Phase IA Archaeological Survey

South Ripley Solar Project

Town of Ripley, Chautauqua County, New York

NYSDPS Case 19-F-0560

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MANAGEMENT SUMMARY

SHPO Project Review Number:	20PR03687
Involved State/Federal Agencies:	New York State Department of Public Service (Article 10); New York State Office of Parks Recreation and Historic Preservation (Section 14.09)
Phase of Survey:	Phase IA Archaeological Survey
Location Information:	Town of Ripley, Chautauqua County
Survey Area:	
Facility Description:	270-megawatt (MW) utility-scale solar facility consisting of ground-mounted photovoltaic arrays and associated infrastructure.
Facility Area:	Approximately 4,510-acre Facility Area
USGS 1:24,000 Topographic Quadrangles:	*South Ripley, NY* and *North East, PA*
Archaeological Resources Overview:	No previously recorded archaeological sites are located within the Facility Area. One archaeological site (01322.000096, [NYSM 5410]) has been previously recorded within one half mile of the Facility Area. This site is reported as "Traces of Occupation"
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Date of Report:	January 2021

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1.0 INTRODUCTION

1.1 Purpose of the Investigation

On behalf of ConnectGen Chautauqua County LLC, a direct subsidiary of ConnectGen LLC (ConnectGen, or the Applicant), Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C. (EDR) has prepared a Phase IA archaeological survey for the proposed South Ripley Solar Project (the Facility) located in the Town of Ripley, Chautauqua County, New York (see Figure 1 and 2). This Phase IA archaeological survey was prepared as part of review of the Project under Article 10 of the New York State Public Service Law, Certification of Major Electrical Generating Facilities. The information and recommendations included in this report are intended to assist New York State Historic Preservation Office (SHPO) in their review of the proposed Facility in accordance with Article 10. Please note that this report addresses only archaeological resources; information concerning the Facility's potential effect on historic-architectural resources has been (and will continue to be) provided to SHPO under separate cover.

As described in 16 NYCRR § 1001.20, an Article 10 application[1] must include:

> Exhibit 20: Cultural Resources:
>
> a. A study of the impacts of the construction and operation of the facility interconnections and related facilities on archaeological resources including:
>   1. A summary of the nature of the probable impact on any archaeological/cultural resources identified addressing how those impacts shall be avoided or minimized;
>   2. A Phase IA archaeological/cultural resources study for the Area of Potential Effect (APE) for the facility site and any areas to be used for interconnections or related facilities, including a description of the methodology used for such study;
>   3. A Phase IB study, if required, as determined in consultation with OPRHP;
>   4. Where warranted based on Phase I study results as determined in consultation with OPRHP, a Phase II study based on intensive archaeological field investigations shall be conducted to assess the boundaries, integrity and significance of cultural resources identified in Phase I studies. Phase II shall be designed to obtain detailed information on the integrity, limits, structure, function, and cultural/historical context of an archaeological site, as feasible, sufficient to evaluate its potential eligibility for listing on the State or National Register of Historic Places. The need for and scope of work for such investigations shall be determined in consultation with OPRHP and DPS;
>   5. A statement demonstrating that all archaeological materials recovered during the facility cultural resources investigation shall be cleaned, catalogued, inventoried, and curated according to New York Archaeological Council standards; that to the extent possible, recovered artifacts shall be identified as to material, temporal or cultural/chronological associations, style and function; and that the facility archaeologists shall provide temporary storage for artifacts until a permanent curatorial facility is identified; and

[1] The Applicant has initiated state permitting with the New York State Board on Electric Generation Siting and the Environment (Siting Board) as set forth under Article 10 of the Public Service Law (Article 10), but may elect to become subject to Article 6 Section 94-c of the Executive Law, with the Office of Renewable Energy Siting (ORES) as the lead agency. SHPO will be informed of any changes to the lead agency or review process for the Facility. For the purpose of this memorandum, all proposed cultural resources work references the requirements of Article 10.

6. An Unanticipated Discovery Plan that shall identify the actions to be taken in the unexpected event that resources of cultural, historical, or archaeological importance are encountered during the excavation process. This plan shall include a provision for work stoppage upon the discovery of possible archaeological or human remains. In addition, the plan shall specify the degree to which the methodology used to assess any discoveries follows the most recent Standards for Cultural Resource Investigations and Curation of Archaeological Collections in New York State. Such an assessment, if warranted, shall be conducted by a professional archaeologist, qualified according to the standards of New York State Archaeological Council.

In accordance with these regulations, the purpose of the Phase IA Archaeological Survey is to:

- Define the Facility's area of potential effect (APE) for Direct Effects relative to archaeological resources;
- Determine whether previously identified archaeological resources are located within the APE for Direct Effects; and,
- Propose a methodology to identify archaeological resources within the APE for Direct Effects, evaluate their eligibility for the State/National Register of Historic Places (S/NRHP), and assess the potential effect of the Facility on those resources.

The Phase IA archaeological survey will follow the SHPO (2020) *Guidelines for Solar Facility Development Cultural Resources Survey Work* (the SHPO Wind Guidelines). All archaeological services provided by EDR are conducted under the supervision of a Registered Professional Archaeologist who meets the Secretary of the Interior's Guidelines (per 36 CFR, Part 61) for Professional Qualifications in Archaeology. The work will be conducted in accordance with the New York Archaeological Council's (1994) *Standards for Cultural Resources Investigations and the Curation of Archaeological Collections in New York State* (the NYAC Standards) and the SHPO (2005) *Phase I Archaeological Report Format Requirements* (the SHPO Guidelines), as appropriate.

1.2 Facility Location and Description

The proposed Facility is a 270-megawatt (MW), alternating current (AC) photovoltaic (PV) solar energy generation system with a potential 20 MW battery energy storage component located entirely within the Town of Ripley in Chautauqua County, New York. The Facility will consist of rows of PV modules in discrete sub-arrays dispersed throughout the Facility Area. These arrays will be enclosed by fences (for safety and security purposes). In addition, the Facility will include electrical direct current (DC) collection cables that connect to inverters and storage devices, and medium voltage alternating current cables that run from the sub-arrays to a point of interconnection switchyard, as well as other Facility components. The Facility will also incorporate energy storage technologies. A current layout of the Facility is provided in Figure 3, but is subject to alterations and changes. Therefore, the Phase IA archaeological survey considers the entirety of the 4,510-acre Facility Area.

The following terms are used throughout this document to describe the proposed action:

Facility:	Collectively refers to all components of the proposed project, including PV panels, access driveways, buried and above ground collection lines, collection substation, point of interconnection switchyard, battery energy storage system, and staging areas.
Facility Area:	The land parcels that will ultimately host the Facility components and associated facilities
Area of Potential Effects (APE) for Direct Effects:	The APE for Direct Effects for the Facility is the area containing all construction related activities associated with the Facility. The APE for Direct Effects is described in greater detail in Section 1.4, below.
Limits of Significant Ground Disturbance:	The portions of the Facility Area which contain project components which have the potential to impact archaeological resources. These components consist of all areas with Facility-related impacts involving *significant* ground disturbance, defined as trenching wider than 1 foot (0.3 meter), or any excavation, grading, paving, and tree and shrub removal and grubbing.

The Facility Area includes approximately 4,510 acres of leased private land, which consists primarily of agricultural land. The specific locations of the Facility components within the Facility Area are identified in Figure 3. The Facility will consist of the following components:

- Internal infrastructure including access roads and fencing;
- Uniform rows of PV solar panels producing DC electricity mounted on fixed-tilt structures with a maximum height of approximately 15 feet;
- Co-located inverters placed throughout the Facility (internal to the panel arrays) to convert DC electricity to AC electricity;
- Medium voltage transformers co-located with the inverters that will increase the voltage of the electricity to 34.5 kV for the collection system;
- A medium voltage collection system that will aggregate the 34.5 kV AC output from the collocated inverters and transformers and deliver electricity to the Facility substation;
- A collection substation where the Facility's electrical output voltage will be combined, and its voltage increased to the transmission line voltage of 230 kV via step-up transformers;
- A new point of interconnection with transmission equipment associated with existing National Grid substation;
- A potential operations and maintenance (O&M) building to be located within the Facility Area;
- Temporary laydown areas for equipment staging during construction; and
- A potential 20 MW battery energy storage system with up to 80 megawatt-hours of energy storage capacity.

1.3 State Historic Preservation Office Consultation

On June 18, 2020, EDR initiated consultation with the SHPO on behalf of the Applicant with an initial project submission via the Cultural Resources Information System (CRIS) website. SHPO responded with a letter dated June 24, 2020 which requested a Phase IA archaeological survey for the Facility. The letter also provided guidance related to the development of the scope of work for the Phase IB archaeological survey:

> Phase IB archaeological testing is not recommended for panel arrays; perimeter fencing and utility poles, if their associated posts are driven or drilled into the ground and no grubbing or grading is involved, and for excavations and grading less than six inches in depth. Phase IB testing is also not recommended for trenches less than three feet wide. However, if the installation of the panel array supports, fencing or utility poles requires grubbing and grading exceeding six inches in depth, then Phase IB archaeological testing is recommended.
>
> Phase IB archaeological testing is recommended for areas of substantial proposed ground disturbance, which includes areas of grading and excavation more than six inches deep, grubbing, tree and stump removal, and trenches more than three feet wide, unless the archaeological sensitivity warrants greater effort (Ferguson, 2020).

The submittal of this Phase IA archaeological survey via the CRIS system continues SHPO consultation for the Facility. This report has been prepared in accordance with the requirements of 16 NYCRR § 1001.20 (Exhibit 20: Cultural Resources), and applicable portions of SHPO's *Phase I Archaeological Report Format Requirements* (SHPO, 2005).

1.4 Facility's Area of Potential Effect and Proposed Construction Methods

Relative to conventional energy generation methods of a similar scale, solar facilities result in minimal impacts to the environment. Impacts from the construction and operation of solar generation are largely the result of the fact that utility-scale solar energy facilities require a large contiguous area for the collection and distribution of energy. The existing land uses in the Town of South Ripley are predominately agricultural, fallow lands, and forested areas. Unlike other areas of Chautauqua County and the Town of South Ripley, the Facility Area does not contain active vineyard lands. Siting the Facility in a rural agricultural region will help minimize the need for significant land clearing; however, because timber plots are located within the proposed Facility Area, some tree clearing is anticipated.

Solar panels will be installed on a low-profile racking system, which typically consists of small I-beam posts, helical piles or ground screw piles driven or screwed into the ground, without the need for other foundations. In some cases where bedrock is shallow, there may be a need to drill into the bedrock, place the piles in the hole, and grout or put sand or gravel in the hole and install a screw type pile. Limited grading may be necessary in some areas. In those limited areas where soil disturbance is necessary, topsoil will be stripped and stockpiled for restoration purposes. Following construction, any disturbed areas will be restored with topsoil, and a cover of native herbaceous species will be established underneath and around the solar panels.

The Applicant is committed to minimizing soil disturbance associated with the proposed Facility as a way to minimize the impact to cultural and natural resources. Therefore, the following section includes a description of the components of the proposed Facility and the proposed construction/installation methods associated with each component. These methods will minimize potential impacts to archaeological resources within the Facility Area.

Construction of the Facility will be accomplished with machines that are consistent in terms of size, weight, and tread with the agricultural machines that are currently used on these properties. Therefore, the existing conditions within the Facility Area, coupled with the specific construction/installation measures discussed below will serve to minimize impacts to archaeological resources within the APE for Direct Effects. The Facility will generally include the following components (described and shown on the following pages of this report):

Inset 1. Typical steel support beams for PV panels and pile-driver during construction. (Photo credit: Clean Energy Collective).

Inset 2. Installed PV panels on steel support beams in Somerset County, MD. (Photo credit: EDR, 2015).

PV Panels: Solar energy will be captured by PV panels which will be mounted on fixed-tilt racking or tracking structures. The panels will have a small footprint, typically consisting of small I-beam posts driven into the ground by a pile-driving machine to a depth of approximately 5 to 8 feet (approximately 1.5 to 2.4 meters). As previously noted, because the areas proposed for PV arrays are relatively flat, minimal grading, is required for the installation of these components. An example of typical pile-driven posts is depicted in Inset 1 and a photo of a typical installed PV panel array is shown in Inset 2. PV arrays will be constructed in groups (or arrays) within existing fields and will be surrounded by security fencing. Fence supports will typically consist of small-diameter round posts which will be driven into the ground with a similar amount of disturbance (although to a lesser depth) than the PV array support posts.

Inverters: The Facility will include a series of inverters placed in select locations throughout the PV arrays, which will be co-located with medium voltage transformers.

Electrical Collection System: The Facility will require a network of cables, which will be located within the panel arrays of the Facility. In agricultural fields and outside of the Facility fenced area, these cables will be buried at least 48 inches (122 centimeters [cm]) below grade per the New York State Department of Agriculture and Markets 2018 *Guidelines for Agricultural Mitigation for Solar Energy Projects*. From each block of panel arrays, electricity will typically be conveyed via an underground medium voltage collection system that will aggregate AC output from the inverters and will bring the electrical output to a collection substation (described below).

Access Roads: The PV arrays will be served by a network of unpaved access roads to provide access to the inverters and transformers. Two types of roads are anticipated to be built for the Facility. Primary access roads will be graded as needed, surfaced with crushed stone/gravel, and underlain by woven geotextile fabric. In addition, select

maintenance roads within the PV arrays will be maintained as grass (i.e., no crushed-stone or other paving). There may be some grading along these grass roadways during construction and it is likely that these roads will experience compaction or other disturbances during routine maintenance use.

Additional Facility components include:

- Collection Substation: The Facility will require the construction of a collection substation where the Facility's electrical output voltage will be combined, and its voltage increased to 115 kV via step-up transformers. The collection substation is anticipated to include an overhead gantry, isolators, surge arrestors, instrument transformers and a control room housing protection relays, meters and telecommunication equipment Construction of the collection substation is anticipated to be in an area that will require significant excavation and grading;
- Point-of-Interconnect: The Facility will connect to the existing Ripley-Dunkirk 230kV transmission line via a new bay associated with the existing National Grid equipment at the existing Ripley Substation. Construction of the POI bay is not anticipated to require significant excavation and grading if construction is confined to the footprint of the existing substation;
- Transmission or Gen-Tie Line: A short (several hundred feet) transmission line connecting the Collection Substation to the POI Switchyard adjacent to the existing and Ripley Substation; and
- Temporary Laydown Yards: During Facility construction, temporary laydown yards will be used to accommodate larger project storage containers, components, and parking for construction workers for storage of construction equipment and supplies. The laydown yards will be constructed by adding crushed stone/gravel to the existing ground surface and will be reclaimed following construction.
- A potential O&M building: to house permanent staff offices and store maintenance equipment and supplies. It will require grading and excavation within its footprint, as well as potential buried utilities, parking areas, and stormwater facilities.

As described above, solar facilities result in minimal impacts to the environment. These components consist of all areas where Facility-related impacts involving significant ground disturbance, defined as trenching wider than 1 foot (0.3 meter), or any excavation, grading, and/or paving. Areas of significant ground disturbance for the proposed South Ripley Solar Project are anticipated to include:

- Inverter pads;
- Access roads;
- Improvements associated with the proposed substation;

- Buried collection lines installed in a trench greater than 1 foot (0.3 meter) wide;
- Areas of tree removal or grubbing;
- Construction staging/laydown areas that require grading, and/or paving; and,
- Any other areas where Facility-related impacts include earth disturbance beyond the installation of small posts or I-beams or the excavation of a less than 1-foot (0.3-meter) wide trench.

The Limits of Significant Ground Disturbance will be subjected to Phase IB survey following the methods outlined in Section 4.0, below.

2.0 BACKGROUND AND SITE HISTORY

2.1 Geology and Soils

Chautauqua County is a 1,062 square-mile area bounded on the northwest by Lake Erie, on the west and south by Pennsylvania, and on the east by Cattaraugus County (New York) and the Cattaraugus Indian Reservation. The bedrock underlying Chautauqua County consists of Devonian shales. The Facility Area lies fully within the Appalachian Plateau physiographic province. The Erie-Ontario Lake Plain consists of a strip of lowland (that was previously lakebed) between two and six miles wide that extends along the shore of Lake Erie within the northwestern portion of the county. The lake plain ranges in elevation from approximately 570 to 850 feet above mean sea level (AMSL). The Appalachian Plateau is defined by glacial topography, hills and ridgelines ranging in elevation from approximately 1600 to 2190 feet AMSL that are separated by wide, flat, steep-sided valleys. The lake plain and adjacent upland areas drain into the Lake Erie-St. Lawrence River watershed while most of the rest of the county drainage flows into the Allegheny-Ohio-Mississippi watershed (Kirst, 2005; SCS, 1994). The Project is located entirely within the northern edge of Appalachian Plateau (Figure 1). Elevations within the Project site range between approximately 1,411 feet AMSL along Picket Brook in the northwestern portion of the Project site and 2,083 feet AMSL at the summit of Pickett Hill in the southeastern portion of the Project site.

EDR reviewed the Soil Survey of Chautauqua County, New York (SCS, 1994) for data concerning soils within the Facility Area, as well as electronic data from the Environmental Systems Research Institute (ESRI) and Natural Resources Conservation Service (NRCS) online Web Soil Service (ESRI and NRCS, 2020). The Facility Area consists of relatively level upland terrain with slopes ranging from gentle to steep (Figure 4). The leased parcels of the Facility Area are located near several tributaries associated with Twelvemile Creek, Sixteen Mile Creek, Twentymile Creek, and Findley Lake-West Branch Creek which drain much of the Facility Area (Figure 4). Elevations within the Facility Area range between approximately 450 and 1,570 feet (137 and 478 meters) amsl. The bedrock underlying the Facility Area is comprised of Conneaut Group, undivided shales and mudstone of the Upper Devonian geological age (approximately 382.7 to 358.9 million years before present) (United States Geological Society [USGS], 2020).

The surficial geology of the Facility Area is made up of silty colluvium, glacial till of variable texture, and lacustrine deposits of silt, very fine sand, and clay; as depicted in Figure 4. EDR reviewed the *Soil Survey of Chautauqua County, New York* (SCS, 1994) for data relating to soils within the Facility Area, as well as electronic data from the Environmental Systems Research Institute (ESRI) and Natural Resources Conservation Service (NRCS) online Web Soil Service (ESRI and NRCS, 2020). The Facility Area contains 20 mapped soil units, one of which is water. The 20 mapped soil units consist primarily of silt loams ranging from poorly drained to well drained. Only nine of the soil units, however, each cover more than 2% of the Facility Area. These nine soils units are summarized in Table 1.

Table 1: Major Map Soil Units within the Facility Area

Map Unit Name	% Facility Area	Soil Horizon Depth (inches)	Texture, Inclusions	Slope %	Drainage	Landform
Alden mucky silt loam	2.3%	H1: 0-9 H2: 9-35 H3: 35-72	Mucky SiLo SiLo GrlLo	0 to 3%	Very poorly drained	Depressions, Flood plains
Ashville silt loam	6.1%	H1: 0-9 H2: 9-36 H3: 36-72	SiLo SiLo GrlSiLo	0 to 3%	Poorly drained	Depressions
Busti silt loam	13.0%	Ap: 0-8 Bw1: 8-17 Bw2: 17-25 BC: 25-33 C: 33-72	SiLo SiLo SiLo GrlSiLo GrlSiLo	0 to 3% 3 to 8% 8 to 15%	Somewhat poorly drained	Hills, depressions
Canandaigua silt loam: loamy substratum, and mucky silt loam	2.2%	H1: 0-10 H2: 10-36 H3: 36-72	SiLo SiLo SiLo	0 to 3%	Poorly drained	Depressions
Chadakoin silt loam	6.4%	H1: 0-4 H2: 4-24 H3: 24-43 H4: 43-72	SiLo SiLo GrlLo GrlLo	3 to 8% 8 to 15% 15 to 25% 25 to 35% 35 to 50%	Well drained	Drumlinoid ridges, hills, till plains
Chautauqua silt loam	10.2%	Ap: 0-8 Bw1: 8-22 Bw2: 22-35 C: 35-72 Oa: 0-2 A: 2-3 BE: 3-8 Bw1: 8-22 Bw2: 22-35 C: 35-72	SiLo SiLo GrlSiLo GrlLo Plant material SiLo SiLo GrlSiLo GrlLo	3 to 8% 8 to 15% 15 to 25%	Moderately well drained	Hills, drumlinoid ridges, till plains
Erie silt loam	28.8%	Ap: 0-9 E: 9-13 Bg: 13-15 Bx: 15-38 C: 38-72	SiLo ChnSiLo ChnSiLo ChnSiLo ChnLo	0 to 3% 3 to 8% 8 to 15%	Somewhat poorly drained	Hills, till plains, drumlinoid ridges, depressions
Langford silt loam	22.0%	Ap: 0-9 Bw: 9-17 E: 17-21 Bx: 21-48 C: 48-72	SiLo ChnSiLo ChnLo ChnSiLo ChnSiLo	3 to 8% 8 to 15%	Moderately well drained	Hills
Volusia channery silt loam	4.8%	Ap: 0-9 Bw: 9-15 Eg: 15-17 Bx1: 17-29 Bx2: 29-54 C: 54-72	ChnSiLo ChnSiLo ChnSiLo ChnLo ChnLo ChnSiLo	0 to 3% 3 to 8%	Somewhat poorly drained	Hills, mountains, depressions

[1] Lt = Light; Dk = Dark; Pl = Pale; V = Very; / = Mottled; Brn = Brown; Blk = Black; Gry = Gray; Ylw = Yellow; GBrn = Gray Brown; StrBrn = Strong Brown; RBrn = Red Brown; YBrn = Yellow Brown; OBrn = Olive Brown; BGry = Brownish Gray
[2] Cl = Clay; Si = Silt; Sa = Sand; Lo = Loam; Grl = Gravel; Cbs = Cobbles; Pbs = Pebbles; Chn = Channery; Rts = Roots; Fn = Fine; Cs = Coarse; V = Very; Stra=Stratified; Ext=Extremely; Fla=Flaggy

2.2 Previous Archaeological Resource Surveys within 1-mile (1.6-km) of the Facility Area

EDR consulted the SHPO's online Cultural Resources Information System (CRIS) database, and maps used by SHPO prior to the use of the CRIS database, to determine if previous archaeological surveys have been conducted within or adjacent to the Facility Area. According to the CRIS database, no archaeological surveys are recorded within 1-mile (1.6-km) of the Facility Area. Additional cultural resources surveys not available on CRIS were identified during this review, though the reports themselves were not readily available. Two Phase I surveys (McKenna and Nelson 1984; SUNY Buffalo and Hartner 1994) were conducted within portions of the Facility Area. The survey inventory sheets indicate that no archaeological sites were identified. These two surveys are depicted in Figure 5 and detailed in Table 2 below.

Table 2: Previous Archaeological Surveys within 1-mile (1.6-km) of the Facility Area

Report Name	Sites identified	Distance from Facility Area	Reference
Cultural Resource Survey for a Proposed Natural Gas Pipeline in the Towns of Mina and Ripley, Chautauqua County, New York; Chautauqua County Report #69	0	Partially within	Gloria J. McKenna and Ben A. Nelson, 1984
Cultural Resources Investigation of Pin 5008.07, the Reconstruction of NYS Route 76 Bridge (BIN 1-03000-0) Over Twentymile Creek, Town of Ripley, Chautauqua County	0	Partially within	SUNY Buffalo/ J.E. Hartner, 1994

2.3 Previously Identified Archaeological Sites within 1-mile (1.6-km) of the Facility Area

EDR reviewed the CRIS database and the scanned Chautauqua County maps from SHPO (which pre-date the CRIS system) to determine whether previously recorded archaeological sites are located within 1-mile (1.6-km) of the Facility Area. Only one site is recorded in the CRIS database and is noted below in Table 3. This site is a Native American occupation of unknown date, first reported by Arthur C. Parker (Parker 1907). This site is listed as undetermined for eligibility on the S/NRHP.

Table 3: Previously Recorded Archaeological Sites within 1-mile (1.6-km) of the Facility Area

Site Number	Site Name	S/NRHP-Eligibility	Time Period	Site Type	Distance from Facility Area
01322.000096 (NYSM 5410)	Parker Chautauqua Co. Unnumbered Site	Undetermined	Unknown	Traces of Occupation	0.5 mile

2.4 Archaeological and Historic Context

Initial settlement in what is now Western New York began with Paleoindian groups following the retreating continental glaciers around 11,500 years ago. These groups specialized in hunting large game (likely Caribou; and possibly mammoth and mastodon) in the recently exposed periglacial tundra and boreal forests, although they exploited diverse floral resources, small game, and fish as well (Ritchie and Funk, 1973). Although these early groups were highly mobile, there is also evidence of moderate to large aggregations at certain times and places (e.g., the Bull Brook sites in Massachusetts) (Curran, 1999).

Post-Glacial conditions had stabilized by approximately 10,000 years ago, and small groups of hunter-gatherers reduced their mobility and exploited the diverse resources available to them in the newly emerging mixed deciduous/coniferous forests. The megafauna was gone at this point, but big game such as deer, elk, and moose, and perhaps woodland caribou was still available, as well as small game, fish, and wild plants (Funk, 1978). Material culture during this time is characterized by stemmed and corner-notched projectile points as well as the first appearance of notched stone net-sinkers (Funk, 1978). Eventually, up to approximately 3,500 years ago, regional diversity led to a greater variety of stone tools, including broad, side-notched projectile points, as well as gouges, plummets, and ground slate artifacts (Funk, 1978; Ritchie 1980). Groundstone tools included nutting stones which presumably indicate the first systematic exploitation of resources such as acorns and chestnuts (Funk, 1978; Ritchie and Funk, 1973:7).

The first substantial and widespread development of agriculture in northeastern North America began approximately 2,500 years ago, possibly in response to favorable climatic conditions during the Medieval Climatic Anomaly (Fitting, 1978:44). Western New York at this time was within the northeastern edge of the Hopewell cultural sphere, characterized by mound burials and other earthworks, dentate-stamped and rocker-stamped ceramic vessels, elaborate tobacco pipes, and stemmed, side-notched, and triangular unnotched Levanna projectile points (Engelbrecht, 2014; Ritchie and Funk, 1973). Groups in the northeast during this period also maintained extensive trade networks, evidenced by the presence of exotic goods (Fitting, 1978; Ritchie 1980; Ritchie and Funk, 1973). Settlement occurs in small villages during this period, but larger agricultural settlements are unknown in western New York until approximately 1,000 years ago. In the centuries following, the region sees the first appearance of maize/bean/squash

agriculture and substantial village sites, including some with palisades and earthwork fortifications (Ritchie and Funk, 1973). Ritchie and others (Ritchie, 1980; Ritchie and Funk, 1973). By this time we see the formation of the Haudenosaunee Confederacy, including the Mohawk, Oneida, Onondaga, Cayuga and Seneca Nations, and by 1722, the Tuscarora Nation (Snow, 1996).

At the time of European contact and colonization in the eighteenth century, the Project site was located within the territory of the Seneca Nation of the Haudenosaunee Confederacy, though it was previously territory of the Erie Nation. Erie territory encompassed modern-day Chautauqua County until the mid-seventeenth century, extending westward along the southern shore of Lake Erie, and eastward toward the Genesee Valley (Downs and Hedley, 1921; Kirst, 2005). The French began utilizing the western end of Chautauqua Lake by 1679, setting the stage for later European land claims. By the eighteenth century, France had claimed the land around Chautauqua Lake for their own, which they ceded to Great Britain in 1763. By 1797, the land had been purchased by the Holland Land Company, which subdivided and sold it to early European American settlers.

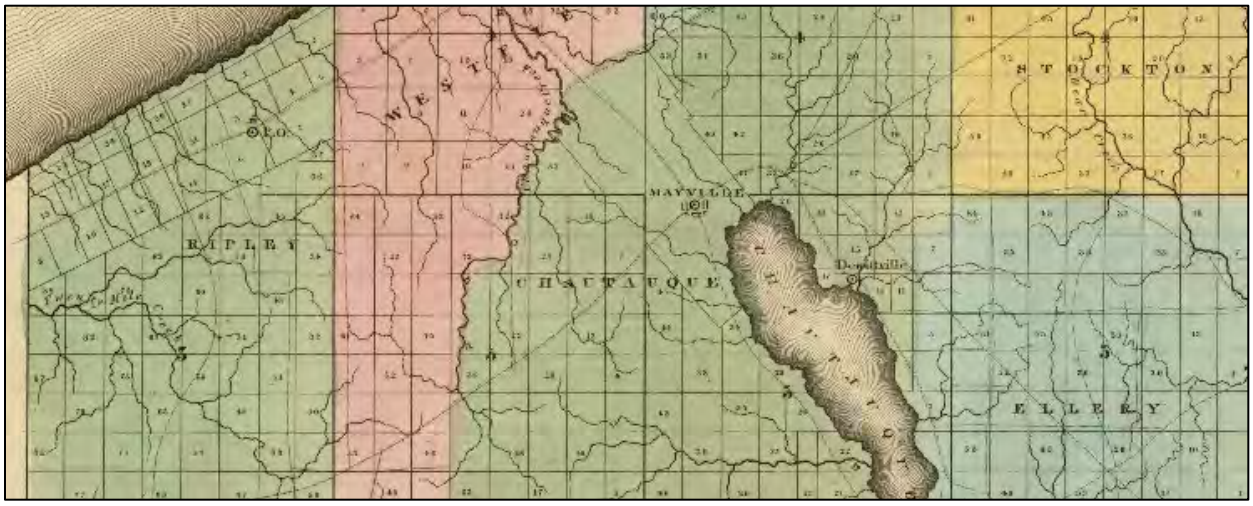
Chautauqua County was created in 1811 after being split from Genesee County along with the land that is now Niagara County in 1808. Within a decade, major settlements began to form adjacent to water bodies, including Dunkirk and Portland along Lake Erie, Mayville at the northern end of Chautauqua Lake, and Jamestown along the Chadakoin River in the southern part of the county (see Inset 3). In 1829, several new towns were formed from existing early town parcels, establishing the general land patterns that would define Chautauqua County throughout the nineteenth and twentieth centuries (see Inset 4). The opening of the Erie Canal to the north brought new trade and settlers to western New York, and by 1835, the population of Chautauqua County had reached 35,000, mostly concentrated along the borders of the Chautauqua Lake and Lake Erie (Beers, 1881; Kirst, 2005).

The Town of Ripley was formed in 1817 from the Town of Portland and named in honor of General Eleazar Wheelock Ripley, a celebrated War of 1812 veteran. In 1829, Ripley's borders decreased to accommodate the formation of the Town of Westfield. Prior to widespread European settlement of the area, James McMahan purchased a tract of more than four thousand acres (known as the McMahan tract) in 1801. Most of the town's first residents settled in the McMahan tract; the early lots lacked the uniform layout later established elsewhere in Ripley following the formal survey of the town. The Village of Quincey (also, Quincy) was settled rapidly in the early nineteenth-century and later renamed the Village of Ripley in 1873. By 1804, the village was accessible via the Buffalo & Erie Road (later renamed the Main Road) and became a key point along the railroad. Later roads, the lake and sidehill roads, developed parallel to the Main Road provided access to both the Lake Erie shoreline and the rural interior of the town. Ripley is one of eight towns in Chautauqua County that comprises part of the region's grape belt. Grapes were first introduced in the town by John B. Dinsmore, Walter Loomis, and Joel Calvin in 1860. Grapes, most commonly Concord grapes, were grown

along the sidehill and lake roads and sold to grape processors to produce juice, wine, jam, and jelly (French, 1860; Young, 1875; Edson, 1894; Downs and Hedley, 1921; McCutcheon, 2005; Town of Ripley, 2020).

Inset 3. 1817 Lay *Map of the State of New York*

By 1817, most parts of Chautauqua County had begun to be settled, though there were only a few organized townships. Much of the town remained rural throughout the subsequent decade (Lay, 1817; collections of the David Rumsey Historical Map Collection).



Inset 4. 1829 Burr *Map of the County of Chautauqua*

By 1829, several new towns had been formed, and laid out in a generally grid-like pattern (Burr, 1829; collections of the David Rumsey Historical Map Collection).

Historic maps reflect the nineteenth century settlement and expansion of the towns within the county and the area, surrounding the Facility, though the local area seems to have received little attention from settlers at the time with this relative lack of population growth continuing throughout the twentieth century. The 1854 Keeney *Map of Chautauqua County, New York* (Figure 6) shows populations in the Town of Ripley concentrated along the shore of Lake Erie around the population center of Quincy. Within the Facility Area itself, the population is dispersed, primarily as farmsteads,

with a smaller population locus surrounding a flax and sawmill on Twentymile Creek. The 1905 *Clymer, NY* and 1913 *North East, PA* 1:62,500 USGS Topographic Quadrangles (Figure 7) show little change in the settlement of the Facility Area, with the population still widely dispersed throughout as apparent farmsteads located along the few roadways present. The 1916 Rand McNally *Map of Ripley, Chautauqua, New York* (Figure 8) displays a slight increase in settlement within the Facility Area with the population still concentrated around crossroads near the mills noted on the 1854 Keeney map in two minor clusters, which is labeled as Raters Corners and Sheldon Corners. South Ripley is also noted as a population cluster. The 1941 *Clymer, NY* and 1943 *North East, PA* 1:62,500 USGS Topographic Quadrangles (Figure 9) show little change in the location and arrangement of the population in and around the Facility Area. Overall, the Facility Area reviewed in the above historical maps does not reflect significant growth or change in character or population dispersion during the periods represented.

2.5 Existing Conditions

The Facility is located in the Town of Ripley in Chautauqua County, New York. The 1,062 square miles of the county are divided into two cities, part of the Cattaraugus Indian Reservation, and 17 towns which contain 9 incorporated villages. It is located in a rural part of Chautauqua County, 4.5 miles southeast of Lake Erie. To the north is the Interstate 90 transportation corridor and to the south is Interstate 86. As previously noted, the Facility Area is situated on gently rolling topography. Currently, the Facility Area is primarily utilized as agricultural lands (see Appendix A, Photos 1-4), with undeveloped second-growth forest, and planted tree farms bounding and dividing agricultural fields (Appendix A, Photos 1, 6, 7). Existing conditions within the Facility Area have been observed and evaluated during site visits and through an examination of aerial imagery and can be summarized as follows:

- Land use is typical for an agricultural, rural area in Western New York and consists of hay, corn, and soybean fields, as well as fallow fields and pastures scattered residential development along area roadways, and moderately sized tracts of undeveloped second-growth forest intermixed with the fields (Appendix A, Photos 1-7).
- Numerous streams, wetlands, and creeks (Appendix A, Photo 5) are located within the Facility Area including Twentymile Creek. Additional tributaries throughout the Facility Area flow into Twelvemile Creek, Sixteen Mile Creek, and Findley Lake-West Branch Creek. Lake Erie is approximately 4.5 miles to the northeast of the Facility Area.
- Ponds and wetlands occur throughout the Facility Area (Appendix A, Photo 8).
- Roads within the Facility Area are paved and arranged in a rough grid and oriented on Twentymile Creek. Discounting Interstates 90 and 86 to the north and south of the Facility Area respectively, Northeast Sherman Road is the main road traversing the Facility Area trending east-west through the proposed Facility.
- Farm lanes, woods roads, and all-terrain vehicle trails are also common throughout the Facility Area.

- The Facility Area includes several overhead transmission lines ranging from small, single wooden pole supports to much larger double wooden poles and steel support structures.

3.0 ARCHAEOLOGICAL SENSITIVITY ASSESSMENT AND MODEL

In addition to conducting a literature review and background research for the proposed Facility, EDR created a GIS-based archaeological sensitivity model in order to assess the probability of encountering archaeological resources based on the variables described below in Sections 3.1 and 3.2. As described in Section 1.4 above, the potential impacts to archaeological resources from industrial-scale solar facilities are reduced compared to traditional energy generating facilities (e.g., wind, coal, natural gas). Therefore, an archaeological sensitivity model such as the one presented here, provides the opportunity to target archaeological survey in areas of higher sensitivity while maintaining a level of effort that is consistent with the scope of ground disturbance associated with the proposed Facility. This assessment evaluates the relative potential for the presence of archaeological resources based on elevated and low sensitivity for either Native American or Euro-American related archaeological materials.

3.1 Archaeological Sensitivity Assessment

As described in Section 2.3 of this report, one previously recorded archaeological site occurs within 1-mile (1.6-km) of the Facility Area and is described as "traces of occupation." Sensitivity for archaeological material is typically assessed based on topography, setting, soil, and proximity to water sources, as well as the presence of previously recorded archaeological sites. The primary assumption behind the assessment of archaeological sensitivity is that pre-industrial populations located their settlements in areas that maximized their access to key subsistence resources (e.g., water, fish, game, wild plant foods, and domesticated plants). Therefore, major habitation sites are often located on flat terrain, along major streams and rivers, in proximity to wetlands, and on well-drained soils. Though this model was developed primarily with a focus on identifying areas sensitive for Native American related archaeological resources, it can also be considered predictive of sensitivity for undocumented pre-industrial Euro-American sites and resources. Sensitivity for historically map-documented structure (MDS) is discussed below in Section 3.2. Based on these variables, and as described further below, approximately 25% of the Facility Area has an elevated sensitivity to contain undocumented archaeological sites.

In order to explicitly identify areas of elevated archaeological sensitivity, EDR developed a GIS-based archaeological sensitivity model for the Facility Area. The archaeological sensitivity model was designed in order to identify portions of the Limits of Significant Ground Disturbance which would be more likely to contain archaeological materials than others. The model incorporates the following variables:

- Proximity to previously recorded archaeological sites (defined as SHPO or NYSM Sites/Areas);
- Proximity to water, wetlands, and hydric soils;
- Presence of well drained soils; and,
- Slope.

EDR examined the one previously recorded site (listed above in Table 3) in terms of proximity to water, wetlands, and hydric soils, as well as soil drainage, and ground slope. In addition to the environmental variables examined, the model also takes into account the paucity of a sample consisting of one site, therefore, EDR employed a wider set of variables and conditions than the analysis of the single previously reported site necessarily indicates. The distribution of the three environmental variables (proximity to water/wetlands, soil drainage, and ground slope) has been successfully applied to previous models in western New York in order to establish the appropriate criteria (or thresholds) for areas of elevated archaeological sensitivity. The purpose of the model is to use these variables to identify a subset of lands within the Facility Area that are more likely to contain archaeological materials.

Therefore, based on analysis of the variables described above, EDR established the following criteria to define elevated archaeological sensitivity:

1. Areas within 1,000 feet (305 meters) of known archaeological sites (defined as NYSOPRHP or NYSM Sites);
2. Areas within known NYSM Areas;
3. Areas within 1,500 feet (457 meters) of water, wetlands, or hydric soils;
4. Soils classified as moderately well drained, well drained, somewhat excessively drained, and excessively drained, according to ESRI and SSURGO (2020) soils mapping; and,
5. Ground slope of 5% or less.

Therefore, as depicted on Figure 10, the entire Facility Area was categorized as having either elevated or reduced sensitivity, based on the above criteria. All areas within 1,000 feet (305 meters) of previously recorded archaeological sites, are considered to have elevated sensitivity. Furthermore, those locations within the Facility Area having a combination of at least two or more of criteria #3-5 (proximity to water, well-drained soils, and slope of 5% or less) are also considered to have elevated sensitivity (see Figure 10). For this model, proximity to water was prioritized over slope within the Facility Area. It is important to note, however, that any areas containing 12% or greater slopes were considered as low sensitivity due to steep slopes regardless of whether they met any of criteria 1 through 5 above.

The proposed application of this sensitivity model to the Phase IB archaeological survey is described below in Section 4.2 of this report.

3.2 Map-Documented-Structure Sensitivity Assessment

Areas where there is a greater potential for encountering historic-period archaeological resources include those areas located proximate to water and navigable waterways, railways, roadways, as well as the former locations of structures

depicted on historical maps and atlases within the Facility Area. As described in Section 2.4 and illustrated on historical maps, the Facility Area has been occupied by Europeans and Americans since the eighteenth century. The locations of former structures within and near the Facility Area are depicted on the Keeney's 1854 *Map of Chautauqua County, New York* (Figure 6), the 1905 *Clymer, NY* and 1913 *North East, PA* 1:62,500 USGS Topographic Quadrangles (Figure 7), the 1916 Rand McNally *Map of Ripley, Chautauqua, New York* (Figure 8), and the 1941 *Clymer, NY* and 1943 *North East, PA* 1:62,500 USGS Topographic Quadrangles (Figure 9)..

Historically MDS locations within the Facility Area are generally located adjacent to existing roadways. In some instances, MDS represent existing buildings and/or farms. In other instances, they are abandoned structures that now may be represented only by archaeological remains. Potential archaeological resources associated with these MDS locations could include abandoned residential and/or farmstead sites, where the complete residential and/or agricultural complex consisting of foundations, structural remains, artifact scatters, and other features, would constitute an archaeological site. In other locations, more limited remains of these sites, perhaps represented by only a foundation or an artifact scatter, may be present.

As depicted on Figure 10, areas located in the immediate vicinity—within approximately 200 feet (61 meters)—of MDS locations are considered to have an elevated sensitivity for the presence of mapped and otherwise associated historical archaeological resources. The remaining portions of the Facility Area exhibit minimal (if any) likelihood for significant historically recorded archaeological sites to be present. Based on this and the results of the background research and historical map analysis, the Facility Area is considered to have a moderate to high probability to contain these archaeological resources.

3.3 Ground Slope and Disturbance

The *NYAC Standards* indicate that a Phase I archaeological survey is not necessary in inundated wetland (or standing water) areas, previously disturbed areas, and areas where slopes exceed 12-15% (NYAC, 1994). Slope is anticipated to be a relatively minor factor in the archaeological sensitivity of the APE for Direct Effects because of the gently rolling topography with few steep slopes (see Figure 4 and Appendix A: Photos 1-4, 6). Additionally, Facility components will be preferentially sited on level to nearly level ground in order to minimize the grading required for Facility construction.

Wetland areas within the Facility Area are being investigated as part of the environmental review for the Facility. In general, Facility components have been and will be sited to minimize impacts to wetlands.

Previous ground disturbance within the Facility Area is, for the most part, limited to previous or ongoing agricultural activities. Farming is not considered significant in terms of its potential to affect the integrity of archaeological resources

(NYAC, 1994; SHPO, 2005). Additionally, some areas immediately adjacent to existing roads within the Facility Area include drainage ditches, culverts, buried utilities, natural gas wells, and areas of cut and/or fill. With the exception of these areas, the Facility Area in general does not appear to have been subjected to significant previous ground disturbance.

4.0 ARCHAEOLOGICAL SURVEY RESEARCH DESIGN

4.1 Phase IB Archaeological Survey Methodology

The Facility Area includes active and fallow agricultural lands (including pastures, corn and hay fields), open meadows, forested/shrubland areas, and steeply sloped areas (i.e., areas in excess of 12-15% slopes per the NYAC Standards [NYAC, 1994]). It is anticipated that the Phase IB archaeological survey will cover the entire Limits of Significant Ground Disturbance, as defined at the time of the survey. Following previous fieldwork methods, it is anticipated that EDR's additional archaeological survey work in these areas will consist of the following:

- Pedestrian Surface Survey: Fields Planted in Row Crops. In existing crop fields and/or previously cultivated areas with greater than 70% ground-surface visibility, archaeologists will conduct a pedestrian surface survey to determine whether archaeological sites are present (in accordance with the NYAC Standards; NYAC, 1994). In these areas, archaeologists will traverse the archaeological APE along transects spaced at 3- to 5-meter intervals while inspecting the ground surface for artifacts and/or archaeological features. The timing for this work is critical because surface survey needs to be conducted after a field has been freshly plowed and disked, and preferably following a rain event. If any artifacts or other indication of an archaeological site is observed on the ground surface, then the location of all finds will be recorded using sub-meter accuracy Global Positioning System (GPS) equipment. After recording the locations of all artifacts and/or features in a given area, archaeologists will collect observed artifacts (or a representative sample) for subsequent laboratory identification and analysis, in accordance with standard archaeological methods.
- Shovel Test Pits: Hay Fields, Forests, and Shrubland. In selected areas not suitable for pedestrian surface survey, archaeologists will excavate shovel test pits (STPs) to determine whether archaeological sites are present. STPs will be excavated along transects at 50-foot (15-meter) intervals, and in open fields at 16 STP's per acre, in accordance with the NYAC Standards (1994). STPs excavated for the Facility will be 30-50 cm in diameter and excavated to sterile subsoil or the practical limits of hand excavation (NYAC, 1994). Field notes for each STP will be recorded on standardized forms that describe soil stratigraphy, record whether any artifacts were recovered, and note any other relevant observations. All soils excavated from STPs will be screened through 0.25-inch hardware cloth. If Pre-Contact Native American artifacts are recovered from an isolated STP, then up to eight additional STPs will be excavated at one-meter and three-meter intervals around the original STP to determine whether the artifacts represent an isolated find or may indicate the presence of a more substantial archaeological site.

  In the vicinity of non-extant MDS locations, per the 2005 SHPO *Phase I Archaeological Report Format Requirements,* a transect of shovel tests will be excavated within 1 meter (3 feet, 4 inches) or less of the

foundation (if a foundation can be identified). Shovel tests within this transect will be excavated at an 8-meter (25-foot) or less interval, as will any shovel test transects excavated in the suspected yard area of the former structure. The Facility will not require the demolition of any standing structures and no Facility components are sited in the yard areas of standing structures.

- No Phase IB Archaeological Testing: Steeply Sloped, Wetland, and Disturbed Areas. No systematic archaeological survey work is proposed in steeply sloped areas, delineated wetlands, or areas where visual inspection can confirm previous soil disturbance (per the NYAC Standards; NYAC, 1994). In these areas, archaeological survey will be restricted to pedestrian walkover supplemented by judgmental shovel testing if indications of a potential archaeological site are observed (e.g., foundations, structural remains, or rock overhangs suitable for use as shelters).

4.2 Archaeological Resources Survey Research Design

The archaeological sensitivity model described in Sections 3.1 and 3.2 is depicted in Figure 10 and summarized below in Table 4. The sensitivity model identified areas of elevated archaeological sensitivity as well as areas of reduced sensitivity. It is proposed that 100% of elevated sensitivity areas be subjected to Phase I archaeological survey following the methodology described above. As indicated in Table 4, 25% of the Facility Area is identified as having elevated sensitivity for archaeological sites and/or historically documented structures, so this will provide an adequate sample to evaluate the Facility's potential effect on archaeological resources. No archaeological survey is recommended in the areas identified as low sensitivity. However, during the Phase IB fieldwork, if any of these areas are assessed by field archaeologists as potentially being of elevated sensitivity (based on microtopography, soils, or other factors not identified in the sensitivity model), portions of the low sensitivity areas may be surveyed.

Table 4 Archaeological Research Design and Sensitivity Model

Archaeological Sensitivity	Criteria	Acres	Recommended Phase I Survey Intensity
Elevated Native American Archaeological Sensitivity	• <1,000 feet from previously recorded site; • <1,500 feet from water/ wetlands/hydric soils; • Well drained soils; • And/or <5% slope.	869	Complete Phase IB Survey via pedestrian survey or shovel testing in the Limits of Significant Ground Disturbance
Elevated Historically MDS Sensitivity	<200 feet from historically map-documented structure.	240	Complete Phase IB Survey via pedestrian survey or shovel testing in the Limits of Significant Ground Disturbance

Archaeological Sensitivity	Criteria	Acres	Recommended Phase I Survey Intensity
Reduced Sensitivity	• >1,000 feet from previously recorded site; • >1,500 feet from water/ wetlands/hydric soils; • Poorly drained soils; • >5% slope. • And/or >200 feet from historically map-documented structure.	3,401	No Phase IB Survey

4.3 Phase IB Archaeological Survey Reports and Delivery of Electronic Data

Results of subsequent Phase IB archaeological survey conducted for the Facility will be summarized in an illustrated report prepared in accordance with the *New York State Historic Preservation Office Phase I Archaeological Report Format Requirements* (SHPO, 2005). Descriptive information for any archaeological sites identified during the Phase IB surveys will be uploaded to SHPO's online CRIS database at the same time as the survey report. EDR will also provide accurate location information for any additional sites identified during the Phase IB surveys via CRIS.

5.0 SUMMARY AND CONCLUSIONS

5.1 Summary of Phase IA Archaeological Survey

Relative to the potential for archaeological sites to be located in the Facility Area, the results of the Phase IA archaeological resources survey for the proposed South Ripley Solar Project can be summarized as follows:

- No previously recorded archaeological sites are located wholly within the Facility Area. One previously recorded archaeological site is located within 1-mile (1.6-km) of the Facility Area. This site was reported as traces of a Native American occupation of unknown temporal affiliation (Parker, 1922).
- Based on EDR's archaeological sensitivity model, approximately 25% of the Facility Area is considered sensitive for archaeological sites and resources.
- Portions of the Facility Area located in the immediate vicinity—within approximately 200 feet [61 meters]—of MDS locations are considered to have high potential for the presence of archaeological resources. This constitutes approximately 5% of the Facility Area, some of which overlaps with areas of elevated archaeological sensitivity (approximately 1% of MDS sensitive areas). The remaining (non-MDS) portions of the Facility Area exhibit minimal likelihood for historically documented structures or their remains to be present.

Proposed construction of the Facility will include ground disturbing activities that have the potential to impact archaeological resources. The APE for Direct Effects will include all areas within the limits of disturbance for proposed construction activities; however, some of these activities do not involve a significant amount of earth disturbance and, therefore, do not have the potential to adversely impact archaeological resources. These include the installation of PV panel arrays and fencing. The construction/installation of other Facility components, such as the substation, inverter pads, access roads, any buried collection line installed in a trench wider than 1 foot (0.3 meters), tree removal/grubbing, and construction staging areas that require any amount of grading or paving, will constitute significant earth disturbance and have the potential to adversely impact archaeological resources.

Any archaeological sites located within the Facility Area that are not within the limits of disturbance for proposed Facility components will not be affected by the Facility.

5.2 Conclusion

It is currently proposed that 100% of the Limits of Significant Ground Disturbance identified as having elevated sensitivity (for either archaeological resources or historical MDS) will be subjected to Phase IB archaeological survey.

Any changes to the Facility layout will be investigated in the Phase IB survey consistent with the archaeological sensitivity model and research design.

EDR has provided this work plan to SHPO to confirm the proposed field methodology and to ensure that the proposed scope of the survey is consistent with SHPO's expectations. Please provide a formal response indicating SHPO's concurrence with and/or comments on the research design described herein.

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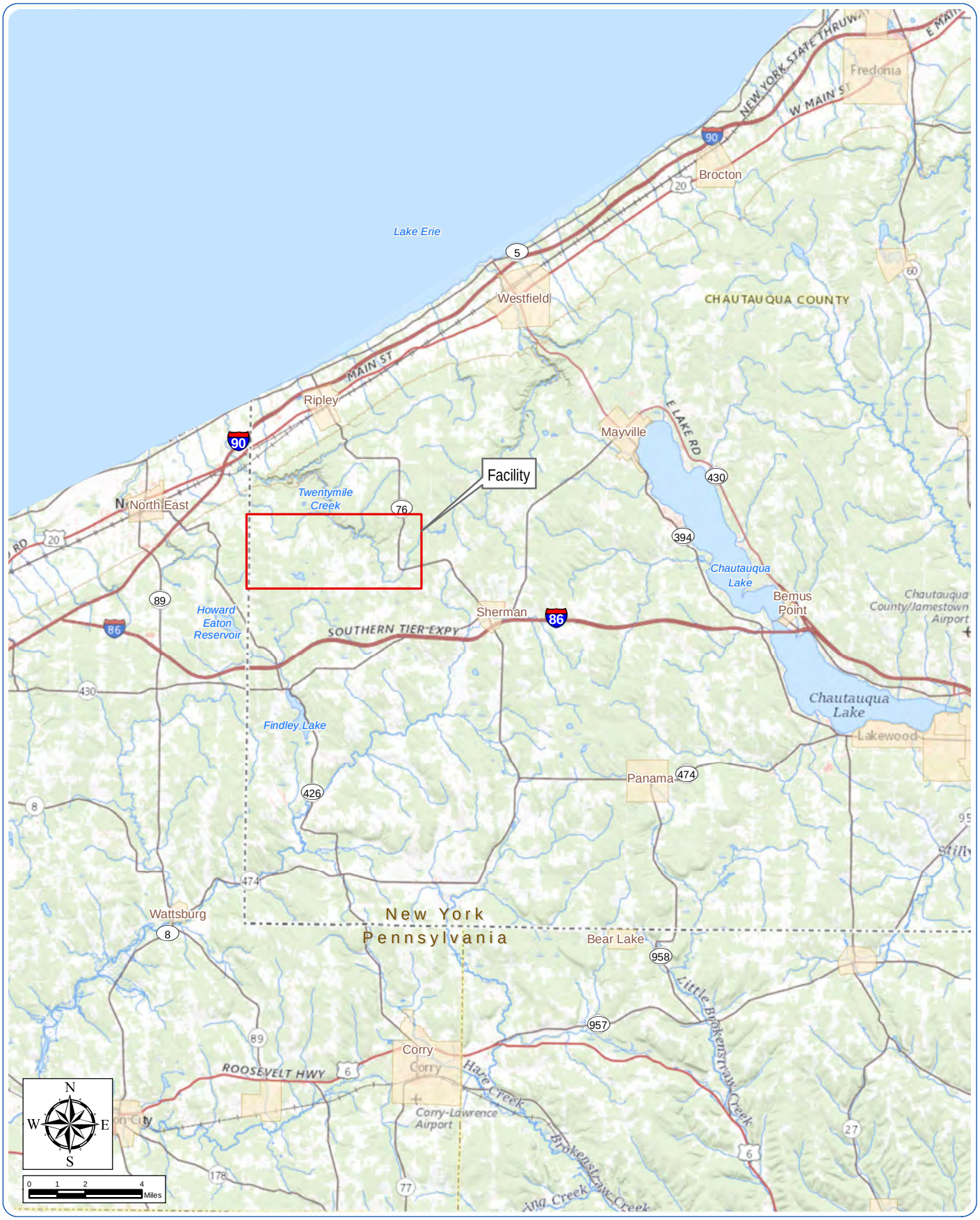
FIGURES

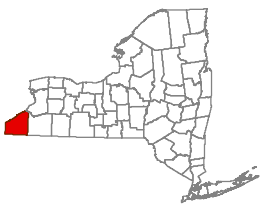


South Ripley Solar Project

Town of Ripley, Chautauqua County, New York

Figure 1: Regional Facility Location

State Boundary

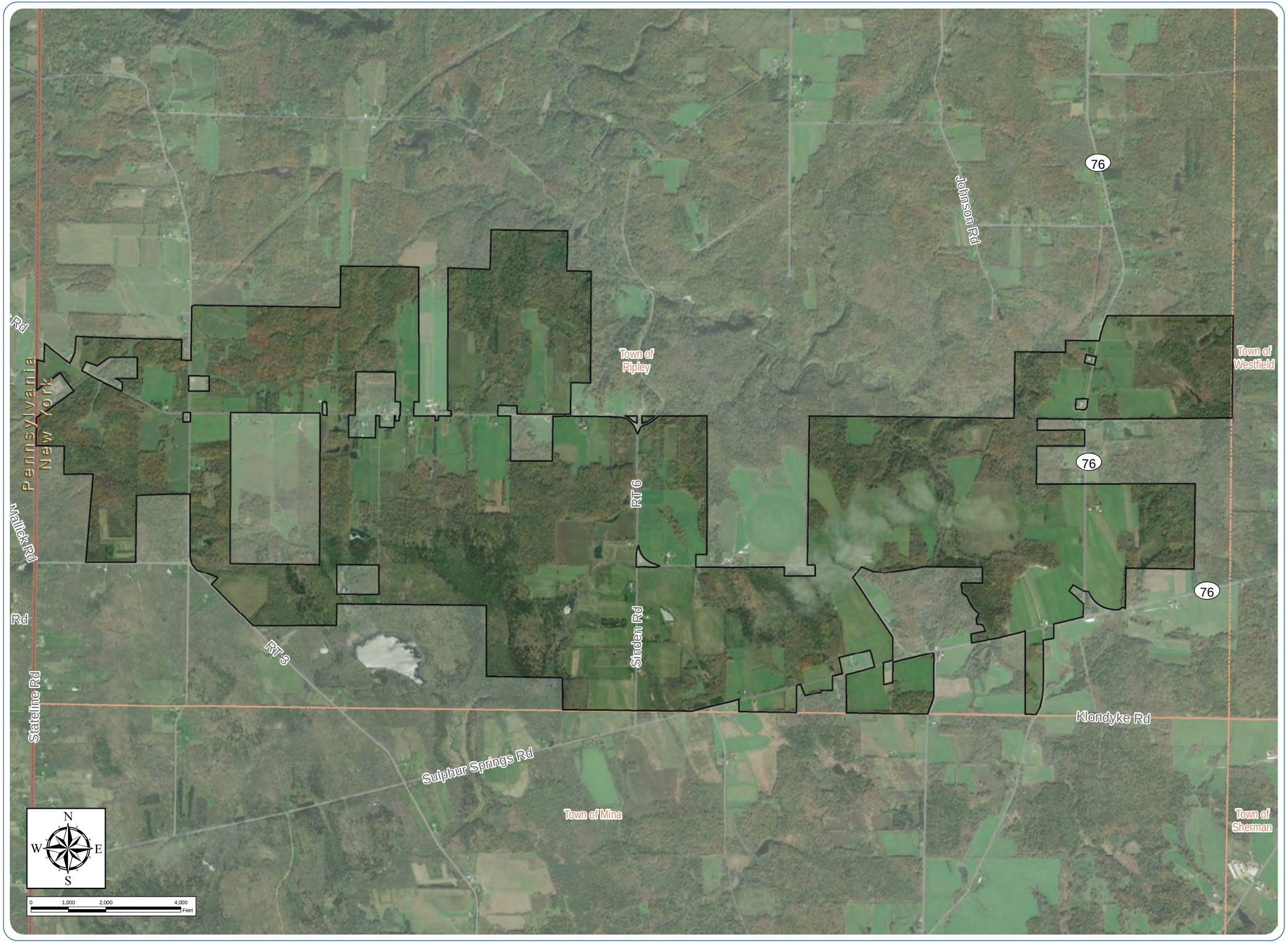


Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on October 29, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

South Ripley Solar Project

Town of Ripley, Chautauqua County, New York

Figure 2: Facility Area



Facility Area

Town Boundary

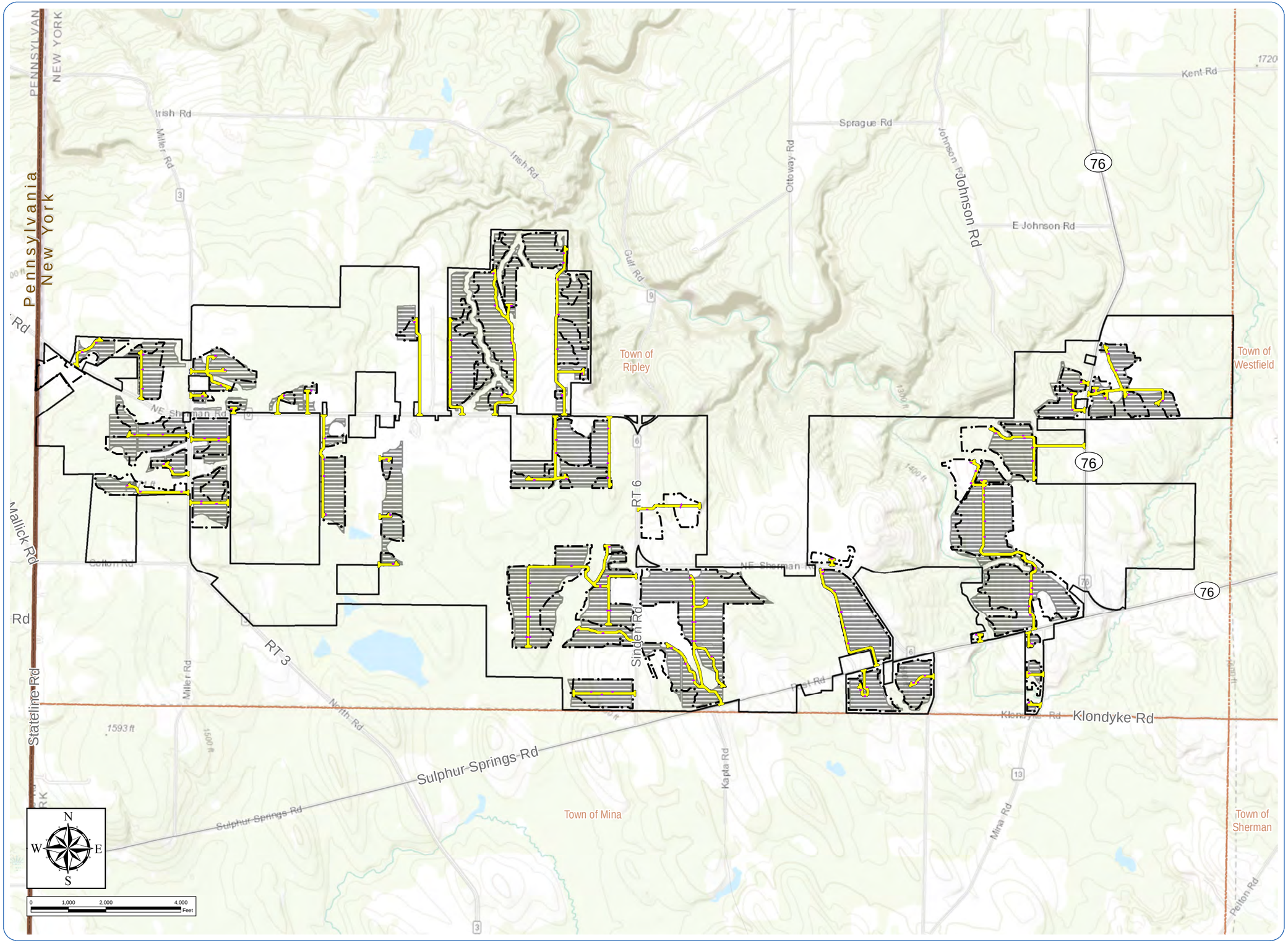
State Boundary

Notes: 1. Basemap: ESRI ArcGIS Online "World Imagery" map service. 2. This map was generated in ArcMap on October 29, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

South Ripley Solar Project

Town of Ripley, Chautauqua County, New York

Figure 3: Facility Components



Access Road
Inverter
Fenceline
PV Panel Area
Facility Area

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on October 30, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

South Ripley Solar Project

Town of Ripley, Chautauqua County, New York

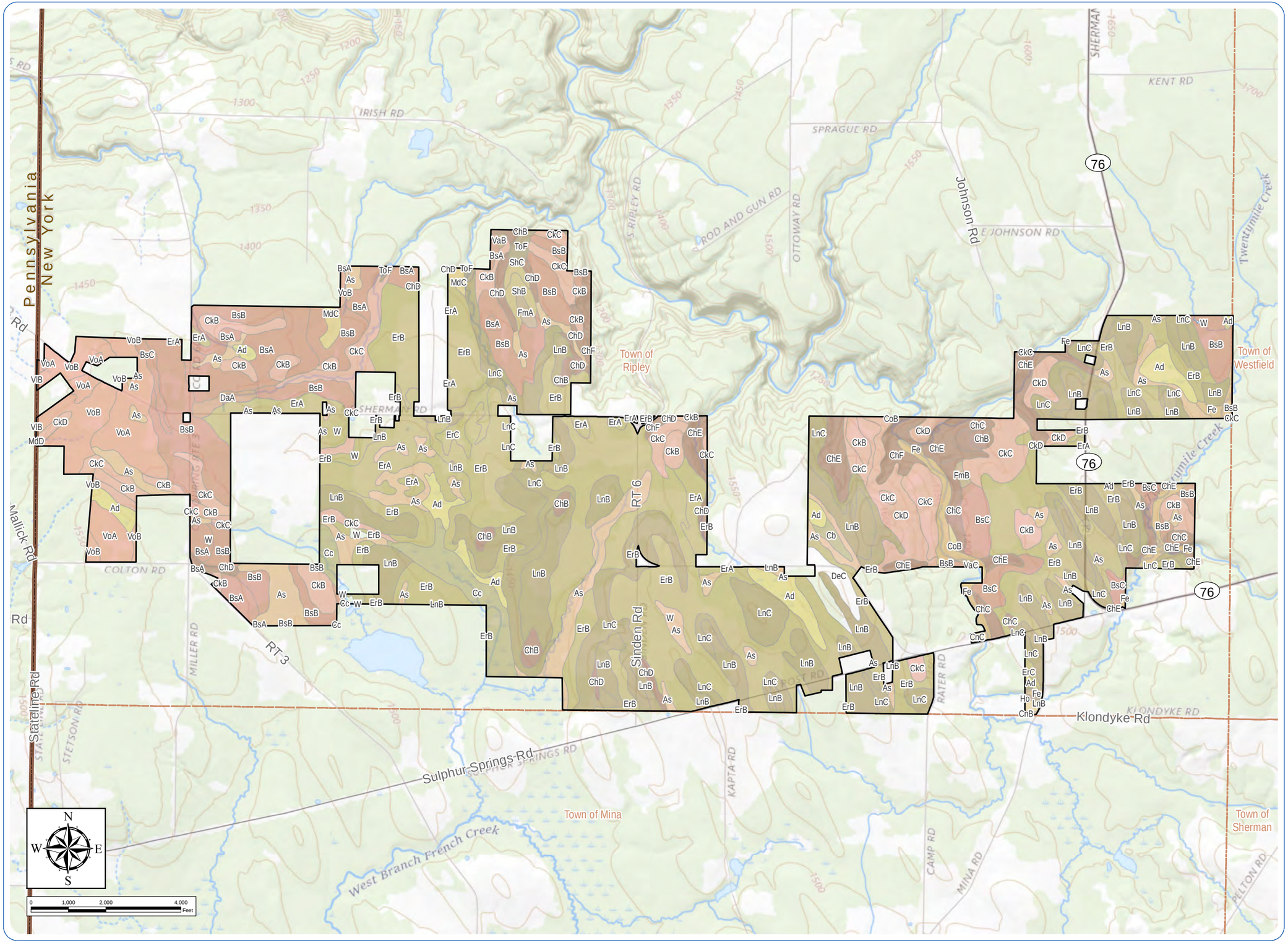
Figure 4: Project Topography and Soils

- Facility Area
- Town Boundary
- State Boundary

Soil Series

- Alden
- Ashville
- Busti
- Canandaigua
- Chadakoin
- Chautauqua
- Chenango
- Dalton
- Erie
- Fluvaquents
- Fremont
- Holderton
- Langford
- Mardin
- Schuyler
- Towerville
- Valois
- Volusia

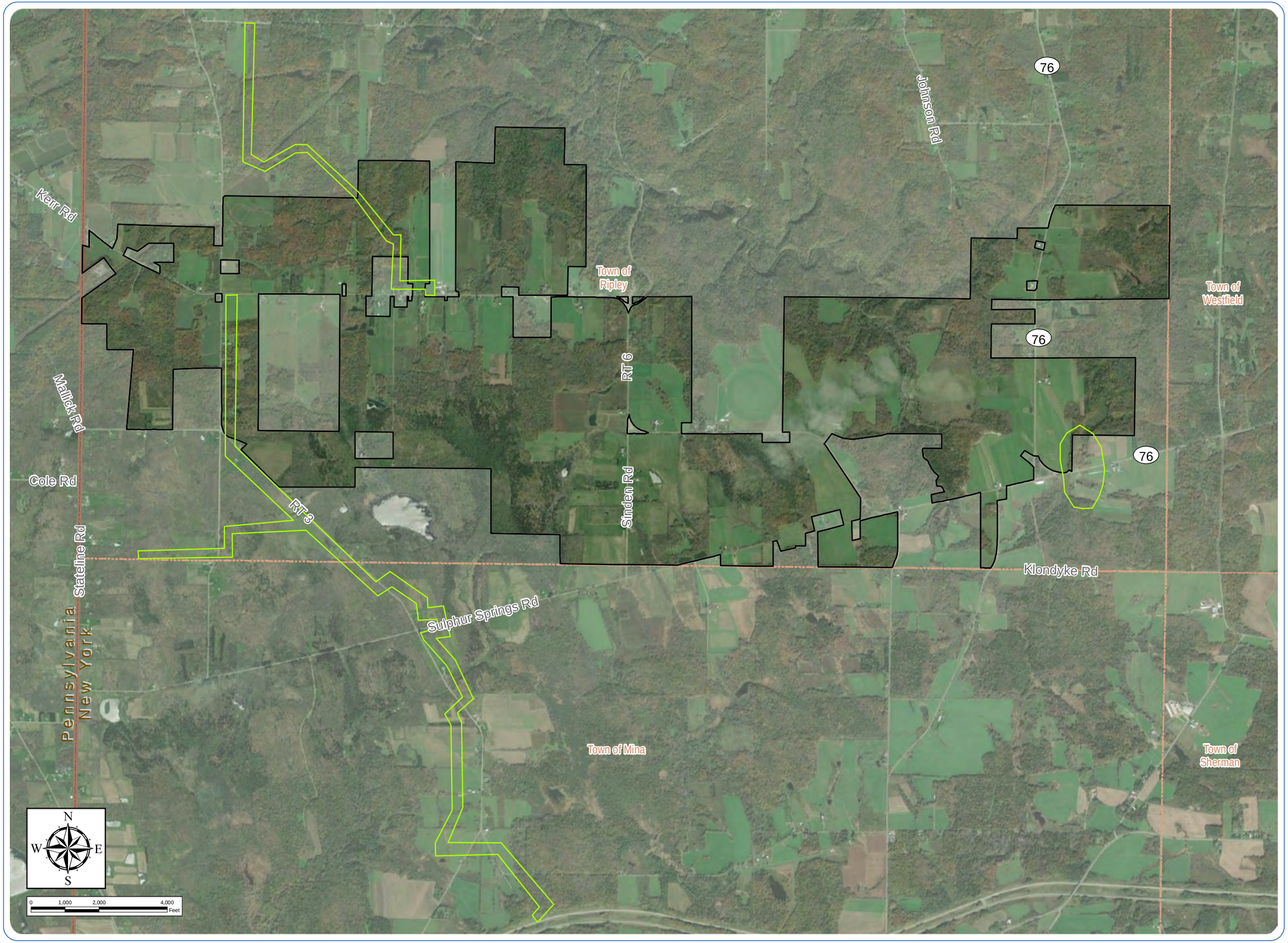
Notes: 1. Basemap: ESRI ArcGIS Online "USGS National Map" map service. 2. This map was generated in ArcMap on October 29, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.



South Ripley Solar Project

Town of Ripley, Chautauqua County, New York

Figure 5: Previous Archaeological Surveys



Previous Archaeolgical Survey

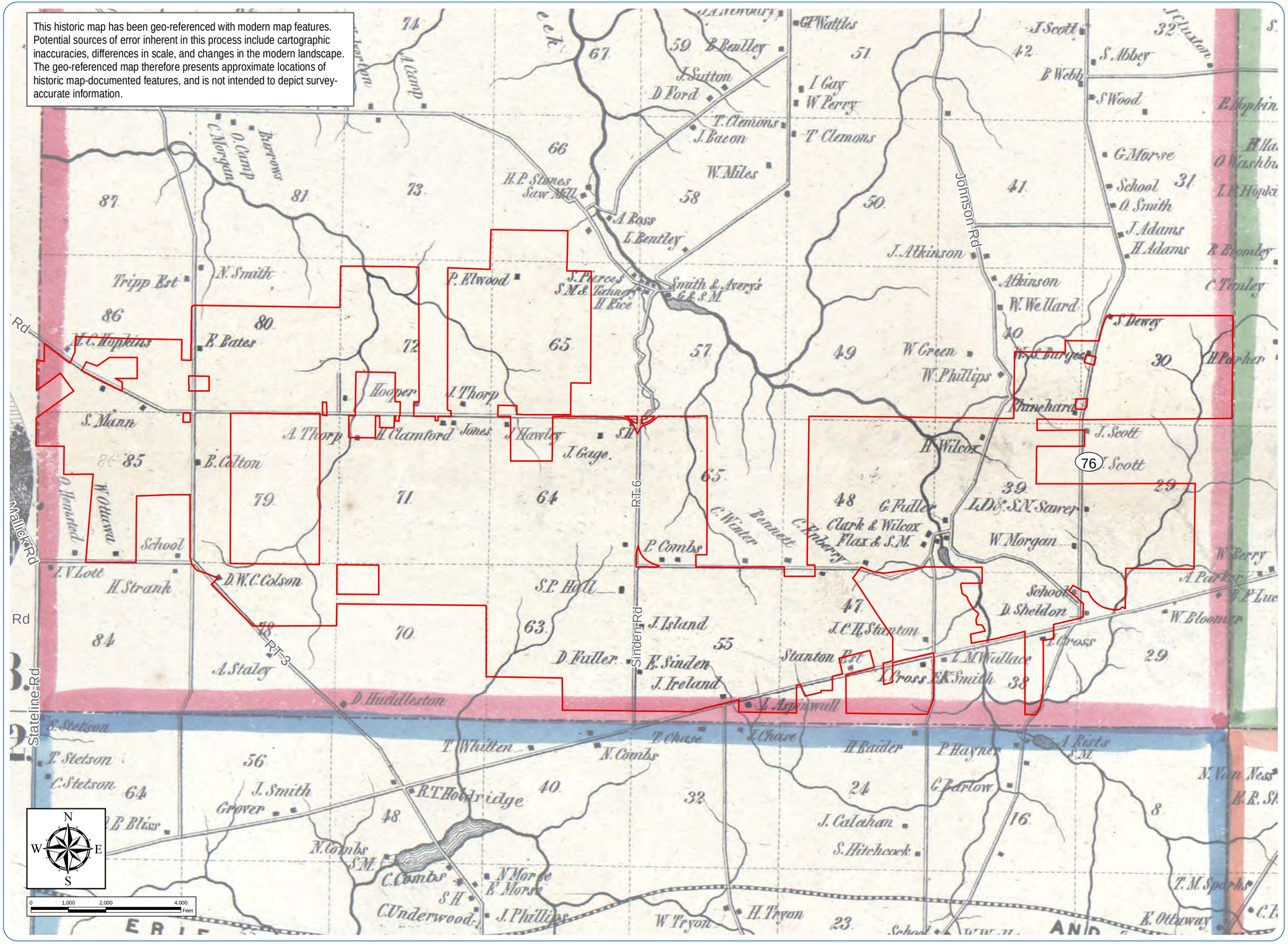
Facility Area

Town Boundary

State Boundary

Notes: 1. Basemap: ESRI ArcGIS Online "World Imagery" map service. 2. This map was generated in ArcMap on October 29, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

This historic map has been geo-referenced with modern map features. Potential sources of error inherent in this process include cartographic inaccuracies, differences in scale, and changes in the modern landscape. The geo-referenced map therefore presents approximate locations of historic map-documented features, and is not intended to depict survey-accurate information.



South Ripley Solar Project

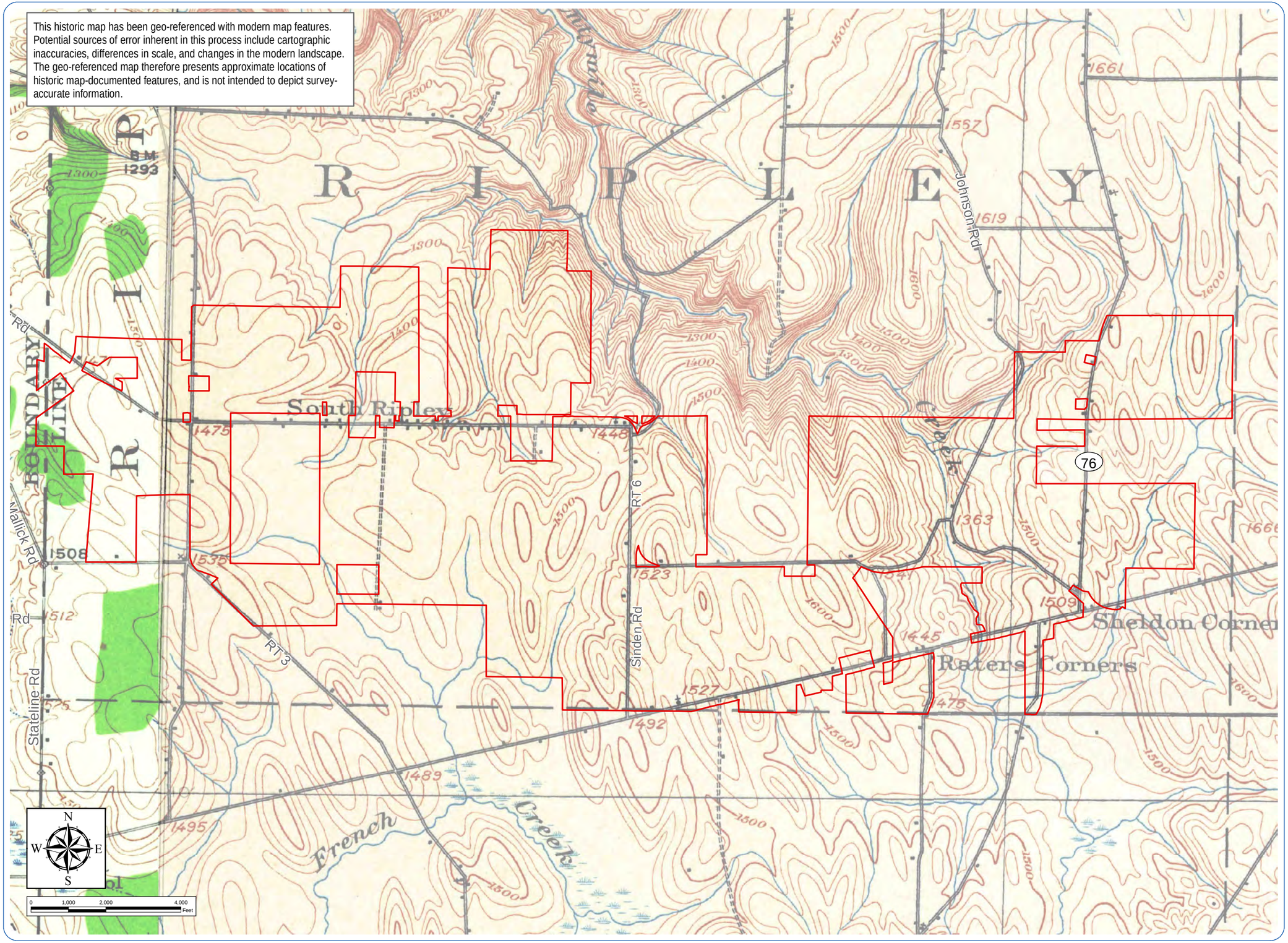
Town of Ripley, Chautauqua County, New York

Figure 6: 1854 Map of Chautauqua County, NY

Facility Area

Notes: 1. Basemap: 1854 Keeney Map of Chautauqua County, NY. 2. This map was generated in ArcMap on October 29, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

This historic map has been geo-referenced with modern map features. Potential sources of error inherent in this process include cartographic inaccuracies, differences in scale, and changes in the modern landscape. The geo-referenced map therefore presents approximate locations of historic map-documented features, and is not intended to depict survey-accurate information.



South Ripley Solar Project

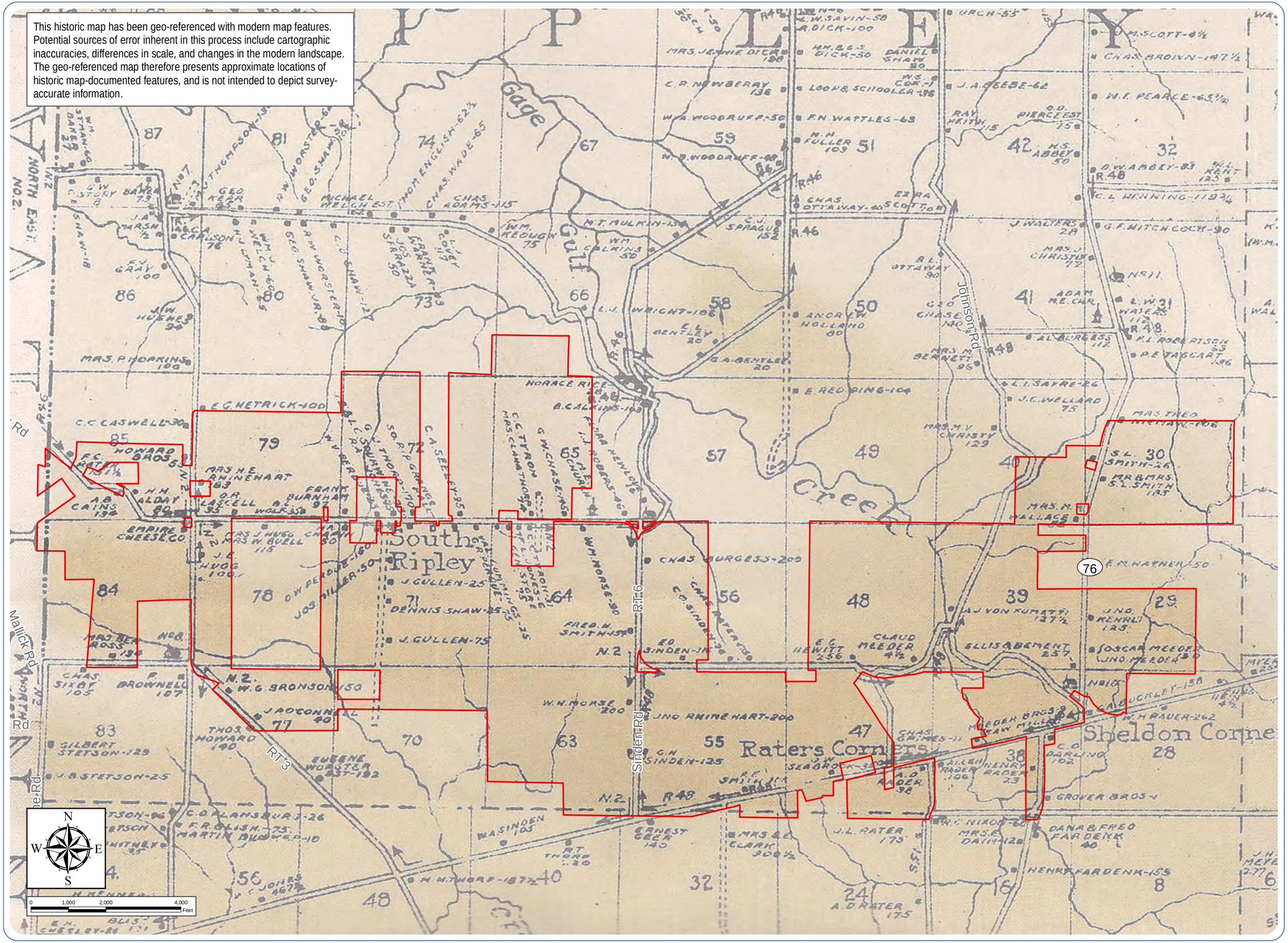
Town of Ripley, Chautauqua County, New York

Figure 7. 1905 *Clymer, NY* and 1913 *North East, PA* 1:62,500 USGS Topographic Quadrangles

Facility Area

Notes: 1. Basemap: 1905 *Clymer, NY* and 1913 *North East, PA* 1:62,500 USGS Topographic Quadrangles. 2. This map was generated in ArcMap on October 29, 2020. 3. This is a color graphic. Reproduction in grayscale may

This historic map has been geo-referenced with modern map features. Potential sources of error inherent in this process include cartographic inaccuracies, differences in scale, and changes in the modern landscape. The geo-referenced map therefore presents approximate locations of historic map-documented features, and is not intended to depict survey-accurate information.



South Ripley Solar Project

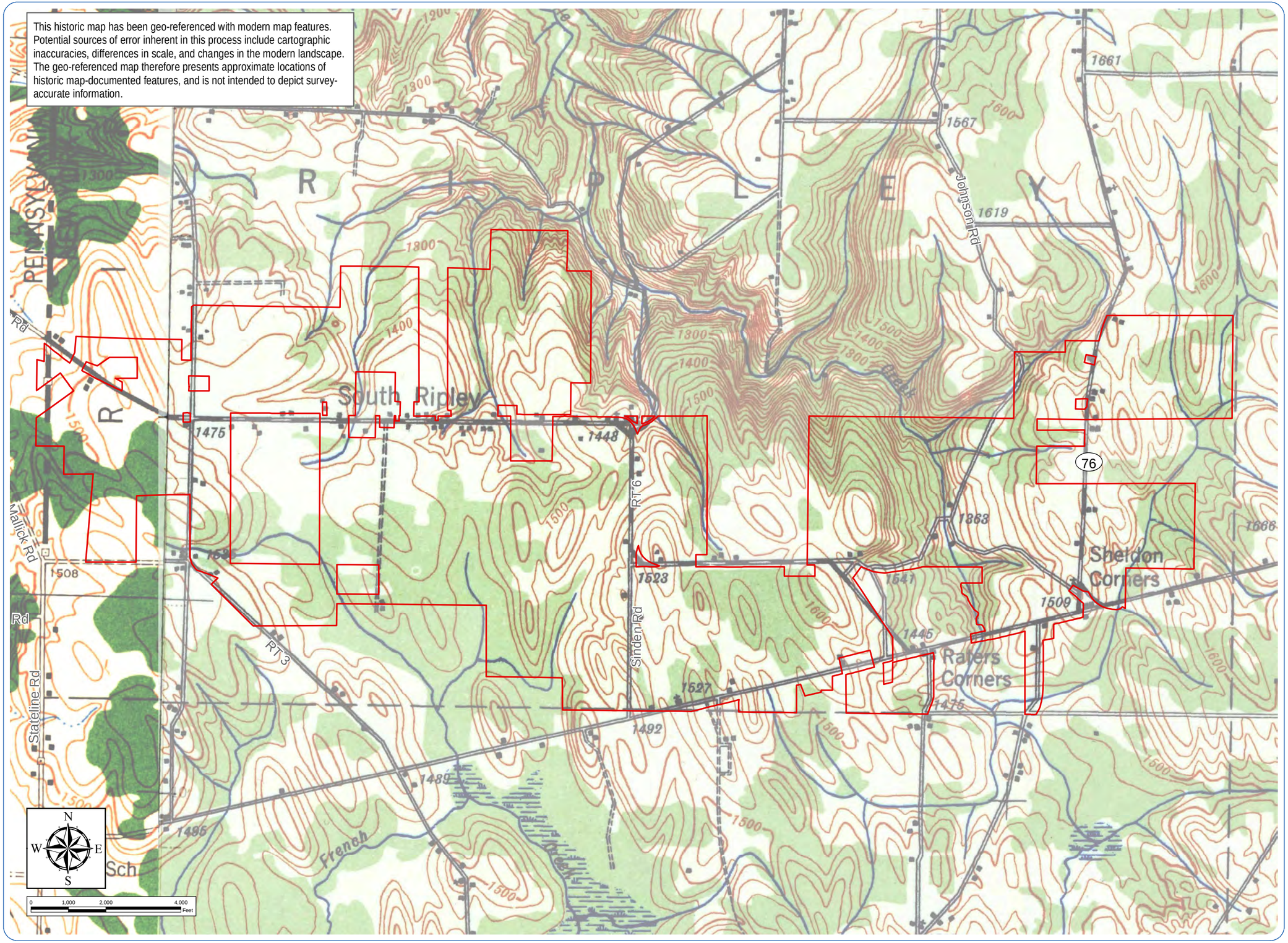
Town of Ripley, Chautauqua County, New York

Figure 8. 1916 Map of Chautauqua County, NY

Facility Area

Notes: 1. Basemap: Rand McNally 1916 Map of Chautauqua County, NY. 2. This map was generated in ArcMap on October 29, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

This historic map has been geo-referenced with modern map features. Potential sources of error inherent in this process include cartographic inaccuracies, differences in scale, and changes in the modern landscape. The geo-referenced map therefore presents approximate locations of historic map-documented features, and is not intended to depict survey-accurate information.



South Ripley Solar Project

Town of Ripley, Chautauqua County, New York

Figure 9. 1941 *Clymer, NY* and 1943 *North East, PA* 1:62,500 USGS Topographic Quadrangles

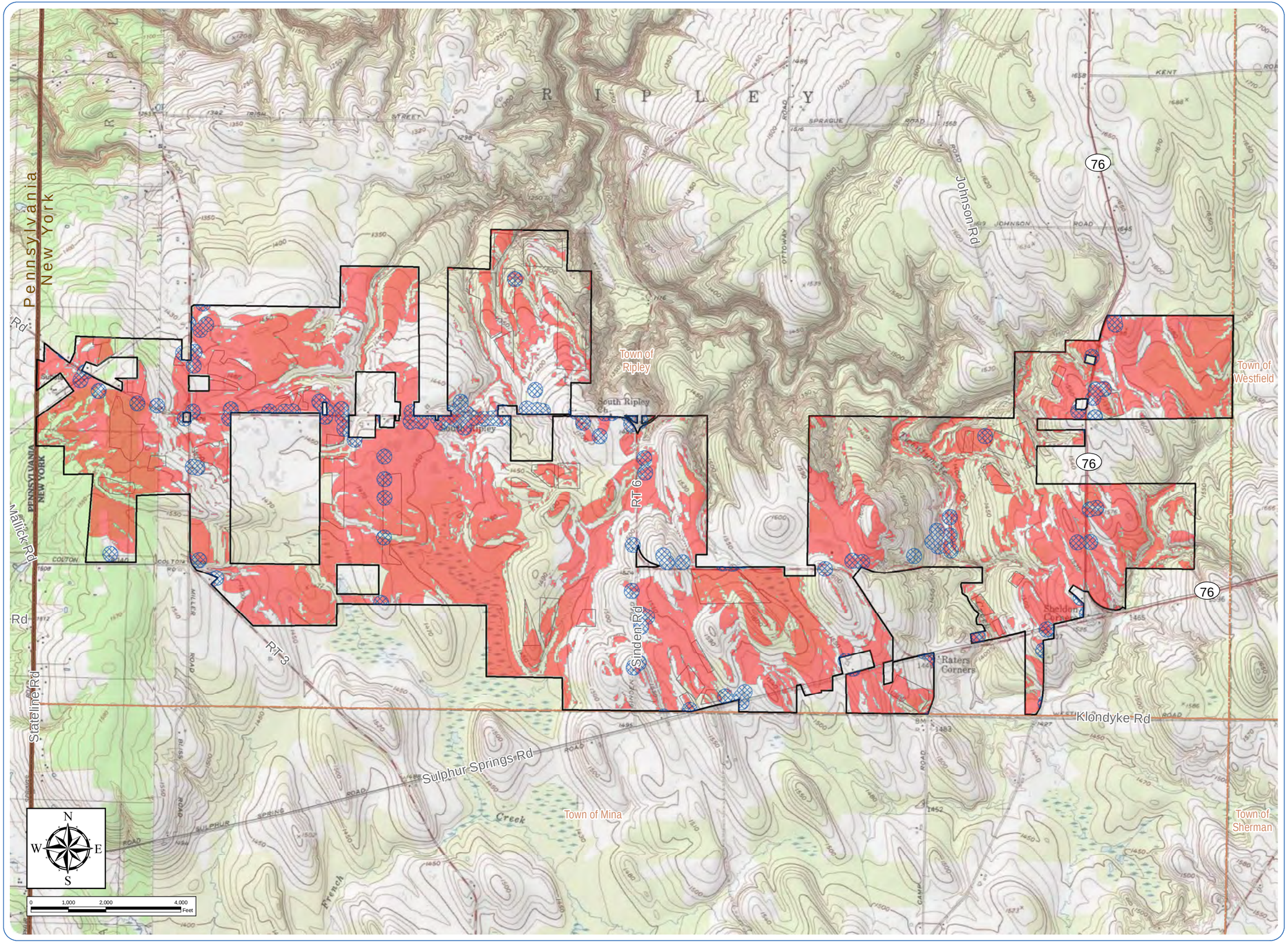
Facility Area

Notes: 1. Basemap: 1941 *Clymer, NY* and 1943 *North East, PA* 1:62,500 USGS Topographic Quadrangles. 2. This map was generated in ArcMap on October 29, 2020. 3. This is a color graphic. Reproduction in grayscale may

South Ripley Solar Project

Town of Ripley, Chautauqua County, New York

Figure 10: Archaeological Sensitivity



Elevated Archaeological Sensitivity

Elevated Sensitivity for Map-Documented Structure

Facility Area

State Boundary

Notes: 1. Basemap:ESRI ArcGIS Online "USA Topo Maps" map service. 2. This map was generated in ArcMap on October 29, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

APPENDIX A: PHOTOGRAPHS

Photograph 1

Secondary forest of varying maturity bound the majority of the agricultural fields in the Facility Area. Viewed southwest from Miller Road.

Photograph 2

Rolling agricultural fields dominate the majority of the Facility Area. Viewed north from Northeast Sherman Road.

Photograph 3

Agricultural development remains the primary land use in the Facility Area. Viewed south from Northeast Sherman Road.

Photograph 4

Residences and agricultural outbuildings are widely dispersed throughout the Facility Area, with development concentrated along roadways. Viewed to the northeast from Northeast Sherman Road.

Photograph 5

An unnamed tributary stream of Twentymile Creek serves as a representative example of many of the other tributary streams present throughout the Facility Area.

Photograph 6

An example of secondary forest present throughout the Facility Area.

Photograph 7

Tree farms are present throughout the Facility Area, with varying levels of associated disturbance present. Viewed is an example of more extreme disturbance associated with tree cultivation.

Photograph 8

A delineated upland wetland in secondary forest.