

# Clearview Solar I, LLC

Clearview Solar

Exhibit Z

Preliminary Drain Tile Assessment

**Case No. 20-1362-EL-BGN**

# Clearview Solar

## Preliminary Drain Tile Assessment

Prepared for:

**Clearview I, LLC**

1105 Navasota St  
Austin, TX 78702

Location: Champaign County, OH  
Date: December 8, 2020

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EVS Project No.: 2020-140.1





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## 1.0 Introduction

The purpose of this report is to describe the process of locating existing agricultural drain tile so that it can be avoided, and/or corrected when designing and constructing a ground mounted solar photovoltaic array on a project site known to have the possibility of drain tile present.

Agricultural drain tile is a piped underground utility used to remove excess runoff from agricultural fields in order to promote optimum moisture conditions in the soil. Drain tile is typically a perforated plastic, concrete, or clay pipe designed to allow runoff water to infiltrate the pipe and drain via gravity to natural or manmade outlet points ie. ditch, swale, pond, etc. Drain tile is often constructed as a network made up of smaller lateral pipes combining into larger trunk pipes. Drain tile networks can cross property lines and serve multiple landowners. Of particular importance and focus of this effort will be the identification of trunk pipes located on project properties that are part of a network extending upstream of the project properties. These trunk pipes are the most critical to maintain functionality so as not to impact adjacent properties.

## 2.0 Drain Tile Location Identification

The following are methods of identifying location and routing of agricultural drain tile. Included with each is a description of how they can be or have been utilized on this project.

### 2.1 Mapping

#### Landowner Input

If available, landowners will provide official mapping of drain tile as provided by the installation professional. If no such mapping is available, each participating landowner has been provided with a map of their property with which they will draw, to the best of their knowledge, the location and type of any drain tiles. Each map contains an aerial image, project area outline, county drain tile lines, and topographic contours. Using these maps as a guide, landowners have been asked to provide as much information regarding location of existing drain tile as possible. They have been asked to differentiate between trunk mains and laterals (or pattern tile) wherever possible.

Landowner communication and mapping is ongoing.

### 2.2 Visual Indicators

#### Aerial Images

- An aerial image taken at the right time of year can provide a visual indicator of the presence of drain tile. Dark colored soil will dry faster above drain tile resulting in a lighter color. A review of available aerial images can produce approximate locations of existing tile.
- Grassed swales through fields are often accompanied by drain tile beneath. Aerial images can be used to map grassed swales which can then be verified as containing drain tile through other physical identification methods.

#### Inlets/Outlets

Some drain tiles have inlets that are marked by the presence of a brightly colored riser, field marker, or protective grate at the inlet. Drain tile outlets can be identified by visually locating the pipe.

### Soil Subsidence

As runoff infiltrates into the perforated drain tile, it can carry a small amount of soil with it. Over time, when enough soil has been transported into the pipe, small subsidence pockets become visible at the surface. If a drain tile is suspected in a location, visually locating these subsidence pockets over the suspected route can verify the presence of the tile.

### Topography

Drain tile (in particular trunk pipe) is typically located in low areas or follows existing drainage paths. Evaluating existing topography provides some insight into the likely location of drain tile by identifying low poorly drained areas and natural flow paths that would provide the easiest route for a drain tile. Topography is also used to identify which adjacent properties would be “upstream” of the project and therefore the most important to identify a shared drain tile network.

## **2.3 Physical Exploration**

Once drain tile locations or routes are approximately known, the following methods can be used to physically locate the drain tile which allows the location to be marked and surveyed so that it can be added to a map as an accurate representation of drain tile routing.

### Pothole

Using an excavator or other small piece of equipment, digging trenches perpendicular to the suspected drain tile route until the pipe is exposed.

### Probe

Using a T-handled steel rod during soft soil conditions, the steel rod can be pressed vertically down into the soil where drain tile is suspected to occur. When the rod hits a tile, the spot is marked and surveyed.

### Maverick Tile Finder

A flexible rod is inserted into the drain tile at a known location. Embedded in the rod is a copper wire that sends a signal to a locator on the surface. The locator traverses the approximate drain tile route above and when a positive signal is encountered, the location is marked and surveyed.

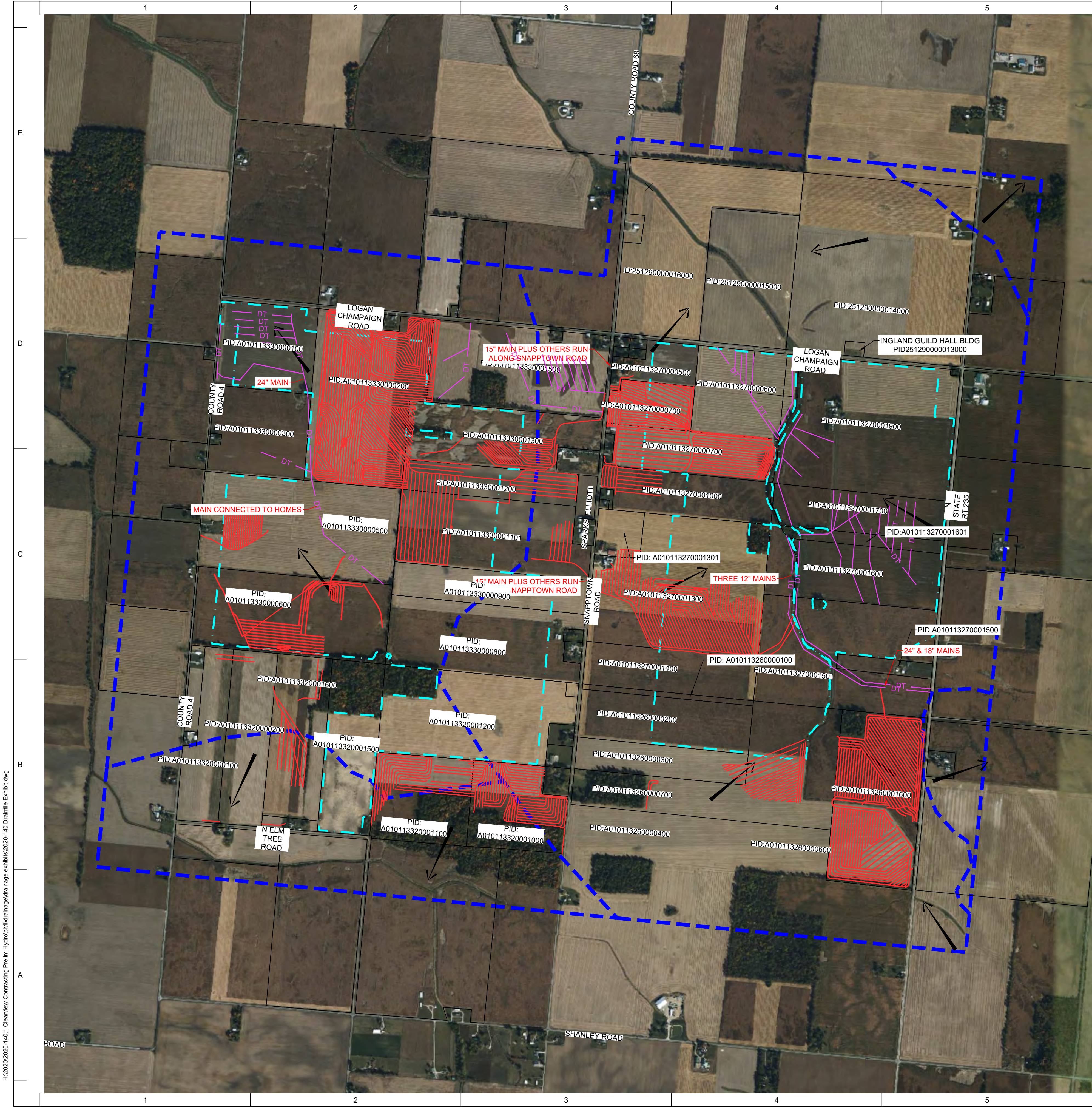
## **3.0 Recommendation**

It is the intent of Clearview Solar I, LLC to avoid negative impacts to existing drainage of the project property and surrounding properties by maintaining the functionality of the existing drain tile network. The project design and construction should seek to identify and avoid or reroute drain tile when possible. If successfully implemented, a composite map of existing drain tile can be assembled and added to the proposed engineering plans as a design constraint. When it is not possible to identify drain tile locations, the next priority will be to identify damaged drain tile and repair it. Damaged drain tile can be identified by the presence of water flowing out of the ground in an unexpected location. Excavating the area and following the source of the flowing water will lead to the broken pipe. All exploration and mitigation measures should be performed by a contractor experienced in the installation and repair of drain tile in the geographic region of the project.

## 4.0 Conclusion

Many megawatts of solar have been designed and constructed on agricultural land similar to the Clearview Solar project throughout the Midwest where drain tile is commonly used. The desire to maintain operable drain tile is universal and has similarly been addressed many times. Unknown drain tile locations can present a challenge, but one that can be overcome through a well-coordinated program of research, preliminary mapping, physical investigation, locating, surveying, and proposed design, like the one described in this assessment. Clearview Solar I, LLC is dedicated to successfully implementing such a program to ensure that nearby properties are not negatively impacted by damage to existing drain tile networks.





LEGEND

OO NWHL SD RHSD DWSDMSR  
C HM FDO SSD M  
NB SDC JMNVM C HMSH D  
OO NWHL SDC JMNVM  
C HMSH DE NL D H  
DT DT

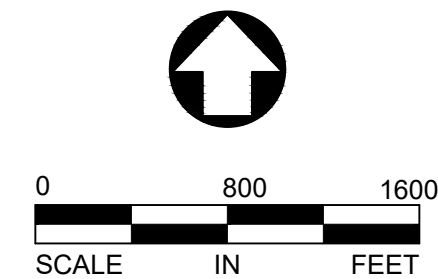


CLIENT  
OPEN ROAD  
RENEWABLES

PROJECT  
CLEARVIEW SOLAR

LOCATION  
CHAMPAIGN  
COUNTY, OHIO  
SUBMITTAL

SCALE



#	DATE	DESCRIPTION

DRAWN BY  
CJL  
DATE  
11.24.2020  
CHECKED BY  
DG  
PROJECT #  
2020-140

SHEET NAME  
DRAINTILE EXHIBIT  
OVERALL  
SHEET NUMBER  
EX-DT





LEGEND

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OO NWHL SD RHSD DWSDMSR  
RTAB SBGLDMS ANTC X  
C HM FDO SSD M  
NB SDC JMNVM C HMSH D  
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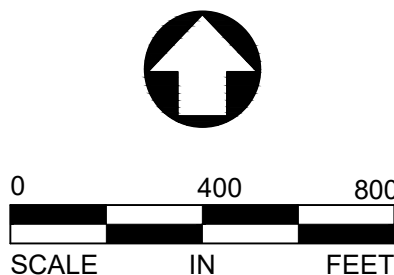


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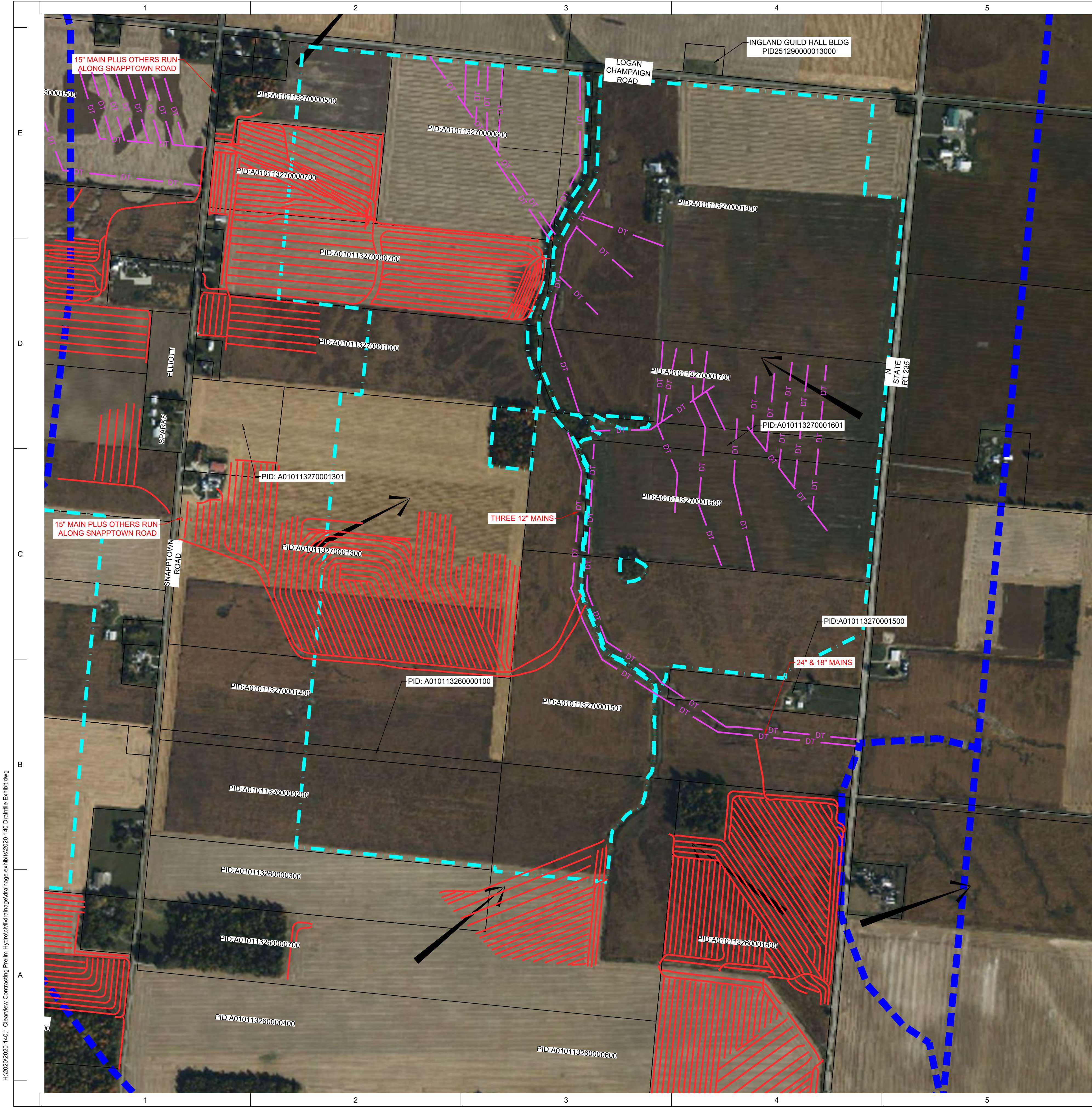
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**LEGEND**

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OO NWHL SD RHSD DWSDMSR

RTAB SBGLDMS ANTC X

C HM FDO SSD M

NB SDC JMNVM C HMSH D

OO NWHL SDC JMNVM

C HMSH DE NL D H

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CLIENT

**OPEN ROAD RENEWABLES**

PROJECT

**CLEARVIEW SOLAR**

LOCATION

**CHAMPAIGN COUNTY, OHIO**

SUBMITTAL

SCALE

0 400 800  
SCALE IN FEET

#	DATE	DESCRIPTION

DRAWN BY  
**CJL**

CHECKED BY  
**DG**

DATE  
**11.24.2020**

PROJECT #  
**2020-140**

SHEET NAME

**DRAINTILE EXHIBIT**

SHEET NUMBER

**EX-DT-2**

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**This foregoing document was electronically filed with the Public Utilities**

**Commission of Ohio Docketing Information System on**

**12/17/2020 6:34:00 PM**

**in**

**Case No(s). 20-1362-EL-BGN**

Summary: Application - Part 31 of 31 Ex. Z Preliminary Drain Tile Assessment electronically filed by Christine M.T. Pirik on behalf of Clearview Solar I, LLC