Arche Solar Project

Case No. 20-0979-EL-BGN

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Exhibit D

Hydrology and Geotechnical Desktop Study

HULL

Environment / Energy / Infrastructure

June 5, 2020

7X Energy, Inc.
Attn: Mr. Cliff Scher, Director of Project Development
3809 Juniper Trace, Suite 100
Austin, Texas 78738

RE: Groundwater, Hydrogeological and Geotechnical Desktop Document Review Summary Report for the Proposed Arche Energy Project in Fulton County, Ohio; XEN001.0003.

Dear Mr. Scher:

Hull & Associates, LLC (Hull) is pleased to provide 7X Energy, Inc. (Client) with this Desktop Document Review Summary Report of readily available geologic, hydrogeologic, and geotechnical information for the proposed Arche Energy Project located in Fulton County, Ohio (Project). The proposed development would construct a 107-megawatt AC (MW_{ac}) utility-scale solar energy facility on approximately 1,065 acres of rural property in Fulton County (Project Area). The proposed Facility includes approximately 675 acres of solar panels, along with associated infrastructure such as access roads, inverters, electrical collection lines, a meteorological station, and a project switchyard.

For this report, the following definitions have been used when describing the Project pursuant to the Ohio Power Siting Board's (OPSB's) current Ohio Administrative Code (OAC) rules (Chapter 4906-1-01):

- **Project Area:** "all land within a contiguous geographic boundary that contains the facility, associated setbacks, and properties under lease or agreement that contain any components of the facility" (OAC 4906-1-01(GG)).
- **Facility:** "the proposed major utility facility and all associated facilities" (OAC 4901-1-01(W)).
- **Study Area:** is defined by Hull to better describe the region outside of the Project Area that was included during database searches of available public information. The Study Area generally includes all of Fulton County, as well as adjacent counties, whose physical characteristics could globally impact the Project Area (e.g., floodplains, faults, regional geology).

PROJECT APPROACH

The Desktop Document Review was completed to gather applicable geologic, hydrogeological, and geotechnical information specified in the OPSB's current OAC rules (Chapter 4906-4) concerning certificate applications for electric generation facilities. A literature review of readily available hydrogeological and geotechnical documents was completed to develop a generalized understanding of the suitability of conditions within the Project Area for the construction of the proposed Facility. The information summarized in this report was obtained from available online databases and/or documents maintained or produced by the following federal, state, and local agencies:

1. Federal Emergency Management Agency (FEMA);
2. Ohio Department of Agriculture (ODA);
3. Ohio Department of Natural Resources (ODNR);
4. Ohio Environmental Protection Agency (Ohio EPA);
5. Ohio Department of Transportation District 2 (ODOT);
6. The Ohio State University, Agricultural Extension Office;
7. Office of the Fulton County Engineer;
8. United States Department of Agriculture (USDA); and
9. United States Geological Survey (USGS).

No environmental studies or structural evaluations were performed as part of the scope of work for this report, and therefore no information relative to environmental or structural considerations are included in this report.

PROJECT LOCATION

The proposed Project Area comprises approximately 1,065 acres of rural property in Gorham Township near the town of Fayette in Fulton County, Ohio, as shown on Figure 1and subsequent figures presented in this report.

INFORMATION REVIEW AND ANALYSIS

The following provides a summary of the information reviewed and its applicability to the proposed Project.

Regional Geology

The Study Area lies within the Maumee Lake Plains region of the Huron-Erie Lake Plains section of the Central Lowland Physiographic Region. This region is characterized as a flat-lying Ice-Age lake basin containing beach ridges, bars, dunes, deltas and clay flats. The Region formerly contained the Black Swamp, slightly dissected by modern streams. Surface elevations in the Maumee Lake Plains Region range from approximately 570 to 800 feet above mean sea level (msl) (Ohio Division of Geological Survey, 1998).

The surface topography within the Project Area is largely the result of the Wisconsinan-age ice-deposited ground moraine and wave-planed ground moraine. The surface deposits are characterized as Pleistocene-age silt, clay and wave-planed clayey till over Silurian- and Devonian-age carbonate rocks and shales (Ohio Division of Geological Survey, 2005).

The predominant uppermost bedrock units within the Project Area are the Coldwater Shale (Mc) and Sunbury/Bedford Shales, undivided (MDs) (see Figure 2). The Coldwater Shale is composed gray to greenish black, clayey and calcareous, thinly bedded shale ranging from 0 to over 150 feet in thickness. The Sunbury and Bedford Shales, undivided unit consists of dark brown to black carbonaceous shale in the upper 10-15 feet and gray silty shale below ranging from 0 to 100 feet in thickness. Both the Coldwater Shale and Sunbury/Bedford Shales, undivided are unexposed, overlain by Quaternary deposits (Ohio Division Geological Survey, 2006).

The bedrock topographic surface is shown on Figure 3. Bedrock dips east from 600 to 540 feet msl. across the Project Area. ODNR water well logs indicate bedrock was not encountered during well drilling of several domestic water wells in the Project Area.

Karst Topography

Information obtained from ODNR, Division of Geological Survey, indicated the Project Area lies west and northwest of the Bellevue-Castalia Karst Plain. No probable karst areas have been identified within the Project Area (see Figure 4). The nearest mapped karst feature, an inactive sink, is approximately 54 miles east of the Project Area in Washington Township, Sandusky County.

Seismicity

Structural features (e.g. faults, folds) and earthquake epicenters within the Study Area are shown on Figure 5. A review of the geologic and seismic information indicated that no historical earthquake epicenters are mapped within the Project Area or within Fulton County. The nearest seismic event occurred in 1926 and was a 3.4-magnitude earthquake located in Lucas County, Ohio, with an epicenter located approximately 35 miles east of the Project Area (ODNR Web, 2020). There are no mapped faults located within the Project Area. The two nearest mapped faults to the Project Area are the Maumee and the Bowling Green Fault Systems located approximately 30 miles east of the Project Area in Lucas County.

One of the most historically active seismic areas in Ohio, the Western Ohio Seismic Zone (WOSZ), is located approximately 100 miles south of the Project Area, although most seismic events associated with this zone have caused little to no damage to building structures. Given its relative proximity, the potential for the WOSZ to cause strong ground shaking at the Project Area is considered remote.

Hydrology and Hydrogeology

Surface water flow within the Project Area is generally toward the southeast. The entire Project Area is located within the Lake Erie Drainage Basin. Surface water bodies present within the Project Area include several small streams, tributaries, ditches, and ponds. The streams generally flow from the northwest to the southeast. Most of the surface water runoff flows into Spring Creek which generally bisects the central portion of the Project Area. Spring Creek flows into Deer Creek, Bean Creek, Tiffin River, Maumee River and Lake Erie.

Figure 6 was prepared using information obtained from the ODNR and FEMA and shows there are 100-year floodplain areas mapped inside the Project Area mostly surrounding Spring Creek, bisecting the central-northern and southeastern portions of the Project Area. Similarly, several small wetlands are mapped by the National Wetlands Inventory and are located within the Project Area mostly surrounding Spring Creek, Spring Brook, and unnamed tributaries.

The principal groundwater source for the majority of the Project Area is the unconsolidated, Williams Complex Aquifer. Groundwater yields from this aquifer can range up to 500 per minute (gpm) for properly constructed, large diameter wells. Recharge is moderate to low due to flatter topography and the relatively low permeability of the clayey soils that make up the vadose zone (Walker, 1991). The aquifer locations are shown on Figure 7.

The Project Area lies within a rural area. Some property owners within the Project Area utilize private wells to supply potable water. Locations of these water wells are shown in Figure 7. Water well location information was provided by ODNR, Ohio EPA, and the Fulton County Health Department.

The presence of Source Water Protection Areas (SWPAs) for public water systems within the Project Area was evaluated. SWPAs are areas defined and approved by the Ohio EPA for the purpose of protecting drinking water resources. The SWPA map provided by Ohio EPA, Division of Drinking and Ground Waters, included in Attachment A shows that the Archbold Corridor Management Zone is located within the Project Area. This area is delineated 500 feet on each bank of tributaries that transect the Project Area. The nearest downstream Groundwater Protection Area is located approximately 12 miles south of the Project Area (Ohio Environmental Protection Agency, 2020). This Groundwater Protection Area acts as a protective measure for potable water resources at two community wells located in Stryker, Ohio, which draws water from an unconsolidated aquifer approximately 142 feet from the ground surface (ODNR Web, 2020).

Environmental regulatory programs of the Ohio EPA, as well as other regulatory agencies such as the Ohio Bureau of Underground Storage Regulations (BUSTR), have adopted regulations that restrict specific activities within SWPAs. These activities include concentrated animal feeding operations, wastewater treatment land application systems, industrial, municipal and residual waste landfills, leaking underground storage tanks (LUSTs), and voluntary action program (VAP) cleanups. The restrictions typically apply to SWPAs relying on groundwater as their drinking water source. Hull has reviewed the range of programs which have adopted rules related to the presence of SWPAs and has concluded that construction of the proposed solar farm facility will not constitute an activity that would be restricted within either a surface water or groundwater SWPA.

Well Survey

Hull mailed a brief well survey to six property owners within the Project Area that were under contract with the Client at the time the hydrogeology review commenced in February 2020. A list of names and addresses for the property owners was provided to Hull by the Client. The survey included multiple questions regarding

the number, depth, installation date, and construction of wells on their properties. Additional information was requested regarding the aquifer type, depth to water, and yield of each well. The survey also requested information regarding any problems experienced by the property owners with their wells.

At the time this Desktop Document Review was completed, five surveys are confirmed delivered to property owners and Hull had received five responses. Copies of the well surveys are included in Attachment B.

Of the five survey respondents, four respondents reported having no wells on their property. Only one respondent confirmed a domestic well (i.e., drinking/potable) on their property. The well is reported to be a 4-inch diameter well drilled to 190 feet bgs with a steel casing. The respondent was unaware of the groundwater source, depth to water or approximate yield of the well.
Respondents were asked on the survey whether they had ever experienced problems with their wells related to the water table being lowered and/or poor yield. None of the respondents indicated that they have had to drill a new water well on their property.

Soil Survey

Soil surveys provide maps of surfical soils and general descriptions of the various soil types over the potentially present over the survey area and can be used as a tool to compare the suitability of large areas for general land uses. The USDA Soil Conservation Service Soil Survey of Fulton County (USDA, 1984) maps the majority of the surfical soils within the Project Area as Haskins loam (HkA) and Fulton silt loams (FtA) which cover approximately 16 and 15 percent of the Project Area, respectively. Sloan silty clay loam (So) covers approximately 10 percent of the Project Area. The remainder of the Project Area is covered by various silt loams as show in the soil types map, Figure 8.

The soil survey information suggests that the Fulton silt loams have 0 to 2 percent slopes and are somewhat poorly drained soils. The permeability of these soils is generally low to moderately high, the available water capacity is moderate (7.3 inches), and the depth to the top of the seasonal high-water table can range from 12 to 30 inches below ground surface (bgs). The Haskins loam have 0 to 3 percent slopes and are somewhat poorly drained soils. The permeability of these soils is low to moderately high, the available water capacity is moderate (7.5 inches), and the depth to the top of the seasonal high-water table is 12 to 30 inches bgs. The Sloan silty clay loam is frequently flooded with 0 to 2 percent slopes and are very poorly drained soils. The permeability of these soils is moderately high to high, the water capacity is high (about 10.4 inches), and the depth to the top of the seasonal high-water table is 0 to 12 inches bgs (USDA Web, 2020).

Underground and Surface Mines

Information obtained from the ODNR Division of Mineral Resources (ODNR, Web, 2020) indicates that there are no mapped abandoned underground or surface mines in the Project Area. Within the Study Area there are active and inactive sand and gravel surface mines mapped greater than 4 miles from the Project Area; one active mine due southeast and two inactive mines east of the Project Area. Soil survey information provided by the USDA further indicates that there are no surface mine quarries located in the Project Area (USDA, 2019). Figure 9 illustrates that no known coal, underground, abandoned, or surface mines are mapped within the Project Area.

PROJECT AREA RECONNAISSANCE

Hull completed a field reconnaissance, of the Project Area on March 23, 2020, to observe geotechnical-related site conditions including topography, surface geologic features, and surface water conditions. The areas within and adjoining the Project Area predominantly consist of agricultural fields. In general, the Project Area appears to be adequately drained. Based on a review of the existing topography of the Project Area and the visual observations completed by Hull during the reconnaissance, it is anticipated that the potential for rockfalls and landslides is very low due to the relative flat topography of the Project Area. In addition, Hull did not observe sinkholes, depressions, or evidence of karst topography within the Project Area. Representative photographs from the site reconnaissance and a photo location map are presented in Attachment C which illustrate the general Project Area conditions.

AGENCY INTERVIEWS

Hull contacted the ODOT District 2 and Fulton County Engineer's offices to inquire about their knowledge and experience of previous construction projects, subsurface conditions, and maintenance history within the Project Area. Conversations with Patrick McColley, PE, SI and Doug Rodger, PE with ODOT District 2 were ongoing and no geotechnical issues within the Project Area (i.e. US20) were identified at the time this report was issued. Hull also made multiple attempts to contact Frank Onweller, PE, PS and Bob Abbot at the Fulton County Engineer's Office but were unsuccessful in getting responses at the time this report was issued. It should be noted that ditch and drain tile crossings that are maintained by the County Engineer will likely require crossing permits.

PRELIMINARY CONSTRUCTION CONSIDERATIONS

Based on our experience with earthwork in the region and our understanding that solar array equipment is lightly loaded, and conventional driven steel piles and/or helical piles are typical foundation support for solar modules. However, this assumption will need to be confirmed through geotechnical exploration and evaluation for each solar array site (i.e., each solar module and associated access road locations). If it is determined that driven steel piles or helical piles are not suitable for structural support, alternate foundation systems, such as auger cast piles, concrete foundations, ballasted foundations, or rammed aggregate pier systems, may be necessary to support solar modules and site improvements. The Geotechnical Engineer should evaluate the subsurface conditions at the site as a basis for determining appropriate foundation support of the planned improvements, review foundation designs and suitability for the site soils, and approve the work prior to construction of foundation components.

Based on the information collected to date, it is anticipated that there will be limited risk associated with construction concerns related to the access roads. Like any preparation work related to access roads, localized subgrade areas may need to be stabilized by undercutting, chemical stabilization, placement of geogrid reinforcement, etc. However, this assumption will need to be confirmed by a geotechnical exploration and evaluation of each access road location.

Adequate surface water runoff drainage should be established at each solar array, access road, and other improvement locations to minimize the potential to increase in the moisture content of the subgrade material. Surface water runoff should be properly controlled and drained away from the work areas during construction. Positive drainage should be created by gently sloping the ground surface toward existing or proposed drainage swales. It should be noted that the subgrade soils are subject to shrinking and swelling with variation in seasonal moisture content and consideration should be given during constructability reviews to determine how best to deal with potential moisture fluctuations.

The contractors should be prepared to deal with groundwater seepage and/or surface water that may accumulate in excavations. Site dewatering may be required during construction if excavations extend below the water table, or significant precipitation events occur when foundation excavations are exposed. The contractor should be able to minimize the amount of excavation exposed at one time, especially when precipitation is forecasted. Fluctuations in the groundwater level may occur seasonally due to variations in rainfall, construction activity, surface runoff, and other factors. Because such variation is anticipated, we recommend that design drawings and specifications accommodate such considerations and that construction planning be based on the assumption that such variation can occur.

It is understood that the foundations and excavations are to be designed by the Client's structural designer. The contractor should be solely responsible for constructing stable, temporary excavations and should shore, slope, or bench the sides of excavations as required to maintain stability of both the excavation sides and bottoms. All excavations should comply with applicable local, state, and federal safety regulations including the current Occupational Safety and Health Administration (OSHA) Excavation and Trench Safety Standards (29 CFR Part 1926).

Based on a review of the soil survey information and our experience with earthwork in the Study Area, the soils are expected to be suitable for grading, compaction, and drainage when each solar array is prepared as discussed in the Geotechnical Engineering Report prepared for the project. Due to the anticipated depth

of bedrock, it is anticipated that excavation within bedrock will be unlikely within the Project Area. Furthermore, no karst areas were identified in the Project Area. These assumptions must be confirmed by geotechnical investigation prior to construction.

Additional considerations relative to site preparation, suitability of fill materials, fill placement and weather limitations are presented in Attachment D for reference. These considerations are provided as general guidelines and may not be applicable to site-specific conditions. The contractor is responsible for selecting and implementing the most appropriate construction techniques (e.g., construction means, methods, sequences or procedures, and safety precautions or programs) for each site-specific condition(s).

SUMMARY

Based on the information reviewed to date and the field reconnaissance, it does not appear that the local geology and/or hydrogeology will be prohibitive regarding construction of the proposed solar modules, access roads, and associated site improvements. Likewise, based on Hull's knowledge of typical solar module foundation construction, it does not appear that the construction of the proposed solar array will have a significant impact on the local geology and/or hydrogeology of the Project Area.

Although the exact location of each potable use well cannot be determined with the information obtained to date, it is assumed that the potable wells are located in close proximity to each property owners' residence. Therefore, based on the information presented herein and the associated analysis, construction and operation of the Facility is not anticipated to result in any significant negative impact to public and private water supplies.

The 100-year floodplain areas mapped within the Project Area are mostly surrounding Spring Creek which bisects the central-northern and southeastern portions of the Project Area. Construction and operation of the Facility is anticipated to only necessitate minor grading that would not result in significant changes to the topography within the Project Area. Therefore, construction and operation of the Facility is not anticipated to result in any significant negative impact to the 100-year floodplain.

Based on the information reviewed and the field reconnaissance, it appears that the primary geotechnical consideration for design and construction of the solar arrays, access roads, and site development is variable subsurface conditions (e.g., depth of fill soils, unsuitable subgrade conditions, weak soils, groundwater). As previously discussed, adequate surface water drainage should be established at within the Project Area to minimize the potential to increase in the moisture content of the subgrade materials. Surface water drainage can be managed by implementing techniques such as surface water swales, drainage berms, etc. Furthermore, foundation system design for each solar array should consider the findings and recommendations of the geotechnical subsurface investigation and laboratory testing.

Site-specific geotechnical information should be obtained by the Client prior to design of the solar array foundations, and prior to preparation of construction specifications and design plans. This may require, but not be limited to, completion of geotechnical explorations to further evaluate the subsurface conditions at each module. A generalized scope of work template for the geotechnical explorations has been provided in Attachment E which can be used to prepare detailed Requests for Proposals for the solar array.

The conclusions included in this Desktop Document Review are based on general summaries available through the resources previously listed. There may be anomalies in the hydrogeology or geotechnical conditions of a specific Facility that cannot be resolved at the scale of the publicly available data used in this study. As noted previously, site-specific geotechnical information should be obtained prior to final solar array foundation design and construction.

STANDARD OF CARE

Hull has performed its services using that degree of care and skill ordinarily exercised under similar conditions by reputable members of its profession practicing in the same or similar locality at the time of service. No other warranty, expressed or implied, is made or intended by our proposal or by our oral or written reports. The work does not attempt to evaluate past or present compliance with

federal, state, or local environmental or land use laws or regulations. Conclusions presented by Hull regarding the area within the Project Area are consistent with the Scope of Work, level of effort specified, and investigative techniques employed. Reports, opinions, letters, and other documents do not evaluate the presence or absence of any condition not specifically analyzed and reported. Hull makes no guarantees regarding the completeness or accuracy of any information obtained from public or private files or information provided by subcontractors.

If you have any questions regarding the summary and conclusions presented in this Desktop Document Review, please do not hesitate to contact either of the undersigned at your convenience.

Sincerely,

Ted Wallace
Hydrogeologist II

Christopher M. Kokesh, P.E.
Geotechnical Engineering Practice Leader

attachments

REFERENCES

1. Ohio Department of Natural Resources. *Water Well Log and Drilling Report*. Retrieved February 2020, from Division of Water website: https://apps.ohiodnr.gov/water/maptechs/wellogs/app/.

2. Ohio Department of Natural Resources, *Descriptions of Geologic Map Units*. Retrieved February 2020, from Division of Geological Survey website: http://geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/Misc_State_Maps&Pubs/mapunits.pdf.

3. Ohio Department of Natural Resources. *ODNR Mines of Ohio Viewer*. Retrieved February 2020, from website: https://gis.ohiodnr.gov/MapViewer/?config=OhioMines

4. Ohio Department of Natural Resources. *Ohio Earthquake Epicenters*. Retrieved February 2020, from Geographic Information Systems website: https://gis.ohiodnr.gov/MapViewer/?config=Earthquakes.

5. Ohio Division of Geological Survey, 1998, Physiographic regions of Ohio: Ohio Department of Natural Resources, Division of Geological Survey, page-size map with text, 2p., scale 1:2,100,000.

6. Ohio Division of Geological Survey, 2006, Bedrock Geologic Map of Ohio: Ohio Division of Geological Survey Map BG-1, version 6.0, scale 1:500,000.

7. Ohio Division of Geological Survey, rev. 2006, Ohio Karst Areas: Ohio Department of Natural Resources, Division of Geological Survey, page-size map with text, 2p., scale 1:2,000,000.

8. Ohio Division of Geological Survey, 2005, Glacial Map of Ohio: Ohio Department of Natural Resources, Division of Geological Survey, page-size map with text, 2p., scale 1:2,000,000.

9. Ohio Division of Geological Survey, 2012, Earthquake Epicenters in Ohio and Adjacent Areas: Ohio Department of Natural Resources, Division of Geological Survey, page-size map., scale 1:2,000,000.

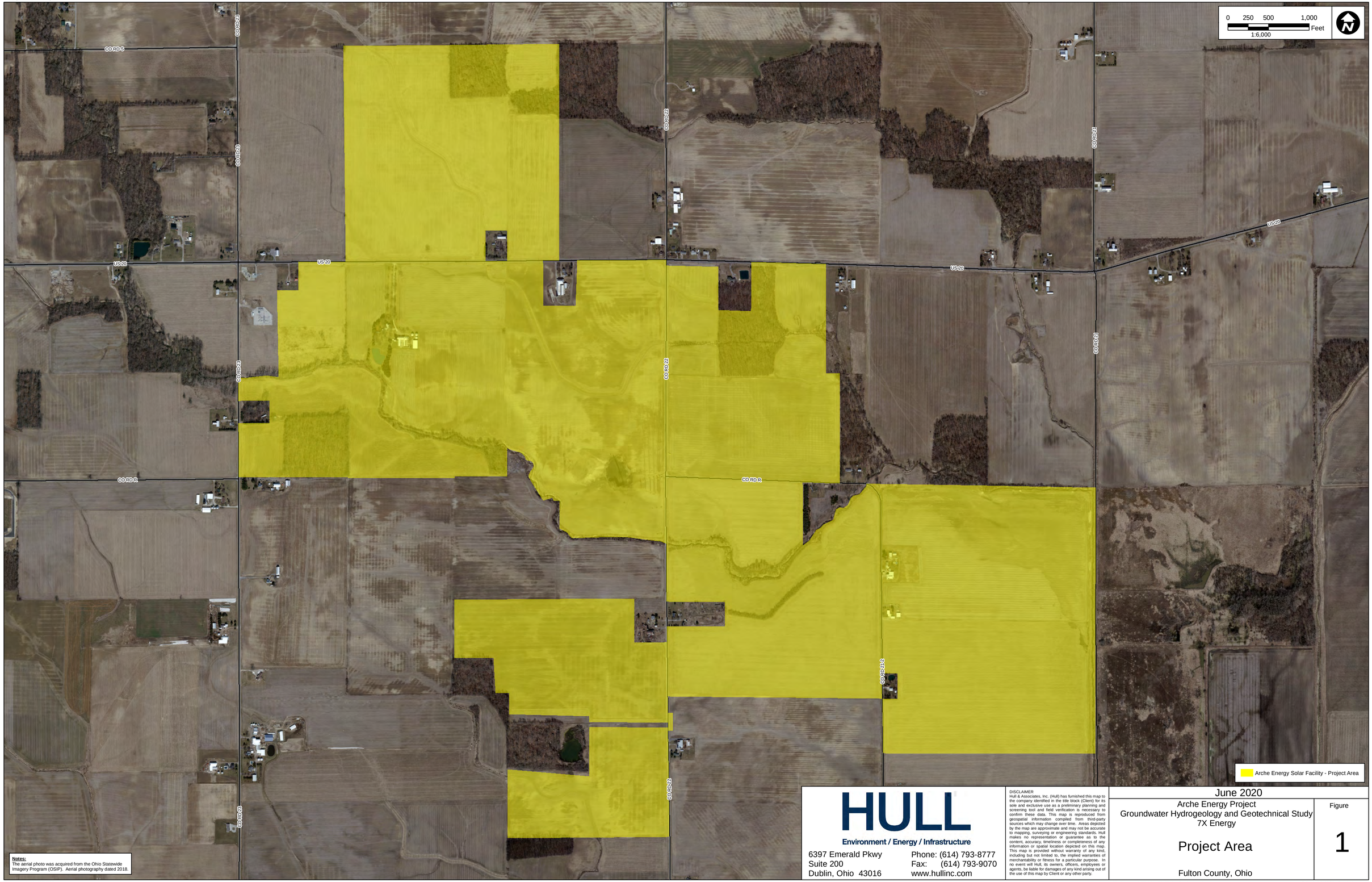
10. Ohio Environmental Protection Agency. Drinking Water Source Protection Areas – Groundwater Public Water Systems. Retrieved February 2020, from website: https://oepa.maps.arcgis.com/apps/webappviewer/index.html?id=3b39e11ba7fc43c3b41801e3580e6d21

11. United States Department of Agriculture, Soil Conservation Service, Soil Survey of Fulton County, 1984.

12. United States Department of Agriculture, *Web Soil Survey*. Retrieved February 2020, from Natural Resources Conservation Service-site: https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

13. Walker, Alfred C., 1991, Ground-Water Resources of Fulton County, Ohio Department of Natural Resources, Division of Water.

FIGURES



Notes:
The aerial photo was acquired from the Ohio Statewide Imagery Program (OSIP). Aerial photography dated 2018.

Produced using ArcGIS 10.7

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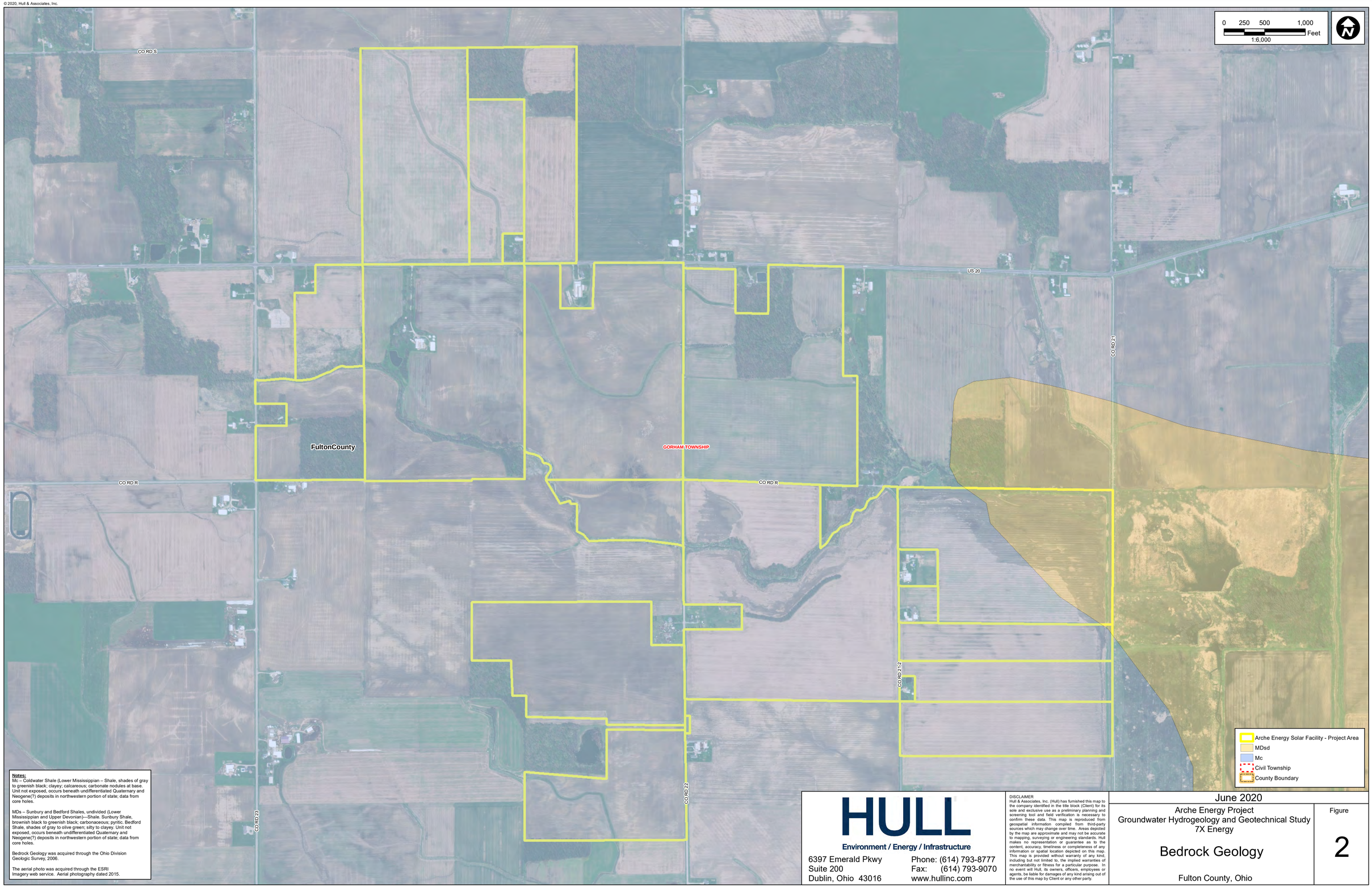
Project Area

Fulton County, Ohio

Figure 1

File Name: XEN001_01_Fig01_Review.mxd

Edited: 6/5/2020 By: rkaip



Notes:

Mc – Coldwater Shale (Lower Mississippian – Shale, shades of gray to greenish black; clayey; calcareous; carbonate nodules at base. Unit not exposed, occurs beneath undifferentiated Quaternary and Neogene(?) deposits in northwestern portion of state; data from core holes.

MDs – Sunbury and Bedford Shales, undivided (Lower Mississippian and Upper Devonian)—Shale. Sunbury Shale, brownish black to greenish black; carbonaceous; pyritic. Bedford Shale, shades of gray to olive green; silty to clayey. Unit not exposed, occurs beneath undifferentiated Quaternary and Neogene(?) deposits in northwestern portion of state; data from core holes.

Bedrock Geology was acquired through the Ohio Division Geologic Survey, 2006.

The aerial photo was acquired through the ESRI Imagery web service. Aerial photography dated 2015.

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Bedrock Geology

Fulton County, Ohio

Figure 2

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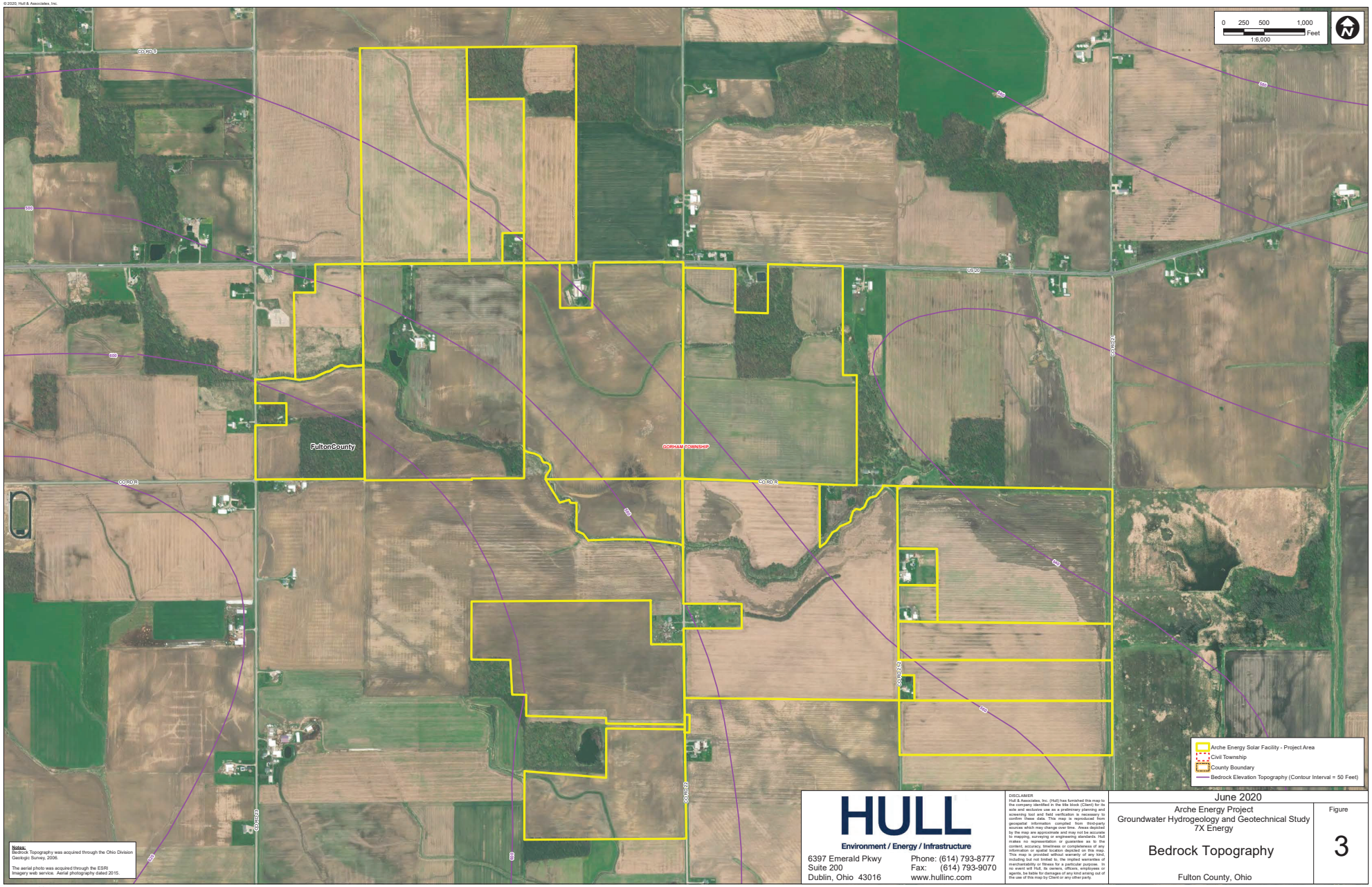
File Name: XEN001_01_Fig02_BedrockGeol.mxd

Edited: 6/5/2020 By: rkaip



Notes:
Bedrock Topography was acquired through the Ohio Division Geologic Survey, 2006.

The aerial photo was acquired through the ESRI imagery web service. Aerial photography dated 2015.

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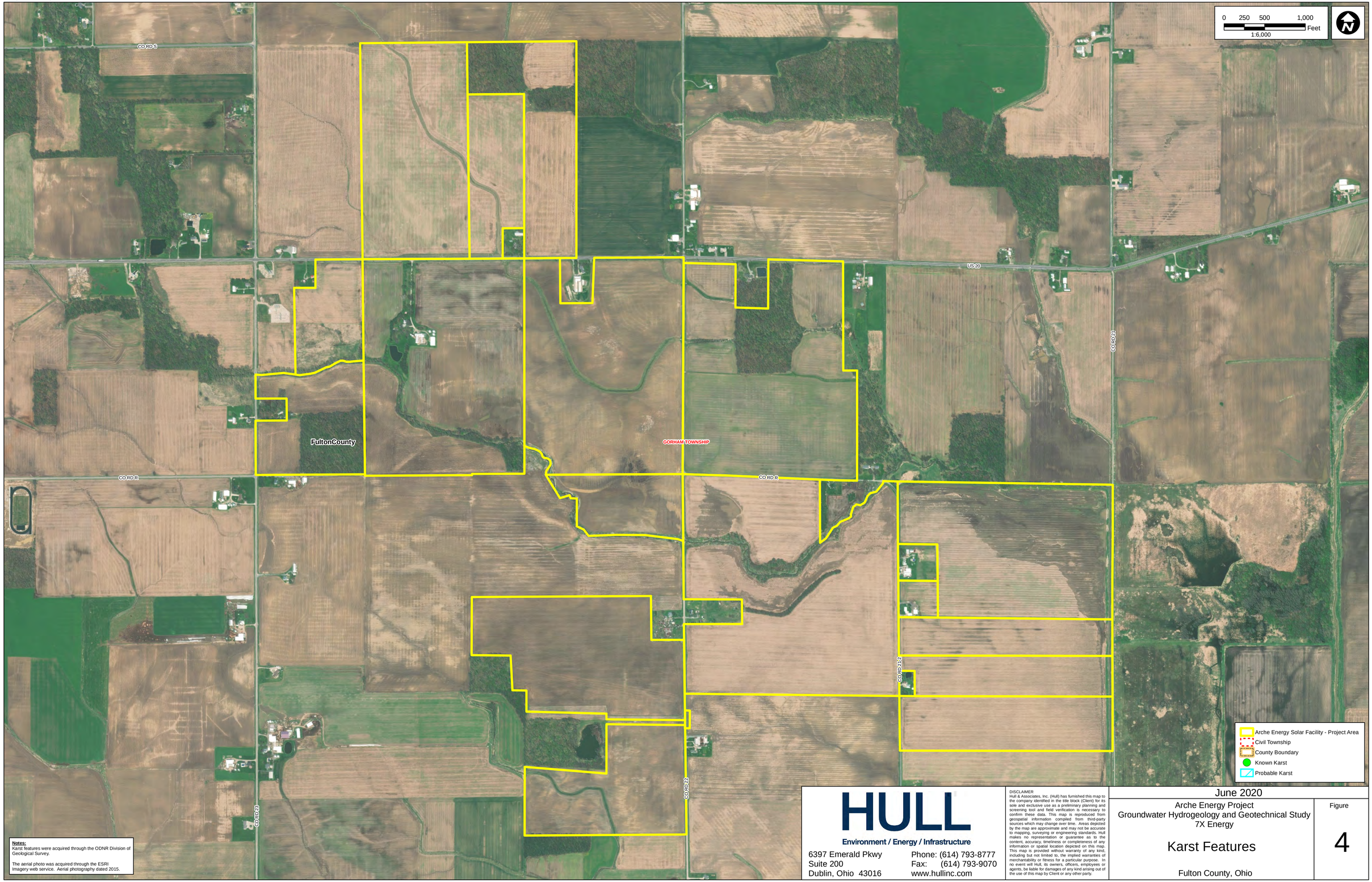
Bedrock Topography

Fulton County, Ohio

Figure 3

File Name: XEN001_01_Fig03_BedrockTopo.mxd

Edited: 6/5/2020 By: rkalp



Notes:
Karst features were acquired through the ODNR Division of Geological Survey.

The aerial photo was acquired through the ESRI Imagery web service. Aerial photography dated 2015.

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Karst Features

Fulton County, Ohio

Figure 4

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File Name: XEN001_01_Fig04_Karst.mxd

Edited: 6/5/2020 By: rkaip

0 2.5 5 10 Miles
1:150,000

Project Area
Earthquake Epicenter
Fault Line
Tectonic Anomalies
County Boundary

Notes:
Seismic features were acquired through the ODNR Ohio Earthquake Epicenter Web Application, 2020.

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Structural and Seismic Features

Fulton County, Ohio

Figure 5

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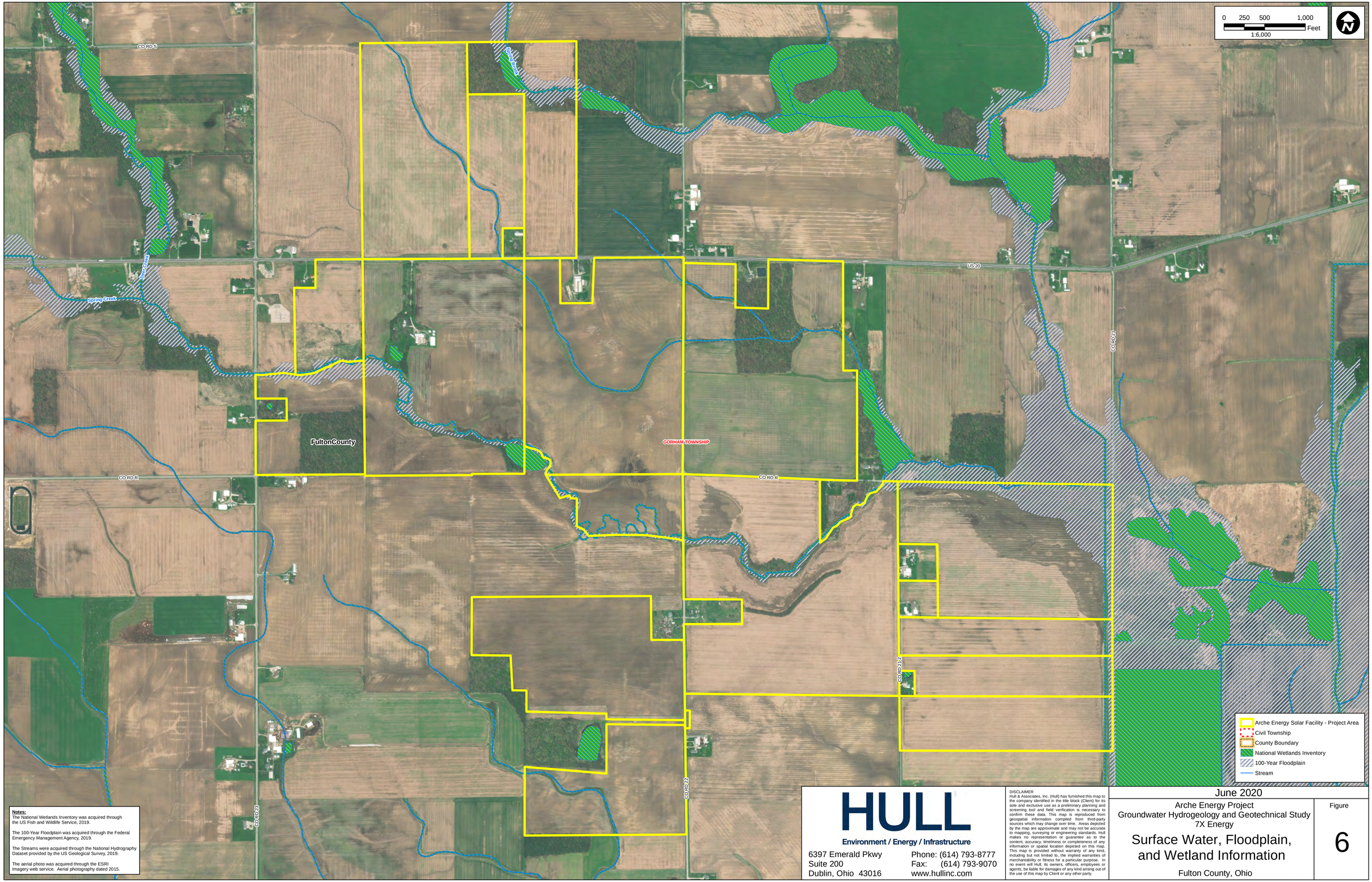
File Name: XEN001_01_Fig05_Geophysical.mxd

Edited: 6/5/2020 By: rkaip



Notes:
The National Wetlands Inventory was acquired through the US Fish and Wildlife Service, 2019.

The 100-Year Floodplain was acquired through the Federal Emergency Management Agency, 2019.

The Streams were acquired through the National Hydrography Dataset provided by the US Geological Survey, 2019.

The aerial photo was acquired through the ESRI Imagery web service. Aerial photography dated 2015.

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Surface Water, Floodplain, and Wetland Information

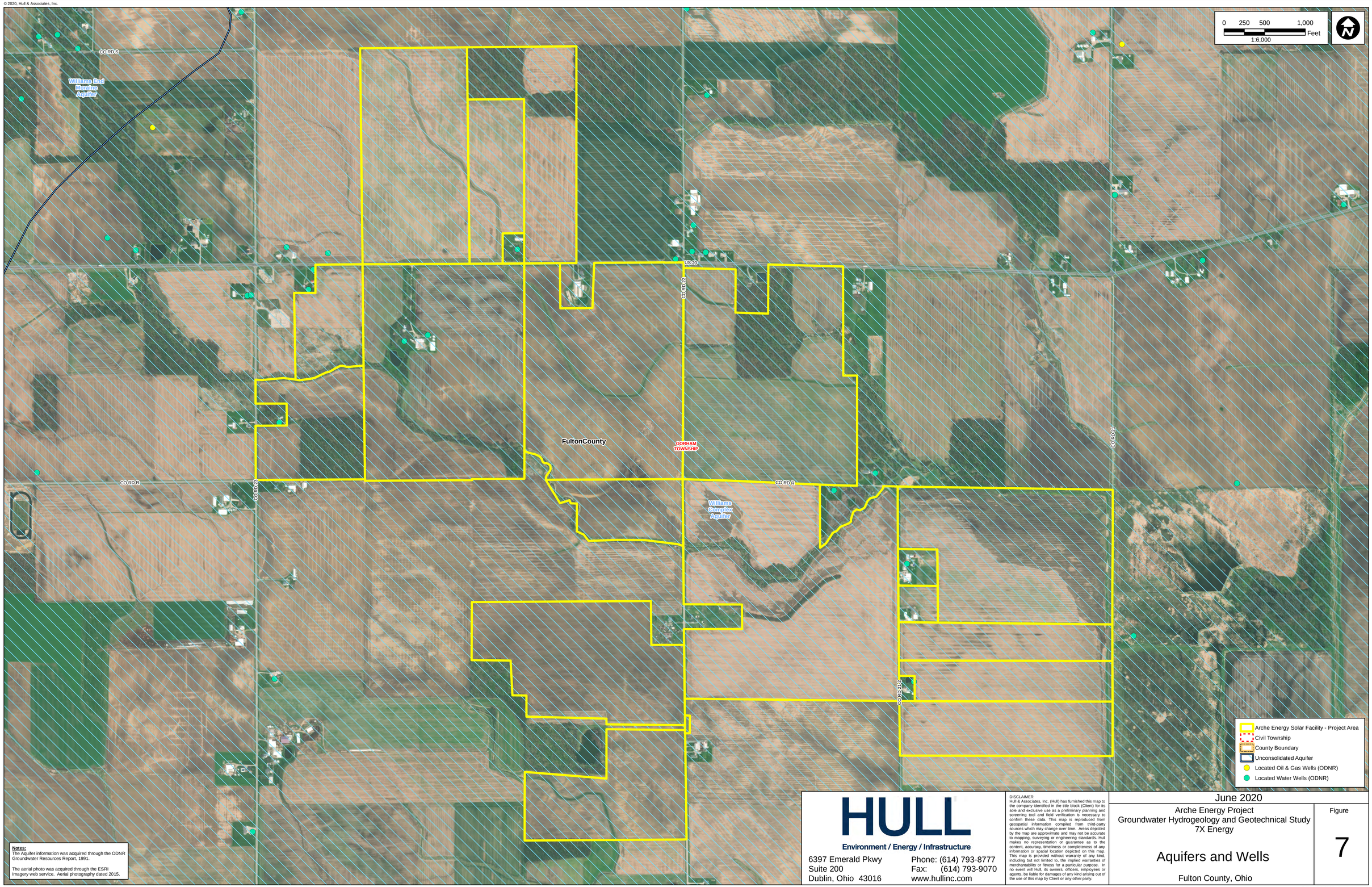
Fulton County, Ohio

Figure 6

Produced using ArcGIS 10.7

File Name: XEN001_01_Fig06_Eco.mxd

Edited: 6/5/2020 By: rkaip



Notes:
The Aquifer information was acquired through the ODNR Groundwater Resources Report, 1991.

The aerial photo was acquired through the ESRI Imagery web service. Aerial photography dated 2015.

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Aquifers and Wells

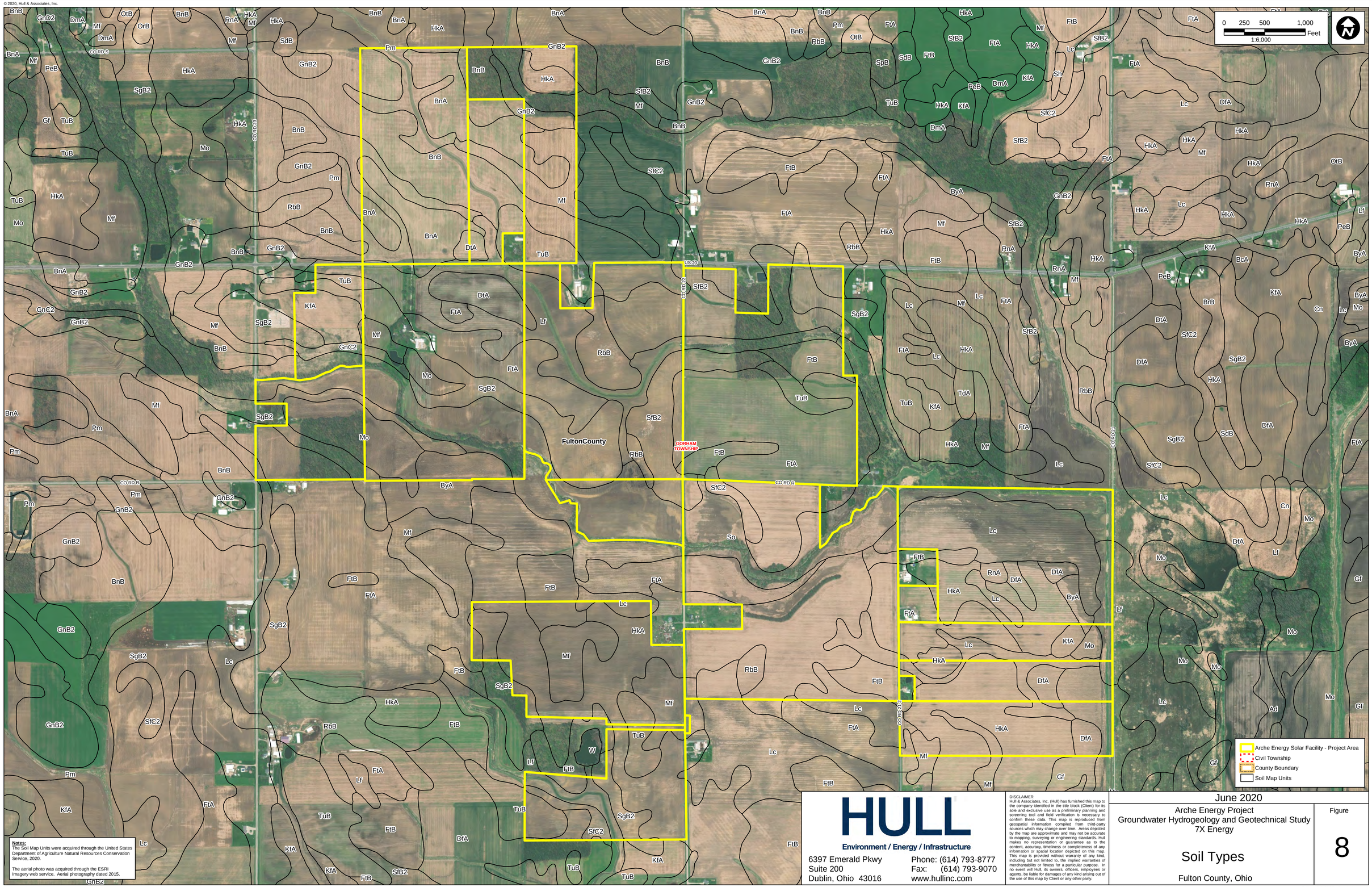
Fulton County, Ohio

Figure 7

Produced using ArcGIS 10.7

File Name: XEN001_01_Fig07_Wells.mxd

Edited: 6/5/2020 By: rkaip



Notes:
The Soil Map Units were acquired through the United States Department of Agriculture Natural Resources Conservation Service, 2020.

The aerial photo was acquired through the ESRI Imagery web service. Aerial photography dated 2015.

Produced using ArcGIS 10.7

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June 2020

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Groundwater Hydrogeology and Geotechnical Study
7X Energy

Soil Types

Fulton County, Ohio

Figure 8

File Name: XEN001_01_Fig08_Soils.mxd

Edited: 6/5/2020 By: rkaip

0 2.5 5 10 Miles

1:150,000

Notes:
The Mining Information was acquired through the ODNR Division of Mineral Resources, 2019.

Project Area
County Boundary
Surface Affected Area
Industrial Minerals - Surface Mine
Active
Inactive

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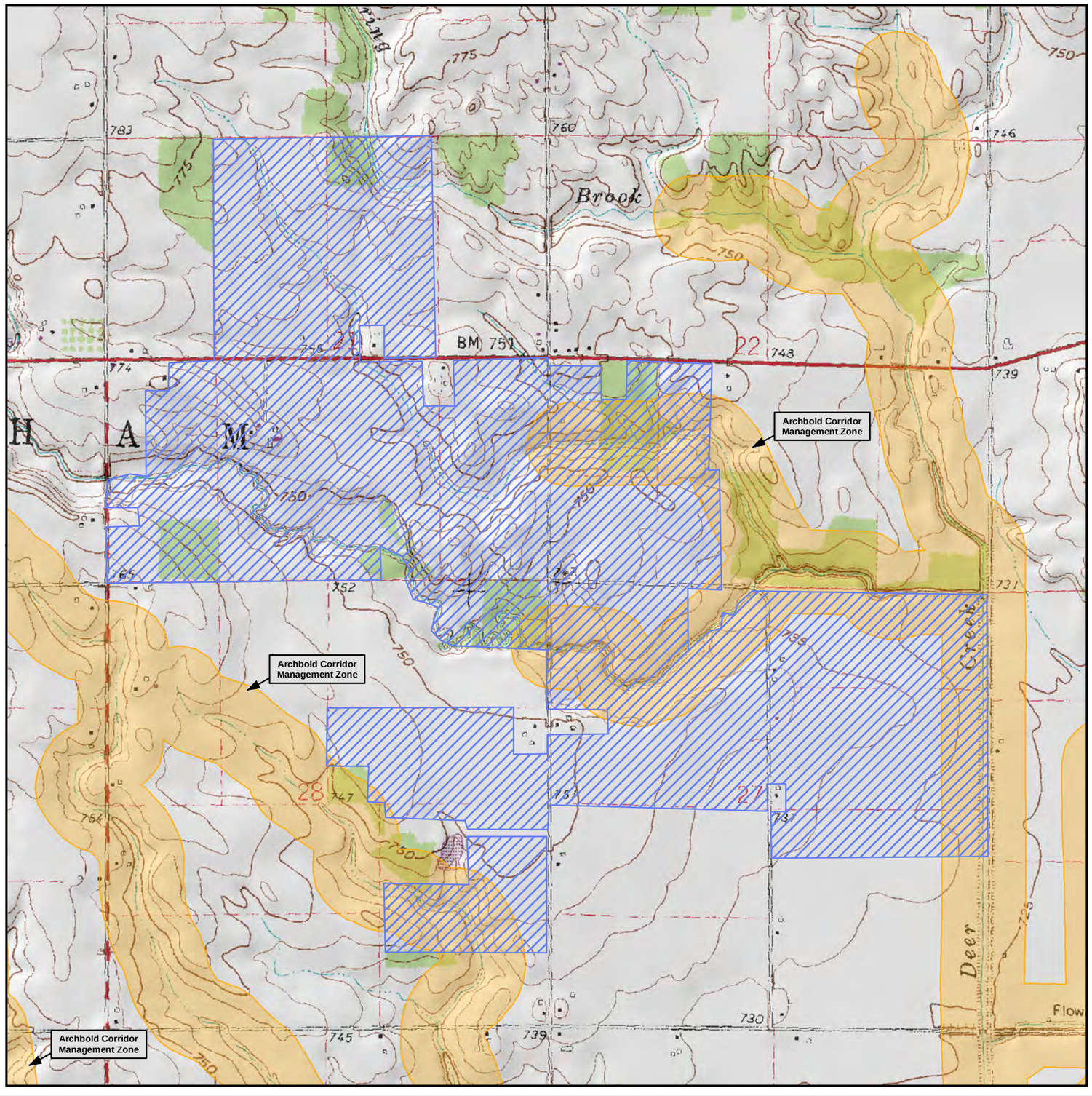
Underground and Suface Mines in Study Area

Fulton County, Ohio

Figure 9

ATTACHMENT A

Ohio EPA SWPA



Drinking Water Source Protection Areas and Sole Source Aquifers near the Arche Energy Solar Facility Gorham Township, Fulton County

Scale 0 1,000 2,000 4,000 Feet

0 0.25 0.5 1 Mile

N

USGS 7.5 Minute Quadrangle Topo Maps: Fayette (1972)

Map created March 2, 2020

EXPLANATION

Approximate Project Area

Drinking Water Source Protection Areas - Ground Water Sources

Protection Area (Outer line = 5-year time-of-travel)

Inner Management Zone (Inner line = 1-year time-of-travel)

Label text reflects system type as defined in Chapter 3745-81-01 of the Ohio Administrative Code as noted below.

Community Water System Non-Transient, Non-Community Water System *Transient, Non-Community Water System*

Drinking Water Source Protection Areas - Surface Water Sources

Corridor Management Zone

Emergency Management Zone

Critical Assessment Zone (Lake Erie systems only)

Potential Influence Zone (Lake Erie systems only)

Zone of Critical Concern (Ohio River systems only)

Label text reflects system type as defined in Chapter 3745-81-01 of the Ohio Administrative Code as noted below.

Community Water System Non-Transient, Non-Community Water System *Transient, Non-Community Water System*

Sole Source Aquifer

The sole source aquifers displayed on this map represent the area as designated by U.S. EPA.

Ohio Environmental Protection Agency

Division of Drinking and Ground Waters

ATTACHMENT B

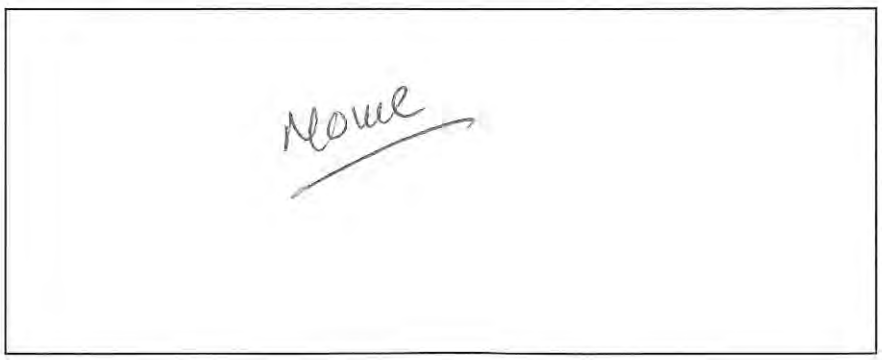
Well Survey Responses

WELL SURVEY QUESTIONNAIRE

PLEASE FILL OUT THE FOLLOWING QUESTIONNAIRE TO THE BEST OF YOUR KNOWLEDGE. IF YOU ARE NOT SURE OF THE ANSWER TO A QUESTION, PLEASE COMMENT AS "UNKNOWN". AFTER COMPLETION, PLEASE RETURN THIS QUESTIONNAIRE IN THE ENCLOSED STAMPED ENVELOPE.

1. Name and Contact Info: Ronald Rupp
2. How Many Wells Do You Have On Your Property? -0-
3. Are You Connected/Provided with Municipal Water (i.e., water provided by town or private water supply company)? NO
4. Are the Wells Used for Domestic Purposes (i.e., Drinking/Potable Water) and/or for Irrigation Purposes? N/A
5. Approximate Depth of Well(s)? N/A
6. Diameter of Well(s)? N/A
7. Type of Well/Groundwater Source (i.e., Bedrock Well – B; or Overburden/Sand-Gravel Well – O/SG)? N/A
8. Type of Well Construction (i.e., Steel Casing – SC; PVC; brick/clay – B/C; Other – O)? None
9. Date of Installation of Well(s)? -0-
10. Depth to Water/Groundwater Within Well (or depth to water encountered during drilling of well)? -0-
11. Approximate Yield of Well(s) [i.e., referenced in gallons per minute (gpm)]? -0-
12. Have You Ever Had to Drill a New Well Due to Lowering of Water Table or Poor Well Yield (if yes, indicate reason)? -0-

DIAGRAM OF WELL LOCATION(S) (If known, please provide a rough sketch of where your well(s) are with respect to your approximate property boundaries and/or permanent structures/buildings):

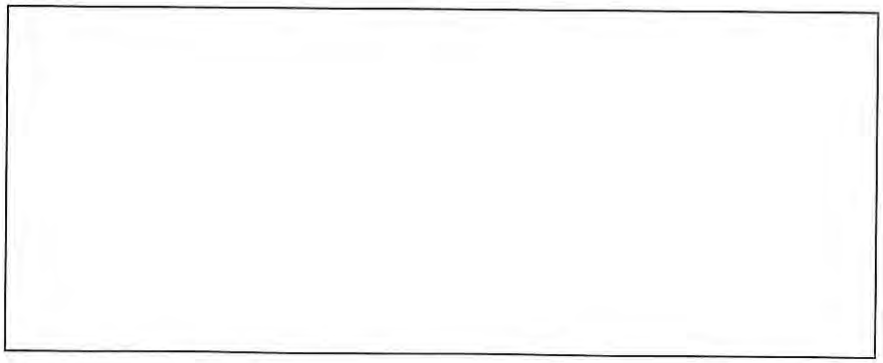


WELL SURVEY QUESTIONNAIRE

PLEASE FILL OUT THE FOLLOWING QUESTIONNAIRE TO THE BEST OF YOUR KNOWLEDGE. IF YOU ARE NOT SURE OF THE ANSWER TO A QUESTION, PLEASE COMMENT AS "UNKNOWN". AFTER COMPLETION, PLEASE RETURN THIS QUESTIONNAIRE IN THE ENCLOSED STAMPED ENVELOPE.

1. Name and Contact Info: Ben Kuntz 419-583-0058
2. How Many Wells Do You Have On Your Property? 0
3. Are You Connected/Provided with Municipal Water (i.e., water provided by town or private water supply company)?
4. Are the Wells Used for Domestic Purposes (i.e., Drinking/Potable Water) and/or for Irrigation Purposes?
5. Approximate Depth of Well(s)?
6. Diameter of Well(s)?
7. Type of Well/Groundwater Source (i.e., Bedrock Well – B; or Overburden/Sand-Gravel Well – O/SG)?
8. Type of Well Construction (i.e., Steel Casing – SC; PVC; brick/clay – B/C; Other – O)?
9. Date of Installation of Well(s)?
10. Depth to Water/Groundwater Within Well (or depth to water encountered during drilling of well)?
11. Approximate Yield of Well(s) [i.e., referenced in gallons per minute (gpm)]?
12. Have You Ever Had to Drill a New Well Due to Lowering of Water Table or Poor Well Yield (if yes, indicate reason)?

DIAGRAM OF WELL LOCATION(S) (If known, please provide a rough sketch of where your well(s) are with respect to your approximate property boundaries and/or permanent structures/buildings):

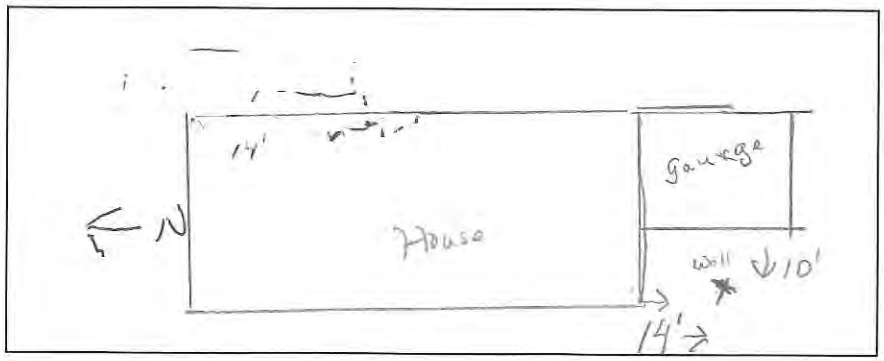


WELL SURVEY QUESTIONNAIRE

PLEASE FILL OUT THE FOLLOWING QUESTIONNAIRE TO THE BEST OF YOUR KNOWLEDGE. IF YOU ARE NOT SURE OF THE ANSWER TO A QUESTION, PLEASE COMMENT AS "UNKNOWN". AFTER COMPLETION, PLEASE RETURN THIS QUESTIONNAIRE IN THE ENCLOSED STAMPED ENVELOPE.

1. Name and Contact Info: William & Sandra McKinney
2. How Many Wells Do You Have On Your Property? 1
3. Are You Connected/Provided with Municipal Water (i.e., water provided by town or private water supply company)? NO
4. Are the Wells Used for Domestic Purposes (i.e., Drinking/Potable Water) and/or for Irrigation Purposes? Yes
5. Approximate Depth of Well(s)? 190'
6. Diameter of Well(s)? 4"
7. Type of Well/Groundwater Source (i.e., Bedrock Well – B; or Overburden/Sand-Gravel Well – O/SG)? Unknown
8. Type of Well Construction (i.e., Steel Casing – SC; PVC; brick/clay – B/C; Other – O)? SC
9. Date of Installation of Well(s)? 1964
10. Depth to Water/Groundwater Within Well (or depth to water encountered during drilling of well)? Unknown
11. Approximate Yield of Well(s) [i.e., referenced in gallons per minute (gpm)]? Unknown
12. Have You Ever Had to Drill a New Well Due to Lowering of Water Table or Poor Well Yield (if yes, indicate reason)? NO

DIAGRAM OF WELL LOCATION(S) (If known, please provide a rough sketch of where your well(s) are with respect to your approximate property boundaries and/or permanent structures/buildings):

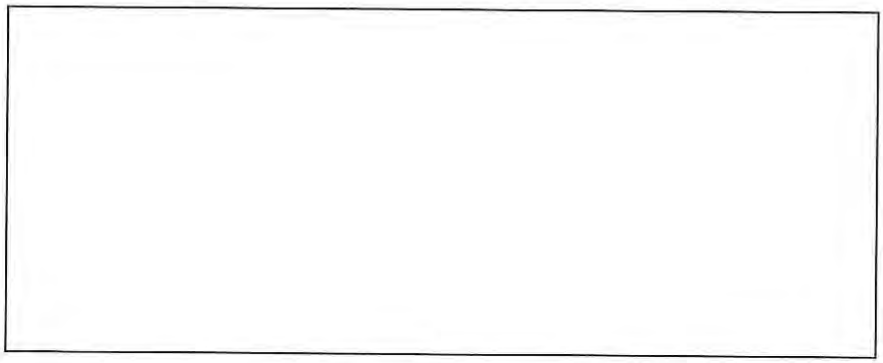


WELL SURVEY QUESTIONNAIRE

PLEASE FILL OUT THE FOLLOWING QUESTIONNAIRE TO THE BEST OF YOUR KNOWLEDGE. IF YOU ARE NOT SURE OF THE ANSWER TO A QUESTION, PLEASE COMMENT AS "UNKNOWN". AFTER COMPLETION, PLEASE RETURN THIS QUESTIONNAIRE IN THE ENCLOSED STAMPED ENVELOPE.

1. Name and Contact Info: DAREN MEYERS
2. How Many Wells Do You Have On Your Property? NONE
3. Are You Connected/Provided with Municipal Water (i.e., water provided by town or private water supply company)? NO
4. Are the Wells Used for Domestic Purposes (i.e., Drinking/Potable Water) and/or for Irrigation Purposes?
5. Approximate Depth of Well(s)?
6. Diameter of Well(s)?
7. Type of Well/Groundwater Source (i.e., Bedrock Well – B; or Overburden/Sand-Gravel Well – O/SG)?
8. Type of Well Construction (i.e., Steel Casing – SC; PVC; brick/clay – B/C; Other – O)?
9. Date of Installation of Well(s)?
10. Depth to Water/Groundwater Within Well (or depth to water encountered during drilling of well)?
11. Approximate Yield of Well(s) [i.e., referenced in gallons per minute (gpm)]?
12. Have You Ever Had to Drill a New Well Due to Lowering of Water Table or Poor Well Yield (if yes, indicate reason)? NO

DIAGRAM OF WELL LOCATION(S) (If known, please provide a rough sketch of where your well(s) are with respect to your approximate property boundaries and/or permanent structures/buildings):

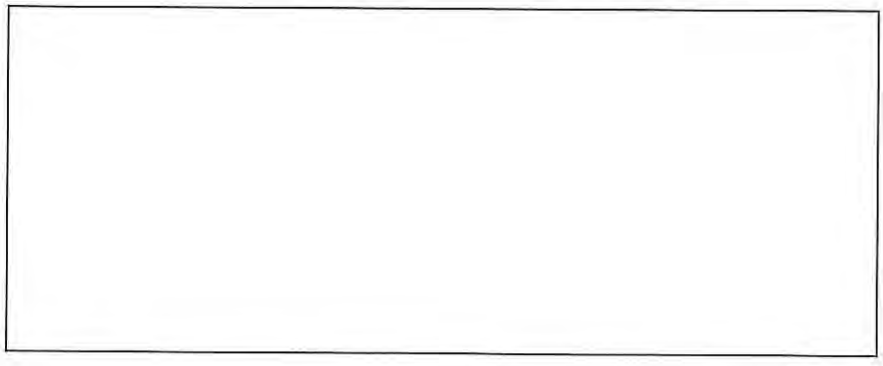


WELL SURVEY QUESTIONNAIRE

PLEASE FILL OUT THE FOLLOWING QUESTIONNAIRE TO THE BEST OF YOUR KNOWLEDGE. IF YOU ARE NOT SURE OF THE ANSWER TO A QUESTION, PLEASE COMMENT AS "UNKNOWN". AFTER COMPLETION, PLEASE RETURN THIS QUESTIONNAIRE IN THE ENCLOSED STAMPED ENVELOPE.

1. Name and Contact Info: Jerry Short, Trustee
2. How Many Wells Do You Have On Your Property? None
3. Are You Connected/Provided with Municipal Water (i.e., water provided by town or private water supply company)? None
4. Are the Wells Used for Domestic Purposes (i.e., Drinking/Potable Water) and/or for Irrigation Purposes?
5. Approximate Depth of Well(s)?
6. Diameter of Well(s)?
7. Type of Well/Groundwater Source (i.e., Bedrock Well – B; or Overburden/Sand-Gravel Well – O/SG)?
8. Type of Well Construction (i.e., Steel Casing – SC; PVC; brick/clay – B/C; Other – O)?
9. Date of Installation of Well(s)?
10. Depth to Water/Groundwater Within Well (or depth to water encountered during drilling of well)?
11. Approximate Yield of Well(s) [i.e., referenced in gallons per minute (gpm)]?
12. Have You Ever Had to Drill a New Well Due to Lowering of Water Table or Poor Well Yield (if yes, indicate reason)?

DIAGRAM OF WELL LOCATION(S) (If known, please provide a rough sketch of where your well(s) are with respect to your approximate property boundaries and/or permanent structures/buildings):



ATTACHMENT C

Photographs from March 23, 2020 Site Reconnaissance

PHOTO 1: View at the east end of County Road R at intersection of County Road 23 looking northeast.

PHOTO 2: View of the northern portion of Project Area from U.S. 20 looking north.

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7X Energy
Arche Energy Project

Site Photographs

Fulton County, Ohio

Date: JUNE 2020

Project Number: XEN001

File Name: XEN001.0001.xslx

PHOTO 3: View at the southwest corner of U.S. 20 and County Road 22 facing southwest.

PHOTO 4: View near the southeast corner of County Road and County Road R facing south east.

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Site Photographs

Fulton County, Ohio

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PHOTO 5: View of the eastern portion of the Project Area from County Road 21 facing west.

PHOTO 6: View of the south portion of the Project Area from County Road 22 facing west.

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Fulton County, Ohio

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File Name: XEN001.0001.xslx

ATTACHMENT D

General Earthwork Recommendations

GENERAL EARTHWORK RECOMMENDATIONS

Earthwork is most efficiently accomplished using large, heavy-duty equipment, unimpeded by obstacles. Consequently, it is preferable to complete as much of this work as is possible prior to initiating other phases of construction, such as excavation and installation of underground utilities. The following are general recommendations concerning earthwork construction and may not be applicable to site-specific conditions. Furthermore, the contractor is responsible in selecting and implementing the most appropriate construction techniques (e.g., construction means, methods, sequences or procedures, safety precautions/programs) for each site-specific condition.

1. Stripping, clearing and grubbing

In areas where fill is to be placed to support structures, drive and parking areas, the following is proposed:

Strip and remove all sod, topsoil, and organic contaminated soils.

Remove all trees and shrubs, designated to be cleared, inclusive of grubbing roots of larger trees.

Remove all trash, debris, rubble, existing random fill, soil softened by standing water, and any other soft soil as determined necessary by the Geotechnical Engineer. The fill placement should begin on firm, relatively unyielding foundation material.

The fill foundation should be stripped and cleared beyond the limits of the structure by a distance equal to not less than the thickness of the fill below the structure foundation plus 10 feet. For drives and parking areas, the fill foundation should be stripped and cleared for a distance of at least 5 feet beyond the limits of the pavement.

2. Fill Material – Composition

Material satisfactory for use as fill includes clayey silt and silty (lean) clay soils or sand and gravel, free of topsoil, organic or other decomposable matter, rocks having a major dimension greater than 6 inches, and/or frozen soil.

Soils having a maximum dry density of less than 100 pounds per cubic foot as determined by the moisture-density relationship are not considered suitable for use as fill.

Soils described as SILT (USCS ML, MH or ODOT A-4B) are considered questionably suitable for use as fill material because the stability of these materials is very sensitive to increases in moisture. These soils should not be placed within three feet of the top of the subgrade.

3. Fill Material – Moisture

Predominately fine-grained fill materials (lean clayey soils) are recommended to contain moisture contents within 3 percent (above or below) the optimum moisture as determined by the moisture-density relationship (ASTM International D698), or less if found to be needed to obtain stability below the compaction equipment. This provides the best assurance of establishing not only adequate density for ultimate support of construction but also provides stability of the compacted soil under the dynamic loading induced by the heavyweight construction equipment during placement.

Sand and gravel fill material is not as sensitive to moisture content with regards to stability. Therefore, we recommend no specified limitation, provided the specified density and stability can be established.

4. Moisture Adjustment

If the moisture content of the material from the fill source or native subgrade is not appropriate to establish density, moisture adjustment of the material will be required.

If the moisture content of the fill being placed or the native subgrade is too high, appropriate adjustment entails spreading and exposing to the sun and wind for drying and using equipment such as a disc and/or a grader. This may not be feasible during wet seasonal conditions. Wet soils will pump and may cause excessive rutting under heavy equipment traffic. Therefore, improvements to the subgrade may be achieved by undercutting and replacing with suitable fill (possibly in combination with a geotextile or geogrid) or stabilization with lime or cement. The most appropriate subgrade improvement technique should be determined at the time of construction.

If the moisture content of the fill is too low, a water truck with a sprinkler bar may be required. After sprinkling, the soil should be thoroughly mixed with a disc and/or a grader.

5. Equipment

Equipment to compact the fill should be heavy duty with a steel drum roller having a minimum effective unit weight of 10 tons. For example:

Fine-grained materials (clayey silts and lean clays) may be efficiently compacted using a sheepsfoot roller comparable to a Caterpillar 815 self-propelled roller.

Coarse-grained materials (sand and gravel) having little or no silt and clay sizes may be efficiently compacted using a heavy, self-propelled, vibratory smooth wheel roller.

Coarse-grained materials having about 10% or more silt and clay sizes may be efficiently compacted using a sheepsfoot roller comparable to a Caterpillar 815 self-propelled sheepsfoot roller.

6. Lift Thickness

Fill should be placed in horizontal layers, 8-inch loose thickness, compacted uniformly to approximately 6-inch thickness.

If equipment is used which is lighter weight than recommended above, lift thickness should be appropriately thinner.

7. Fill Density

In areas to support access roads and within the pad, the fill and backfill should be compacted to the density requirements as recommended in the Geotechnical Exploration Report.

8. Season of Earthwork

Weather conditions are very important to efficiency in working soils. Generally, earthwork is accomplished most efficiently between May and November. Cold periods may hamper moisture adjustment. If the temperature is below 32 degrees Fahrenheit (°F) for prolonged periods, frozen material on the fill surface must be removed before subsequent lifts may be placed. Also, densification of fill is more difficult when air temperatures are below freezing. Granular material, such as bank run sand and gravel is somewhat less sensitive to weather conditions but is not immune from difficulties that may be presented by precipitation and low temperatures.

9. Trench Backfill

Trench backfill should be controlled compacted fill, placed in accordance with recommendations presented above and as engineered for thermal properties in collection systems.

It is recommended that suitable granular material be used to backfill trenches that traverse beneath buildings, drives, or parking areas.

10. Proof Rolling

Upon completion of stripping, clearing, and grubbing; the areas planned to support pavement or building floor slab shall be proof rolled in accordance with ODOT Item 204 to identify any soft, weak, loose, or excessively wet subgrade conditions. At a minimum, the proof rolling should be completed with a minimum 20-ton loaded tandem axle dump truck. The vehicle should pass in each of two perpendicular directions covering the proposed work area. Any observed unsuitable materials should be undercut and replaced with suitable fill as directed by the Geotechnical Engineer.

11. General

All fill should be placed and compacted under continuous observation and testing by a soils technician under the general guidance of the Geotechnical Engineer.

ATTACHMENT E

Generalized Geotechnical Exploration Work Plan

GENERALIZED GEOTECHNICAL EXPLORATION WORK PLAN

A Geotechnical Engineer shall prepare a proposal for a geotechnical site exploration in general accordance with the suggested scope of work provided below. The Geotechnical Engineer shall be qualified in geotechnical investigations. The geotechnical exploration program suggested below (e.g., boring frequency, location, depth, and sampling and testing procedures) should be adjusted by the Geotechnical Engineer based on their experience and to allow for specific geological, topographic, and drainage conditions of the individual site(s).

PROJECT DESCRIPTION

A geotechnical exploration will be performed at the proposed Project Area in Fulton County, Ohio. The project involves planned construction of solar arrays at various locations at the Arche Energy Project (Site). Upon completion of the geotechnical exploration, suitable foundation systems will be reviewed that will work with the Site conditions as determined by the geotechnical exploration and design preferences provided by the Client. Foundation types that are typical to support the solar arrays included driven steel piles and helical pile supported foundation systems.

The purpose of the geotechnical exploration is to obtain subsurface information and to determine relevant engineering properties of the Site soils. A review of generalized geologic references, including ODNR Well Logs and ODNR Groundwater Resource Maps, suggest the Project Area is underlain by clayey till deposits with shale bedrock depths estimated 150 feet or deeper below existing ground surface in the Project Area.

PROPOSED SCOPE OF WORK

Reconnaissance, Planning and Boring Layout

The following will be conducted as part of this task:

1. A review of pertinent, readily available subsurface and geotechnical information for the Site that is provided to the Geotechnical Engineer will be performed.

2. A site visit will be performed to layout the borings and clear underground utilities at the boring locations. The landowner(s) will be consulted to provide the Geotechnical Engineer with information and the locations of all private utilities at the site. The Geotechnical Engineer will be responsible for locating the borings, which should be located (e.g., survey or GPS) and staked in the field prior to drilling.

3. The Ohio Utility Protection Service (OUPS) and Ohio Oil & Gas Producers Underground Protection Service (OGPUPS) will be notified a minimum of 48-hours prior to the commencement of drilling services.

Drilling and Sampling

After the Geotechnical Engineer has reviewed available subsurface and geotechnical information, they will determine the number of borings to be drilled at the solar array locations. The borings will extend to the proposed depth or competent bedrock, whichever is encountered first.

For all borings, the following can be performed:

1. Split-barrel sampling of soil will be performed in accordance with ASTM International D1586 for each boring in increments of 2.5 feet to the depth of 10 feet and at 5-foot intervals below 10 feet to the depth of the borings. In all the borings, Standard Penetration Test (SPT) data will be developed and representative samples preserved. Shelby tube samples should be obtained where low strength and/or highly compressible cohesive soils are encountered as deemed necessary by the Geotechnical Engineer.

2. It is anticipated that the drilling will be accessible with and performed by a truck-mounted drilling rig. Provisions shall be made by the Geotechnical Engineer based on the time of year the fieldwork will occur in using a track-mounted or ATV drill rig if the borings cannot be accessed with truck-mounted drilling equipment.

3. Water observations in the boreholes will be recorded during and at the completion of drilling.

4. All borings will be backfilled at the completion of drilling with bentonite chips and drill cuttings.

Geotechnical Laboratory Testing

A laboratory testing program will be established by the Geotechnical Engineer based on the observations made during the drilling activities and experience. The following laboratory tests shall be performed on samples retained during the drilling activities:

1. All samples should be classified in the field/laboratory based on the visual-manual procedures (ASTM D2488) in accordance with the Unified Soil Classification System (USCS) and the laboratory test results. Formal boring logs will be prepared based on the field logs and incorporation of laboratory testing results.

2. Laboratory testing may include moisture content, particle-size analyses, and Atterberg limits determination of a limited number of samples considered to be representative of the foundation materials encountered in the borings. Unconfined compression and consolidation tests should be performed if low strength and/or highly compressible cohesive soils are encountered as deemed necessary by the Geotechnical Engineer.

3. Additional laboratory testing for corrosion potential and/or thermal resistivity may be completed based on project design requirements.

4. All laboratory testing will be performed in accordance with the procedures of ASTM International or other specified standards.

Geotechnical Exploration Report

The Geotechnical Engineer will prepare a Geotechnical Exploration Report that will include the findings, conclusions and recommendations concerning proposed geotechnical related design/construction considerations and foundation design recommendations. The report shall also include a boring location plan, a legend of the boring log terminology, boring logs, laboratory testing results, and other pertinent information.