance demonstrated over these decades, as well as the results of accelerated lifetime testing, helped lead to an industry-standard 25-year power production warranty for PV panels. These power warranties warrant a PV panel to produce at least 80% of their original nameplate production after 25 years of use. A recent SolarCity and DNV GL study reported that today's quality PV panels should be expected to reliably and efficiently produce power for thirty-five years.[4]

Local building codes require all structures, including ground mounted solar arrays, to be engineered to withstand anticipated wind speeds, as defined by the local wind speed requirements. Many racking products are available in versions engineered for wind speeds of up to 150 miles per hour, which is significantly higher than the wind speed requirement anywhere in North Carolina. The strength of PV mounting structures were demonstrated during Hurricane Sandy in 2012 and again during Hurricane Matthew in 2016. During Hurricane Sandy, the many large-scale solar facilities in New Jersey and New York at that time suffered only minor damage.[5] In the fall of 2016, the US and Caribbean experienced destructive winds and torrential rains from Hurricane Matthew, yet one leading solar tracker manufacturer reported that their numerous systems in the impacted area received zero damage from wind or flooding.[6]

In the event of a catastrophic event capable of damaging solar equipment, such as a tornado, the system will almost certainly have property insurance that will cover the cost to cleanup and repair the project. It is in the best interest of the system owner to protect their investment against such risks. It is also in their interest to get the project repaired and producing full power as soon as possible. Therefore, the investment in adequate insurance is a wise business practice for the system owner. For the same

reasons, adequate insurance coverage is also generally a requirement of the bank or firm providing financing for the project.

1.2.2 Photovoltaic (PV) Technologies

a. Crystalline Silicon

This subsection explores the toxicity of silicon-based PV panels and concludes that they do not pose a material risk of toxicity to public health and safety. Modern crystalline silicon PV panels, which account for over 90% of solar PV panels installed today, are, more or less, a commodity product. The overwhelming majority of panels installed in North Carolina are crystalline silicon panels that are informally classified as Tier I panels. Tier I panels are from well-respected manufacturers that have a good chance of being able to honor warranty claims. Tier I panels are understood to be of high quality, with predictable performance, durability, and content. Well over 80% (by weight) of the content of a PV panel is the tempered glass front and the aluminum frame, both of which are common building materials. Most of the remaining portion are common plastics, including polyethylene terephthalate in the backsheet, EVA encapsulation of the PV cells, polyphenyl ether in the junction box, and polyethylene insulation on the wire leads. The active, working components of the system are the silicon photovoltaic cells, the small electrical leads connecting them together, and to the wires coming out of the back of the panel. The electricity generating and conducting components makeup less than 5% of the weight of most panels. The PV cell itself is nearly 100% silicon, and silicon is the second most common element in the Earth's crust. The silicon for PV cells is obtained by high-temperature processing of quartz sand (SiO_2) that removes its oxygen molecules. The refined silicon is converted to a PV cell by adding extremely small amounts of boron and phosphorus, both of which are common and of very low toxicity.

The other minor components of the PV cell are also generally benign; however, some contain lead, which is a human toxicant that is particularly harmful to young children. The minor components include an extremely thin antireflective coating (silicon nitride or titanium dioxide), a thin layer of aluminum on the rear, and thin strips of silver alloy that are screen-printed on the front and rear of cell.[7] In order for the front and rear electrodes to make effective electrical contact with the proper layer of the PV cell, other materials (called glass frit) are mixed with the silver alloy and then heated to etch the metals into the cell. This glass frit historically contains a small amount of lead (Pb) in the form of lead oxide. The 60 or 72 PV cells in a PV panel are connected by soldering thin solder-covered copper tabs from the back of one cell to the front of the next cell. Traditionally a tin-based solder containing some lead (Pb) is used, but some manufacturers have switched to lead-free solder. The glass frit and/or the solder may contain trace amounts of other metals, potentially including some with human toxicity such as cadmium. However, testing to simulate the potential for leaching from broken panels, which is discussed in more detail below, did not find a potential toxicity threat from these trace elements. Therefore, the tiny amount of lead in the grass frit and the solder is the only part of silicon PV panels with a potential to create a negative health impact. However, as described below, the very limited amount of lead involved and its strong physical and chemical attachment to other components of the PV panel means that even in worst-case scenarios the health hazard it poses is insignificant.

As with many electronic industries, the solder in silicon PV panels has historically been a lead-based solder, often 36% lead, due to the superior properties of such solder. However, recent advances in lead-free solders have spurred a trend among PV panel manufacturers to reduce or remove the lead in their panels. According to the 2015 Solar Scorecard from the Silicon Valley Toxics Coalition, a group that tracks environmental responsibility of photovoltaic panel manufacturers, fourteen companies (increased from twelve companies in 2014) manufacture PV panels certified to meet the European Restriction of

Hazardous Substances (RoHS) standard. This means that the amount of cadmium and lead in the panels they manufacture fall below the RoHS thresholds, which are set by the European Union and serve as the world's de facto standard for hazardous substances in manufactured goods.[8] The Restriction of Hazardous Substances (RoHS) standard requires that the maximum concentration found in any homogenous material in a produce is less than 0.01% cadmium and less than 0.10% lead, therefore, any solder can be no more than 0.10% lead.[9]

While some manufacturers are producing PV panels that meet the RoHS standard, there is no requirement that they do so because the RoHS Directive explicitly states that the directive does not apply to photovoltaic panels.[10] The justification for this is provided in item 17 of the current RoHS Directive: "The development of renewable forms of energy is one of the Union's key objectives, and the contribution made by renewable energy sources to environmental and climate objectives is crucial. Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources (4) recalls that there should be coherence between those objectives and other Union environmental legislation. Consequently, this Directive should not prevent the development of renewable energy technologies that have no negative impact on health and the environment and that are sustainable and economically viable."

The use of lead is common in our modern economy. However, only about 0.5% of the annual lead consumption in the U.S. is for electronic solder for all uses; PV solder makes up only a tiny portion of this 0.5%. Close to 90% of lead consumption in the US is in batteries, which do not encapsulate the pounds of lead contained in each typical automotive battery. This puts the lead in batteries at great risk of leaching into the environment. Estimates for the lead in a single PV panel with lead-based solder range from 1.6 to 24 grams of lead, with 13g (less than half of an ounce) per panel seen most often in the literature.[11] At 13 g/panel[12], each panel contains one-half of the lead in a typical 12-gauge shotgun shell. This amount equates to roughly 1/750th of the lead in a single car battery. In a panel, it is all durably encapsulated from air or water for the full life of the panel.[14]

As indicated by their 20 to 30-year power warranty, PV modules are designed for a long service life, generally over 25 years. For a panel to comply with its 25-year power warranty, its internal components, including lead, must be sealed from any moisture. Otherwise, they would corrode and the panel's output would fall below power warranty levels. Thus, the lead in operating PV modules is not at risk of release to the environment during their service lifetime. In extreme experiments, researchers have shown that lead can leach from crushed or pulverized panels.[15, 16] However, more real-world tests designed to represent typical trash compaction that are used to classify waste as hazardous or non-hazardous show no danger from leaching.[17, 18] For more information about PV panel end-of-life, see the Panel Disposal section.

As illustrated throughout this section, silicon-based PV panels do not pose a material threat to public health and safety. The only aspect of the panels with potential toxicity concerns is the very small amount of lead in some panels. However, any lead in a panel is well sealed from environmental exposure for the operating lifetime of the solar panel and thus not at risk of release into the environment.

b. Cadmium Telluride (CdTe) PV Panels

This subsection examines the components of a cadmium telluride (CdTe) PV panel. Research demonstrates that they pose negligible toxicity risk to public health and safety while significantly reducing the public's exposure to cadmium by reducing coal emissions. As of mid-2016, a few hundred MWs of

cadmium telluride (CdTe) panels, all manufactured by the U.S. company First Solar, have been installed in North Carolina.

Questions about the potential health and environmental impacts from the use of this PV technology are related to the concern that these panels contain cadmium, a toxic heavy metal. However, scientific studies have shown that cadmium telluride differs from cadmium due to its high chemical and thermal stability.[19] Research has shown that the tiny amount of cadmium in these panels does not pose a health or safety risk.[20] Further, there are very compelling reasons to welcome its adoption due to reductions in unhealthy pollution associated with burning coal. Every GWh of electricity generated by burning coal produces about 4 grams of cadmium air emissions.[21] Even though North Carolina produces a significant fraction of our electricity from coal, electricity from solar offsets much more natural gas than coal due to natural gas plants being able to adjust their rate of production more easily and quickly. If solar electricity offsets 90% natural gas and 10% coal, each 5-megawatt (5 MW_{AC}, which is generally 7 MW_{DC}) CdTe solar facility in North Carolina keeps about 157 grams, or about a third of a pound, of cadmium *out of* our environment.[22, 23]

Cadmium is toxic, but all the approximately 7 grams of cadmium in one CdTe panel is in the form of a chemical compound cadmium telluride,[24] which has $1/100^{th}$ the toxicity of free cadmium.[25] Cadmium telluride is a very stable compound that is non-volatile and non-soluble in water. Even in the case of a fire, research shows that less than 0.1% of the cadmium is released when a CdTe panel is exposed to fire. The fire melts the glass and encapsulates over 99.9% of the cadmium in the molten glass.[27]

It is important to understand the source of the cadmium used to manufacture CdTe PV panels. The cadmium is a byproduct of zinc and lead refining. The element is collected from emissions and waste streams during the production of these metals and combined with tellurium to create the CdTe used in PV panels. If the cadmium were not collected for use in the PV panels or other products, it would otherwise either be stockpiled for future use, cemented and buried, or disposed of.[28] Nearly all the cadmium in old or broken panels can be recycled which can eventually serve as the primary source of cadmium for new PV panels.[29]

Similar to silicon-based PV panels, CdTe panels are constructed of a tempered glass front, one instead of two clear plastic encapsulation layers, and a rear heat strengthened glass backing (together >98% by weight). The final product is built to withstand exposure to the elements without significant damage for over 25 years. While not representative of damage that may occur in the field or even at a landfill, laboratory evidence has illustrated that when panels are ground into a fine powder, very acidic water is able to leach portions of the cadmium and tellurium,[30] similar to the process used to recycle CdTe panels. Like many silicon-based panels, CdTe panels are reported (as far back ask 1998[31]) to pass the EPA's Toxic Characteristic Leaching Procedure (TCLP) test, which tests the potential for crushed panels in a landfill to leach hazardous substances into groundwater.[32] Passing this test means that they are classified as non-hazardous waste and can be deposited in landfills.[33, 34] For more information about PV panel end-of-life, see the Panel Disposal section.

There is also concern of environmental impact resulting from potential catastrophic events involving CdTe PV panels. An analysis of worst-case scenarios for environmental impact from CdTe PV panels, including earthquakes, fires, and floods, was conducted by the University of Tokyo in 2013. After reviewing the extensive international body of research on CdTe PV technology, their report concluded, "Even in the worst-case scenarios, it is unlikely that the Cd concentrations in air and sea water will exceed the environmental regulation values."[35] In a worst-case scenario of damaged panels abandoned on the ground, insignificant amounts of cadmium will leach from the panels. This is because this scenario is

much less conducive (larger module pieces, less acidity) to leaching than the conditions of the EPA's TCLP test used to simulate landfill conditions, which CdTe panels pass.[36]

First Solar, a U.S. company, and the only significant supplier of CdTe panels, has a robust panel take-back and recycling program that has been operating commercially since 2005.[37] The company states that it is "committed to providing a commercially attractive recycling solution for photovoltaic (PV) power plant and module owners to help them meet their module (end of life) EOL obligation simply, cost-effectively and responsibly." First Solar global recycling services to their customers to collect and recycle panels once they reach the end of productive life whether due to age or damage. These recycling service agreements are structured to be financially attractive to both First Solar and the solar panel owner. For First Solar, the contract provides the company with an affordable source of raw materials needed for new panels and presumably a diminished risk of undesired release of Cd. The contract also benefits the solar panel owner by allowing them to avoid tipping fees at a waste disposal site. The legal contract helps provide peace of mind by ensuring compliance by both parties when considering the continuing trend of rising disposal costs and increasing regulatory requirements.

c. **CIS/CIGS and other PV technologies**

Copper indium gallium selenide PV technology, often referred to as CIGS, is the second most common type of thin-film PV panel but a distant second behind CdTe. CIGS cells are composed of a thin layer of copper, indium, gallium, and selenium on a glass or plastic backing. None of these elements are very toxic, although selenium is a regulated metal under the Federal Resource Conservation and Recovery Act (RCRA).[38] The cells often also have an extremely thin layer of cadmium sulfide that contains a tiny amount of cadmium, which is toxic. The promise of high efficiency CIGS panels drove heavy investment in this technology in the past. However, researchers have struggled to transfer high efficiency success in the lab to low-cost full-scale panels in the field.[39] Recently, a CIGS manufacturer based in Japan, Solar Frontier, has achieved some market success with a rigid, glass-faced CIGS module that competes with silicon panels. Solar Frontier produces the majority of CIS panels on the market today.[40] Notably, these panels are RoHS compliant,[41] thus meeting the rigorous toxicity standard adopted by the European Union even thought this directive exempts PV panels. The authors are unaware of any completed or proposed utility-scale system in North Carolina using CIS/CIGS panels.

1.2.3 Panel End-of-Life Management

Concerns about the volume, disposal, toxicity, and recycling of PV panels are addressed in this subsection. To put the volume of PV waste into perspective, consider that by 2050, when PV systems installed in 2020 will reach the end of their lives, it is estimated that the global annual PV panel waste tonnage will be 10% of the 2014 global e-waste tonnage.[42] In the U.S., end-of-life disposal of solar products is governed by the Federal Resource Conservation and Recovery Act (RCRA), as well as state policies in some situations. RCRA separates waste into hazardous (not accepted at ordinary landfill) and solid waste (generally accepted at ordinary landfill) based on a series of rules. According to RCRA, the way to determine if a PV panel is classified as hazardous waste is the Toxic Characteristic Leaching Procedure (TCLP) test. This EPA test is designed to simulate landfill disposal and determine the risk of hazardous substances leaching out of the landfill.[43, 44, 45] Multiple sources report that most modern PV panels (both crystalline silicon and cadmium telluride) pass the TCLP test.[46, 47] Some studies found that some older (1990s) crystalline silicon panels, and perhaps some newer crystalline silicon panels (specifics are not given about vintage of panels tested), do not pass the lead (Pb) leachate limits in the TCLP test.[48, 49]

The test begins with the crushing of a panel into centimeter-sized pieces. The pieces are then mixed in an acid bath. After tumbling for eighteen hours, the fluid is tested for forty hazardous substances that all must be below specific threshold levels to pass the test. Research comparing TCLP conditions to conditions of damaged panels in the field found that simulated landfill conditions provide overly conservative estimates of leaching for field-damaged panels.[50] Additionally, research in Japan has found no detectable Cd leaching from cracked CdTe panels when exposed to simulated acid rain.[51]

Although modern panels can generally be landfilled, they can also be recycled. Even though recent waste volume has not been adequate to support significant PV-specific recycling infrastructure, the existing recycling industry in North Carolina reports that it recycles much of the current small volume of broken PV panels. In an informal survey conducted by the NC Clean Energy Technology Center survey in early 2016, seven of the eight large active North Carolina utility-scale solar developers surveyed reported that they send damaged panels back to the manufacturer and/or to a local recycler. Only one developer reported sending damaged panels to the landfill.

The developers reported at that time that they are usually paid a small amount per panel by local recycling firms. In early 2017, a PV developer reported that a local recycler was charging a small fee per panel to recycle damaged PV panels. The local recycling firm known to authors to accept PV panels described their current PV panel recycling practice as of early 2016 as removing the aluminum frame for local recycling and removing the wire leads for local copper recycling. The remainder of the panel is sent to a facility for processing the non-metallic portions of crushed vehicles, referred to as “fluff” in the recycling industry.[52] This processing within existing general recycling plants allows for significant material recovery of major components, including glass which is 80% of the module weight, but at lower yields than PV-specific recycling plants. Notably almost half of the material value in a PV panel is in the few grams of silver contained in almost every PV panel produced today. In the long-term, dedicated PV panel recycling plants can increase treatment capacities and maximize revenues resulting in better output quality and the ability to recover a greater fraction of the useful materials.[53] PV-specific panel recycling technologies have been researched and implemented to some extent for the past decade, and have been shown to be able to recover over 95% of PV material (semiconductor) and over 90% of the glass in a PV panel.[54]

A look at global PV recycling trends hints at the future possibilities of the practice in our country. Europe installed MW-scale volumes of PV years before the U.S. In 2007, a public-private partnership between the European Union and the solar industry set up a voluntary collection and recycling system called PV CYCLE. This arrangement was later made mandatory under the EU’s WEEE directive, a program for waste electrical and electronic equipment.[55] Its member companies (PV panel producers) fully finance the association. This makes it possible for end-users to return the member companies’ defective panels for recycling at any of the over 300 collection points around Europe without added costs. Additionally, PV CYCLE will pick up batches of 40 or more used panels at no cost to the user. This arrangement has been very successful, collecting and recycling over 13,000 tons by the end of 2015.[56]

In 2012, the WEEE Directive added the end-of-life collection and recycling of PV panels to its scope.[57] This directive is based on the principle of extended-producer-responsibility. It has a global impact because producers that want to sell into the EU market are legally responsible for end-of-life management. Starting in 2018, this directive targets that 85% of PV products “put in the market” in Europe are recovered and 80% is prepared for reuse and recycling.

The success of the PV panel collection and recycling practices in Europe provides promise for the future of recycling in the U.S. In mid-2016, the US Solar Energy Industry Association (SEIA) announced that they are starting a national solar panel recycling program with the guidance and support of many

leading PV panel producers.[58] The program will aggregate the services offered by recycling vendors and PV manufacturers, which will make it easier for consumers to select a cost-effective and environmentally responsible end-of-life management solution for their PV products. According to SEIA, they are planning the program in an effort to make the entire industry landfill-free. In addition to the national recycling network program, the program will provide a portal for system owners and consumers with information on how to responsibly recycle their PV systems.

While a cautious approach toward the potential for negative environmental and/or health impacts from retired PV panels is fully warranted, this section has shown that the positive health impacts of reduced emissions from fossil fuel combustion from PV systems more than outweighs any potential risk. Testing shows that silicon and CdTe panels are both safe to dispose of in landfills, and are also safe in worst case conditions of abandonment or damage in a disaster. Additionally, analysis by local engineers has found that the current salvage value of the equipment in a utility scale PV facility generally exceeds general contractor estimates for the cost to remove the entire PV system.[59, 60, 61]

1.2.4 Non-Panel System Components (racking, wiring, inverter, transformer)

While previous toxicity subsections discussed PV panels, this subsection describes the non-panel components of utility-scale PV systems and investigates any potential public health and safety concerns. The most significant non-panel component of a ground-mounted PV system is the mounting structure of the rows of panels, commonly referred to as “racking”. The vertical post portion of the racking is galvanized steel and the remaining above-ground racking components are either galvanized steel or aluminum, which are both extremely common and benign building materials. The inverters that make the solar generated electricity ready to send to the grid have weather-proof steel enclosures that protect the working components from the elements. The only fluids that they might contain are associated with their cooling systems, which are not unlike the cooling system in a computer. Many inverters today are RoHS compliant.

The electrical transformers (to boost the inverter output voltage to the voltage of the utility connection point) do contain a liquid cooling oil. However, the fluid used for that function is either a non-toxic mineral oil or a biodegradable non-toxic vegetable oil, such as BIOTEMP from ABB. These vegetable transformer oils have the additional advantage of being much less flammable than traditional mineral oils. Significant health hazards are associated with old transformers containing cooling oil with toxic PCBs. Transfers with PCB-containing oil were common before PCBs were outlawed in the U.S. in 1979. PCBs still exist in older transformers in the field across the country.

Other than a few utility research sites, there are no batteries on- or off-site associated with utility-scale solar energy facilities in North Carolina, avoiding any potential health or safety concerns related to battery technologies. However, as battery technologies continue to improve and prices continue to decline we are likely to start seeing some batteries at solar facilities. Lithium ion batteries currently dominate the world utility-scale battery market, which are not very toxic. No non-panel system components were found to pose any health or environmental dangers.

1.4 Operations and Maintenance – Panel Washing and Vegetation Control

Throughout the eastern U.S., the climate provides frequent and heavy enough rain to keep panels adequately clean. This dependable weather pattern eliminates the need to wash the panels on a regular basis. Some system owners may choose to wash panels as often as once a year to increase production, but most in N.C. do not regularly wash any PV panels. Dirt build up over time may justify panel washing a few times over the panels' lifetime; however, nothing more than soap and water are required for this activity.

The maintenance of ground-mounted PV facilities requires that vegetation be kept low, both for aesthetics and to avoid shading of the PV panels. Several approaches are used to maintain vegetation at NC solar facilities, including planting of limited-height species, mowing, weed-eating, herbicides, and grazing livestock (sheep). The following descriptions of vegetation maintenance practices are based on interviews with several solar developers as well as with three maintenance firms that together are contracted to maintain well over 100 of the solar facilities in N.C. The majority of solar facilities in North Carolina maintain vegetation primarily by mowing. Each row of panels has a single row of supports, allowing sickle mowers to mow under the panels. The sites usually require mowing about once a month during the growing season. Some sites employ sheep to graze the site, which greatly reduces the human effort required to maintain the vegetation and produces high quality lamb meat.[62]

In addition to mowing and weed eating, solar facilities often use some herbicides. Solar facilities generally do not spray herbicides over the entire acreage; rather they apply them only in strategic locations such as at the base of the perimeter fence, around exterior vegetative buffer, on interior dirt roads, and near the panel support posts. Also unlike many row crop operations, solar facilities generally use only general use herbicides, which are available over the counter, as opposed to restricted use herbicides commonly used in commercial agriculture that require a special restricted use license. The herbicides used at solar facilities are primarily 2-4-D and glyphosate (Round-up®), which are two of the most common herbicides used in lawns, parks, and agriculture across the country. One maintenance firm that was interviewed sprays the grass with a class of herbicide known as a growth regulator in order to slow the growth of grass so that mowing is only required twice a year. Growth regulators are commonly used on highway roadsides and golf courses for the same purpose. A commercial pesticide applicator license is required for anyone other than the landowner to apply herbicides, which helps ensure that all applicators are adequately educated about proper herbicide use and application. The license must be renewed annually and requires passing of a certification exam appropriate to the area in which the applicator wishes to work. Based on the limited data available, it appears that solar facilities in N.C. generally use significantly less herbicides per acre than most commercial agriculture or lawn maintenance services.

2. Electromagnetic Fields (EMF)

PV systems do not emit any material during their operation; however, they do generate electromagnetic fields (EMF), sometimes referred to as radiation. EMF produced by electricity is non-ionizing radiation, meaning the radiation has enough energy to move atoms in a molecule around (experienced as heat), but not enough energy to remove electrons from an atom or molecule (ionize) or to damage DNA. As shown below, modern humans are all exposed to EMF throughout our daily lives without negative health impact. Someone outside of the fenced perimeter of a solar facility is not exposed to significant EMF from the solar facility. Therefore, there is no negative health impact from the EMF

produced in a solar farm. The following paragraphs provide some additional background and detail to support this conclusion.

Since the 1970s, some have expressed concern over potential health consequences of EMF from electricity, but no studies have ever shown this EMF to cause health problems.[63] These concerns are based on some epidemiological studies that found a slight increase in childhood leukemia associated with average exposure to residential power-frequency magnetic fields above 0.3 to 0.4 µT (microteslas) (equal to 3.0 to 4.0 mG (milligauss)). µT and mG are both units used to measure magnetic field strength. For comparison, the average exposure for people in the U.S. is one mG or 0.1 µT, with about 1% of the population with an average exposure in excess of 0.4 µT (or 4 mG).[64] These epidemiological studies, which found an association but not a causal relationship, led the World Health Organization's International Agency for Research on Cancer (IARC) to classify ELF magnetic fields as "possibly carcinogenic to humans". Coffee also has this classification. This classification means there is limited evidence but not enough evidence to designate as either a "probable carcinogen" or "human carcinogen". Overall, there is very little concern that ELF EMF damages public health. The only concern that does exist is for long-term exposure above 0.4 µT (4 mG) that may have some connection to increased cases of childhood leukemia. In 1997, the National Academies of Science were directed by Congress to examine this concern and concluded:

> "Based on a comprehensive evaluation of published studies relating to the effects of power-frequency electric and magnetic fields on cells, tissues, and organisms (including humans), the conclusion of the committee is that the current body of evidence does not show that exposure to these fields presents a human-health hazard. Specifically, no conclusive and consistent evidence shows that exposures to residential electric and magnetic fields produce cancer, adverse neurobehavioral effects, or reproductive and developmental effects."[65]

There are two aspects to electromagnetic fields, an electric field and a magnetic field. The electric field is generated by voltage and the magnetic field is generated by electric current, i.e., moving electrons. A task group of scientific experts convened by the World Health Organization (WHO) in 2005 concluded that there were no substantive health issues related to *electric* fields (0 to 100,000 Hz) at levels generally encountered by members of the public.[66] The relatively low voltages in a solar facility and the fact that electric fields are easily shielded (i.e., blocked) by common materials, such as plastic, metal, or soil means that there is no concern of negative health impacts from the electric fields generated by a solar facility. Thus, the remainder of this section addresses magnetic fields. Magnetic fields are not shielded by most common materials and thus can easily pass through them. Both types of fields are strongest close to the source of electric generation and weaken quickly with distance from the source.

The direct current (DC) electricity produced by PV panels produce stationary (0 Hz) electric and magnetic fields. Because of minimal concern about potential risks of stationary fields, little scientific research has examined stationary fields' impact on human health.[67] In even the largest PV facilities, the DC voltages and currents are not very high. One can illustrate the weakness of the EMF generated by a PV panel by placing a compass on an operating solar panel and observing that the needle still points north.

While the electricity throughout the majority of a solar site is DC electricity, the inverters convert this DC electricity to alternating current (AC) electricity matching the 60 Hz frequency of the grid. Therefore, the inverters and the wires delivering this power to the grid are producing non-stationary EMF, known as extremely low frequency (ELF) EMF, normally oscillating with a frequency of 60 Hz. This frequency is at the low-energy end of the electromagnetic spectrum. Therefore, it has less energy than

other commonly encountered types of non-ionizing radiation like radio waves, infrared radiation, and visible light.

The wide use of electricity results in background levels of ELF EMFs in nearly all locations where people spend time – homes, workplaces, schools, cars, the supermarket, etc. A person's average exposure depends upon the sources they encounter, how close they are to them, and the amount of time they spend there.[68] As stated above, the average exposure to magnetic fields in the U.S. is estimated to be around one mG or 0.1 μT, but can vary considerably depending on a person's exposure to EMF from electrical devices and wiring.[69] At times we are often exposed to much higher ELF magnetic fields, for example when standing three feet from a refrigerator the ELF magnetic field is 6 mG and when standing three feet from a microwave oven the field is about 50 mG.[70] The strength of these fields diminish quickly with distance from the source, but when surrounded by electricity in our homes and other buildings moving away from one source moves you closer to another. However, unless you are inside of the fence at a utility-scale solar facility or electrical substation it is impossible to get very close to the EMF sources. Because of this, EMF levels at the fence of electrical substations containing high voltages and currents are considered "generally negligible".[71, 72]

The strength of ELF-EMF present at the perimeter of a solar facility or near a PV system in a commercial or residential building is significantly lower than the typical American's average EMF exposure.[73, 74] Researchers in Massachusetts measured magnetic fields at PV projects and found the magnetic fields dropped to very low levels of 0.5 mG or less, and in many cases to less than background levels (0.2 mG), at distances of no more than nine feet from the residential inverters and 150 feet from the utility-scale inverters.[75] Even when measured within a few feet of the utility-scale inverter, the ELF magnetic fields were well below the International Commission on Non-Ionizing Radiation Protection's recommended magnetic field level exposure limit for the general public of 2,000 mG.[76] It is typical that utility scale designs locate large inverters central to the PV panels that feed them because this minimizes the length of wire required and shields neighbors from the sound of the inverter's cooling fans. Thus, it is rare for a large PV inverter to be within 150 feet of the project's security fence.

Anyone relying on a medical device such as pacemaker or other implanted device to maintain proper heart rhythm may have concern about the potential for a solar project to interfere with the operation of his or her device. However, there is no reason for concern because the EMF outside of the solar facility's fence is less than 1/1000 of the level at which manufacturers test for ELF EMF interference, which is 1,000 mG.[77] Manufacturers of potentially affected implanted devices often provide advice on electromagnetic interference that includes avoiding letting the implanted device get too close to certain sources of fields such as some household appliances, some walkie-talkies, and similar transmitting devices. Some manufacturers' literature does not mention high-voltage power lines, some say that exposure in public areas should not give interference, and some advise not spending extended periods of time close to power lines.[78]

3. Electric Shock and Arc Flash Hazards

There is a real danger of electric shock to anyone entering any of the electrical cabinets such as combiner boxes, disconnect switches, inverters, or transformers; or otherwise coming in contact with voltages over 50 Volts.[79] Another electrical hazard is an arc flash, which is an explosion of energy that can occur in a short circuit situation. This explosive release of energy causes a flash of heat and a shockwave, both of which can cause serious injury or death. Properly trained and equipped technicians and electricians know how to safely install, test, and repair PV systems, but there is always some risk of

injury when hazardous voltages and/or currents are present. Untrained individuals should not attempt to inspect, test, or repair any aspect of a PV system due to the potential for injury or death due to electric shock and arc flash, The National Electric Code (NEC) requires appropriate levels of warning signs on all electrical components based on the level of danger determined by the voltages and current potentials. The national electric code also requires the site to be secured from unauthorized visitors with either a six-foot chain link fence with three strands of barbed wire or an eight-foot fence, both with adequate hazard warning signs.

4. Fire Safety

The possibility of fires resulting from or intensified by PV systems may trigger concern among the general public as well as among firefighters. However, concern over solar fire hazards should be limited because only a small portion of materials in the panels are flammable, and those components cannot self-support a significant fire. Flammable components of PV panels include the thin layers of polymer encapsulates surrounding the PV cells, polymer backsheets (framed panels only), plastic junction boxes on rear of panel, and insulation on wiring. The rest of the panel is composed of non-flammable components, notably including one or two layers of protective glass that make up over three quarters of the panel's weight.

Heat from a small flame is not adequate to ignite a PV panel, but heat from a more intense fire or energy from an electrical fault can ignite a PV panel.[80] One real-world example of this occurred during July 2015 in an arid area of California. Three acres of grass under a thin film PV facility burned without igniting the panels mounted on fixed-tilt racks just above the grass.[81] While it is possible for electrical faults in PV systems on homes or commercial buildings to start a fire, this is extremely rare.[82] Improving understanding of the PV-specific risks, safer system designs, and updated fire-related codes and standards will continue to reduce the risk of fire caused by PV systems.

PV systems on buildings can affect firefighters in two primary ways, 1) impact their methods of fighting the fire, and 2) pose safety hazard to the firefighters. One of the most important techniques that firefighters use to suppress fire is ventilation of a building's roof. This technique allows superheated toxic gases to quickly exit the building. By doing so, the firefighters gain easier and safer access to the building, Ventilation of the roof also makes the challenge of putting out the fire easier. However, the placement of rooftop PV panels may interfere with ventilating the roof by limiting access to desired venting locations.

New solar-specific building code requirements are working to minimize these concerns. Also, the latest National Electric Code has added requirements that make it easier for first responders to safely and effectively turn off a PV system. Concern for firefighting a building with PV can be reduced with proper fire fighter training, system design, and installation. Numerous organizations have studied fire fighter safety related to PV. Many organizations have published valuable guides and training programs. Some notable examples are listed below.

- The International Association of Fire Fighters (IAFF) and International Renewable Energy Council (IREC) partnered to create an online training course that is far beyond the PowerPoint click-and-view model. The self-paced online course, "Solar PV Safety for Fire Fighters," features rich video content and simulated environments so fire fighters can practice the knowledge they've learned. www.iaff.org/pvsafetytraining
- Photovoltaic Systems and the Fire Code: Office of NC Fire Marshal
- Fire Service Training, Underwriter's Laboratory

- Firefighter Safety and Response for Solar Power Systems, National Fire Protection Research Foundation
- Bridging the Gap: Fire Safety & Green Buildings, National Association of State Fire Marshalls
- Guidelines for Fire Safety Elements of Solar Photovoltaic Systems, Orange County Fire Chiefs Association
- Solar Photovoltaic Installation Guidelines, California Department of Forestry & Fire Protection, Office of the State Fire Marshall
- PV Safety & Firefighting, Matthew Paiss, Homepower Magazine
- PV Safety and Code Development: Matthew Paiss, Cooperative Research Network

Summary

The purpose of this paper is to address and alleviate concerns of public health and safety for utility-scale solar PV projects. Concerns of public health and safety were divided and discussed in the four following sections: (1) Toxicity, (2) Electromagnetic Fields, (3) Electric Shock and Arc Flash, and (4) Fire. In each of these sections, the negative health and safety impacts of utility-scale PV development were shown to be negligible, while the public health and safety benefits of installing these facilities are significant and far outweigh any negative impacts.

[1] Wiser, Ryan, Trieu Mai, Dev Millstein, Jordan Macknick, Alberta Carpenter, Stuart Cohen, Wesley Cole, Bethany Frew, and Garvin A. Heath. 2016. On the Path to SunShot: The Environmental and Public Health Benefits of Achieving High Penetrations of Solar Energy in the United States. Golden, CO: National Renewable Energy Laboratory. Accessed March 2017, www.nrel.gov/docs/fy16osti/65628.pdf

[2] IRENA and IEA-PVPS (2016), "End-of-Life Management: Solar Photovoltaic Panels," International Renewable Energy Agency and International Energy Agency Photovoltaic Power Systems.

[3] National Renewable Energy Laboratory, *Overview of Field Experience – Degradation Rates & Lifetimes*. September 14, 2015. Solar Power International Conference. Accessed March 2017, www.nrel.gov/docs/fy15osti/65040.pdf

[4] Miesel et al. *SolarCity Photovoltaic Modules with 35 Year Useful Life.* June 2016. Accessed March 2017. http://www.solarcity.com/newsroom/reports/solarcity-photovoltaic-modules-35-year-useful-life

[5] David Unger. *Are Renewables Stormproof? Hurricane Sandy Tests Solar, Wind.* November 2012. Accessed March 2017. http://www.csmonitor.com/Environment/Energy-Voices/2012/1119/Are-renewables-stormproof-Hurricane-Sandy-tests-solar-wind & http://www.csmonitor.com/Environment/Energy-Voices/2012/1119/Are-renewables-stormproof-Hurricane-Sandy-tests-solar-wind

[6] NEXTracker and 365 Pronto, *Tracking Your Solar Investment: Best Practices for Solar Tracker O&M*. Accessed March 2017. www.nextracker.com/content/uploads/2017/03/NEXTracker_OandM-WhitePaper_FINAL_March-2017.pdf

[7] Christiana Honsberg, Stuart Bowden. *Overview of Screen Printed Solar Cells.* Accessed January 2017. www.pveducation.org/pvcdrom/manufacturing/screen-printed

[8] Silicon Valley Toxics Coalition. *2015 Solar Scorecard.* Accessed August 2016. www.solarscorecard.com/2015/2015-SVTC-Solar-Scorecard.pdf

[9] European Commission. *Recast of Reduction of Hazardous Substances (RoHS) Directive*. September 2016. Accessed August 2016. http://ec.europa.eu/environment/waste/rohs_eee/index_en.htm

[10] Official Journal of the European Union, *DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.* June 2011. Accessed May 2017. http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32011L0065&from=en

[11] Giancarlo Giacchetta, Mariella Leporini, Barbara Marchetti. *Evaluation of the Environmental Benefits of New High Value Process for the Management of the End of Life of Thin Film Photovoltaic Modules.* July 2013. Accessed August 2016. www.researchgate.net/publication/257408804_Evaluation_of_the_environmental_benefits_of_new_high_value_process_for_the_management_of_the_end_of_life_of_thin_film_photovoltaic_modules

[12] European Commission. *Study on Photovoltaic Panels Supplementing The Impact Assessment for a Recast of the Weee Directive.* April 2011. Accessed August 2016. http://ec.europa.eu/environment/waste/weee/pdf/Study%20on%20PVs%20Bio%20final.pdf

[14] The amount of lead in a typical car battery is 21.4 pounds. Waste 360. Chaz Miller. *Lead Acid Batteries.* March 2006. Accessed August 2016. http://waste360.com/mag/waste_leadacid_batteries_3

[15] Okkenhaug G. *Leaching from CdTe PV module material results from batch, column and availability tests.* Norwegian Geotechnical Institute, NGI report No. 20092155-00-6-R; 2010

[16] International Journal of Advanced Applied Physics Research. Renate Zapf-Gottwick1, et al. *Leaching Hazardous Substances out of Photovoltaic Modules*. January 2015. Accessed January 2016. www.cosmosscholars.com/phms/index.php/ijaapr/article/download/485/298

[17] ibid

[18] Parikhit Sinha, et al. Evaluation of Potential Health and Environmental Impacts from End-Of-Life Disposal of Photovoltaics, Photovoltaics, 2014. Accessed May 2016

[19] Bonnet, D. and P. Meyers. 1998. *Cadmium-telluride—Material for thin film solar cells.* J. Mater. Res., Vol. 13, No. 10, pp. 2740-2753

[20] V. Fthenakis, K. Zweibel. *CdTe PV: Real and Perceived EHS Risks*. National Center ofr Photovoltaics and Solar Program Review Meeting, March 24-26, 2003. www.nrel.gov/docs/fy03osti/33561.pdf. Accessed May 2017

[21] International Energy Agency Photovoltaic Power Systems Programme. *Life Cycle Inventories and Life Cycle Assessments of Photovoltaic Systems*. March 2015. Accessed August 2016. http://iea-pvps.org/index.php?id=315

[22] Data not available on fraction of various generation sources offset by solar generation in NC, but this is believed to be a reasonable rough estimate. The SunShot report entitled The Environmental and Public Health Benefits of Achieving High Penetrations of Solar Energy in the United States analysis contributes significant (% not provided) offsetting of coal-fired generation by solar PV energy in the southeast.

[23] 7 MW_{DC} * 1.5 GWh/MW_{DC} * 25 years * 0.93 degradation factor * (0.1 *4.65 grams/GWh + 0.9*0.2 grams/GWh)

[24] Vasilis Fthenakis. *CdTe PV: Facts and Handy Comparisons.* January 2003. Accessed March 2017. https://www.bnl.gov/pv/files/pdf/art_165.pdf

[25] Kaczmar, S., *Evaluating the Read-Across Approach on CdTe Toxicity for CdTe Photovoltaics*, SETAC North America 32nd Annual Meeting, Boston, MA, November 2011. Available at: ftp://ftp.co.imperial.ca.us/icpds/eir/campo-verde-solar/final/evaluating-toxicity.pdf, Accessed May 2017

[27] V. M. Fthenakis et al, *Emissions and Encapsulation of Cadmium in CdTe PV Modules During Fires* Renewable Progress in Photovoltaics: Research and Application: Res. Appl. 2005; 13:1–11, Accessed March 2017, www.bnl.gov/pv/files/pdf/abs_179.pdf

[28] Fthenakis *V.M., Life Cycle Impact Analysis of Cadmium in CdTe Photovoltaic Production*, Renewable and Sustainable Energy Reviews, 8, 303-334, 2004. www.clca.columbia.edu/papers/Life_Cycle_Impact_Analysis_Cadmium_CdTe_Photovoltaic_production.pdf, Accessed May 2017

[29] International Renewable Energy Agency. Stephanie Weckend, Andreas Wade, Garvin Heath. *End of Life Management: Solar Photovoltaic Panels*. June 2016. Accessed November 2016.

[30] International Journal of Advanced Applied Physics Research. Renate Zapf-Gottwick1, et al. *Leaching Hazardous Substances out of Photovoltaic Modules*. January 2015. Accessed January 2016. www.cosmosscholars.com/phms/index.php/ijaapr/article/download/485/298

[31] Cunningham D., Discussion about TCLP protocols, Photovoltaics and the Environment Workshop, July 23-24, 1998, Brookhaven National Laboratory, BNL-52557

[32] Parikhit Sinha, et al. Evaluation of Potential Health and Environmental Impacts from End-Of-Life Disposal of Photovoltaics, Photovoltaics, 2014. Accessed May 2016

[33] Practical Handbook of Photovoltaics: Fundamentals and Applications. T. Markvart and L. Castaner. *Chapter VII-2: Overview of Potential Hazards*. December 2003. Accessed August 2016. https://www.bnl.gov/pv/files/pdf/art_170.pdf

[34] Norwegian Geotechnical Institute. *Environmental Risks Regarding the Use and End-of-Life Disposal of CdTe PV Modules*. April 2010. Accessed August 2016. https://www.dtsc.ca.gov/LawsRegsPolicies/upload/Norwegian-Geotechnical-Institute-Study.pdf

[35] First Solar. Dr. Yasunari Matsuno. December 2013. August 2016. *Environmental Risk Assessment of CdTe PV Systems to be considered under Catastrophic Events in Japan.* http://www.firstsolar.com/-/media/Documents/Sustainability/Peer-Reviews/Japan_Peer-Review_Matsuno_CdTe-PV-Tsunami.ashx

[36] First Solar. Parikhit Sinha, Andreas Wade. *Assessment of Leaching Tests for Evaluating Potential Environmental Impacts of PV Module Field Breakage*. 2015 IEEE

[37] See p. 22 of First Solar, Sustainability Report. Available at: www.firstsolar.com/-/media/First-Solar/Sustainability-Documents/03801_FirstSolar_SustainabilityReport_08MAR16_Web.ashx, Accessed May 2017

[38] 40 CFR §261.24. *Toxicity Characteristic*. May 2017. Accessed May 2017. https://www.ecfr.gov/cgi-bin/text-idx?node=se40.26.261_124&rgn=div8
[39] Office of Energy Efficiency & Renewable Energy. *Copper Indium Gallium Diselenide.* Accessed March 2017. https://www.energy.gov/eere/sunshot/copper-indium-gallium-diselenide
[40] Mathias Maehlum. *Best Thin Film Solar Panels – Amorphous, Cadmium Telluride or CIGS?* April 2015. Accessed March 2017. http://energyinformative.org/best-thin-film-solar-panels-amorphous-cadmium-telluride-cigs/
[41] RoHS tested certificate for Solar Frontier PV modules. TUVRheinland, signed 11.11.2013
[42] International Renewable Energy Agency. Stephanie Weckend, Andreas Wade, Garvin Heath. *End of Life Management: Solar Photovoltaic Panels*. June 2016. Accessed November 2016. http://www.irena.org/DocumentDownloads/Publications/IRENA_IEAPVPS_End-of-Life_Solar_PV_Panels_2016.pdf
[43] 40 C.F.R. §261.10. *Identifying the Characteristics of Hazardous Waste and for Listing Hazardous Waste*. November 2016. Accessed November 2016 http://www.ecfr.gov/cgi-bin/text-idx?SID=ce0006d66da40146b490084ca2816143&mc=true&node=pt40.26.261&rgn=div5#sp40.28.261.b
[44] 40 C.F.R. §261.24 *Toxicity Characteristic.* November 2016. Accessed November 2016. http://www.ecfr.gov/cgi-bin/text-idx?SID=ce0006d66da40146b490084ca2816143&mc=true&node=pt40.26.261&rgn=div5#se40.28.261_124
[45] International Renewable Energy Agency. Stephanie Weckend, Andreas Wade, Garvin Heath. *End of Life Management: Solar Photovoltaic Panels.* June 2016. Accessed November 2016. http://www.irena.org/DocumentDownloads/Publications/IRENA_IEAPVPS_End-of-Life_Solar_PV_Panels_2016.pdf
[46] TLCP test results from third-party laboratories for REC, Jinko, and Canadian Solar silicon-based panels. Provided by PV panel manufacturers directly or indirectly to authors
[47] Sinovoltaics, *Introduction to Solar Panel Recycling*, March 2014. Accessed October 2016. http://sinovoltaics.com/solar-basics/introduction-to-solar-panel-recycling/
[48] Brookhaven National Laboratory. Vasilis Fthenakis, *Regulations on Photovoltaic Module Disposal and Recycling.* January 29, 2001.
[49] Parikhit Sinha, et al. Evaluation of Potential Health and Environmental Impacts from End-Of-Life Disposal of Photovoltaics, Photovoltaics, 2014.
[50] First Solar. Parikhit Sinha, Andreas Wade. *Assessment of Leaching Tests for Evaluating Potential Environmental Impacts of PV Module Field Breakage.* October 2015. Accessed August 2016. http://www.firstsolar.com/-/media/Documents/Sustainability/PVSC42-Manuscript-20150912--Assessment-of-Leaching-Tests-for-Evaluating-Potential-Environmental-Impa.ashx
[51] First Solar. Dr. Yasunari Matsuno. December 2013. *Environmental Risk Assessment of CdTe PV Systems to be considered under Catastrophic Events in Japan*. http://www.firstsolar.com/-/media/Documents/Sustainability/Peer-Reviews/Japan_Peer-Review_Matsuno_CdTe-PV-Tsunami.ashx
[52] Phone interview, February 3, 2016, TT&E Iron & Metal, Garner, NC www.ncscrapmetal.com/
[53] Wen-His Huang, et al. *Strategy and Technology To Recycle Water-silicon Solar Modules*. Solar Energy, Volume 144, March 2017, Pages 22-31
[54] International Renewable Energy Agency. Stephanie Weckend, Andreas Wade, Garvin Heath. *End of Life Management: Solar Photovoltaic Panels.* June 2016. Accessed November 2016. http://www.irena.org/DocumentDownloads/Publications/IRENA_IEAPVPS_End-of-Life_Solar_PV_Panels_2016.pdf
[55] Official Journal of the European Union. *Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on Waste Electrical and Electronic Equipment*. July 2012. Accessed November 2016. http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32012L0019
[56] PV CYCLE. *Annual Report 2015.* Accessed November 2016. https://pvcyclepublications.cld.bz/Annual-Report-PV-CYCLE-2015/6-7
[57] Official Journal of the European Union. *Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on Waste Electrical and Electronic Equipment*. July 2012. Accessed November 2016. http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32012L0019
[58] SEIA National PV Recycling Program: www.seia.org/seia-national-pv-recycling-program
[59] RBI Solar, Decommissioning Plan submitted to Catawba County associated with permitting of a 5MW solar project in June 2016. Accessed April 2017. www.catawbacountync.gov/Planning/Projects/Rezonings/RZ2015-05_DecommissioningPlan.pdf
[60] Birdseye Renewables, Decommissioning Plan submitted to Catawba County associated with permitting of a 5MW solar project in May 2015. Accessed April 2017. www.catawbacountync.gov/Planning/Projects/Rezonings/RZ2015-04_DecommissioningPlan.pdf
[61] Cypress Creek Renewables, Decommissioning Plan submitted to Catawba County associated with permitting of a 5MW solar project in September 2016. Accessed April 2017. www.catawbacountync.gov/Planning/Projects/Rezonings/RZ2016-06decommission.pdf
[62] Sun Raised Farms: http://sunraisedfarms.com/index.html
[63] National Institute of Environmental Health Sciences and National Institutes of Health, EMF: Electric and Magnetic Fields Associated with Electric Power: Questions and Answers, June 2002

[64] World Health Organization. *Electromagnetic Fields and Public Health: Exposure to Extremely Low Frequency Fields*. June 2007. Accessed August 2016. http://www.who.int/peh-emf/publications/facts/fs322/en/
[65] Committee on the Possible Effects of Electromagnetic Fields on Biologic Systems, National Research Council, Possible Health Effects of Exposure to Residential Electric and Magnetic Fields, ISBN: 0-309-55671-6, 384 pages, 6 x 9, (1997) This PDF is available from the National Academies Press at: http://www.nap.edu/catalog/5155.html
[66] World Health Organization. *Electromagnetic Fields and Public Health: Exposure to Extremely Low Frequency Fields*. June 2007. Accessed August 2016. http://www.who.int/peh-emf/publications/facts/fs322/en/
[67] World Health Organization. *Electromagnetic Fields and Public Health: Static Electric and Magnetic Fields.* March 2006. Accessed August 2016. http://www.who.int/peh-emf/publications/facts/fs299/en/
[68] Asher Sheppard, Health Issues Related to the Static and Power-Frequency Electric and Magnetic Fields (EMFs) of the Soitec Solar Energy Farms, April 30, 2014. Accessed March 2017: www.sandiegocounty.gov/content/dam/sdc/pds/ceqa/Soitec-Documents/Final-EIR-Files/Appendix_9.0-1_EMF.pdf
[69] Massachusetts Clean Energy Center. *Study of Acoustic and EMF Levels from Solar Photovoltaic Projects*. December 2012. Accessed August 2016.
[70] Duke Energy Corporation. *Frequently Asked Questions: Electric and Magnetic Fields*. Accessed August 2016. https://www.duke-energy.com/about-energy/frequently_asked_questions.asp
[71] National Institute of Environmental Health Sciences, *Electric and Magnetic Fields Associate with the use of Electric Power: Questions and Answers*, 2002. Accessed November 2016 www.niehs.nih.gov/health/materials/electric_and_magnetic_fields
[72] Duke Energy Corporation. *Frequently Asked Questions: Electric and Magnetic Fields*. Accessed August 2016. https://www.duke-energy.com/about-energy/frequently_asked_questions.asp
[73] R.A. Tell et al, *Electromagnetic Fields Associated with Commercial Solar Photovoltaic Electric Power Generating Facilities*, Journal of Occupational and Environmental Hygiene, Volume 12, 2015,- Issue 11. Abstract Accessed March 2016: http://www.tandfonline.com/doi/full/10.1080/15459624.2015.1047021
[74] Massachusetts Department of Energy Resources, Massachusetts Department of Environmental Protection, and Massachusetts Clean Energy Center. *Questions & Answers: Ground-Mounted Solar Photovoltaic Systems*. June 2015. Accessed August 2016. http://www.mass.gov/eea/docs/doer/renewables/solar/solar-pv-guide.pdf
[75] Ibid.
[76] Ibid.
[77] *EMFs and medical devices*, Accessed March 2017. www.emfs.info/effects/medical-devices/
[78] ibid.
[79] Damon McCluer. *Electrical Construction & Maintenance: NFPA 70E's Approach to Considering DC Hazards*. September 2013. Accessed October 2016. http://ecmweb.com/safety/nfpa-70e-s-approach-considering-dc-hazards,
[80] Hong-Yun Yang, et. al. *Experimental Studies on the Flammability and Fire Hazards of Photovoltaic Modules, Materials.* July 2015. Accessed August 2016. http://www.mdpi.com/1996-1944/8/7/4210/pdf
[81] Matt Fountain. The Tribune. *Fire breaks out at Topaz Solar Farm*. July 2015. Accessed August 2016. www.sanluisobispo.com/news/local/article39055539.html
[82] Cooperative Research Network. Matthew Paiss. *Tech Surveillance: PV Safety & Code Developments*. October 2014. Accessed August 2016. http://www.nreca.coop/wp-content/uploads/2013/06/ts_pv_fire_safety_oct_2014.pdf

Published by the N.C. Clean Energy Technology Center at N.C. State University



MSDS REPORT

MATERIAL SAFETY DATA SHEET

Contents

SECTION 1- PRODUCT AND COMPANY IDENTIFICATION 2
SECTION2- COMPOSITION, INFORMATION ON INGREDIENTS 3
SECTION3- HAZARDS IDENTIFICATION 5
SECTION4- FIRST AID MEASURES 5
SECTION5- FIRE FIGHTING MEASURES 5
SECTION6- ACCIDENTAL RELEASE MEASURES 6
SECTION7- HANDLING AND STORAGE 6
SECTION8-EXPOSURE CONTROLS/PERSONAL PROTECTION EQUIPMENT 8
SECTION9- PHYSICAL AND CHEMICAL PROPERTIES 8
SECTION10- STABILITY AND REACTIVITY 8
SECTION11- TOXICOLOGICAL INFORMATION 9
SECTION12- ECOLOGICAL INFORMATION 9
SECTION13- DISPOSAL 9
SECTION14- TRANSPORT INFORMATION 9
SECTION15- REGULATORY INFORMATION 9
SECTION16-OTHER INFORMATION 9

SECTION 1- PRODUCT AND COMPANY IDENTIFICATION

Solar Electric Crystal Silicon Module

Company Identification: JA SOLAR
Building No. 8, Nuode Center,
Automobile Museum East Road, Fengtai District
Beijing, China

T: +86 (10) 636 11888 F: +86 (10) 636 11999 E: sales@jasolar.com

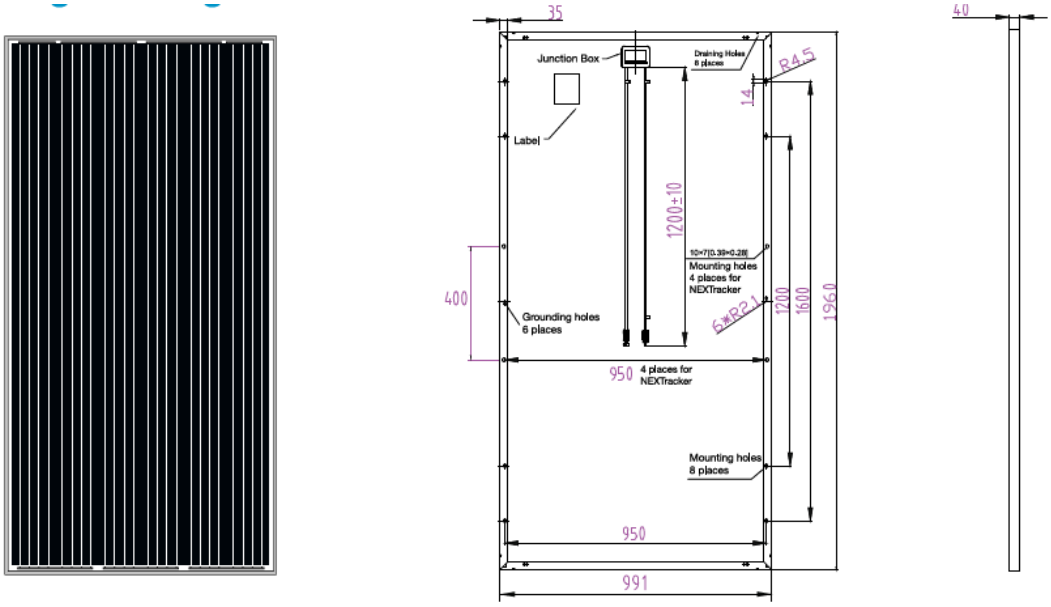


Figure 1 72 Cell Module

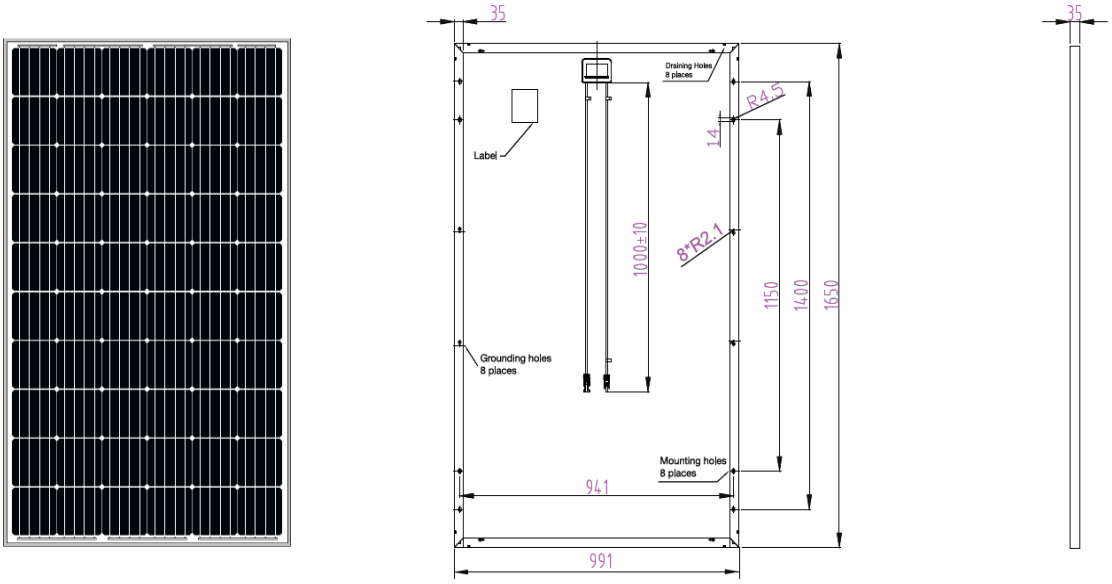
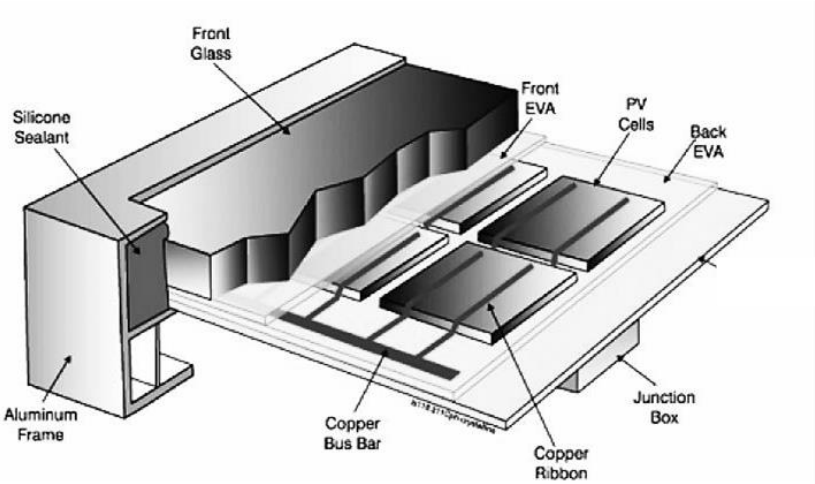
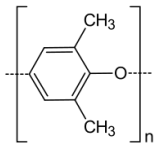
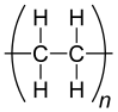
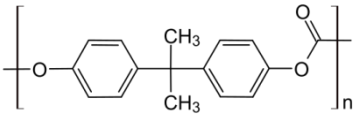
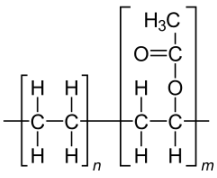


Figure 2 60 Cell Module

SECTION2- COMPOSITION, INFORMATION ON INGREDIENTS



Material Item	Chemical Name of Composition	Formula & Model
Frame	Aluminum	AL
	Alumina	AL_2O_3
	Manganese	Mn
Cell	Silicon	Si
	Phosphorus	P
	Boron	B
	Silicon nitride	Si_3N_x
	Silver	Ag
	Aluminum	AL

Junction-Box	Polyphenylene oxide (PPO)	
	Tin	Sn
	Copper	Cu
	Polyethylene (PE)	
	Polycarbonate (PC)	
Glass	Tin	Sn
	Tempered glass	SIO_2
Silica Gel	Silicon substrate	(SiO2)m·(H20)n
	Silane coupling agent	KH550
Bus bar	Copper	Cu
	Tin	Sn
	Isopropyl alcohol	C_3H_8O
Back Sheet	Polyvinylidene Fluoride (PVDF)	
	Polyethylene terephthalate (PET)	-OCH_2-$CH_2OCOC_6H_4CO$-
	Polyethylene (PE)	nCH_2=CH_2→—[CH_2—CH_2]—
Laminate material	EVA Ethylene Vinyl Acetate	

SECTION3- HAZARDS IDENTIFICATION

Emergency Overview: warning, non-demolition, not exposed to flame or fire. There is the risk of explosion and burn under fire conditions. Do not short-circuit, squeezing, burning, or removing the module.

Potential health hazards

Risk Categories: None Invasive Ways: None

Environmental Hazards: None Health Hazards: None

Explosion Hazard: Tempered glass has a 1/10000 explosion risk.

The inverter device does not meet the provision, the flaws on system design, the quality problem of the junction box, the hot spot effect will be the reason of spontaneous combustion of this product.

SECTION4- FIRST AID MEASURES

Eye contact: No damage found on eye contact, no special provisions.

Skin contact: No skin contact injury found. It is proposed to wash hands before and after touch back sheet. If molten polymer contacts skin, immediately cool it with cold water, and do not directly peel them from the skin, go to hospital for treatment by burns drugs.

- Ingestion: No damage found, no special provisions.
- Inhalation: No damage found, no special provisions. If you have overheating or fire hazard, be away from heat. Go to hospital if any discomfort.

SECTION5- FIRE FIGHTING MEASURES

In general: during normal operation, this product is not prone to burning.

Hazardous Combustion Products: CO, HF,
Extinguishing Media: The hydrogen produced under the using of water may be mixed with air to form an explosive mixture if the module is burning. For small fires, carbon dioxide, dry powder or foam extinguishing agent are preferred medium. But they may not work to the burning module until the combustion module will be completely burned out. LITH-X (powdered graphite) or copper powder extinguisher, sand, dried, pulverized dolomite or soda ash can also be used, and these materials can be used as a smothering agent.
Extinguishing Note: transfer people to a safe area in the upwind air, wear respirators, protective gloves and fire fighting clothing. If large amounts are inhaled, give emergency medical treatment.

SECTION6- ACCIDENTAL RELEASE MEASURES

Emergency treatment: solid normally, NA.

SECTION7- HANDLING AND STORAGE

Handling Precautions Outline

1, In strict accordance with the requirements of the specification to install modules, and are not free to install, maintain.

2, Do not strongly illuminate module artificially(artificial sunlight is unavailable)

3, The system DC voltage exceeds 100V, operation must be done by specialized electrician.

4, It is potentially dangerous to contact a voltage of 30V or above.

5, Junction boxes, cables, brackets, etc. should be matched with modules during installation of electrical systems.

6, Installation of all accessories must follow safe working practices (other accessories must also comply with the security provisions of operation)

7, The installation should be in accordance with local, national and international standards.

8, Module installation should be operated by professionals.

Safe handling

1, Properly packed before installation of modules.

2, Do not directly holding the junction box to handle the modules

3, Not drop modules or obstacles fall on it.

4, Handle it gently, especially angular point.

5, Do not disassemble the modules and move any part of the modules or label after installation.

6, Do spray paint or stick other items on the back of the modules.

7, Do not drill on the glass and module border.

8, Do not place the module without bracket or not an unsafe place

9, The module cannot be used after glass is broken.

10. To operate with dry tool in the clean environment.

Install security

1, Do not allow the children to close during installation.

2, Module cannot be installed in high winds.

3, Appropriate Installation methods and safety equipment should be used in the installation site to prevent the falling of modules.

4, Do not touch the wire or connection port when the installation of the modules or the modules are exposed to the sunlight.

5, Do not wear metal jewelry during the installation.

6, Do not disconnect the line or unplug the connection plug when circuit is working.

Fire safety

1, Roof structures and installations that may affect the fire safety of the entire building, unreasonable installation will aggravate to the severity of the fire.

2, The modules should be installed on the fire isolation layer, in order to improve security

3, Module installation on the rooftop and ground should be the same, with insurance device and circuit fuse.

4, Do not install the modules near the storage equipment and place of flammable gas.

Electrical Installation

1, Avoid the risk of electric shock during installation, wiring, module operating.

2, The module of different specifications cannot used in the same array.

3, The open circuit voltage of module is less than the maximum voltage of standard system.

4, All of the modules no matter how much voltage should be grounding.

5, The cable is to be placed where the children and animals cannot touch.

6, Cables and junction boxes may overheat at high current.

7, Make sure junction box and wire can go through the short-circuit current.

8, Make sure the positive and negative polarity of the cable and terminal during connection.

9, Grounding line is provided.

Mechanical Installation

1, Fix the modules with the installation tools and special bracket to support modules

2, Make sure the module can still work carrying a certain load, which is not affected by the impact of the snow load or thermal expansion and contraction

3, Make sure that the modules can still work in the ambient temperature within the variable range of -40 to +80 F / -40 to 176 F

4, Off-grid power generation system installed in large areas of snow, require module position lower and bracket narrower

5, Providing install mounting holes for frame modules which can withstand a certain degree of mechanical strength.

6, All four position holes on the module are used for installation.

7, Be well-ventilated behind the module. (5 cm / 2 inch gap)

8, Be away from the other items behind the modules.

Storage:

Use wooden boxes (carton) packaging and store it in a cool, well-ventilated place, be away from heat and fire sources.

SECTION8-EXPOSURE CONTROLS/PERSONAL PROTECTION EQUIPMENT

Engineering Controls: NA

Eye protection: NA

Skin contact: NA under normal conditions, if the module is damaged, please wear appropriate protective gloves.

Clothing: NA under normal conditions, if the module is on fire and burst, please wear appropriate protective clothing.

Respirator: NA under normal conditions

SECTION9- PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Solid

Odor: None

Voltage: different specifications, different voltage

Weight: 19.5 kg

Solubility in water: insoluble in water

SECTION10- STABILITY AND REACTIVITY

Stability: Stable under normal storage and operating conditions.

Conditions to avoid: fire, high temperature, high humidity, salt spray

Substances to be avoided: strong oxidizing agents.

Hazardous decomposition products: fire conditions may produce hazardous decomposition products.

Hazardous Polymerization: No information available.

S

SECTION11- TOXICOLOGICAL INFORMATION

Acute poisoning: under normal conditions, the product will not cause any abnormal emergency injury

Irritation: None

SECTION12- ECOLOGICAL INFORMATION

Ecological toxicity: the proper use and disposal of the module will not cause harm to the environment. Disposal of waste modules, be away from the water, rain and snow.

SECTION13- DISPOSAL

Disposal: Should refer to national and local laws and regulations before disposal.

SECTION14- TRANSPORT INFORMATION

Dangerous Goods Code: No information

UN Number: information

Packing mark: no information

Packaging category: Z01

Packing method: No information available.

Transportation Note: Package should be complete before transportation, and loading should be safe. To ensure that the container does not leak, not fall, not damaged during transportation. Do not be together with oxidizing agents, alkalis, food chemicals. Goods should be anti-exposure, rain, anti-high temperature during transportation.

SECTION15- REGULATORY INFORMATION

Regulatory Information: Refer to local, domestic, EU / international regulations

SECTION16-OTHER INFORMATION

MSDS Preparation date: February 2017

JA SOLAR USA, TMG

Dielectric Fluids

Cargill®

Electrical Apparatus

R2000

Envirotemp™ FR3™ Fluid

DESCRIPTION

Envirotemp™ FR3™ fluid is a renewable, bio-based natural ester dielectric coolant for use in distribution and power class transformers where its unique fire safety, environmental, electrical, and chemical properties are advantageous. Acceptance limits for new fluid are shown in Table 1. More than 20 years of field experience (with over one million transformers in service) confirms excellent performance.

Envirotemp FR3 fluid is formulated from seed oils and performance enhancing additives. It does **not** contain petroleum, halogens, silicones or corrosive sulfur. It quickly and thoroughly biodegrades[1] in the environment. The fluid is non-toxic in acute aquatic[2] and oral toxicity tests[3]. The Color Green tint reflects its favorable environmental profile (See Table 2) and readily distinguishes it from petroleum based oils.

Envirotemp FR3 fluid has exceptionally high flash/fire points of approximately 330/360 °C - the highest ignition resistance of any high fire point dielectric fluid currently available. It qualifies as a "high-fire-point", "less-flammable", "IEC Class K", and "non-propagating" fluid. Envirotemp FR3 fluid is Approved[4] by FM Global and Classified[5] by Underwriters Laboratories as a Less-Flammable Dielectric Liquid for use in complying with the National Electric Code[6] (NEC) and insurance listing requirements[7].

Envirotemp FR3 fluid is compatible with standard transformer construction materials and components. Envirotemp FR3 fluid should be stored, handled, and processed in a similar meticulous manner as transformer mineral oil. See Cargill's Envirotemp FR3 Fluid Storage and Handling Guide, S10, for additional information.

A transformer filled with FR3 fluid complies with the transformer temperature operating range requirements defined in IEEE C57.12.00 and IEC 60076-1.

TABLE 1

Acceptable values for receipt of shipments of new FR3 fluid

	Standard test methods		ASTM D6871	IEC 62770
PROPERTY	**ASTM**	**ISO/IEC**	**As-received new fluid property requirements**	**Unused new fluid property requirements**
Physical				
Color	D1500	ISO 2211	≤1.0	
Flash Point PMCC (˚C)	D93	ISO 2719		≥250
Flash Point COC (˚C)	D92	ISO 2592	≥275	
Fire Point (˚C)	D92	ISO 2592	≥300	>300
Pour Point (˚C)	D97	ISO 3016	<-10	≤-10
Density at 20˚C (g/cm³)		ISO 3675		
Relative Density (Specific Gravity) 15˚C	D1298		≤0.96	≤0.96
Viscosity (mm²/sec)	D445	ISO 3104		
100 ˚C			≤15	≤15
40 ˚C			≤50	≤50
0 ˚C			≤500	
Visual Examination	D1524	IEC 61099 9.2	bright and clear	clear, free from sediment and suspended matter
Biodegradation		OECD 301	readily biodegradable	readily biodegradable
Electrical				
Dielectric Breakdown (kV)	D877		≥30	
Dielectric Breakdown (kV)				
1mm gap	D1816		≥20	
2mm gap	D1816		≥35	
2.5mm gap		IEC 60156		≥35
Gassing Tendency (mm/min)	D2300		≤0	
Dissipation Factor				
25˚C (%)	D924		≤0.20	
90˚C (tan δ)		IEC 60247		≤0.05
100˚C (%)	D924		≤4.0	
Chemical				
Corrosive Sulfur	D1275	IEC 62697	non-corrosive	non-corrosive
Water Content (mg/kg)	D1533	IEC 60814	≤200	≤200
Acid Number (mg KOH/g)	D974	IEC 62021.3	≤0.06	≤0.06
PCB Content (mg/kg)	D4059		not detectable	free from PCBs
Oxidation Stability (48 hrs, 120˚C)		IEC 61125C		
Total Acidity (mg KOH/g)		IEC 62621.3		≤0.6
Viscosity at 40°C (mm²/sec)		ISO 3104		≤ 30% increase over initial
Dissipation Factor at 90°C (tan δ)		IEC 60247		≤ 0.5

NOTE: Specifications should be written referencing only the defined ASTM or IEC industry standard acceptance values and test methods. The listed 'typical' values are average values summarized from a significant number of data points over many years; they are not to be identified as acceptance values.

ASTM D6871 Standard Specification for Natural (Vegetable Oil) Ester Fluids Used in Electrical Apparatus.
IEC 62770: Fluids for electrotechnical applications – Unused natural esters liquids for transformers and similar electrical equipment.

1 Per OPPTS 835.3110
2 Per OECD 203, Method B
3 Per OECD 420
4 Less-Flammable Transformer Fluids, Approval Guide – Electrical Equipment, FM Approvals, FM Global, Norwood, MA, USA
5 EOVK.MH10678, Transformer Fluids, UL Listed and Classified Products, Underwriters Laboratories, Northbrook, IL, USA
EOUV.MH10678, Dielectric Mediums, UL Listed and Classified Products, Underwriters Laboratories, Northbrook, IL, USA;
6 National Electrical Code, NFPA 70, National Fire Protection Association, Quincy, MA, USA
7 Transformers, 5-4, Property Loss Prevention Sheets, FM Global, Norwood, MA, USA

The information presented herein is believed to be true and accurate. However, all statements, recommendations and suggestions are made without guarantee, express or implied, and are subject to change without notice. WE DISCLAIM ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE and FREEDOM FROM INFRINGEMENT and disclaim all liability in connection with the use of the products or information contained herein. All such risks are assumed by the equipment manufacturer/user and the final determination of suitability of each use application is the responsibility of the equipment manufacturer/user. Products may present unknown hazards and should be used with caution. Although certain hazards are described herein, we do not guarantee that these are the only hazards that exist.

In addition to new distribution and power class transformers, a variety of other equipment, including voltage regulators, sectionalizing switches, transformer rectifiers, and electromagnets use Envirotemp FR3 fluid. The fluid is also used in retrofill applications for transformers and other fluid-filled distribution and power equipment.

ENVIRONMENTAL AND HEALTH

Envirotemp FR3 fluid is specifically formulated to help minimize health and environmental risks. The base oils come from renewable resources - commodity seeds - and are recyclable and reusable.

The US and California Environmental Protection Agencies published Envirotemp FR3 fluid's Environmental Technology Verification Report in 2003. The verification process includes biodegradation and toxicity testing. Results from the aquatic biodegradation test confirm that Envirotemp FR3 fluid's rate of biodegradation is the same as that of the standard reference material. Envirotemp FR3 fluid meets the "ultimately biodegradable" criteria (Figure 1). When tested for acute oral toxicity, Envirotemp FR3 fluid is not toxic.

The Edible Oil Regulatory Reform Act (US Public Law 104-55, 1995) makes Envirotemp FR3 fluid eligible for current and future regulatory relief. The options of alternative spill response procedures, such as bio-based remediation, are now available. The fluid's inherent viscosity and tendency of thin layers to polymerize help prevent migration along the surface and into subsurface soils.

The EPA, Occupational Safety & Health Administration (OSHA), and the Department of Transportation (DOT) do not list Envirotemp FR3 fluid as hazardous. Its Hazardous Material Information System (HMIS) rating is 1 for both health and reactivity. Envirotemp FR3 fluid is not classified as bio-accumulating or mutagenic. It is not listed as a carcinogen by National Toxicology Program (NTP), in International Agency for Research on Cancer (IARC) monographs, or by OSHA Regulation. The products of complete combustion of Envirotemp FR3 fluid are essentially carbon dioxide and water.

TABLE 2
Envirotemp™ FR3™ fluid's Environmental Attributes

Attribute	Results	Method
Aquatic Biodegradation [%]	>99	EPA OPPTS 835.3100
Ready Biodegradation [%]	>99	EPA OPPTS 835.3110
Acute Aquatic Toxicity	Non-toxic	OECD 203
Acute Oral Toxicity	Non-toxic	OECD 420
Biobased Material Content	>95%	USDA Biopreferred Program
Total Life Cycle Carbon Footprint	Carbon Neutral	Department of Commerce NIST BEES V4.0
Overall Environmental impact	1/4th impact of mineral oil	Department of Commerce NIST BEES V4.0

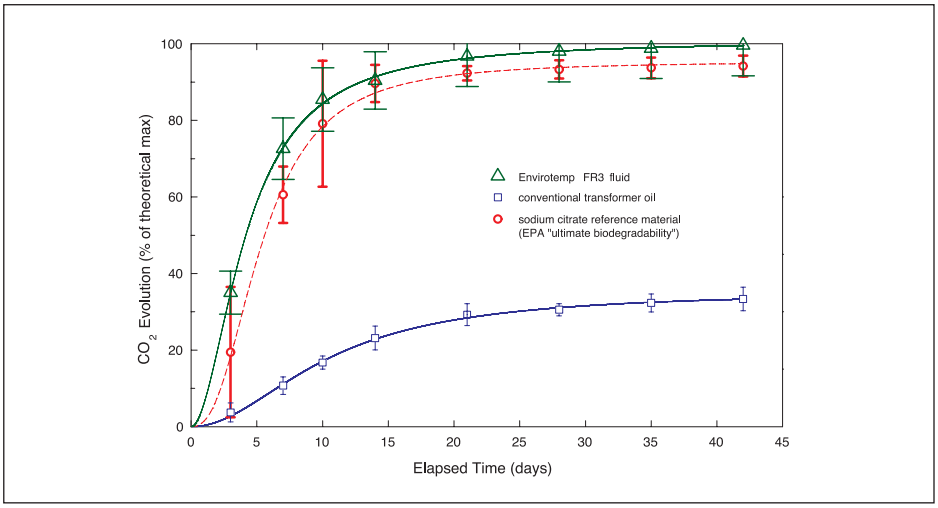


Figure 1.
Aerobic Aquatic Biodegradation Graph EPA Test OPPTS 835.3100

TABLE 3
Greenhouse gases[a] attributed to transformer fluid for its complete life cycle.

	Grams Per Unit[b]		Tons Per 1000 Gallons	
Catagory	Mineral Oil	Envirotemp FR3 Fluid	Mineral Oil	Envirotemp FR3 Fluid
Raw Materials	1,048,184	-381,590	2.306	-0.839
Manufacturing	544,363	160,212	1.198	0.352
Transportation	122,478	71,498	0.269	0.157
Use	154,124	153,450	0.339	0.338
End of Life	30,825	30,690	0.068	0.068
Total	1,899,973	34,260	4.180	0.075

a carbon dioxide equivalents
b In BEES 4.0e, one unit is a 1000 kVA transformer containing 500 gallons of fluid

SUSTAINABILITY

Building for Environmental and Economic Sustainability (BEES) software[8], available from the National Institute of Standards and Technology, uses a life-cycle assessment approach, analyzing raw material acquisition, manufacture, transportation, installation, use, and recycling and waste management, to determine a product's global warming potential.

Table 3 shows the BEES amounts of greenhouse gas generated from raw materials through end of life for mineral oil and Envirotemp FR3 fluid. The cost of mineral oil, in terms of carbon

[8] BEES, Version 4.0e, Building and Fire Research Laboratory, National Institute of Standards and Technology, August 2007, http://www.bfrl.nist.gov/oae/software/bees/

emissions, is expensive. Meanwhile, Envirotemp FR3 fluid is relatively inexpensive, about 8.2 lb/gal less green house gas emitted to produce it. Additionally, the study reports that Envirotemp FR3 fluid's overall environmental performance impact score is 1/4th that reported for mineral oil (and that's without consideration for Envirotemp FR3 fluid's transformer insulation life extending properties). This cumulative score results from adding the impacts of water intake, smog, ozone depletion, indoor air, human health, habitat alteration, global warming, fossil fuel depletion, eutrophication, ecological toxicity, critical air pollutants, and acidification.

Envirotemp FR3 fluid, and transformers filled with Envirotemp FR3 fluid are listed in the US Federal BioPreferred℠ Products Program, making them readily identifiable as BioPreferred to all applicable Federal agencies. Envirotemp FR3 fluid is an excellent option for ISO 14000, Green Build, and other similar environmental programs that promote the use of alternative, environmentally preferable and sustainable materials and procedures.

FIRE SAFETY

Envirotemp FR3 fluid has a fire point of approximately 360°C, well above the minimum of 300°C required for high fire point fluid classifications. Its flash point (approximately 330°C) is higher than the fire point of most other ignition resistant dielectric fluids in use today (Figure 2).

In laboratory and full-scale ignition tests, Envirotemp FR3 fluid has demonstrated greater fire resistance than other dielectric fluid types. Based on large-scale arc ignition testing, FM Global concluded that the probability of a pool fire evolving from Envirotemp Envirotemp FR3 fluid was so low that a heat release rate need not be determined or considered for FM Global approval.

Based on large-scale arc ignition and hot metal ignition tests, FM Global recognizes Envirotemp FR3 fluid as an equivalent safeguard to space separation, fire barriers, and fire suppression systems for most installations.

FM Global recognizes Envirotemp FR3 fluid as a component of Approved transformers per FM Global Standard 3990. When used in transformers

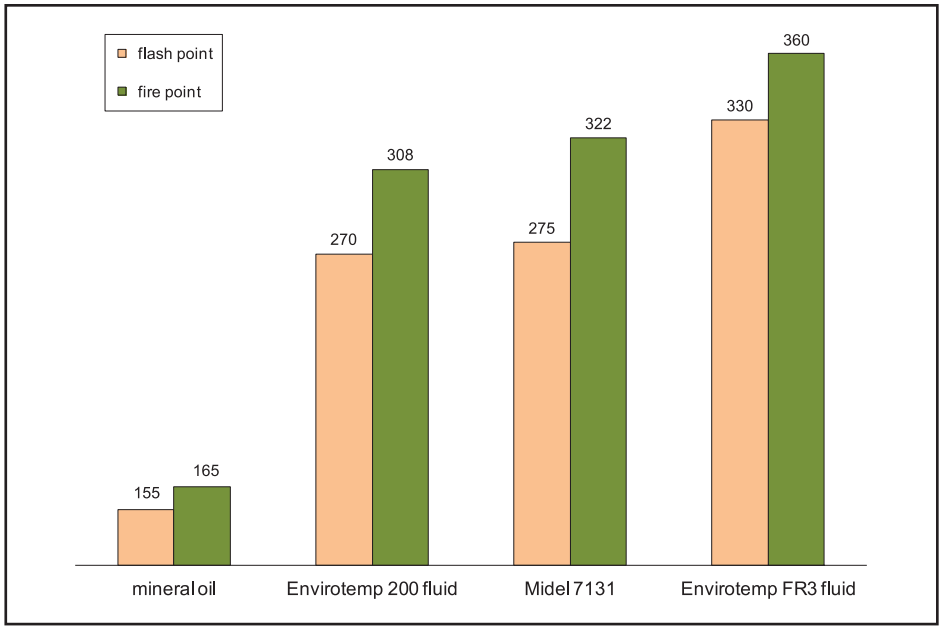


Figure 2.
Flash & Fire Point of Dielectric Fluids (°C).

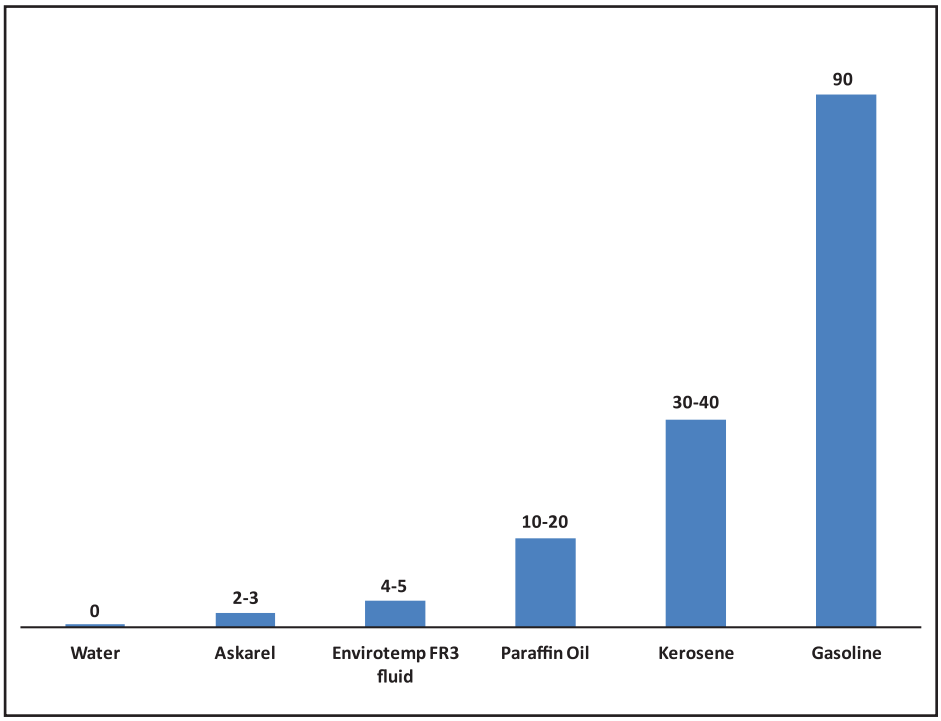


Figure 3.
Fire Hazard Rating UL Standard 340.

containing 10,000 gallons of fluid or less, transformers' separation distance to buildings and other equipment may be up to 1/10th the distance required for mineral oil filled transformers, without fire walls or deluge systems.

OSHA recognizes this FM Global standard as fitting the definition of a Listed and Labeled Product per NEC Section 110-3(b). The standard permits Envirotemp FR3 fluid-filled transformers to be installed indoors, typically without sprinklers or vaults, with a minimum clearance to walls of just 3 feet (0.9M).

UL Standard 340 compares the fire hazard ratings of various fluids. Figure 3 shows the favorable rating assigned to Envirotemp FR3 fluid.

TABLE 4
Transformer Insulating Paper End-of-Life (Hours)

End-of-Life Basis	150°C Mineral Oil	150°C Envirotemp FR3 Fluid	150°C IEEE Basis	170°C Mineral Oil	170°C Envirotemp FR3 Fluid	170°C IEEE Basis
Retained Tensile Strength						
50%	3100	>4000*	1602	240	1300	323
25%	4000	>4000*	3327	490	4000	671
Degree of Polymerization						
200	3200	>4000*	3697	480	3400	746

* Paper did not reach end-of-life over the duration of the test. To be conservative, extrapolation was not employed.

There are no known reports of dielectric pool fires involving Envirotemp FR3 fluid filled transformers.

MEETING THE CODES

Less-Flammable fluids are recognized as a fire safeguard in Section 15 of the National Electrical Safety Code (Accredited Standards Committee C2) for generation and distribution substations. Envirotemp FR3 fluid meets the National Electrical Code Section 450-23 requirements as a listed less-flammable liquid. It is covered by OSHA Article §1910.305, Section 5(v).

Envirotemp FR3 fluid is FM Global Approved and Underwriters Laboratories Classified "Less-Flammable" per NEC Article 450-23, fitting the definition of a Listed Product per NEC. For additional information, request Cargill's NEC Requirement Guidelines 2008 Code Options for the Installation of Listed Less-Flammable Liquid Filled Transformers.

FLUID/PAPER INSULATION SYSTEM

The unique chemical structure of Envirotemp FR3 fluid provides superior insulation system performance compared to other types of dielectric fluids. The thermal properties of Envirotemp FR3 fluid make it a more efficient coolant than higher molecular weight silicone and hydrocarbon dielectric coolants.

Envirotemp FR3 fluid has an exceptional ability to remove water generated by aging paper. This enables the fluid to significantly reduce the aging rate of transformer insulating paper. Per IEEE C57.100, accelerated aging tests show that Thermally Upgraded Paper (TUK) paper insulation aged in Envirotemp FR3 fluid takes 5-8 times longer to reach the same end-of-life points as TUK paper insulation aged in conventional mineral oil.

Table 4 compares the time to reach insulation end-of-life for TUK paper aged in Envirotemp FR3 fluid and conventional transformer oil. The time to insulation end-of-life calculated using the IEEE C57.91 loading guide is included for comparison. Accelerated aging tests show similar thermal aging improvement for non-thermally upgraded Kraft paper.

APPLICATIONS

NOTE: The suitability of each application of Envirotemp FR3 fluid is the responsibility of the user. Contact Cargill Envirotemp FR3 Fluids group for application guidelines.

New Transformers

Distribution and Power class transformers filled with Envirotemp FR3 fluid for indoor, submersible and outdoor applications are available from manufacturers worldwide.

For indoor applications, Envirotemp FR3 fluid-filled transformers provide the proven technical and performance advantages of liquid-filled designs over dry types as well as a lower total life cycle cost when compared to all other transformer types.

Many types of Envirotemp FR3 fluid-filled transformers are in service: pole-mounted, pad-mounted, networks, reactors, small, medium and large substations, transmission substations, and generator step-ups. Envirotemp FR3 fluid-filled transformers are accepted in both industry and government. Contact Cargill Envirotemp FR3 Fluids group for a copy of the Envirotemp FR3 Fluid User's List, Bulletin B110.

Retrofilling Transformers

Envirotemp FR3 fluid is especially suited for upgrading the environmental and fire safety of mineral oil-filled transformers. It is miscible with mineral oil, high molecular weight hydrocarbons and other ester fluids. FR3 fluid is not miscible with silicone and should not be applied in transformers previously containing silicone. FR3 fluid can also be used in PCB (Askarel) replacement initiatives.

Unlike most other fluid types, the residual transformer oil in a properly retrofilled transformer should not reduce the fire point of Envirotemp FR3 fluid below the NEC minimum of 300°C (Figure 4). This is true even after full equilibrium has been achieved between the replacement fluid and the residual mineral oil in the paper.

Additional advantages of retrofilling with Envirotemp FR3 fluid include high dielectric strength, better match of dielectric constant to Kraft paper insulation, excellent lubricity, material compatibility, and a coefficient of expansion similar to conventional transformer oil. Envirotemp FR3 fluid has superior resistance to coking and sludge formation when compared to conventional transformer oil. In addition to passing the Power Factor Valued Oxidation (PFVO) test, Doble Laboratories' Sludge-Free Life tests resulted in no measurable sludge. The fluid also acts as a drying agent for transformer insulation that has become wet from aging, extending the useful life of the transformer insulation system.

Switching Devices

With excellent dielectric strength retention (Figure 5), lubricity, and gassing tendencies, Envirotemp FR3 fluid is an excellent switching medium at normal operating temperatures. Proven applications include new and retrofilled sectionalizing switches and transformers with load break accessories such as Bay-O-Net and current-limiting fusing, on-off and four position switches, and Vacuum Fault Interruption protection devices.

[9] P.J. Hopkinson, L. Dix, "Tapchangers for De-energized Operation in Natural Ester Fluid, Mineral Oil, and Silicone" IEEE/PES Transmission & Distribution Conference & Exposition, July 26-30, 2009, Calgary Canada

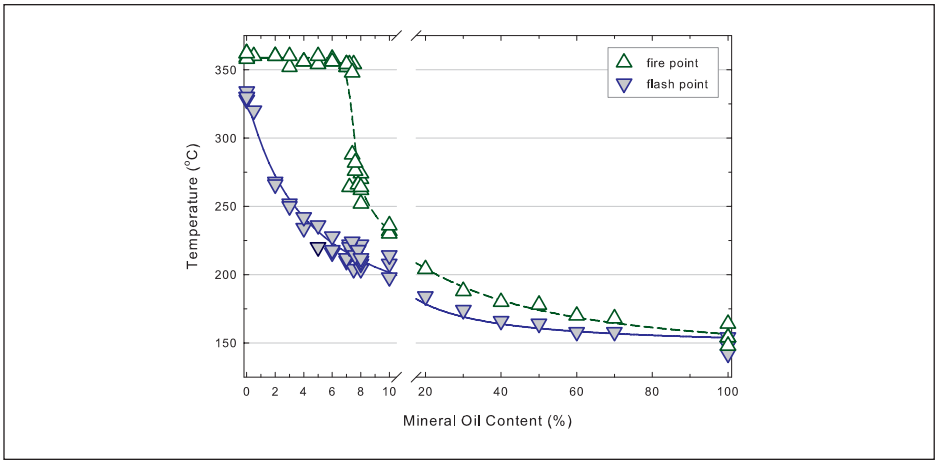


Figure 4.
Envirotemp™ FR3™ fluid Flash & Fire Point Variation with Conventional Transformer Oil Content.

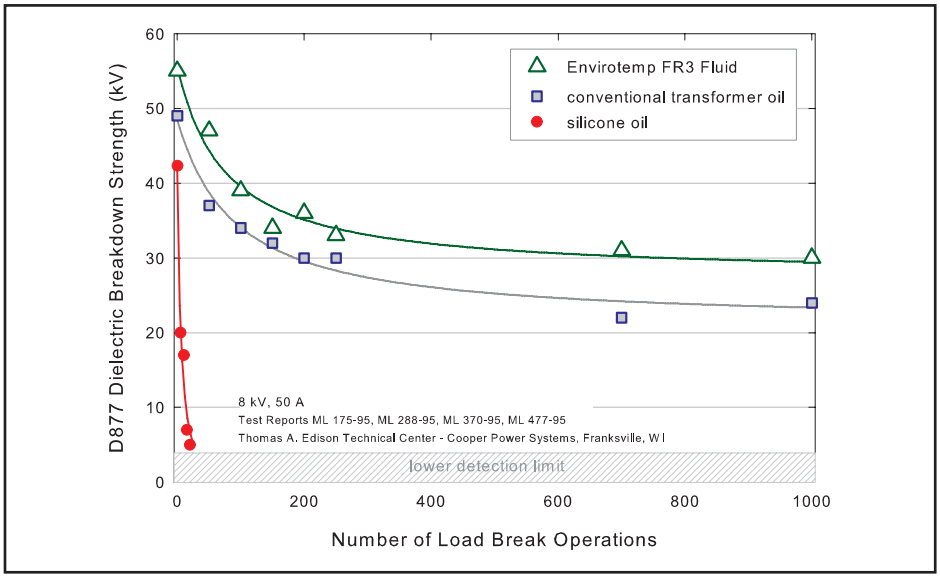


Figure 5.
Fluid loadbreak dielectric strength retention comparison.

Accelerated life tests confirm stationary contacts are most stable in Envirotemp FR3 fluid[9]. In coking tests, Envirotemp FR3 fluid produced less than 1/20th of the deposits that were produced in conventional mineral oil.

Due to the low temperature viscosity difference of Envirotemp FR3 fluid compared to conventional transformer oil, the equipment manufacturer should verify applications at low ambient temperatures.

Other Applications

The inherent safety and performance properties of Envirotemp FR3 fluid have led to its application in electrical equipment other than transformers, including industrial electromagnets, superconducting motors, klystron modulators, transformer/rectifier sets, and heat transfer applications. Envirotemp FR3 fluid has excellent lubricity, an important characteristic for application in equipment with moving parts. High voltage bushing applications also appear promising due to the fluid's excellent ability to minimize insulating paper degradation and its low gassing tendency value of approximately -79 µl/min.

STORAGE AND HANDLING

Similar meticulous procedures for storing and handling conventional transformer mineral oil should be followed with Envirotemp FR3 fluid. To help maintain the extremely low percent moisture saturation at time of fluid manufacture, exposure time to air should be minimized. Drum and tote storage should be indoors or outdoors protected from the elements, including sunlight. Refer to the Cargill Envirotemp FR3 Fluid Storage and Handling Guide S10.

Note: To maintain the optimal fluid properties for its intended use as an electrical insulating fluid, exposure to oxygen, moisture, and other contaminants must be minimized. Except for short storage periods, material that has been immersed in Envirotemp FR3 fluid should not be exposed to air. Thin films of natural esters tend to polymerize much faster than conventional transformer oil. For equipment drained of Envirotemp FR3 fluid, it is recommended that the equipment be placed in an inert gas environment, be re-immersed in fluid, or rinsed with mineral oil. Where the transformer power factor is a concern, hot air drying is an unacceptable process for assemblies already impregnated with a natural ester fluid. For impregnated assemblies that require additional drying, a method of drying that does not expose the impregnated insulation to air is required to avoid excessive oxidation of the dielectric fluid.

FLUID MAINTENANCE

Periodic preventive maintenance tests for Envirotemp FR3 fluid-filled equipment should follow the same schedule used for transformers filled with conventional transformer oil. Key tests on fluid samples include:

1. Dielectric Strength: The IEEE C57.147 minimum acceptable ASTM D1816, 2mm gap limits for continued use of service-aged Envirotemp FR3 fluid are 40 kV (≤ 69 kV), 47 kV (69 ≤ kV < 230), and 50 kV (≥ 230 kV).
2. Flash Point and Fire Point. Small amounts of mineral oil will not significantly reduce the fire point of Envirotemp FR3 fluid. Contamination above 7% may lower the fire point below 300°C. If contamination is suspected, the flash and fire points should be measured.



Figure 6.
Prior to shipment, Envirotemp™ FR3™ fluid undergoes extensive quality assurance testing. The facility where Envirotemp FR3 fluid is produced is ISO 9001 Certified.

3. Dissolved gas analysis of Envirotemp FR3 fluid is particularly useful for high value equipment or equipment servicing critical loads.
4. Color and appearance, dissipation factor, acid number, resistivity, viscosity, and interfacial tension are indicators of possible fluid contamination or unusual degradation.

For fluid that cannot be reconditioned, disposal options include selling to lube oil recyclers, rendering companies, or providers of fuel for industrial boilers and furnaces. Used fluid uncontaminated by controlled hazardous materials does not fall under the jurisdiction of the Federal Used Oil Regulation (CFR Title 40 Part 279).

FUNCTIONAL SPECIFICATION FOR NEW ENVIROTEMP FR3 NATURAL ESTER LESS-FLAMMABLE TRANSFORMER DIELECTRIC COOLANT

1.0 Scope

1.1. This specification describes a non-toxic (in acute aquatic[10], and oral toxicity[11] tests), biodegradable[12], fire resistant, bio-based[13] natural ester dielectric fluid. It is intended for use in electrical equipment as an environmentally preferred, less-flammable insulating and cooling medium.

2.0 Requirements

2.1 Fluid Manufacturer

Fluid manufacturer shall have a minimum of ten (10) years experience producing and testing dielectric coolants. Manufacturer upon request shall provide AC withstand and impulse withstand for both gap and creep from 3mm to 150mm.

2.2 Dielectric Coolant

The dielectric coolant shall be a biobased biodegradable, be FM Global Approved, UL® Classified as a less-flammable fluid. It shall meet the property limits listed below. The base fluid shall be 100% derived from seed oils.

2.3 Acceptable values for receipt of shipments of new Enviotemp FR3 fluid are shown in Table 1

2.4 Environmental and Health Third Party Validations

The fluid shall have a US EPA Environmental Technology Verification (ETV) Statement published. The fluid shall meet the test limits shown in Table 2

2.5 Packaging

The electrical insulating fluid shall be furnished in sealed vessels suitable for the purpose, including 5-gallon containers, 55-gallon drums, 330-gallon totes, or in bulk. Each vessel shall have tampering indicating devices.

3.0 Recommended Customer Receiving Quality Control

3.1 Inspection

Each lot received shall be visibly inspected for container integrity. Verify that tamper proof seals are intact and no leaks are visible.

3.2 Receiving Tests

Samples shall be taken from containers per ASTM D 923 Section 2.2, as follows:

Lot Size (gallons)	Number of Containers Sampled
600 or less	1
601 - 3000	2-6
3001 or more	6 minimum (10% of quantity of containers recommended)

When material will be combined for production, samples may be mixed together in equal proportions to create a composite sample for testing. Minimum tests required are dielectric strength and visual inspection. Dissipation factor test is highly recommended, although not essential.

4.0 Important information

4.1 Storage

Avoid storing drums and totes outdoors. Extreme temperature variations can stress the integrity of container protective seals. Exposure of totes to sunlight can cause fluid discoloration

4.2 Intended Use

The use of electrical insulating and cooling fluid is generally dictated by the engineering design of the electrical apparatus. The electrical insulating fluid covered by this specification is intended for use as an insulating and cooling medium in electrical equipment.

[10] Per OECD 203, Method B
[11] Per OECD 420
[12] Per US EPA OPPTS 835.3100 and US EPA OPPTS 835.8110 (ii)
[13] Per USDA Biopreferred minimum biobased content for Fluid-Filled Transformers - Vegetable Oil-Based

4.3 Fluid Transfer

When transferring electrical insulating fluid from its original container, take care to prevent contamination with moisture, dust, and foreign matter. These impurities can cause deterioration of the dielectric strength and electrical performance.

4.4 Partial Containers

Provide nitrogen blanket for partially filled containers, and properly seal to prevent contamination.

© 2016 Cargill Incorporated

Envirotemp™, FR3™ are trademarks of Cargill Incorporated.
IEEE Standard C57.104-2008, IEEE Standard C57.91-2011, IEEE Standard C57.147-2008, IEEE Standard C57.154-2012, 2017 National Electrical Safety Code (NESC), IEEE C2-2017, IEC 62770:2013, IEC 60076-14:2013 are trademarks of the Institute of Electrical and Electronics Engineers, Inc., and the International Electrotechnical Commission.
UL® is a registered trademark of the Underwriters Laboratories Inc.
NEC® is a registered trademark of the National Electrical Code.
ANSI® is a registered trademark of the American National Standards Institute
FM Global® is a registered trademark of Factory Mutual Insurance Company
BioPreferred℠ is a service mark of the The United States Department of Agriculture

Cargill Industrial Specialties
P.O. Box 5700, MS 66
Minneapolis, MN 55440-5700
1-800-842-3631
envirotempfluids.com

Solar PV Recycling Identified as Untapped Business Opportunity

June 27, 2016

A new report, *End-of-Life Management: Solar Photovoltaic Panels (http://www.iea-pvps.org/index.php?id=357)*, highlights that recycling or repurposing solar PV panels at the end of their roughly 30-year lifetime can unlock a large stock of raw materials and other valuable components.

The report, co-authored by NREL, the International Renewable Energy Agency (IRENA) and the International Energy Agency's Photovoltaic Power Systems Programme (IEA-PVPS), is the first time projections of PV panel waste volumes have been made to 2050.

"The technical potential of materials recovered from end-of-life solar PV panels could exceed $15 billion by 2050," said NREL Analyst Garvin Heath and co-author of the report. "Enabling policy frameworks and technology R&D are needed to address the challenge and will entail long lead times. Lessons learned that are summarized in this report can help guide the future effort. Supporting data collection and analysis are critical to providing information and insights necessary for strategic investments and effective, efficient and affordable end of life management strategies."

The global solar photovoltaic (PV) boom currently underway could represent a significant untapped business opportunity as decommissioned solar panels enter the waste stream in the years ahead.

The report estimates that PV panel waste, comprised mostly of glass, could total 78 million tons globally by 2050. If fully injected back into the economy, the value of the recovered material could exceed $15 billion by 2050. This potential material influx could produce 2 billion new panels or be sold into global commodity markets, thus increasing the security of future PV supply or other raw material-dependent products.

The report suggests that addressing growing solar PV waste, and spurring the establishment of an industry to handle it, would require: the adoption of effective, PV-specific waste regulation; the expansion of existing waste management infrastructure to include end-of-life treatment of PV panels; and the promotion of ongoing innovation in panel waste management.

Heath, who leads the IEA-PVPS group, says the group is preparing an additional publication that reviews global public- and private-sector trends in the technology development of PV module recycling.

April 18, 2018

Mr. Matt Asselmeier
Kendall County Planning, Building & Zoning
111 West Fox Street
Yorkville, IL 60560-1498

Subject: Borrego Solar Systems, Inc.
Kendall County (WBK Project No. 16-0100.S)

Dear Mr. Asselmeier:
WBK Engineering has reviewed the stormwater submittal and site plans for the subject project. We received the following information:

- Stormwater Management Narrative prepared by Greenberg Farrow dated April 11, 2018 and received April 16, 2018.

- Site Use Plans prepared by Greenberg Farrow dated April 12, 2018 and received April 16, 2018.

The following comments are offered for the petitioner's consideration and require resolution prior to our recommendation for final approval.

Stormwater Narrative

1. The CN values for existing conditions appear to be overstated based on potential crop type. Since we don't know the crop type assume the most conservative value; CN of 85. Similarly, the proposed CN value appears to be understated based on vegetation. Consider using a CN of 84. The end result will most likely not change relative to improvements but the report will more accurately state the proposed conditions will not significantly change the existing conditions.

2. Provide a plans, exhibits or narrative that generally describe the solar panel size, rotation, post size, material, installation, configuration and total number of posts anticipated.

3. A field tile survey that indicates size and depth of existing field tile.

4. Identify the presence of any depressional storage and documentation of wetlands within the project limits. Describe buffer requirements.

5. Provide a description of facility decommissioning.

WBK Engineering, LLC
WBKEngineering.com
Part of the Mno-Bmadsen Family

St. Charles Office
116 West Main Street, Suite 201
St. Charles, IL 60174
630.443.7755

Aurora Office
8 East Galena Boulevard, Suite 402
Aurora, IL 60506
630.701.2245

6. Provide a description of any vegetation prep prior to placement of the solar panels (i.e. tilling, herbicide, etc.)

Site Use Plans

1. The landscape plan identifies a 100 foot buffer. Please clarify the required and proposed buffers.

The applicant's design professionals are responsible for performing and checking all design computations, dimensions, details, and specifications in accordance with all applicable codes and regulations, and obtaining all permits necessary to complete this work. In no way does this review relieve applicant's design professionals of their duties to comply with the law and any applicable codes and regulations, nor does it relieve the Contractors in any way from their sole responsibility for the quality and workmanship of the work and for strict compliance with the permitted plans and specifications.

If you have any questions or comments, please contact us at (630) 443-7755.

Sincerely,

Greg Chismark, P.E.
Municipal Practice Principal
WBK Engineering LLC

Attachment 15- Road In



Attachment 16
Property to North



Attachment 17 Looking West



Attachment 18 Looking Southwest



Attachment 19 Looking Southeast




Attachment 20 Looking East

DEPARTMENT OF PLANNING, BUILDING & ZONING
111 West Fox Street • Room 203
Yorkville, IL • 60560
(630) 553-4141 Fax (630) 553-4179

Petition 18-16
Lawrence Slattery on Behalf of R.Y. Management Corp. (Owner) and Jorge Ramirez a/k/a Rancho La Purisima Corp. (Prospective Buyer)
A-1 Special Use – Banquet Facility

INTRODUCTION
Jorge Ramirez currently rents the subject property from the Owner. Mr. Ramirez would like to establish at banquet facility at the subject property.

SITE INFORMATION

PETITIONER	Lawrence Slattery on Behalf of R.Y. Management Corp. and Jorge Ramirez a/k/a Rancho La Purisima Corp.
ADDRESS	8218 Route 30
LOCATION	South Side of Route 30; Approximately 0.20 Miles East of Dickson Road



TOWNSHIP	Bristol
PARCEL #	02-03-200-001
LOT SIZE	5 Acres
EXITING LAND USE	Agricultural/Single Family Residential

ZONING A-1 Agricultural District

LRMP

Land Use	Suburban Residential
Roads	Route 30 is a State Highway and is Classified as a Major Collector Road
Trails	None
Floodplain/ Wetlands	None

REQUESTED ACTION A-1 Special Use to Operate a Banquet Facility.

APPLICABLE REGULATIONS Section 7.01 D.10 – A-1 Special Uses – Permits Banquet Facilities to be Located in the A-1 District with Approval of a Special Use Provided that the Facility Meets Certain Criteria

Section 13.08 – Special Use Procedures

SURROUNDING LAND USE

Location	Adjacent Land Use	Adjacent Zoning	Land Resource Management Plan	Zoning within ½ Mile
North	Single-Family Residential and Condos	A-1	Single-Family and Single-Family Attached	R-3 PUD and R-5B PUD (Montgomery) F (Kane County)
South	Agricultural	A-1	Suburban Residential	A-1 (County) R-2 PUD (Montgomery)
East	Agricultural	A-1	Suburban Residential	A-1 (County) B-2 PUD, R-4 PUD, and R-5B PUD (Montgomery)
West	Agricultural	A-1	Suburban Residential	A-1 (County)

PHYSICAL DATA

ENDANGERED SPECIES REPORT

EcoCat submitted April 11, 2018; required prior to Kendall County Regional Planning Commission meeting.

NATURAL RESOURCES INVENTORY

NRI application submitted on April 16, 2018.

ACTION SUMMARY

BRISTOL TOWNSHIP

Bristol Township was emailed information on April 24, 2018.

VILLAGE OF MONTGOMERY

The Village of Montgomery was emailed information on April 24, 2018.

GENERAL
Lawrence Slattery currently owns the subject property and leases the property to Jorge Ramirez. Mr. Ramirez is requesting an A-1 Special Use to operate a banquet facility at the subject property under the business name Rancho La Purisima. Mr. Slattery's approval of Mr. Ramirez's request can be found on Pages 2-4 of Attachment 1. Mr. Ramirez would purchase the property from Mr. Slattery. The incorporation papers for Mr. Ramirez's business can be found on Page 7 of Attachment 1.

This type of use is permitted as a special use on an A-1 property with certain conditions. Those conditions include:

a. The facility shall have direct access to a road designated as an arterial roadway or major collector road as identified in the Land Resource Management Plan.

b. The subject parcel must be a minimum of 5 acres.

c. The use of this property shall be in compliance with all applicable ordinances. The banquet facility shall conform to the regulations of the Kendall County Health Department and the Kendall County Liquor Control Ordinance. (Ord. 99-34)

d. Off-street parking, lighting and landscaping shall be provided in accordance with the provisions of Section 11 of the zoning ordinance.

e. All signage shall comply with the provisions of Section 12 of the Kendall County Zoning Ordinance.

f. Retail sales are permitted as long as the retail sales will be ancillary to the main operation.

g. The noise regulations are as follows:

   Day Hours: No person shall cause or allow the emission of sound during daytime hours (7:00 A.M. to 10:00 P.M.) from any noise source to any receiving residential land which exceeds sixty five (65) dBA when measured at any point within such receiving residential land, provided; however, that point of measurement shall be on the property line of the complainant.

   Night Hours: No person shall cause or allow the emission of sound during nighttime hours (10:00 P.M. to 7:00 A.M.) from any noise source to any receiving residential land which exceeds fifty five (55) dBA when measured at any point within such receiving residential land provided; however, that point of measurement shall be on the property line of the complainant.

   EXEMPTION: Powered Equipment: Powered equipment, such as lawn mowers, small lawn and garden tools, riding tractors, and snow removal equipment which is necessary for the maintenance of property is exempted from the noise regulations between the hours of seven o'clock (7:00) A.M. and ten o'clock (10:00) P.M.

BUSINESS OPERATION
Mr. Ramirez's business plan is included as Attachment 2. Per the business plan, the banquet facility would operate inside the existing red barn located on the property. The outside and inside elevations of the barn are included as Attachments 7 and 8. The kitchen and restrooms would be located on the northeast side of the first floor of the barn. The dining and dancing area would be located on the south half of the first floor of the barn. A chapel or additional meeting space would be located on the northeast corner of the second floor of the barn. Mr. Ramirez indicated that the capacity for the first floor areas was two hundred fifty (250) people and the maximum capacity for the second floor area was one hundred fifty (150) people. **These capacity number have not been verified by a fire or building official.** Mr. Ramirez does not have any plans to use both space at the same time. The maximum number of guests at the property would be two hundred fifty (250). The barn is approximately eight thousand, three hundred (8,300) square feet in size.

The facility would be operational from May 1st through October 31st. The proposed hours of operation are Fridays from 3:00 p.m. until 11:30 p.m., Saturdays from Noon until 11:30 p.m., and Sundays from Noon until 9:00 p.m. At a meeting with Staff on April 20th, Mr. Ramirez indicated that setup and takedown for events would occur during hours of operation. In addition, tours of the facility for prospective customers shall occur only during the hours of operation. Mr. Ramirez indicated that he did not want more than one (1) event at the property per weekend.

Mr. Ramirez plans to employ three (3) part-time employees and contract security services.

Patrons will bring their own food and drinks. No alcohol will be sold on the premises.

The banquet hall will be used for weddings, quinceaneras, birthdays, baptisms, and similar events.

Mr. Ramirez will live on the property and he has fourteen (14) years of experience as a banquet chef. He is in the framing business full-time and hopes to use the banquet facility for additional revenue.

BUILDING CODES
A Change of Occupancy Permit will be required for each existing structure or portion of each existing structure that will be used in conjunction with the proposed banquet facility.

ENVIRONMENTAL HEALTH
Mr. Ramirez submitted a soil study (See Attachment 6).

The well and septic systems for the house are located on the northwest side of the house. The proposed location for the well and septic system for the barn will be located on the northeast corner of the property.

While bathrooms are planned inside the existing barn, porta-potties will be need for some events.

PARKING
Mr. Ramirez submitted a parking plan showing eighty-one (81) parking spaces and four (4) handicapped parking spaces (See Attachment 5).

LIGHTING
Mr. Ramirez submitted a lighting plan as part of the parking lot survey (See Attachment 5). Five (5) individual light poles and one (1) pole with four (4) lights are planned for the parking area. In addition, several lights are already located on the existing red barn.

SIGNAGE
An illuminated sign is proposed inside the fence west of the trees and driveway. The sign will be approximately five feet, five inches (5'5") in height and approximately eight feet eight inches (8'8") in width.

The sign must meet the following criteria per the Kendall County Zoning Ordinance:

1. All signs shall be located a minimum of ten feet from the property line or ROW line (whichever is greater), provided the Planning, Building and Zoning Department may require a greater setback or other location, so that said sign will not obstruct the view along any highway, at any intersection, private driveway, field entrance, or other point of ingress or egress.

2. No sign shall be allowed to encroach upon the public right-of-way or public property.

3. Non-flashing Illuminated Signs, as follows: One wall or free-standing sign shall be permitted on each frontage. Hours of illumination shall be limited from 7:00a.m. to 11:00p.m. daily except that public safety facilities may be illuminated 24 hours a day.

LANDSCAPING
Mr. Ramirez provided a Landscaping Plan (See Attachment 5, Page 2). The plan calls for the planting of Northern White Cedar trees on the northeast, east, and most of the south side of the property. According to information provided to Staff, the trees would be approximately six feet (6') in height at the time of planting.

NOISE CONTROL
The barn would not be air conditioned. The doors and windows on the south and east sides would be open.

Mr. Ramirez agreed that no music would occur outdoors except processionals and recessionals at wedding ceremonies.

Mr. Ramirez indicated that he would be willing to install noise measuring and controlling devices to comply with the noise requirements.

ADDITIONAL OR MISSING INFORMATION
Before Staff makes a recommendation on the request, the following information is requested. The Petitioners' attorney was sent this request on April 20th:

1. A revised plat of survey or topographic survey showing a scale, north arrow, location map, name of the owner/developer, all existing structures on adjacent properties within 100' of the property line, and the present zoning classification and PINs for the subject property and all adjacent properties.

2. The Findings of Fact from the special use application.

The results of the EcoCat and NRI would also be needed before a final recommendation is offered.

ATTACHMENTS
1. Application
2. Business Plan
3. Aerial
4. Topographical and Plat of Survey
5. Site Plan, Landscaping Plan, and Parking Lot Plan
6. Soil Test
7. Outside Elevations
8. Inside Elevations
9. Front of Property
10. Driveway Looking South
11. Houses at Driveway Entrance
12. Houses North of Parking Area
13. Parking Area from Route 30
14. Parking Area Looking East
15. Parking Area Looking West
16. Parking Area Looking North
17. East Side of Barn
18. South Side of Barn
19. South and East Sides of Barn
20. North Side of Barn
21. Inside Upstairs Looking West
22. Inside Upstairs Looking East
23. Inside Downstairs South Side

1117 DOGLAS AVE AURORA I 1117 DOGLAS AVE AURORA IL 60505S

THE COUNTY OF KENDALL
FEBRUARY 19, 1841

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

APPLICATION

PROJECT NAME Rancho La Purisima **FILE #:**_____

NAME OF APPLICANT
Jorge Ramirez a/k/a Rancho La Purisima Corp

CURRENT LANDOWNER/NAME(s)
Lawrence Slattery, R.Y. Property Management Corp.

SITE INFORMATION

ACRES	SITE ADDRESS OR LOCATION	ASSESSOR'S ID NUMBER (PIN)
5	8218 Route 30, Bristol, IL 60512	02-03-200-001

EXISTING LAND USE	CURRENT ZONING	LAND CLASSIFICATION ON LRMP
AG/Farm	A1	Suburban Residential

REQUESTED ACTION (Check All That Apply):

X SPECIAL USE ___ MAP AMENDMENT (Rezone to ____) X VARIANCE

____ADMINISTRATIVE VARIANCE ___ A-1 CONDITIONAL USE for:_____ ___ SITE PLAN REVIEW

___ TEXT AMENDMENT ___ RPD (___Concept; ___ Preliminary; ___ Final) ___ ADMINISTRATIVE APPEAL

___ PRELIMINARY PLAT ___ FINAL PLAT ___ OTHER PLAT (Vacation, Dedication, etc.)

___AMENDMENT TO A SPECIAL USE (____Major; ____Minor)

[1]PRIMARY CONTACT	PRIMARY CONTACT MAILING ADDRESS	PRIMARY CONTACT EMAIL
Stuart A. Petersen	[redacted]	

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

[2]ENGINEER CONTACT	ENGINEER MAILING ADDRESS	ENGINEER EMAIL
Harold Beron	[redacted]	

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

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

I CERTIFY THAT THE INFORMATION AND EXHIBITS SUBMITTED ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND THAT I AM TO FILE THIS APPLICATION AND ACT ON BEHALF OF THE ABOVE SIGNATURES.

SIGNATURE OF APPLICANT [redacted] **DATE** 4-17-18

FEE PAID:$_____
CHECK #:_____

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

RUDDY, KING & PETERSEN

2631 Ginger Woods Parkway, Suite 101
Aurora, IL 60502-7429
Phone: (630) 820-0333
Fax: (630) 820-0594
Email: info@ruddyking.com
www.ruddyking.com

John C. Ruddy
Lincoln M. King
Stuart A. Petersen

April 17, 2018

Laurence Slattery

VIA Email at [redacted]

RE: Special use Permit/Zoning application for Jorge Ramirez and property known as 8218 Route 30, Bristol IL 60512.

Dear Mr. Slattery:

Per our discussion please execute below acknowledging your consent and authorization on behalf of yourself and the entity known as R.Y. Property Management, Corp. the owner of record for the property known as 8218 Route 30, Bristol Illinois and party to an Article of Agreement for Deed for the property with the Buyer known as Jorge Ramirez and recorded as a Memorandum of Agreement Kendall County Recorder document # 201600005721 that Attorney Stuart A. Petersen is authorized to place your/my signature on any Petition for Special use or any other required Petition or document required by Kendall County Illinois to allow Jorge Ramirez to apply for all required special use permits or zoning variances. Subject to the Articles for Agreement for Deed.

I, Laurence Slattery, individually and authorized agent for R.Y. Property Management Corp. hereby authorize Attorney Stuart A. Petersen to execute my signature on any Petition for Special Use or [redacted]tion for Kendall County Illinois as indicated hereinabove.

[redacted] Date 4/17/18

Laurence Slattery, Individually and as Authorized Agent for R.Y. Property Management Corp.

Thank you for your assistance in this matter.

[redacted]

201600005721

DEBBIE GILLETTE
KENDALL COUNTY, IL

RECORDED: 4/27/2016 8:40 AM
AGR: 49.00 RHSPS FEE: 10.00
PAGES: 3

Debbie Gillette

Kendall County Recorder
111 W Fox St.
Yorkville IL 60560

Recording Cover Page

This page added for the purposes of affixing Recording Information

- ○ **Deed** _____
- ○ **Lien** _____
- ☒ **Other** Agreement _____
- ○ **UCC**
- ○ **Plat**

Remarks:

Prepared by: NAME: The G.I.L Law Group
ADDRESS: 605 N. Broadway
Aurora IL 60505

RETURN TO: NAME: The G.I.L Law Group
ADDRESS: 605 N. Broadway
Aurora, IL 60505

MEMORANDUM OF AGREEMENT

This Memorandum of Agreement relates to an Articles of Agreement for Deed dated March 30, 2016 between R.Y. Property Management, Corp. (the "Buyer") and Lawrence and Kathleen Slattery (the "Sellers") under which the Buyer agreed to purchase from the Sellers, and the Sellers agreed to sell to the Buyer, according to the terms of the Articles of Agreement for Deed, the following property:

Common Address: 8218 Route 30, Bristol, Illinois 60512
Parcel Number: 02-03-200-001
Legal Description: Attached

For good and valuable consideration, the Sellers covenant and agree to convey to the Buyer the above referenced property under the provisions contained in the above mentioned unrecorded Articles of Agreement for Deed, which is incorporated into this memorandum by reference. The terms of said Agreement shall last through and including September 30, 2019, or until such date contained in any written extension thereof, agreed to and executed by all parties.

This memorandum is not intended to be a complete summary of the Articles of Agreement for Deed. Provisions in this Memorandum shall not be used for interpreting the said Articles of Agreement for Deed terms. In the event of a conflict between this Memorandum and unrecorded Articles of Agreement for Deed, the terms of the unrecorded Articles of Agreement for Deed shall control.

IN WITNESS WHEREOF, the parties have executed this memorandum this 30th day of March, 2016

[redacted]

SELLER Lawrence Slattery

[redacted]

SELLER Kathleen Slattery

by [redacted] atty-in-fact

Jorge Ramirez

BUYER

OFFICIAL SEAL
JENIFFER A SMUTZER
Notary Public - State of Illinois
My Commission Expires Feb 1, 2019

Sworn to and Subscribed to Before Me
This 30th day of March, 2016

[redacted]

NOTARY PUBLIC
My commission expires: 2-1-19


OFFICIAL SEAL
JENNIFER A SMUTZER
Notary Public - State of Illinois
My Commission Expires Feb 1, 2019

LEGAL DESCRIPTION

THAT PART OF THE NORTHEAST 1/4 OF SECTION 3, TOWNSHIP 37 NORTH, RANGE 7 EAST OF THE THIRD PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS: COMMENCING AT THE NORTHWEST CORNER OF SAID NORTHEAST 1/4; THENCE EASTERLY ALONG THE NORTH LINE OF SAID NORTHEAST 1/4, 1,119.50 FEET TO THE LINE OF A FENCE EXTENDED FROM THE SOUTH FOR THE POINTOF BEGINNING; THENCE SOUTHERLY ALONG SAID EXTENDED FENCE LINE WHICH FORMS AN ANGLE OF 91 DEGREES, 29 MINUTES, 13 SECONDS WITH THE CENTER LINE OF U.S. ROUTE NO. 30 (MEASURED FROM WEST TO SOUTH), 57.27 FEET TO THE SOUTHERLY RIGHT OF WAY LINE OF SAID ROUTE 30; THENCE SOUTHERLY ALONG THE LAST DESCRIBED COURSE , 305.85 FEET; THENCE EASTERLY ALONG A LINE WHICH FORMS AN ANGLE OF 91 DEGREES, 30 MINUTES, 0 SECONDS WITH THE LAST DESCRIBED COURSE, (MEASURED CLOCKWISE THEREFROM), 600.0 FEET; THENCE NORTHERLY ALONG A LINE WHICH FORMS AN AGGLE OF 88 DEGREES, 30 MIUTES, 0 SECONDS WITH THE LAST DESCRIBED COURSE, (MEASURED CLOCKWISE THEREFROM), 363.12 FEET TO SAID NORTH LINE; THENCE WESTERLY ALONG SAID NORTH LINE, 600.0 FEET TO THE POINT OF BEGINNING; IN THE TOWNSHIP OF BRISTOL, KENDALL COUNTY, ILLINOIS.

Commonly Known as: 8218 ROUTE 30 BRISTOL, IL 60512

TAX ID #: 02-03-200-001

Prepared By: The Gil Law Group
605 N. Broadway
Aurora, Illinois 60505

Return To: Law Office of Richard C. Claahsen
215 Hillcrest Ave. Suite C
Yorkville, IL 60560

FORM **BCA 2.10**
ARTICLES OF INCORPORATION
Business Corporation Act

Filing Fee: $150
Franchise Tax: $ 25
Total: $175

File #: **71797856**

Approved By: JXR

FILED
APR 17 2018
Jesse White
Secretary of State

1. Corporate Name: RANCHO LA PURISIMA, CORP.

2. Initial Registered Agent: ATTORNEY STUART A. PETERSEN
(First Name / Middle Initial / Last Name)

Initial Registered Office: 2631 GINGER WOODS PKWY STE 101
(Number / Street / Suite No.)

AURORA (City) IL 60502-7429 (ZIP Code) KANE (County)

3. Purposes for which the Corporation is Organized:
The transaction of any or all lawful businesses for which corporations may be incorporated under the Illinois Business Corporation Act.

4. Authorized Shares, Issued Shares and Consideration Received:

Class	Number of Shares Authorized	Number of Shares Proposed to be Issued	Consideration to be Received Therefor
COMMON	10000	1000	$ 1000

NAME & ADDRESS OF INCORPORATOR

5. The undersigned incorporator hereby declares, under penalties of perjury, that the statements made in the foregoing Articles of Incorporation are true.

Dated APRIL 17 (Month & Day), 2018 (Year) 8218 ROUTE 30 (Street)

JORGE RAMIREZ (Name) BRISTOL (City/Town) IL (State) 60512 (ZIP Code)

This document was generated electronically at www.cyberdriveillinois.com

KENDALL COUNTY
DISCLOSURE OF BENEFICIARIES FORM

1. Applicant JORGE RAMIREZ a/k/a RANCHO LA PURISIMA CORO.

   Address 8218 Route 30

   City Bristol State IL Zip 60560

2. Nature of Benefit Sought Special Use Permit banquet hall liqour license

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

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

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

NAME	ADDRESS	INTEREST
JORGE RAMIREZ	8218 ROUTE 30 BRISTOL IL	100%

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

   JORGE RAMIREZ INDIVIDUALLY AND AUTHRIZED AGET OF CORPOTRATION

VERIFICATION

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

Subscribed and sworn to before me this 17th day of April, A.D. 2018

(seal)

LINCOLN M KING
Official Seal
Notary Public - State of Illinois
My Commission Expires Mar 3, 2020

[redacted]
Notary Public

Kendall County Soil & Water Conservation District

7775A Route 47, Yorkville, Illinois 60560 • (630)553-5821 extension 3

www.kendallswcd.org

NATURAL RESOURCE INFORMATION (NRI) REPORT APPLICATION

Petitioner: Jorge Ramirez Contact Person: Attorney Stewart Peterson

Address: [redacted]

City, State, Zi[redacted]

Phone Numb[redacted]

Email: [redacted]

Please select: How would you like to receive a copy of the NRI Report? ☑ Email ☑ Mail

Site Location & Proposed Use

Township Name Bristol Township 37 N, Range 7 E, Section(s) _____

Parcel Index Number(s) 07-03-200-001

Project or Subdivision Name Banquet Hall Number of Acres 5

Current Use of Site Farmette Proposed Use Banquet Hall Event Barn

Proposed Number of Lots 1 No Subdivision Proposed Number of Structures _____

Proposed Water Supply well Proposed type of Wastewater Treatment Septic/Portable Bathrooms

Proposed type of Storm Water Management _____

Type of Request

☐ Change in Zoning from _____ to _____

☐ Variance (Please describe fully on separate page)

☒ Special Use Permit (Please describe fully on separate page)

Name of County or Municipality the request is being filed with: Kendall County see attached letter to DOR for explanation

In addition to this completed application form, please including the following to ensure proper processing:

☒ **Plat of Survey/Site Plan** – showing location, legal description and property measurements

☒ **Concept Plan** - showing the locations of proposed lots, buildings, roads, stormwater detention, open areas, etc.

☒ If available: topography map, field tile map, copy of soil boring and/or wetland studies

☐ **NRI fee** (Please make checks payable to Kendall County SWCD)

The NRI fees, as of July 1, 2010, are as follows:

Full Report: $375.00 for five acres and under, plus $18.00 per acre for each additional acre or any fraction thereof over five.

Executive Summary Report: $300.00 (KCSWCD staff will determine when a summary or full report will be necessary.)

Fee for first five acres and under	$ 375.00
_____ Additional Acres at $18.00 each	$ _____
Total NRI Fee	$ _____

NOTE: Applications are due by the 1st of each month to be on that month's SWCD Board Meeting Agenda. Once a completed application is submitted, please allow 30 days for inspection, evaluation and processing of this report.

I (We) understand the filing of this application allows the authorized representative of the Kendall County Soil and Water Conservation District (SWCD) to visit and conduct an evaluation of the site described above. The completed NRI report expiration date will be 3 years after the date reported.

Jorge Ramirez. 4-16-18

Petitioner or Authorized Agent **Date**

This report will be issued on a nondiscriminatory basis without regard to race, color, religion, national origin, age, sex, handicap or marital status.

FOR OFFICE USE ONLY

NRI# 1803 Date initially rec'd 4/16/18 Date all rec'd _____ Board Meeting May 2018

Fee Due $_____ Fee Paid $ 375.00 Check #[redacted] Over/Under Payment _____ Refund Due_____

RUDDY, KING & PETERSEN
LAW GROUP, LLC

2631 Ginger Woods Parkway, Suite 101
Aurora, IL 60502-7429
Phone: (630) 820-0333
Fax: (630) 820-0594
Email: info@ruddyking.com
www.ruddyking.com

John C. Ruddy
Lincoln M. King
Stuart A. Petersen

April 11, 2018

IDNR

Division of Ecosystems and Environment

One Natural Resources Way

Springfield, IL. 62702

RE: 8218 Route 30 Bristol Illinois Endangered Species Consultation Report.

Dear IDNR:

Enclosed please find the request for an Illinois Endangered Species Consultation Report. I attached to the request a copy of a site plan along with a full survey of the property, which includes a full legal description. Note the framed barn on the property is being converted into a banquet hall and no buildings are being demolished on the property nor are any new buildings being erected. If you have any questions please contact my office.

[redacted]

Stuart A. Petersen

Endangered Species Consultation Agency Action Report

(Illinois Administrative Code Title 17 Part 1075)
Division of Ecosystems and Environment

Date 4-11-18

1. Indicate the government unit and type of action requiring consultation.

☒ Local Government ☐ State Agency

- ○ Authorization (a unit of state or local government must issue a permit or other authorization)
- ○ Funding (a unit of state or local government will provide a grant, loan, or other direct support)
- ○ Performance (a unit of state or local government is performing the action, such as construction)

Name of government unit Kendall County, Zoning Dept.
Government contact name Matt Asselmeier
Address 111 west Fox St., Yorkville IL. 60560
Phone 630-553-4141 Fax 630-553-4179

If local government, is it a county highway or local roads department? ☐ Yes ☒ No

2. Will the project receive technical assistance or funding from the state of Illinois? ☐ Yes ☒ No

If yes, indicate the state agency providing support N/A

Projects receiving state assistance (including federal funding through a state agency) must comply with the Interagency Wetland Policy Act. These projects will be reviewed for wetland impacts.

3. Applicant information

Applicant name Jorge Ramirez
Conta[redacted]
Addre[redacted]
Phone[redacted]

4. Project information and location *(a map showing the location of the proposed action is required)*

Project name Bristol Banquet Hall County Kendall
Address 8218 Rt. 30 Bristol IL.
City and zip Bristol IL 60560
Township/Range/Section (e.g., T45N,R9E,S2) T37N R7E section 3 Legal Attached to survey provided
(Projects cannot be reviewed without the TRS)

Project description Conversion of existing Framed Barn into Banquet Hall All Food and Beverages Brought in by Renters, No Buildings will be Demolished or any new Buildings will be erected, Survey and Building parking Plan Attached.

If this is a resubmittal, please provide previous IDNR Project Code _____

Mail completed form and map of project location to:
Illinois Department of Natural Resources
Division of Ecosystems and Environment
One Natural Resources Way
Springfield, IL 62702

IDNR Use Only
Project Code: _____

BUSINESS PLAN FOR OPERATIONS OF BANQUET FACILITY LOCATED AT 8218 ROUTE 30 BRISTOL ILLINOIS AND KNOWN AS "Rancho La Purisima and/or" La Purisima Farm"

Summary :

The General business to being proposed to operate at 8218 Rt. Bristol Illinois is a rental banquet facility in the main framed barn that exists on the property. The occupancy would be limited the number of parking spaces available which I propose as 77 including 3 handicap spaces and 1 space for every 3 occupants. The months of operation would by from May 1, through October 31 on a yearly basis. The facility would be available to rent Friday through Sunday. The facility is to be rented by other party's the" Renter" and no other services are being provided. The renter would be responsible for their own food and liquor. The Business is providing hosting services rental of the building only and does not provide food or alcohol. The business is seeking a special use permit to allow for the facility to be rented and the renter having the ability to bring in their own catered food and alcohol. No alcohol will be permitted to be sold on the property. The Business will cooperate with neighbor properties to address any concerns they may have relating to the operation of the facility.

The Purisima Farm Corp. is the entity to be formed to operate the business.

The business is to operate weekends in the summer only from May to October.

Hours and dates of operation:
Hours: Saturdays 12:00 p.m. at 11:30 p.m.
Hours: Sunday 12:00 p.m. at 9:00 p.m.
Hours: Friday 3:00 p.m. at 11:30 p.m.

Maximum capacity of people in the first floor: 250 people. We have two emergency exits in the lower room and lights in the parking lots.

Maximum capacity of people in the second floor: 150 people. We have two emergency exits in the Arriva room and lights in the parking lots.

But at no time would both rooms be occupied at the same time and cannot exceed the occupancy limit.

The following events are the type of events that will be allowed to rent the building: Weddings, Quinceaneras, Birthdays, Baptisms and only family events will be allowed.

Security

We plan on having a security guard for every 100 people inside the building. As well as another security guard outside to keep the flow of the cars under control in the to order the parking.

Noise Control

All of the music and entertainment will be inside the building and we will make sure that the music is not so loud to prevent from bothering the neighbors. The Landscaping is being designed to help reduce any noise from traveling outside the properties boundary.

Bathrooms

We are going to be using portable bathrooms until we are approved. After we get approved we are planning on installing enough stationary bathrooms to accommodate the number of personnel indicated. It has anticipated that eventually an onsite waste diposal sytem will be installed on the property.

Kitchen

We will have a small prep kitchen so that people can keep their food warm that the are bringing or catering in to event.

Parking

Parking plan has bee attached to the application which also indicates the proposed lighting.

Landscaping

A landscaping plan as been attached to the application which show the placemen of trees so as to help with noise and light traveling out side the property. Note the purposed lighting is designed as minimize the light from affecting others outside the property boundaries.

Attachment 3 Aerial



April 20, 2018

1:3,175

0 0.0275 0.055 0.11 mi

0 0.0425 0.085 0.17 km

Kendall County Illinois GIS

Agricultural

Agricultural-Building Permit

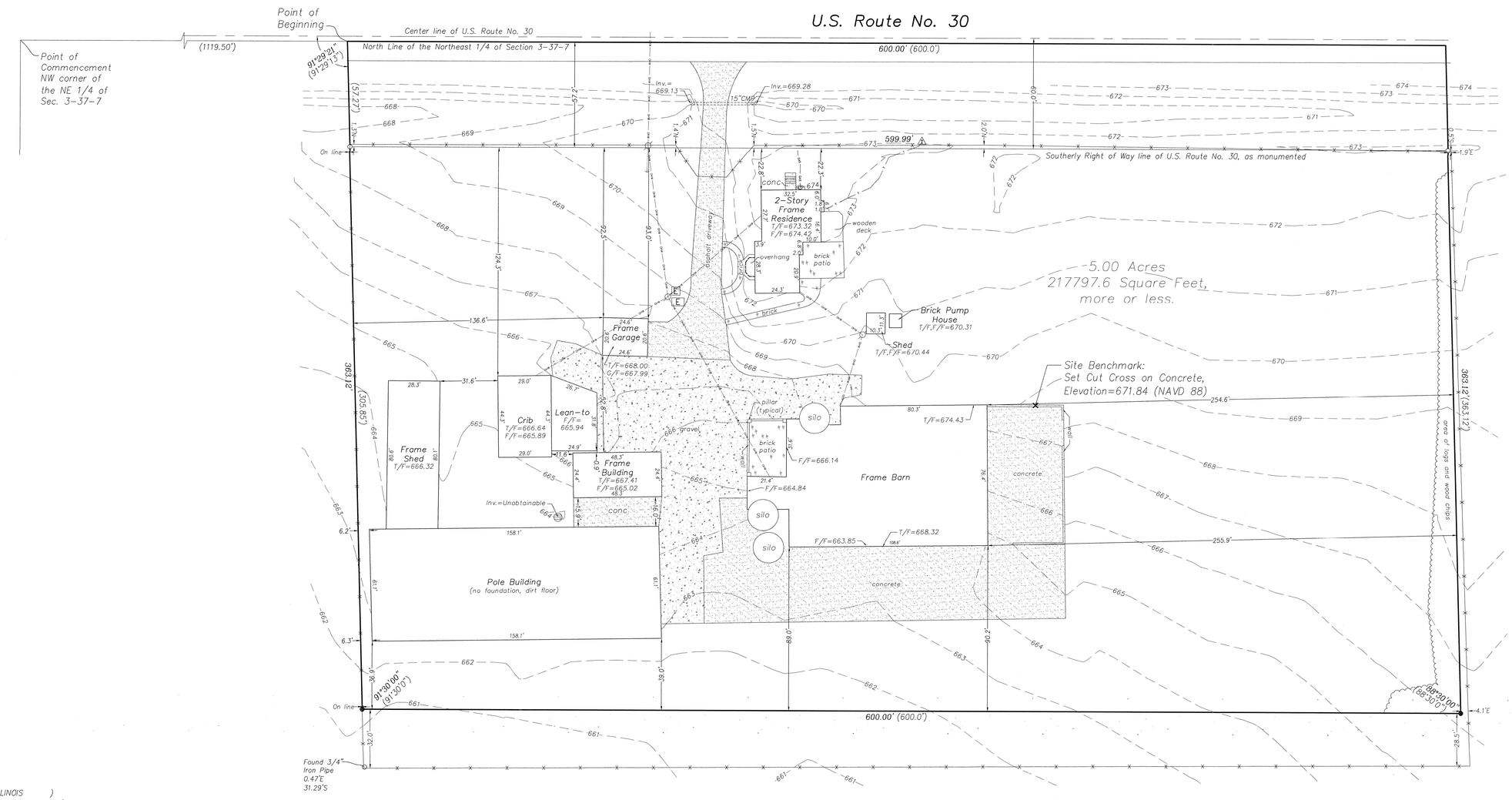
Agricultural-Special Use

Agricultural-Special Use-Planned Unit Development

TOPOGRAPHIC SURVEY

THAT PART OF THE NORTHEAST 1/4 OF SECTION 3, TOWNSHIP 37 NORTH, RANGE 7 EAST OF THE THIRD PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS: COMMENCING AT THE NORTHWEST CORNER OF SAID NORTHEAST 1/4; THENCE EASTERLY ALONG THE NORTH LINE OF SAID NORTHEAST 1/4, 1,119.50 FEET TO THE LINE OF A FENCE EXTENDED FROM THE SOUTH FOR THE POINT OF BEGINNING; THENCE SOUTHERLY ALONG SAID EXTENDED FENCE LINE WHICH FORMS AN ANGLE OF 91 DEGREES, 29 MINUTES, 13 SECONDS WITH THE CENTER LINE OF U.S. ROUTE NO. 30, (MEASURED FROM WEST TO SOUTH), 57.27 FEET TO THE SOUTHERLY RIGHT OF WAY LINE OF SAID ROUTE 30; THENCE SOUTHERLY ALONG THE LAST DESCRIBED COURSE, 305.85 FEET; THENCE EASTERLY ALONG A LINE WHICH FORMS AN ANGLE OF 91 DEGREES, 30 MINUTES, 0 SECONDS WITH THE LAST DESCRIBED COURSE, (MEASURED CLOCKWISE THEREFROM), 600.0 FEET; THENCE NORTHERLY ALONG A LINE WHICH FORMS AN ANGLE OF 88 DEGREES, 30 MINUTES, 0 SECONDS WITH THE LAST DESCRIBED COURSE, (MEASURED CLOCKWISE THEREFROM), 363.12 FEET TO SAID NORTH LINE; THENCE WESTERLY ALONG SAID NORTH LINE, 600.0 FEET TO THE POINT OF BEGINNING; IN THE TOWNSHIP OF BRISTOL, KENDALL COUNTY, ILLINOIS.

COMMONLY KNOWN AS: 8218 ROUTE 30, BRISTOL, ILLINOIS.



Legend

- = utility pole
- = anchor wire
- = telephone pedestal
- E = electric meter
- E = electric junction box
- = inlet
- = gas meter
- T/F= = top of foundation
- F/F= = finished floor
- G/F= = garage floor
- = overhead wires
- = gas line
- = underground telephone line
- = fence
- = contour line
- = gravel
- = concrete/asphalt

Note:

Source Benchmarks:

City of Aurora Control Monument No. 5, Elevation=690.81 (NAVD 88)

City of Aurora Control Monument No. 8, Elevation=668.71 (NAVD 88)

STATE OF ILLINOIS)
) SS
COUNTY OF KENDALL)

WE, CORNERSTONE SURVEYING, P.C., AN ILLINOIS PROFESSIONAL DESIGN FIRM LAND SURVEYOR CORPORATION NO. 184.006522, DO HEREBY CERTIFY THAT THIS PROFESSIONAL SERVICE CONFORMS TO THE CURRENT ILLINOIS MINIMUM STANDARDS FOR A BOUNDARY SURVEY. SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS OF RECORD, ENCUMBRANCES, RESTRICTIVE COVENANTS, OWNERSHIP TITLE EVIDENCE, OR ANY OTHER FACTS WHICH AN ACCURATE TITLE SEARCH MAY DISCLOSE.

DATED AT YORKVILLE, ILLINOIS ON APRIL 12, 2018.

PROFESSIONAL LAND SURVEYOR
ERIC C. POKORNY
035-003818
YORKVILLE, IL
STATE OF ILLINOIS

Scale: 1" = 30'

○=Found 3/4" Dia. Iron Pipe
●=Set Iron Pipe 3/4" Dia. x 24"
N = North E = East
S = South W = West
(XX.XX') = Record Distance
XX.XX' = Measured Distance
Fence= -x-x-x-

Michel C. Ensalaco, P.L.S. 2768, Exp. 11/30/2018
Eric C. Pokorny, P.L.S. 3818, Exp. 11/30/2018

TODD SURVEYING
Professional Land Surveying Services
"Cornerstone Surveying PC"
759 John Street, Suite D
Yorkville, IL 60560
Phone: 630-892-1309 Fax: 630-892-5544

Survey is only valid if original seal is shown in red.

Client:	R.Y. Property Management Corporation
Book #: 2445	Drawn By: MA,ECP Plat #: 4743
Reference:	2016-0360,FB2305
Field Work Completed:	04/10/2018

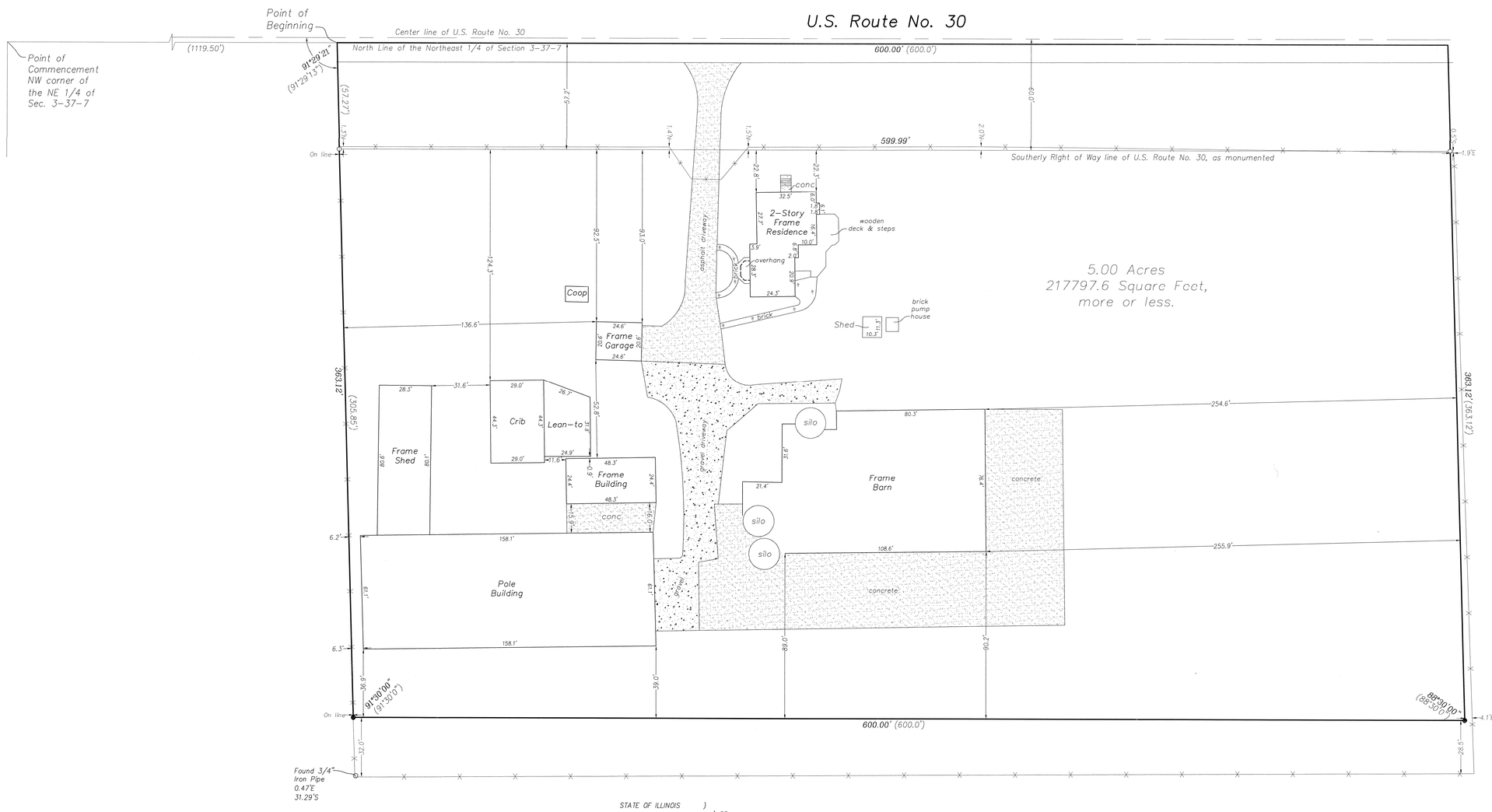
Rev. Date	Rev. Description

Project Number: 2018-0544

PLAT OF SURVEY

THAT PART OF THE NORTHEAST 1/4 OF SECTION 3, TOWNSHIP 37 NORTH, RANGE 7 EAST OF THE THIRD PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS: COMMENCING AT THE NORTHWEST CORNER OF SAID NORTHEAST 1/4; THENCE EASTERLY ALONG THE NORTH LINE OF SAID NORTHEAST 1/4, 1,119.50 FEET TO THE LINE OF A FENCE EXTENDED FROM THE SOUTH FOR THE POINT OF BEGINNING; THENCE SOUTHERLY ALONG SAID EXTENDED FENCE LINE WHICH FORMS AN ANGLE OF 91 DEGREES, 29 MINUTES, 13 SECONDS WITH THE CENTER LINE OF U.S. ROUTE NO. 30, (MEASURED FROM WEST TO SOUTH), 57.27 FEET TO THE SOUTHERLY RIGHT OF WAY LINE OF SAID ROUTE 30; THENCE SOUTHERLY ALONG THE LAST DESCRIBED COURSE, 305.85 FEET; THENCE EASTERLY ALONG A LINE WHICH FORMS AN ANGLE OF 91 DEGREES, 30 MINUTES, 0 SECONDS WITH THE LAST DESCRIBED COURSE, (MEASURED CLOCKWISE THEREFROM), 600.0 FEET; THENCE NORTHERLY ALONG A LINE WHICH FORMS AN ANGLE OF 88 DEGREES, 30 MINUTES, 0 SECONDS WITH THE LAST DESCRIBED COURSE, (MEASURED CLOCKWISE THEREFROM), 363.12 FEET TO SAID NORTH LINE; THENCE WESTERLY ALONG SAID NORTH LINE, 600.0 FEET TO THE POINT OF BEGINNING; IN THE TOWNSHIP OF BRISTOL, KENDALL COUNTY, ILLINOIS.

COMMONLY KNOWN AS: 8218 ROUTE 30, BRISTOL, ILLINOIS.



STATE OF ILLINOIS)
) SS
COUNTY OF KENDALL)

WE, CORNERSTONE SURVEYING, P.C., AN ILLINOIS PROFESSIONAL DESIGN FIRM LAND SURVEYOR CORPORATION NO. 184.006522, DO HEREBY CERTIFY THAT THIS PROFESSIONAL SERVICE CONFORMS TO THE CURRENT ILLINOIS MINIMUM STANDARDS FOR A BOUNDARY SURVEY. SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS OF RECORD, ENCUMBRANCES, RESTRICTIVE COVENANTS, OWNERSHIP TITLE EVIDENCE, OR ANY OTHER FACTS WHICH AN ACCURATE TITLE SEARCH MAY DISCLOSE.

DATED AT YORKVILLE, ILLINOIS ON MARCH 14, 2016. Michel C. Ensalaco

PROFESSIONAL LAND SURVEYOR
MICHEL C. ENSALACO
035-002768
YORKVILLE, IL
STATE OF ILLINOIS

Scale: 1" = 30'

O=Found 3/4" Dia. Iron Pipe
●=Set Iron Pipe 3/4" Dia. x 24"
N = North E = East
S = South W = West
(XX.XX') = Record Distance
XX.XX' = Measured Distance
Fence= -x-x-x-
= Concrete/Asphalt
= Gravel

Michel C. Ensalaco, P.L.S. 2768, Exp. 11/30/2016
Eric C. Pokorny, P.L.S. 3818, Exp. 11/30/2016

TODD SURVEYING
Professional Land Surveying Services
"Cornerstone Surveying PC"
1304 Sunset Avenue, Suite E
Yorkville, IL 60560
Phone: 630-892-1309 Fax: 630-892-5544
Survey is only valid if original seal is shown in red.

Client: Law Office of Richard C. Claahsen
Book #: 2305 | Drawn By: JG,JH | Plat #: 4743
Reference:
Field Work Completed: 3/11/2016

Rev. Date	Rev. Description

Project Number: 2016-0360

BERON DESIGN GROUP
ARCHITECTS, PLANERS & DESIGNERS

150 WEST WASHINGTON ST.
WEST CHICAGO IL 60185
TEL. (630) 473-0581
FAX. (630) 708-0581
HAROLD@BERONDESIGNGROUP.COM

PROPOSED RESTROOMS & WARM-UP KITCHEN
8218 ROUTE 30
BRISTOL, ILLINOIS 60612

US. ROUTE 30

PROPOSED MONUMENT SIGN
5'-9"
599.99'
SOD
2-STORY FRAME RESIDENCE
32.5'
16.4'
10.0'
6.8'
28.3'
20.9'
COOP
ASPHALT
24.6' FRAME GARAGE 20.6'
WELL HOUSE
SHED 10.3'
NEW PROPOSED ASPHALT
HANDICAPPED SIGN
GRAVEL
SILO
80.3'
31.6'
FRAME BARN
76.4'
21.4'
108.6'
PORTABLE RESTROOMS
28.3' CRIB 80.6' 80.1'
29.0' CRIB 44.3'
LEAN BUILDING 31.8' 24.9'
26.7'
48.3' FRAME BUILDING 24.4'
158.1' POLE BUILDING 60.1' 61.1'
363.12'
GRAVEL
CONCRETE
-9'-0" 20'-0" 24'-0" 43'-0"
11 SPACES 9'x20'
13 SPACES 9'x20'
35 SPACES 9'x20'
POLE 1
POLE 2
POLE 3
POLE 4
600.0'

1" 1'-6" 5'-0" 5'-8"

ILLUMINATED SIGN
LIMESTONE
FACE BRICK
#6 BAR
LIMESTONE
FACESTONE
LIMESTONE
5'-0" 1'-6" 3'-0" 1'-6"
SECTION

2 / L1-1 SIGN
NOT TO SCALE

GRID FOR LAYOUT ONLY
ONE SQUARE EQUALS 4"x 4"

4 / L1-1 HANDICAPPED SIGN
NOT TO SCALE

ACCESSIBLE PARKING SIGNAGE
RESERVED PARKING
TYPICAL VAN ACCESSIBLE PARKING SPACE SIGNAGE, IF REQUIRED.
VAN ACCESSIBLE
PENALTY SIGN WITH WORDING AS REQUIRED BY LOCAL OR STATE LAW.
PENALTY $250 FINE TOW AWAY ZONE
CHANNEL POST
YELLOW SIGN/BOLLARD COVER W/ RED REFLECTIVE TAPE FIELD DRILL OPENING OF CHANNEL POST DIAMETER
PIPE BOLLARD, FILLED W/ CONCRETE.
CONCRETE BASE
TOP OF CURB
NOTE :
CONTRACTOR SHALL COORDINATE INSTALLATION OF BOLLARD COVER PRIOR TO SIGNAGE INSTALLATION

4 / C1-1 GROUND MOUNTED SIGNAGE
NOT TO SCALE

1 / C1-1 PROPOSED SITE PLAN
SCALE 1"=20'-0"

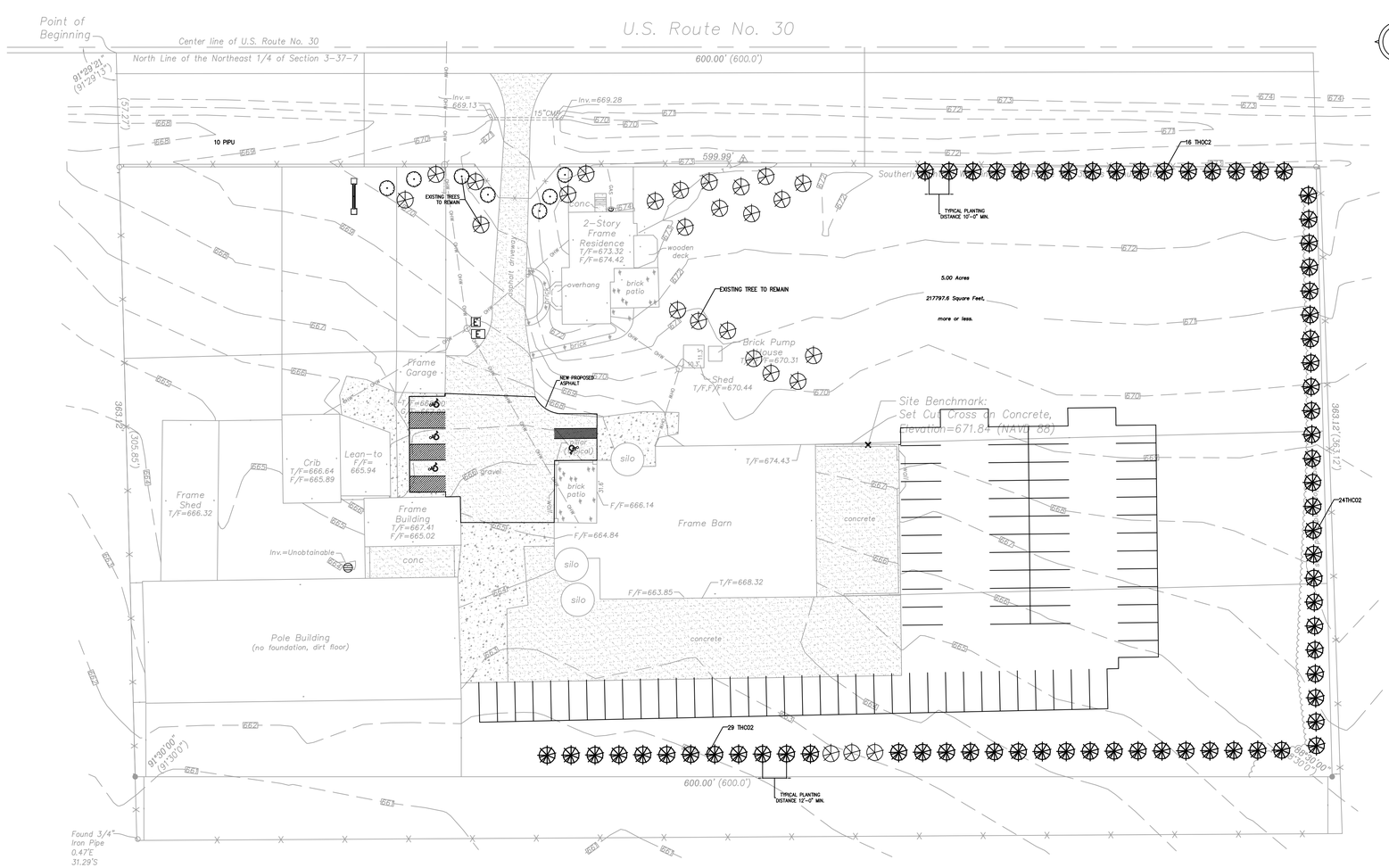
NO.	REVISIONS	DATE
1	OWNER REVIEW	04/16/18

DSGN. HB CHKD. HB
DWN. HB
SCALE: AS SHOWN

SHEET TITLE :
EXISTING SITE PLAN

PROJECT NO. 3804
DATE 04/15/2018
SHEET NO. C1-1

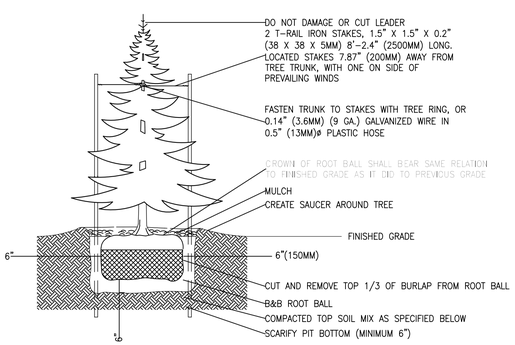
I HEREBY CERTIFY THAT THIS PLANS WERE PREPARED UNDER MY SUPERVISION AND TO THE BEST OF MY KNOWLEDGE COMPLY WITH THE KENDALL COUNTY BUILDING CODE AND ORDINANCES.



PLANT LIST

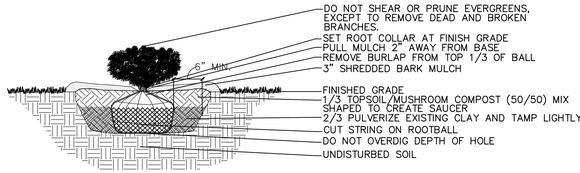
QUAN.	CODE	BOTANICAL NAME	COMMON NAME	SIZE	CONDITION
69	THCO2	Techny Arborvitae	Techny(Northern White Cedar)	6 feet	CONT.

1 / C1-2 PROPOSED LANDSCAPE PLAN
SCALE 1/32"=1'-0"

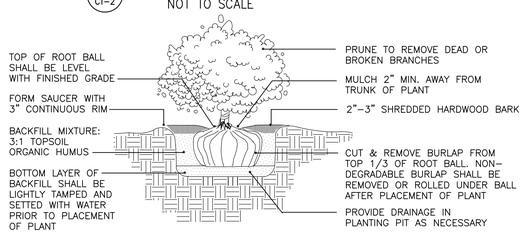


SPECIFICATIONS:
1. DO NOT DAMAGE MAIN ROOTS OR DESTROY ROOT BALL WHEN INSTALLING TREE STAKE.
2. WATER THOROUGHLY AFTER INSTALLATION.
3. REMOVE TREE RINGS AND STAKES TWO YEARS AFTER INSTALLATIONS
4. PROVIDED DRAINAGE FOR PLANTING PIT IN IMPERMEABLE SOIL.
5. TOPSOIL MIX, SEE SPEC.

4 / C1-2 CONIFEROUS TREE DETAIL
NOT TO SCALE



2 / C1-2 EVERGREEN SHRUB DETAIL
NOT TO SCALE



3 / C1-2 PLANTING DETAIL
NOT TO SCALE

LANDSCAPE NOTES:

1. LANDSCAPE PLANS SHALL NOT BE USED FOR LANDSCAPE INSTALLATION UNLESS EXCLUSIVELY DATED AND MARKED "FOR CONSTRUCTION". REVIEW ALL LANDSCAPE SPECIFICATIONS AND DETAILS PRIOR TO INSTALLATION.
2. LAY OUT COMPLETE PLANTING AS PER LANDSCAPE PLAN.
3. NOTIFY THE LANDSCAPE ARCHITECT SEVEN (7) WORKING DAYS PRIOR TO LANDSCAPE INSTALLATION. THE LANDSCAPE ARCHITECT MUST EXAMINE THE SITE PRIOR TO THE SPREADING OF TOPSOIL TO ASSESS GROWING CONDITIONS. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE JOB SITE.
4. ALL EXISTING LANDSCAPE THAT IS TO REMAIN SHOULD BE PROTECTED PRIOR TO AND DURING CONSTRUCTION.
5. QUANTITY LISTS ARE PROVIDED AS A CONVENIENCE. THE LANDSCAPE CONTRACTOR SHALL VERIFY ALL QUANTITIES ON THE DRAWINGS
6. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL UNDERGROUND UTILITIES PRIOR TO STARTING CONSTRUCTION. FOR LOCATIONS WITHIN THE CITY OF CHICAGO CALL "DIGGER" (312.744.4000).
7. LOCATIONS AND GRADES ARE APPROXIMATE. FIELD VERIFY ALL INFORMATION PRIOR TO STARTING WORK.
8. ESTABLISH GRADE AT WALKS, CURBS, PLANTERS, OTHER STRUCTURES, ETC. GRADING SHALL PROVIDE SLOPES THAT ARE SMOOTH AND CONTINUOUS. POSITIVE DRAINAGE SHALL BE PROVIDED IN ALL AREAS.
9. ALL PLANTING AREAS SHALL BE EXCAVATED AND BACKFILLED WITH TOPSOIL OR ACCEPTABLE EXCAVATED SOIL. ANY UNUSED EXCAVATED EARTH SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR AT HIS OWN EXPENSE. ANY OTHER EXCAVATED MATERIAL MUST BE REMOVED FROM THE SITE BY THE CONTRACTOR AT HIS OWN EXPENSE UNLESS BACKFILLING IS AUTHORIZED BY THE ARCHITECT AND/OR THE OWNER BY WRITTEN CONSENT.
10. TOPSOIL SHALL BE A SANDY LOAM MINERAL SOIL, UNIFORM IN COLOR AND TEXTURE; CORRESPONDING TO NATIVE SOILS; CONTAINING NO GRASS ROOTS, SOD, WEEDS, ROCKS, STIFF CLAY, CLODS, OR ANY OTHER SUBSTANCE UNDESIRABLE TO PLANT GROWTH. THE SOIL SHALL BE LOOSE, FRIABLE, AND OF GOOD TILTH. THE pH SHALL RANGE BETWEEN 5.5 TO 6.5
    EXCAVATE NEW LANDSCAPE AREAS AS INDICATED ON THE DRAWINGS AND TO THE FOLLOWING DEPTHS: SOD, SEED AND LAWN AREAS 8" MIN. DEPTH, GROUNDCOVER & PERENNIAL BEDS 18" MIN. DEPTH, SHRUB BEDS 24" MIN. DEPTH.
    NOTE: WHERE SHRUBS AND PERENNIALS/GROUNDCOVER ARE TO BE PLANTED IN THE SAME BED, PROVIDE BED DEPTHS TO MEET THE MINIMUM DEPTH FOR SHRUBS. PROVIDE ADDITIONAL EXCAVATION OF TREE PITS WHERE TREES ARE TO BE PLANTED IN SHRUB AND PERENNIAL BEDS.
11. THE LANDSCAPE CONTRACTOR SHALL REPORT ANY DISCREPANCIES ON THE LANDSCAPE PLAN TO ARCHITECT AND GET WRITTEN APPROVAL BEFORE COMMENCING WITH CONSTRUCTION.
12. PLANT MATERIAL SHALL BE NURSERY GROWN AND ALL PLANT MATERIAL SHALL BE GUARANTEED FOR A MINIMUM OF ONE (1) YEAR. GUARANTEED AT MINIMUM: THE PLANTING, LAWN, AND AREAS NOT IN A HEALTHY GROWING CONDITION SHALL BE REMOVED AND REPLACED WITH PLANTING OF LIKE SPECIES/KIND, VARIETY, AND SIZE BEFORE THE CLOSE OF THE NEXT PLANTING SEASON BY THE LANDSCAPE CONTRACTOR AT NO CHARGE TO THE OWNER.
13. ALL PLANT SPECIES SPECIFIED ARE SUBJECT TO AVAILABILITY. NO SUBSTITUTION OF PLANT MATERIAL SHALL BE ALLOWED UNLESS APPROVED THROUGH WRITTEN CONSENT BY THE LANDSCAPE ARCHITECT AND/OR THE OWNER.
14. SEE DETAILS FOR PROPER PLANTING TECHNIQUES.
15. SIZE, GRADING STANDARDS, BRANCHING, AND BALL SIZE SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE U.S.A. STANDARD FOR NURSERY STOCK AMERICAN ASSOCIATION OF NURSERYMEN, INC.
16. PLANT SYMBOLS ARE NOT LITERAL REPRESENTATIONS. THEY ARE ILLUSTRATED ON THE LANDSCAPE PLAN AS THE GRAPHIC REPRESENTATION OF THE PROPOSED PLANT MATERIAL. THEY DO NOT NECESSARILY REPRESENT THE SPREAD OF THE PLANT AT THE TIME OF INSTALLATION. BY THE
17. ALL PLANTING BED LINES AND TREE SAUCERS SHALL REQUIRE A HAND SPADED EDGE BETWEEN LAWN AND MULCHED AREAS.
18. ALL PLANTING BEDS SHALL BE COVERED WITH THREE INCHES (3") OF SHREDDED HARDBARK MULCH (SEE DETAILS), RAKED LEVEL AND WATERED DOWN; PLANTING BEDS SHOULD BE WEED FREE AND SHALL BE TREATED WITH A PRE-EMERGENT HERBICIDE PRIOR TO MULCH INSTALLATION. MULCH TO BE APPROVED BY LANDSCAPE ARCHITECT.
19. DO NOT SHEAR ANY PLANT MATERIALS. HAND PRUNE ALL PLANTS, AS NEEDED, AFTER INSTALLATION OF PLANTING PLAN IS COMPLETED.
20. CLEAN UP ALL AREAS, SWEEP WALKS AND DRIVES, AND HAUL AWAY DEBRIS.
21. SOD SHALL BE CERTIFIED KENTUCKY BLUEGRASS BLEND AND IS REQUIRED IN ALL UNPAVED WITHIN THE SITE BOUNDARIES AND ADJACENT R.O.W. UNLESS OTHERWISE SPECIFIED ON THE LANDSCAPE PLAN.
22. ALL BASE INFORMATION HEREIN WAS PROVIDED TO LANDSCAPE ARCHITECT BY ARCHITECT AND/OR OWNER.
23. ANY AREA DISTURBED DURING CONSTRUCTION, INCLUDING PARKWAY, SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION.
24. THE LANDSCAPE ARCHITECT SHALL NOT HAVE CONTROL OR CHARGE OF AND SHALL NOT BE RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, OR PROCEDURES; OR FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK, AND FOR ANY ACTS AND OMISSIONS

BERON DESIGN GROUP
ARCHITECTS, PLANERS & DESIGNERS
150 WEST WASHINGTON ST.
WEST CHICAGO IL 60185
TEL. (630) 473-0581
FAX. (630) 708-0581
HAROLD@BERONDESIGNGROUP.COM

PROPOSED RESTROOMS & WARM-UP KITCHEN
8218 ROUTE 30
BRISTOL, ILLINOIS 60612

NO.	REVISIONS	DATE
1	OWNER REVIEW	04/16/18

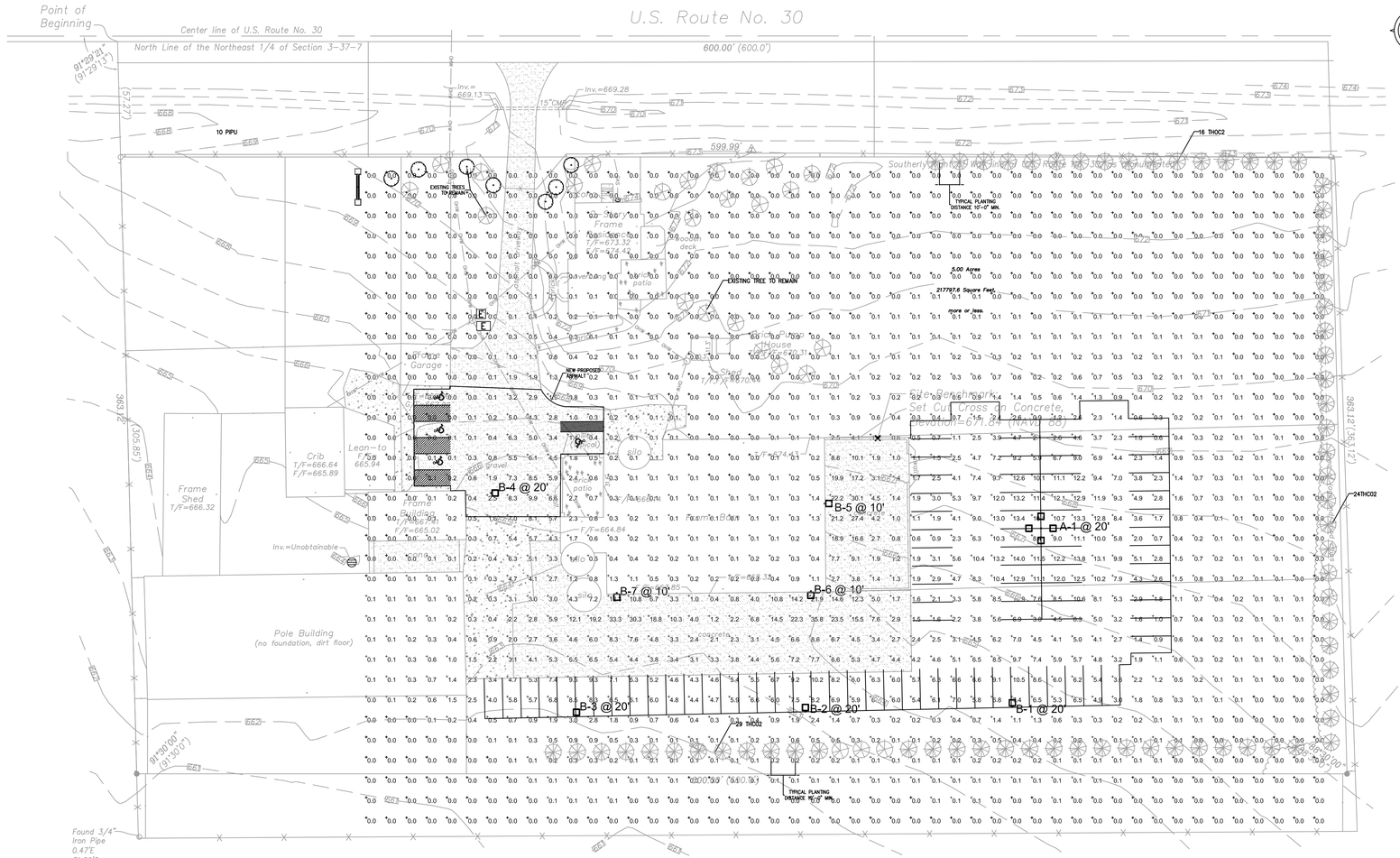
DSGN. HB CHKD. HB
DWN. HB
SCALE: AS SHOWN

SHEET TITLE :
PROPOSED LANDSCAPE PLAN

PROJECT NO. 3804
DATE 04/15/2018
SHEET NO. C1-2

32' 16' 0 32'

I HEREBY CERTIFY THAT THIS PLANS WERE PREPARED UNDER MY SUPERVISION AND TO THE BEST OF MY KNOWLEDGE COMPLY WITH THE KENDALL COUNTY BUILDING CODE AND ORDINANCES.


Point of Beginning
Center line of U.S. Route No. 30
North Line of the Northeast 1/4 of Section 3-37-7
U.S. Route No. 30
600.00' (600.0')
599.99'
S1°29'21"E (S1°29'13")
381.72' (381.72')
10 PIPU
16 THOC2
29 THOD2
24 THC02
EXISTING TREES TO REMAIN
EXISTING TREE TO REMAIN
NEW PROPOSED ASPHALT
Inv.= 669.13
Inv.=669.28
15"CMP
Southerly right-of-way line of U.S. Route No. 30 (66' Dedicated)
Frame Garage T/F=673.12 F/F=674.44
Frame Shed T/F=666.32
Crib T/F=666.64 F/F=665.89
Lean-to 665.94
Frame Building T/F=665.21 F/F=665.02
Frame Building T/F=664.84 F/F=664.84
Pole Building (no foundation, dirt floor)
Inv.=Unobtainable
Silo
Silo
Silo

PUTMAN SOIL TESTING, INC.
SOIL TESTING AND CLASSIFICATION
1200 PORTAGE LANE, WOODSTOCK, ILLINOIS 60098
TELEPHONE: 815-338-6218
FAX: 815-338-7210

SOIL EVALUATION SUMMARY REPORT

PROJECT SITE:

8218 Route 30, Bristol (PIN 02-03-200-001), Kendall County, Illinois

INTRODUCTION

The subject property was investigated on March 29, 2018 for the purpose of classifying the soils for on-site waste disposal. The site is located in Section 3, T37N, R7E. The report has been prepared for George Ramirez.

METHODS

Three samples were taken in the area of the proposed septic field. The soils were sampled with a Giddings two-inch diameter core to a depth of 5 feet. The soils were described according to current State and local County requirements, with detailed soil descriptions written for each site. Soil types were identified and correlated to the current USDA soils legend for Kendall County.

RESULTS

The soils on this site formed in loess over loamy sediments over loam till. Evidence of an estimated seasonal high groundwater table (based on soil color) was recorded at all sample sites. Restrictive permeability due to bedrock was not recorded at any sample site. A summary of findings is as follows:

SOIL PROPERTY	SAMPLE 1	SAMPLE 2	SAMPLE 3
Estimated high water table	21	21	24
Observed water table	45	45	>60
Bedrock	>60	>60	>60
Soil series	145-512	171	145-512

This soil test does not fully determine the suitability of a site for a septic field. A County Health Department approved septic design is required to determine if a site is suitable for a septic field. This soil test is not for building foundation design. This soil test does not include information regarding proximity to designated Waters of the U.S.

APPLICANT:
LEGAL DESCRIPTION: 8218 Route 30, Bristol (PIN 02-03-200-001),
SECTION #: 3 TOWNSHIP: T37N RANGE: R7E
BORING #: 1 SOIL SERIES: 145-512 (Saybrook-Danabrook)
MOTTLE DEPTH (in.): 21
OBSERVED GROUNDWATER TABLE: 45
SAMPLE METHOD: 2-inch core
REMARKS:

DATE: March 29, 2018

COUNTY: Kendall
PARENT MATERIAL: loess/loam till
RESTRICTIVE PERMEABILITY (in.): >60
ASPECT/SLOPE: 3 percent to the south

HORIZ.	DEPTH	COLOR	TEXTURE	REDOX FEATURES	STRUCTURE	CONS.	COATINGS	STATE SOIL GROUP	PERMEABILITY AND LOADING RATE
A	0-11	10YR 3/2	Sil		2-m-gr	Fr		5D	.75
Bt1	11-16	10YR 4/4	Sicl		2-vf-sbk	Fr	C 10YR 3/3	6D	.62
Bt2	16-32	10YR 4/4	Sicl	c-1-d 10YR 6/2, c-1-d 10YR 5/6 at 21 inches	2-f-sbk & 2-m-sbk	Fr	C 10YR 4/3	6D	.62
2BCt	32-42	10YR 5/4	L	c-2-d 10YR 6/2, c-2-d 10YR 5/6	1-m-sbk	Fr	C 10YR 4/3	5F	.45
2C	42-60	10YR 5/4	L	c-2-d 10YR 6/2, c-2-d 10YR 5/6	M	Fr		5N	.27

SOIL CLASSIFIER: BRUCE PUTMAN, CPSC (ARCPACS/ISCA)
PUTMAN SOIL TESTING, INC.
1200 PORTAGE LANE, WOODSTOCK, IL 60098
PHONE: 815-338-6218

SIGNATURE: _____

BRUCE PUTMAN
ISCA
No. 50
EXPIRES
7/1/19
CERTIFIED PROFESSIONAL SOIL CLASSIFIER

Attachment 6, Page 2

APPLICANT:
LEGAL DESCRIPTION: 8218 Route 30, Bristol (PIN 02-03-200-001),
SECTION #: 3 TOWNSHIP: T37N RANGE: R7E
BORING #: 2 SOIL SERIES: 171 (Catlin)
MOTTLE DEPTH (in.): 21
OBSERVED GROUNDWATER TABLE: 45
SAMPLE METHOD: 2-inch core
REMARKS:

DATE: March 29, 2018

COUNTY: Kendall
PARENT MATERIAL: loess/loamy sediments/loam till
RESTRICTIVE PERMEABILITY (in.): >60
ASPECT/SLOPE: 3 percent to the south

HORIZ.	DEPTH	COLOR	TEXTURE	REDOX FEATURES	STRUCTURE	CONS.	COATINGS	STATE SOIL GROUP	PERMEABILITY AND LOADING RATE
A	0-12	10YR 3/2	Sil		2-m-gr	Fr		5D	.75
Bt1	12-16	10YR 4/4	Sicl		2-vf-sbk	Fr	C 10YR 3/3	6D	.62
Bt2	16-25	10YR 4/4	Sicl	c-1-d 10YR 6/2, c-1-d 10YR 5/6 at 21 inches	2-f-sbk & 2-m-sbk	Fr	C 10YR 4/3	6D	.62
Bt3	25-31	10YR 4/3, 10YR 5/3	Sicl	c-2-d 10YR 6/2, c-2-d 10YR 5/6	2-f-pr	Fr		6D	.62
BCt	31-39	10YR 5/4, 10YR 5/3	Sil, Sicl	c-2-d 10YR 6/2, c-2-d 10YR 5/6	1-m-pr	Fr	C 10YR 5/2	5B, 6B	.62
C1	39-49	10YR 5/4, 10YR 5/3	Sil	c-2-d 10YR 6/2, c-2-d 10YR 5/6	M	Fr		5L	.52
2C2	49-55	10YR 5/3, 10YR 4/3	L, Sl	c-2-d 10YR 6/2, c-2-d 10YR 5/6	M	Fr, Vfr		5L	.52
3C3	55-60	10YR 5/4	L	c-2-d 10YR 6/2, c-2-d 10YR 5/6	M	Fr		5N	.27

SOIL CLASSIFIER: BRUCE PUTMAN, CPSC (ARCPACS/ISCA)
PUTMAN SOIL TESTING, INC.
1200 PORTAGE LANE, WOODSTOCK, IL 60098
PHONE: 815-338-6218

SIGNATURE: _____

BRUCE PUTMAN
ISCA
No. 50
EXPIRES
2/1/19
CERTIFIED PROFESSIONAL SOIL CLASSIFIER

APPLICANT:
LEGAL DESCRIPTION: 8218 Route 30, Bristol (PIN 02-03-200-001),
SECTION #: 3 TOWNSHIP: T37N RANGE: R7E
BORING #: 3 SOIL SERIES: 145-512 (Saybrook-Danabrook)
MOTTLE DEPTH (in.): 24
OBSERVED GROUNDWATER TABLE: 45
SAMPLE METHOD: 2-inch core
REMARKS:

DATE: March 29, 2018

COUNTY: Kendall
PARENT MATERIAL: loess/loam till
RESTRICTIVE PERMEABILITY (in.): >60
ASPECT/SLOPE: 4 percent to the south

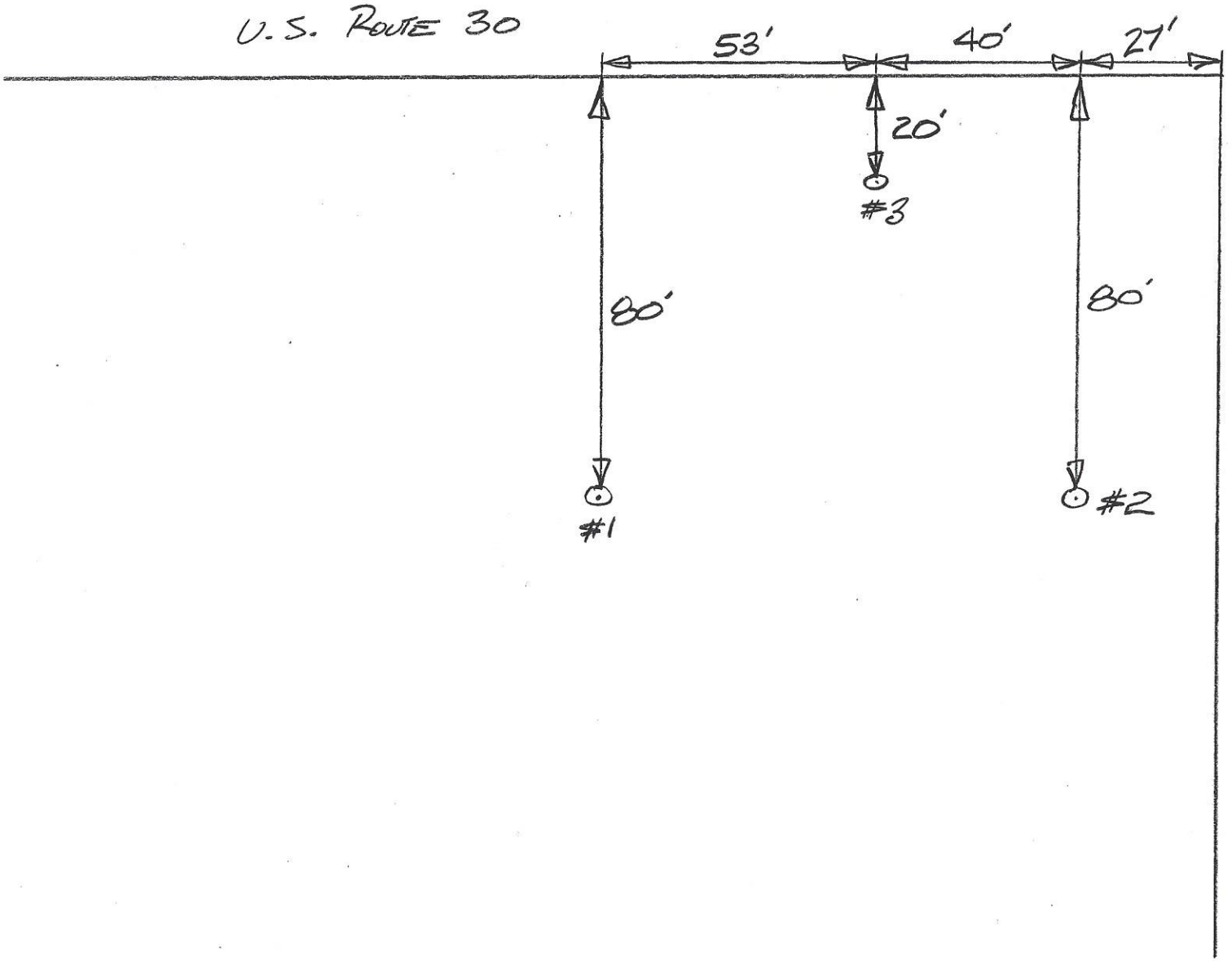
HORIZ.	DEPTH	COLOR	TEXTURE	REDOX FEATURES	STRUCTURE	CONS.	COATINGS	STATE SOIL GROUP	PERMEABILITY AND LOADING RATE
A	0-12	10YR 3/2	Sil		2-m-gr	Fr		5D	.75
Bt1	12-17	10YR 4/4	Sicl		2-vf-sbk	Fr	C 10YR 3/2	6D	.62
Bt2	17-28	10YR 4/4	Sicl	c-1-d 10YR 6/2, c-1-d 10YR 5/6 at 24 inches	2-f-sbk & 2-m-sbk	Fr	C 10YR 4/3	6D	.62
2Bt3	28-34	10YR 4/4, 10YR 4/3	Cl	c-1-d 10YR 6/2, c-1-d 10YR 5/6	2-m-sbk	Fr		6H	.52
2BCt	34-43	10YR 5/4	L	c-2-d 10YR 6/2, c-2-d 10YR 5/6	1-m-sbk	Fr	C 10YR 4/3	5F	.45
2C	43-60	10YR 5/4	L	c-2-d 10YR 6/2, c-2-d 10YR 5/6	M	Fr		5N	.27

SOIL CLASSIFIER: BRUCE PUTMAN, CPSC (ARCPACS/ISCA)
PUTMAN SOIL TESTING, INC.
1200 PORTAGE LANE, WOODSTOCK, IL 60098
PHONE: 815-338-6218

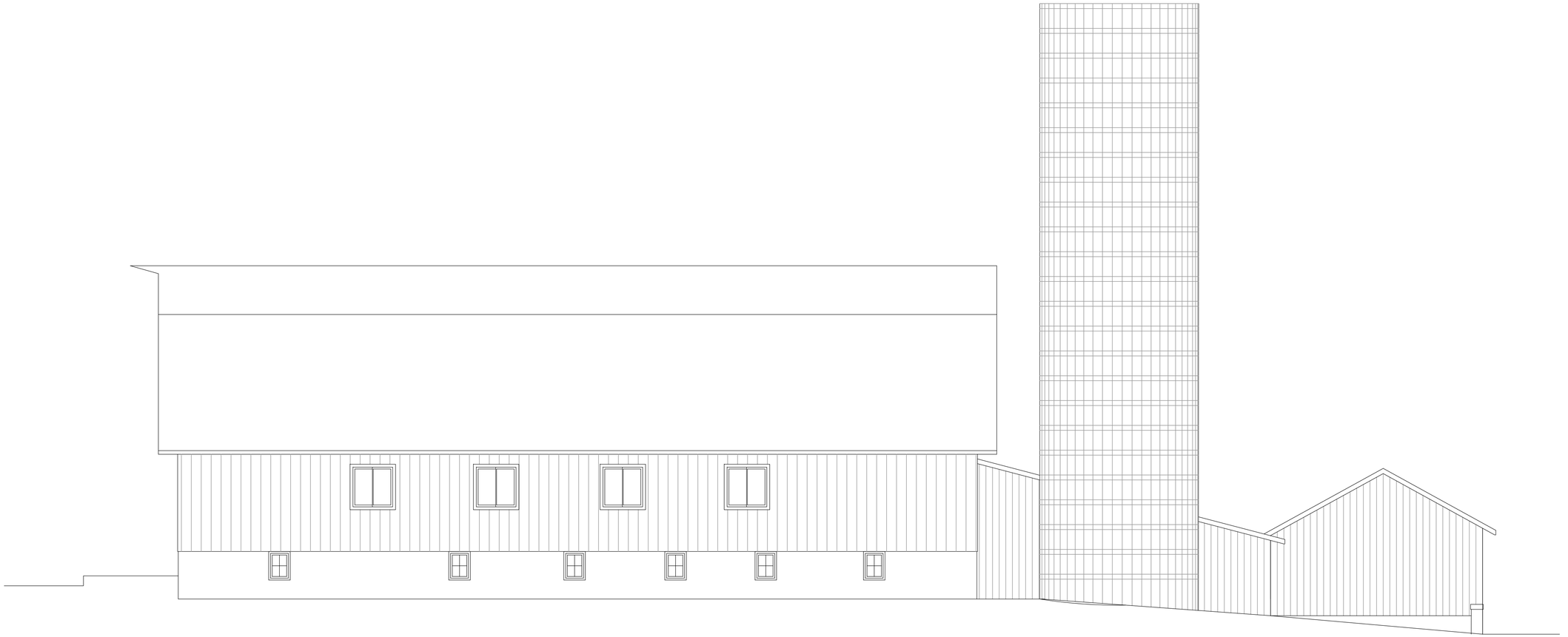
SIGNATURE: _____



Location of Soil Test Sites
8218 Route 30, Bristol
Kendall County, IL 3/29/18



1" = 30'



1 / A2-1 EXISTING NORTH ELEVATION
SCALE 3/16"=1'-0"

BERON DESIGN GROUP
ARCHITECTS, PLANERS & DESIGNERS

150 WEST WASHINGTON ST.
WEST CHICAGO IL 60185
TEL. (630) 473-0581
FAX. (630) 708-0581
HAROLD@BERONDESIGNGROUP.COM

PROPOSED RESTROOMS & WARM-UP KITCHEN
8218 ROUTE 30
BRISTOL, ILLINOIS 60612

NO.	REVISIONS	DATE
1	OWNER REVIEW	04/16/18

DSGN. HB CHKD. HB
DWN. HB
SCALE: AS SHOWN

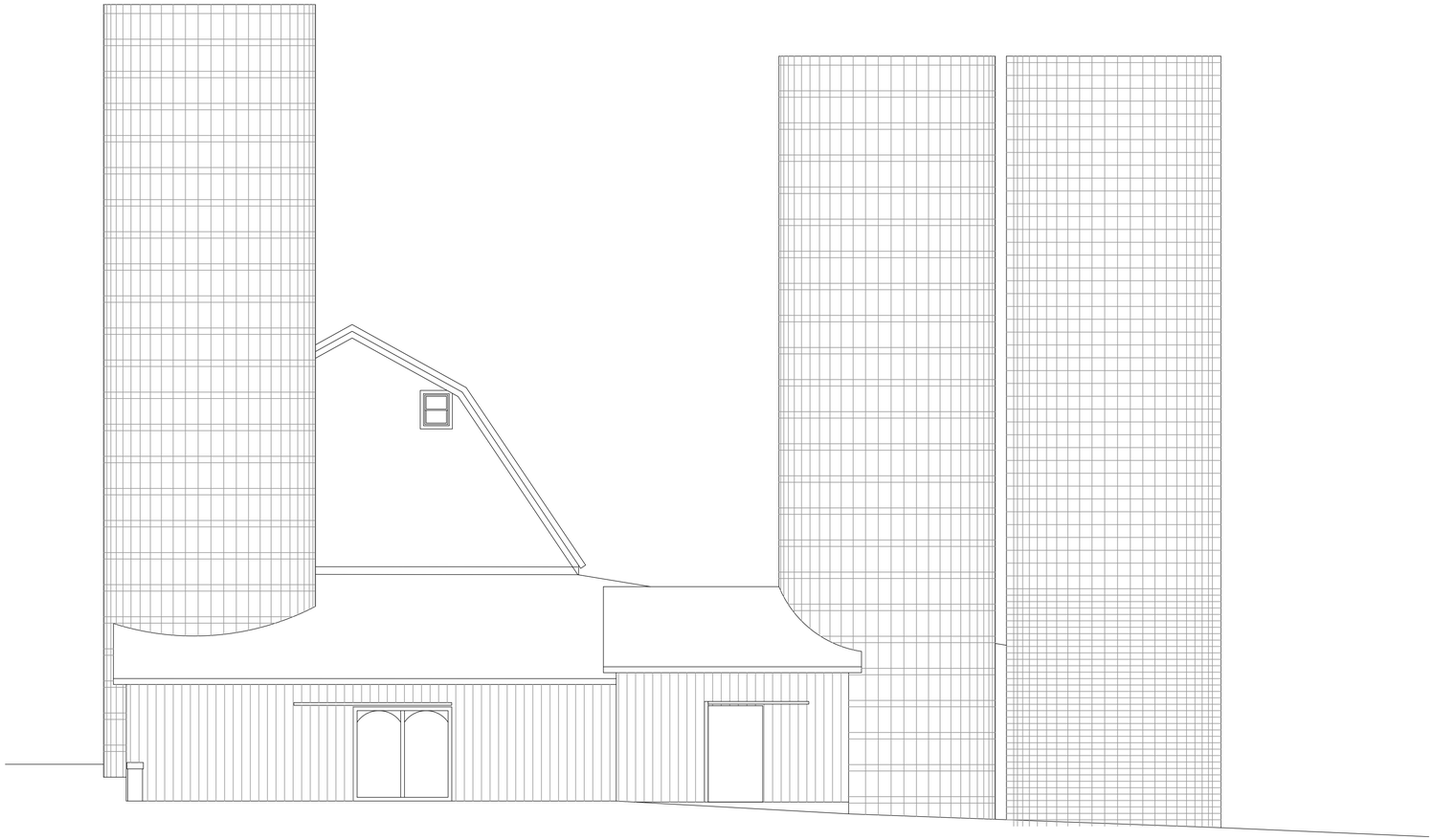
SHEET TITLE :
EXISTING NORTH ELEVATION

PROJECT NO. 3804
DATE 04/15/2018
SHEET NO. A2-1

Exp 11-30-2018
DATE
STATE OF ILLINOIS
HAROLD BERON
001-015361
LICENSED ARCHITECT
DESIGN FIRM LICENSE
NO.184.007748-0001

I HEREBY CERTIFY THAT THIS PLANS WERE PREPARED UNDER MY SUPERVISION AND TO THE BEST OF MY KNOWLEDGE COMPLY WITH THE KENDALL COUNTY BUILDING CODE AND ORDINANCES.

5'-4" 2'-8" 0 5'-4"



1 / A2-2 EXISTING WEST ELEVATION
SCALE 3/16"=1'-0"

BERON DESIGN GROUP
ARCHITECTS, PLANERS & DESIGNERS

150 WEST WASHINGTON ST.
WEST CHICAGO IL 60185
TEL. (630) 473-0581
FAX. (630) 708-0581
HAROLD@BERONDESIGNGROUP.COM

PROPOSED RESTROOMS & WARM-UP KITCHEN
8218 ROUTE 30
BRISTOL, ILLINOIS 60612

NO.	REVISIONS	DATE
1	OWNER REVIEW	04/16/18

DSGN. HB | CHKD. HB
DWN. HB
SCALE: AS SHOWN

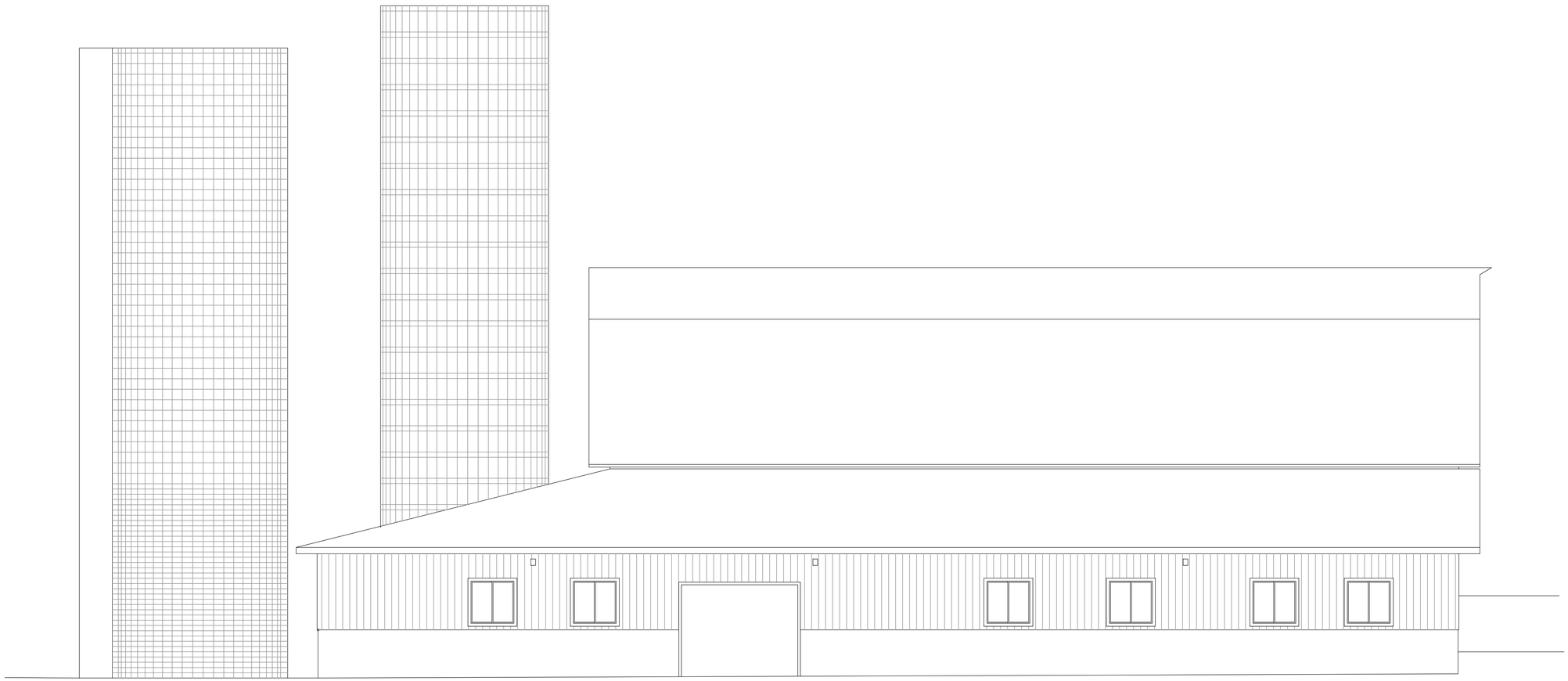
SHEET TITLE :
EXISTING WEST ELEVATION

Exp 11-30-2018
DATE
STATE OF ILLINOIS
HAROLD
001-015361
LICENSED ARCHITECT
DESIGN FIRM LICENSE
NO.184.007748-0001

I HEREBY CERTIFY THAT THIS PLANS WERE PREPARED UNDER MY SUPERVISION AND TO THE BEST OF MY KNOWLEDGE COMPLY WITH THE KENDALL COUNTY BUILDING CODE AND ORDINANCES.

5'-4" 2'-8" 0 5'-4"

PROJECT NO. 3804
SHEET NO. A2-2
DATE 04/15/2018



1 / A2-2 EXISTING SOUTH ELEVATION

SCALE 3/16"=1'-0"

5'-4" 2'-8" 0 5'-4"

BERON DESIGN GROUP
ARCHITECTS, PLANERS & DESIGNERS

150 WEST WASHINGTON ST.
WEST CHICAGO IL 60185
TEL. (630) 473-0581
FAX. (630) 708-0581
HAROLD@BERONDESIGNGROUP.COM

PROPOSED RESTROOMS & WARM-UP KITCHEN
8218 ROUTE 30
BRISTOL, ILLINOIS 60612

NO.	REVISIONS	DATE
1	OWNER REVIEW	04/16/18

DSGN. HB CHKD. HB
DWN. HB
SCALE: AS SHOWN

SHEET TITLE :

EXISTING SOUTH ELEVATION

Exp 11-30-2018
DATE

STATE OF ILLINOIS
HAROLD
BERON
001-011581
LICENSED ARCHITECT

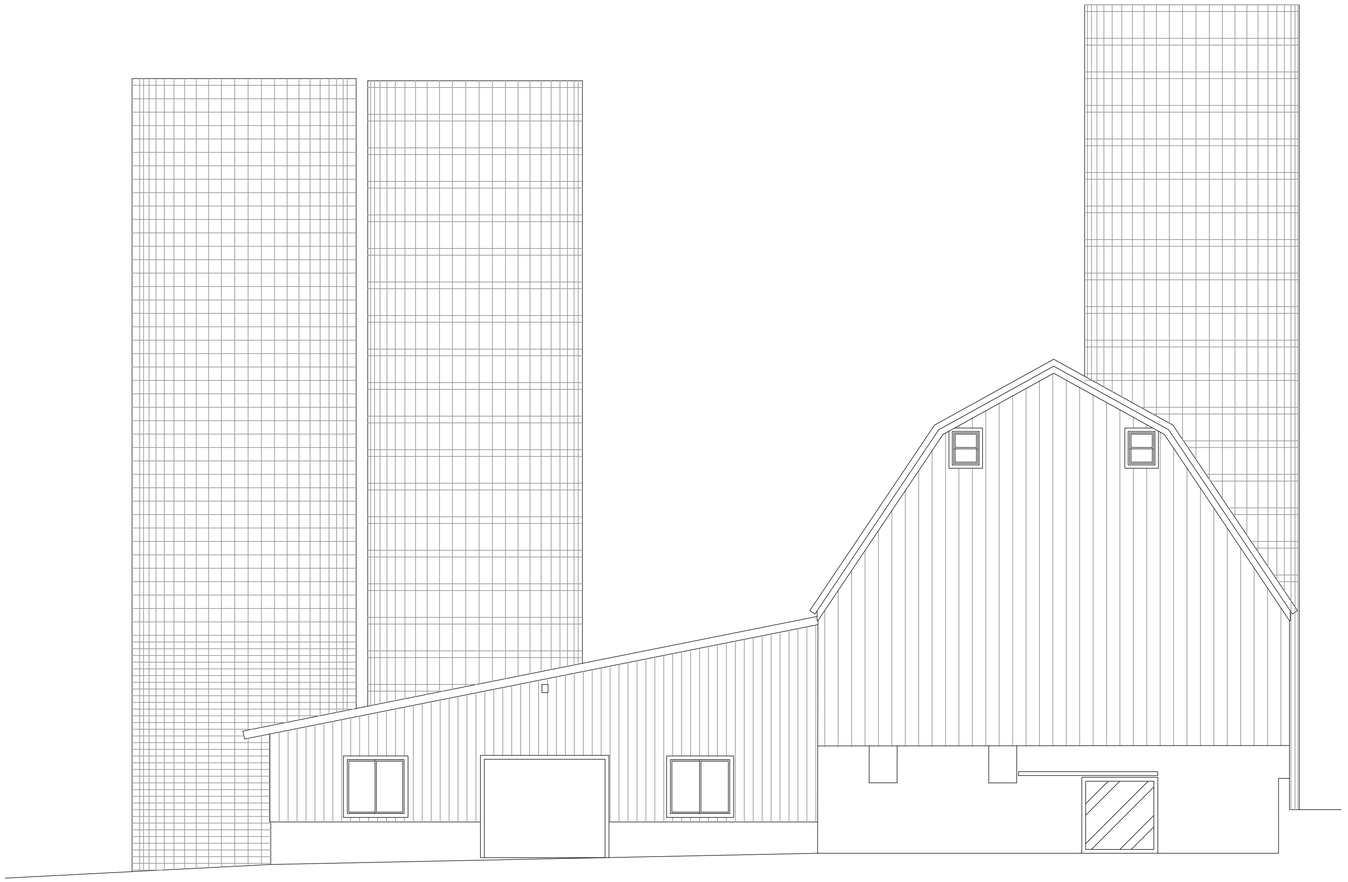
DESIGN FIRM LICENSE
NO.184.007748-0001

I HEREBY CERTIFY THAT THIS PLANS WERE PREPARED UNDER MY SUPERVISION AND TO THE BEST OF MY KNOWLEDGE COMPLY WITH THE KENDALL COUNTY BUILDING CODE AND ORDINANCES.

PROJECT NO. 3804

SHEET NO. A2-3

DATE 04/15/2018



1 / A2-4 EXISTING EAST ELEVATION
SCALE 3/16"=1'-0"

BERON DESIGN GROUP
ARCHITECTS, PLANERS & DESIGNERS

150 WEST WASHINGTON ST.
WEST CHICAGO IL 60185
TEL. (630) 473-0581
FAX. (630) 708-0581
HAROLD@BERONDESIGNGROUP.COM

PROPOSED RESTROOMS & WARM-UP KITCHEN
8218 ROUTE 30
BRISTOL, ILLINOIS 60612

NO.	REVISIONS	DATE
1	OWNER REVIEW	04/16/18

DSGN. HB CHKD. HB
DWN. HB
SCALE: AS SHOWN

SHEET TITLE :
EXISTING EAST ELEVATION

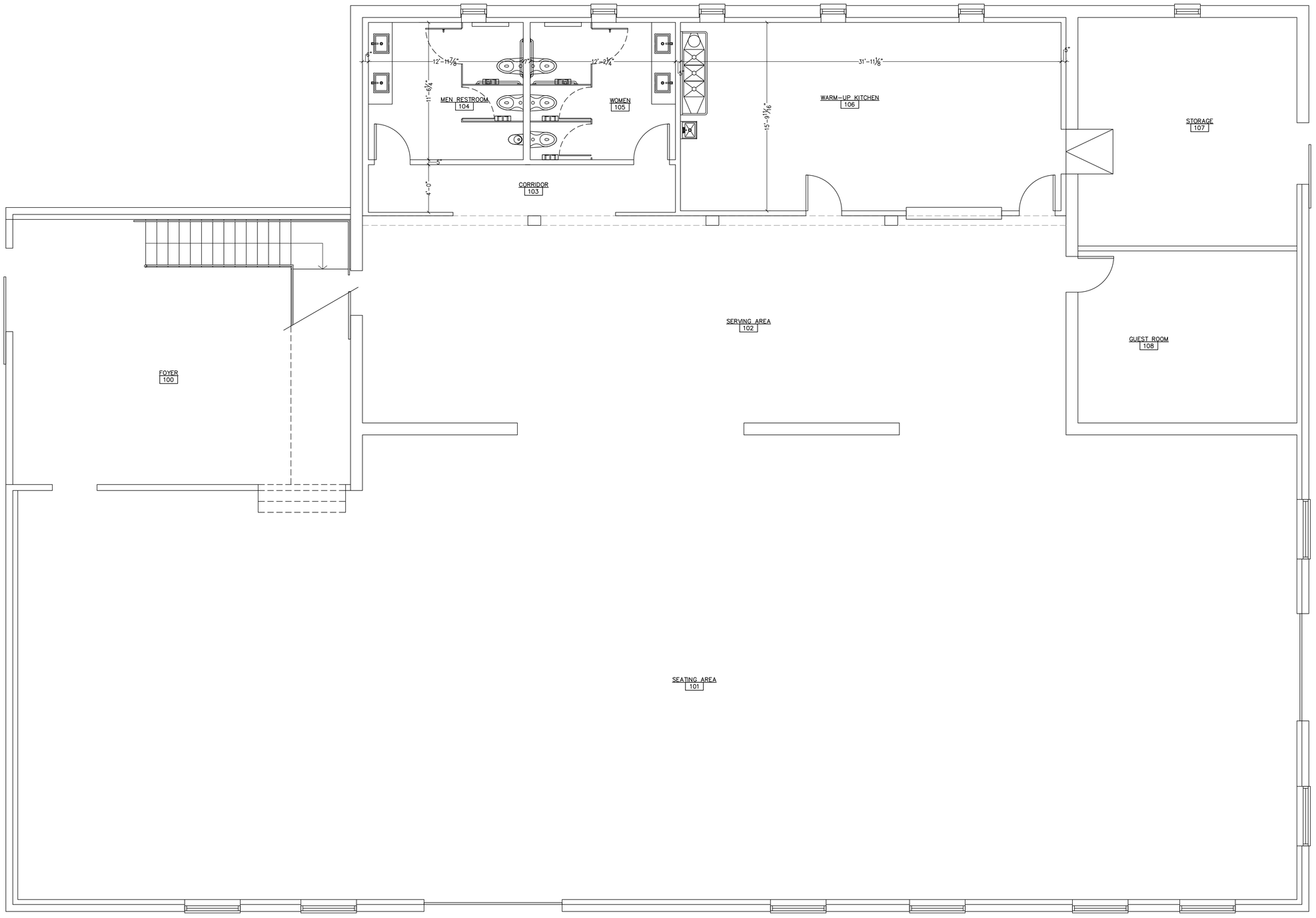
PROJECT NO. 3804
SHEET NO. A2-4
DATE 04/15/2018

Exp 11-30-2018
DATE
STATE OF ILLINOIS
HAROLD
BERON
001-013361
LICENSED ARCHITECT

DESIGN FIRM LICENSE
NO.184.007748-0001

I HEREBY CERTIFY THAT THIS PLANS WERE PREPARED UNDER MY SUPERVISION AND TO THE BEST OF MY KNOWLEDGE COMPLY WITH THE KENDALL COUNTY BUILDING CODE AND ORDINANCES.

5'-4" 2'-8" 0 5'-4"



1 / A1-1 PROPOSED PLAN
SCALE 1/4"=1'-0"

4' 2' 0 4'

I HEREBY CERTIFY THAT THIS PLANS WERE PREPARED UNDER MY SUPERVISION AND TO THE BEST OF MY KNOWLEDGE COMPLY WITH THE KENDALL COUNTY BUILDING CODE AND ORDINANCES.

BERON DESIGN GROUP
ARCHITECTS, PLANERS & DESIGNERS
150 WEST WASHINGTON ST.
WEST CHICAGO IL 60185
TEL. (630) 473-0581
FAX. (630) 708-0581
HAROLD@BERONDESIGNGROUP.COM

PROPOSED RESTROOMS & WARM-UP KITCHEN
8218 ROUTE 30
BRISTOL, ILLINOIS 60612

NO.	REVISIONS	DATE
1	OWNER REVIEW	01/07/18

DSGN. HB | CHKD. HB
DWN. HB
SCALE: AS SHOWN

SHEET TITLE :
PROPOSED RESTROOMS & WARM-UP KITCHEN

PROJECT NO. 3804
SHEET NO. A1-1
DATE 01/15/2018


Attachment 9 Front of Property
8218
8218


Attachment 10 Driveway Looking South


Attachment 11 Houses at Driveway Entrance


Attachment 12 Houses North of Parking Area

Attachment 13 Parking Area from Route 30



Attachment 14 Parking Area Looking East



Attachment 15 Parking Area Looking West



Attachment 16 Parking Area Looking North



Attachment 17 East Side of Barn




Attachment 18 South Side of Barn

Attachment 19 South and East Sides of Barn



Attachment 20 North Side of Barn




Attachment 21 Inside Upstairs Looking West


Attachment 22 Inside Upstairs Looking East


Attachment 23 Inside Downstairs South Side