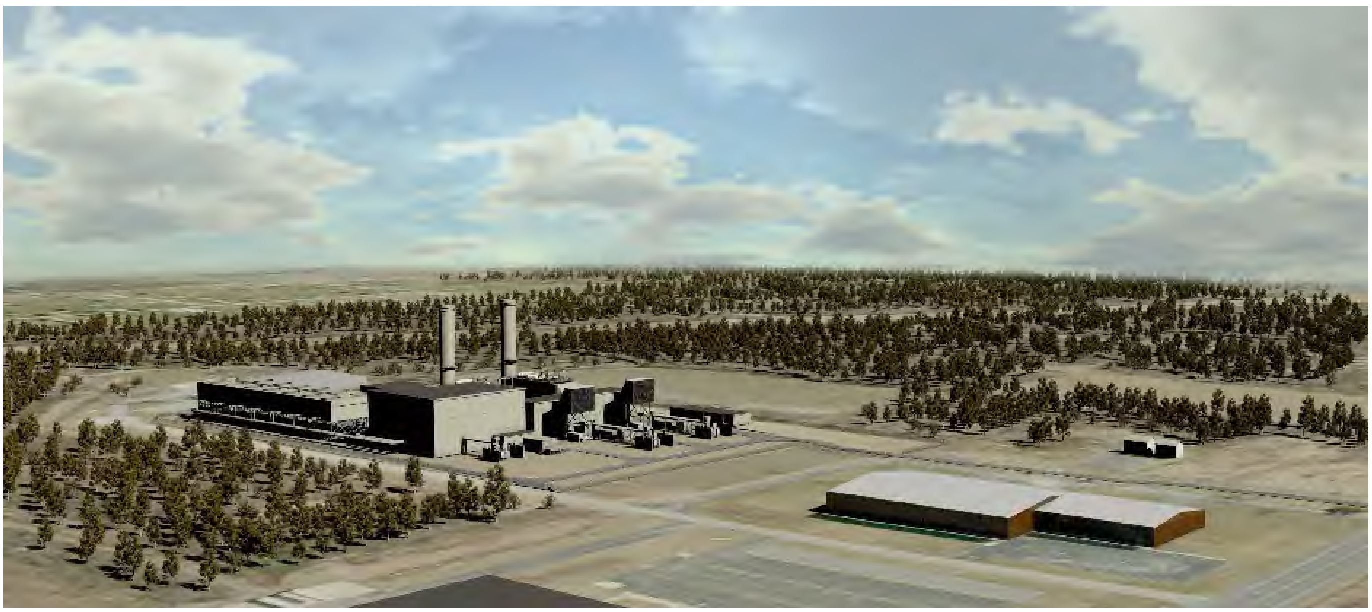
Case No. 14-2322-EL-BGN

APPLICATION TO THE

Ohio Power Siting Board FOR A Certificate of Environmental Compatibility and Public Need FOR THE Lordstown Energy Center



SUBMITTED BY: **Clean Energy Future - Lordstown, LLC**

Lordstown Energy Center
Clean Energy for Northeastern Ohio

March 2015

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March 23, 2015

Ms. Barcy McNeal
Administration/Docketing
Public Utilities Commission of Ohio
180 East Broad Street, 11th Floor
Columbus, OH 43215-3793

Re:Clean Energy Future-Lordstown, LLC,
OPSB Case No. 14-2322-EL-BGN

Dear Ms. McNeal:

Enclosed, please find an original and four copies of the Application of Clean Energy Future-Lordstown, LLC, a limited liability company, for a Certificate of Environmental Compatibility and Public Need for an Electric Generating Facility within the Lordstown Industrial Park, Trumbull County, Ohio, under Chapter 4906-13 of the Ohio Administrative Code (OAC). Pursuant to OAC Rule 4906-5-03(A)(3), the applicant makes the following declarations:

Name of Applicant: Clean Energy Future-Lordstown, LLC
whose president is
William Siderewicz, P.E.
24 Proctor Street
Manchester, MA 01944

Name/Location of
Proposed Facility: Clean Energy Future-Lordstown, LLC
Lordstown, Ohio

Authorized Representative
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Since the pre application was filed, there have been no revisions that appear in the application.

Notarized Statement: See Attached Affidavit of William Siderewicz, P.E., on behalf of Clean Energy Future-Lordstown, LLC

Sincerely on behalf of
CLEAN ENERGY FUTURE-LORDSTOWN, LLC

Sally W Bloomfield

Sally W. Bloomfield

Attachment

BEFORE
THE OHIO POWER SITING BOARD

In the Matter of the Application of **Clean Energy Future-Lordstown, LLC** for a Certificate of Environmental Compatibility and Public Need for an Electric Generating Facility in Lordstown, Ohio, Trumbull County	)))))	Case No. 14-2322-EL-BGN

AFFIDAVIT OF WILLIAM SIDEREWICZ, P.E., CLEAN ENERGY FURTURE-LORDSTOWN, LLC

STATE OF MASSACHUETTS :
: ss.
COUNTY OF ESSEX :

I, William Siderewicz, P.E., being duly sworn and cautioned, state that I am over 18 years of age and competent to testify to the matters stated in this affidavit and further state the following based upon my personal knowledge:

1. I am executing this affidavit on behalf of Clean Energy Future-Lordstown, LLC as its president.

2. I have reviewed Clean Energy Future-Lordstown, LLC's Application to the Ohio Power Siting Board for a Certificate of Environmental Compatibility and Public Need for the Lordstown Energy Center project.

3. To the best of my knowledge, information, and belief, the information and materials contained in the above-referenced Application are true and accurate.

4. To the best of my knowledge, information, and belief, the above-referenced Application is complete.

William Siderewicz, P.E.

Sworn to before and signed in my presence this 16th day of March 2015.

Notary Public

[SEAL]

ANN MARIE GIROUX
Notary Public
Commonwealth of Massachusetts
My Commission Expires Jan. 18, 2019

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ACRONYMS AND ABBREVIATIONS

%	percent
°F	degrees Fahrenheit
$\mu g/m^3$	microgram per cubic meter
μPa	microPascals
AERMOD	A USEPA steady-state air quality dispersion plume model
APE	Area of Potential Effect
ASTM	ASTM International, formerly known as American Society for Testing and Materials
BACT	Best Available Control Technology
BAT	Best Available Technology
bgs	below ground surface
BMPs	Best Management Practices
Btu	British thermal units
CAIR	Clean Air Interstate Rule
Calypso	Calypso Communications LLC
CEF-L	Clean Energy Future – Lordstown, LLC
CEMS	Continuous Emissions Monitoring System
CFR	Code of Federal Regulations
CI	compression ignition
CO	carbon monoxide
CO_2	carbon dioxide
CO_{2e}	carbon dioxide equivalent
the Court	the United States Court of Appeals for the District of Columbia Circuit
CSAPR	Cross-State Air Pollution Rule
CTG	combustion turbine generator
dB	decibels
dBA	A-weighted decibels
DLN	dry low NO_X
Dominion	Dominion East Ohio
EMF	electric and magnetic fields
FAA	Federal Aviation Administration
the Facility	Lordstown Energy Center
Facility Site	An approximately 17-acre property on which the Lordstown Energy Center will be constructed
FERC	Federal Energy Regulatory Commission

g/hp-hr	grams per horsepower-hour
g/kW-hr	grams per kilowatt-hour
GE	General Electric
GHG	greenhouse gas
GM	General Motors
gpm	gallons per minute
GW	gigawatts
HAP	hazardous air pollutant
HHV	higher heating value
Ho	Holly silt loam
hp	horsepower
HRSG	heat recovery steam generator
I-76	Interstate 76
I-80	Interstate 80
ISO	International Organization for Standardization
kV	kilovolt
kW	kilowatt
Laydown Area	A 23.5-acre property, located adjacent to the south of the Facility Site, with the potential to be used for temporary construction laydown
lb/MMBtu	pounds per million British thermal units
lb/MW-hr	pounds per megawatt-hour
L_{eq}	Equivalent steady sound level of a noise energy-averaged over time
LT	long-term
MgA	Mahoning silt loam, 0 to 2 percent slopes
MgB	Mahoning silt loam, 2 to 6 percent slopes
mgd	million gallons per day
ML	monitoring location
MMBtu/hr	million British thermal units per hour
MMcf	million cubic feet
mph	miles per hour
MW	megawatts
MW-hr	megawatt-hour
NAAQS	National Ambient Air Quality Standards
NCGT	North Coast Gas Transmission
NESHAP	National Emissions Standards for Hazardous Air Pollutants

NFPA	National Fire Protection Association
ng/J	nanograms per Joule
NH_3	ammonia
NO	nitric oxide
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
Northern Laydown Area	An approximately 4.5-acre property located adjacent to the north of Henn Parkway, with the potential to be used for temporary construction laydown
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSPS	New Source Performance Standards
NSR	New Source Review
O_2	oxygen
O&M	operation and maintenance
OAC	Ohio Administrative Code
OCC	Ohio Commerce Center
ODNR	Ohio Department of Natural Resources
Ohio EPA	Ohio Environmental Protection Agency
OHI	Ohio Historic Inventory
OPSB	Ohio Power Siting Board
Or	Orrville silt loam, frequently flooded
OSHA	Occupational Safety and Health Administration
PADEP	Pennsylvania Department of Environmental Protection
PJM	the regional electric transmission Independent System Operator
PM	particulate matter
PM_{10}	particulate matter with a diameter of less than or equal to 10 microns
$PM_{2.5}$	particulate matter with a diameter of less than or equal to 2.5 microns
POTW	publicly owned treatment works
ppmvdc	parts per million by volume dry basis corrected to 15 percent O_2
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
PTI	Permit to Install
Ringbus Interconnection	A 100-foot wide electrical transmission corridor connecting the Facility Site to the Ringbus Site

Ringbus Interconnection Property	Approximately 70-acre property, stretching from north to northeast of the Facility Site, within which the Ringbus Interconnection will be routed
Ringbus Property	Approximately 71-acre property, located northeast of the Facility Site on which the 5-breaker ringbus will be located
Ringbus Site	An approximately 3.5-acre parcel, located within the Ringbus Property, proposed for the 5-breaker ringbus
ROW	right-of-way
RsB	Rittman silt loam, 2 to 6 percent slopes
RsC	Rittman silt loam, 6 to 12 percent slopes
Sc	Sebring silt loam
SCR	selective catalytic reduction
SER	Significant Emission Rate
SHPO	Ohio State Historic Preservation Office
SIL	Significant Impact Level
SO_2	sulfur dioxide
STG	steam turbine generator
Study Area	Approximately 182-acre area included in this Application associated with the Lordstown Energy Center, including the Facility Site, Laydown Area, Ringbus Interconnection Property, and Ringbus Property
tpy	tons per year
ULSD	ultra-low sulfur distillate
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOC	volatile organic compounds
WbA	Wadsworth silt loam, 0 to 2 percent slopes
WbB	Wadsworth silt loam, 2 to 6 percent slopes

(A) PROJECT SUMMARY AND OVERVIEW

Clean Energy Future – Lordstown, LLC (CEF-L) is proposing to develop, finance, build, own, and operate the Lordstown Energy Center (the Facility), a new natural gas-fired combined-cycle electric generating facility located in the Village of Lordstown, Trumbull County, Ohio (Figure 01-1). Approval is currently being sought for a capacity up to 800 megawatts (MW).

(1) General Purpose of the Facility

The Facility will help meet electricity demand in the region, particularly in light of the recent and planned retirements of existing coal-fired generating assets located in Ohio (5.9 gigawatts [GW] have retired since 2013 and 10.5 GW are pending retirement by the end of 2015), including several plants in northeastern Ohio (Niles; East Lake; Bay Shore; Lake Shore; and Ashtabula). The Facility will help meet this need by providing additional base load and peaking capability via its natural gas-fired combined-cycle technology.

(2) Description of the Facility

The Facility is identified in its PJM[1] interconnect application as a nominal net 800-MW (unfired International Organization for Standardization [ISO] conditions) capacity and energy facility, and will utilize advanced gas turbine/steam turbine, combined-cycle technology to generate electricity. Consistent with the PJM interconnection application, this Ohio Power Siting Board (OPSB) Application reflects a Facility net generation capacity of 800 MW. Because the maximum net power output of the Facility has the potential to reach 940 MW, CEF-L is working on a new PJM interconnection application

[1] PJM is the regional independent transmission organization that coordinates the movement of wholesale electricity in all or part of 13 states (including Ohio) and the District of Columbia. Its name results from its origin serving Pennsylvania (P), New Jersey (J), and Maryland (M).

requesting an increase in MW sales from 800 MW to 940 MW. Once this request has received appropriate review milestones, supplemental information will be filed with the OPSB to request authorization of the additional output.

Because a final combustion turbine vendor has not yet been selected, both Siemens and General Electric (GE) technology were evaluated for this Application. The environmental impacts are similar between the two options; this Application reflects the maximum impact associated with both potential turbine technologies.

The Facility (with the exception of limited-use ancillary equipment) is designed to operate solely on natural gas and will not be capable of operating on fuel oil. CEF-L has determined that, due to the abundant, local, low-cost natural gas in proximity to the Facility, including Utica shale gas, a back-up fuel such as fuel oil is not required. The gas turbine and steam turbine power generating equipment will be located indoors, making the Facility visually pleasing and a quiet neighbor.

The proposed location for the Facility consists of a rectangular-shaped parcel of land, totaling 17 acres (Facility Site). A 23.5-acre parcel located adjacent to the south of the Facility Site has the potential to be used for temporary construction laydown (Laydown Area). In addition to the Facility, this Application includes a 5-breaker ringbus. CEF-L has an option on approximately 71 acres of land located between two First Energy 345-kilovolt (kV) transmission line corridors for this purpose (Ringbus Property). Approximately 3.5 acres within the Ringbus Property will house the ringbus (Ringbus Site). An electrical interconnection (Ringbus Interconnection) will be required between the Facility Site and the Ringbus Site. For the purpose of this Application, an approximately 70-acre area was examined for potential locations for the Ringbus

Interconnection (Ringbus Interconnection Property). Approximately 4.5 acres of the Ringbus Interconnection Property, located adjacent to the Facility Site and north of Henn Parkway, also has the potential to be used for temporary construction laydown (Northern Laydown Area). Therefore, a total of approximately 182 acres are included in this Application for the Facility and associated structures (Study Area). The Study Area – the project area under review in this OPSB Application – is located entirely within Trumbull County, off State Route 45 (Tod Avenue) in the Village of Lordstown, Ohio.

The Facility Site is zoned “I-1” for industrial use and is located within the Lordstown Industrial Park, a designated Enterprise Zone with Foreign Trade Zone status, as further discussed in Section 4906-13-07(C)(1). Access to the Facility Site is good; the Facility Site is located approximately 1 mile northeast of Interstate 80 (I-80) and 2.6 miles north of Interstate 76 (I-76). Route 45, a four-lane road that runs north-south, forms the western boundary of the Facility Site, and provides direct access via Henn Parkway.

Two First Energy-owned 345-kV transmission line corridors extend in a general north-south direction east of the Facility Site, across the Ringbus Property. The southeastern corner of the Laydown Area abuts Mud Creek, with the 100- and 500-year floodplains extending onto a small portion of the Laydown Area, as further discussed in Section 4906-13-04(A)(5). Mud Creek flows northeast, across the Ringbus Property, before entering the Mahoning River approximately 3 miles northeast of the Study Area. An unnamed tributary to Mud Creek flows eastward across the Ringbus Interconnection Property before entering Mud Creek, and a smaller unnamed stream flows eastward across the Ringbus Property before entering Cedar Lake.

The Study Area is set within a mixed industrial, commercial, residential, and agricultural area northeast of I-80, south of Salt Springs Road, and west of Highland Avenue. Surrounding area to the west is zoned I-1 Industrial, and is dominated by the General Motors (GM) Lordstown Assembly Plant, located on the west side of Route 45. Areas to the north, east, and south are predominantly zoned for residential use, with scattered commercial development along the busier roadways (Route 45 and Salt Springs Road). The Lion's Club currently meets at a building located within the Laydown Site; negotiations are underway to relocate this use and remove this structure from the property or repurpose it for Facility use.

Lordstown Village Park, a 60-acre public recreational area comprised of various sports fields, picnic pavilions, and a 1-mile nature trail, is located approximately 1.5 miles north of the Facility Site. The Warren Wildlife Area, a 40-acre preserved public recreational area, is located approximately 3.5 miles northeast of the Facility Site, and the Mill Creek Metroparks Bikeway, an 11-mile paved trail, is located approximately 4 miles southeast of the Facility Site.

(3) Site Selection Process

The Facility Site selection process is described in greater detail in Section 4906-13-03. As outlined in that section, CEF-L's market knowledge identified this region of northeastern Ohio as one where the planned shutdown of existing coal-fired capacity will create the need for clean, efficient power generation. The Village of Lordstown and the proposed Facility Site were selected based on consideration of a range of key characteristics for a successful Facility. Upon identification of this Facility Site, additional scrutiny of a range of issues was undertaken prior to initiating the engineering and environmental activities necessary for completion of the OPSB Application.

Key characteristics of the proposed Facility Site that makes it suitable for Facility development are outlined in Table 01-1.

TABLE 01-1
PROPOSED FACILITY SITE CHARACTERISTICS

Key Attribute	Site Conditions
Adequate Size	Adequate space for the Facility layout exists within the approximately 17-acre property, with additional adjacent property available for temporary construction laydown.
Compatible Zoning and Land Use	The Facility Site is within an Industrial zone in a setting that includes other industrial facilities.
Natural Gas Alternatives	There is an abundant, local, low-cost supply of natural gas in the region, including Utica shale gas.
Short Distance to Robust Electrical Interconnection	Two First Energy 345-kV transmission line corridors are located in close proximity to the Facility Site.
Transmission Interconnection Alternatives	Undeveloped area between the Facility Site and existing First Energy transmission corridors allows for electrical interconnection route options.
Adequate Water Supply	There are existing robust and underutilized municipal water systems capable of providing water to the Facility. Adequate capacity exists such that community water use will not be affected.
Feasible Wastewater Discharge	There are existing robust municipal wastewater systems capable of receiving Facility discharge.
Strong Transportation Network	The Facility Site is located in close proximity to major highways (e.g., Route 45, I-80, I-76) and railways.
Lack of Significant Environmental Constraints	The Facility Site is located in an attainment area with respect to National Ambient Air Quality Standards (NAAQS) for all criteria pollutants. Since existing studies and approvals for wetland impacts have already been attained, the Facility can be accommodated with limited additional environmental impact.

(4) Principal Environmental and Socioeconomic Considerations

CEF-L has evaluated the impacts of the proposed Facility's construction and operation on the environment and on the community. Topics evaluated include: air quality;

water resources; solid waste; demographics; noise; ecology; land use; economics (including employment); cultural resources; and agricultural districts.

(a) Potential Construction Impacts

Construction impacts have been minimized through the selection of a Facility Site that is relatively flat, requires no tree clearing, and has an existing United States Army Corps of Engineers (USACE) Permit for the necessary wetland impacts.

The 23.5-acre Laydown Area was also sited on an active agricultural field that is relatively flat, requires minimal tree clearing, and will avoid wetland impacts. Located adjacent to the Facility Site, use of the Laydown Area would minimize construction traffic on public roadways. Floodplain is restricted to the southeastern corner of the Laydown Area, associated with nearby Mud Creek. This area will be avoided during construction activities.

The Northern Laydown Area is located within a portion of the Ringbus Interconnection Property that avoids wetlands and minimizes tree clearing. The Ringbus Site is located on an open field, will require minimal tree clearing and will avoid wetland impacts. The proposed Ringbus Interconnection, which will connect the Facility Site to the Ringbus Site, balances technical requirements and minimization of impacts to existing vegetation and wetlands.

Although the Facility Site and Laydown Area are in active agricultural use, they are not within a designated agricultural district; therefore, no impact to such area is anticipated as a result of the Facility.

An on-site archaeological investigation has been completed for the majority of the Facility-related footprint within the Study Area to confirm that there are no significant on-site artifacts; confirmation regarding the balance of the Study Area will occur once seasonal conditions allow. The report of this investigation is pending acceptance by the Ohio State Historic Preservation Office (SHPO). No impacts to cultural resources are anticipated.

All parks and recreational and open space areas are at least 1.5 miles from the Facility Site. The closest, Lordstown Village Park, is a 60-acre public-access recreational area comprised of various sports fields, a 1-mile nature trail walk, and several pavilions. Meander Golf Course, a nine-hole public golf course, is located approximately 4 miles south of the Facility Site, and Mill Creek Metroparks Bikeway, an 11-mile paved public bike trail, runs generally southwest to northeast approximately 4 miles southeast of the Facility Site.

The Warren Wildlife Area, a 40-acre public hunting and fishing area, is located approximately 3.5 miles northeast of the Facility Site. The wildlife area consists of primarily bottomland hardwoods with a small marsh area in the center and is home to a variety of game animals, furbearers, and nesting and migratory bird species.

During construction, air quality impacts will be limited to relatively minor emissions from the construction equipment required for Facility Site preparation and from fugitive dust emissions. Impacts to water quality will also be extremely limited, with no direct impacts to wetlands or surface waters proposed. The Facility will obtain general permit coverage for construction under the National Pollutant

Discharge Elimination System (NPDES) program and will implement Best Management Practices (BMPs) to maintain water quality standards and minimize erosion and sediment control. Solid waste generated by Facility construction will be minimized and removed from the Facility Site by licensed haulers and disposed of at local or regional approved facilities. Traffic will increase during the 32-month construction period. In order to minimize potential effect on the community, CEF-L will coordinate with local officials to ensure that shift times and travel routes are optimized to the extent possible.

(b) Potential Operational Impacts

Following construction, operational impacts will also be minimized. Operational impacts on air quality will be minimized through the use of efficient new gas turbine technology, and incorporating dry-low nitrogen oxide (DLN) combustors, oxidation catalysts, and selective catalytic reduction (SCR). The Facility will not be equipped to burn liquid fuel, thereby ensuring low emission rates throughout its operating life. All air quality impacts will be below United States Environmental Protection Agency (USEPA) NAAQS (as discussed in Section 4906-13-06(B)(3)(b)). Noise impacts associated with the Facility will comply with the Village of Lordstown Noise Ordinance and with OPSB precedent. With sound-generating equipment located at least 1,700 feet from the nearest residential property, minimal noise impacts are anticipated. All solid waste generated during Facility operation will be minimized and removed from the Facility Site by licensed haulers and disposed of at local or regional approved facilities. Facility-related traffic will be minimal once the Facility is operational, with only approximately 25 to 27 employees and Facility-related deliveries traveling to and from the Facility Site on a regular basis.

The Facility is expected to have a significant positive impact on the local economy since it will pay for local services utilized, as well as contribute to the local tax base. The Facility will utilize existing available municipal water supplies, likely the City of Warren and Meander Water District, eliminating the potential need for a new surface water intake structure or groundwater well. Process wastewaters generated by the Facility will be directly discharged to the existing Village wastewater collection system and conveyed to the City of Warren's publicly owned treatment works (POTW) in accordance with existing pretreatment requirements protective of water quality.

(5) Project Schedule

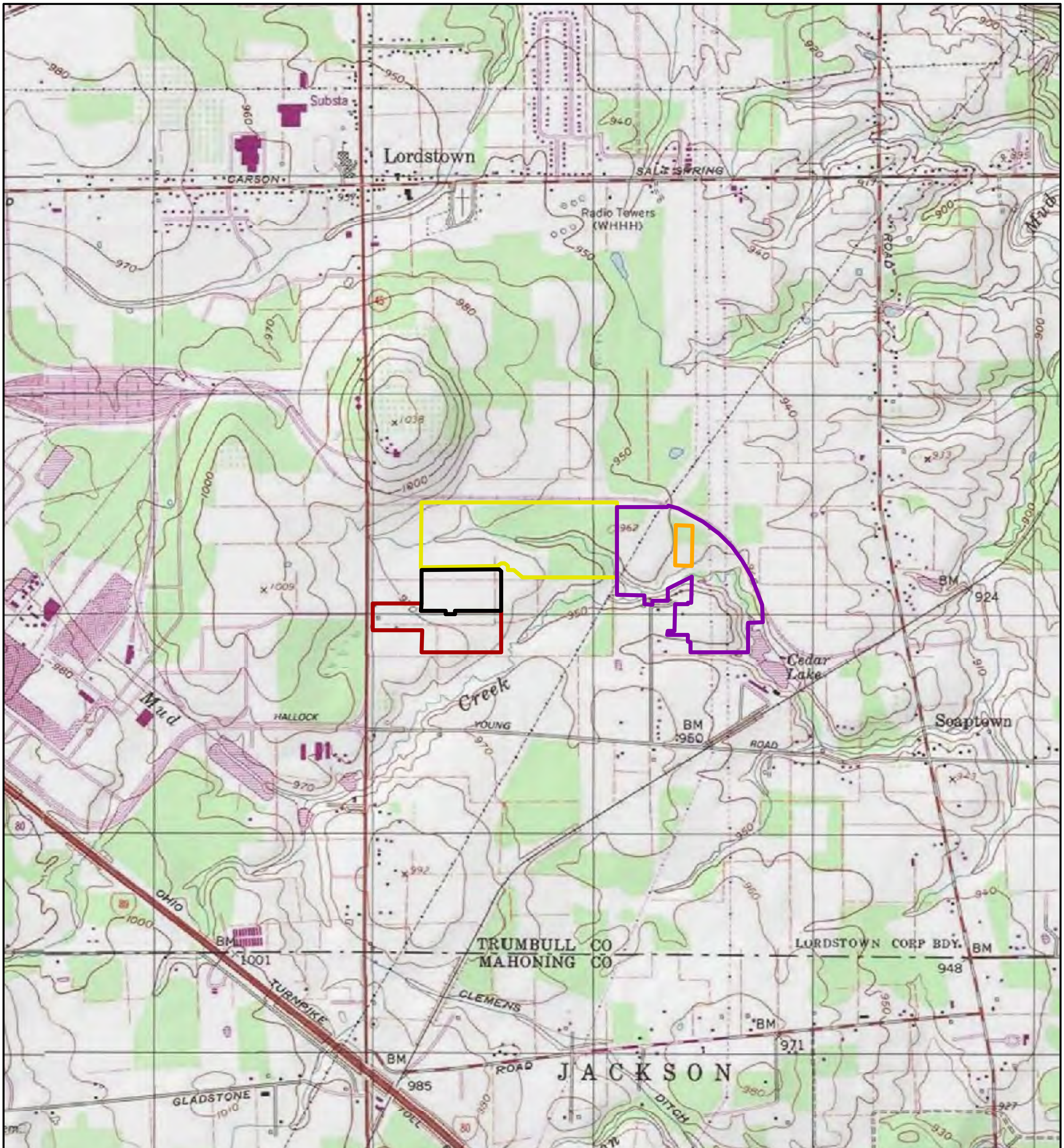
The Facility schedule is based on the submission of this Application in March 2015, the issuance of the OPSB certificate by August 2015, and the commencement of commercial operation by May 2018 in order to meet the anticipated summer peak load demands within the PJM marketplace.

Any delay in the issuance of the OPSB certificate would have a significant negative commercial impact on the Facility's planned summer 2018 operations and would jeopardize the Facility's ability to meet contractual PJM needs, as well as lowering the availability of capacity during critical summertime conditions.

CEF-L intends to bid into PJM's Capacity Auction in May 2015, for delivery of Facility capacity from summer 2018 through summer 2019. As part of this bid process, CEF-L will be making guarantees to PJM that the Facility will be operational by May 2018.

If development delays occur, including issuance of permits, CEF-L will be subject to substantial financial penalties by PJM, since PJM would be relying upon capacity not operational when needed the most.

CEF-L is confident that this schedule is achievable and that the Facility will be producing electricity on May 1, 2018 when the State of Ohio needs new electricity resources.



Legend

- Facility Site
- Laydown Area
- Ringbus Site
- Ringbus Property
- Ringbus Interconnection Property

0 0.25 0.5 Miles

N

Figure 01-1
Facility Location

Lordstown Energy Center
Village of Lordstown, Ohio

(A) DETAILED DESCRIPTION OF PROPOSED GENERATION AND ASSOCIATED FACILITIES

Figures 02-1A through 02-1H identify: the proposed Facility; major population centers and administrative boundaries; major transportation routes and utility corridors; named rivers, streams, and other bodies of water; and major institutions, parks, and recreational areas within a 5-mile radius of the Study Area. Figure 02-2 illustrates the proposed Facility on an aerial photograph overlain with the Facility layout, showing surrounding road names and major features of the proposed Facility. Additional detail is provided in Figure 02-3, a plot plan which focuses on the primary Facility footprint and labels the various Facility components. A computer-generated color rendering of the Facility is included as Figure 02-4.

(1) Project Details

(a) Generating Units

The Facility is designed to be a nominal net 800-MW (unfired at all temperature conditions) power plant and will consist of two Siemens SCC6-8000H or GE 7HA.01 combustion turbine generators (CTGs) each capable of generating a nominal output of approximately 285 MW and a maximum output of approximately 312 MW. Each gas turbine will be equipped with power augmentation in the form of evaporative coolers. The Facility will be capable of operating up to 8,760 hours per year, although its actual hours of operation will be dependent upon energy needs in the region and will incorporate downtime for planned and unplanned maintenance events. Based on power market data for northeastern Ohio, it is anticipated that the

Facility will initially operate at least 85 to 90 percent of the year. The Facility will also include one three-pressure heat recovery steam generator (HRSG) with auxiliary duct burners for each of the two combustion turbines and one reheat, condensing steam turbine generator (STG) utilized by both HRSGs. The Facility will be designed to operate in combined-cycle mode only.

(b) Land Area Requirements

The Facility Site encompasses approximately 17 acres within the Lordstown Industrial Park, under option by CEF-L.

The Laydown Area, located south of the Facility Site, is also within the Lordstown Industrial Park and comprises 23.5 acres of predominantly open fields with some mature trees. This property is available for use as temporary laydown during Facility construction.

The Ringbus Site occupies 3.5 acres, located within a larger 71-acre property northeast of the Facility Site (Ringbus Property) that will house the 5-breaker ringbus.

The 100-foot wide Ringbus Interconnection will extend across the 70-acre Ringbus Interconnection Property, connecting the Facility Site to the Ringbus Site. From the ringbus, only a short connection is required to interconnect with two existing First Energy-owned 345-kV transmission lines that extend through this area, namely the Highland to Sammis and Highland to Mansfield circuits. Also within the Ringbus Interconnection

Property, approximately 4.5 acres (the Northern Laydown Area) may be temporarily used for construction laydown or parking.

(c) Fuel Quantity and Quality

The fuel will be natural gas supplied at an approximate pressure of 300 to 500 pounds per square inch gauge (psig) depending on the season. The natural gas provider will deliver fuel to the on-site Facility metering station. A liquids removal, pre-heating system, metering, and gas compression system (as required) will be installed as part of the natural gas fuel system. The high efficiency gas turbines will require that the natural gas has a pressure of about 600 psig upon entry to the gas turbines. Table 02-1 is a summary of the natural gas characteristics.

TABLE 02-1
FUEL CHARACTERISTICS

Characteristics	Natural Gas
Ash (percent [%])	--
Sulfur Content (grains per 100 dry standard cubic feet)	0.5
British thermal unit (Btu) Value (Btu/cubic foot, higher heating value [HHV])	1,028

(d) Plant Emissions

Construction impacts on air quality will consist of relatively minor emissions from the construction equipment required for site preparation and from fugitive dust emissions. General construction vehicles (both gasoline- and diesel-powered) and other diesel-powered engines will emit insignificant amounts of volatile organic compounds (VOC), sulfur dioxide

(SO_2), carbon monoxide (CO), nitrogen oxides (NO_X), and particulate matter (PM). These emissions are not expected to cause any significant adverse impacts on-site or beyond the Study Area.

Atmospheric dispersion modeling has been performed to predict maximum concentrations for a range of Facility operating conditions, and has confirmed that Facility impacts will be below Significant Impact Levels (SILs) for all steady-state operating conditions. The model accounts for emission rates, stack heights of 160 feet, exhaust parameters, meteorological data (wind speed, direction, atmospheric stability, and temperature), and the topography around the Facility Site. The following is a list of the federal criteria pollutants that will be emitted from the Facility: SO_2, particulate matter with a diameter of less than or equal to 10 microns (PM_{10}), particulate matter with a diameter of less than or equal to 2.5 microns ($PM_{2.5}$), NO_X, CO, and VOCs. Several non-criteria pollutants will be emitted, including sulfuric acid mist, ammonia (NH_3), and formaldehyde.

The air pollution controls proposed for this Facility are proven technologies. The primary control devices include DLN combustors in each of the two gas turbines, and SCR systems and oxidation catalysts in each of the two HRSGs. The SCR and oxidation catalyst systems reduce emissions of both NO_X and CO to 2 parts per million by volume dry basis corrected to 15 percent O_2 (oxygen), or ppmvdc. In addition, emissions from the Facility will be continuously tracked using a Continuous Emissions Monitoring

System (CEMS). In the unlikely event of a control equipment failure, it would be immediately detected by the distributed control system and corrective actions would be initiated. It is unlikely that any unforeseen outage of pollution control systems would result in a significant impact before corrective actions could be taken.

(e) Water Requirements

CEF-L has selected a closed-loop cooling system employing a wet mechanical draft cooling tower. This system has been identified as an appropriate water use option that maintains the economic viability of the Facility and balances other resource issues. Comparable generation using once-through cooling would likely require around 325 million gallons per day (mgd), as compared to the Facility's estimated maximum withdrawal of around 5.5 mgd, which is based on a 95 degrees Fahrenheit (°F) day with maximum duct-firing and full utilization of evaporative coolers. Conversely, at 0°F the Facility's water need drops to approximately 1.4 mgd. A detailed water balance for the average case, which is based on a 50°F day with maximum duct firing and no evaporative coolers, is provided in Figure 02-5. The Facility's average water use is approximately 3.6 mgd.

Water needs of the Facility (including process water, fire protection, and domestic use) will be met through contracts with two existing water suppliers, the City of Warren and the Meander Water District.

Water supply capabilities of both the City of Warren and Meander Water District have been evaluated. Each entity is operating at only about

50 percent of their respective water treatment plant capabilities. The combined potable water capabilities of the two suppliers is approximately 83 mgd. This excess capacity allows for them to meet the Facility's water need with minimal impact on their own supply systems.

Potable water from these suppliers will be treated on-site with a reverse osmosis system to supply demineralized water to the HRSG and for other process water. Water used in the cooling tower will not require any further on-site treatment. The approximately 5.5 mgd maximum water use, reflects operating the Facility with full utilization of evaporative coolers and 100 percent duct-firing at an average ambient temperature of 95°F for a 24-hour period. The Facility's average daily water use of approximately 3.6 mgd (shown on Figure 02-5) is estimated based on operating the Facility with 100 percent duct-firing, no utilization of evaporative cooling, and an average ambient temperature of 50°F.

Each of the potential water supply sources currently under consideration has indicated the ability to reliably provide adequate water for the Facility, and the willingness to implement any potential upgrades or added infrastructure to bring water services to the Facility Site where the Facility tie-in can be made. The Facility will likely connect to both of the available water suppliers just north of the Facility Site, on Route 45. This is the location where both the City of Warren and the Village of Lordstown (via the Meander Water District) maintain elevated tanks and water delivery pipes.

Wastewater discharge will also vary seasonally, from approximately 0.3 to 1.1 mgd. Discharge of Facility wastewaters will utilize the existing Village sewer piping located along Hallock Young Road (south of the Facility Site); wastewater flows will discharge to the existing City of Warren POTW.

Stormwater flows from the developed Facility Site will be controlled through the use of detention ponds and other features. Preliminary stormwater control features are shown in Appendix A.

(2) Description of Major Equipment

The Facility will include two CTGs with natural gas as the fuel; evaporative coolers for inlet air cooling; two three-pressure-level HRSGs; two duct burners; and one reheat, condensing STG. Additionally, the Facility will utilize a 14-cell cooling tower and a steam-surface condenser. An auxiliary steam boiler will be used for heating steam to accommodate a faster Facility start-up. The Facility will include three approximately 20- to 345-kV step-up transformers, one for each generator. The CTGs and STG will be located indoors.

Significant plant equipment not addressed above is described below.

- *Gas Fuel Handling* – Natural gas supplied to the Facility will likely require additional on-site compression for use in the CTGs. In that case, electrically powered gas compressors would be used to increase natural gas pressure. A knock-out drum will be provided to remove any liquids that may be present in the gas. The fuel gas system will be metered and include unit pressure regulations. Filter/separators will further treat the fuel gas by removing any debris or liquids prior to entering the CTGs. The auxiliary steam boiler will use lower pressure natural gas.

- *Steam System* – The steam system will consist of: steam drums, super-heaters and economizers; steam piping to and from the steam turbine; steam turbine bypass piping; steam piping to gland seal and steam jet air ejector systems; and solids and chemistry control. No export steam will be produced at this Facility. Steam generated by the auxiliary boiler will be used for heating and start-up purposes.
- *Condensate System* – The condensate system will be designed to provide water sufficiently deaerated and with the proper water chemistry to meet HRSG and steam turbine requirements. The system will provide sufficient capacity for operation over the entire ambient range and supply water to the auxiliary boiler.
- *Feedwater System* – Boiler feedwater will be supplied by a three-element feedwater control system for each section of the HRSG. Chemical treatment of the boiler feedwater will be accomplished using chemical feed equipment. Although the particular treatment program for this Facility has not yet been determined, a typical program would include corrosion inhibitor injected to the HRSG steam drum; oxygen scavenger injected into the HRSG; and pH control amine injected into the boiler feedwater pump suction piping.

- *Cooling Water System/Steam Condensing* – The circulating water cooling system will provide cooling for condensing the steam turbine exhaust and the Facility closed-loop cooling system. The system will consist of a 14-cell cooling tower constructed of fiberglass reinforced plastic or wood, and a steam surface condenser with an air ejector/vacuum system. The cooling tower will include high efficiency drift eliminators for PM reduction capable of achieving a 0.0005 percent cooling tower drift rate. Chemical treatment of the cooling tower water will be accomplished utilizing chemical feed equipment. Although the particular treatment program for this Facility has not yet been determined, a typical program could include: pH control (acid or caustic); scale inhibitor; biocide; dispersant; and chlorine/hypochlorite.
- *Closed Loop Auxiliary/Cooling Water System* – The closed loop auxiliary cooling water system provides cooling for auxiliary equipment. The system will utilize demineralized water with corrosion inhibitor.
- *Fire Protection System* – A complete fire protection/detection system will be provided for the Facility. Detection will include automatic ionization or photo-electric smoke detectors, heat detectors, flame detectors, and gas detectors as well as manual push button alarms. The fire extinguishing system will include fixed water fire suppression systems, fire hose stations, hydrants, portable fire

extinguishers, detection and control systems. The system will include a motor-driven fire pump and an ultra-low sulfur distillate (USLD) engine-driven fire water pump (an approximately 50-gallon double containment ULSD storage tank will be integrated into the unit). It will be designed and installed in accordance with National Fire Protection Association (NFPA) standards and insurer's recommendations. All fire protection equipment and systems will be Underwriters' Laboratory approved and comply with the Village fire protection authority's and CEF-L's insurance carrier's requirements.

The Village has installed an in-ground fire loop in the Lordstown Industrial Park. Across from the Facility Site, along Henn Parkway, are two existing fire hydrants.

- *Stand-by (Emergency) Diesel Generator* – A 1,200-kilowatt (kW) diesel engine-driven generator will be provided and designed to safely shut the Facility down in the event of a disruption of power delivery. The generator will provide power to essential services necessary to protect the equipment. ULSD will be utilized, stored in an approximately 800-gallon double containment tank integrated into the equipment skid.
- *Water System* – Water for the Facility will be supplied by existing water suppliers that have excess capacity, the City of Warren and the Meander Water District. A water balance depicting the Facility's average use and volumetric flows is shown in Figure 02-5.

- *Demineralizer* – Demineralized water will be created by on-site treatment of the Facility's potable water. Demineralized water will be used in the evaporative cooler, for CTG compressor water washes, and as makeup water to the steam cycle. Water will be processed by the demineralizer system, which will remove the dissolved solids to the level required by the HRSG and steam turbine manufacturer's requirements. The effluent from the demineralized system will be sent to the demineralized water storage tank. The demineralized water storage tank will provide demineralized water for condenser hot-well makeup and be of sufficient size so as to allow normal Facility operations without excessive cycling of the demineralized water system. Demineralizer regeneration waste will be equalized and neutralized in a fiberglass tank before being discharged to the existing sewer system.
- *Wastewater System* – A regeneration waste neutralization system will receive the regeneration wastes from the demineralized waste system and the chemical waste sump. This system will equalize and adjust the pH through the addition of acid or caustic to comply with discharge limits. The gas turbine compressor wash water will be collected in a pit and manually hauled away. Sanitary waste collected from the administration and control building will be piped to the Village of Lordstown municipal wastewater system for treatment and disposal. The cooling tower blowdown and reverse osmosis reject

wastewater will also be collected and discharged to the Village's existing wastewater collection system. This wastewater will then be pumped to the City of Warren's wastewater treatment plant. Stormwater will be routed to on-site detention basins to control runoff from the Facility Site.

(3) Transmission Line Interconnect

System interconnection studies have been initiated with PJM for 800 MW, with the input of First Energy. The PJM Feasibility Study was completed in August 2014 (Appendix B), with the System Impact Study initiated in September 2014. As a result, the Facility was assigned queue position Z2-028. Completion of the System Impact Study is anticipated in March 2015. This information will be provided to OPSB staff once available.

Located within the Lordstown Industrial Park, the Facility intends to connect the generators' output to two First Energy 345-kV transmission circuits located about 3,400 feet to the east: the Highland to Sammis and Highland to Mansfield 345-kV circuits. These two circuits were identified as the primary Points of Interconnection within the Feasibility Study analysis initially completed by PJM/First Energy, as part of the Facility's PJM Queue Evaluation. As can be seen from Figure 02-2, the Highland to Sammis and Highland to Mansfield lines/towers are positioned in a north-south route just to the east of the Facility Site. In order to accommodate the Facility's interconnection, and First Energy's 345-kV circuits, a new 5-breaker ringbus is required. The proposed location of the Ringbus Site is adjacent to the west of the two First Energy circuits into which the ringbus will connect (Figure 02-6).

Power leaving the Facility generators will be “stepped up” to 345 kV prior to being conveyed to the new 5-breaker ringbus. Each of the three power generators (the two CTGs and the STG) will have three generator leads. All nine generator leads will be consolidated in an on-site collector bus so that only three phases, each containing a double conductor, will leave the Facility Site to convey the new electricity supply to the grid.

Selection of the proposed Ringbus Interconnection routing was based on an evaluation of technical feasibility, cost, and environmental impacts. The proposed and an alternative routing to connect the Facility to the First Energy 345-kV circuits are shown in Figure 02-7. The alternative routing was not selected due to a slightly greater distance resulting in additional cost as well as environmental impact. Details of the proposed and alternate routes are provided below.

Proposed Route

The Proposed Route is the most direct routing for the Ringbus Interconnection. Conductors from the Facility will cross Henn Parkway in a northerly direction from the on-site collector bus and immediately be connected to Pole 1, a single steel pole (designed as shown in Figure 02-8A), allowing the lines to make a 90 degree turn to the east. Poles 2, 3, 4, and 5 will also be single steel poles, each approximately 500 feet apart in an easterly heading and within a 100-foot right-of-way (ROW). The poles are proposed in such a way as to avoid any construction in existing wetlands while also minimizing tree clearing.

Pole 6 will brings the Ringbus Interconnection to the edge of First Energy's ROW containing the Highland to Hanna 345-kV circuit and the 138-kV circuit (immediately to the east of, and parallel to the Highland to Hanna 345-kV circuit). First Energy is currently implementing a construction project to "lift" the Highland to Hanna 345-kV circuit from an H-style three wooden pole design to a single metal pole design. The adjacent 138-kV system will remain on a metal truss-tower structure. Based upon coordination with First Energy, the Ringbus Interconnection will be constructed under First Energy's existing lines. In order to do so, Pole 6 will be a more traditional H-design (shown in Figure 02-8C). CEF-L will work closely with First Energy and be responsible for any costs associated with this crossing under their 345-kV and 138-kV circuits.

As shown in Figure 02-7, the Ringbus Interconnection will proceed from the H-tower (Pole 6) in an east-northeast direction to Pole 7, another H-tower. From Pole 7, the conductors will proceed northeast into the northwest corner of the Ringbus Site into a dead-end structure (as shown in Figure 02-8B).

An electric and magnetic field (EMF) evaluation was completed (Appendix C) to confirm that values would be acceptable. The study determined that calculated magnetic field levels at all location are far below recommended reference levels; and that calculated electric-field levels beyond the ROW edges are less than 1.9 kV/m, also well before the recommended reference levels.

The location of the Ringbus Site is based on feedback from First Energy (Mr. Matt Monnot), indicating that the two 345-kV First Energy circuits can most easily be "broken" and connected to the 5-breaker ringbus approximately 300 feet west of the Highland to Sammis tower/lines, at its closest point. By locating the new 5-breaker ringbus in this area, the existing trees on the southern boundary of the Ringbus Site will be retained and will act as a natural visual barrier to anyone located on Goldner Lane.

Although this route is the most direct and desirable option, its east-to-west layout cuts directly through an undeveloped property which makes up the northeastern portion of the Lordstown Industrial Park. Therefore, CEF-L is working with the property owner to option this entire parcel.

Alternate Route

Under the alternate route (shown in Figure 02-7), the Ringbus Interconnection would exit the collector bus in a north-northeast direction and cross Henn Parkway, as in the proposed route. A single metal pole (Pole 1) would be located in this position (designed as shown in Figure 02-8A). From this pole, the corridor would extend in a northeasterly direction for about 800 feet, stopping just short of the existing Norfolk Southern Railroad easement. Given this intervening distance, one vertical metal pole will be positioned in an intervening upland area (Pole 2), as shown in Figure 02-7. At Pole 3, the ROW would then turn in an easterly direction, following the railroad easement and requiring four additional poles/structures (Poles 4, 5, 6 and 7).

Although in a different location from the proposed route, Pole 7 for the alternate route would similarly be an H-style design to allow for the Ringbus Interconnection to pass under the existing First Energy ROW. From that point, the Ringbus Interconnection would extend to the Ringbus Site.

A comparison of key features associated with the proposed and alternate routes is provided in Table 02-2.

TABLE 02-2
COMPARISON OF PROPOSED AND ALTERNATE RINGBUS INTERCONNECTION ROUTES

Characteristics	Proposed Route	Alternate Route
Total Length	3,438 feet	3,875 feet
Number of Poles	6	6
Maximum Height of Poles	100	100
Wetland Fill	None	None
Wetland Clearing	0.14 acres	0.51 acres
Tree Clearing	3.5 acres	6.7 acres
EMF	Complies with standard	Complies with standard

The intention is to subdivide the specific area to be used for the ringbus, such that when the ringbus is built, it can be conveyed (with the land) to First Energy. First Energy will be able to reach the Ringbus Site via a new access road to be built from the end of Goldner Lane, crossing Mud Creek using an existing culvert. The ringbus conceptual design (Figure 02-6) was developed as part of PJM/First Energy's Feasibility Study/System Impact Study for Facility Queue position Z2-028; any final design would require the input of First Energy.

(4) New Gas Transmission Line

The Facility is designed to burn natural gas as its only fuel to make electricity. Assuming that the Facility is operating at net output of 800 MW it will consume approximately 130 million cubic feet (MMcf) per day of natural gas, or an hourly consumption of 5.415 MMcf.

Because the Village of Lordstown has a variety of industrial and commercial entities along Route 45, gas transmission infrastructure exists within the Village. The local distribution company that serves the Village of Lordstown is Dominion East Ohio (Dominion). Figure 02-9 illustrates Dominion's existing gas infrastructure located in northeastern Ohio and western Pennsylvania. The Facility is located in southern Trumbull County, within close proximity of Dominion's local lines. The existing Dominion gas lines from Austintown to Lordstown are sized at 10 inches and 16 inches in diameter, sizes which are inadequate to carry the gas supply needs of the Facility. In addition, an approximate gas pressure of 650 psig is required when delivered to the Facility's gas turbines, consistent with most modern-day efficient gas turbines; this is unlikely to be accommodated by this existing infrastructure.

Therefore, CEF-L is pursuing two gas delivery options, on a simultaneous basis, with the intention of selecting and pursuing one. Both options involve development of a gas transportation system to deliver natural gas from the Tennessee Pipeline interstate system (4 barrel system: 36-inch, 26-inch, 26-inch and 26-inch). The Tennessee pipelines are located close to both Dominion's Augusta and Petersburg stations.

Once the options are more fully evaluated, the appropriate option will be selected (anticipated in April 2015). The natural gas infrastructure will be the subject of separate regulatory proceedings under the jurisdiction of either the Federal Energy Regulatory Commission (FERC) or the OPSB.

Gas Delivery Option 1

Under Option 1, Dominion would finance, build, own, and operate a new dedicated gas lateral from the Austintown station, north to the Facility Site. To support this option, Dominion is currently completing technical/commercial analyses on a new lateral which is anticipated to be about 5 miles long. Since Dominion is a local distribution company entity (with low operating pressure), on-site gas compression will be required. The gas volume delivered by Dominion will be adequate. Any new gas pipeline will be installed well in advance of the Facility's commercial operation date of May 2018.

Gas Delivery Option 2

CEF-L has a working relationship with North Coast Gas Transmission (NCGT), an Ohio-based mid-stream gas transport company. Under Option 2, NCGT would engineer, license, finance, construct, and own a new gas lateral that connects the Tennessee Pipeline system to the Facility that would meet 100 percent of the Facility's gas needs. Since the Tennessee Pipeline system typically operates at pressures above 700 psig, gas delivered via Option 2 may not require the installation of new gas compressors at the Facility Site. The Tennessee Pipeline system, in the vicinity of the Kensington gas processing plant, is about 22 miles south of the Facility Site. The new lateral to be provided by NCGT would be installed and operational in advance of the Facility's commercial operation date of May 2018.

(B) DETAILED PROJECT SCHEDULE

(1) Schedule

The planning stages for the Facility began in 2013, with an ultimate goal of being fully functional and operational by spring 2018 in order to sell capacity/energy into the grid by June 1, 2018. PJM's Capacity Auction process dictates the timeline as to when capacity should be made available. The May 2015 PJM Auction, dictated that a facility must commit to supply capacity starting June 1, 2018 and continue for a year. With a goal of Facility operation by spring 2018, CEF-L would like to have all essential permits approved by late summer 2015. Once permits are obtained, financing can be concluded and construction can begin.

Figure 02-10 provides the proposed Facility schedule for major activities and milestones. This schedule is based on the submission of this Application in March 2015, the receipt of the OPSB certificate by August 2015, and placing the Facility into commercial operation by May 2018.

(2) Delays

It is crucial that the proposed in-service date of May 2018 be achieved in order to meet the anticipated summer peak load demand. CEF-L intends to enter the PJM Capacity Auction to be held in May 2015 for delivery of power from summer 2018 to summer 2019. Therefore, the OPSB certificate must be issued prior to a late summer construction start date in order for the Facility to be completed on schedule. A delay in the schedule before the beginning of construction would jeopardize the Facility's ability to meet peak summer demand in 2018, potentially lowering the region's available capacity during critical summertime conditions and resulting in significant performance penalties payable by CEF-L for not meeting PJM's contractual performance date (starting in May 2018). Based on PJM's Capacity Auction rules/procedures, CEF-L must make contractually binding commitments in May 2015 to supply capacity beginning in May 2018 (for a one-year contractual capacity supply period).

(A) SITE SELECTION STUDY

(1) Site Selection Process

(a) Description of Study Area

CEF-L has extensive experience in understanding energy markets and locations for potential electricity demand. Research beginning in the summer of 2013 focused on the potential future closure of several thousand megawatts of aging and environmentally challenged coal-fired power plants throughout the 13-state PJM system. According to PJM, 20,884.7 MW within First Energy's territory have already been retired, including: Niles, Units 1 and 2 (217 MW); Eastlake, Units 4 and 5 (837 MW); and Bay Shore, Units 2 through 4 (495 MW).[2] An additional 11,077 MW within First Energy's territory have requested deactivation by the end of 2017, including Eastlake, Units 1 through 3 (396 MW); Lake Shore, Unit 18 (245 MW); and Ashtabula, Unit 5 (244 MW).[3] With these existing and upcoming closures, the northeastern Ohio region will soon be short of capacity and dependent on imported power, resulting in higher prices for electricity by ratepayers in that region. Terry Boston, President and Chief Executive Officer of PJM, labeled the coal plant closures in the greater Lake Erie region as "unprecedented" in PJM's 2013 Annual Report.[4]

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[2] PJM. *Generator Deactivations (as of February 18, 2015).* Retrieved from http://www.pjm.com/planning/generation-deactivation/gd-summaries.aspx.
[3] PJM. *Future Deactivations (as of March 3, 2015).* Retrieved from http://www.pjm.com/planning/generation-deactivation/gd-summaries.aspx.
[4] PJM. 2013 *Annual Report (Issued May 2014).* Retrieved from http://www.pjm.com/about-pjm/who-we-are/annual-report.aspx.

In addition to the near-term need for electricity projected by PJM in their public reports and meetings, CEF-L had extensive experience working within this particular region, most notably in Fremont, Ohio and Oregon, Ohio. For these reasons, CEF-L determined that identifying a site within the PJM region, with a particular focus in Ohio, would be more appropriate than within other regions of the PJM system.

(b) Study Area and Site Map

Within the very expansive PJM region, several states were considered, including Maryland, Virginia, Indiana, and Ohio. Capacity needs, transmission constraints, and pricing structure were considered, as well as other economic factors and the complexity and anticipated timeline associated with applicable regulatory processes. CEF-L intended to focus its efforts and resources on a single project with the most favorable characteristics possible. Through this evaluation, it was determined that Ohio – and specifically, potential locations in northeastern Ohio – yielded the most favorable balance of attributes.

(c) Siting Criteria

Careful site evaluation was undertaken to determine suitability for the proposed Facility. Criteria considered in selecting and evaluating sites included:

- Adequate site size;
- Compatible zoning and land use;
- Availability of natural gas alternatives;

- Proximity of robust electrical interconnection;
- Water supply and wastewater discharge alternatives to support a water-cooled facility (due to the higher energy efficient associated with that cooling technology);
- Strong transportation network;
- No environmental fatal flaws; and
- Community political support for industrial development and this type of project.

(d) Process for Identifying the Proposed Site

Potential locations within northeastern Ohio were considered using the criteria noted above. Due to the perceived energy gaps within the greater Cleveland area associated with existing coal-fired facility shut-downs, this area was a particular focus.

CEF-L engaged real estate consultants who were familiar with the characteristics of a suitable community and site. As sites were identified, they were then evaluated as to whether they met the minimum siting criteria. A number of sites were considered that met some, but not all, of the identified and required attributes. The Facility Site and Laydown Area (Figure 03-1) in the Lordstown Industrial Park was one of the early locations identified and appeared to meet all identified site selection and screening criteria.

In addition, a site within the Village of Lordstown on Salt Springs Road was identified and judged to be more favorable, primarily due to shorter interconnection requirements; the need for rezoning from "business" to I-1 Industrial was identified as a complicating issue. When re-zoning of this location was not successful, CEF-L determined to focus on the Lordstown Industrial Park properties where industrial zoning (I-1) was already in place.

CEF-L secured property within the Lordstown Industrial Park on Route 45. With that option in place, CEF-L continued with its queue position in PJM (Z2-028) to verify the robust nature of the selected point of interconnection, and undertook detailed assessments to review characteristics of the Facility Site and confirm key criteria were met.

(e) Factors in Selecting the Proposed Site

The Facility Site was one of the early locations identified by CEF-L real estate consultants. Evaluation of key characteristics that would indicate suitability was undertaken to determine the feasibility of the Facility in this location.

Regional attributes included confirmation that several major coal-fired power plants in northeastern Ohio and western Pennsylvania were planning to close before 2017, supporting a need for additional energy generation.

The Village of Lordstown encourages industrial development, in particular within this portion of the Village, which is zoned for industrial use. The Village is currently home to several heavy industrial plants, including a large GM manufacturing facility and Matalco's aluminum recycling plant. From CEF-L's initial introduction, the Village leadership was cooperative and supportive. In addition, the Facility Site has significant services and infrastructure in place, such as ample economically priced water supply and sewage disposal, direct access to high voltage electrical transmission lines adjacent to the Facility Site, reinforced roads and bridges (important when transporting heavy equipment), and other strong transportation attributes such as an active rail spur adjacent to the Facility Site, all particularly important during the construction phase.

The location of the Facility Site allows for consideration of several gas supply options, an unusual advantage when developing an independent power production plant. Flexibility in fuel source can lead to particularly competitive pricing, resulting in lower overall energy costs to rate payers for the purchase of electricity.

Once the PJM queue position was favorably established and evaluation underway, CEF-L conducted a more formal due diligence on the Facility Site. CEF-L contracted a local firm to complete a Phase I Environmental Site Assessment that concluded that no indication existed of historical or current Recognized Environmental Conditions that would have the potential to result in liability at the Facility Site.

With the results of these independent studies confirming the Facility Site as favorable for the proposed Facility, CEF-L continued with the more detailed environmental and other studies, as well as Facility engineering design, to support the OPSB Application for the Facility.

(2) Constraint Map

Figure 03-1 provides constraint mapping completed as part of the critical issues assessment for the Facility.

(B) SUMMARY TABLE OF EVALUATED SITES

As previously noted, CEF-L had originally considered a “business” site along Salt Springs Road in Lordstown, but a plan to seek rezoning to I-1 Industrial was not successful.

No additional sites, besides the Salt Springs Road site, were formally evaluated. A summary of key characteristics of the selected Facility Site is provided in Table 01-1.

(C) ADDITIONAL SITE SELECTION STUDIES

No additional site selection studies have been completed for the Facility.

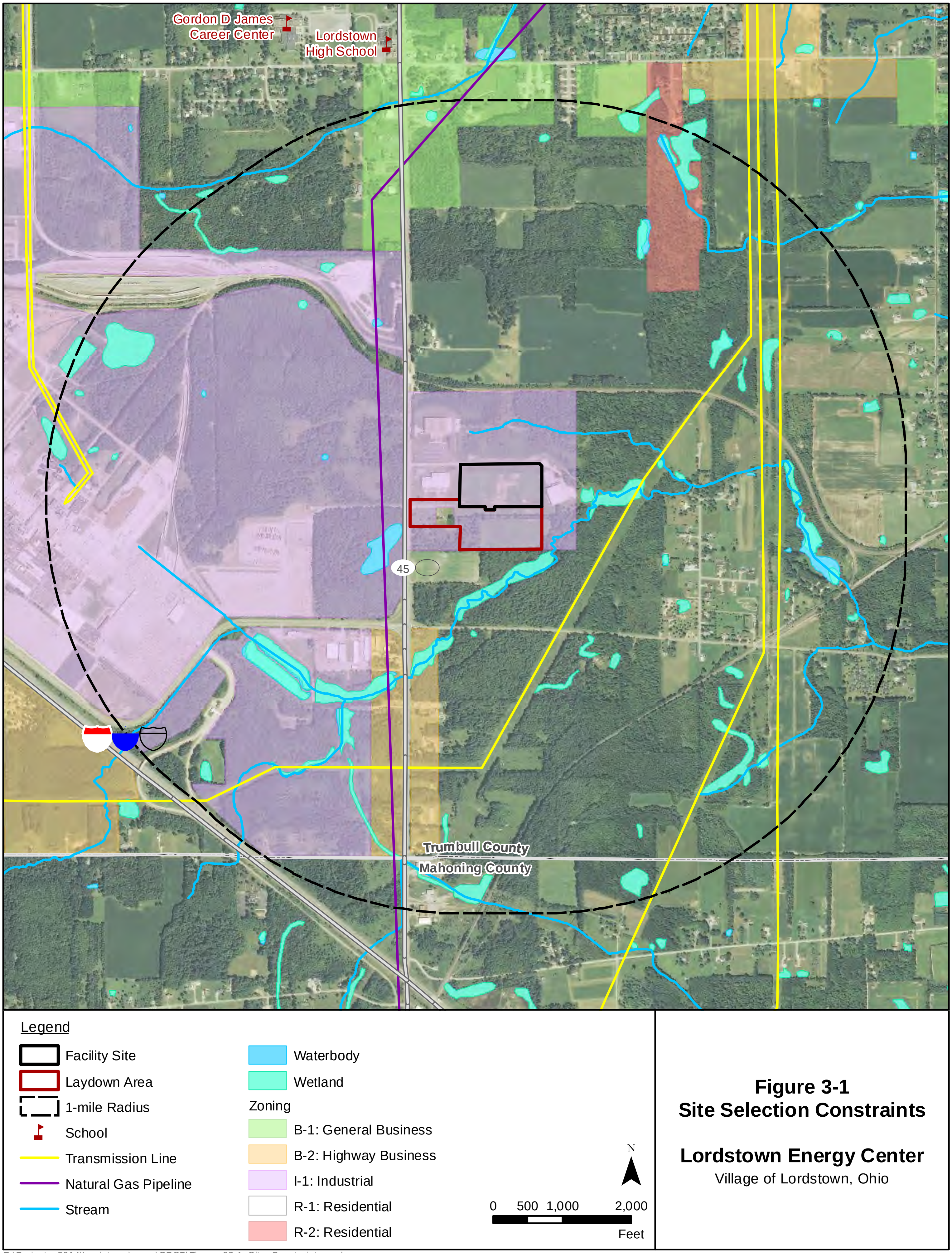

Figure 3-1
Site Selection Constraints

Lordstown Energy Center
Village of Lordstown, Ohio

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(A) SITE

(1) Geography and Topography

Figures 02-1A through Figure 02-1H present eight maps at 1:24,000 scale exhibiting the area within a 5-mile radius of the Study Area, and is a compilation of the area shown on the following six United States Geological Survey (USGS) 7.5-minute series topographic maps: Newton Falls; Warren; Canfield; and Lake Milton. Figure 02-1 shows the following: the proposed Facility; major population centers and administrative boundaries; major transportation routes and utility corridors; names rivers, streams, and other bodies of water; and major institutions, parks, and recreational areas.

As can be seen in Figure 02-1, the Facility is located entirely within the Village of Lordstown in Trumbull County, Ohio, and approximately 6.5 miles south of Warren, Ohio. The Facility Site is a rectangular-shaped parcel encompassing an area of approximately 17 acres, with the 23.5-acre Laydown Area located adjacent to the south proposed for temporary construction laydown. As shown on Figure 02-1, the Facility Site is located at a latitude of 41° 8’ 51” N and a longitude of 80° 51’ 12” W.

Several parcels to the north and northeast are proposed for elements of the Facility’s electrical interconnection and as another potential laydown area. The Ringbus Interconnection, a 100-foot wide electrical transmission corridor, will extend north and east, across the 70-acre Ringbus Interconnection Property, crossing under two First Energy-owned electrical transmission circuits, and terminating at the Ringbus Site, a 3.5-acre parcel located within the 71-acre Ringbus Property. Access to the Ringbus Site will be off the cul-de-sac on Goldner Lane, crossing over Mud Creek on an existing, unimproved road and culvert. A 4.5-acre Northern Laydown Area is identified within a portion of the Ringbus Interconnection Property.

The topography of the Study Area is generally flat with elevations ranging from approximately 928 feet to 974 feet (North American Vertical Datum of 1988). The land surface of the surrounding area is also generally flat with eastward flowing streams traversing the gentle hills. The relief of the land surface within a 1-mile radius of the Study Area is approximately 147 feet, with a high of approximately 1,036 feet to the northwest, and a low of approximately 889 feet to the northeast.

Much of the relief seen in the land surface surrounding the Study Area has facilitated the proximate industrial and residential development, as well as the active agricultural fields.

The Facility Site is situated between Mud Creek and an unnamed tributary to Mud Creek. Surface water runoff is to the southeast, discharging into Mud Creek, which drains to Cedar Lake and eventually the Mahoning River. The unnamed tributary bisects the Ringbus Interconnection Property as it flows eastward. An unnamed stream flows eastward on the Ringbus Property, entering directly into Cedar Lake.

As shown in Figure 02-1, First Energy-owned transmission lines extend in a southwest-northeast direction in two corridors, with the closest corridor located approximately 1,300 feet east of the Facility Site at its closest point. The Facility

Site and Laydown Area consist of farmland and scattered trees, with an undeveloped farm road extending eastward off Route 45. The majority of the Facility Site and Laydown Area are in agricultural use. Land surrounding the Facility Site to the north, east, and south is zoned for residential use, although agricultural fields lie most proximate to the Facility Site. Route 45 generally forms the western boundary of the Laydown Area, with scattered residential and commercial uses lying along the divided, four-lane roadway. Existing development within the Lordstown Industrial Park lies east and west of the Facility Site, with Henn Parkway forming the Facility Site's northern boundary. The GM Lordstown Assembly Plant, a large manufacturing facility, is located on the other side of Route 45. This facility employs approximately 4,500 people and focuses on the production of the Chevrolet Cruze.

(2) Aerial Photograph

Figure 02-2 provide an aerial photograph showing the location of the proposed Facility in relation to surface features. As can be seen, the proposed Facility Site is comprised of active agricultural fields with no tree clearing required to accommodate the proposed Facility footprint.

The Laydown Area is comprised of active agricultural fields and scattered trees, some of which would be cleared to accommodate potential laydown activities. The Ringbus Site was situated within the Ringbus Property to avoid wetland impacts and minimize tree clearing. The Ringbus Interconnection Property is largely tree-covered with several expansive wetland areas. Options for the Ringbus Interconnection were evaluated based on their technical feasibility, cost, environmental impacts, and landowner issues. The Northern Laydown Area portion of the Ringbus Interconnection Property was selected to avoid wetland impact and minimize clearing.

Area surrounding the Study Area are similar in character, with agricultural, as well as other mixed industrial and commercial and residential uses. Residences are scattered throughout the area, with the closest located approximately 0.35 mile north of the Facility Site.

(3) Site Mapping

Figures 04-1A and 04-1B present a map showing surveyed boundaries and topographic contours, respectively, including Mud Creek, which is located southeast of the Facility Site, flowing northeast toward the Mahoning River, and an unnamed tributary that is located north of the Facility Site, flowing east to join with Mud Creek. The Facility Site and Laydown Area are industrially zoned. Portions of the Ringbus Interconnection Property and Ringbus Property proposed for the Facility's electrical interconnection are in a residential zone. The northern boundary of the Ringbus Interconnection Property is generally formed by the Norfolk Southern Railroad easement, and the Ringbus Site is located amidst two existing First Energy 345-kV transmission line corridors.

Because the Facility Site is in active agricultural use, no clearing is required. The Laydown Area is also in active agricultural use with one wooded area, but otherwise only scattered trees; approximately 6 acres of clearing is required. The Ringbus Site is situated on an open field with only a perimeter of trees, covering approximately 1.5 acres, being cleared. The Ringbus Interconnection Property is a mixture of open fields and forested area. The proposed Ringbus Interconnection route will require 3.5 acres of tree clearing within the 100-foot wide ROW. The Northern Laydown Area, with only scattered trees, will require approximately 0.15 acre of clearing.

There are no structures located on the Facility Site; however, a former residential property that has been converted into meeting space for the Lordstown Lion's Club is located within the Laydown Area. CEF-L has worked with the Lordstown Lion's Club to relocate its activities; this structure is planned to be demolished or repurposed.

(4) Geology and Seismology

(a) Geological Issues

A preliminary geotechnical investigation has been completed for the Facility. A copy of the report is provided as Appendix D, with information summarized in this section of the OPSB Application.

Regional geologic maps from the Ohio Department of Natural Resources (ODNR) indicate that the Facility Site is located in the Glaciated Allegheny Plateaus Physiographic Region of Ohio; more specifically, the Facility Site is located on the Killbuck-Glaciated Pittsburgh Plateau. Within this region, geologic deposits consist of glacial sediments, including materials deposited from advancing and retreating ice sheets.

Based on reviews of the boring logs and laboratory test results provided in Appendix D (in Appendices A and B of the Geotechnical Investigation, respectively), the subsoils encountered underlying the topsoil consist primarily of fine-grained glacial material with varying sized particles. The bedrock encountered in the borings consists of highly-weathered gray shale and was encountered at an average depth of 16 feet below ground surface (bgs).

The groundwater level was observed at 5 to 5.5 feet bgs in the borings. Changes in soil color, from brown to gray, generally indicated the median water table, and were seen at approximately 9 feet bgs. Additionally, wet (saturated) soils were encountered at boring location B-01 at a depth of approximately 14 feet bgs. The groundwater elevation fluctuates, and would be at a seasonal high during the period when the investigation was conducted.

According to "Earthquakes and Seismic Risk" by the ODNR Division of Geological Survey (GeoFacts No. 3, May 2012), earthquake risk in Ohio is difficult to determine due to the infrequency of earthquake occurrences. Ohio is on the edge of the New Madrid Seismic Zone, an area centered in Missouri and extending into adjacent states. While at least 120 earthquakes with epicenters in Ohio have been reported since 1776, the areas of Ohio that are found to be most susceptible to seismic activity are Shelby County and surrounding counties in western Ohio and Cuyahoga, Lake, Geauga and Ashtabula Counties in northeastern Ohio.

Northeastern Ohio has experienced over 100 "felt" earthquakes since 1836. Most of these earthquakes were small, causing little or no damage. However, an earthquake of magnitude 5.0 occurred on January 31, 1986 with epicenter in the area of Geauga and Lake Counties. This earthquake was felt in 10 states and southern Canada; it caused minor to moderate damage in the epi-central area including toppled chimneys, cracked plaster, and broken windows. An earthquake of magnitude of 4.0 occurred in Mahoning County on December 31, 2011. Minor damage was reported in the area including cracked plaster and glassware falling from shelves.

According to the ODNR, recent seismic events recorded at a magnitude of 2.1 to 3.0 have occurred close to the Facility Site in the Mahoning and Trumbull County. In March 2014, a series of five recorded earthquakes, ranging from magnitude of 2.1 to 3.0, occurred within 0.6 mile of active hydraulic fracturing operations taking place in Poland, Mahoning County, Ohio. The ODNR has since halted operations at this location. Due to advances in seismic monitoring and an increase in hydraulic fracturing, the frequency of these recorded events is anticipated to increase. These seismic events reportedly resulted in no damages to buildings or structures.

Damage to structures during an earthquake is primarily the result of liquefaction of soils. For liquefaction to occur, appreciable sand strata (typically loose and/or saturated) must be present in the subsurface profile. Liquefaction potential due to seismic-induced motions does not represent a significant risk at the Facility Site, since the subsurface profile, as determined by the test borings, is dominated by silty clays at depths ranging from 9 to 16 feet bgs. Therefore, due to the low magnitude of recorded seismic events in the region and the presence of soils not susceptible to liquefaction from seismic events, damage to structures on the Facility Site is unlikely.

Based on a review of geological and seismic information, geological issues are not expected to restrict development at the Facility Site.

(b) Soils and Soil Suitability

Based on review of the Soil Survey database for Trumbull County, Ohio, the soil units in the Study Area are mapped as Wadsworth silt loam, 0 to 2 percent slopes (WbA) and 2 to 6 percent slopes (WbB); Mahoning silt loam, 0 to 2 percent slopes (MgA) and 2 to 6 percent slopes (MgB); Rittman silt loam, 2 to 6 percent slopes (RsB) and 6 to 12 percent slopes (RsC); Sebring silt loam (Sc); Orrville silt loam, frequently flooded (Or); and Holly silt loam (Ho) (Figure 04-2). Additional detail on each soil unit is provided below in the order of prevalence in the Study Area.

WbA, which covers approximately 30 percent of the Study Area, is a nearly level, somewhat poorly drained soil on flats on till plains with restrictive features at 18 to 36 inches. The soil receives runoff from adjacent higher-lying soils, but is not subject to ponding or flooding. Depth to water table may be from 12 to 24 inches.

Sc, which covers approximately 23 percent of the Study Area, is a deep, nearly level, poorly drained soil commonly found on flats and in slightly concaved areas and depressions on till plains. Subject to frequent ponding due to runoff from higher adjacent soils, the Sebring soils have a perched seasonal high water table. Permeability is slow or moderately slow and runoff is very slow. The root zone is deep and available water capacity is high.

WbB, which covers approximately 16 percent of the Study Area, is a deep, gently sloping, somewhat poorly drained soil commonly found on low knolls and side slopes of till plains. Wadsworth soils have a perched seasonal high water table at a depth of 12 to 24 inches. Permeability is moderate to moderately slow above the fragipan and slow or very slow in the fragipan. The root zone is mainly above the fragipan, with medium runoff and a low water capacity.

MgA, which covers approximately 12 percent of the Study Area, is a nearly level, deep, somewhat poorly drained soil commonly found in broad areas on flats and in small areas at the head of drainageways on till plains. Typically irregularly shaped and ranging from 10 to 150 acres in size, Mahoning soil has a perched seasonal high water table at a depth of 6 to 18 inches. The root zone is restricted mainly to the 30 to 42 inches above compact glacial till; available water capacity is moderate, and permeability and runoff is slow to very slow.

MgB, which covers approximately 9 percent of the Study Area, is a gently sloping, deep, somewhat poorly drained soil commonly located on knolls and gently undulating slopes in broad transitional areas ranging from 20 to 250 acres in size. Mahoning soil has a perched seasonal high water table at a depth of 6 to 18 inches with slow to very slow permeability. Runoff is medium and the root zone is restricted mainly to the 30 to 42 inches above compact glacial till. Available water capacity is moderate.

Ho, which covers less than 6 percent of the Study Area, is a nearly level, deep, poorly drained soil commonly found in floodplains. Slopes are 0 to 2 percent, and most areas are long and narrow, ranging from 10 to 100 acres in size. This type of soil has a seasonal high water table with very slow runoff, a deep root zone, and a high available water capacity. Permeability is moderate to moderately slow in the subsoil and moderate to moderately rapid in the substratum.

RsB, which cover approximately 3 percent of the Study Area, is a gently sloping, deep, moderately well drained soil commonly located in irregular shapes ranging from 3 to 100 acres on knolls and side slopes on till plains. This Rittman soil has a perched seasonally high water table at a depth of 18 to 36 inches with moderate permeability above the fragipan and slow permeability in the fragipan. Runoff is medium and the root zone is restricted mainly to above the fragipan. This zone has a low available water capacity.

RsC, which covers approximately 1 percent of the Study Area, is a sloping, deep, moderately well drained soil commonly found on ridgetops and on side slopes along well-defined drainageways on till plains. Most areas are long and narrow ranging from 3 to 50 acres in size. Rittman soil has a perched seasonal high water table at a depth of 18 to 36 inches with moderate permeability above the fragipan and slow permeability in the fragipan. Runoff is rapid and the root zone is restricted to above the dense fragipan. This zone has a low available water capacity.

Or, which covers less than 1 percent of the Study Area, is a deep, nearly level, somewhat poorly drained soil commonly found on floodplains and subject to frequent flooding. The Orrville soils have a seasonal high water table with moderate permeability and slow runoff. The root zone is deep and available water capacity is high.

Table 04-1 presents a summary of the soil properties and characteristics as provided in the Trumbull County Soil Survey (1992).

TABLE 04-1
SOIL PROPERTIES AND CHARACTERISTICS

Soil Series	Depth Below Surface (inches)	Permeability (inches per hour)	Soil pH	Potential Frost Action	Shrink-Swell Potential
Wadsworth silt loam, 0 to 2 percent slope (WbA)	0 – 8 8– 25 25 – 48 48 – 80	0.6 – 2.0 0.2 – 2.0 < 0.2 0.06 – 0.6	3.6 to 7.3 3.6 to 6.0 4.5 to 7.3 5.6 to 8.4	High	Low Moderate Low Low
Wadsworth silt loam, 2 to 6 percent slope (WbB)	0 – 8 8– 25 25 – 48 48 – 80	0.6 – 2.0 0.2 – 2.0 < 0.2 0.06 – 0.6	3.6 to 7.3 3.6 to 6.0 4.5 to 7.3 5.6 to 8.4	High	Low Moderate Low Low
Rittman silt loam, 2 to 6 percent slopes (RsB)	0 – 16 16 – 28 28 – 46 46 – 72	0.6 – 2.0 0.6 – 2.0 0.06 – 0.2 0.06 – 0.6	3.6 to 7.3 3.6 to 5.5 4.5 to 7.3 5.6 to 7.8	High	Low Moderate Low Low
Rittman silt loam, 6 to 12 percent slopes (RsC)	0 – 16 16 – 28 28 – 46 46 – 72	0.6 – 2.0 0.6 – 2.0 0.06 – 0.2 0.06 – 0.6	3.6 to 7.3 3.6 to 5.5 4.5 to 7.3 5.6 to 7.8	High	Low Moderate Low Low
Sebring silt loam (Sc)	0 – 9 9 – 49 49 – 60	0.6 – 2.0 0.2 – 0.6 0.06 – 0.6	4.5 to 7.3 4.5 to 6.0 6.1 to 8.4	High	Low Moderate Low

Soil Series	Depth Below Surface (inches)	Permeability (inches per hour)	Soil pH	Potential Frost Action	Shrink-Swell Potential
Orrville silt loam, frequently flooded (Or)	0 – 10	0.6 – 2.0	5.1 to 7.3	High	Low
	10 – 36	0.6 – 2.0	5.1 to 6.5		Low
	36 – 60	0.6 – 6.0	5.1 to 7.3		Low
Holly silt loam (Ho)	0 – 7	0.6 – 2.0	5.6 to 7.3	High	Low
	7 – 33	0.2 – 2.0	5.1 to 7.3		Low
	33 – 45	0.6 – 6.0	5.6 to 7.9		Low
	45 – 68	0.6 – 6.0	5.6 to 7.8		Low

As previously noted, a preliminary geotechnical investigation has been completed on the Study Area (Appendix D) to determine the suitability of the subsurface soil for construction of the proposed Facility. The subsurface investigation included six test borings designated as Borings B-1 through B-6 (shown on Figure 04-3), drilled in representative Facility Site locations during the period from January 7 through January 8, 2015. Table 04-2 provides general boring information from the on-site testing program. As noted, two of the six borings included rock coring.

TABLE 04-2
GENERAL BORING INFORMATION

Boring Number	Ground Surface Elevation (feet)	Boring Termination Depth (feet)	Boring Termination Elevation (feet)	Rock Core Sample Interval Depth (feet)
B-1	960.692	24.3	936.392	19.3 to 24.3
B-2	960.238	24.3	935.938	19.3 to 24.3
B-3	961.02	15.0	946.02	--
B-4	960.518	15.0	945.518	--
B-5	961.306	15.0	946.306	--
B-6	959.398	14.3	945.098	--

The test borings were performed in general accordance with geotechnical investigative procedures outlined in ASTM International (formerly known as American Society for Testing and Materials [ASTM]) Standards D 1452 and D 5434. The test borings performed during this investigation were drilled with an all-terrain vehicle-mounted rotary drilling rig utilizing 3¼-inch inside diameter hollow-stem augers. Upon completion of drilling, the boreholes were backfilled using a cement-bentonite grout to just below ground surface, and then capped with soil backfill.

During auger advancement, soil samples were generally collected at 2½-foot intervals to a depth of 10 feet and at 5-foot intervals thereafter. Split-spoon samples were obtained by the Standard Penetration Test Method (ASTM D 1586), which consists of driving a 2-inch outside diameter split-barrel sampler into the soil with a 140-pound weight falling freely through a distance of 35 inches. The sampler is driven in three successive 6-inch increments with the number of blows per increment being recorded. The sum of the number of blows required to advance the sampler the second and third 6-inch increments is termed the Standard Penetration Resistance and is presented on the test boring logs provided in Appendix D.

Geological cross-sections reflecting conditions at the boring locations sampled is provided in Figures 04-4A and 04-4B. Based on the results of field and laboratory test results, there are three soil units in the soil profile:

- Soil Unit 1 is at the surface and consists primarily of topsoil material to an average depth of 10 inches bgs.
- Soil Unit 2, located below Soil Unit 1, is a fine-grained glacial material consisting primarily of silt and clay sized particles with varying amounts of sand and gravel and was encountered to an average depth of 9 feet bgs.
- Soil Unit 3, located below Soil Unit 2, is a fine-grained residual soil material consisting primarily of silt and sand sized particles and was encountered until refusal, which was at an average depth of 16 feet bgs.

Boring B-06 was terminated upon encountering auger refusal at a depth of 14.3 feet. Borings B-03, B-04, and B-05 were terminated at a depth of approximately 15 feet, prior to encountering auger refusal. In Borings B-01 and B-02, Soil Unit 3 soils were encountered to auger refusal at a depth of 19.3 feet, and these borings were then advanced by coring an additional five feet into the bedrock. Underlying the Soil Unit 3 soils in Borings B-01 and B-02, gray shale was encountered to boring termination at a depth of 24.3 feet. Based on visual classification, the gray shale would be characterized as "highly-weathered" rock. Based on Rock Quality Designation of 0 percent, the apparent rock mass quality within the zone of exploration can be generally described as very poor.

Groundwater was not initially encountered during drilling in any of the six test borings. Upon completion of drilling operations, groundwater was observed in all six test borings, at depths ranging from 5 to 5.5 feet below existing grade. Changes in soil color, from brown to gray, generally indicative of the median water table, were seen at approximately 9 feet bgs. Additionally, wet (saturated) soils were encountered at boring location B-01 at a depth of approximately 14 feet bgs. The groundwater elevation fluctuates and is naturally at a seasonal high during the winter and spring, and would be expected to vary at different times of the year.

Based on the results of the preliminary geotechnical program, geological issues are not expected to restrict development at the Facility Site. However, given the potential for variability within any given site, a more detailed geotechnical program will be undertaken to support final design and construction of the Facility.

(5) Hydrology and Wind

(a) Characteristics of Directly Affected Waterbodies

The only surface waterbodies located on or adjacent to the Study Area are Mud Creek and two unnamed streams. Mud Creek was the only USGS "blue line stream" identified on the Study Area. Based on the Quality Habitat Evaluation Index, Mud Creek is classified as a Warmwater Habitat. An unnamed tributary to Mud Creek flows east across the Ringbus Interconnection Property and is classified as a Class I Primary Head Water Habitat. An unnamed stream, which flows east across the Ringbus Property into Cedar Lake, is classified as a Class II Primary Head Water Habitat.

Delineated wetlands located on the Facility Site had been pre-approved for alteration by the USACE as part of the Lordstown Industrial Park, previously known as the Henn Industrial Park (the USACE permit is provided in Appendix E). Additional details characterizing wetland and streams in the Study Area can be found in the Wetland and Surface Water Delineation Report and the Wetland and Stream Mitigation Plan, also provided in Appendix E. A discussion of anticipated impacts, existing approvals, and mitigation measures is provided in Section 4906-13-07(B)(1)(d).

Water needs for the Facility will be met through the use of potable water from existing water suppliers. Both the City of Warren and the Meander Water District have adequate supply and are the targeted entities to contract with to serve the Facility.

No direct surface water discharges or permanent impacts to streams are proposed to result from the Facility. Accordingly, natural and the man-affected budgets for each body of water likely to be directly affected by the proposed Facility are not applicable and not included in this Application. Facility wastewater will be discharged to an existing POTW, and will comply with quality standards to support the POTW's existing NPDES permit requirements; therefore, no impact to surface waters will result from the discharge of Facility wastewater.

Stormwater will be discharged from the Facility Site via a detention basin. BMPs will be utilized to ensure compliance with water quality standards, to minimize erosion and sedimentation, and to avoid impact on adjacent properties.

(b) Potential for Flooding or High Wind Conditions

The only mapped 100- and 500-year flood zones within the Study Area lie along the banks of Mud Creek. The southeastern corner of the Laydown Area and portions of the Ringbus Property are within the 100- and 500-year flood zone. The Ringbus Site has been situated to avoid any flood zones, with the exception of the access, which uses an existing culvert crossing; the southeastern corner of the Laydown Area will be avoided. The extent of the 100- and 500-year flood zone is shown in Figure 04-2.

Figure 04-5 presents the distribution of wind speeds and directions for historic data collected in Vienna, Ohio (Youngstown-Warren Regional Airport) for the years 2009 through 2013 in the form of a wind rose. The prevailing wind direction, occurring approximately 10 percent of the time, is from the southwest. The average prevailing wind speed is 7.25 knots (8.3 miles per hour [mph]). High winds (greater than or equal to 22 mph) have been recorded in Vienna, Ohio and have occurred from the north-northwest, northwest, west, south-southwest, and southwest. Calm winds (less than 1 knot [1.15 mph]) were recorded 10.14 percent of the time.

(c) Aquifer Mapping

Figure 04-6 illustrates the groundwater resources throughout the entire county as well as in the immediate vicinity of the Study Area. As Figure 04-6 shows, the Study Area is situated in the Alliance Thin Upland

Aquifer, an area where groundwater yields of less than 75 gallons per minute (gpm) may be developed from the underlying sandstone aquifer. Although Figure 04-6 identified 17 water wells located within approximately 1 mile of the Study Area, the ODNR website lists an additional ten water wells in unidentified locations within a 1 mile radius of the Study Area.[5] The 27 private, municipal or industrial water wells identified on ODNR's website have groundwater yields between 6 gpm and 80 gpm, respectively.

(B) LAYOUT AND CONSTRUCTION

The natural topography of the Study Area is flat, but fill materials may be required to facilitate drainage. The Facility Site and Laydown Area will be cleared and graded prior to the start of major construction activity. The top approximately 1 foot depth of soil with significant organic matter will be removed within the Facility Site boundary. This material will be stockpiled and may be used later for final grading and seeding. No piling or blasting will be required.

The access drive and the stormwater system and erosion and sedimentation controls will then be installed, and the Facility Site will be graded to an elevation of approximately 960.5 feet above mean sea level prior to the start of construction. Spoil materials from the equipment foundation will be spread within the property. Additional fill will also be brought to the Facility Site. Construction debris will be routinely collected in containers and hauled off-site to a landfill by a licensed waste hauler.

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[5] ODNR. Earth Resource Information Network (ERiN) Well Log Application. http://gisdev1.oit.ohio.gov/Geocortex/Essentials/Web/viewer.aspx?Site=ERINWellLogApp&ReloadKey=True

(1) Site Activities

(a) Test Borings

Preliminary test borings have been conducted at the Facility Site, as previously discussed in Section 4906-13-04(A)(4). Additional geotechnical borings will be completed prior to Facility final design and construction.

(b) Removal of Vegetation

As previously described, the Site is located in an agricultural production area. Planting and harvesting of crops will be coordinated to allow Facility construction to commence.

Since the Facility Site is currently in agricultural use, no tree-clearing is required within this area. The Laydown Area will require approximately 6 acres of tree clearing and the Northern Laydown Area will require clearing of only approximately 0.15 acre. The Ringbus Site has been situated on an open field to minimize tree clearing, with only approximately 1.5 acres to be cleared. The proposed Ringbus Interconnection will require 3.5 acres of tree clearing within the 100-foot wide ROW.

(c) Grading and Drainage

The Facility Site will be graded and properly sloped to facilitate drainage. Ditches, swales, and drainage structures will be provided to capture stormwater and direct it by gravity flow to detention basins that will discharge to the two nearby streams. A Grading and Drainage Plan will be developed in coordination with the Village of Lordstown.

(d) Access Roads

Henn Parkway extends eastward off Route 45 and will provide access to the Facility Site, as shown in Figure 02-2. Henn Parkway is an existing, paved roadway capable of supporting construction and operation activities. Two access points off Henn Parkway will be provided to accommodate two lanes of travel (two lanes plus road shoulders).

A temporary road will be needed to provide access from the Facility Site to the adjacent Laydown Area. This temporary access road is anticipated to be approximately 24 feet wide and will facilitate internal construction traffic while minimizing Facility-related travel on public roadways.

An additional access road will provide access to the Ringbus Site, north of the Goldner Lane neighborhood. An unimproved roadway currently extends east off the Goldner Lane cul-de-sac, then north over an existing culvert in Mud Creek. CEF-L plans to improve this access road without any additional impacts to the surrounding area or wetlands.

No additional access roads will be needed.

(e) Removal and Disposal of Debris

Excess soil materials will be used as backfill where possible throughout the Facility Site. Debris generated during the construction phase of the Facility will be collected in containers and hauled off-site to a landfill by a licensed waste hauler.

(f) Post-Construction Reclamation

Areas around the Facility not covered with concrete foundations, concrete paving, or asphalt will receive a 6-inch thick course of crushed stone or be loamed, seeded and landscaped. The unoccupied areas disrupted around the Facility during construction will be graded and seeded with native grass or stabilized in another appropriate manner immediately after construction activities are complete.

(2) Layout

The overall layout of the proposed Facility is provided on the Proposed Facility and Vicinity map (Figure 02-2) and the Proposed Plot Plan (Figure 02-3). A rendering illustrating the Facility layout is provided in Figure 02-4. The ringbus layout is provided in Figure 02-6 and the proposed route for the Ringbus Interconnection is provided in Figure 02-7.

(3) Structures

(a) Dimensions

The specific dimensions of major structures can be seen on Figure 02-2. Other buildings to be included at the Facility Site are:

- A 14-cell cooling tower (approximately 115 feet wide by 380 feet long by 60 feet high);
- The control/maintenance/administration building (approximately 48 feet wide by 142 feet long by 25 feet high); and
- An auxiliary boiler skid (approximately 25 feet wide by 35 feet long by 30 feet high).

(b) Construction Materials

The CTGs, HRSGs, and STG will all be installed on reinforced concrete foundations. All materials and construction practices used will meet or exceed safe and reliable power plant engineering and design standards.

(c) Color and Texture

Final design colors and textures have not been selected, however, neutral-colored coatings will be used on exposed surfaces for aesthetic appeal, and ribbed siding materials will be used for metal buildings.

(d) Pictorial Sketches

A computer-generated color rendering of the Facility is included as Figure 02-4.

(e) Unusual Features

No unusual characteristics are incorporated into the design and final appearance of the proposed new Facility.

(4) Plans for Construction

Initial construction activities will commence following certification by the OPSB and receipt of other environmental permits. Site preparation and demolition, grading, Facility Site access, stormwater management, and underground utilities will be completed, followed by equipment foundations.

As equipment foundations are complete, CTGs, tanks, pumps, and electric equipment will be installed. During this same period, electrical cable, piping, and pre-engineered metal buildings will be installed. As the various equipment components are installed, system checkout, and testing activities will be performed to ensure the plant conforms to design specifications. After completing checkout, inspection, and testing activities, the Facility will be started up for operation.

In conjunction with initial start-up and testing of the Facility, finish coatings, insulation, paving, and landscaping activities will be completed.

(5) Future Plans

There are no plans for future addition of generating units at the Facility Site. The opportunity exists for future use of the construction laydown parcel for additional power facility development in the future. However, should this be proposed, separate review and approvals will be sought.

(C) EQUIPMENT

(1) Description of Major Generating Equipment

The major equipment at the Facility will include two CTGs with natural gas as the fuel, evaporative coolers for inlet air cooling, two three-pressure level HRSGs, two duct burners, and one reheat, condensing STG. The Facility will utilize a 14-cell cooling tower and a steam surface condenser. An auxiliary gas-fired steam boiler will be used for heating steam to accommodate a faster Facility start-up.

(a) Combustion Turbine Generators

Two advanced technology Siemens or GE CTGs will be provided. The CTGs will be capable of delivering electric power in continuous operation and include all associated auxiliary systems and accessory equipment. Evaporative coolers will be supplied for cooling inlet air. The

CTGs will be equipped with DLN combustors for turbine exhaust emission control. The HRSGs will be equipped with SCR systems to minimize NO_X and oxidation catalysts to minimize CO and VOC emissions. Facility emissions under all operating conditions will comply with permit requirements.

(b) Heat Recovery Steam Generators

One HRSG will be provided for each CTG to recover the waste heat from gas turbine exhaust and then generate steam. The HRSG will be a supplementary-fired three-pressure level, natural circulation design with steam reheat and superheater sections, complete with steam attemperators. SCR will be installed for NO_X control in each HRSG. Each HRSG will be equipped with an ammonia injection grid and associated aqueous ammonia storage tank. Additionally, an oxidation catalyst will be provided in each HRSG for CO and VOC control. All associated auxiliary systems and accessory equipment, as well as a 160-foot exhaust stack for each unit, will be provided.

(c) Steam Turbine Generator

The STG will be condensing type with reheat capability. The unit will include all of the associated auxiliary systems and accessory equipment. The STG's maximum rated output is 322.9 MW at 95°F ambient temperature.

(d) Fuel Gas System

Natural gas may be compressed to a higher pressure via an electrically powered gas compressor station. A knock-out drum will be provided to remove any liquids that may be present in the gas. Filter/separators will further treat the fuel gas by removing any debris or liquids prior to entering the turbines. The auxiliary steam boiler and duct burners will use low-pressure natural gas.

(e) Steam System

The steam system will consist of steam drums, super-heaters and economizers, steam piping to and from the steam turbine, steam turbine bypass piping, steam piping to gland seal and steam jet air ejector systems, and solids and chemistry control. No export steam will be produced at this Facility. Steam generated by the auxiliary boiler will be used for heating and warm-up purposes.

(f) Condensate System

The condensate system will be designed to provide water sufficiently deaerated and with the proper water chemistry to meet HRSG and steam turbine requirements. The system will provide sufficient capacity for operation over the entire ambient range, and also supply water to the auxiliary boiler.

(g) Feedwater System

Boiler feedwater will be supplied by a three-element feedwater control system for each section of the HRSG. Chemical treatment of the boiler feedwater will be accomplished using chemical feed equipment. Although the particular treatment program for this Facility has not yet been determined, a typical program could include: corrosion inhibitor injected to the HRSG steam drums; oxygen scavenger injected into the HRSG; and pH control amine injected into the boiler feedwater pump suction piping.

(h) Cooling Water System/Steam Condensing

The circulating water cooling system will provide cooling for condensing the steam turbine exhaust and the Facility closed-loop cooling system. The system will consist of a 14-cell cooling tower constructed of either wood or fiberglass reinforced plastic and a steam surface condenser with an air ejector/vacuum system. The cooling tower will include high efficiency drift eliminators for reduction particulate emissions capable of achieving a 0.0005 percent cooling tower drift rate.

Chemical treatment of the cooling tower water will be accomplished utilizing chemical feed equipment. Although the particular treatment program for this Facility has not yet been determined, a typical program could include: pH control (acid or caustic); scale inhibitor; biocide; dispersant; and chlorine/hypochlorite.

(i) Closed Loop Auxiliary/Cooling Water System

The closed loop auxiliary cooling water system provides cooling for auxiliary equipment. The system will utilize demineralized water with corrosion inhibitor.

(j) Fire Protection System

A complete fire protection/detection system will be provided for the Facility. It will include fixed water fire suppression systems, fire hose stations, hydrants, portable fire extinguishers, detection and control systems. The system will include a motor-driven fire pump and an ULSD engine-driven fire water pump (an approximately 50-gallon double containment oil ULSD storage tank will be integrated into the unit). It will be designed and installed in accordance with NFPA standards and insurer's recommendations. All fire protection equipment and systems will be Underwriters' Laboratory approved, and will comply with the Village fire protection authority's and CEF-L's insurance carrier's requirements.

The Facility is located along Henn Parkway. The Village maintains two fire hydrants on Henn Parkway, across from the Facility.

(k) Water System

The Facility will be supplied potable-quality water by existing water suppliers in the area, namely the City of Warren and the Meander Water District. Water will be used in the cooling tower for makeup to replace water loss due to evaporative coolers, and other Facility uses. A water balance depicting the Facility's average uses and flows is shown in Figure 02-5.

(l) Demineralizer

The potable-quality water will require further demineralization for use as makeup water to the steam cycle to replace water lost as a result of boiler blowdown. Water will be processed by the demineralizer system, which will remove the dissolved solids to the level required by the HRSG and steam turbine manufacturer's requirements. The product from the demineralizer system will be sent to the demineralized water storage tank. The demineralized water for condenser hot-well makeup, and will be of sufficient size so as to allow normal Facility operations without excessive cycling of the demineralized water system. Demineralizer regeneration waste will be equalized and neutralized in a fiberglass tank before being discharged to the wastewater system.

(m) Wastewater System

A regeneration waste neutralization system will receive the regeneration wastes from the demineralized waste system and chemical waste sump. This system will equalize and adjust the pH through the addition of acid or caustic to comply with discharge limits. Process wastewater from equipment drains will be routed through an oil/water separator, then recycled through the cooling tower. Any oils remaining in the oil/water separator will be removed by qualified contractors. Boiler blowdown will also be recycled through the cooling tower. Sanitary waste and the cooling tower blowdown will be piped to the Village of Lordstown wastewater collection system for conveyance to the City of Warren POTW for treatment and disposal. The Village's existing wastewater collection system is located along Hallock Young Road, just south of the Facility Site.

Stormwater will be routed to on-site detention basins to maintain acceptable rates of runoff from the Site.

(n) Backup Generation

A 1,200-kW diesel engine driven generator will be provided and designed to safely shut the Facility down in the event of a disruption of power delivery. The generator will provide power to essential services necessary to protect the equipment. ULSD will be utilized, which will be stored in an approximately 800-gallon double containment tank integrated into the equipment skid.

(o) Transformers

Electrical power will be generated by the Facility at a voltage level of approximately 20 kV and then stepped-up to a voltage level of 345 kV by newly installed transformers to be located adjacent to the power block. Each step-up transformer will be oil-filled with low voltage windings sized for the maximum output of each generator. The transformers will be provided with no load tap changers and surge arresters. The power will then move through available transmission paths to wholesale electric customers throughout Ohio and the Midwest. In addition to the main step-up transformers, two auxiliary transformers will provide power for station loads.

(2) Emissions Control and Safety Equipment

(a) Flue Gas Emissions Control

The DLN combustors in the CTG, coupled with SCR in the HRSGs, will limit Facility NO_X emissions to a level that meets those specified in the

Facility air permit to be issued by the Ohio Environmental Protection Agency (Ohio EPA). The exclusive use of natural gas, combined with state-of-the-art combustion control/optimization, will minimize emissions of other pollutants.

SCR is an air pollution control technology that is used to remove NO_X from the flue gases that are produced during combustion of fossil fuels in turbines or boilers. SCR removes NO_X through a catalyzed chemical reduction of NO_X by NH_3 that is introduced as a reactant in the flue gas in the presence of excess O_2. This reaction generates nitrogen gas and water as the reduced end products that are ultimately emitted from the stack to the atmosphere. The resulting NO_X emissions will be controlled to 2 ppmvdc.

The HRSG will also be equipped with an oxidation catalyst for control of CO and collateral control of VOC.

A CEMS will be provided for each HRSG with sample porting located on the corresponding HRSG stacks. The CEMS will continuously extract flue gas samples from both units near the HRSG exhaust and measure flue gas parameters. The parameters subject to CEMS measurement will be specified in the air permit required from Ohio EPA, and will likely include NO_X, CO, and O_2.

(b) Equipment Reliability and Efficiency Reduction

The reliability of the DLN system, because it is an integral combustion turbine component, exceeds combustion turbine reliability. A failure of a DLN combustor would require that the respective turbine be shutdown. The oxidation catalyst is similarly integral to overall Facility operation. The SCR system is of high reliability. Ceramic block life span varies by manufacturer, with replacement normally completed during a regularly scheduled preventative maintenance outage lasting a couple of days. The CEMS will detect a deterioration of performance well before a failure of the catalyst occurs. At no time will a unit operate if its respective SCR is not functioning properly.

(c) Effluent Control Equipment

No direct discharge of wastewater to a surface water body will occur as a result of the Facility. The Facility will be designed with appropriate effluent control equipment to ensure that no indirect impact will occur and that all applicable pretreatment standards are met when discharging to the Village of Lordstown's sewer system.

A regeneration waste neutralization system will receive the regeneration wastes from the demineralizer system. This system equalizes and adjusts the pH by the addition of acid or caustic to comply with discharge limits.

Equipment drains will be routed through an oil/water separator. Waste oil and equipment wash solutions will be collected and removed by a qualified waste contractor. Process and sanitary wastewater will be directed to the Village of Lordstown's nearby sewer collection system. Stormwater will be routed to on-site detention basins prior to discharge to the nearby Mud Creek.

(d) Public Safety Equipment

There will be no public access to the proposed Facility. A security fence will be installed around the Facility with card-activated gates and Facility operator access control. Occupational Safety and Health Administration (OSHA) requirements will be implemented to ensure worker safety during Facility construction and operation.

(3) Other Major Equipment

The major equipment not addressed in Section 1 and 2 above are described below.

(a) Combustion Turbine Air Inlet Coolers

Combustion air inlet coolers provide evaporative cooling of inlet air by circulating water over a fill material in the inlet housing of the combustion turbine. These units will typically be operational at ambient temperatures above approximately 59°F.

(b) Auxiliary Boiler

During initial start-up or during turbine downtime over a short duration (i.e., with no cold reheat or high pressure steam available), auxiliary steam is provided by the auxiliary boiler. The auxiliary boiler is fired by natural gas from the fuel gas system and will have a maximum input capacity of approximately 28.8 million British thermal units per hour (MMBtu/hr). Makeup water for the auxiliary boiler is supplied from the demineralized water system.

The auxiliary boiler provides steam until the HRSG has sufficient pressure to supply the needs of the auxiliary steam system. At that point the auxiliary boiler can be shut down.

(c) Fuel Gas Preheaters

A fuel gas performance heater will be supplied for each gas turbine. This is a carbon steel shell and tube heat exchanger that utilizes hot water taken from the HRSG to heat the fuel gas as required for improved cycle efficiency.

(d) Fire Water Pump – Diesel Engine Driven

One 140-horsepower (hp) diesel engine driven fire water pump will be provided with an associated 300-gallon fuel tank.

(e) Oil/Water Separator

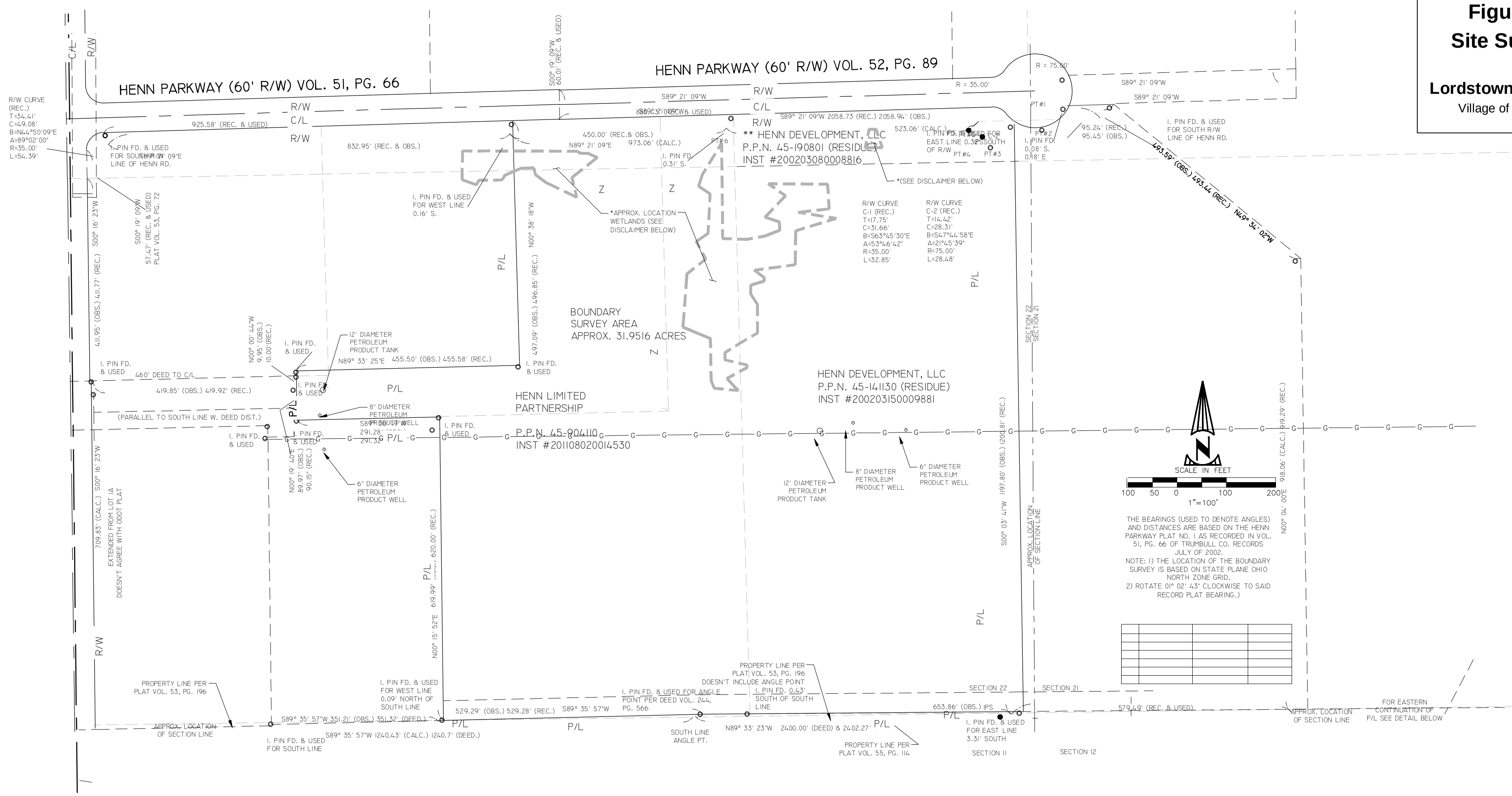
An oil/water separator will be provided to remove hydrocarbon materials and sediment from equipment drains.

Section 4: Figures

- **Figures 04-1A and 04-1B: Site Survey Maps**
- **Figure 04-2: Soils and Floodplain Map**
- **Figure 04-3: Soil Boring Locations**
- **Figures 04-4A and 04-B: Geological Cross-Sections**
- **Figure 04-5: Wind Rose**
- **Figure 04-6: Aquifers, Water Wells, Oil and Gas Wells and Drinking Water Protection Areas**

Figure 04-1A
Site Survey Map

Lordstown Energy Center
Village of Lordstown, Ohio



BOUNDARY SURVEY

SITUATED IN SECTION 22 OF THE VILLAGE OF LORDSTOWN, COUNTY OF TRUMBULL, STATE OF OHIO AND BEING LOT 4A IN THE LORDSTOWN INDUSTRIAL PARK PLAT NO. 1 REPLAT OF LOT 4 AS RECORDED IN PLAT VOL. 55, PG. 114 OF TRUMBULL COUNTY AND OTHER UNRECORDED LAND IN SECTION 22 OF LORDSTOWN VILLAGE IN TRUMBULL COUNTY, OHIO.

LEGEND

- ● IPS - 30" IRON PIN SET (EXCEPT AS INDICATED ON MAP) SET PINS ARE 5/8" DIA. REBAR AND CAPPED, DESIGNATED "MANNIK & SMITH GROUP, INC."
- ○ - IRON PIN FOUND (OR OTHER TYPE OF MON. AS NOTED ON MAP)
- □ - MONUMENT BOX
- P/L - PROPERTY LINE
- R/W - RIGHT-OF-WAY
- C/L - CENTER LINE
- (REC.) - RECORD
- (OBS.) - OBSERVED
- (CALC.) - CALCULATED
- P.P.O.B. - PRINCIPLE PLACE OF BEGINNING
- P.O.C. - POINT OF COMMENCEMENT
- - WETLAND DELINEATION

PROPERTY LINE PER PLAT VOL. 53, PG. 196
N89° 33' 23"W 1748.41' (OBS.)
N89° 33' 23"E 2400.00' (DEED) & 2402.27' (OBS.)
FOR WESTERN CONTINUATION OF P/L SEE MAP ABOVE
I. PIN FD. & USED FOR FOUR LOT COMMON CORNER PER DEED BOOK 1327, PG. 215

SURVEYOR'S CERTIFICATE :

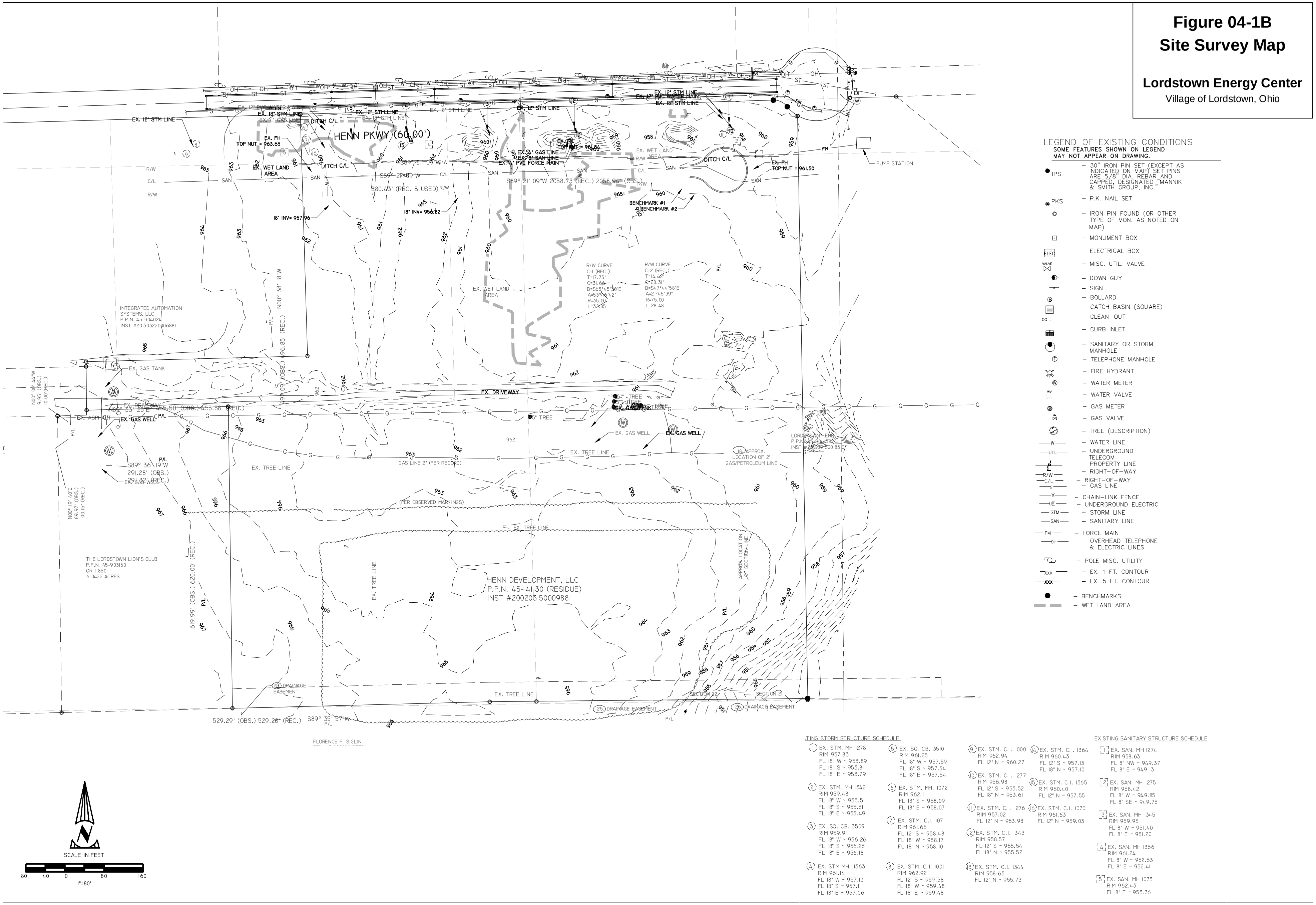
I DO HEREBY CERTIFY THAT I HAVE SURVEYED THE LAND SHOWN ON THIS BOUNDARY SURVEY IN ACCORDANCE WITH THE PROVISIONS OF CHAPTER 4733-37 OF THE OHIO ADMINISTRATIVE CODE, THAT THIS MAP IS A CORRECT REPRESENTATION OF THE LAND SURVEYED AND THAT I HAVE FOUND OR SET THE PINS AND MONUMENTS SHOWN ON THIS MAP.

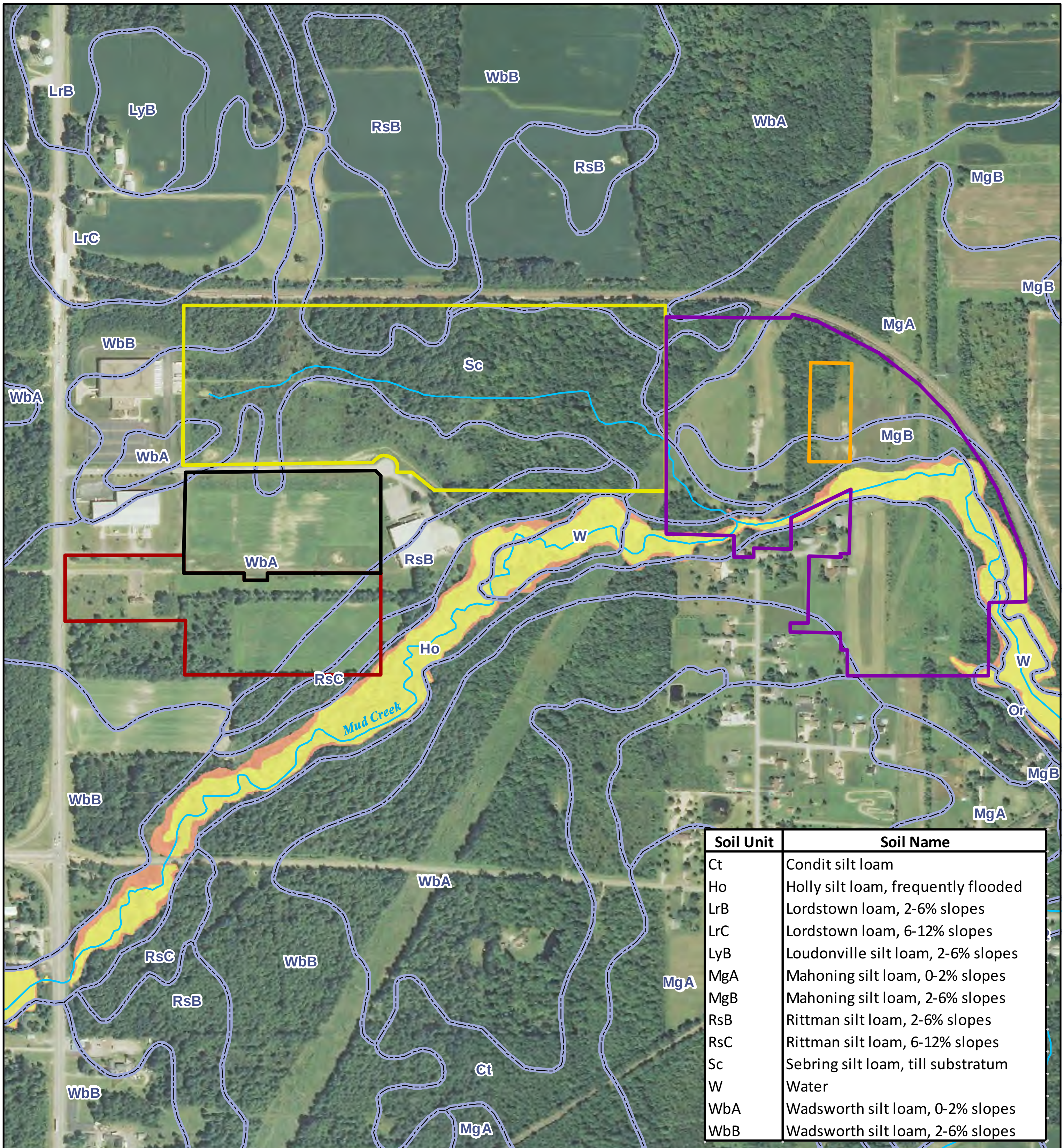
JON D. BRUNER, P.S.
LICENSED PROFESSIONAL SURVEYOR
OHIO LICENSE NO. 7098
DATE: NOVEMBER 17, 2014 REVISED NOVEMBER 20, 2014
JOB NUMBER: C4580001 REVISED DECEMBER 2, 2014
JBRUNER@MANNIKSMITHGROUP.COM

Figure 04-1B
Site Survey Map

Lordstown Energy Center

Village of Lordstown, Ohio





Soil Unit	Soil Name
Ct	Condit silt loam
Ho	Holly silt loam, frequently flooded
LrB	Lordstown loam, 2-6% slopes
LrC	Lordstown loam, 6-12% slopes
LyB	Loudonville silt loam, 2-6% slopes
MgA	Mahoning silt loam, 0-2% slopes
MgB	Mahoning silt loam, 2-6% slopes
RsB	Rittman silt loam, 2-6% slopes
RsC	Rittman silt loam, 6-12% slopes
Sc	Sebring silt loam, till substratum
W	Water
WbA	Wadsworth silt loam, 0-2% slopes
WbB	Wadsworth silt loam, 2-6% slopes

Legend

- Facility Site
- Laydown Area
- Ringbus Site
- Ringbus Property
- Ringbus Interconnection Property
- Stream
- Soil Unit Boundary
- 100-year Flood Zone
- 500-year Flood Zone

0 250 500 1,000 Feet

N

Figure 04-2
Soils and Floodplain

Lordstown Energy Center
Village of Lordstown, Ohio

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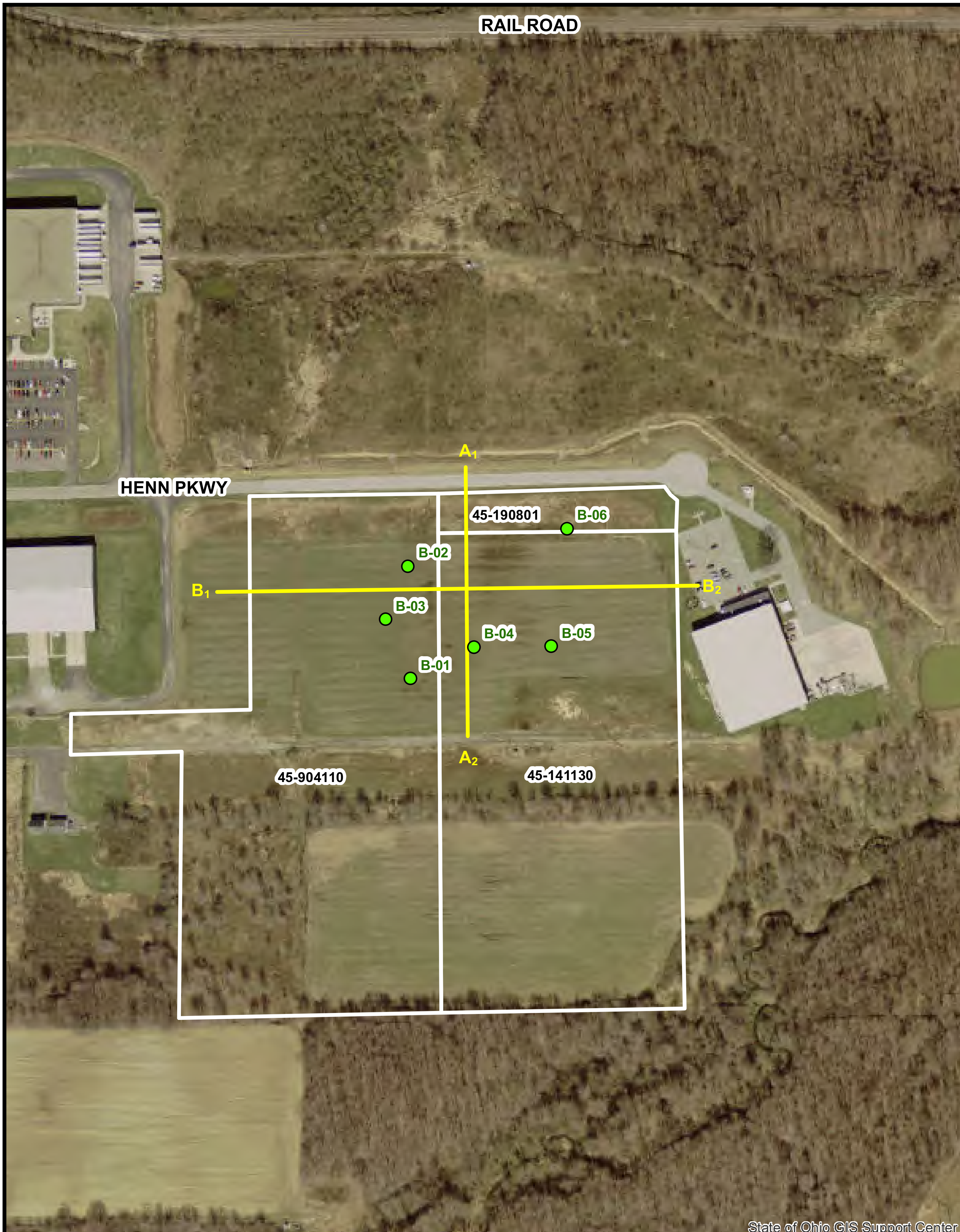


Legend

- Soil Boring (Approximate)
- Cross Section
- Site

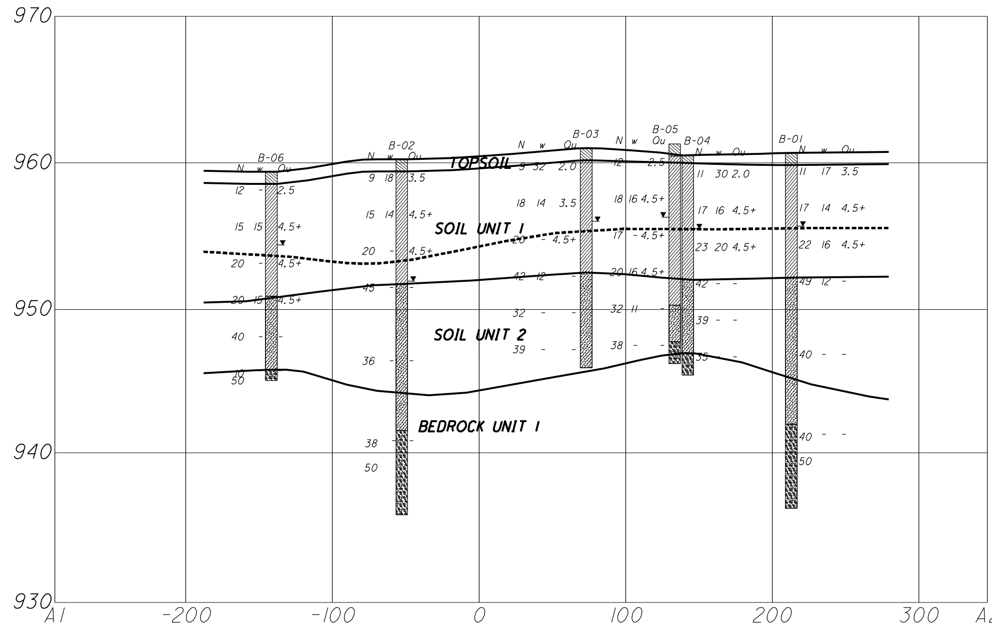
Notes

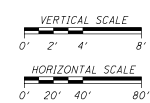
The Trumbull County photography, dated April 2011, is provided by OGRIP as part of the Ohio Statewide Imagery Program.

Feet
0 200 400

Figure 04-3
Soil Boring Locations

Lordstown Energy Center
Village of Lordstown, Ohio





LEGEND

- TOPSOIL
- SILTY CLAY (CL)
- CLAYEY SAND (RESIDUAL SOIL) (SC)
- WEATHERED SHALE
- DEPTH OF GROUNDWATER OBSERVED UPON COMPLETION OF DRILLING (PIEZOMETRIC SURFACE)
- w MOISTURE CONTENT (%)
- N SPT N-VALUE
- Qu UNCONFINED COMPRESSIVE STRENGTH FROM POCKET PENETROMETER READINGS (TSF)

NOTES:

1. BORING ELEVATIONS WERE SURVEYED BY THE MANNIK & SMITH GROUP, INC.
2. STRATA BOUNDARIES ARE INFERRED BETWEEN BORINGS.
3. VERTICAL EXAGGERATION IS 10H:1V.
4. ZERO LOCATION ALONG HORIZONTAL AXIS IS THE INTERSECTION OF CROSS-SECTION A1-A2 AND CROSS-SECTION B1-B2.
5. IT SHOULD BE NOTED THAT THIS IS NOT A TRUE GEOLOGIC SECTION. THIS IS INTENDED TO SHOW GENERALIZED SUBSURFACE CONDITIONS ACROSS THE ENTIRE SITE.

Figure 04-4A
Geologic Cross-Section

Lordstown Energy Center
Village of Lordstown, Ohio

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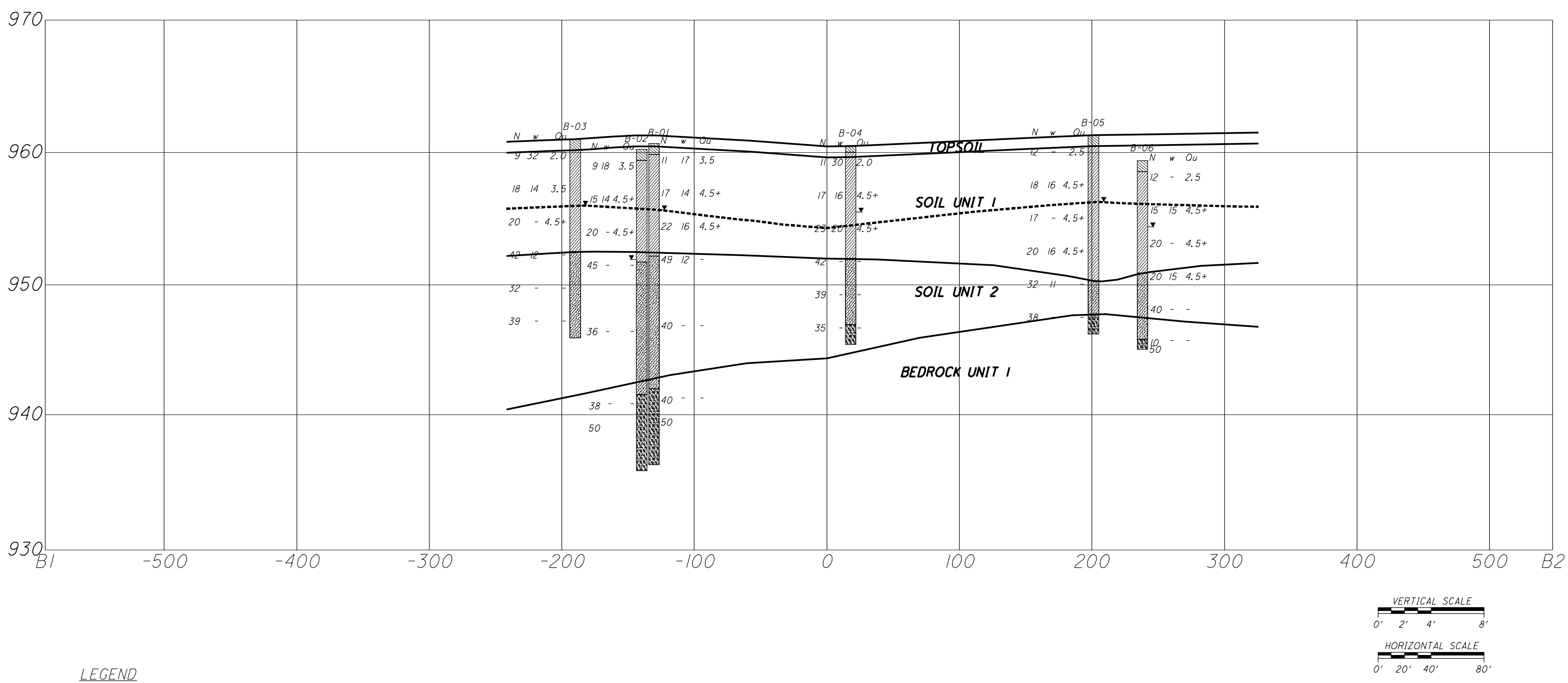
3/6/2015



LEGEND

- TOPSOIL
- SILTY CLAY (CL)
- CLAYEY SAND (RESIDUAL SOIL) (SC)
- WEATHERED SHALE
- DEPTH OF GROUNDWATER OBSERVED UPON COMPLETION OF DRILLING (PIEZOMETRIC SURFACE)
- w MOISTURE CONTENT (%)
- N SPT N-VALUE
- Qu UNCONFINED COMPRESSIVE STRENGTH FROM POCKET PENETROMETER READINGS (TSF)

NOTES:

1. BORING ELEVATIONS WERE SURVEYED BY THE MANNIK & SMITH GROUP, INC.
2. STRATA BOUNDARIES ARE INFERRED BETWEEN BORINGS.
3. VERTICAL EXAGGERATION IS 10H:1V.
4. ZERO LOCATION ALONG HORIZONTAL AXIS IS THE INTERSECTION OF CROSS-SECTION A1-A2 AND CROSS-SECTION B1-B2.
5. IT SHOULD BE NOTED THAT THIS IS NOT A TRUE GEOLOGIC SECTION. THIS IS INTENDED TO SHOW GENERALIZED SUBSURFACE CONDITIONS ACROSS THE ENTIRE SITE.

Figure 04-4B
Geologic Cross-Section

Lordstown Energy Center
Village of Lordstown, Ohio

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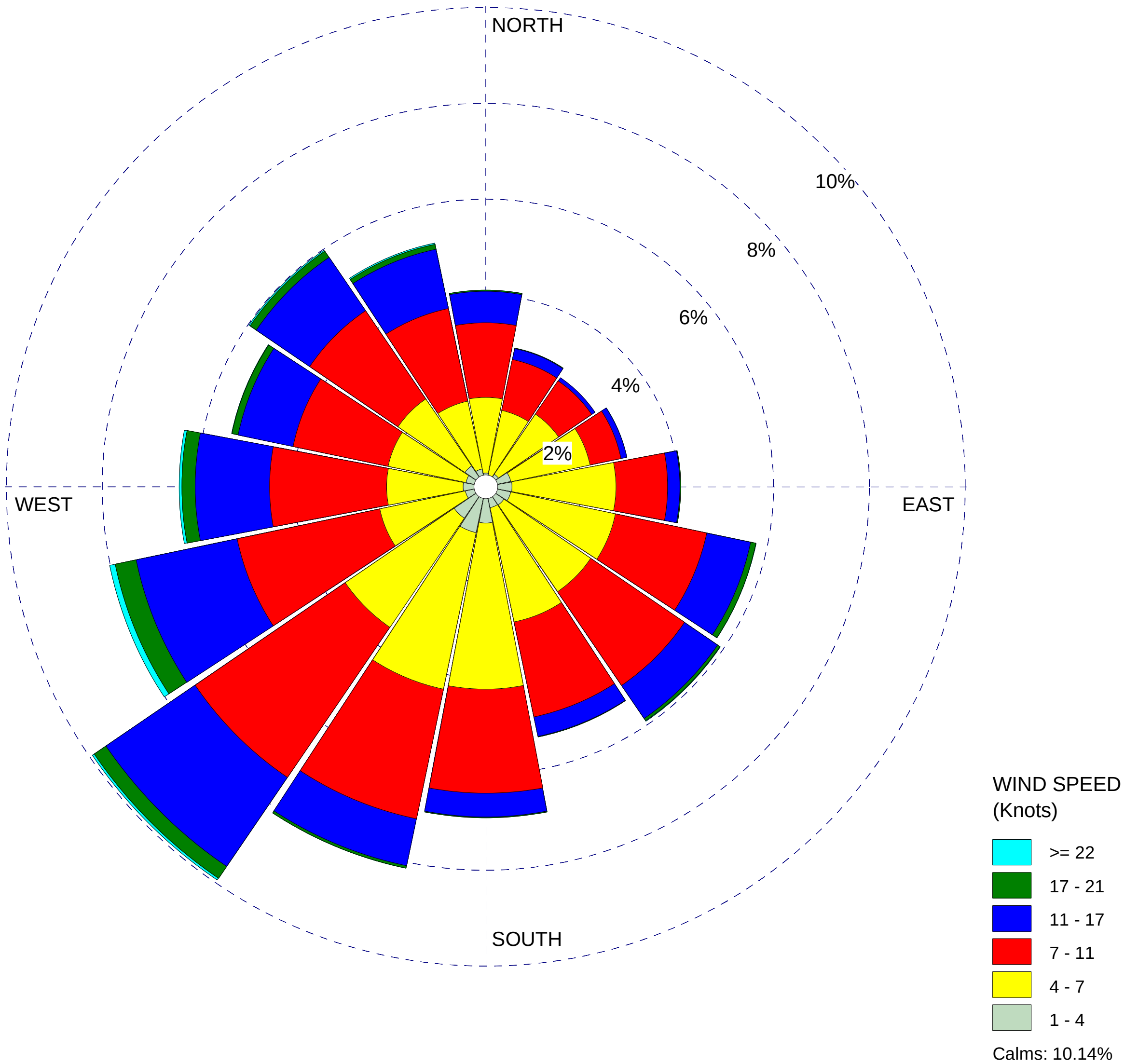
3/6/2015

WIND ROSE PLOT:

Lordstown Energy Center
Youngstown-Warren Regional Airport, OH (2009-2013)

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Wind Rose Plot for Youngstown-Warren Regional Airport Meteorological Data (2009-2013)

DATA PERIOD:

Start Date: 1/1/2009 - 00:00
End Date: 12/31/2013 - 19:00

MODELER:

CALM WINDS:

10.14%

TOTAL COUNT:

43034 hrs.

AVG. WIND SPEED:

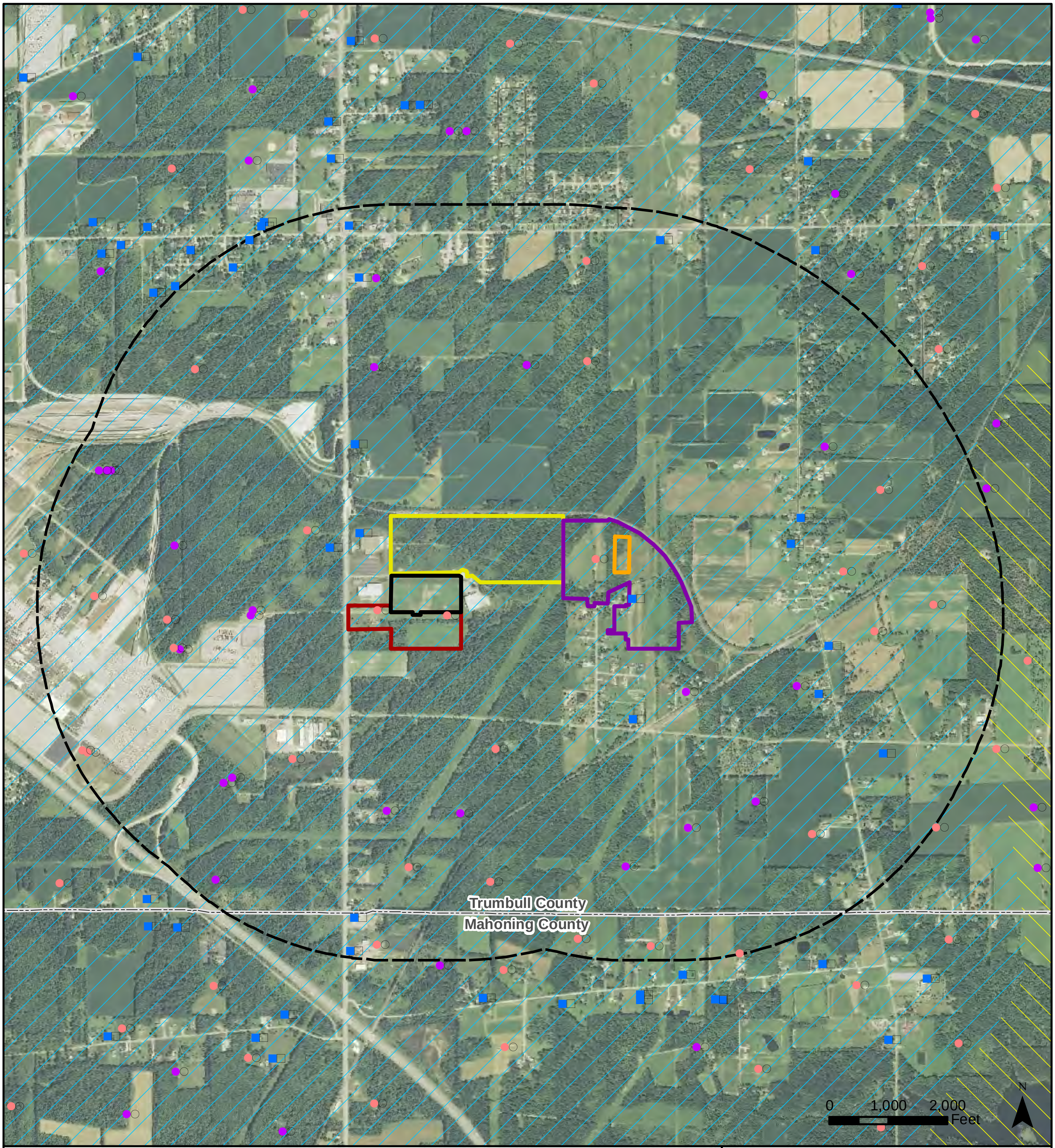
7.25 Knots

DATE:

2/18/2015

Figure 04-5
Wind Rose

Lordstown Energy Center
Village of Lordstown, Ohio



Legend

- Facility Site
- Laydown Area
- Ringbus Site
- Ringbus Property
- Ringbus Interconnection Property
- 1-mile Radius
- Alliance Thin Upland Aquifer
- Mahoning Buried Valley Aquifer
- Gas Well
- Oil Well
- Oil and Gas Well
- Water Well

Notes: No drinking water protection areas known in the project vicinity.
Oil/gas wells and water wells from ODNR.

Figure 04-6
Aquifers, Water Wells, Oil and Gas Wells and Drinking Water Protection Areas

Lordstown Energy Center
Village of Lordstown, Ohio

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(A) OWNERSHIP

CEF-L will develop, construct, own, and operate the proposed Facility. CEF-L currently has an option to own the approximately 17-acre property on which it proposes to construct the Facility. CEF-L will own all the equipment, structures and on-site improvements associated with the Facility. The Facility Site is adequately sized to build the Facility. An adjacent 23.5-acre property is available for construction laydown and parking. CEF-L also has optioned a 71-acre non-contiguous parcel proposed for the Facility switchyard, located northeast of the Facility Site. Land will either be purchased or easement agreements will be negotiated for the Ringbus Interconnection route.

(B) CAPITAL AND INTANGIBLE COSTS

(1) Estimated Capital and Intangible Costs

Table 05-1 presents cost information using Generally Acceptable Accounting Principles accounting format.

TABLE 05-1
ESTIMATED CAPITAL AND INTANGIBLE COSTS ($1,000)

Description	Cost
Engineering, Procurement, Construction	655,000
Transmission Interconnection Costs	18,500
Facility Development Costs	20,000
Land	1,000
Facility Financing Costs	95,000
Total ($987 per kW)	789,500

(2) Capital Cost Comparison

Within the recent past, a number of large-scale combined-cycle power projects have been successfully financed by non-utility entities, throughout PJM. Due to multiple factors including unique local economic conditions, specific Facility modifications and timing of equipment purchases, CEF-L estimates that the PJM regional range of combined-cycle combustion turbine costs would vary from $760 million ($950 per kW) to $960 million ($1,200 per kW). However, the Facility's all-in capital cost (including financing related costs) of $987 per kW is clearly within the range of similar large-scale combined-cycle plants.

(3) Present Worth and Annualized Capital Costs

No Facility configuration alternates are presently being considered and, thus, no comparison can be developed.

(C) OPERATION AND MAINTENANCE EXPENSES

(1) Estimated Annual Operation and Maintenance Expenses

CEF-L estimates that the fixed and variable annual operation and maintenance (O&M) expense for the Facility's partial calendar year in operation (2018) will be approximately $16.9 million. Commercial operation is currently expected to occur in late May of 2018, so that expenses for that year reflect only 7 months of operation. In 2019, the Facility's first entire calendar year in operation, the estimated O&M expense will be $29.5 million. However, neither of these expense estimates includes the cost of fuel or major overhauls required by the Facility machinery. Using current dispatch estimates of 92 percent of available hours in 2018 and of 92 percent of available hours in 2019, the sum of all O&M

annual expense corresponds to an expected $4.49 per megawatt-hour (MW-hr) and $4.57 per MW-hr, respectively. Due to the unique features of a particular combined-cycle project, the variable O&M costs, when coupled with the large amount of fixed costs associated with operation, can result in a total O&M value expressed as costs per MW-hr that can vary slightly from location to location.

The amount, and thus cost, of natural gas that will be utilized by the Facility is a function of both the net heat rate and the percentage of the annual hours in a given year that the Facility will be run, or "dispatched." Assuming an 92 percent annual average dispatch rate and a 2018 delivered gas price of $4.50/MMBtu, the annual cost of purchased natural gas, including transportation to the Facility, will be approximately $187 million (on a full-year basis).

(2) Operation and Maintenance Expenses Comparison

As discussed in Section (B)(2) above, CEF-L does not own other combined-cycle natural gas-fired power plants. However, estimates of annual non-fuel fixed and variable O&M expenses associated with other facilities that have publicly available data, range from $4.25 per MW-hr to $5.25 per MW-hr, depending in large part on the forecasted plant dispatch, local economic conditions, and specific facility characteristics. With consideration of these influences, the Facility is anticipated to perform well within this given range of expected plant costs. This fact has been confirmed by an in-depth independent dispatch analysis by ESAI (Wakefield, MA). Their analysis shows that the favorable economics of the Facility, coupled with its low net heat rate and scale, will push the Facility to surpass other combined-cycle gas turbines in PJM and dispatch above 90 percent.

(3) Present Worth and Annualized Operation and Maintenance Expenses

CEF-L is not considering any alternate O&M regime or Facility technology configurations at this time.

(D) DELAYS

A significant portion of the initial annual Facility energy revenues are associated with commercial operation during the specific months of June, July, August, and September of 2018 when electricity has its highest value. This is due to the fact that electricity consumption is highest in the summer, and the value of energy is also at its highest during these months. Any cost associated with a delay of operations would primarily be the result of these lost energy and capacity revenue opportunities. Each of those summer months has an estimated lost revenue value of $11 – 13 million per month. The remaining cost of delay for the months of October 2018 through the end of 2018 is estimated to be $7 – 9 million per month.

Delay also adds unnecessary Facility costs such as: storage and double-handling costs for major equipment slated for the Facility; interest costs on funds used to purchase major equipment; higher risk for increases in cost of construction debt; and cost increases associated with general construction.

It is critical that the proposed in-service date of May 2018 be achieved in order to meet the anticipated summer peak load demand of 2018. PJM manages the eastern U.S. electrical grid that includes Ohio. To the extent CEF-L commits to PJM in May 2015 to have the Facility operational in May 2018 and does not meet that schedule, there are significant non-performance penalties that would be owed by CEF-L to PJM. Therefore, the OPSB certificate should ideally be issued to allow for the scheduled start of construction date of September 2015, in order for the Facility to be completed on schedule. A delay in the Facility before the beginning of construction would jeopardize the Facility's ability to meet peak summer demand of 2018.

CEF-L is about to order two combustion turbines from either Siemens or GE that will become the primary power generation equipment within the Facility. This "power island" package, including the two CTGs, two HRSGs, and single STG, represents a CEF-L financial commitment of more than $230 million. The fabrication of these units will need to commence in 2015; however, this significant expenditure would not occur until OPSB approval is certain. Any delay in the OPSB process results in a day-for-day delay in commencing manufacturing of the primary generation equipment that is the "critical path" component of the overall Facility construction schedule.

It is important also to keep in mind the potential regional power circumstances relative to supply of electricity generation. PJM keeps a list of planned plant closures on its web site, under Planning/Generation Deactivation. The most recent version of this list, dated March 3, 2015, shows that between now and 2018, and additional 12,464 MW will close.[6] Included on this list are: Ashtabula, Unit 5 (244 MW); Eastlake, Units 1 through 3 (396 MW); and Lake Shore, Unit 18 (245 MW), all plants located in the greater Cleveland area. Additional plant closures are also planned for western Pennsylvania, resulting in fewer generation resources that could possibly meet Cleveland's power demands. Without replacement generation in the implementation stages (namely, summer 2018 operation of the Facility), there will be a "power generation void" in northeastern Ohio. Loss of power

[6] PJM. *Future Deactivations (as of March 3, 2015).* Retrieved from http://www.pjm.com/planning/generation-deactivation/gd-summaries.aspx

generation supply without adequate replacement can lead to costly regional grid reliability issues. The financial consequences of inadequate regional power supply and compromised grid reliability can cost regional customers hundreds of millions of dollars, as has been detailed in public testimony by PJM's transmission experts (in, for example, Case Docket 9214 before the Maryland Public Utilities Commission in January 2012 where similar regional coal plant closures were planned).

(A) GENERAL

This section provides an assessment of the environmental effects specifically relating to air quality, water quality, and waste generation/disposal associated with the proposed Facility. Instances where existing data have been substituted for physical measurements are indicated, as applicable, below.

(B) AIR

(1) Preconstruction

(a) Description of Ambient Air Quality

Both the Ohio EPA and the Pennsylvania Department of Environmental Protection (PADEP) collect air quality data (ambient air pollutant concentrations) at a number of monitoring locations in the area surrounding the Facility. Ohio EPA collects data in Trumbull County, where the Facility is proposed. Data collected from air quality monitoring sites are used, in part, to verify attainment of the NAAQS. NAAQS exist for various criteria air pollutants, including particulate matter (PM_{10} and $PM_{2.5}$), nitrogen dioxide (NO_2), and CO. The proposed Study Area is within an area classified as in attainment for all criteria pollutants.

As defined by the Ohio EPA, background air quality includes pollutant concentrations due to natural sources, nearby sources other than the one(s) under consideration, and unidentified sources. Background air quality is defined as the ambient air pollutant concentration that exists as a result of these sources, not including the proposed Facility.

For the Study Area, monitoring data from both the Ohio EPA and the PADEP were reviewed to determine representative monitoring sites and ambient background concentrations. Table 06-1 summarizes these background data, and Table 06-2 compares the data to the NAAQS. In general, the monitors located closest to the Study Area were selected for all pollutants. In addition, the location of each monitor is generally in an area that is similar or more industrialized than the Study Area, which makes the monitoring data conservatively representative. Figure 06-1 shows the location of each monitoring station.

TABLE 06-1
BACKGROUND AIR QUALITY MONITORING STATIONS

Pollutant	Station Location	Station ID
NO_2	Pittsburgh-Beaver Falls, Pennsylvania	42-007-004
$PM_{2.5}$	Warren Laird, Ohio	39-155-0005
PM_{10}	Warren Waste Treatment Plant, Ohio	39-155-0006
CO	New Castle, Pennsylvania	42-073-0015

TABLE 06-2
BACKGROUND AIR QUALITY DATA

Pollutant	Average Period	Proposed Background (µg/m^3)[a]	NAAQS (µg/m^3)
NO_2	1-hour	73.32	188
	Annual	19.06	100
CO	1-hour	2,748	40,000
	8-hour	1,946.5	10,000
PM_{10}	24-hour	32	150
$PM_{2.5}$	24-hour	22.9	35
	Annual	9.89	12
[a] microgram per cubic meter (µg/m^3)			

The following subsections summarize background air quality by pollutant.

Particulates – PM_{10} is defined as any liquid (aerosol) or solid substance found in the atmosphere with a diameter equal to or less than 10 micrometers (microns). Common forms of suspended particulate matter are fly ash, process dusts, soot, and oil aerosols. Industrial processes, electric power generation, industrial fuel combustion, and dust from the plowed fields, roadways, or construction sites are examples of major sources of PM_{10}. The background concentration for PM_{10} was selected from a monitoring station located in Warren, Ohio. Although more densely populated than the Study Area, this monitor was determined to be more representative than the next nearest monitoring station.

$PM_{2.5}$ is defined as any liquid (aerosol) or solid substance found in the atmosphere with a diameter equal to or less than 2.5 micrometers (microns). Industrial processes, electric power generation, industrial fuel combustion, and dust from the plowed fields, roadways, or construction sites are examples of major sources of $PM_{2.5}$. The background concentration for $PM_{2.5}$ was selected from a monitoring station located in Warren, Ohio. Although more densely populated than the Study Area, this monitor was determined to be more representative than the next nearest monitoring station.

Nitrogen Dioxide – Oxides of nitrogen are toxic gases formed in a high temperature combustion process when nitrogen in the air is oxidized to nitric oxide (NO) or NO_2. The NAAQS for NO_X is specific to NO_2. The major sources of NO_X are high temperature fuel combustion, motor vehicles, and certain chemical processes.

The background concentrations for NO_2 were selected from a monitoring station in Pittsburgh-Beaver Falls, Pennsylvania. The concentrations from this monitor are more representative of Study Area conditions than the next nearest monitor, which is located in the Cleveland area.

Carbon Monoxide – CO is produced by the incomplete combustion of carbon-containing fuels, primarily from internal combustion engines. CO is a general urban pollutant that is produced mainly from transportation vehicles.

The background concentrations of CO were selected from monitoring station in New Castle, Pennsylvania. Although more densely populated than the Study Area, this monitor was determined to be more representative than the next nearest monitoring site located in Akron, Ohio.

(b) Description of Pollution Control Equipment

A review of the air emissions and controls for the proposed Facility is presented below.

Nitrogen Oxides

NO_X is formed in the turbine combustion chamber during high temperature gas firing primarily as a result of the reaction between nitrogen and oxygen present in the combustion air (thermal NO_X). The combustion turbines and duct burners utilize DLN combustors which are integrated within the combustion turbines. The DLN combustion controls NO_X formation by pre-mixing fuel and air immediately prior to combustion. Pre-mixing inhibits NO_X formation by minimizing both the flame temperature and the concentration of oxygen at the flame front.

SCR, a post-combustion chemical process, will be installed in the HRSGs to treat exhaust gases downstream of the CTGs. The SCR process will use 19 percent aqueous NH_3 as a reagent. Aqueous NH_3 will be injected into the flue gas stream, upstream of the SCR catalysts, where it will mix with NO_X. The catalyst bed will be located in a temperature zone of the HRSG where the catalyst is most effective. The mixture will pass over the catalyst and the NO_X will be reduced to nitrogen gas and water. The SCR system will reduce NO_X concentrations to 2.0 ppmvdc with or without duct firing at all steady-state load conditions and ambient temperatures. A small amount of NH_3 will remain un-reacted through the catalyst, which is called the "ammonia slip." The ammonia slip will be limited to 5.0 ppmvdc at all steady-state load conditions and ambient temperatures.

NO_X emissions will increase during limited periods of start-up and shutdown since the DLN combustor does not operate the same way at these loads as it does during steady-state loads. Additionally, the SCR unit is not operational during start-up and shutdown until the turbine exhaust reaches the operating temperature window required by the SCR.

The use of DLN and SCR meets Best Available Control Technology (BACT) for control of NO_X emissions from the CTGs and duct burners.

The proposed auxiliary boiler will minimize NO_X emissions using flue gas recirculation, low NO_X burners, and clean-burning natural gas as the sole fuel for the Facility. This meets BACT for NO_X.

State-of-the-art combustion design in both the emergency fire pump and emergency generator will minimize NO_X emissions.

Particulate Matter

PM emissions result from trace quantities of ash (non-combustibles) in the fuel and formation of ammonia sulfate salts from unreacted NH_3 from the SCR system. Particulate emissions for the turbines, duct burners, and auxiliary boiler are minimized by exclusive use of clean-burning natural gas as the sole fuel for the CTGs and duct burners in conjunction with good combustion practices. A $PM_{10}/PM_{2.5}$ emission limit of 0.0068 pound per million British thermal units (lb/MMBtu) without duct burning and 0.0049 lb/MMBtu with duct burning is BACT for the proposed Facility. This level of emissions will be achieved by combusting only commercially available pipeline quality natural gas in the turbines. A $PM_{10}/PM_{2.5}$ emission limit of 0.008 lb/MMBtu is proposed for the auxiliary boiler. The use of clean-burning natural gas, in conjunction with good combustion practices, is BACT for control of $PM_{10}/PM_{2.5}$ emissions.

The Facility will use a 14-cell cooling tower for condensing the steam turbine exhaust. Particulates may be emitted from the cooling tower as some small water droplets evaporate and liberate dissolved solids in the cooling water to the atmosphere. In order to minimize particulate emissions from the cooling tower, drift eliminators with a drift rate of 0.0005 percent will be used for this Facility. This represents BACT for $PM_{10}/PM_{2.5}$ from the cooling towers.

Carbon Monoxide

CO emitted from combustion turbines is a product of incomplete combustion of the fuel. An oxidation catalyst system will be located within each HRSG to control emissions of CO. Exhaust gases from the turbines will be passed over a catalyst bed where excess air will oxidize the CO. The oxidation catalyst system will reduce CO concentration to 2.0 ppmvdc in the exhaust gas under all steady-state load conditions. The use of oxidation catalyst systems meets BACT for CO. CO emissions will increase during limited periods of start-up and shutdown due to less efficient combustion at these loads.

BACT for control of CO from the auxiliary boiler will also be met using good combustion practices.

Volatile Organic Compounds

VOCs emitted from the combustion turbines, duct burners, and auxiliary boiler are products of incomplete combustion of the fuel. The use of an oxidation catalyst system within each HRSG will control VOC emissions. Exhaust gases from the turbines will pass over a catalyst bed where excess air will oxidize the VOCs. The oxidation catalyst will also reduce VOC emissions to 1.0 ppmvdc without supplemental duct firing and 2.0 ppmvdc with supplemental duct firing. The use of oxidation catalyst systems is BACT for control of VOC from the combustion turbines. VOC emissions will increase during limited periods of start-up and shutdown due to less efficient combustion at these loads. For the auxiliary boiler, VOC emissions will be less than 0.005 lb/MMBtu. Use of clean-burning natural gas as the sole fuel is BACT for control of VOC emissions from the auxiliary boiler.

(c) Description of Regulatory Applicability

Prevention of Significant Deterioration Review and New Source Review

New major stationary sources of air pollution and major modifications to major stationary sources of air pollution are required by the Clean Air Act to obtain an air permit before commencing construction. This process is called New Source Review (NSR) and is required whether the major source or modification is planned for an area where the NAAQS are not being achieved (i.e., nonattainment area) or an area where air quality is better than the NAAQS or cannot be classified (i.e., attainment and unclassifiable areas). NSR for sources in attainment areas is referred to as Prevention of Significant Deterioration (PSD) review, whereas NSR for sources in nonattainment areas is referred to as Nonattainment NSR review. The entire program, including both PSD and Nonattainment NSR permits, is referred to as the NSR program. The USEPA has delegated authority to issue PSD and Nonattainment NSR permits to Ohio EPA. Regulations adopted and administered by Ohio EPA for PSD and Nonattainment NSR are codified in the Ohio Administrative Code (OAC) Chapter 3745-31, Permit to Install New Sources of Pollution. OAC Chapter 3745-31 provides requirements for obtaining a Permit to Install (PTI) for industrial processes. The requirements in this chapter incorporate the provisions of the federal PSD and Nonattainment NSR programs as defined in 40 Code of Federal Regulations (CFR) Parts 51 and 52.

The NSR requirements are pollutant-specific. Even though a source may emit many types of air pollutants, only specific pollutants may be governed by the NSR, depending on the magnitude of the emissions of each pollutant. Moreover, a source may undergo both PSD and Nonattainment NSR review if it is located in an area that is designated attainment for one or more pollutants and nonattainment for the remaining pollutants. Trumbull County, Ohio has been designated or is treated as attainment for all criteria pollutants. Because the area is attainment for all air pollutants, only PSD review applies to the Facility.

The NSR program requires that an applicability determination be conducted for any proposed source (either new source or modification of an existing source) to see if it will be subject to PSD pre-construction review. Three basic criteria must be evaluated when making a PSD applicability determination. These criteria are the magnitude of the emissions for a new or modified source, location in an attainment or nonattainment area, and the pollutants released.

A combined-cycle power generating facility is listed as one of USEPA's 28 named source categories and is considered a major new source under PSD regulations if it has the potential to emit 100 tons per year (tpy) or more (including fugitive emissions) of a regulated air pollutant. The Facility has the potential to emit more than 100 tpy of the regulated pollutants NO_X, $PM_{2.5}$, PM_{10}, and CO and is, therefore, subject to review for these pollutants under PSD regulations.

Once a facility is subject to review under the PSD regulations by exceeding the major source threshold for at least one pollutant, PSD review encompasses each attainment air pollutant that can be emitted at rates greater than the Significant Emission Rates (SERs) listed in 40 CFR 52.21 and OCA Rule 3745-31-01(MMMMM). Based on potential emission estimates, the Facility is subject to PSD review for several regulated air pollutants. The air pollutants subject to PSD review and their respective SERs include NO_X (40 tpy), CO (100 tpy), PM_{10} (15 tpy), $PM_{2.5}$ (10 tpy), and VOC (40 tpy), and the regulated non-criteria pollutant sulfuric acid mist (7 tpy). Isopleths illustrating dispersion modeling results for applicable criteria pollutants are provided in Figures 06-2 through 06-9.

On April 2, 2007, the United States Supreme Court found that greenhouse gases (GHGs), including carbon dioxide (CO_2), are air pollutants covered by the Clean Air Act. On May 13, 2010, the USEPA issued a rule (called the "Tailoring Rule") that established an approach to regulating GHG emissions from stationary sources under the Clean Air Act.

This final rule "tailored" the requirements of the Clean Air Act permitting program to limit which facilities will be required to obtain PSD permits. Under this rule, effective July 1, 2011, PSD permitting requirements would apply to new construction projects that exceed 100,000 tpy of GHG emissions as carbon dioxide equivalent (CO_{2e}). However, on June 23, 2014, the United States Supreme Court ruled that GHG emissions cannot alone determine major source status, but that sources otherwise classified as major sources (so-called "anyway" sources) can still be subject to PSD review for GHG if GHG emissions exceed an agency threshold for GHG SER. USEPA then issued a Policy Memo dated July 24, 2014, indicating that it intends to apply the current GHG SER threshold for requiring PSD BACT review for GHG for "anyway" sources of 75,000 tpy CO_{2e}. The Facility has the potential to emit more than 75,000 tpy of GHG emissions and, therefore, is subject to PSD BACT review for GHGs in addition to the pollutants discussed above.

The other significant aspects of OAC Chapter 3745-31 are outlined in the following paragraphs.

OAC Rule 3745-31-06 – Completeness determinations, processing requirements, public participation, public notice, and issuance – This section mandates that a completeness determination be rendered within 60 days of application receipt by Ohio EPA and within 40 days of receiving a written request from the applicant. The director must rule on a permit application within 180 days after the date that the application is deemed complete. The director must notify the public, by advertisement in a local newspaper, of the draft decision to grant or deny the permit and offer an opportunity for the public to comment or request a hearing.

OAC Rule 3745-31-11 – Ambient Air Ceilings and Increments – The emissions increases due to the proposed new source or modification must not cause an ambient air quality impact that exceeds the maximum allowable increment in the area, nor can they cause any exceedance of any NAAQS, which represent the ambient air quality ceilings.

OAC Rule 3745-31-13/OAC Rule 3745-31-14 – Ambient Monitoring Requirements – The director may determine that pre-construction ambient monitoring data is needed for the purposes of determining whether emission of an air pollutant would cause or contribute to a violation of any NAAQS or applicable increment. Existing air quality data in the Facility vicinity is sufficient for determining ambient background levels.

OAC Rule 3745-31-15 – Control Technology Review – The owner or operator of a new source must employ BACT for each pollutant subject to major source review.

OAC Rule 3745-31-16 – Impact Analysis – The owner or operator of a new source must conduct an impact analysis to demonstrate that the increase in emissions, in conjunction with all other applicable emission increases and decreases, will not cause an exceedance of any NAAQS or applicable increment.

OAC Rule 3745-31-17 – Additional Impact Analysis – The owner or operator of a new source must provide an analysis of the impairment to visibility, soils, and vegetation that would occur as a result of the emission increases and an analysis of the ambient air quality impact of expected secondary growth in the area.

Other Regulatory Requirements

In addition to the NSR program, other federal and state air quality standards also apply during operation of an air pollutant source. They include federal New Source Performance Standards (NSPS), federal National Emission Standards for Hazardous Air Pollutants (NESHAP), and the Ohio EPA rules codified under the various chapters of OAC Chapter 3745.

40 CFR 60 Subpart KKKK applies to Stationary Combustion Turbines and places emission limits on NO_X and SO_2 from new combustion turbines. The combustion turbines and duct burners would be subject to this standard. For new combustion turbines firing natural gas with a rated heat input greater than 850 MMBtu/hr, NO_X emissions are limited to:

- 15 ppmvdc; or
- 54 nanograms per Joule (ng/J) of useful output (0.43 pound per megawatt-hour [lb/MW-hr]).

Additionally, SO_2 emissions must meet one of the following:

- Emissions limited to 110 ng/J (0.90 lb/MW-hr) gross output; or
- Emissions limited to 26 ng/J (0.060 lb/MMBtu).

The Facility will use an SCR system to reduce NO_X emissions to 2 ppmvdc and pipeline-quality natural gas to limit SO_2 emissions to 0.0015 lb/MMBtu. As such, the Facility will meet the emission limits under Subpart KKKK.

Additionally, the provisions of this Subpart require continuous monitoring of water-to-fuel ratio, but allow for the use of either a 40 CFR Part 60 or Part 75 certified NO_X CEMS in lieu of this requirement. The Facility proposes to use a 40 CFR Part 75 certified NO_X CEMS, which will satisfy this requirement.

40 CFR 60 Subpart Dc applies to steam generating units with a maximum input capacity greater than 10 MMBtu/hr and less than 100 MMBtu/hr. The auxiliary boiler has a maximum input capacity of 99 MMBtu/hr, and is, therefore, subject to 40 CFR 60 Subpart Dc. For units combusting natural gas, the standard requires initial notifications at the start of construction and at startup. In addition, records must be maintained regarding the amount of fuel burned on a monthly basis; however, since natural gas is the only fuel burned in the boiler, there are no specific testing or reporting requirements to the USEPA under Subpart Dc.

40 CFR 60 Subpart III is applicable to owners and operators of stationary compression ignition (CI) internal combustion engines that commence operation after July 11, 2005. For the Facility, this rule applies to the emergency generator and emergency fire pump. For model year 2009 and later fire pump engines with a displacement less than 30 liters per

cylinder and an energy rating between 300 and 600 hp, Subpart III provides the following emission limits:

- 4.0 grams per kilowatt-hour (g/kW-hr) (3.0 grams per horsepower-hour [g/hp-hr]) of VOC + NO_X
- 3.5 g/kW-hr (2.6 g/hp-hr) of CO
- 0.2 g/kW-hr (0.15 g/hp-hr) of PM

The Facility will install a fire pump meeting these emissions standards. To comply with Subpart IIII, the emergency generator must meet the emission standards for new non-road CI engines (Tier 2 or 3). Engines with a model year 2006 or later with a power rating of 560 kW (750 hp) or greater must meet the following limits:

- 6.4 g/kW-hr (4.8 g/hp-hr) of VOC + NO_X
- 3.5 g/kW-hr (2.6 g/hp-hr) of CO
- 0.2 g/kW-hr (0.15 g/hp-hr) of PM

The emergency generator associated with the Facility will be certified to meet non-road emission standards.

There are no NESHAP regulations under 40 CFR Part 61 that are applicable to the Facility's operations. However, the NESHAP regulations under 40 CFR 63 are applicable to certain facility sources. The USEPA has promulgated a variety of standards for each category or subcategory of major sources and area sources of hazardous air pollutants (HAPs) under 40 CFR 63. For the Facility, the potential emissions of any single HAP will not exceed the major source threshold of 10 tpy. In addition, potential emissions of combined HAPs will be less than the major source threshold of 25 tpy. Therefore, under 40 CFR Part 63, the Facility is considered an "area" (non-major) HAP source. An area source of HAPs is a source that is not major, i.e., emits or has the Potential to Emit below the major source thresholds. The only area source NESHAP that applies to the Facility is the NESHAP under Subpart ZZZZ for Stationary Reciprocating Internal Combustion Engines, which applies to the emergency generator and the emergency fire pump. The Facility will comply with the NESHAP Subpart ZZZZ standards which require compliance with the NSPS Subpart IIII standards.

The SCR system will use aqueous NH_3 with a less than 19 percent weight solution; therefore, the Facility will not be subject to the requirements of the USEPA's Accidental Release Prevention Program.

The Facility will be subject to the Acid Rain Program based on the provisions of 40 CFR 72.6(a)(3) because the turbines are considered utility units under the program definition and they do not meet the exemptions listed under paragraph (b) of this Section. As required under this rule, the Facility will submit an acid rain permit application at least 24 months prior to the date on which the affected unit commences operation.

On March 10, 2005, USEPA issued the Clean Air Interstate Rule (CAIR) which required reductions in emissions of NO_X and SO_2 from large fossil fuel-fired electric generating units using a cap-and-trade system. The rule provided both annual emissions budgets and an ozone season emission budget for each state. On July 11, 2008, the United States Court of Appeals for the District of Columbia Circuit (the Court) issued an opinion vacating and remanding these rules. However, on December 23, 2008, the Court granted rehearing only to the extent that it remanded the rules to USEPA without vacating them. The December 23, 2008 ruling left CAIR in place until the USEPA issued a new rule to replace CAIR, in accordance with the July 11, 2008 provisions.

On July 6, 2011, the USEPA issued the Cross-State Air Pollution Rule (CSAPR) which replaced CAIR. Ohio power generation sources of 25 MW or greater would be subject to this rule. CSPAR was to go into effect January 1, 2012 and would have imposed new cap-and-trade programs for ozone season NO_X, annual NO_X, and annual SO_2 emissions. However, a ruling issued by the Court on December 30, 2011 stayed CSAPR until further resolution of petitions filed by several entities. On August 21, 2012, the Court vacated CSPAR and ruled that the former CAIR remain in effect until a viable replacement to CSAPR was made.

On April 29, 2014, the United States Supreme Court reversed the Court opinion vacating CSAPR, and on June 26, 2014, USEPA filed a motion with the Court to lift the stay of CSAPR. On October 23, 2014, the Court ordered that USEPA's motion to lift the stay of the CSAPR be granted. CSAPR Phase I implementation commenced, replacing CAIR, at the beginning of 2015. The Facility will comply with the rules in effect when the Facility becomes operational.

The applicable Ohio EPA rules include OAC Rule 3745-17-07(A)(1), which limits visible particulate emission limitations for stack emissions to 20 percent opacity as a six-minute average; OAC Rule 3745-17-10(B)(1), which limits PM from gaseous fuel-burning equipment to 0.20 lb/MMBtu; OAC Rule 3745-18-06(F), which limits SO_2 emissions; OAC Rule 3745-21-08, which limits CO emissions; OAC Rule 3745-21-09, which limits VOC emissions; OAC Chapter 3745-31, which requires a PTI and use of Best Available Technology (BAT) for emissions abatement; OAC Chapter 3745-77, which requires a Title V Operating Permit; and OAC Chapter 3745-103, which requires an Acid Rain Permit.

The closest public-use airport is located approximately 8.8 miles from the Facility Site (Figure 06-10). With two 160-foot stacks and a significant distance to the nearest airport, CEF-L has requested review by the Federal Aviation Administration (FAA), and expects to receive Determinations of No Hazard.

(d) Required Permits to Install and Operate Air Pollution Sources

Federal authority is delegated to the state, and all air permit applications will be submitted to Ohio EPA. The air construction permit, known as the PTI, will serve as the air construction permit and initial operating permit. Since the Facility qualifies as a “Part 70” major source under Title V rules, the Facility will be required to apply for a Title V Operating Permit within 12 months after initial start-up.

The following list of air permits is applicable to the proposed Facility:

- *Ohio EPA PTI:* OAC Chapter 3745-31- Permit to Install New Source of Pollution: OAC Rules 3745-31-01 through -27. The PTI will serve as the submission vehicle for the PSD preconstruction review and construction permit.
- *Title V Permits:* OAC Chapter 3745-77 – Title V Permits: OAC 3745-77-01 through -10. The Title V permit will serve as the federally enforceable operating permit for the Facility.
- *Title IV:* Phase II Acid Rain Permit Program (40 CFR Part 72).

(e) Air Monitoring Stations and Major Source Mapping

Existing ambient air quality data are available for the Facility area or from other representative locations within the state. Figure 06-1 provides a section of a USGS map (1:100,000 scale) showing the location of the Facility in relation to the Ohio EPA and PADEP monitoring stations used to identify background levels for the Facility, along with other identified major point sources in the area.

(f) Demonstration of Regulatory Compliance

A PTI for the Facility was submitted to Ohio EPA in February 2015. The modeling report was also submitted as an addendum to the original PTI application in February 2015. These documents address compliance with the requirements identified in Section (B)(1)(c) and (B)(1)(d). Demonstration that the Facility will meet the range of applicable standards, including demonstrating compliance with NAAQS and PSD increments, was made. A variety of compliance demonstration procedures, in the form of testing, monitoring, recordkeeping, and reporting, will be required to ensure operational compliance with all applicable air rules, standards, and permit conditions. These procedures will be performed in accordance with federal NSPS for combustion turbines (Subpart KKK), boilers (Subpart Dc), emergency generator and emergency fire pump (Subpart IIII).

(2) Construction

Construction impacts on air quality will consist mainly of the relatively minor emissions from the construction equipment required for Facility Site preparation and from fugitive dust emissions. General construction vehicles (both gasoline- and diesel-powered) and other diesel-powered engines will emit minor amounts of VOC, SO_2, CO, NO_X, and PM. These contaminants are not expected to cause any significant impacts on-site or beyond the Study Area boundary.

(3) Operation

(a) Description of Air Monitoring Plans

There are no plans to perform any ambient air quality monitoring during operation. However, as noted above, a variety of compliance monitoring procedures in accordance with the federal NSPS for combustion turbines will be implemented to ensure compliance with all applicable rules, standards, and permit conditions.

(b) Estimated Air Concentration Isopleths

The ambient air quality impacts of the Facility were assessed by dispersion modeling, using the USEPA model AERMOD, in accordance with Ohio EPA guidance as summarized in *Engineering Guide #69, Air Dispersion Modeling Guidance*. Modeling was performed using five years of hourly meteorological data (2009 through 2013) consisting of surface data from the Youngstown merged with upper air data from Pittsburgh. This data set was provided by the Ohio EPA, Division of Air Pollution Control. Impacts of the Facility were evaluated for a series of ambient temperatures and operating loads spanning the range of anticipated operating conditions.

The calculated maximum air quality impacts of the combustion turbines are summarized in Table 06-3. The maximum impacts are below the SILs and PSD increments for all criteria pollutants, with the exception of the maximum-impact scenario for 1-hour NO_2. For the start-up scenario, maximum predicted impacts were added to monitored background concentrations. These results are summarized in Table 06-4 and show that the sum of modeled maximum impacts and existing ambient background concentrations are less than the NAAQS. Isopleth plots showing the spatial pattern of calculated concentrations by pollutant and averaging time are provided in Figures 06-2 through 06-9.

TABLE 06-3
MAXIMUM CALCULATED FACILITY IMPACTS FOR CRITERIA POLLUTANTS

Pollutant	Averaging Time	Maximum Calculated Impact (μg/m^3)	SIL (μg/m^3)	Class II PSD Increment (μg/m^3)
NO_2	Annual – Steady State	0.08	1	25
	Annual – SU/SD	0.10		
	1-hour – Steady State	5.04	7.5	NA
	1-hour – SU/SD	73.32		
CO	1-hour	275.11	2,000	NA
	8-hour	132.14	500	NA
PM_{10}	24-hour	2.68	5	30
	Annual	0.17	1	17
$PM_{2.5}$	24-hour – NAAQS	1.19	1.2	--
	24-hour – PSD	1.72	--	9
	Annual – NAAQS	0.09	0.3	--
	Annual – PSD	0.10	--	4

TABLE 06-4
MAXIMUM CALCULATED FACILITY IMPACTS ADDED TO BACKGROUND CONCENTRATIONS FOR 1-HOUR NO_2

Pollutant	Averaging Time	Predicted Impact (μg/m^3)	Background Concentration (μg/m^3)	Predicted Impact plus Background (μg/m^3)	NAAQS (μg/m^3)
NO_2	1-hour	57.64	73.32	130.96	188

(c) Potential Failure of Air Pollution Control Equipment

The pollution control equipment consists primarily of the DLN combustion, SCR, and the oxidation catalyst system. This equipment has been proven to be reliable, safe, and effective. The DLN control is built into the combustion chamber of the combustion turbine. If a DLN combustor fails, there are detection systems that will notice the failure and automatically initiate shutdown, informing the operator to initiate corrective action. The typical life span of a combustor is based upon the number of starts and hours of operation. The turbine manufacturer recommends periodic maintenance, including inspection of the combustor at specific intervals, which will minimize the risk of in-service failure of any of the components.

Performance of the combustor is also monitored in the Facility computer control system, which will detect degradation in a combustor prior to failure. The CEMS would also detect changes in emissions.

The SCR and oxidation catalyst systems are integral parts of the HRSG. Steel framework is erected in the combustion turbine exhaust gas path along with the HRSG boiler tubes. This framework holds catalyst blocks. The oxidation catalyst is a passive device (no reagent required). Aqueous ammonia is distributed into the exhaust gas stream ahead of the SCR catalyst blocks to achieve the chemical reaction for NO_X reduction. The catalyst blocks for both systems must be periodically replaced. Their life span varies by manufacturer; however, replacements would typically be completed during a regularly scheduled preventative maintenance outage. The CEMS will detect a deterioration of performance well before a failure of the catalyst could occur. In addition, the Facility will have a sophisticated computer control system that has the ability to automatically shut down the unit quickly, if necessary.

(C) WATER

The proposed Facility design incorporates significant water conservation measures. The Facility's maximum water use will be on the order of 5.5 mgd. The maximum daily water use is conservatively estimated based on operating the Facility with full utilization of evaporative cooling on the two CTGs and 100 percent duct-firing of the HRSG at an average ambient temperature of 95°F for a 24-hour period. As shown in Figure 02-5, the Facility's average daily water use will be on the order of 3.6 million gallons. The average daily water use is estimated based on operating the Facility with no evaporative cooling and 100 percent duct-firing of the HRSG at an average ambient temperature of 50°F for a 24-hour period.

Average wastewater from the Facility is also shown on Figure 02-5. Based on the Facility operating with no evaporative cooling and full duct-firing at an average ambient temperature of 50°F, average wastewater will be on the order of 0.7 mgd. At 95°F, with the Facility operating with full utilization of evaporative cooling on the two CTGs and 100 percent duct-firing, maximum wastewater will be approximately 1.1 mgd. When the temperature drops to 0°F, and the Facility is operating with no evaporative cooling and 100 percent duct-firing, wastewater will fall to approximately 0.3 mgd.

The Facility will use existing water suppliers in the region, namely the City of Warren and Meander Water District. Adequate potable water exists from these sources as outlined further below. Wastewater will be discharged to the existing Village of Lordstown sewer systems, which has available and adequate capacity, as also described below.

City of Warren Water Supply

The City of Warren owns and operates its own public water system. The amount of finished water pumped into the Warren distribution system has been steadily declining since the mid-1980, due to the departure of several large industrial customers. Mosquito Reservoir, supplied by Mosquito Creek, is an approximately 7,850-acre, 22.6 billion-gallon reservoir owned and operated by the USACE. The City of Warren has an agreement with the USACE to withdraw an average of 18 mgd from Mosquito Reservoir. Water is treated in a conventional sedimentation and filtration plant with a rated capacity of 22.8 mgd and current sales of 12 mgd. Finished water meets all applicable primary and secondary drinking water standards. The distribution system includes several elevated tanks, including a 500,000-gallon elevated tank on Route 45, only about 0.5 mile from the Facility Site.

Meander Water District Water Supply

Meander Water District, also known as the Mahoning Valley Sanitary District, was formed by authority of Chapter 61115 of the Ohio Revised Code. Meander Water District provides treated water to only three communities on a master metered basis; however, these three communities in turn supply water to other communities. Like the Village of Lordstown, Meander Reservoir, a 2,010-acre protected impoundment with an 11-billion-gallon capacity, is owned by Meander Water District and acts as the main water supply. A secondary supply is via Berlin Reservoir which includes a 9-mile raw water pipeline. The rated capacity of the water treatment plant is 60 mgd, with current daily sales averaging 24 mgd. Meander Water District's finished water meets all applicable primary and secondary drinking water standards. In order to serve their three primary customers, the distribution system includes 27 miles of transmission main ranging in size from 20 to 48 inches. One such pipe is a new 24-inch main that connects the water treatment plant to Lordstown's elevated tank on Route 45, close to the Facility. A pressure and flow control station is located near the main entrance of the Facility Site.

Given the excess potable water treatment capability of both the City of Warren and Meander Water District, the supply of water to the Facility would not stress or overburden either system.

Village of Lordstown Collection and City of Warren POTW

The Village of Lordstown owns its own sewer collection system, but discharges into the City of Warren collection system and POTW. The City of Warren POTW has a treatment capacity of 16 mgd, with an average daily flow of 13 mgd. Treated effluent is discharged directly into the nearby Mahoning River, in accordance with NPDES Permit 3PE00008. The Village of Lordstown currently collects between 300,000 and 400,000 gallons of wastewater each day, with the ability to accommodate up to 1.7 mgd in additional flow. This additional capacity could accommodate the Facility's 1.1 mgd maximum discharge.

(1) Preconstruction

(a) List of Permits

Prior to construction, the Facility will obtain a general NPDES permit for stormwater discharges associated with construction (Ohio EPA's Construction General Permit #OHC000004).

(b) Location of Survey Data Sources

No monitoring or gauging stations have been used to collect preconstruction survey data because no new surface or groundwater sources will be utilized by the proposed Facility; therefore, no mapping of such stations has been provided.

(c) Description of Data Sampling Stations

Because there are no monitoring stations, this is not applicable.

(d) Water Quality of Receiving Stream

Stormwater from the Site will be held within on-site detention basins, to allow clean stormwater to further settle and retain peak flows, prior to release into the on-site ditches. This information, therefore, is not applicable.

(e) Water Discharge Permit Information

No water discharge permitting is required prior to construction, other than confirmation of coverage under the Ohio EPA construction general permit.

(2) Construction

(a) Location of Water Monitoring and Gauging Stations

No water discharges will be associated with the Facility during construction with the exception of stormwater runoff. Sanitary wastes during construction will be handled using portable units that will be the responsibility of an independent contractor. Therefore, no monitoring or gauging stations are intended to be utilized during construction.

(b) Aquatic Discharges

Discharges are not anticipated to occur in association with Facility construction that would influence aquatic resources.

(c) Mitigation Plan

The use of BMPs in accordance with federal and state requirements will ensure that the potential for erosion and sedimentation will be minimized during construction, and that stormwater from the Facility Site will not cause off-site impact.

(d) Changes to Flow Pattern

The Facility Site is flat, and existing drainage patterns will be maintained to the extent possible; therefore, no significant changes in flow patterns are anticipated.

(3) Operation

(a) Location of Water Monitoring and Gauging Stations

Facility wastewater will be directed to an existing municipal POTW in accordance with an existing NPDES requirements. Since the Facility will implement BMPs and good engineering design practices, water quality impact is not anticipated as a result of this Facility. No water monitoring or gauging stations are proposed.

(b) Water Pollution Control Equipment and Treatment Process

Water pollution control equipment to be located at the Facility Site will include: an in-line pH meter; a neutralization tank for demineralizer regenerate waste; oil/water separator for equipment drains; spill containment areas for bulk chemical storage tanks and unloading areas; in-line flow equalization; and detention ponds for stormwater management. A waste neutralization tank will receive the regeneration wastes from the water demineralizer system. The neutralization tank equalizes and adjusts the pH of the wastewater by the addition of acid or caustic to comply with pretreatment standards.

(c) NPDES Permit

The Facility may require coverage under a general NPDES permit for operational stormwater. The Facility will incorporate BMPs and will identify responsibility for tracking changes in stormwater management procedures. No NPDES permit will be required for the Facility's wastewater discharge because it will be conveyed to an existing POTW consistent with pretreatment requirements; appropriate approvals from the POTW and Ohio EPA will be obtained for this interconnection.

(d) Water and Water-Borne Wastes

The Facility water balance, shown in Figure 02-5, provides specific information with regard to water use and discharge. The following are shown: sewerage; blowdown; chemical and additive processing; wastewater processing; oil/water separators; and runoff from other soils/surfaces. No runoff or leachate from fuels and solid wastes is anticipated due to the Facility's exclusive use of natural gas as fuel, the limited solid waste storage planned, and the use of an oil/water separator to ensure collection of any incidental materials on-site.

(e) Water Conservation

Under normal summer baseload operating conditions, a maximum of approximately 1.1 mgd is expected to be discharged from the Facility to an existing, regulated discharge system. This maximum discharge, based on 100 percent duct-firing, full utilization of evaporative cooling, and an ambient temperature of 95°F, will be limited to the hottest summer days. Conversely, the wastewater volume will be at its minimum of 0.3 mgd when the Facility is operating on a cold winter day (i.e., 0°F). In all cases, the discharge from the Facility is expected to meet the requirements of the City of Warren POTW's NPDES standards.

The proposed Facility design incorporates significant water conservation measures. The Facility cooling water system is designed to maximize cycles of concentration to reduce water intake requirements. Another measure incorporated in the cooling tower to minimize water requirements is the use of a state-of-the-art cooling tower drift elimination system (0.0005%). Other measures include the return of recovered boiler blowdown to the cooling tower.

(D) SOLID WASTE

(1) Preconstruction

The Facility Site is currently undeveloped and used for agricultural purposes. No debris was noted during on-site reconnaissance efforts. Therefore, no disposal of solid waste is expected to be required during the pre-construction phase of the Facility.

(2) Construction

During Facility construction, solid waste will be generated that is typical of normal construction efforts. This includes packing materials, office waste, scrap lumber, metals, cables, glass, cardboard containers, and miscellaneous trash. In addition, during Facility construction and pre-operational cleaning, some solvents and flushing materials will be used. Solid waste that can be neither recycled nor reused will be stored in on-site containers for disposal. Programs will be developed to ensure that potentially hazardous wastes are separated from normal waste, including segregation of storage areas and proper labeling of containers. All waste will be removed from the Facility Site by licensed contractors in accordance with applicable regulatory requirements and managed in licensed facilities. The construction phase of the Facility is estimated to take approximately 32 months. The estimated volume of solid waste generated by construction activities during this time is approximately 1,200 cubic yards.

(3) Operation

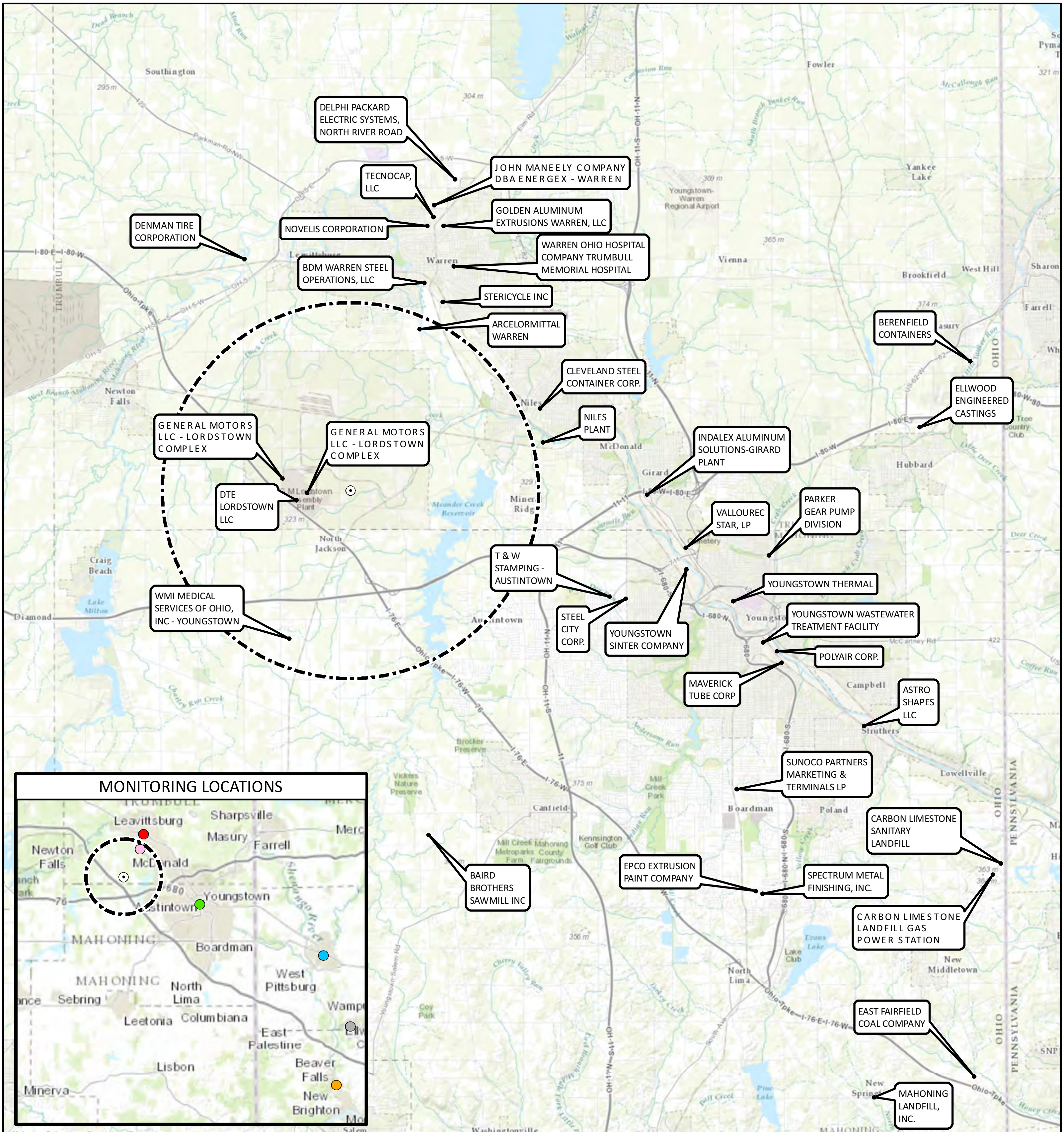
During Facility operations, generated solid waste is anticipated to consist of office waste, including paper and miscellaneous trash, as well as plant operations wastes such as spent chemical and lube oil containers, spare parts, packaging, etc. Any solid waste generated will be removed from the Facility Site by a licensed hauler. The estimated volume of solid waste generated during operation of the Facility is 120 cubic yards on an annual basis.

(4) Licenses and Permits

No new solid waste treatment or disposal facility is proposed as a part of this Facility, or will be necessitated as a result of the construction or operation of this Facility. All solid waste generated will be trucked off-site by an appropriately licensed contractor. SCR catalysts will be removed and returned to a catalyst vendor for regeneration, salvage or disposal. Therefore, since no hazardous wastes are expected to be generated, no such licenses or permits will be required.

Section 6: Figures

- **Figure 06-1: Air Monitoring Stations and Major Source Mapping**
- **Figure 06-2: Air Modeling Isopleths: Annual NO_2**
- **Figure 06-3: Air Modeling Isopleths: 1-hour NO_2**
- **Figure 06-4: Air Modeling Isopleths: 1-hour NO_2 (Start-Up/Shutdown)**
- **Figure 06-5: Air Modeling Isopleths: 8-hour CO**
- **Figure 06-6: Air Modeling Isopleths: 1-hour CO**
- **Figure 06-7: Air Modeling Isopleths: Annual $PM_{2.5}$**
- **Figure 06-8: Air Modeling Isopleths: 24-hour $PM_{2.5}$**
- **Figure 06-9: Air Modeling Isopleths: 24-hour PM_{10}**
- **Figure 06-10: Air Modeling Isopleths: Air Transportation Facilities**



N

0 1 2 3 4

Miles

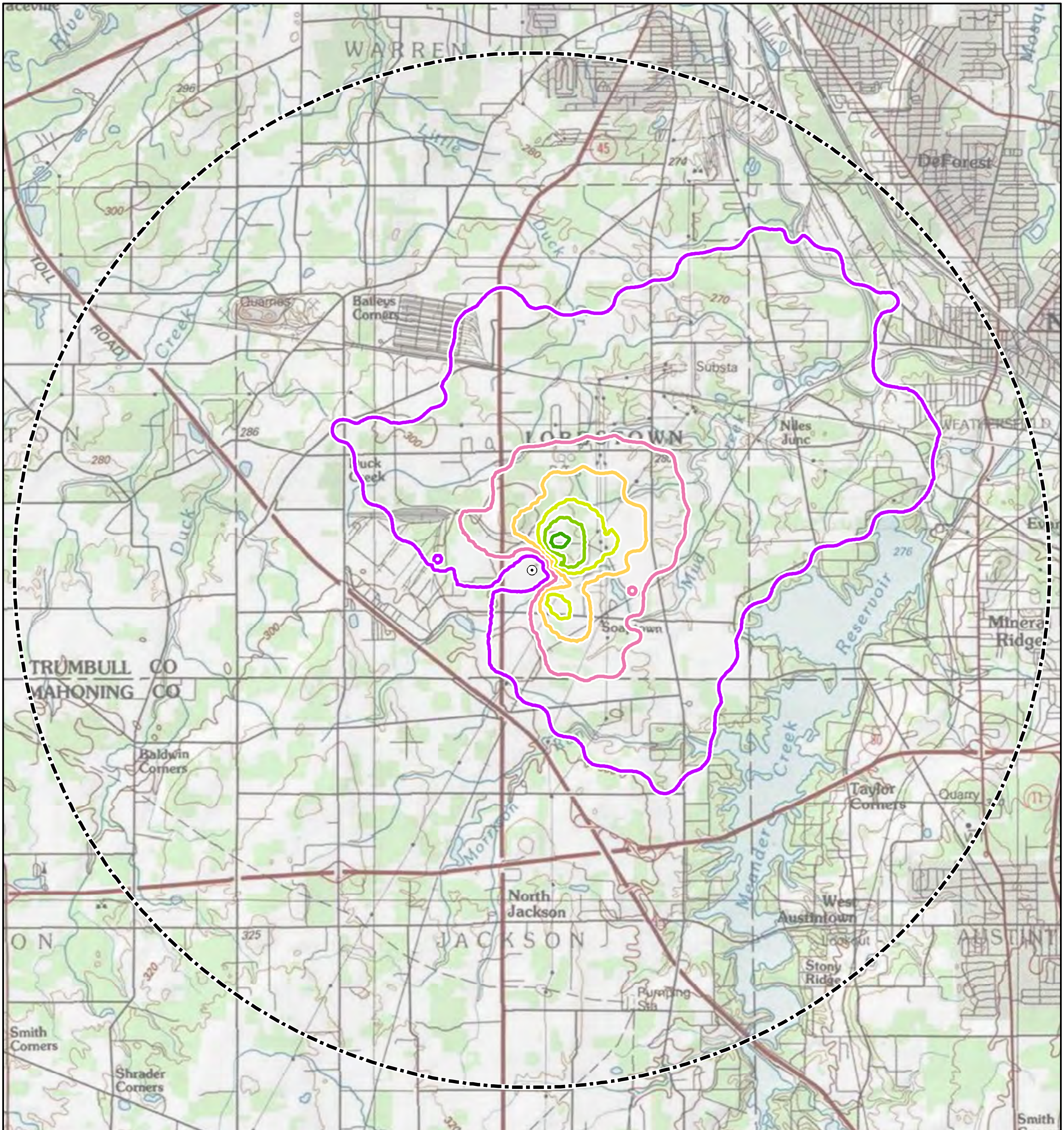
- Facility Site
- CO monitor (ID: 42-073-0015)
- NO_2 monitor (ID: 42-007-0014)
- O_3 monitor (ID: 39-099-0013)/ SO_2 monitor (ID: 39-009-0013)
- PM_{10} monitor (ID: 39-155-0006)
- $PM_{2.5}$ monitor (ID: 39-155-0005)
- Pb Monitor (ID: 42-073-0011)
- Major Source (as identified by review of issued Title V Permits and Permits-to-Install in Trumbull and Mahoning Counties)
- 5-mile Buffer

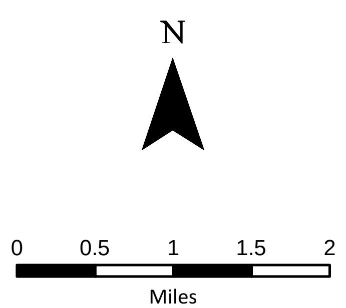
Figure 06-1
Air Monitoring Stations and Major Source Mapping

Lordstown Energy Center
Village of Lordstown, Ohio

OVERVIEW MAP

Path: P:\GIS\Lordstown_OH\GIS\Spatial\MXD\AirModelingConcentrationisopleths\Fig06_1_MonitoringStations_EmissionsSources.mxd





Facility Location

5-mile Buffer

Annual NO_2 Concentration Contour (µg/m³)

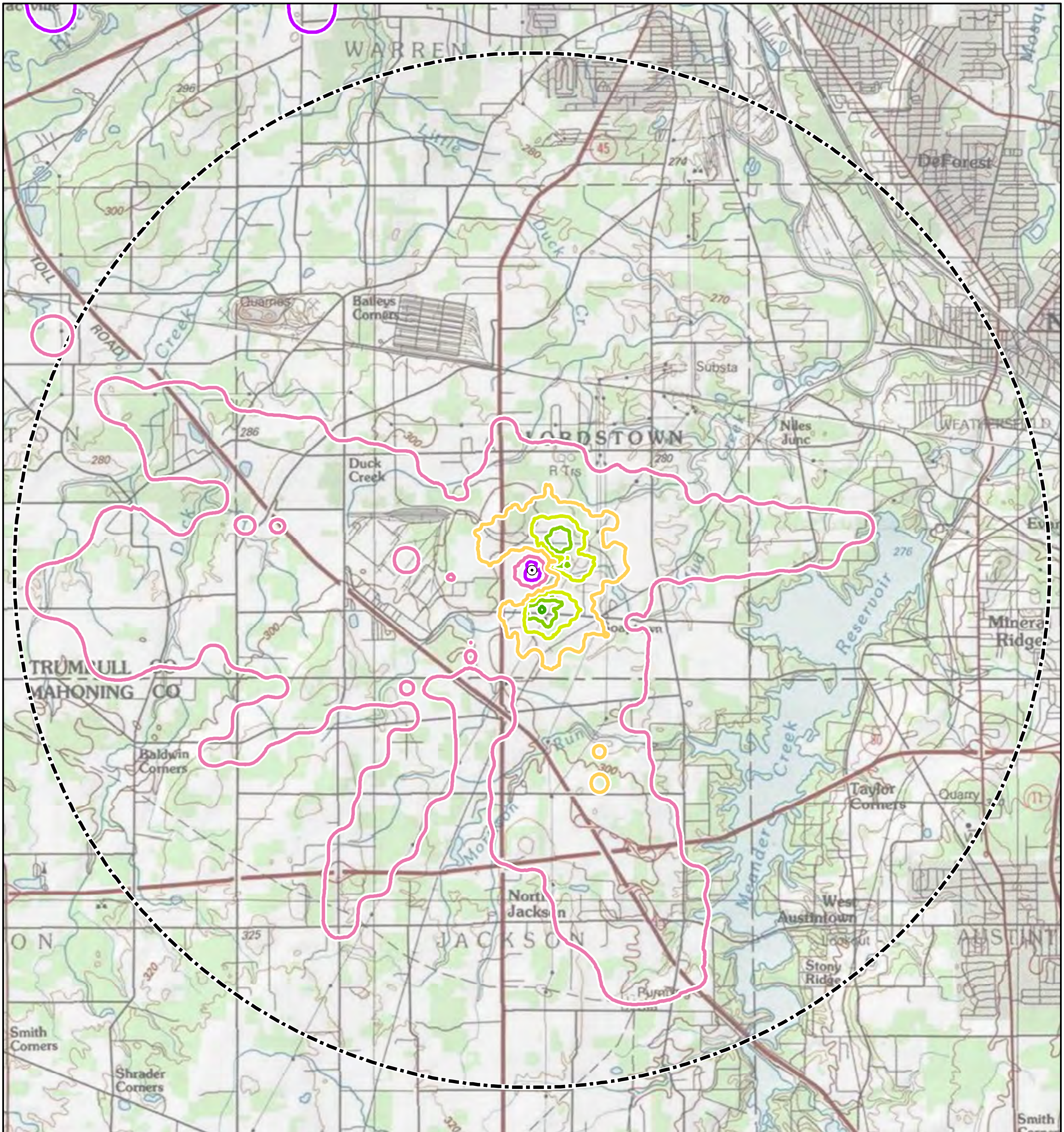
0.01125 | 0.0225 | 0.03375 | 0.045 | 0.05625 | 0.0675

Figure 06-2
Air Modeling Isopleths: Annual NO_2
Normal Operation

Lordstown Energy Center
Village of Lordstown, Ohio

OVERVIEW MAP

Path: P:\GIS\Lordstown_OH\GIS\Spatial\MXD\AirModelingConcentrationIsopleths\Fig06_2_Annual_NO2_Normal.mxd



⊙ Facility Location

5-mile Buffer

1-hour NO_2 Concentration Contour (µg/m³)

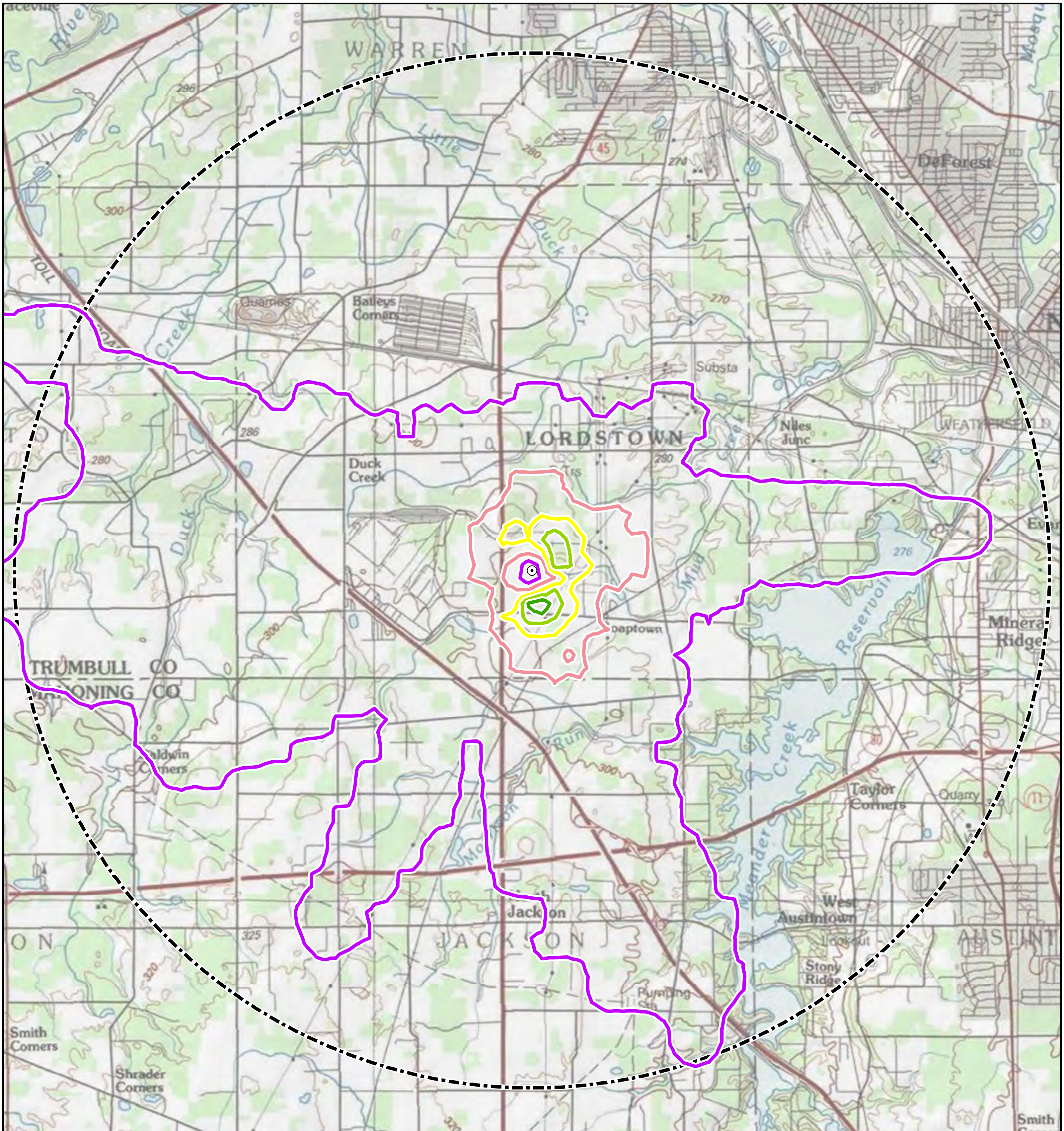
0.8 1.6 2.4 3.2 4 4.8

Figure 06-3
Air Modeling Isopleths: 1-hour NO_2
Normal Operation (5-year Average)

Lordstown Energy Center
Village of Lordstown, Ohio

OVERVIEW MAP

Path: P:\GIS\Lordstown_OH\GIS\Spatial\MXD\AirModelingConcentrationIsopleths\Fig06_4_1hr_NO2_Normal.mxd



N

0 0.5 1 1.5 2

Miles

Facility Location

5-mile Buffer

1-hour NO_2 Concentration Contour ($\mu g/m^3$)

16 28 40 52 64

Figure 06-4

Air Modeling Isopleths: 1-hour NO_2

SU/SD Operation (5-year Average)

Lordstown Energy Center

Village of Lordstown, Ohio

OVERVIEW MAP

Path: P:\GIS\Lordstown_OH\GIS\Spatial\MXD\AirModelingConcentrationIsopleths\Fig06_5_1hr_NO2_SUSD.mxd

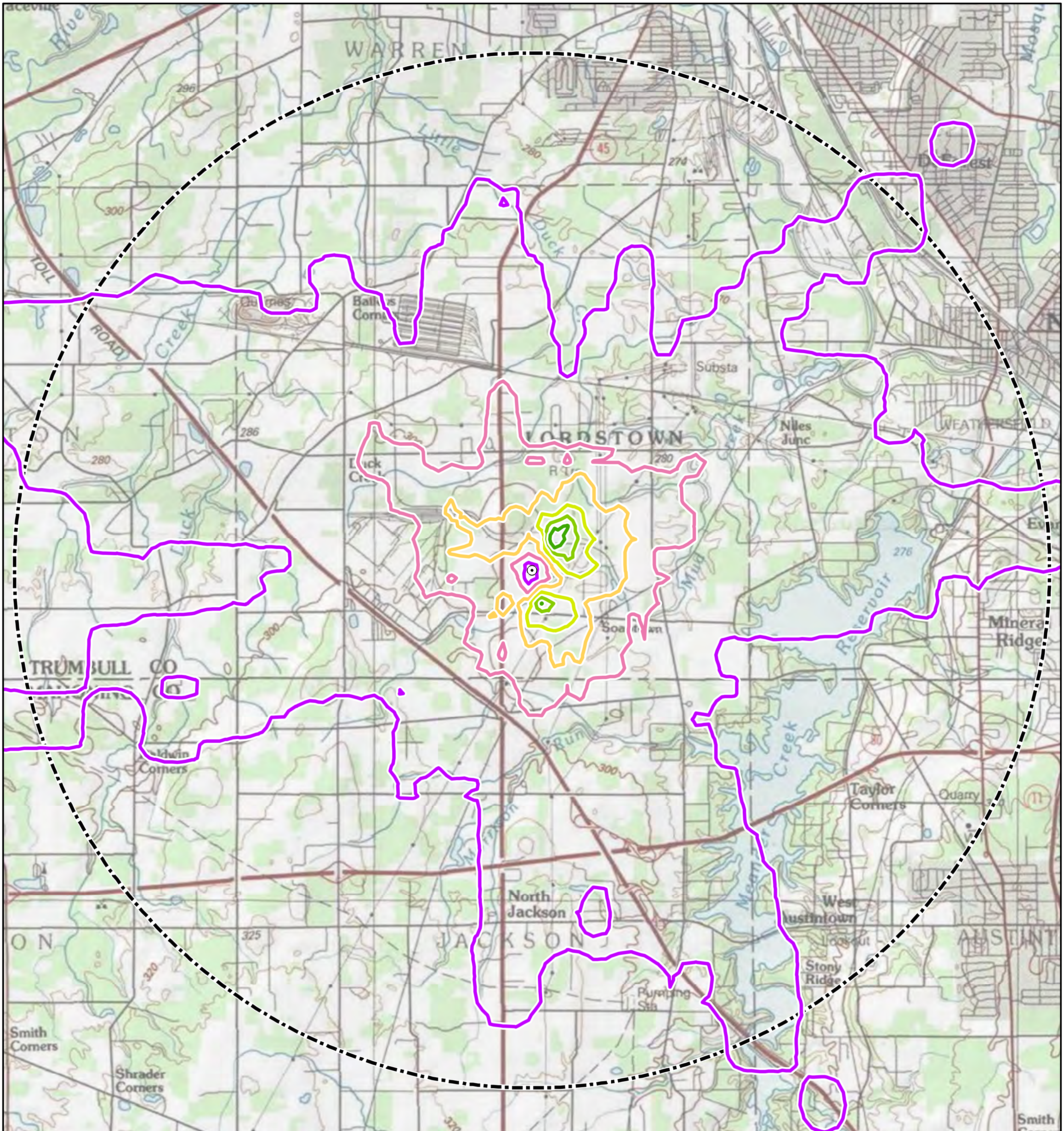
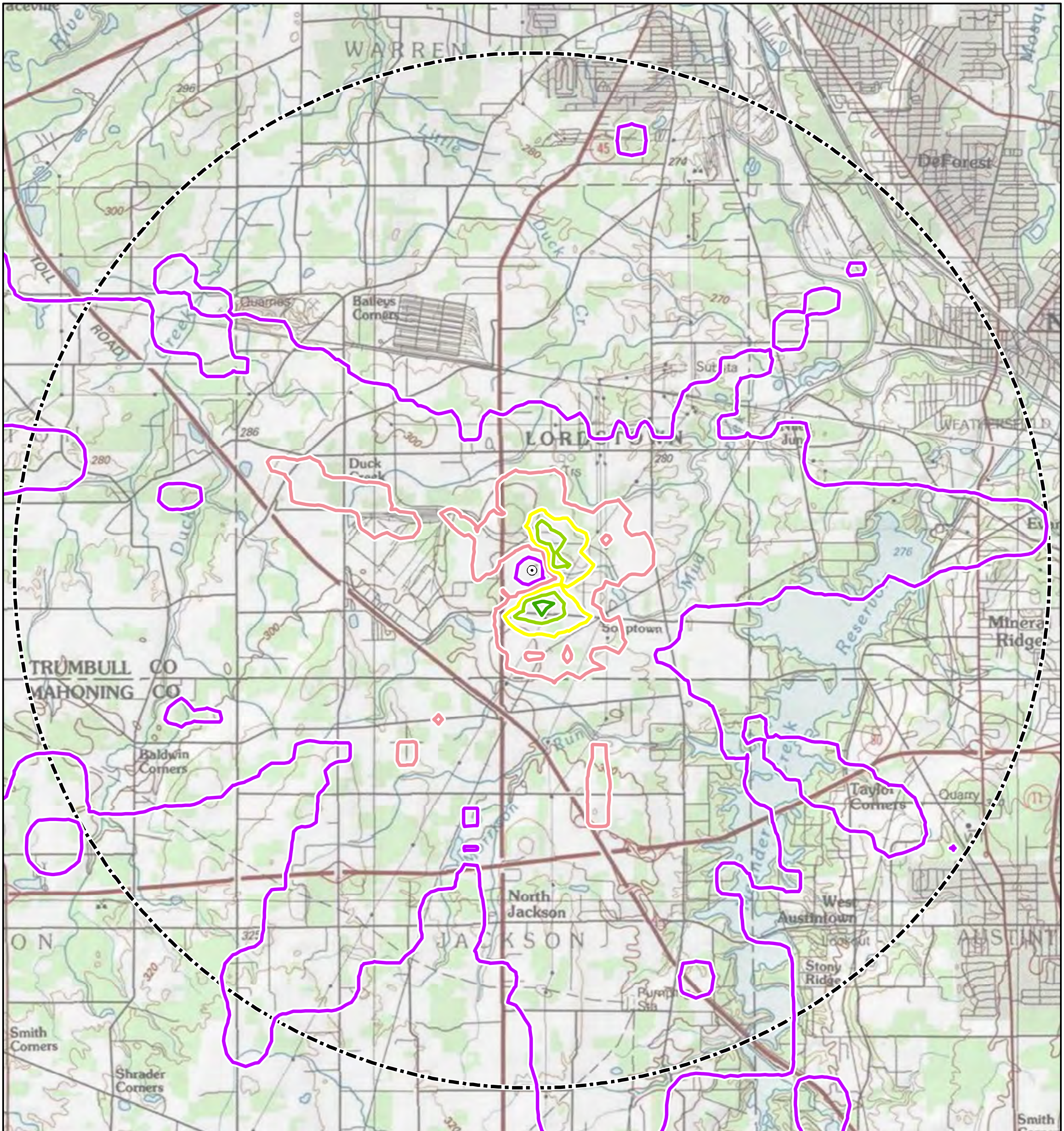
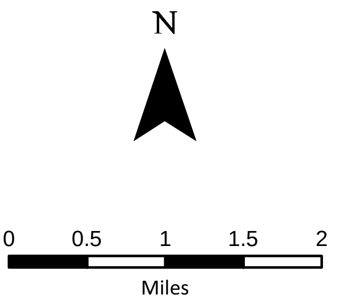


Figure 06-5
Air Modeling Isopleths: 8-hour CO

Lordstown Energy Center
Village of Lordstown, Ohio

Path: P:\GIS\Lordstown_OH\GIS\Spatial\MXD\AirModelingConcentrationIsopleths\Fig06_6_8hr_CO.mxd





Facility Location

5-mile Buffer

1-hour CO Concentration Contour (µg/m³)

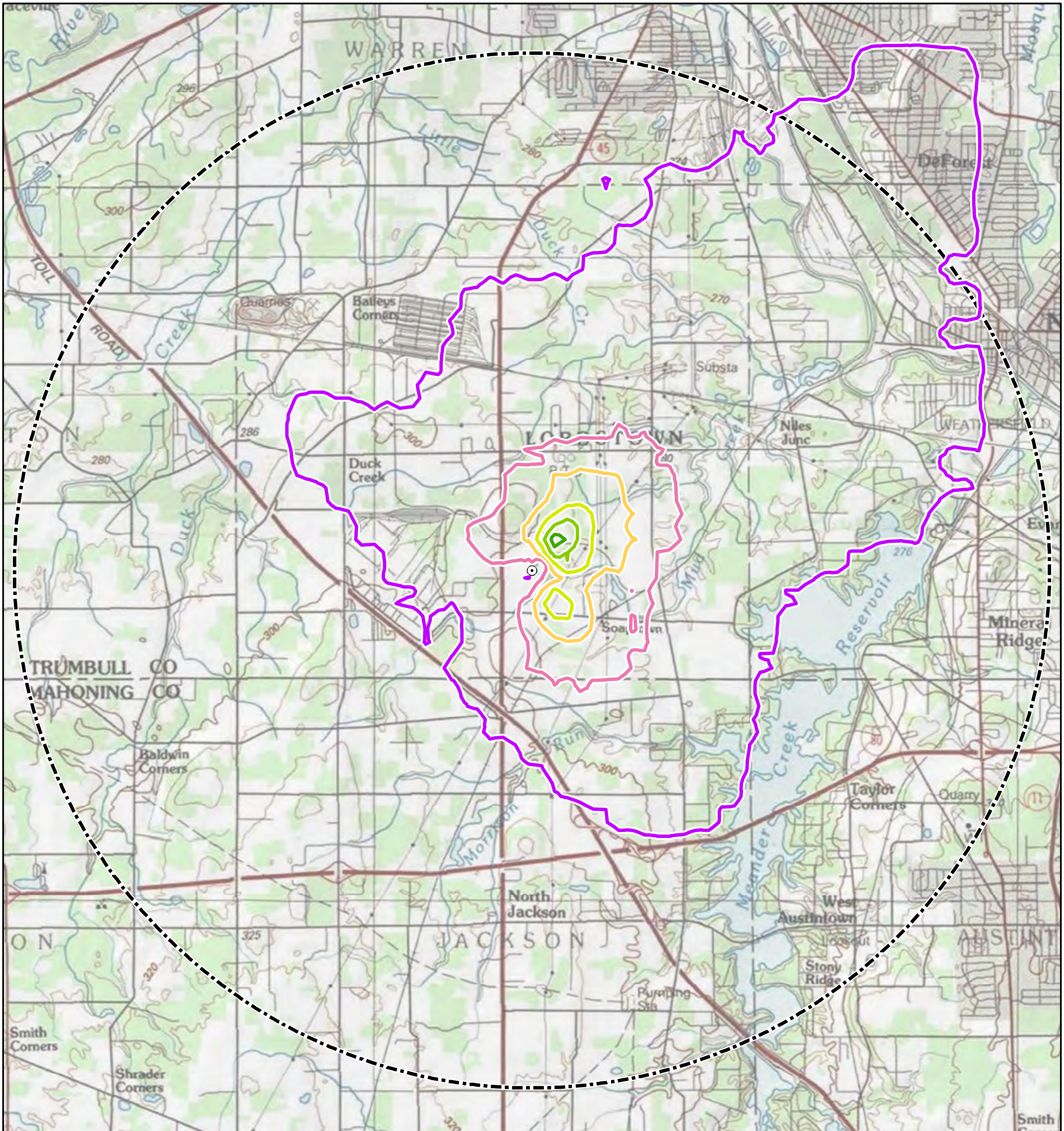
60 95 130 165 200

Figure 06-6
Air Modeling Isopleths: 1-hour CO

Lordstown Energy Center
Village of Lordstown, Ohio

OVERVIEW MAP

Path: P:\GIS\Lordstown_OH\GIS\Spatial\MXD\AirModelingConcentrationIsopleths\Fig06_7_1hr_CO.mxd



N

0 0.5 1 1.5 2
Miles

⊙ **Facility** Location

5-mile Buffer

Annual $PM_{2.5}$ Concentration Contour ($\mu g/m^3$)

0.01 0.024 0.038 0.052 0.066 0.08

Figure 06-7

Air Modeling Isopleths: Annual $PM_{2.5}$

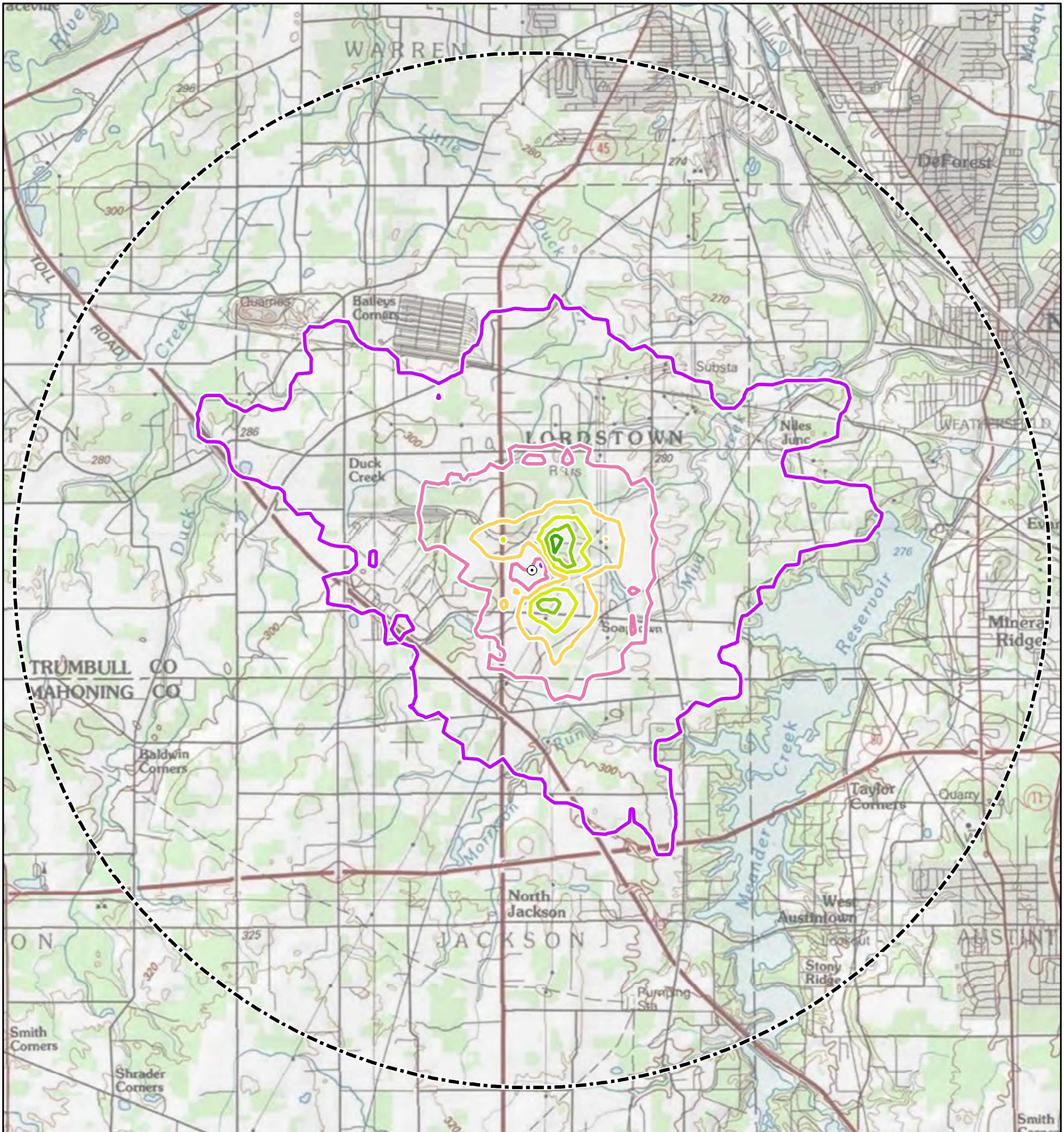
(5-year Average - NAAQS)

Lordstown Energy Center

Village of Lordstown, Ohio

OVERVIEW MAP

Path: P:\GIS\Lordstown_OH\GIS\Spatial\MXD\AirModelingConcentrationIsopleths\Fig06_8_Annual_PM_2_5.mxd



N

0 0.5 1 1.5 2
Miles

Facility Location
5-mile Buffer

24-hour $PM_{2.5}$ Concentration Contour ($\mu g/m^3$)

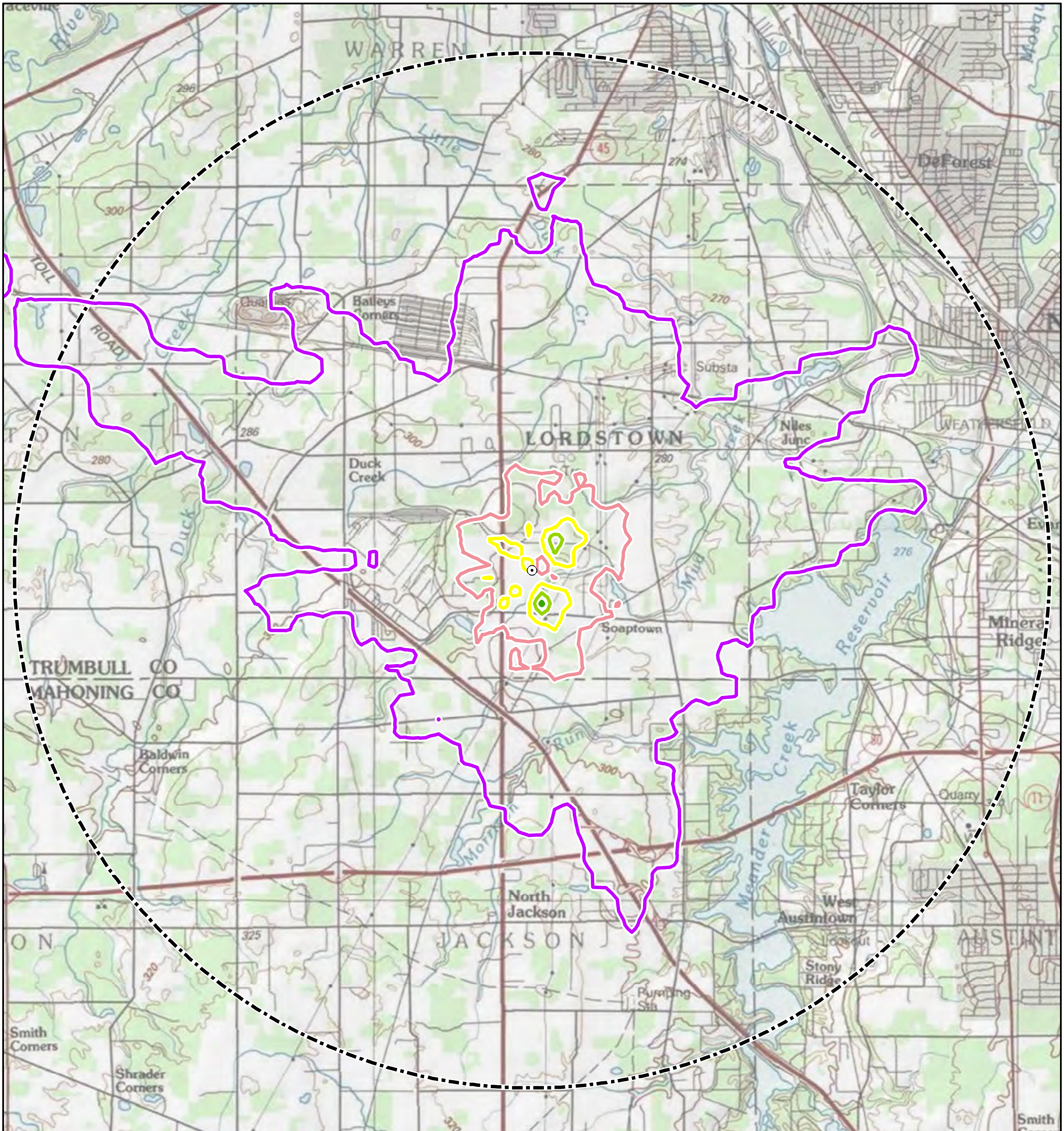
0.15 0.32 0.49 0.66 0.83 1

Figure 06-8
Air Modeling Isopleths: 24-hour $PM_{2.5}$
(5-year Average - NAAQS)

Lordstown Energy Center
Village of Lordstown, Ohio

OVERVIEW MAP

Path: P:\GIS\Lordstown_OH\GIS\Spatial\MXD\AirModelingConcentrationIsopleths\Fig06_9_24hr_PM_2_5.mxd



N

0 0.5 1 1.5 2
Miles

⊙ Facility Location
5-mile Buffer

24-hour PM_{10} Concentration Contour (µg/m^3)

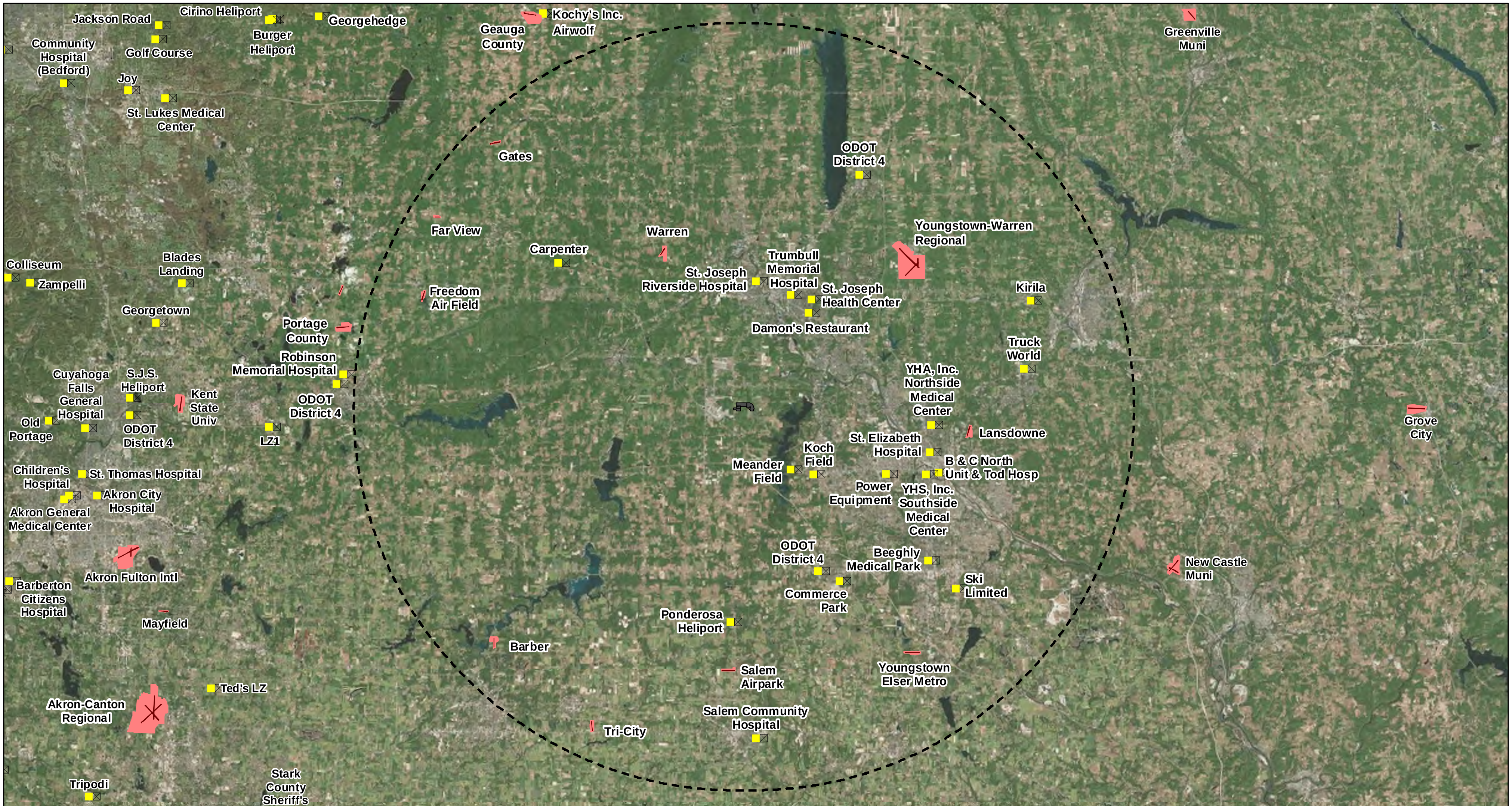
0.2 0.6 1 1.4 1.8

Figure 06-9
Air Modeling Isopleths: 24-hour PM_{10}
Normal Operation (5-year Average)

Lordstown Energy Center
Village of Lordstown, Ohio

OVERVIEW MAP

Path: P:\GIS\Lordstown_OH\GIS\Spatial\MXD\AirModelingConcentrationIsopleths\Fig06_10_24hr_PM_10.mxd



Legend

Study Area
20-mile Radius
Airport Area
Runway
Heliport

0 2.5 5 10 Miles

N

Figure 06-10
Air Transportation Facilities

Lordstown Energy Center
Village of Lordstown, Ohio

R:\Projects_2014\Lordstown\maps\OPSB\Figure_06-11_Airports.mxd

The data presented in this section are intended to provide a basis for assessing the costs and benefits of the Facility with regard to health and safety, ecology, land use, community development, cultural and aesthetic qualities, public responsibility, and agricultural district land.

(A) HEALTH AND SAFETY

(1) Demographic Characteristics

Areas within a 5-mile radius of the Study Area include Austintown, Bolindale, Mineral Ridge, City of Niles, Village of Lordstown, and City of Warren within Trumbull and Mahoning County. The 2010 populations were acquired through the 2010 Census of Population for Cities and Villages published in March 2011 by the Ohio Department of Development, Office of Strategic Research, a state affiliate of the U.S. Census Bureau. Table 07-1 presents the population data for each city and/or township within 5 miles of the Study Area.

TABLE 07-1
EXISTING AND PROJECTED POPULATIONS

City/Village/Census Designated Area	Percent of Community Within the 5-Mile Radius[1]	2010 Population (Within the 5-Mile Radius)	2020 Projected Population (Within the 5-Mile Radius) [2]
Austintown	15.30	4,541	4,259
Bolindale	45.38	948	796
Village of Lordstown	100.00	3,417	3,215
Mineral Ridge	99.35	3,867	3,859
City of Niles	42.67	8,221	7,563
City of Warren	6.18	2,568	2,278

City/Village/Census Designated Area	Percent of Community Within the 5-Mile Radius[1]	2010 Population (Within the 5-Mile Radius)	2020 Projected Population (Within the 5-Mile Radius) [2]
Unincorporated Area – Trumbull County[3]	6.04	12,704	11,865
Unincorporated Area – Mahoning County[3]	7.49	17,891	16,585
[1] Based on a percentage of geographic area within the 5-mile radius, not population density. [2] Based on the annual population change of each city/township as provided in the 2010 Census of Population for Cities and Villages published by the Ohio Development Service Agency in March 2011. [3] Based on county populations and geographic area, not population density.			

(2) Atmospheric Emissions

No impact to the population is anticipated as a result of atmospheric emissions. Air modeling indicates that Facility impacts will be in full compliance with all applicable ambient air quality standards. The air pollution control technologies to be used for the Facility have been proven to be reliable, safe and effective. In addition, CEMS will continuously monitor compliance with applicable air emission standards. In the event of an air permit exceedances, Facility personnel will take immediate action, including immediate shutdown, if warranted.

(3) Noise

An analysis of construction and operational sound anticipated from the Facility has been completed, as outlined in the following sections and detailed in Appendix F.

Metric Descriptions

Energy is required to produce sound and this sound energy is transmitted through the air in the form of sound waves – tiny, quick oscillations of pressure just above and just below atmospheric pressure. These oscillations, or sound pressures, impinge on the ear, creating the sound we hear. Since the range of human hearing is so wide, sound levels are expressed in terms of decibels (dB). The sound pressure level in dB is the logarithm of the ratio of the sound pressure of the source to the reference sound pressure of 20 microPascals (μPa), multiplied by 20. The range of sound pressures that can be detected by a person with normal hearing is very wide, ranging from about 20 μPa for very faint sounds at the threshold of hearing to nearly 10 million μPa for extremely loud sounds, such as a jet during take-off at a distance of 300 feet.

An inherent property of the logarithmic decibel scale is that the sound pressure levels of two separate sources are not directly additive. For example, if a sound of 50 dB is added to another sound of 50 dB, the result is a 3 dB increase (or 53 dB), not an arithmetic doubling of 100 dB.

Since the human ear does not perceive every frequency with equal loudness, spectrally-varying sounds are often adjusted with a weighting filter. The A-weighted filter is applied to compensate for the frequency response of the human auditory system, and is represented in dBA.

While the concept of sound is defined by the laws of physics, the term "noise" has further qualities of being excessive or loud, and is subjective. The perception of sound as noise is influenced by technical factors such as intensity, sound quality, tonality, duration, and the existing background levels which may mask new sources.

Sound can be measured, modeled, and presented in various formats, with the most common metric being the equivalent sound level (L_{eq}). The equivalent sound level has been shown to provide both an effective and uniform method for comparing time-varying sound levels and is widely used in acoustic assessments in the state of Ohio.

Estimates of noise sources and outdoor acoustic environments, and the comparison of relative loudness are presented in Table 07-2.

TABLE 07-2
RELATIVE LOUDNESS OF TYPICAL NOISE SOURCES

Noise Source or Activity	Sound Level (dBA)	Subjective Impression
Vacuum cleaner (10 feet)	70	Moderate
Passenger car at 65 mph (25 feet)	65	
Large store air-conditioning unit (20 feet)	60	
Light auto traffic (100 feet)	50	Quiet
Quiet rural residential area with no activity	45	
Bedroom or quiet living room; bird calls	40	Faint
Typical wilderness area	35	
Quiet library, soft whisper (15 feet)	30	Very quiet
Wilderness with no wind or animal activity	25	Extremely quiet
High-quality recording studio	20	
Acoustic test chamber	10	Just audible
	0	Threshold of hearing

Adapted from Kurze and Beranek (1988) and USEPA (1971).

Applicable Noise Level Regulations

There are no specific numerical decibel limits applicable to the Facility at the local, county, state, or federal level. The Village of Lordstown sets noise standards to prohibit any use which would cause objectionable noise and well other potential nuisances such as dust, odor, and smoke. There is no numerical decibel limit associated with the nuisance clause, and the Board of Zoning Appeals has the authority to determine what would constitute an objectionable condition. As stated in Section 1161.04 of the Codified Ordinances of Lordstown:

> *No land or building in any district shall be used or occupied in any manner creating dangerous, injurious, noxious, or otherwise objectionable conditions which could adversely affect the surrounding areas or adjoining premises, except that any use permitted by this Zoning Ordinance may be undertaken and maintained if acceptable measures and safeguards to reduce dangerous and objectionable conditions to acceptable limits as established by the performance requirements in the following subsections.*
>
>> *(h) Noise. Objectionable noise as determined by the Board of Zoning Appeals which is due to volume, frequency, or beat shall be muffled or otherwise controlled. Air-raid sirens and related apparatus used solely for public purposes are exempt from this requirement.*

The OPSB typically considers the modeled change in sound level anticipated as compared to existing background levels, as well as published guidelines and standards at the federal level such as those imposed by OSHA for worker safety and by USEPA. The OPSB rules do not define quantifiable sound limits; precedent for recent energy facilities undergoing permitting has shown that the OPSB has previously identified thresholds of significance including both increases in sound level relative to ambient conditions and absolute sound level limits.

The federal government has long recognized the potential hazards caused by noise associated with construction projects, as well as operating industrial facilities. The USEPA has published Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (USEPA 1974), that recommends a day-night sound level of 55 dBA for outdoor residential areas. The USEPA sound level guidelines also suggest an L_{eq}

of 70 dBA (24-hour) to avoid adverse effects on health and safety at publicly accessible property lines or work areas where extended periods public exposure is possible.

Ambient Noise Level Survey

Short-term, attended ambient sound measurements were performed at five monitoring locations (ML) surrounding the Facility Site, representative of the closest noise-sensitive land uses in the vicinity of the Facility. Short-term measurements of 30 minutes in duration were made at each community location for typical daytime (10:00 a.m. to 4:00 p.m.) periods and for typical nighttime periods (10:00 p.m. to 4:00 a.m.). One long-term (LT) measurement was made on-site to determine the diurnal and weekday to weekend variation within the study area.

The MLs are mapped on Figure 07-1 and described in Table 07-3.

TABLE 07-3
BASELINE SOUND MONITORING LOCATIONS

Location	Land Use	Coordinates	Description
ML-1	Residential	41º 8’25” N, 80º 51’22” W	Route 45, southwest of Facility Site
ML-2	Residential	41º 9’23” N, 80º 51’27” W	Route 45, northwest of Facility Site
ML-3	Residential	41º 8’34” N, 80º 50’58” W	Hallock Young Road, Southeast of Facility Site
ML-4	Residential	41º 8’55” N, 80º 50’26” W	Goldner Lane, East of Facility Site
ML-5	Residential	41º 9’48” N, 80º 50’55” W	Woodview Drive, North of Facility Site
LT-1	Proposed Facility Site	41º 8’53” N, 80º 51’12” W	Property Location (currently in agricultural use)

Table 07-4 presents baseline monitoring results in terms of sound level metrics for both short- and long-term measurement locations. Further details pertaining to the baseline sound survey can be found in Appendix F.

TABLE 07-4
AMBIENT SOUND MONITORING RESULTS

Location	Start Time	End Time	Time Period	Sound Level Metrics (L_{eq}, dBA)
ML-1	10:06 a.m.	10:38 a.m.	Day	53
	11:01 p.m.	11:33 p.m.	Night	52
ML-2	11:07 a.m.	11:37 a.m.	Day	60
	11:40 p.m.	12:10 a.m.	Night	54
ML-3	11:50 a.m.	12:20 p.m.	Day	49
	12:20 a.m.	12:50 a.m.	Night	45
ML-4	1:12 p.m.	1:42 p.m.	Day	48
	1:02 a.m.	1:32 a.m.	Night	45
ML-5	1:55 p.m.	2:35 p.m.	Day	46
	1:48 a.m.	2:19 a.m.	Night	38
LT-1	Tuesday, November 11, 2014	Thursday, November 20, 2014	Day	49
			Night	48

Results of the ambient sound survey show that sound levels surrounding the Facility Site are at moderate levels reflective of sound sources within their environment, include proximate industrial facilities, high-traffic roadways, and active rail lines. Ambient sound levels also exhibited a typical diurnal pattern, with higher ambient sound levels during the daytime, except at the on-site location which exhibited a more constant sound level. Daytime L_{eq} sound levels at the measurement locations ranged from a low of 46 dBA at ML-5 to a high of 60 dBA at ML-2. Nighttime L_{eq} sound levels ranged from a low of 38 dBA at ML-5 to a high of 54 dBA at ML-2. The high sound levels recorded at ML-2 and ML-1 were as expected, given the proximity to local roadways and I-80, which influenced both daytime and nighttime measurement periods. The varied sound levels during the daytime versus nighttime at ML-3 and ML-4 were as expected, given the dominant daytime sources, which tend to fluctuate over time and contribute considerably less during the nighttime measurements, with lower human activity levels during the overnight period. The sound levels presented for ML-5, situated north-northeast of the Facility Site, were the lowest, reflecting the minimal traffic observed within that residential area. The dominant sources within this area during nighttime were natural sounds and distant high speed traffic. Noise from train movements and occasional overhead aircraft also contributed to the measured ambient sound levels during both measurement periods.

(a) Construction Noise Levels

Construction of the Facility is expected to be typical of other power generating facilities in terms of schedule, equipment, and activities. Construction is anticipated to require approximately 32 months. Nighttime construction is not generally expected, but activities may occur 6 days per week, 10 hours per day. The last 4 to 6 months of construction would include commissioning and start-up, which will involve periodic steam blows.

Acoustic emission levels for activities associated with construction were based upon typical ranges of energy equivalent noise levels at construction sites, as documented by USEPA (USEPA, Technical Document NTID300.1, December 1971) and the USEPA's "Construction

Noise Control Technology Initiatives" (USEPA, Technical Report No. 1789, September 1980). The USEPA methodology distinguishes between type of construction and construction phase. The five phases are (1) demolition and site preparation; (2) excavation; (3) concrete pouring and construction of buildings; (4) mechanical; and (5) equipment installation and finishing work.

Using those energy equivalent noise levels as input to a basic propagation model, construction noise levels were calculated at the Facility Site boundary and the monitoring locations, representative of the proximate noise sensitive areas. Conservative assumptions are reflected in the modeling to represent anticipated construction conditions over the various phases of activity.

Table 07-5 summarizes the projected noise levels due to construction. The highest projected L_{eq} from construction related activity is expected to occur during activities associated with excavation and finishing work. As shown in Table 07-5, the highest projected noise level from construction-related activity is expected to occur at ML-3, during activities associated with excavation and commissioning.

TABLE 07-5
ESTIMATED FACILITY CONSTRUCTION SOUND LEVELS BY PHASE

Construction Phase	USEPA Construction Noise Level 50 feet	Closest Property Line	ML-1	ML-2	ML-3	ML-4	ML-5
Phase 1: Site clearing and grading	86	69	49	50	53	51	46
Phase 2: Excavation and placement of major structural concrete foundations	89	72	52	53	56	54	49
Phase 3: Erection of building structural steel	78	61	41	42	45	43	38
Phase 4: Installation of mechanical and electrical equipment	83	66	46	47	50	48	43
Phase 5: Equipment installation, commissioning and testing of equipment	89	72	52	53	56	54	49

Periodically, some noises will be higher or lower than the levels presented here, but the overall sound levels should be lower because of excess attenuation and the trend toward quieter construction equipment in the intervening decade since the USEPA data were developed. In addition, the Facility will make reasonable efforts to minimize the impact of noise resulting from construction activities at noise-sensitive areas through the use of noise mitigation. Because of the temporary nature of the construction noise, no adverse or long-term effects are expected.

(b) Operational Noise Levels

Operational broadband (dBA) sound pressure levels were calculated using the Cadna-A® model for normal operation assuming that all components identified previously are operating continuously and concurrently at the representative manufacturer-rated sound levels.

Sound contour plots displaying the modeled broadband (dBA) sound levels presented as color-coded isopleths are provided in Figure 07-2. Figure 07-2 shows the mitigated anticipated noise levels due to the full, normal operation of Facility equipment as noise contours in 1-dB intervals. The noise contours are graphical representations of the cumulative noise associated with full operation of the equipment and show how operational noise would be distributed over the surrounding area. The contour lines shown in the figures are analogous to elevation contours on a topographic map, i.e., the noise contours are continuous lines of equal noise level around some source, or sources, of noise. Figure 07-2 also shows the short-term measurement and prediction locations and the long-term measurement location located within the Facility Site.

Table 07-6 shows the projected exterior sound levels resulting from full, normal operation of the Facility at existing noise sensitive areas under the mitigated design. In addition, the expected incremental increase in sound levels resulting from the Facility relative to existing conditions is provided.

TABLE 07-6
ACOUSTICAL MODEL RESULTS SUMMARY – MITIGATED DESIGN

Location	Nighttime Ambient (L_{eq}, dBA)	Facility Sound Level (dBA)	Total Sound Level (Ambient + Facility), (dBA)	Net Increase in Sound Level (dBA)
ML-1	52	44	53	+1
ML-2	54	42	54	<1
ML-3	45	46	49	+4
ML-4	45	41	46	+1
ML-5	38	34	39	+1

As shown in Table 07-6, operational noise levels from the Facility will range from 34 to 46 dBA L_{eq} at the nearby noise sensitive areas. In comparison, ambient nighttime noise levels range from 38 to 54 dBA L_{eq}, which demonstrates that the Facility is expected to have a minimal effect on ambient sound levels in the adjacent community. The projected increase in the nighttime L_{eq} is expected to range from less than 1 to 4 dBA.

The calculated cumulative sound levels due to full, normal operation of the Facility is expected to be below 50 dBA L_{eq} at all locations, with the exception of ML-1 and ML-2. Note that the existing ambient sound level exceeds 50 dBA in these locations, which are proximate to numerous industrial facilities, as well as several busy roadways.

Potential audible noise and radio noise were also considered for the electric transmission structures. As outlined in Appendix C, radio noise levels are below recommended reference levels, and the Ringbus Interconnection will be nearly inaudible under fair-weather conditions. In foul weather conditions, the highest calculated audible noise value is 51 dBA, which would be further masked by other noise sources associated with foul weather (e.g., rain and wind noise).

(c) Identification of Noise-Sensitive Areas

The Facility Site is located in an industrial setting, with the immediate surroundings dominated by active agricultural fields and industrial facilities. As shown in Figure 07-1, there are also several residential properties located within proximity to the Facility Site. Two residences located on Route 45, north-northwest of the Site are located approximately 0.35 mile of the Facility Site (represented by ML-2). Several other residences are located between 0.4 and 1 mile away, many situated within residential neighborhoods. To the east, a cul-de-sac neighborhood lies on Goldner Lane, with the nearest residence approximately (0.4 mile) to the east of the Facility Site. More than 30 residences are located in the Goldner neighborhood, ranging from 0.4 to 0.6 mile from the Facility (represented by ML-4). North of the Facility, along Woodview Drive, a small residential neighborhood is located approximately 1 mile away from the Facility Site (represented by ML-5). More distant residential neighborhoods exist in all directions from the Facility. The nearest schools and hospital facilities are located approximately 1.2 miles and 6.4 miles, respectively, from the Facility Site. The modeled sound contours illustrated in Figure 07-2 indicates anticipated sound levels at all noise sensitive locations within 1 mile of the Facility Site.

(d) Description of Equipment and Noise Mitigation Measures

Construction Noise

Construction noise is difficult to control because of the mobile nature of its sources and the flexibility of schedule inherent in most construction work. However, construction is also temporary in nature. In order to mitigate the possible effect of noise caused during the temporary construction period, the following steps will be taken:

- Maintain all construction tools and equipment in good operating order according to manufacturers' specifications.
- Limit use of major excavating and earth moving machinery to daytime hours.
- To the extent practicable, schedule construction activity during normal working hours on weekdays when higher sound levels are typically present, and are found acceptable. Some limited activities, such as concrete pours, will be required to occur continuously until completion.
- Equip any internal combustion engine used for any purpose on the job or related to the job with a properly operating muffler that is free from rust, holes, and leaks.
- For construction devices that utilize internal combustion engines, ensure the engine's housing doors are kept closed, and install noise-insulating material mounted on the engine housing consistent with manufacturers' guidelines, if possible.
- Limiting possible evening shift work to low noise activities such as welding, wire pulling and other similar activities, together with appropriate material handling equipment.
- Prior to the start of construction, a procedure for addressing any noise complaints received from residents will be prepared.
- Commissioning activities could involve extended periods of activity that could be temporarily disruptive to the community.

Before conducting specific loud noise activities, such as steam blows, communication will occur to plan ahead for such events.

By scheduling the construction effort to be as efficient as possible, sound associated with construction activity will be minimized as the duration of the construction effort is minimized. Because of the temporary nature of the construction noise, no adverse long-term effects are anticipated.

Operational Noise

Sound resulting from Facility operation will be mitigated through design measures both inherent in the equipment and added for additional attenuation. The Facility will be highly efficient and state-of-the-art, incorporating design features to minimize the potential adverse effects of operational noise on the surrounding community. For example, the major equipment will within acoustically-rated structures. Furthermore, the main step-up transformers associated with the CTGs and the STG will be low noise-rated and the HRSG exhaust stack will include a stack silencer. Key features of low-noise design are:

- Facility siting to achieve an adequate distance buffer between noise sensitive areas and noise-producing equipment;
- The CTGs and the STG will be housed in acoustical enclosures equipped with acoustic silencers and attenuators as required to reduce noise emissions from ventilation openings, fans, and make-up air units;

- Safety and relief valves that release high pressure steam will be equipped with silencing, to the extent permitted by the American Society for Mechanical Engineers code;
- A combustion turbine inlet silencing package designed to reduce air inlet sound power levels below the base design inlet silencer;
- Acoustical lagging of the CTG exhaust diffuser as it exits the turbine compartment and enters the HRSG;
- On-site gas compressors (if required) will be located within a self-contained building with sound insulation;
- A stack silencing package inclusive of the HRSG will be designed to reduce sound pressure levels leaving the flue in the stack structure;
- National Electrical Manufacturers Association low-noise-rated step-up transformers associated with the CTGs and the STG, combined with the use of fire walls and acoustical barriers will further serve to reduce offsite transformer noise levels; and
- A low-noise design mechanical draft water cooling tower is specified in the design, with use of splash attenuators or other acoustical treatments will be applied as necessary to achieve far-field acoustic design targets.

For the balance of Facility components, no additional mitigation is required beyond what is typically provided by the manufacturers as part of their standard design. This may include the use of low-noise gas heaters and housing large pumps and air compressors associated with the HRSG and power train (i.e., boiler feed water pumps, vacuum pumps, and fuel oil forwarding pumps) in buildings or acoustical enclosures.

Adjustments to this mitigation will occur through final design, eliminating or modifying features as appropriate while maintaining sound level commitments. During final design, the noise analysis will be updated to reflect final design conditions and confirm that the Facility has been adequately designed to meet the results as reflected in this Application.

(4) Water

No significant impact to water bodies is anticipated as a result of the Facility. The Facility will have a maximum water demand of about 5.5 mgd, and a maximum discharge of 1.1 mgd. Water for the Facility will be supplied through existing water suppliers in the region, namely the City of Warren and the Meander Water District, and will be piped to the Facility.

Wastewater discharge will be to an existing sewer system in place within the Village of Lordstown, in compliance with required limits. Ultimately, this wastewater will flow to the City of Warren's POTW.

Stormwater will be treated on-site through a settling and detention basin prior to release of storm flows into the nearby creek. Stormwater features and calculations are provided in Appendix A.

(a) Construction and Operation Impacts to Public and Private Water Supplies

The Facility intends to obtain water during Facility commissioning, start-up, and operation from an existing, regulated potable water supplier. Water will be routed to an on-site treatment plant for treatment prior to use. Adequate water supply is available from two sources, each of which can meet the Facility's needs without constraining other uses.

Known groundwater well logs and oil and gas wells in areas surrounding the Study Area are shown on Figure 04-6; geologic conditions at the Site are shown on Figures 04-3 and 04-4. The Facility is not anticipated to have an influence on any potential private well use in the area. No groundwater will be used by the Facility, and spill prevention practices will be designed and implemented for the Facility to prevent potential contamination of groundwater.

Based on distance from the Facility Site and use of BMPs for chemical use, potential impact to public or private water supplies is expected to be extremely low. In addition to design measures, staff will receive training on emergency procedures to ensure prompt and efficient response in the event of an accidental release to the environment.

(b) Impact of Pollution Control Equipment Failures on Public and Private Water Supplies

No impact to public or private water supplies is anticipated as a result of water pollution control equipment failures. Non-point source water pollution controls to be used at the Facility Site consist of an oil/water separator for in-plant treatment of floor drains and equipment washdown areas, and containment devices around aboveground storage tanks and station transformers (outdoors). The oil/water separator will be regularly maintained to ensure good operating condition. The containment devices will be designed to collect stormwater. After completion of a visual inspection, collected stormwater will be released through the stormwater discharge system.

No adverse impacts are anticipated to occur to public or private water supplies as a result of distance and BMPs that will be implemented.

The wastewater discharge will have insignificant impacts because of its physical and chemical characteristics. The Facility has been designed to cycle cooling water five times in the cooling tower while still meeting applicable discharge limits. By cycling water in the cooling water system, water is conserved, resulting in increasing the concentration of ambient constituents in the discharge by approximately the same factor as the number of cycles. Typical chemicals that are added to the water include: biocides; minor amounts of chemicals associated with system cleaning; acid and caustic for neutralization; and cooling water and boiler water treatment chemicals. All Facility wastewaters will be discharged into an existing sanitary sewer system.

(B) ECOLOGICAL IMPACT

(1) Site Information

(a) Mapping

Figure 07-3 shows the boundary of the Study Area and information including: the location of wood lots or vacant fields; delineated wetlands; surface bodies of water; slopes greater than 12 percent; and wildlife areas, nature preserves and other conservation areas. No wildlife areas, nature preserves or other conservation areas are present in the Study Area or within 0.5 mile. Figure 07-4 illustrates the ecological impacts of the Facility and its associated components including tree clearing and wetland crossings associated with the Laydown Area, Northern Laydown Area, Ringbus Site, and Ringbus Interconnection (as further discussed in Section 4906-13-07(B)(1)(d)).

(b) Vegetation Survey

A survey was conducted of representative plant species present on the Study Area. A list of plant species noted during the survey is provided in Table 07-7.

TABLE 07-7
VEGETATION RECORDED ON AND ADJACENT TO THE STUDY AREA

Common Name	Scientific Name	Strata
American beech	*Fagus grandifolia*	Tree
American hornbeam	*Carpinus caroliniana*	Tree
Northern red oak	*Quercus rubra*	Tree
Orchard apple	*Malus domestica*	Tree
Pin oak	*Quercus palustris*	Tree
Red maple	*Acer rubrum*	Tree
Slippery elm	*Ulmus rubra*	Tree

Common Name	Scientific Name	Strata
Swamp white oak	*Quercus bicolor*	Tree
Sweet birch	*Betula lenta*	Tree
Ash-leaf maple	*Acer negundo*	Shrub
Black elder	*Sambucus nigra*	Shrub
Black willow	*Salix nigra*	Shrub
Cedar sp.	*Cedrus sp.*	Shrub
Eastern white pine	*Pinus strobus*	Shrub
Gray dogwood	*Cornus racemosa*	Shrub
Hawthorn sp.	*Crataegus sp.*	Shrub
Nanny-berry	*Viburnum lentago*	Shrub
Rambler rose	*Rosa multiflora*	Shrub
Red maple	*Acer rubrum*	Shrub
Red osier dogwood	*Cornus sericea*	Shrub
Silky dogwood	*Cornus amomum*	Shrub
Allegheny blackberry	*Rubus allegheniensis*	Herb
Allegheny monkey-flower	*Mimulus ringens*	Herb
Aster sp.	*Symphyotrichum sp.*	Herb
Blunt spike-rush	*Eleocharis obtusa*	Herb
Bristle grass sp.	*Setaria sp.*	Herb
Broad-leaf cat-tail	*Typha latifolia*	Herb
Broom-sedge	*Andropogon virginicus*	Herb
Bull thistle	*Cirsium vulgare*	Herb
Canadian goldenrod	*Solidago canadensis*	Herb
Catnip	*Nepeta cataria*	Herb
Chinaroot	*Smilax hispida*	Herb
Common fox sedge	*Carex vulpinoidea*	Herb
Common reed	*Phragmites australis*	Herb
Common selfheal	*Prunella vulgaris*	Herb
Common yarrow	*Achillea millefolium*	Herb
Coneflower sp.	*Echinacea sp.*	Herb
Cottongrass bulrush	*Scirpus cyperinus*	Herb
Dark-green bulrush	*Scirpus atrovirens*	Herb
Devil's-pitchfork	*Bidens frondosa*	Herb
Drooping bulrush	*Scirpus lineatus*	Herb
Eastern poison ivy	*Toxicodendron radicans*	Herb
Flat-top goldentop	*Euthamia graminifolia*	Herb
Fuller's teasel	*Dipsacus fullonum*	Herb
Goldenrod sp.	*Solidago sp.*	Herb

Common Name	Scientific Name	Strata
Grass sp.	*Poaceae sp.*	Herb
Great mullein	*Verbascum thapsus*	Herb
Indian-hemp	*Apocynum cannabinum*	Herb
Japanese stilt grass	*Microstegium vimineum*	Herb
Lamp rush	*Juncus effusus*	Herb
Lesser poverty rush	*Juncus tenuis*	Herb
Longhair sedge	*Carex comosa Boott*	Herb
Meadow evening-primrose	*Oenothera pilosella*	Herb
Narrow-leaf cat-tail	*Typha angustifolia*	Herb
Northern green rush	*Juncus alpinoarticulatus*	Herb
Northern spicebush	*Lindera benzoin*	Herb
Orchard grass	*Dactylis glomerata*	Herb
Ox-eye daisy	*Leucanthemum vulgare*	Herb
Purple-leaf willowherb	*Epilobium coloratum*	Herb
Queen Anne's-lace	*Daucus carota*	Herb
Reed canary grass	*Phalaris arundinacea*	Herb
Sedge sp.	*Carex sp.*	Herb
Seedbox	*Ludwigia alternifolia*	Herb
Sensitive fern	*Onoclea sensibilis*	Herb
Silky dogwood	*Cornus amomum*	Herb
Spearmint	*Mentha spicata*	Herb
Swamp milkweed	*Asclepias incarnata*	Herb
Switchgrass	*Panicum vigatum*	Herb
Tall goldenrod	*Solidago altissima*	Herb
White heath american-aster	*Symphyotrichum ericoides*	Herb

At the time of the reconnaissance, the majority of the Facility Site was a barren field comprised of grasses (*Poaceae* sp.). Vegetation communities abutting the barren field were an early disturbed prairie edge and a successional utilized trail, comprised of reed canary grass, Queen Anne's-lace, black willow, aster sp., silky dogwood, tall goldenrod, goldenrod sp., nanny-berry, red osier dogwood, devil's pitchfork, purple-leaf willowherb, orchard grass, Japanese stilt grass, and common reed.

The majority of the Laydown Area also consisted of a barren field comprised of grasses. Vegetation communities abutting the barren field were a successional forest and a mature forest comprised of red maple, sweet birch, northern red oak, pin oak, Canadian goldenrod, rambler rose, Japanese stilt grass, silky dogwood, and allegheny blackberry.

The plant community located within the proposed Ringbus Interconnection Property consisted of a scrub shrub, forested floodplain, and maintained field, comprised of silky dogwood, gray dogwood, Canadian goldenrod, allegheny blackberry, pin oak, red maple, slippery elm, northern spicebush, American beech, Japanese stilt grass, common rush, reed canary grass, and common selfheal.

Vegetation communities abutting the Facility Site were a field berm and *Phragmites* depression comprised of Queen Anne's-lace, fuller's teasel, great mullein, narrow-leaf cat-tail, a goldenrod species, common rush, black willow, and reed canary grass.

The majority of the Ringbus Site was comprised of a fallow cultivated field with a plant community consisting of broom-sedge, Canadian goldenrod, and silky dogwood. Abutting the fallow cultivated field was a forested floodplain comprised of pin oak, red maple, Japanese stilt grass, slippery elm, American beech, and northern spicebush.

Mud Creek, a perennial stream, flows eastward south of the proposed Ringbus Site, beyond the forested floodplain and fallow cultivated field. The stream is within a forested floodplain and flows east through a fallow cultivated field into Cedar Lake. This watercourse is supported by upstream tributaries. The stream channel is approximately 12 feet in width and contains cobble, gravel, clay, and sand substrate.

A perennial, unnamed tributary of Mud Creek is located north of the Facility Site, flowing east in the forested portion of the proposed Ringbus Interconnection Property. This watercourse is supported by groundwater, drainage from tributaries, drainage from the aforementioned pastureland, and surficial runoff from adjacent uplands. The stream channel is approximately 6 feet wide and contains a clay and sand substrate.

A second perennial, unnamed tributary of Mud Creek is located south of the proposed Ringbus Interconnection. This watercourse is supported by groundwater, drainage from tributaries, drainage from the aforementioned pastureland, and surficial runoff from adjacent uplands. The stream channel contains a silt substrate.

The riparian corridor canopies, where present, are comprised of a mix of red maple, red oak, swamp white oak, slippery elm, and pin oak in the overstory. The understory was comprised of multiflora rose, with Allegheny blackberry, and silky dogwood present.

Wetlands have been identified within the Study Area, and are described in Section 4906-13-17(B)(1)(d).

(c) Species Survey

An assessment of wildlife species and habitat was conducted on the Study Area during a November 2014 site visit. Table 07-8 lists common wildlife species generally observed during field investigations through direct observation or sign. Land use of the Study Area is industrial development, active agriculture and forested upland and riparian corridors, which may provide moderate quality wildlife habitat.

TABLE 07-8
WILDLIFE SPECIES RECORDED ON AND ADJACENT TO THE STUDY AREA

Common Name	Latin Binomial
American crow	*Corvus brachyrhynchos*
American robin	*Turdus migratorius*
Blue jay	*Cyanocitta cristata*
European starling	*Sturnus vulgaris*
Eastern chipmunk	*Tamias striatus*
Field sparrow	*Spizella pusilla*
Fowlers toad	*Bufo fowleri*
Grey catbird	*Dumetella carolinensis*
Grey squirrel	*Sciurus carolinensis*
Northern cardinal	*Cardinalis cardinalis*
Northern mockingbird	*Mimus polyglottos*
Raccoon	*Procyon lotor*
Red fox	*Vulpes vulpes*
Spicebush swallowtail	*Papilio troilus*
Turkey vulture	*Cathartes aura*
White-tailed deer	*Odocoileus virginianus*
Wild turkey	*Meleagris gallopavo*
Woodchuck	*Marmota monax*

Avian species may utilize the Study Area for foraging during spring and fall migration periods; non-migratory resident species may also be present. Common passerines, doves, and corvids would be expected to utilize this type of area for foraging and/or nesting. Representative species that could be found to utilize the Facility Site include: house sparrow (*Paser domesticus*), European starling, song sparrow (*Melospiza melodia*), American robin, mourning dove (*Zenaida macroura*), American crow, and blue jay.

Mammals that could utilize the Study Area include herbivorous species such as white-tailed deer and woodchuck; carnivorous species such as red fox; and omnivores such as raccoon, North American opossum (*Didelphis virginiana*), and striped skunk (*Mephitis mephitis*). The proposed disturbance areas consist predominantly of open areas and agricultural fields with a fringe of forested uplands and provides low quality habitat.

Common reptiles and amphibian species such as eastern garter snake (*Thamnophis sirtalis*) and American toad (*Bufo americanus*) would be expected to occur within the Study Area. Other more aquatic species such as the green frog (*Rana clamitans*) would be expected to potentially inhabit the perennial tributaries.

(d) Ecological Study

Wetland Assessment

As a part of activities associated with the Lordstown Industrial Park, a wetland delineation was previously completed of several parcels, including within the Study Area. Following this delineation, USACE issued a permit (No. 2005-1448) for the fill of 1.76 acres of wetlands, including 1.66 acres on the Facility Site (provided in Appendix E). The permit required that 0.31 acre of unpermitted fill be removed from a nearby wetland, located on the Ringbus Interconnection Property, and a mitigation wetland at least 2.64 acres in size be created.

A wetland and surface water delineation was completed in November 2014 to supplement the prior delineation activities (Appendix E). The Facility Site includes the wetlands that were pre-approved and pre-mitigated for fill under the existing USACE permit. No additional wetland resources were noted on the Facility Site during the November 2014 field investigations. The Laydown Area did not have wetlands identified as part of the USACE permitting process; however, a small area of additional wetland (Wetland L) was identified just to the south of the potential temporary work area. Therefore, the only wetland impact associated with the Facility Site and Laydown Area will be the previously approved fill authorized by the USACE.

A forested wetland system confirmed by the USACE extends across the Ringbus Interconnection Property. The majority of wetland areas across this property are connected and associated with the unnamed tributary to Mud Creek, although several smaller wetlands have also been delineated in this area. As discussed in Section 4906-13-02(A)(3), a proposed ROW which minimizes wetland impact, wetland clearing and tree clearing was selected for the Ringbus Interconnection. Although wetlands will be traversed by overhead electrical lines associated with the interconnection, no wetland fill is proposed. All structures associated with each of the potential alternatives will be placed in upland area. No wetland alteration would be associated with use of the Northern Laydown Area.

The Ringbus Property was not previously delineated. During the November 2014 field efforts, the wetland mitigation area created for the pre-approved fill was identified, as well as nine additional wetlands ranging in size from 0.116 to 0.784 acre. According to *Wetland and Stream Mitigation Plan – Revised, Henn Development*, dated December 2011 and provided in Appendix E, the mitigation area totals 2.77 acres in size, which exceeds the minimum wetland creation requirement.

The ringbus has been sited to avoid impact to wetland areas, including use of an existing culverted crossing to provide access to the Ringbus Property.

The existing USACE Permit (No. 2005-1448) requires the creation of a conservation instrument protecting no less than 25.87 acres of wetland, including the mitigation area and the unimpacted wetlands (as identified in the permit).

Facility elements have been carefully sited to avoid wetland impacts to the greatest extent possible, with the only wetland fill associated with the existing USACE Lordstown Industrial Park approval. A preliminary meeting with the USACE to discuss the Facility indicated that the existing permit can be readily modified to reflect any appropriate adjustments for the Facility.

Ecological Impact Study

The Facility Site and Laydown Area are predominantly agricultural in nature, and are expected to have limited ecological value. No tree clearing is required on the Facility Site, and full use of the Laydown Area will result in the clearing of approximately 6 acres. The Northern Laydown Area requires only approximately 0.15 acre of tree clearing. The Ringbus Site is also situated on an open field with only a perimeter of trees, covering approximately 1.5 acres, proposed to be cleared.

The Ringbus Interconnection Property is a mixture of open fields and forested area. The proposed Ringbus Interconnection requires 3.5 acres of clearing within the 100-foot wide ROW.

(e) List of Major Species

Endangered or Threatened Species

The United States Fish and Wildlife Services (USFWS) and ODNR were contacted regarding the potential presence of any sensitive natural communities or rare or endangered species in the vicinity of the Study Area (Appendix G).

The USFWS Information, Planning, and Conservation System indicated there were no federal wilderness areas, wildlife refuges, or designated critical habitat within the vicinity of the Facility Site. A total of four threatened, endangered or candidate species were identified as potentially within the range of the Facility including the clubshell mussel (*Pleurobema clava*), Indiana bat (*Myotis sodalis*), northern long-eared bat (*Myotis seeptentrionalis*), and eastern massasauga (*Sistrurus catenatus*).

Thirteen migratory bird species were also identified as within the range of the proposed activities.

USFWS correspondence dated January 12, 2015 indicated there were no federal wilderness areas, wildlife refuges, or designated critical habitat within the vicinity of the Facility Site, but recommended avoiding associated habitats of the Indiana bat and the proposed federally endangered northern long-eared bat. Restricting clearing to the winter months, when Indiana bats and northern long-eared bats would not be using roost trees, provides a safeguard against any potential impact to the Indiana bat and northern long-eared bat. Additional correspondence dated February 25, 2015 was consistent with the above information, identifying that the Facility is in the potential range of the Indiana bat, northern long-eared bat, and the eastern massasauga.

A response letter from ODNR dated December 24, 2014 provided shapefiles that indicated no records in their database of unique ecological attributes or rare or endangered species within 1 mile of the Facility Site with the exception of a great blue heron rookery last observed in 2005 in a location on the opposite side of Route 45 adjacent to the GM facility; this is not anticipated to be a significant issue for the Facility. Further correspondence with the ODNR Office of Real Estate provided on March 12, 2015 recommended wetland avoidance where possible, and noted that the location of the Facility is within the range of the Indiana bat (as also noted by USFWS), recommending that if suitable summer habitat is present, tree cutting occur between October 1 and March 31. The Facility is also noted as within the range of the following protected mussels: the clubshell mussel, state and federal endangered; the snuffbox (*Epioblasma triquetra*), state and federal endangered; and the black sandshell (*Ligumia recta*), state threatened. Because no in-water work is proposed in a perennial stream of sufficient size, ODNR notes that the Facility is unlikely to impact these species. Similarly, the Facility is noted as unlikely to affect the northern brook lamprey (*Ichthyomyzon fossor*), the spotted turtle (*Clemmys guttata*), and the black bear (*Ursus americanus*), for which it is also in the range.

Two bird species are identified by ODNR, the state-endangered northern harrier (*Circus cyaneus*) and upland sandpiper (*Bartramia longicauda*), with a range that overlaps that of the Facility Site. Both are ground-nesting birds, with the harrier nesting in large marshes and grasslands (May 15 to August 1) and the sandpiper nesting in grasslands (April 15 to July 31). ONDR notes that, if such habitat is not present, no impacts are expected to occur. The Facility Site and Laydown Area are predominantly in active agricultural use, and would not be suitable habitat; the balance of the Study Area has the potential for small areas that could be suitable. In such areas, work will occur prior to the nesting season to avoid potential impact to the species.

Finally, the Facility is noted by ODNR to be in the range of the eastern massasauga, a state endangered and a federal candidate snake species. The species uses a range of habitats, including wet prairies, fens and other wetlands, as well as drier upland habitat. Due to the potential for suitable habitat within the Study Area, a habitat suitability and presence/absence survey will be conducted by an ODNR-approved herpetologist as field conditions allow.

Recreational or Commercial Species

Based on observation of the Study Area and the surrounding agricultural and industrial land use, limited recreational or commercial species are likely to be present. Terrestrial game species include white-tail deer and mourning dove. Mourning doves breed in areas of shrubs and small trees, habitats that will largely remain undisturbed. Mourning doves forage for seeds in open fields. Although the Facility Site will affect some agricultural land, the percentage lost in the local area is small and should not reduce foraging habitat to a degree that would affect the mourning dove population.

(2) Construction

(a) Impact of Construction on Undeveloped Areas

The construction of the Facility will result in both temporary and permanent impacts on plants and animals within the Study Area. Temporary impacts to wildlife are likely to result during the construction phase as increased noise levels and human activity may displace wildlife to surrounding habitats. After construction is complete, some of the displaced wildlife are expected to recolonize those areas of the Study Area that will remain undeveloped.

The Facility Site, Laydown Area, Northern Laydown Area and Ringbus Site are primarily located within existing agricultural fields or open areas, while the proposed Ringbus Interconnection is primarily located within forested floodplain and scrub shrub areas (but avoiding direct impact to wetlands). As noted above, no clearing of forested area is required on the Facility Site. Approximately 6 and 1.5 acres of clearing will be required for the Laydown Area and the Ringbus Site, respectively. The Northern Laydown Area will require approximately 0.15 acre of tree-clearing. The proposed Ringbus Interconnection requires an additional 3.5 acres of tree clearing within the 100-foot wide ROW. No significant impacts to ecological resources are anticipated that would require special mitigation measures.

(b) Impact of Construction on Major Species

Impacts to endangered or threatened species are not anticipated, although surveys will be conducted to confirm the eastern massasauga will not be affected, and construction activities will consider seasonal restrictions for both summer bat habitat and nesting birds in potentially suitable areas that may exist. Significant construction impacts on recreational or commercial species are also not anticipated. The limited terrestrial habitat to be altered that would be suitable for such species is not expected to affect species populations.

(c) Mitigation for Short-Term and Long-Term Construction Impacts

The following measures are proposed to ensure that short- and long-term construction impacts to ecological resources remain insignificant:

- Sediment and Erosion Control – A detailed sediment and erosion control plan will be developed prior to initiating Facility construction. The plan will detail temporary stormwater basins as well as silt fencing or other erosion control devices proposed to limit off-site transport of sediment. The plan will be submitted to the Village of Lordstown for approval. In addition, a Notice of Intent will be filed with the Ohio EPA for coverage under the NPDES General Construction Stormwater Permit. Preliminary information is provided in the Stormwater Management Plan presented in Appendix A.
- Dust and Particulate Control – During grading activities, dust may be generated as exposed soils dry. Water sprays or other dust suppression methods will be employed on areas of exposed soils to minimize the potential for dust generation.
- Revegetation – Areas of the Facility Site temporarily impacted by construction activities will be revegetated as soon as possible following completion of construction to stabilize exposed areas of soil. Species proposed for the seeding will be coordinated with the Village of Lordstown to ensure compatibility and suitability with surrounding agricultural areas. Per comments received from the

USFWS (Appendix G), care will be taken to prevent the spread of invasive species through revegetation processes.

- Conservation Easement – Work with the USACE will be undertaken to establish appropriate easements consistent with permitting requirements.

(3) Operation

(a) Impact of Operation on Undeveloped Areas

Facility operation is expected to result in a localized increase in lighting and noise in its immediate vicinity. Wildlife species are not anticipated to significantly use the agricultural fields where the majority of the development is proposed. Wildlife species present in the vicinity of the Facility are expected to become acclimated to the normal operations of the Facility over time.

(b) Impact of Operation on Major Species

Threatened or endangered terrestrial or aquatic species or their habitats are not located at the Site and will, therefore, not be impacted by operation of the Facility. Recreational or commercial species will also be unaffected by Facility operation; the Facility has been designed to limit ecological impact through its location on property with little terrestrial habitat diversity.

(C) ECONOMICS, LAND USE AND COMMUNITY DEVELOPMENT

(1) Land Use

(a) Land Use Mapping

Figure 07-5 presents land uses within a 1-mile radius of the Facility Site. Indicated land uses include:

- Residential;
- Commercial;
- Industrial;
- Institutional;
- Recreational; and
- Agricultural.

The land use map was developed from Village of Lordstown data as well as field studies. Figure 07-6 illustrates the Village of Lordstown's zoning as provided by the Planning and Zoning Department. As this figure illustrates, the Facility Site and Laydown Area are within an industrially zoned area. Specifically, the Facility Site is located within the Lordstown Industrial Park, a designated Enterprise Zone with Foreign Trade Zone status.

As can be seen, the land use of the Study Area consists predominantly of agricultural land, with forest and wetland areas, particularly within the Ringbus Interconnection Property. Utility easements, roadways and rail lines also traverse the immediate area.

Land uses within 1 mile include industrial, commercial, agricultural, and residential. The closest recreational use is the Lordstown Village Park, a 60-acre park with picnic pavilions, various sporting fields, and a 1-mile nature trail, located 1.5 miles north of the Facility Site. The nearest school is the Lordstown High School, located approximately 1.25 miles north-northwest from the proposed Facility, with the Lordstown Elementary School located adjacent, slightly further north.

(b) Residential Structures

No residential structures are located on the Facility Site. One residential-appearing structure is located within the Laydown Area; as noted previously, this is currently used as the Lion’s Club meeting place, and is anticipated to be demolished or repurposed, and meetings relocated. As can be seen in Figure 07-5, the closest off-site residences are located approximately 0.35 mile to the northwest, southwest, and southeast. A neighborhood of approximately 35 single-family homes are located along a cul-de-sac east of the Facility, with the nearest residence located about 0.6 mile from the Facility property boundary.

(c) Land Use Impact

As shown in Figure 07-5, the Facility Site is currently indicated as in agricultural use, with abutting industrial properties and forested/open space areas. Residential development exists to the north and east, and commercial development is scattered along the nearby roadways, particularly on Route 45 and along Salt Springs Road. This mixture of agricultural, forested/open space, residential, and commercial land uses extends in the area to the north and east of the Facility Site. Table 07-9 provides the area of each land use type within a 1-mile radius of the Study Area.

TABLE 07-9
LAND USE WITHIN A ONE-MILE RADIUS OF THE STUDY AREA

Land Use	Approximate Acres	Approximate Percentage of Total Area
Agricultural	1,210	30%
Industrial	772	19%
Residential	392	10%
Commercial	59	1%
Institutional	24	1%
Forested/Open Space	1,533	39%
Total	3,990	100%

Although currently in agricultural use, the Facility Site is within an existing industrial park, and zoned I-1 Industrial; industrial development currently exists on adjacent properties and across Route 45 to the west (the GM Lordstown Assembly Plant, a manufacturing complex employing 4,500 people). Figure 07-6, which shows the Village's current zoning, also illustrates the compatibility of the Facility within its proposed setting.

(d) Structures to be Removed or Relocated

No residential structures are located on the Facility Site. An existing two-story structure, currently used by the Lordstown Lions Club, is located adjacent to the west of the Laydown Area. Negotiations are on-going to relocate the Lions Club to a different facility. The existing structure may be demolished or repurposed to a service more aligned with this area's industrial zoning designation.

(e) Formally Adopted Plans for Future use of the Site and Surrounding Lands

The Village of Lordstown has identified this area of the Village for industrial development. As shown on Figure 07-6, the Facility Site lies entirely within the approximately 80-acre Lordstown Industrial Park, an area which has been dedicated to facilitating economic development and that has been prepared for industrial and/or commercial development (for example, through USACE permitting, archaeological surveys and rough grading). The Lordstown Industrial Park is a designated Enterprise Zone with Foreign Trade Zone status. In addition to the Lordstown Industrial Park, other properties shown within proximity to the Facility Site are aligned with the current zoning plan provided by the Village of Lordstown Planning and Zoning Department, as shown in Figure 07-6.

(f) Applicant Plans for Concurrent or Secondary Uses of the Site

There are no planned concurrent or secondary commercial uses of the Site other than for the proposed Facility and its associated natural gas pipeline and electrical interconnections.

(2) Economics

(a) Annual Total Present Worth of Construction and Operation Payroll

Facility construction is scheduled to take place during the period from the fall of 2015 to May 2018. An estimated $148.3 million in labor income (or $55.6 million each year of the construction period) will result in

Trumbull County during this period, including secondary and tertiary multiplier impacts. Annual labor income will increase by $5.2 million in Trumbull and Mahoning Counties, and by an additional $0.98 million in other parts of Ohio, as a result of annual Facility operations. See Appendix H for additional economic analysis. CEF-L has not hired any workers at this time.

(b) Construction and Operation Employment

The number of employees during Facility construction will vary on a monthly basis in accordance with the construction schedule; the maximum number at the Facility Site at any one time is estimated to be in the range of 500 to 550, with a total of 1,026 jobs within Trumbull and Mahoning Counties supported, on average, in each year of the construction effort (see Appendix H). Trumbull County investment by the Lordstown Energy Center will result in an additional 261 jobs within Ohio, but outside of Trumbull County. Approximately 25 to 27 employees will be employed during Facility operation. CEF-L will seek to use local labor where practical.

(c) Increase in Local Revenue

CEF-L has begun and will continue discussions regarding tax payments with local and state economic development officials. Property tax negotiations have not yet been concluded.

(d) Economic Impact on Local Commercial and Industrial Activities

Construction and operation of the proposed Facility will have substantial positive effect on local commercial and industrial activities. The Facility will affect local commercial and industrial activities both directly and indirectly. Financial benefits will be associated with direct purchases related to construction activities, and also by indirect purchases.

The major equipment that comprises the Facility, such as the Siemens or GE combustion turbines, will be purchased from outside the local region. However, the local commercial and industrial communities are anticipated to benefit from direct purchases that will include construction materials and general supplies purchased from local vendors. The same communities will also benefit indirectly from the expenditures by operating personnel for locally supplied goods and services.

CEF-L has retained an independent firm, Calypso Communications LLC (Calypso), to analyze both the direct and indirect economic impact of building and operating the planned Facility (Appendix H). Key findings of this study were:

- Construction of the Facility is estimated to generate $453.7 million in total economic activity in the State of Ohio. This will produce $14.5 million in additional state and local tax revenues (not including property taxes).
- Construction of the Facility is anticipated to create over 1,500 construction jobs and 3,400 total jobs during the 32-month

construction period. Construction of the Facility will increase the forecasted rate of job growth in the Trumbull and Mahoning County region by 50 percent or more each year of the construction phase.

- Once operational, the Facility will result in $17 million annually in new business activity in a wide variety of industries in the Trumbull and Mahoning County region. Operation will increase state and local (non-property) tax revenues by $1.6 million annually.
- During operation, the Facility will employ approximately 28 full-time workers and result in an additional 35 jobs in the Trumbull and Mahoning County region. Average annual wages of these jobs will be significantly higher than the current regional average.

These economic impacts do not include the effect of local Property tax payments that will be made by the Facility.

(3) Public Services and Facilities

The proposed Facility will provide significant economic value to the region. However, since the Facility will have new employment in the range of 25 to 27 during operations, and does not place major demands on local infrastructure, a significant impact on local services is not anticipated. The basis for this estimate is the presumption that the staffing of construction and operation jobs can be met locally, with no significant need for workers to relocate into the area. Hiring of non-resident workers is expected to be limited to highly specialized skills for brief periods of time; it is expected that such workers would stay in local motels and would not require new housing.

The Facility Site is in close proximity to a well-established transportation network. Route 45, to which Henn Parkway has direct access, is a four-lane road designed to accommodate a high volume of existing traffic serving the GM Lordstown Assembly Plant and other nearby industrial facilities. The proximity of I-80 approximately 1 mile south of the Facility Site provides direct access to the major highways for delivery of equipment and supplies.

The principal impact on public services would be short-term increases in traffic on routes leading to the Facility Site. During the construction phase, worker vehicles will enter the Lordstown Industrial Park from Route 45, onto Henn Parkway, and will park on the Laydown Area adjacent to the Facility Site. Delivery of construction materials and supplies will also arrive via Route 45, and unload within the Laydown Area. Some manual control of traffic during the construction phase may be necessary in the immediate vicinity of the Facility during peak periods to ensure safe and efficient maintenance of existing traffic patterns and usage.

No upgrades to local roads or bridges are expected to be necessary for transportation of construction vehicles and Facility equipment, as the Village of Lordstown has planned for industrial traffic within this area and has upgraded road bearing capacities.

Major construction deliveries will be: the CTGs; the STG; and the prefabricated components of the HRSGs. The CTGs and STG are comprised of six major manufactured components, each weighing between 500,000 to 600,000 pounds. It is expected that the components will be shipped to the St. Lawrence Seaway from their manufacturing facilities. Barges transporting this equipment will travel down the St. Lawrence River and into Lake Erie, with a final destination of Cleveland. The timing of this shipment will take into consideration the freezing of the St. Lawrence River, which starts around mid-December of any given year.

From Cleveland, the components will be loaded onto rail cars and delivered to the Ohio Commerce Center (OCC). The OCC is a 1.5 million square foot storage and distribution facility located on 476 acres approximately 2 miles north of the Facility Site in the Village of Lordstown. When ready for installation, the components will be loaded at the OCC onto specially-designed, multi-wheeled trailers and driven along Route 45 to the Facility Site. These components will be lifted and placed onto their foundations.

Once the Facility is operational, related traffic will be minimal, and is not expected to impact the surroundings.

The Facility represents a favorable economic impact to the local community with added employment and purchases of material, supplies, and services without expended public capital or expanded municipal services. The economic impacts ($1.45 billion) from construction and the first 40 years of operation of the Facility have been determined by Calypso in a study commissioned by CEF-L (Appendix H).

Potential emergency service requirements will be coordinated with the local authorities. The Village of Lordstown Police Station and Fire Department are both located approximately 1 mile north of the Facility Site on Salt Springs Road. Local emergency response personnel will be trained to be familiar with the Facility's emergency response system. Coordination will also occur with personnel at Vibra Hospital, located in the City of Warren, approximately 5.5 miles northeast of the Facility Site.

(4) Impact on Regional Development

(a) Impact on Regional Development

The Facility will have a sizeable positive impact on regional development because it will contribute to investment into the local economy, without the need for governmental investment.

Construction of the Facility will employ workers both directly and indirectly in Trumbull County, with annual labor enhancement of $64.7 million for the 2½ to 3-year construction period (Appendix H).

Regional human and material resources are abundant and mobile; no scarcities in labor or materials and equipment are anticipated to be likely. The requirement for non-regional resources, with the exception of major equipment, is expected to be negligible. Additional housing and other services, such as education, public health, and public safety, are very unlikely to be required because the labor force for the Facility is already locally available.

Transportation facilities will not require expansion as a result of the Facility because the impacts of construction will be temporary. Commuting by the approximately 25 to 27 operating personnel is not expected to have a significant impact on local roads.

(b) Compatibility with Regional Plans

The Village of Lordstown Zoning Plan, shown in Figure 07-6, clearly indicates that the Facility Site is located within a portion of the Village designated for the encouragement of commercial and industrial development. The Facility is also consistent with regional energy planning, as evidenced by the review on-going by PJM that indicates favorable interconnection into the existing 345-kV transmission grid located just east of the Facility Site. PJM's Feasibility Study in 2014 has determined that the Facility can interconnect with the need for only limited system upgrades. The PJM System Impact Study is anticipated to be completed in March 2015. As additional PJM studies are completed, they will be made available for OPSB review.

(D) CULTURAL IMPACT

A Phase I archaeological survey had previously been completed for portions of the Lordstown Industrial Park. The archaeological survey report provided in Appendix I (currently under review by the SHPO), documented the findings of the previous survey and conducted a literature review and field studies to reflect other portions of the Study Area. Because a broader area of potential Facility activities was subsequently identified, additional field studies will be completed when weather conditions allow, and a supplemental report will be submitted to SHPO. The findings of the investigation completed to date are described below.

(1) Cultural Resource Mapping

The map provided in Figures 07-7A through 07-7H depicts formally adopted land and water recreation areas and registered landmarks of historic, religion, archaeological, scenic, natural, or other cultural significance within a 5-mile radius of the Facility Site.

(2) Cultural Resource Impacts

No significant impact to the continued meaningfulness of registered landmarks of historic, religious, archaeological, scenic, natural, or other cultural significant is anticipated due to the Facility.

A Phase I archaeological investigation were conducted for the Facility Site, one transmission corridor option, and the Ringbus Site. Investigations began with a literature review for property within the Study Area (Appendix I) which identified two previous surveys that had been conducted within the Study Area (in 2002 and 2010). These areas were, therefore, eliminated from the 2014 field investigation effort. Approximately 13.1 acres, including a portion of the Facility Site, the Ringbus Site, and the Ringbus Interconnection were included in the 2014 archaeological investigations. The surface collection, subsurface testing, and visual inspection completed did not identify any previously unrecorded archaeological sites. Although five previously recorded sites were identified within the Study Area, none were considered to be significant and eligible for the National Register of Historic Places (NRHP). No further work is recommended for the portion of the

Study Area that has been evaluated; archaeological sensitivity for the balance of the Study Area is expected to be similar, but will be evaluated when weather permits.

Based on the historical land use throughout the area, characterized by industrial development, transportation corridors, and utilities; as well as upon the result of field investigations, the proposed Facility is not anticipated to result in any visual impact to historic sites (see Appendix J).

(3) Cultural Resource Landmarks

A Historic Structures analysis was completed for the Facility Site and surrounding area (Appendix J). Although the literature review identified a total of 11 previously recorded Ohio Historic Inventory (OHI) sites within the Area of Potential Effect (APE), defined as a 1-mile radius around the Facility Site, the field survey determined that six of these properties had been razed and are no longer present. One NRHP property is also located within the APE, and while there are no official NRHP Determination of Eligibility properties located within the APE, one of the previously mentioned OHI sites was reviewed by SHPO in 2013 and considered eligible.

A total of five NRHP listed properties, three NRHP Determination of Eligibility properties, and the previously discussed 12 properties are located within a 5-mile radius of the Facility Site. The majority of these properties are over 3 miles from the Facility, with most located in the communities of Niles or Mineral Ridge. Further details and a full list of properties considered can be found in the Historic Structures Report provided in Appendix J.

The APE consists of a mixture of older and modern houses, mobile homes, and modular homes, in addition to a large amount of industrial and commercial properties, open agricultural fields, and forested areas. The majority of the residential areas lie at or near the 1-mile radius of the Facility Site, at the edge of the APE. It is not anticipated that the Facility will significantly affect historic resources, as the viewshed within the APE currently includes modern intrusions. In addition to the modern housing and industrial/commercial development, overhead electric transmission structures extend throughout the area (with active construction of new electrical transmission ROWs in progress to the east and north of the Facility Site). Several large rail yards with multiple tracks, most associated with the nearby Lordstown GM Assembly Plant, are also located within the APE.

(4) Land and Water Recreation Areas

Approximately ten parks, recreation, areas and/or golf courses exist within 5 miles of the Study Area, as shown in Figures 07-7A through 07-7H. This includes portions of state and federal Wildlife Areas, most notably the Warren Wildlife Area, a 40-acre area comprised of primarily bottomland hardwoods with a small marsh area in the center and home to a variety of game animals, furbearers, and nesting and migratory bird species. The Warren Wildlife Area, maintained for public hunting and fishing, is located approximately 3.5 miles northeast of the Facility Site. The closest recreational area, located approximately 1.5 miles north of the Facility Site, is Lordstown Village Park, a 60-acre park comprised of four baseball diamonds, four tennis courts, two soccer fields, two basketball courts, three volleyball courts, horseshoe pits, shuffleboard courts, a 1-mile nature trail, playground equipment, and picnic areas. However, none of these recreation areas are in immediate proximity to the Facility. No impact to land or water recreation is anticipated to result.

(5) Recreational Areas and Potential Impacts

The proposed Facility is not expected to have a negative impact on land and water recreational resources identified within a 5-mile radius. The closest recreational feature is the Lordstown Village Park, located approximately 1.5 miles north of the Site.

(6) Measures to Minimize Visual Impacts

Figure 02-4 presents an artist's rendering of the proposed Facility. The Facility's location within an I-1 Industrial district, proximate to compatible uses minimizes the potential visual effect.

(E) PUBLIC RESPONSIBILITY

(1) Public Interaction Program

Facility-related work within the community has been on-going since 2013, when informal discussions with interested parties began relative to exploring potential sites. CEF-L met with the political leadership of the Village of Lordstown, led by Mayor Arno Hill. Questions raised focused on Facility appearance and on whether a similar facility existed in Ohio that could be visited. Since the principal of CEF-L has been intimately involved in the development two combined-cycle gas turbine projects, the Fremont Energy Center (710 MW) and Oregon Clean Energy Center (870 MW), located in Ohio, the political leadership of Lordstown took it upon themselves to contact both communities and organize group visits to the operational Fremont facility. Attendees of the site visits confirmed that a natural gas-to-electricity plant would be an acceptable and welcomed addition to the Village of Lordstown.

Throughout the summer of 2014, the topic of a potential new electricity production plant was discussed at various public Council meetings. When it was announced that a site in the Lordstown Industrial Park (off Route 45) had been secured for the Facility, the momentum of local support seemed to accelerate. In summer 2014, an option was signed for the Lordstown Industrial Park property. Additional site evaluation work accelerated including interaction with the local economic development organizations and other officials within Lordstown.

Preparation of required permit applications began in the fall of 2014. On December 3, 2014, a pre-application conference meeting was held with the OPSB Staff in Columbus, Ohio as an introductory meeting relative to the Facility, as required by OAC Rule 4906-5-08.

A Public Open House was held on January 13, 2015 in the Village of Lordstown Administration Building/Meeting Hall located on Salt Springs Road. The Open House was advertised in the local newspapers and on the outdoor information board in front of the Village of Lordstown Administration Building. Announcements were also made by the Mayor, Village Council, and School Board during events leading up to the Open House. The meeting was properly noticed in the local newspapers. CEF-L personnel and other representatives staffed the meeting, which included a display of Facility information and an opportunity to speak one-on-one with Facility representatives.

The Open House was covered by media representatives from local/regional newspapers, radio, and TV. Approximately 125 to 150 individuals attended the Open House, including regional elected officials, and the proceedings were very orderly. Many felt the event was complimentary and supportive of the proposed Facility. To date, the sentiment among residents is that there is overwhelming support for the Facility.

CEF-L and its representatives have held numerous meetings with local public officials to discuss the Facility. CEF-L will continue to engage in active public outreach prior to, during, and after construction of the Facility. During the construction phase, an on-site construction manager will be available to respond to local issues. Once the Facility is in commercial operation, CEF-L intends that its local personnel maintain a high level of community involvement.

Since the Facility will be a tax-paying entity, support for its success was heightened after a vote in the Village of Lordstown to raise taxes to cover a budget shortfall, failed in November 2014. With a population of only 3,417 (US Census 2010), the Village of Lordstown does not have many options to cover the budgetary shortfall that it currently faces. Taxes paid by the Facility could significantly alleviate this financial burden. The success of the Facility represents a win-win for the Village, as the Facility supports both financial and energy stability.

Facility benefits to the Village of Lordstown go well beyond just the financial benefit of tax payments, jobs, and the purchase of local goods and services. One of the most exciting aspects of the Facility is its ability to be an educational catalyst for schools in the region, including: Lordstown High School, Youngstown State University, and local Community Colleges. CEF-L was invited by the Village School Board to make a presentation at the local high school describing the proposed Facility. Held on April 24, 2014, the presentation was attended by local citizens as well as local TV, radio, and newspaper representatives. It was clear from this audience that a new electricity generation facility in the Village of Lordstown would be well received.

From construction and on into operations, the Facility can be a focal point for on-the-job education, internships, workshops, and seminars. CEF-L is working with the Lordstown School Board to plan and implement such a cooperative program. In essence, the Facility will be a "living lab" providing insight into the process of converting a common product like natural gas into electricity. Through this partnership between the Facility and local/regional education system, the opportunities for learning and career enhancement are extensive.

(2) Liability Compensation Plans

CEF-L will carry significant amounts of liability insurance. The Facility will be covered under CEF-L's liability insurance programs for general commercial liability insurance and automobile liability insurance during the construction and operation of the Facility.

(F) AGRICULTURAL DISTRICTS

(1) Agricultural Land Mapping

Figure 07-8 illustrates agricultural land located within and proximate to the boundaries of the proposed Facility Site. No agricultural district land is located within the Study Area.

(2) Potential Impact to Agricultural Lands

(a) Potential Construction, Operation and Maintenance Impacts

No impacts to field operations, irrigation or field drainage systems associated with agricultural district lands will occur as a result of construction, operation, or maintenance of the proposed Facility on agricultural district lands. No such lands were identified in the Study Area and measures will be taken to ensure that no impact will occur to adjacent properties.

(b) Agricultural Mitigation Practices

Mitigation procedures will not be necessary since no agricultural districts were identified in the Study Area and, should drainage tile systems utilized by adjoining parcels be affected, they will be either relocated or restored.

(3) Potential Impact on Agricultural Viability

No impact will occur as a result of construction, operation, or maintenance of the proposed Facility on agricultural district lands since no such lands were identified within the Study Area. Where field title disruptions are necessary, CEF-L will work with the Village and appropriate land owners for repair or relocation, or to facilitate suitable drainage alternatives.