Environmental Assessment

Ripley Energy Center
Payne County, Oklahoma

U.S Department of Agriculture Rural Utilities Service

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List of Abbreviations

Abbreviation	Term/Phrase/Name
51 East Corp	51 East Corp Public Water Service
ACHP	Advisory Council on Historic Preservation
AECI	Associated Electric Cooperative, Inc.
APE	area of potential effect
amsl	above mean sea level
BACT	Best Available Control Technology
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
CAA	Clean Air Act
CEMS	continuous emission monitoring system
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	methane
CIA	Critical Issues Analysis
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
dBA	A weighted decibel
EA	environmental assessment
EIS	environmental impact statement
ELFS	Electric Load Forecast Study
EMF	electromagnetic field
EO	Executive Order
EOIT	Enable Oklahoma Intrastate Transmission, LLC
EPA	U.S. Environmental Protection Agency
ER	environmental report
ESA	Endangered Species Act
°F	degree Fahrenheit
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps

FONSI	Finding of No Significant Impact
FR	Federal Register
GHG	greenhouse gas
gpm	gallons per minute
GSU	generator step-up
G&T	generation and transmission
GWP	global warming potential
HAP	hazardous air pollutant
HDPE	high-density polyethylene
HFC	hydrofluorocarbon
HHV	higher heating value
IEC	International Electrotechnical Commission
IPAC	Information for Planning and Consultation
IRP	Integrated Resource Plan
IWG	Interagency Working Group
KAMO Power	KAMO Electric Cooperative, Inc.
kV	kilovolt
LHV	lower heating value
m	meter
µg/m^3	microgram per cubic meter
MACT	Maximum Achievable Control Technology
MMBtu	million British thermal units
MMBtu/hr	million British thermal units per hour
MRLC	Multi-Resolution Land Characteristics
MW	megawatt
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHD	National Hydrography Dataset
NO_2	nitrogen dioxide
NO_x	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NPV	net present value
NWI	National Wetlands Inventory
NRCS	National Resources Conservation Service

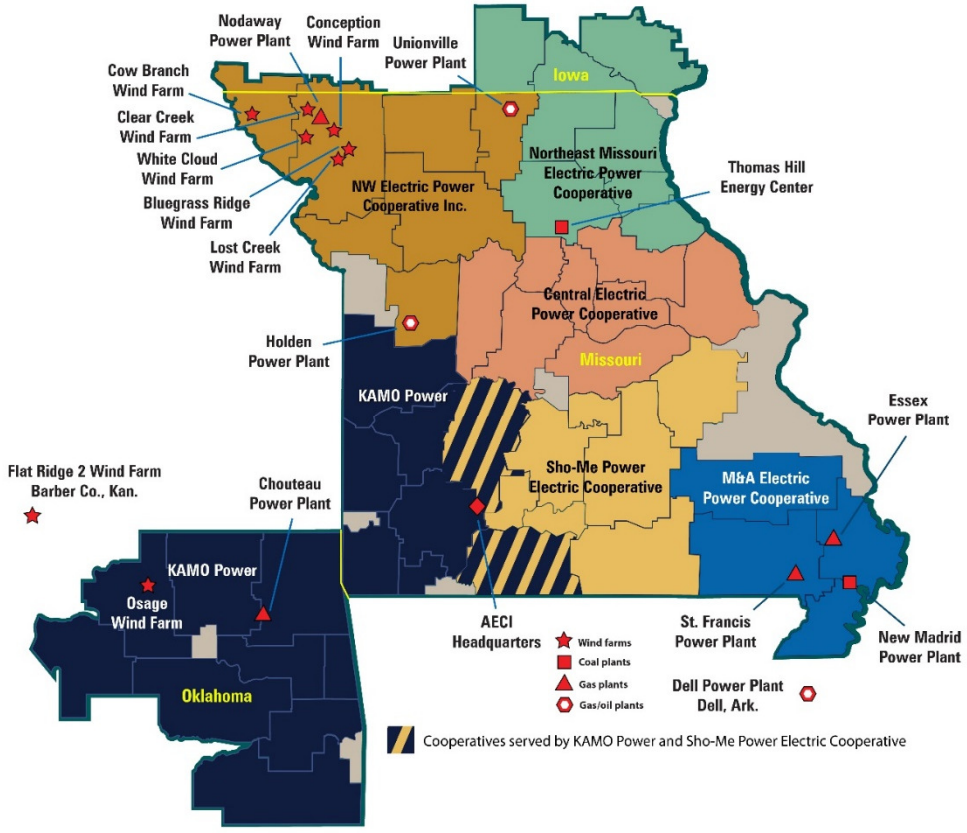
NSPS	New Source Performance Standards
O.A.C.	Oklahoma Administrative Code
OAS	Oklahoma Archaeological Survey
ODEQ	Oklahoma Department of Environmental Quality
ODWC	Oklahoma Department of Wildlife Conservation
OHNI	Oklahoma National Heritage Inventory
OWRB	Oklahoma Water Resources Board
PAB	palustrine aquatic bed
PAP	Priority Action Plan
Pb	lead
PEM	palustrine emergent
PFC	perfluorocarbon
PM	particulate matter
PM_{10}	particulate matter 10 microns or less in diameter
$PM_{2.5}$	particulate matter 2.5 microns or less in diameter
PPA	power purchase agreement
PSD	Prevention of Significant Deterioration
PSS	palustrine scrub-shrub
PUB	palustrine unconsolidated bottom
RFP	Request for Proposal
ROW	right-of-way
RTO	regional transmission organization
RUS	Rural Utilities Service
SC-CH_4	social cost of methane
SC-CO_2	social cost of carbon dioxide
SC-GHG	social cost of greenhouse gas
SC-N_2O	social cost of nitrous oxide
SCGT	simple-cycle gas turbine
SCR	selective catalytic reduction
SER	Significant Emission Rate
SF_6	sulfur hexafluoride
SHPO	State Historic Preservation Office
SIL	Significant Impact Level
SO_2	sulfur dioxide
SSURGO	Soil Survey Geographic

THPO	Tribal Historic Preservation Officer
tpy	tons per year
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 Introduction

Associated Electric Cooperative, Inc. (AECI) is a member-owned, member-led wholesale power generation and transmission cooperative created in 1961 by rural electric cooperatives to provide electricity reliably and affordably for rural areas of the Midwest. Today, AECI and its member cooperatives deliver electricity to 935,000 meters (member-consumers) representing 2.1 million people across rural Missouri, northeast Oklahoma, and southeast Iowa (Figure 1-1). AECI's member-consumers are primarily older, lower income electricity users who live in rural parts of the three-state system. More populous urban and suburban areas of these regions are generally served by municipal or investor-owned electric utilities.

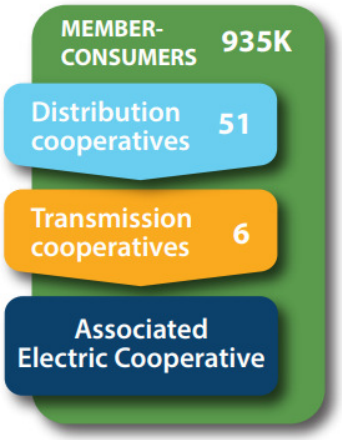
Figure 1-1: AECI Service Territory



AECI is a system comprised of three distinct tiers, each specializing in one critical area of the electric utility process and accountable for its performance through democratic control at every tier.

- Generation: In the first tier, AECI generates power for six regional transmission cooperatives who are member-owners of AECI.

- Transmission: In the second tier, the six regional transmission co-ops use an extensive network of substations and high-voltage power lines to deliver the power to 51 distribution co-ops who are their member-owners. AECI and its six transmission co-op owners own and operate 10,288 miles of transmission lines.
- Distribution: The third tier is made up of the 51 local power co-ops that deliver electricity to member-consumers at homes, farms and businesses in rural areas. 935,000 member-consumers (meters) served by this distribution tier own and are democratically represented at their local co-ops.



1.1 Project Description

1.1.1 Proposed Action

AECI is requesting a loan from the U.S. Department of Agriculture (USDA), Rural Utilities Service (RUS) to procure and construct a 421-megawatt (MW) simple-cycle gas turbine (SCGT), located approximately 6.5 miles north of Ripley, in Payne County, Oklahoma (the "Project Site"). AECI owns 160 acres of agricultural land at the Project Site. Approximately 50 acres would be disturbed with approximately 40 acres ultimately being fenced. The general location of the Project Site including the transmission line is shown in Figure 1-2 and the proposed site layout is shown in Figure 1-3. AECI is a member-owned, member-led wholesale power generation and transmission cooperative created in 1961 by rural electric cooperatives to provide electricity reliably and affordably for rural areas of the Midwest.

To support operation of the new combustion turbine, a new natural gas lateral would be constructed to supply fuel to the Project Site. The new 10-inch lateral would extend approximately 120 feet directly east from the Project Site boundary to a tap point on the existing Enable Oklahoma Intrastate Transmission, LLC (EOIT) pipeline, and then traverse the Project Site approximately 3,000 feet to supply the SCGT (see Figure 1-2). The lateral pipeline will not be owned or operated by AECI and is considered a connected action.

KAMO Electric Cooperative, Inc. (KAMO) will enable AECI's interconnection via an onsite switchyard constructed as part of the Proposed Action (KAMO is a member cooperative of AECI). From there, a new 0.5-mile-long KAMO transmission line, consisting of a single-circuit 138 kilovolt (kV) line, would be constructed to access the existing transmission line right-of-way near the Project Site. From that location, 5.5 miles of existing KAMO-owned transmission line structures would be rebuilt to carry a double circuit in the existing right-of-way (ROW) to the existing Stillwater Substation. The Stillwater Substation would require minimal upgrades to receive the line. The existing distribution line adjacent to the site will be upgraded to provide service power back to the Ripley Energy Center.

A new 1-mile water pipeline would be constructed of eight (8)-inch high-density polyethylene (HDPE) pipe that would tap into an existing ten (10)-inch water transmission main owned by 51 East Water, located approximately 1-mile north of the Project Site boundary. The new water pipeline would replace an existing, smaller water pipeline within the existing ROW.

The Project would be constructed over a 24-month period. The footprint for construction of this Project is approximately 50 acres, located primarily in an open agricultural area within the Project Site boundary (Figure 1-2). Construction activities would also include equipment laydown, temporary offices, and parking.

The proposed action will require the following major new components:

- Advanced-class SCGT and auxiliary equipment
- Air cooled generator and auxiliary equipment
- Selective catalytic reduction and Oxidation Catalyst Systems
- Generator step-up (GSU) and auxiliary transformers
- Fuel oil tanks, offload, and forwarding equipment
- Water tanks
- Electrical equipment for the station including KAMO's 138-kV switchyard
- Substation upgrades to accommodate interconnection to the grid
- Adding a double circuit to the KAMO transmission line
- Upgrading the electrical distribution line
- Fire protection
- Natural gas metering, filtering and pressure regulating equipment
- Permanent offices and warehousing
- Permanent plant roads, lighting, fencing, and cameras

1.1.2 Agency and Program Objectives

RUS's action is the decision to provide financing assistance for the Proposed Action through the Electric Infrastructure Loan & Loan Guarantee Program. Under the Rural Electrification Act of 1936, as amended, the Secretary of Agriculture is authorized and empowered to make loans to nonprofit cooperatives and others for rural electrification for the purpose of financing the construction and operation of generating plants, electric transmission and distribution lines, or systems for the furnishing and improving of electric service to persons in rural areas (7 U.S. Code [USC] § 904). A primary function or mission of RUS is to carry out the electric loan program (7 USC § 6942).

USDA, Rural Development is a mission area that includes three federal agencies – Rural Business-Cooperative Service, Rural Housing Service, and Rural Utilities Service. The agencies have in excess of 50 programs that provide financial assistance and a variety of technical and educational assistance to eligible rural and tribal populations, eligible communities, individuals, cooperatives, and other entities with a goal of improving the quality of life, sustainability, infrastructure, economic opportunity, development, and security in rural America. Financial assistance can include direct loans, guaranteed loans, and grants in order to accomplish program objectives.

This Environmental Assessment (EA) was prepared in accordance with Title 7 of the Code of Federal Regulations (CFR) Part 3100 (7 CFR 3100), which prescribes the policies and procedures of the USDA for implementing the National Environmental Policy Act (NEPA) of 1969, as amended, Title 7 CFR 1970 which provides environmental policies and procedures for the Rural Utilities Service (RUS), the regulations of the Council on Environmental Quality, 40 CFR parts 1500 through 1508, and the USDA Rural Development guidance document 1970-C which serves as a guide for preparing EAs under NEPA.

Figure 1-2: Proposed Layout of New Equipment

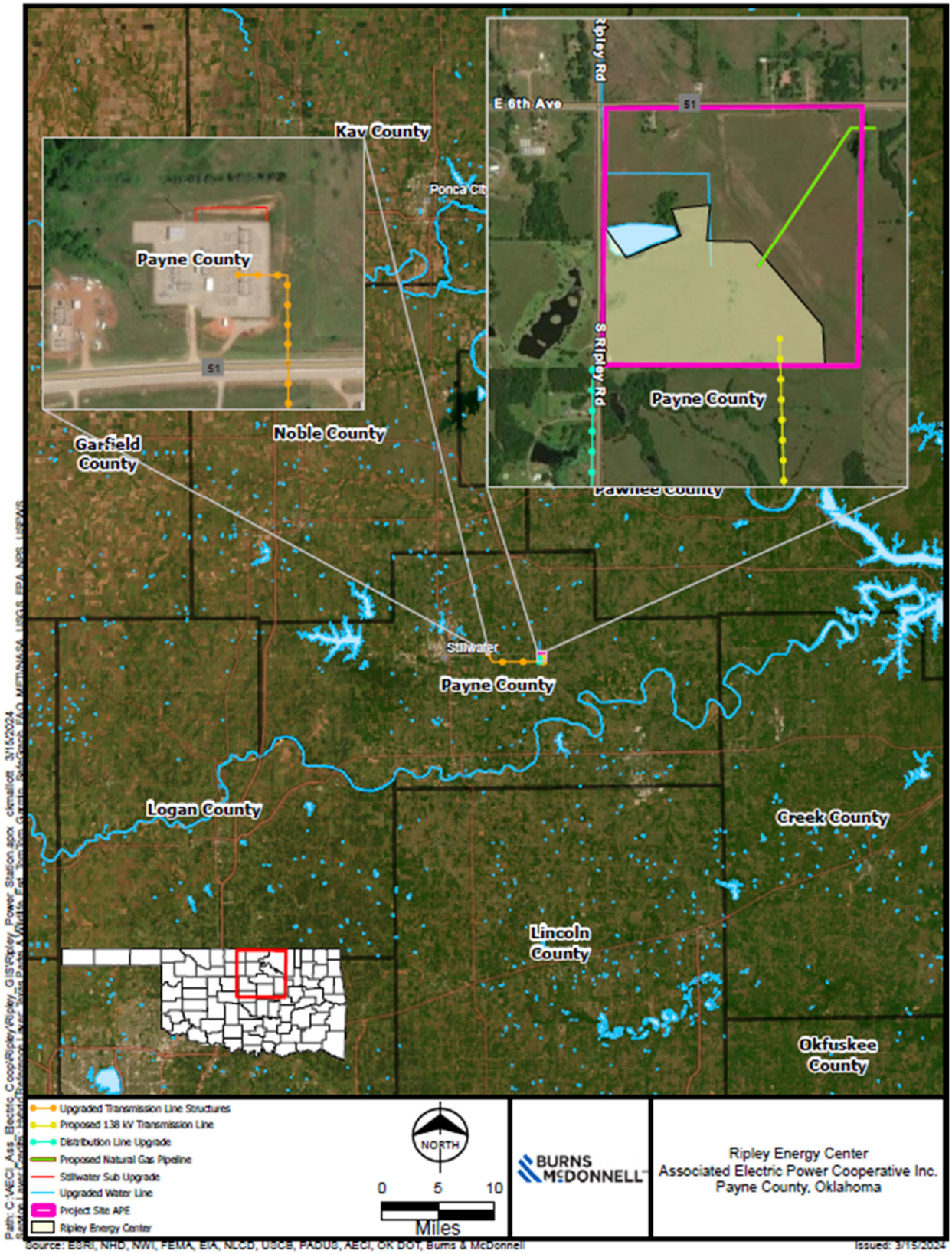


Figure 1-3: Ripley Energy Center Location

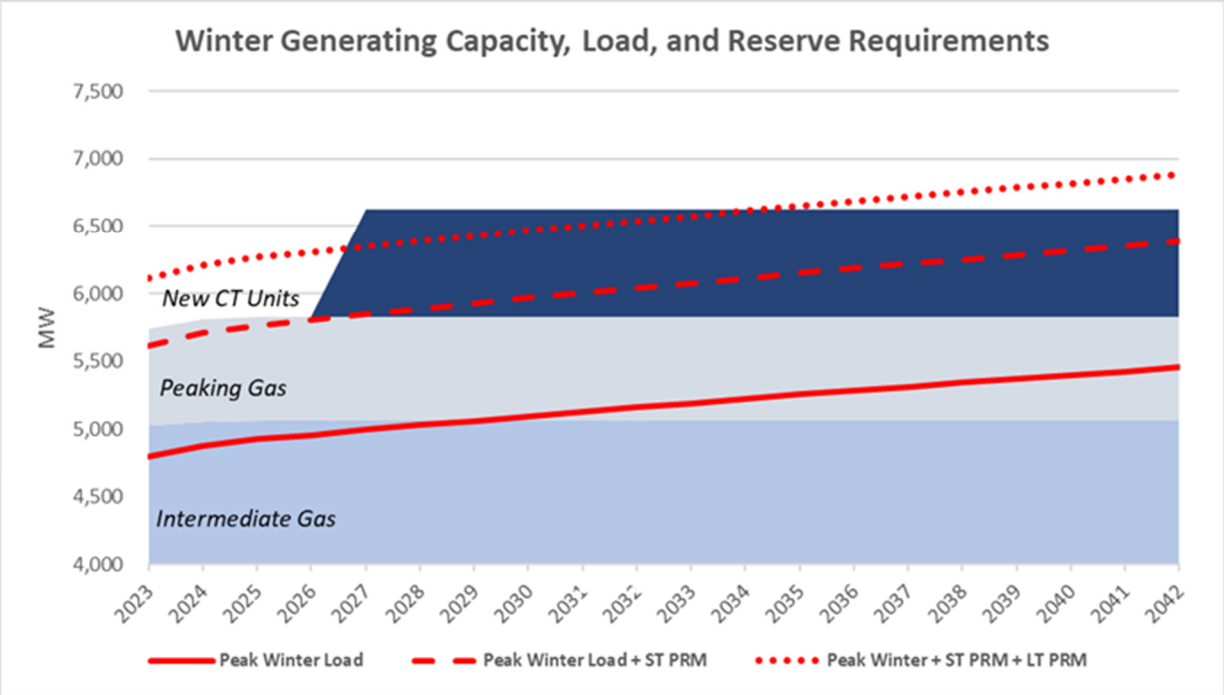
1.2 Purpose and Need

AECI is obligated to provide generating capacity needed to meet its member load requirements through 2075 per all-requirements of the Generation and Transmission (G&T) coordination agreements. AECI consults with Clearspring Energy Advisors to perform an Electric Load Forecast Study (ELFS) every other year (on even years). The ELFS study process takes into account AECI's energy efficiency rebate program and projects additional energy efficiency impacts driven by regulatory appliance standards. The 2022 ELFS was refreshed with 2022 load data, economic outlook, and demographic factors, and serves as the basis for these forecasts.

The load forecast study was used to prepare AECI's 2022 Integrated Resource Plan (IRP). The load forecast studies indicate that AECI will be in a capacity deficit position, without the addition of new resources, by winter season, 2027. As shown in Figure 1-4, the demand forecasts show a deficit between current assets and future demand, thus supporting the need for additional capacity. The detailed analysis identified a need of 844 MW of capacity, in total, and potential operational constraints of AECI's overall system by 2027. These operational constraints fall in three main areas:

1. the need to diversify fuel usage;
2. a necessary bridge to a larger renewables' portfolio in the future; and
3. a firm dispatchable generation asset.

Figure 1-4: Winter Generating Capacity, Load, and Reserve Requirements



2.0 Alternatives

To determine if RUS can fund the Proposed Action, Alternatives that meet the purpose and need should be considered. Several options were evaluated to meet the identified future capacity needs. The options that were evaluated but eliminated from consideration, the preferred alternative, and the no action alternative are discussed in more detail below.

2.1 Introduction

AECI conducted detailed analysis and held internal discussions through strategic planning sessions in the production of its preferred power supply plan to meet the identified need of up to 900 MW of capacity between both the Missouri and Oklahoma service areas, with at least 421 MW at a single site. AECI conducted a study of self-build options in tandem with an request for proposal (RFP) for capacity and energy on a long-term basis in AECI's service territories from potential energy providers. Outside bids were solicited to determine if the open market could provide the capacity needed at a more competitive rate than AECI's self-build options. The RFP yielded alternatives including capacity from a fossil resource (natural gas), standalone batteries, and batteries paired with solar. As there is a need for dispatchable, fast-start capacity to backup renewables, only the fossil fuel option meets the purpose. The most competitive RFP response held a net present value (NPV) cost from 2027-2042 of almost $200 million higher than self-build alternatives. Therefore, AECI is pursuing RUS funding for a self-build alternative.

2.2 Alternatives Considered

The following is a bulleted list of alternatives evaluated but eliminated from consideration. The reason for elimination is briefly described for each.

- Load Management – Load management is voluntary on the power user side. Because of this, load management does not provide reliable reductions sufficient to offset the need for additional capacity.
- Distributed Generation – Distributed generation are systems of generating power, often renewable energy sources, near the point of use instead of centralized generation sources from power plants (e.g., solar panels on a house). These types of systems neither provide sufficient capacity, nor are they dispatchable in response to intermittent power generation from renewables.
- Renewable Energy Resources – Renewable energy resources such as wind, solar, hydro, or energy storage can provide varying amounts of renewable capacity. AECI contracts with eight wind farms totaling 1,240 MW of nameplate capacity. Because of wind generation's intermittent nature, wind energy is not included as capacity for planning purposes. AECI also receives nearly 500 MW of hydropower from the Southwestern Power Administration.
- Hydrogen Combustion – while there are turbines capable of burning hydrogen to create sufficient capacity, there are no viable supplies of hydrogen to an AECI electrical point of interconnection.
- Buying open market power purchase agreements (PPA). The option for new PPAs is very expensive and limited because the region is expected to see a shortfall in

capacity for fossil-fueled sources when several coal facilities are proposed for retirement.

Remaining alternatives to consider include various fossil fuel generation sources. Alternatives for the technology to meet the identified need are described in the next section.

2.2.1 Technology Selection

A technology assessment was completed to determine the self-build generation technology that best met the identified need. SCGTs and combined-cycle gas turbines are capable of generating the amount of capacity need identified and were selected for further analysis.

A SCGT will generate power by combusting natural gas and propelling the exhaust through a turbine. The spinning turbine is connected to a generator. An advanced-class SCGT has the lowest total cost when looking at 20 years of operation, less reliance on the energy market, and greater flexibility. An advanced-class SCGT benefits from faster ramp rates, greater efficiency, and economies of scale due to larger unit capacity.

Combined-cycle units are a combination of gas and steam turbines. The result is that the generation of electricity is increased almost by 50%. The waste heat from the gas turbine is routed to the nearby steam turbine, which generates extra power. However, combined-cycle units require significant amounts of water for process use and cooling. Higher temperatures within the units require additional maintenance. Additionally, the units aren't designed for fast response.

Based on the abilities of these technologies and the financial analyses discussed above, the alternative of a natural gas-fired, simple-cycle combustion turbine (i.e., the Proposed Action) was selected. The Proposed Action will balance AECI's traditional and more intermittent renewable generation assets on the system.

2.2.2 Alternative Project Locations

For the identified technology, AECI will need a site that can accommodate new generation. Both existing and greenfield sites were considered.

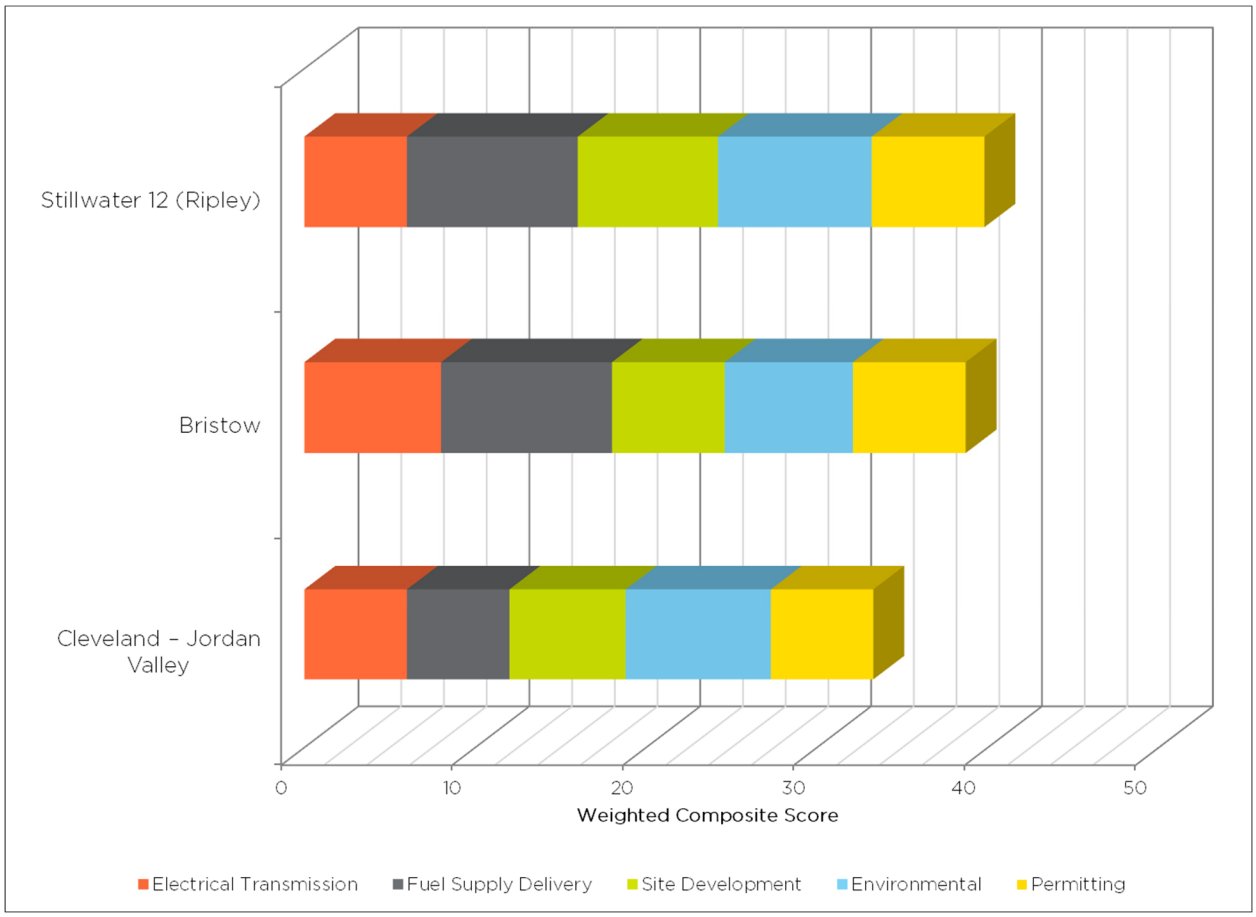
Existing power plant sites were considered in identifying a site that could accommodate the identified technology. AECI's existing power plant sites in the interconnection region cannot provide sufficient load-following gas supply, and there is no gas available in most locations. Additionally, most sites have existing point sources of air emissions nearby which could potentially lead to cumulative air quality issues. Other reasons an existing AECI site could not be used include transmission constraints (i.e., no reasonable interconnection opportunity) and/or national wildlife refuges nearby (i.e., potential federal land air quality impacts). Therefore, AECI's existing sites were considered, but are not carried forward as viable alternative locations. As such, greenfield sites that accommodate the technology identified and minimize environmental impacts were considered.

A siting study of greenfield locations was then conducted to determine suitable sites for the Project's development within AECI's service territory in Oklahoma. The proposed site needed to be capable of accommodating up to 421 MW of natural gas fueled simple-cycle generation and possess the necessary infrastructure critical to plant development. An initial 55 sites across both Oklahoma and Missouri, designated as Preliminary Site Areas, were identified that

met the infrastructure requirements. Preliminary Site Areas were subjected to review for multiple criteria organized by five categories: electrical transmission, fuel supply delivery, site development, environmental, and permitting. Preliminary Site Areas were ranked according to the composite evaluation score of the five categories.

After scoring was complete, an analysis of availability of the sites for purchase was conducted. From this analysis, three sites were selected as Candidate Site Areas. The "Stillwater 12 (Ripley)" site (i.e., the Ripley Energy Center) – scored highest of the Candidate Site Areas. The scoring for each alternative site is shown in (Figure 2-1).

Figure 2-1: Preferred and Alternate Site Area Rankings



A Critical Issues Analysis (CIA) was performed for each of these sites to identify potential fatal flaws and a desktop analysis was completed for the preliminary anticipated impacts for a generic power plant at each site.

All sites appear to have the infrastructure necessary to support the Project, with Bristow and Cleveland - Jordan Valley having a bigger challenge to procure enough water for operations (i.e., they would require significant wells and infrastructure). Based on the identified criteria, the Stillwater 12 (Ripley) site located in Payne County, Oklahoma was selected.

2.3 Proposed Action Alternative

Based on a review of available and feasible alternatives, the construction of a new 421-MW, natural gas-fired simple cycle combustion turbine located at the Ripley Energy Center is the Proposed Action Alternative to effectively address all purpose and need criteria described in Subsection 1.2. Under the Proposed Action Alternative, RUS would approve AECI's financing request and AECI would construct and operate the new generating facility and associated facilities.

The Proposed Action is a natural gas fired SCGT capable of generating approximately 421 MW. It is anticipated that the air permitting process will limit operation of the unit to the standards of 40 CFR Part 60 Subpart TTTT. The project would burn natural gas, with the capability to use fuel oil as a backup, would employ selective catalytic reduction (SCR) technology to control nitrogen oxide (NO_x) emissions, and employ Oxidation Catalyst technology to reduce/control Carbon Monoxide (CO) emissions.

Potential impacts associated with the construction, rebuild, and operation of the distribution line, transmission line and water pipeline, are analyzed as connected actions in this EA. Potential impacts associated with the development of the natural gas pipeline for the Ripley Energy Center are included in the evaluation of cumulative impacts in Chapter 4 of the EA.

As mentioned, the Project would be constructed over a 24-month period with the footprint for construction being approximately 50 acres (Figure 1-2).

2.4 No Action Alternative

Under the No Action Alternative, RUS would not provide financial assistance to AECI for the construction of the Ripley Energy Center. As a result, AECI would be required to secure alternative financing for the proposed Project or secure power to address the projected capacity shortfall from other third-party resources. The No Action Alternative would result in increased Project financing costs, which would have an adverse impact on the financial viability of the Project or require AECI to get power from another source, increasing power output from existing generating resources in the AECI service territory (e.g., existing coal-fired power plants, etc.), or experience rolling blackouts of varying intensity, especially during winter polar vortex events and extreme summer heat.

3.0 Affected Environment/Environmental Consequences

Chapter 3 provides descriptions of the existing environmental conditions of the Project areas and the impacts that may be expected from constructing and/or operating the Project. This chapter provides an understanding of the affected environment and potential environmental consequences for the following resources: air quality; biological resources including vegetation, wildlife, and special status species; cultural resources; geology and soils; infrastructure, transportation, public health and safety; land use; noise; socioeconomics and environmental justice; visual resources; and water resources. Federal, state, and local regulations that apply to managing these resources are also discussed in context of the existing environment. AECI's proposed Project will be located on a greenfield site in central Oklahoma (Table 3-1). The Site is located in Payne County approximately 6.5 miles north of the Town of Ripley.

This chapter assesses the potential impacts of the Proposed Action Alternative and the No Action Alternative. The No Action Alternative provides a basis for comparison in which none of the Project components would be constructed. The EPA's NEPAssist tool was used as a starting point to identify potential concerns for the various resources to be analyzed (Appendix A).

3.1 Land Use, Formally Classified Lands, Geology, Soils, and Farmland

3.1.1 Affected Environment

Land Use

Multi-Resolution Land Characteristics (MRLC) Consortium's National Land Cover Database was utilized to determine land cover within the 152-acre area project boundary. Land cover within the Project Boundary contains large portions of grassland/herbaceous areas. The vegetation type in the Project Boundary is common for this region. Locations surrounding the Project Boundary are similar in composition and are primarily composed of pasture/hay lands and grassland/herbaceous areas. A full breakdown of land use types identified within the Project Boundary is shown in Table 3-1.

Table 3-1: Land Cover Identified within the Project Boundary

Land Use Type	Acres
Open Water	2.2
Developed, Open Space	0.6
Developed, Low Intensity	1.8
Developed, Medium Intensity	0.3
Deciduous Forest	1.5
Grassland/Herbaceous	146

Source: MRLC National Land Cover Database (MRLC, 2019)

Formally Classified Lands

There are no formally classified lands within the Project.

Geology

An Oklahoma geologic map data from the U.S. Geological Survey (USGS) was used to determine the geology of the site (USGS, 2019). According to the map, alluvium, terrace deposits, and the Oscar group make up the area. This soil consists primarily of mudstone with fine-grained, micaceous channel sandstones and conglomerates that are common at the base of sandstone.

Soils

The general soils maps of Payne County, published by the USDA Natural Resources Conservation Service (NRCS) (USDA, 2019), were referenced for the following descriptions of the general soil map units within the Project Boundary. The NRCS Soil Survey Geographic (SSURGO) database was used to identify the specific soil map units associated with the Project Boundary as mapped by the USDA-NRCS. The SSURGO database is generally the most detailed level of soil geographic data available and utilizes information contained in published NRCS soil surveys. The Project Boundary consists of 11 USDA-NRCS soil map units, as summarized in Table 3-2. There are no hydric soils within the Project Boundary.

Soils present in the proposed Project Site area are classified as low to moderate risk of corrosion to concrete. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Three soils (GAMD, 46, and 47) present on the Site were classified as higher risk to corrosion of uncoated steel. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil.

Table 3-2: Soil Map Units within the Project Boundary

Map Soil Unit Symbol	Description	Acres
CoLC	Coyle-Lucien complex, 1 to 5 percent slopes*	14.0
CoyB	Coyle loam, 1 to 3 percent slopes*	3.0
3	Coyle loam, 3 to 5 percent slopes*	18.5
4	Coyle loam, 3 to 5 percent slopes, eroded	3.9
GAMD	Grainola-Ashport frequently flooded-Mulhall complex, 0 to 8 percent slopes	9.0
47	Renfrow loam, 3 to 5 percent slopes, eroded	12.4
46	Renfrow silt loam, 3 to 5 percent slopes*	29.4
W	Water	4.0
ZaHC	Zaneis-Huska complex, 1 to 5 percent slopes*	33.6
ZanB	Zaneis loam, 1 to 3 percent slopes*	12.2
70	Zaneis loam, 3 to 5 percent slopes*	12.5

Source: USDA, 2019
Gray shading indicates soil map unit is considered hydric.
* - Indicates soil map unit is considered prime farmland.

Farmland

The Site and surrounding areas consist of disturbed soils from urbanization and construction related to the existing facilities. The USDA's Web Soil Survey lists the present soils as prime farmland that could yield high crop production if flooded, however this is assumed only with a high level of management regarding irrigation and tillage kept to a minimum. Of the 11 soil units in the Project, seven (7) are considered prime farmland (Table 3-2). There is approximately 123.2 acres of prime farmland crossed by the Project. There are no agricultural areas using center pivot irrigation near the Project.

3.1.2 Environmental Consequences

The following sections summarize potential environmental consequences of the proposed Action Alternatives and No Action Alternative related to land use, formally classified lands, geology, soils, and farmland.

3.1.2.1 Proposed Action Alternative

Construction and operation of the Project would impact the existing grassland land use. While the Project contains prime farmland, there is no agricultural activity occurring on site. The NRCS was consulted, and the AD-1006 form was filled out by RUS/AECI and NRCS. The total screening score for the site was below their threshold of 160, indicating no significant impacts to prime farmland are anticipated and an alternative site does not need to be considered. The site is currently used as a hay field, and the remainder of the site is anticipated to continue producing hay after the Project is built. Construction and operation of the proposed Project will therefore not have a significant impact on prime farmland.

3.1.2.2 No Action Alternative

The No Action Alternative would have no short- or long-term impacts to land use, formally classified lands, geology, soils, or farmland at or near the Project because no construction or operation would occur.

3.1.3 Mitigation

Construction and operation of the proposed Project will alter the current land use and remove prime farmlands from use for production. However, the prime farmland is not and has not been used for production for quite some time. Therefore, no mitigation measures are anticipated.

During construction, portions of the Project site will be cleared, grubbed, graded, excavated, and revegetated. In areas not impacted by these activities, such as areas that do not require clearing, existing vegetation will be preserved where practicable. The amount of soil exposed during construction will be minimized.

Temporary seeding will be applied to areas of exposed soil that have not been brought to final grade yet, where the establishment of vegetation is desired. Additionally, temporary seeding will occur in disturbed areas where further land-disturbing activities will not be performed for a period greater than 30 days, and vegetative cover is required for less than 1 year. Areas needing protection during periods when permanent seeding is not applied, must be seeded with annual species.

Final stabilization is achieved when all soil-disturbing activities at the site have been completed and a uniform (i.e., evenly distributed, without large bare areas) perennial vegetation cover with a density of 70 percent of the native background vegetative cover has been established on all unpaved areas or areas not covered by permanent structures or with alternative surfacing, such as riprap or crushed rock.

AECI will coordinate the proper construction signage near access points on the roads used by construction vehicles for the Project to make drivers aware of the increased hazards associated with the construction vehicle(s) presence.

3.2 Floodplains

3.2.1 Affected Environment

The U.S. Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) indicates that there are no 100- or 500-year floodplains within the Project Boundary (FEMA, 2016).

3.2.2 Environmental Consequences

The following sections summarize potential environmental consequences of the proposed Action Alternatives and No Action Alternative related to floodplains.

3.2.2.1 Proposed Action Alternatives

All construction that will take place will not result in any impacts to floodplains. No future impacts to floodplains are anticipated during operation of the Project. The Project will not result in any additional runoff or impedance of flood flows.

3.2.2.2 No Action Alternative

The No Action Alternative would have no short- or long-term impacts to floodplains as no construction or operation would occur.

3.2.3 Mitigation

As construction and operation of the proposed Project will have no impacts on floodplains, no mitigation measures are required.

3.3 Wetlands and Water Bodies

3.3.1 Affected Environment

Burns & McDonnell completed a desktop assessment using the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) Maps and USGS National Hydrography Dataset (NHD). The NWI data indicates the potential presence of palustrine unconsolidated bottom (PUB) wetlands and riverine wetlands within the proposed Project Boundary. A total of 3.3 acres of NWI wetlands are mapped within the Project Boundary. The NHD data shows there is one stream present in the Project Boundary. Based on the assessment it was determined a field visit would be necessary to identify any wetlands or other aquatic resources that may be present within the Project Boundary.

Burns and McDonnell conducted onsite wetland delineations on June 21-22 and July 25-26, 2023. The delineation was completed following the 1987 *Corps of Engineers Wetlands Delineation Manual* (1987 Manual) and the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains – Version 2.0* (Regional Supplement).

Twenty-one wetlands and eight streams were identified during the wetland delineations study. A total of 11.53 acres of wetlands were delineated representing approximately 5% of the total 233-acre area evaluated within the Project Boundary and the surrounding affected areas (the "Survey Area"). Each delineated wetland was assigned a type based on the Cowardin Classification System (Cowardin et al., 1979). Wetland types identified include palustrine emergent (PEM), palustrine scrub-shrub (PSS), PUB, and palustrine aquatic bed (PAB). A total of 2,060 feet (0.39 miles) of ephemeral, intermittent, and perennial stream crossings were delineated within the Survey Area. Table 3-3 and Table 3-4summarize the identified wetlands and streams, respectively, within the Survey Area. The wetlands report is attached as Appendix B, containing maps with callouts of surveyed wetlands and streams.

Table 3-3: Delineated Wetlands within the Survey Area by Type

Wetland Type[1]	Delineated Area (Acres)	Description[2,3]
PEM	1.42	Characterized by a 30 percent or greater areal cover of emergent, herbaceous vegetation. Additionally, the combined areal cover of shrubs, saplings, and trees in these wetlands was less than 30 percent. Dominant vegetation included flat-stem spike rush *(Eleocharis compressa)*, blunt spike-rush (*Eleocharis obtusa)*, false daisy *(Eclipta prostrata),* little bluestem *(Schizachyrium scoparium),* bog rush *(Juncus marginatus),* golden crown grass *(Paspalum dilatatum),* narrow-leaf cattail *(Typha angustifolia),* hard-stem club-rush *(Schoenoplectus acutus),* globe flat sedge *(Cyperus echinatus),* axil-flower *(Mercardonia acuminata),* common persimmon *(Diospyros virginiana),* and eastern cottonwood (*Populus deltoides).* Wetland hydrology was indicated by surface water, high water table, saturation, crayfish burrows, oxidized rhizospheres along living roots, drainage patterns, geomorphic position, and a positive FAC-neutral test.
PSS	0.43	Characterized by a 30 percent or greater areal cover in the shrub/sapling stratum and an aerial cover of less than 30 percent in the tree stratum. Dominant vegetation included blunt spike-rush, American germander *(Teucrium canadense)*, and green ash *(Fraxinus pennsylvanica).* Wetland hydrology was indicated by drift deposits, drainage patterns, geomorphic position, and a positive FAC-neutral test.
PUB	7.29	Characterized by a combined areal cover of less than 30 percent of vegetation. Common vegetation included sawtooth blackberry *(Rubus argutus),* narrow-leaf cattail black willow (*Salix nigra*), eastern red cedar (*Juniperus virginiana*), and common persimmon. *Wetland h*ydrology was indicated by surface water, inundation visible on aerial photography, and geomorphic position.
PAB	2.39	Characterized by a combined areal cover of 30 percent or greater of vegetation. Common vegetation included Johnson grass *(Sorghum halepense)*, annual ragweed *(Ambrosia artemisiifolia)*, and American lotus *(Nelumbo lutea). Wetland h*ydrology was indicated by surface water, inundation visible on aerial photography, and geomorphic position.

[1]Symbols for wetland type: PEM = palustrine emergent, PSS= palustrine scrub-shrub, PUB = palustrine unconsolidated bottom, PAB = palustrine aquatic bed.
[2]Source: Cowardin et al 1979
[3]Source: Descriptions as observed by Burns & McDonnell onsite wetland delineations completed June 21-22 and July 25-26, 2023.

Table 3-4: Streams Identified within the Survey Area

Stream Type	Delineated Length (Feet)	Characterization[1]
Ephemeral	941	A defined bed and bank but had limited or no flow during the site visit, indicating that the stream largely carries water only during and after precipitation events. Common riparian vegetation included cheatgrass (*Bromus tectorum*), big bluestem (*Andropogon gerardi*), tall goldenrod (*Solidago altissima*), Johnson grass, and eastern red cedar.
Intermittent	1014	The presence of a limited volume of flow at the time of the site visit, indicating that the stream is partially fed by groundwater but that the streams may not flow during dry periods. Common riparian vegetation included Johnson grass and common greenbrier (*Smilax rotundifolia*).
• Perennial	• 105	• The presence of a substantial volume of flow at the time of the site visit, indicating that water likely flows year-round. Common riparian vegetation included Johnson grass.

- [1]Source: Characterizations as observed by Burns & McDonnell onsite wetland delineations completed June 21-22 and July 25-26, 2023.

No other wetlands, water bodies, or other aquatic resources have been identified within the Survey Area except for as noted above. Coordination with U.S. Army Corps of Engineers (USACE) resulted in concurrence with this determination (Appendix D).

3.3.2 Environmental Consequences

The following sections summarize potential environmental consequences of the proposed Action Alternatives and No Action Alternative related to wetlands and water bodies.

3.3.2.1 Proposed Action Alternatives

AECI has selected suitable locations for laydown staging that will be necessary for construction of this Project to avoid any wetlands impacts. The Project Site has been selected to avoid and minimize wetland impacts as much as practical. Two existing surface waters (ponds) on the project site may receive civil engineering design and work to restore integrity and designed receiving flow. It is likely there will be removal of overgrown vegetative trees, consisting of Eastern Red Cedar, Black Willow, Sycamore, Hackberry, Greenbriar. These ponds have been determined to be non-jurisdictional through consultation with USACE (Appendix D). This action is anticipated to be beneficial to the long-term functioning of the ponds. Any wetlands or streams occurring near transmission line upgrades or construction will be spanned and no fill will enter the waterbody. Thus, construction and operation of the proposed Project will have no effects on jurisdictional wetlands, and there are no permits anticipated to be required for the Project.

3.3.2.2 No Action Alternative

The No Action Alternative would have no short- or long-term impacts to wetlands and water bodies at or in the vicinity of the Project because no construction or operation would occur.

3.3.3 Mitigation

As construction and operation of the proposed Project will restore the function of the non-jurisdictional ponds using best management practices, it is anticipated there will be no significant impacts on wetlands and no mitigation measures are required.

3.4 Water Resources

3.4.1 Affected Environment

Surface Waters, Water Supply, and Discharge

As discussed in Section 3.3: Wetland and Water Bodies there are surface waters present within the Project Boundary. However, these are not sources that are viable for water supply and sitting has been selected to avoid permanently impacting these sources.

A rural district supply of water is the most viable option for the Ripley Energy Center. The Oklahoma Water Resources Board (OWRB) Rural Water Systems website was accessed to determine an appropriate nearby public water source (OWRB, 2022). A water pipeline crosses the Project Boundary, and the site is generally located within an existing rural water district, 51 East Corp. Therefore, upgrading and tapping the existing water pipeline of 51 East Rural Water District appears to be the most viable option for the site.

The City of Stillwater's Utilities Department was contacted on December 1, 2022, by Burns & McDonnell to verify water supply availability for the Project. According to the Water Department Supervisor of Stillwater, Kelly Hitch, the city is open to supplying the Project 300 gallons per minute (gpm); however, this would be dependent on the water levels at the time of development.

Groundwater

The Project Boundary does not directly overlie any major or minor alluvial or bedrock aquifers as designated by OWRB, and also doesn't directly overly any sole source aquifers according to NEPAssist (see Appendix A) and therefore groundwater is not readily available.

Water Quality

The Site's water will be supplied by the 51 East Rural Water District. The rural water district sources their water from two locations, 1.) The City of Stillwater and 2.) Lone Chimney Lake. The City's raw water supply comes from Kaw Lake, which is located approximately 10 miles east of Ponca City in Kay County. Raw water from Kaw Lake is transported to the City's treatment facility. Water to be provided to the site is potable. There are no 303d waterbodies (i.e., waterbodies that do not meet water quality standards) within or adjacent to the property. Lone Chimney Lake provides another source of raw water supply to the 51 East Rural Water District. Located approximately five (5) miles east of Glencoe in Payne and Pawnee Counties, the raw water is treated and transported by the water district's treatment facility. This water is also provided to the site as potable water.

3.4.2 Environmental Consequences

The following sections summarize potential environmental consequences of the proposed Action Alternatives and No Action Alternative related to water resources.

3.4.2.1 Proposed Action Alternatives

Construction

There are minimal surface water resources near the Site. The two small surface waters totaling approximately five (5) acres may receive civil design work to restore design and surface flow integrity.

AECI will follow best management practices (BMP) during construction. BMPs may include silt fence, inlet protection, straw wattle barriers, riprap, erosion control blankets, and other erosion and sediment control measures as necessary. Appropriate sediment and erosion control BMP will be installed prior to initiating soil-disturbing activities, such as installation of new foundations and concrete pads. All BMP will be maintained as necessary throughout Project construction.

Construction activities from the Project will not impact the groundwater at the Site. Accordingly, no lowering of the groundwater level will be required during construction.

A new 8-inch high-density polyethylene water pipeline, approximately 1 mile in length, will be constructed to replace an existing smaller pipeline that attaches to the 51 East Rural water District.

Operation

No groundwater would be used for the Project. There would be no impact to groundwater. The Project is expected to use approximately 150 gallons of water per minute, from 51 East Rural Water District, at maximum operation in the rare instance the facility is operating on fuel oil. The majority percentage of water use will be below 150 gallons of water per minute for operations. Water will be used at the site for process water and sanitary purposes. Wastewater streams include process water, sanitary water, and stormwater. Engineering determinations are still being made to decide final wastewater pathways.

Facility waste streams (i.e., toilets, sinks, etc.) are directed to an onsite septic system with lateral fields. The proposed Project process water and stormwater will result in discharged liquids to an onsite settling pond. Drains for areas around equipment that could be contaminated with oil would be gravity drained and directed through oil/water separators prior to discharge to the settling pond. The outfall from the settling pond is expected to be the point of compliance for the facilities water permit and will be directed to a second pond that already exists on site that would decant into a smaller third pond that already exists onsite and will ultimately leave the site via the discharge from this third pond. These ponds are not expected to contribute as water treatment for the facility's National Pollutant Discharge Elimination System (NPDES) Permit.

The proposed Action Alternative will have no effect on the water quality or the impairment status of the surrounding areas.

3.4.2.2 No Action Alternative

The No Action Alternative would have no short- or long-term impacts to water resources at or in the vicinity of the Project because no construction or operation would occur.

3.4.3 Mitigation

Construction and operation of the proposed Project is not anticipated to have any adverse impacts on surface waters or groundwater. AECI will employ good water management practices during construction and operation. No mitigation is required.

3.5 Coastal Resources

3.5.1 Affected Environment

The Facility is proposed to be located in an area where there are no coastal resources.

3.5.2 Environmental Consequences

As there are no coastal resources near the proposed Project, there is no potential for environmental consequences of the proposed Action Alternatives related to biological resources.

3.6 Biological Resources

The biological resources of the area surrounding the Project along with the impacts on biological resources because of the Project are discussed in the following sections.

3.6.1 Affected Environment

The following sections discuss vegetation, wildlife, and special status species within the Study Area.

3.6.1.1 Vegetation

The Project Area is within the Cross Timber Transition level IV ecoregion as mapped by the U.S. Environmental Protection Agency (Wood et al., 2005). The Survey Area is dominated by grassland/herbaceous land. The hay fields are subject to regular disturbance through agricultural practices and haying. Common vegetation in the Survey Area included Johnson grass (Sorghum halepense), cheatgrass (Bromus tectorum), big bluestem (Andropogon gerardii), Carolina joint-tail grass (Coelorachis cylindrica), prairie bundle-flower (Desmanthus illinoensis), coral-berry (Symphoricarpos orbiculatus), rough-leaf dogwood (Cornus drummondii), saw-tooth blackberry (Rubus argutus), common persimmon (Diospyros virginiana), flat-stem spike-rush (Eleocharis compressa), blunt spike-rush (Eleocharis obtusa), eastern cottonwood (Populus deltoides), false daisy (Eclipta prostrata), little bluestem (Schizachyrium scoparium), American germander (Teucrium canadense), and green ash (Fraxinus pennsylvanica). There are no vegetation species listed as federally threatened or endangered in Payne County.

3.6.1.2 Wildlife

A habitat assessment survey was completed to evaluate the potential for special-status species or their critical habitat to occur within or in the vicinity of the Project Area (Appendix C). Special-status species are defined as species designated by the USFWS as Endangered,

Threatened, Proposed for Listing or Candidate for Listing under the Endangered Species Act (ESA) and species protected under the Bald and Golden Eagle Protection Act (BGEPA).

Based on special-status species lists generated from the sources shown below, a habitat assessment was completed to evaluate the potential for special-status species to occur within the Project Area and its vicinity and to determine the presence or absence of designated or proposed critical habitat. The habitat assessments were based on review of the following sources and field observations:

- The natural history and known geographical and elevation range of the special-status species.
- USFWS Information for Planning and Consultation (IPAC) tool used to determine protected or likely to be protected under the ESA that are known or likely to occur in the Project Vicinity.
- Results of an Oklahoma Department of Wildlife Conservation (ODWC) listed species and known critical habitat and the Oklahoma National Heritage Inventory (OHNI) online review to identify known occurrences of protected species.
- Observations recorded by Burns & McDonnell during field reconnaissance on June 21-22 and July 25-26, 2023, of the habitats present in the Project Area (Appendix C)

In total, eight ESA species and two BGEPA listed species were evaluated for their potential to occur in the Project Area. Table 3-5 shows ESA-listed, proposed, and candidate species and designated or proposed critical habitat considered for potential to occur in the Project Area. Final critical habitat for federally protected species has not been designated by the USFWS in the vicinity of the site.

Table 3-5: Payne County Federally Threatened and Endangered Wildlife Species

Common Name (*Scientific Name*)	Federal Status (USFWS)	Known Suitable Habitat	Effect / Potential to Occur
Birds			
Piping Plover *(Charadrius melodus)*	Federally Threatened	The Piping Plover forages in shallow wetlands, lakes, rivers and nests on sandbars and gravel bars (USFWS, 2023b).	No effect. The Project lacks the appropriate habitat for this species. Lake Carl Blackwell, approximately 20 miles west of the Project, has recent records of Piping Plover activity.
Red Knot *(Calidris canutus rufa)*	Federally Threatened	The Red Knot is a small migratory shorebird that uses open salt flats, sandbars, beaches, and shallow wetlands associated with major waterways and reservoirs (USFWS, 2023c).	No effect. Although the species has the potential to migrate through the Project Area, it is not a known nesting species in Oklahoma. Additionally, the Project

Common Name (*Scientific Name*)	Federal Status (USFWS)	Known Suitable Habitat	Effect / Potential to Occur
			will not span the Cimarron River and will not impact sandbars, beaches, or shallow wetlands associated with the river.
Bald Eagle[1] (*Haliaeetus Leucocephalus*)	Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c)	Breeding is concentrated in coastal areas, along rivers, lakes or reservoirs. Typically breeds in forested areas with edge habitat within 1.3 miles of aquatic habitats suitable for foraging. Prefers areas of shallow water and shorelines for fishing and hunting wide variety of waterfowl, and small aquatic and terrestrial mammals. Fish are preferred prey, but carrion is used extensively whenever encountered. Nests away from human disturbance in large trees and rarely on cliff ledges or on the ground when trees are absent. Winters primarily in coastal areas or along major river systems with adequate prey availability and large trees for perching (Buehler, 2020).	No effect. The Project Area lacks appropriate aquatic habitats within 1.3 miles and there are no bald eagle nests were observed within the vicinity of the Project Area.
Golden Eagle[1] (*Aquila Chrysaetos*)	Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c)	Range-wide, breeds in a wide variety of open habitats, with nests typically on cliffs, and avoids heavily forested areas (Katzner et al., 2020). Constructs large nests on cliff ledges, rock outcrops, tall trees or, rarely, transmission towers (Driscoll, 2005). Golden eagles are known to forage within 4.4 miles of the nest (Tesky, 1994), generally in open habitats where prey is available (Katzner et al. 2020). Primarily feeds on small mammals (greater than 80% of prey items) but also consumes birds, reptiles, and fish (Katzner et al., 2020).	No effect. The Project Area is within the winter range of the Golden Eagle, but they would likely be temporary visitors. The Project Area lacks preferred nesting habitat but may be used infrequently as foraging habitat.
Fish			
Peppered Chub (*Macrhybopsis tetranema)*	Federally Endangered	A relatively small, streamlined minnow that occurs in the main channels of large rivers, preferring clean, sandy substrate. Appears to use headwaters and avoid calm, silted bottom waters. (KDWP, 2023).	No effect. The USFWS has designated critical habitat in Payne County in the Cimarron River. The Project will not cross or impact designated critical habitat.
Arkansas River Shiner (*Calidris canutus rufa)*	Federally Threatened	A relatively small, streamlined minnow that occurs in the wide and shallow rivers of Arkansas River basin. Prefers to stay near sand bars and sandy ridges; rarely goes into main river channels (ODWC, 2023)	No effect. There are no designated Critical habitats within Payne County.
Insects			

Common Name (*Scientific Name*)	Federal Status (USFWS)	Known Suitable Habitat	Effect / Potential to Occur
American Burying Beetle (Nicrophorus americanus)	Federally Threatened	Generally found in upland grassland prairies with an abundance of carrion. American Burying Beetles typically occur in loose sandy or clay loam soils that are suitable for excavation and construction of brood chambers (USFWS, 2023d).	No effect. According to USFWS, the Project Area occurs within an area of historic occurrence of the American Burying Beetle. The Project Area contains open grassy areas associated with hayfields; however, is regularly disturbed by agricultural activities. Further, the project does not occur within the boundary of USFWS-defined conservation lands for the American burying beetle,
Monarch butterfly (*Danaus plexippus*)	Federal Candidate for Listing	Monarch caterpillars feed exclusively on plants in the subfamily Asclepiadoideae (milkweed) and adults forage for nectar on a wide variety of flowers. This species can be found wherever milkweed occurs. Overwintering populations use the leaves, branches, and trunks of large trees within forested groves. In California, both native tree species and eucalyptus trees are utilized (Jepsen et al., 2015).	May affect but is unlikely to adversely affect. The Project Area has the appropriate milkweed habitat typically associated with breeding, but the identified locations are subject to regular disturbance through agricultural practices and haying. The Project could result in fragmentation of suitable habitat.
Mammals			
Tricolor Bat (*Perimyotis subflavus)*	Federally Proposed for Listing as Endangered	The tricolored bat hibernates in caves or abandoned mines during the winter. During spring, summer, fall, the bats roost among live and dead leaf clusters in trees of hardwood forested habitats including pine trees, easter red cedar trees, and structures such as barns, sheds, under bridges, or in other buildings that have little human disturbance. Foraging habitats include forest edges and riparian corridors. (USFWS, 2023e)	May affect but is unlikely to adversely affect. The Project Area supports leaf clusters and cedar trees suitable for tricolored bat roosts. However, critical habitat has not been designated by ODWC within Payne County. Conducting tree clearing during bats' inactive season is generally recommended as a conservation measure.
Reptiles			
Alligator Snapping Turtle	Federally Proposed for Listing	The species range occupies the eastern third of Oklahoma. The Alligator Snapping Turtle is known to occur in perennial water bodies such as large	No effect. The Project Area seems to support the appropriate

Common Name (*Scientific Name*)	Federal Status (USFWS)	Known Suitable Habitat	Effect / Potential to Occur
	as Threatened	rivers, canals, reservoirs, oxbows, and bonds near running water (MDC, 2023).	habitat associated with Alligator Snapping Turtles, but Project Siting as proposed has been routed to reduce direct impacts to wetland habitats.

Source: U.S. Fish and Wildlife Service, IPAC report accessed February 23, 2024, Oklahoma Department of Wildlife Conservation Field Guide accessed February 23, 2024, Oklahoma National Heritage Inventory accessed February 23, 2024.
[1]BGEPA Listed Species.

A field-based habitat assessment was completed on June 21-22 and July 25-26, 2023, to evaluate the potential for special-status species or their critical habitat to occur within or in the vicinity of the Project Area (Appendix C).

3.6.2 Environmental Consequences

The following sections summarize potential environmental consequences of the proposed Action Alternatives and No Action Alternative related to biological resources.

3.6.2.1 Proposed Action Alternative

3.6.2.1.1 Vegetation

Since the Project is located on a site that has been continuously hayed and disturbed it is not a suitable habitat for vegetation to grow and flourish. Approximately 30 acres of the site will be fully disturbed once construction of the Project is complete. It is anticipated that the remaining areas of the site will continue to be hayed. Therefore, the amount or type of vegetation onsite is not expected to significantly change due to the Project. It is expected that construction-related disturbances from the Project will not provide an opportunity for the establishment of invasive species as the area will not be conducive to the growth of vegetation.

3.6.2.1.2 Wildlife

In total, eight ESA species and two BGEPA listed species were evaluated for their potential to occur in the Project Area. One candidate and one federally proposed endangered ESA listed species were determined to have potential to occur in the Project Area. No BGEPA species had the potential to occur on the Project Area.

As indicated above in Table 3-5, there is no habitat for federally endangered or threatened species as identified in the IPAC report dated February 23, 2024, at the Project Site. Therefore, the proposed Project will have no effect on protected species or their critical habitats; nor will the proposed Project result in short - or long-term impacts to protected species or critical habitats that may occur in Payne County. While there is suitable habitat for some endangered, threatened, or candidate species in the Project area, no impacts are anticipated to federally listed species that may occur in Payne County if avoidance techniques like tree clearing in the winter is performed.

For the two BGEPA listed species evaluated, bald eagle was determined to have a potential to occur of **Unlikely** as no bald eagle nests were observed within the vicinity of the Project Area during the habitat assessment. Golden eagles were determined to have potential to occur of **None** but may be observed as temporary visitors.

As referenced in Table 3-5, the proposed Project will have no short- or long-term impacts to migratory birds or eagles as there is no suitable habitat on the Project Site, and construction is not anticipated to result in any long-term impacts to wildlife at the Site. Noise and human activity that are associated with construction may result in short-term, temporary displacement impacts to wildlife species foraging in the area. Ongoing operations are not likely to have great impacts to surrounding species.

3.6.2.2 No Action Alternative

The No Action Alternative would have no short- or long-term impacts to biological resources at or in the vicinity of the Project because no construction or operation would occur.

3.6.3 Mitigation

3.6.3.1 Vegetation

As construction and operation of the proposed Project will have minimal impacts to on-site vegetation and will not lead to the introduction of invasive species, no mitigation measures will be necessary.

3.6.3.2 Wildlife

Construction and operation of the proposed Project will have no impacts to listed threatened or endangered species, migratory birds, or eagles. Good conservation practices such as tree clearing during the tricolor bats' inactive season will be implemented as needed. Should instances such as the observation of an active bald eagle nest occur during construction activities, AECI will work with the USFWS to minimize potential impacts. No impacts to listed threatened or endangered species, migratory birds, or eagles are expected to occur within the Project Site; however, bird diverters will be installed on transmission lines near water bodies to minimize accidental collisions.

3.7 Historic and Cultural Resources

3.7.1 Affected Environment

In accordance with Section 106 of the National Historic Preservation Act and 36 CFR Section 800.1, federal agencies are required to consider the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings. If there is more than one federal agency, a lead federal agency may be designated to act for all of the federal agencies. The federal agency or lead federal agency is responsible for coordination with consulting parties which may include the State Historic Preservation Office (SHPO), Tribal Historic Preservation Officers (THPO) if tribal land is involved, Indian Tribes, the public, the ACHP, local governments, and applicants.

The following investigations have been completed to assist the federal agency in their compliance with Section 106. The area of potential effect (APE) has been defined as the entirety of the Ripley property, the proposed corridors for transmission line construction and rebuild, the proposed corridor for a new natural gas supply pipeline, and the proposed work area at the substation in Stillwater, OK for connection of the transmission line was subject to a Phase I cultural resources investigation (the "Project Area"). The total area for this investigation is 223.15 acres.

The cultural resources investigation was designed to conform with the Osage Nation Historic Preservation Office Archaeological Survey Standards. The first part of this investigation consists of a background review of previously recorded cultural resources and previously reported cultural resources surveys in a Study Area consisting of the Project Area and a 1-mile buffer around it. The second part of the investigation consists of the field survey of the Project Area to include systematic shovel testing at 30-meter (m) intervals in block parcels and at 100-m intervals in linear corridors less than 30-m wide.

RUS defined the APE for the Project as an area that includes all Project construction and excavation activity required to construct, modify, improve, or maintain any facilities; any right-of-way or easement areas necessary for the construction, operation, and maintenance of the Project; all areas used for excavation of borrow material and habitat creation; and all construction staging areas, access routes, utilities, spoils areas, and stockpiling areas. Impacts that come from the undertaking at the same time and place with no intervening causes, are considered "direct" regardless of its specific type (e.g., whether it is visual, physical, auditory, etc.). "Indirect" effects to historic properties are those caused by the undertaking that are later in time or farther removed in distance but are still reasonably foreseeable.

Based on this definition, the APE consists of the approximately 0.25-acre area of the substation expansion, the 1,500-foot new transmission line and existing transmission line upgrades, the 0.5-mile distribution line upgrades, 150-foot natural gas pipeline, 1-mile water line, and the approximately 160 acres where the site would be located, as shown in the enclosed maps. The APE does not include any tribal lands as defined pursuant to 36 CFR § 800.16(x). This definition was submitted to the SHPO and THPOs in the agency coordination letters sent June 15, 2023, with a follow-up letter sent to the Oklahoma Archaeological Society and the Oklahoma SHPO on November 29, 2023.

The cultural resources inventory fieldwork was conducted in four parts: 1) June 21-22, 2023, to begin shovel testing at the Ripley property, 2) July 10-14, 2023, to complete shovel testing at the Ripley property, 3) July 25-27, 2023, to complete the survey of the transmission line, substation, and natural gas pipeline, and 4) October 24-26, 2023, to complete the survey of the water supply pipeline corridor. The surveys were conducted by archaeologists Michael H. Davis, Bruce Darnell, Thane Reid, Abdisalam Mohamud, Zoe Pruden, and Victoria Shaw. A total of 829 shovel tests were excavated in the APE. No archaeological sites, features, or artifacts were identified.

The survey area is located within the Northern Limestone-Cuesta Plains physiographic province in Oklahoma. The landscape consists of a broad, upland plain dissected by numerous intermittent streams that form a series of shallow valleys. Irregular, level plains that trend north-northwest to south-southeast have been carved by these valleys. Within the APE, there are headwaters to several intermittent streams which have been dammed to create

small reservoirs and pasture ponds. A 4.8-acre pasture pond located along the west edge of the Site represents the largest body of standing water in the APE.

3.7.2 Environmental Consequences

The following sections summarize potential environmental consequences of the proposed Action Alternatives and No Action Alternative related to historic and cultural resources.

3.7.2.1 Proposed Action Alternative

Based on no findings during background research and field surveys, the cultural report was submitted to the SHPO. SHPO stated a finding of no adverse effect was appropriate.

The cultural report and findings of no adverse effect were presented to the following tribes for concurrence:

- Apache Tribe of Oklahoma
- Cherokee Nation
- Cheyenne and Arapaho Tribes
- Muscogee (Creek) Nation
- Osage Nation
- Otoe-Missouria Tribe of Indians, Oklahoma
- Wichita and Affiliated Tribes

The tribes that responded to Section 106 consultation requests concurred with this finding.

Therefore, construction and operation of the proposed Project is expected to have no adverse effects on any historic or cultural properties.

3.7.2.2 No Action Alternative

The No Action Alternative would have no short- or long-term impacts to historic and cultural resources at or in the vicinity of the Project because no construction or operation would occur.

3.7.3 Mitigation

Avoidance of any identified historic or cultural resources is recommended for the proposed Project.

If avoidance is not possible, it is recommended that a testing and data recovery plan be developed and implemented to mitigate impacts to the sites. No further archaeological work is recommended for the site. All ground-disturbing activities have the potential to unearth human remains

As construction and operation of the proposed Project will have no impacts on historic or cultural properties, no mitigation measures are necessary. Should any material of historical significance be discovered during construction activities, appropriate steps will be taken following the reviewed Unanticipated Discovery Plan (UDP)

3.8 Aesthetics

3.8.1 Affected Environment

The Project Site is primarily undeveloped pasture/hay and grassland/herbaceous areas, bordered by two highways. To the south of the Site is an existing transmission line. There is an existing natural gas pipeline that runs through the Site and another that borders the eastern edge of the property. There is gently rolling topography with minimal trees and an older pole barn on the property. The properties surrounding the Site are similar in composition and are primarily composed of pasture/hay lands and grassland/herbaceous areas. There are two ponds onsite with some treed areas around the banks. The 0.5 mile of new transmission line traverses the same topography with intermixed thickets of eastern red cedar.

The transmission line upgrades will all occur in an existing ROW that already contains a transmission line. The water line upgrades will occur directly parallel with existing water line ROW.

3.8.2 Environmental Consequences

The following sections summarize potential environmental consequences of the proposed Action Alternatives and No Action Alternative related to aesthetics.

3.8.2.1 Proposed Action Alternative

The aesthetics of the surrounding area would be altered by the Project. Vegetation would need to be cleared and light emissions at the Project Site would increase compared to current levels of light emissions, as a result of facility lighting. The stack at the facility, other facility equipment, transmission line structures, and switching station would introduce new features to the landscape. The project is not anticipated to significantly impact any visual resources of the surrounding areas.

3.8.2.2 No Action Alternative

The No Action Alternative would have no short- or long-term impacts to aesthetics at or in the vicinity of the Project because no construction would occur.

3.8.3 Mitigation

Construction will have temporary visual impacts. Once the Project is built, there will be long-term aesthetic changes associated with the new facilities. AECI intends to leave the majority of existing tree rows bordering the property in place to work as a visual buffer, no other mitigation measures are proposed.

3.9 Air Quality

The air quality of the area surrounding the Project and the impacts of the Project on air quality are discussed in the following sections.

3.9.1 Affected Environment

According to the Koppen climate classification, the Project Site is in the Northern Hemisphere's Humid Subtropical zone. Features of this zone include generally warm and

humid summers with mild winters. Periods of extreme cold are infrequent and typically do not last more than a few days. There are no significant precipitation differences between seasons and dry months in the summer. Winter precipitation is dominated by rainfall that tends to be widespread, continuous, and uniform in intensity and tied almost exclusively to synoptic-scale systems. Summertime precipitation is heavy and intense in nature produced by individual thunderstorms or thunderstorm complexes. Average annual rainfall in Payne County is 37.34 inches (Oklahoma Climatological Survey, 2021).

The federal government established the National Ambient Air Quality Standards (NAAQS) under the Clean Air Act (CAA) to protect public health (including the sensitive populations such as asthmatics and the elderly), safety, and welfare from known or anticipated effects of eight air pollutants: sulfur dioxide (SO_2), particulate matter 10 microns or less in diameter (PM_{10}), particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), carbon monoxide (CO), nitrogen dioxide (NO_2), ozone, lead (Pb), and greenhouse gases (GHGs). The Significant Impact Level (SIL) and NAAQS thresholds are listed in Table 3-6, below.

Table 3-6: NAAQS and SIL Thresholds

Pollutant[a]	Averaging Period	NAAQS[b] ($\mu g/m^3$)[e]	SIL[c,d] ($\mu g/m^3$)
SO_2	3-hour	1300	25
	1-hour	196	7.8[f]
PM_{10}	24-hour	150	5
$PM_{2.5}$	Annual	12	0.3
	24-hour	35	1.2
CO	8-hour	10,000	500
	1-hour	40,000	2,000
NO_2	Annual	100	1
	1-hour	188	7.52 [f]
Lead	Rolling 3-	0.15	--

(a) SO_2 = sulfur dioxide, PM_{10} = particulate matter 10 microns or less in diameter, $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter, CO = carbon monoxide, NO_2 = nitrogen dioxide
(b) NAAQS = National Ambient Air Quality Standards
(c) SIL = Significant Impact Level
(d) SIL values listed are for Class II areas
(e) $\mu g/m^3$ = micrograms per cubic meter
(f) interim SIL value

The entire state of Oklahoma is in attainment, meaning that the area follows federal clean air standards. The closest air quality monitoring site is approximately 47 miles to the southwest of the Site operated by the Oklahoma Department of Environmental Quality (ODEQ) Air Quality Division located at the Oklahoma Christian University in Oklahoma City, OK. This site monitors pollutants CO, NO_x, SO_2, $PM_{10}/PM_{2.5}$, and ozone.

3.9.2 Environmental Consequences

The following sections summarize potential environmental consequences of the proposed Action Alternatives and No Action Alternative related to air quality.

3.9.2.1 Proposed Action Alternative

Construction and operation of the proposed gas turbine at the Project Site would be subject to applicable state and Federal air quality regulations. These regulations would apply to the Project equipment (one SGT6-9000HL). Regulations applicable to the proposed Project are Oklahoma Administrative Code: Title 252. Department of Environmental Quality Chapter 100. Air Pollution Control, Title V Operating Permits, New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAP), and Maximum Achievable Control Technology (MACT). The following sections provide potential environmental consequences of construction and operation of the Proposed Action related to air quality.

Construction

Air emissions from the construction of the Project will occur due to 1) vehicular emissions from increased traffic from the construction work force and construction deliveries, 2) internal combustion engine emissions from construction equipment, and 3) fugitive dust (PM_{10} and $PM_{2.5}$) emissions from excavating, site preparation, and storage piles. These emissions from construction activities can be difficult to quantify, as they are dependent on the number and type of construction vehicles in operation at any given point during construction, the number of construction workers driving to and from the Site, and the number and type of construction activities occurring. AECI submitted a Construction Permit Application, which received a completeness determination from ODEQ on March 26, 2024.

Generally, air emissions from construction are low and temporary in nature, fall off rapidly with distance from the construction site, and will not result in any long-term impacts.

Operation

AECI proposes installing a single 421-MW Siemens SGT6-9000HL (60 Hz) simple-cycle combustion turbine to be constructed on a greenfield site. A Siemens SGT6-9000HL (60 Hz) simple-cycle combustion turbine with a maximum heat input of 3,674 million British thermal units per hour (MMBtu/hr), higher heating value (HHV) (3,312 MMBtu/hr lower heating value [LHV]) will be installed as part of the Project. The SCGT will be capable of firing both natural gas and fuel oil. Additionally, it is expected that the turbines will have as many as 730 total startup/shutdown events per year. The combustion turbines will install Continuous Emission Monitoring Systems (CEMS) to monitor emissions of NO_x.

Operation will be restricted to complying with the NSPS Subpart TTTT capacity limitations. Subpart TTTT regulates carbon dioxide (CO_2) emissions from electric generating units under the NSPS (Clean Air Act 111b regulations). The standard provides a limit for natural gas-fired combustion turbines. A newly constructed (commenced construction after January 8, 2014) natural gas-fired combustion turbine that combusts more than 90% natural gas on a 12-operating month rolling average, is limited to 450 kilograms of CO_2 per megawatt-hour of gross energy output (1,000 pounds of CO_2 per megawatt hour) on a 12-operating month rolling average basis if supplying more than its design efficiency times its potential electric output as net-electric sales (typically). If a combustion turbine cannot meet this limit, then

alternative limits apply. Table 2 in Subpart TTTT displays the limit of 120 pounds of CO_2 per million British thermal unit (lb/MMBtu) for natural gas-fired turbines (combusting 90% or more natural gas) that supply its design efficiency times its potential electric output or less as net electric sales. Basically, the combustion turbine is limited to its design efficiency, which, based on information from Siemens, is 43% (ISO, baseload, LHV). Thus, on a 3-year average, the turbine is limited to 43% annual capacity based on heat input. Therefore, the turbine must meet 120 lb/MMBtu CO_2 limit.

The combustion turbines will have an SCR system to control emissions of NO_x and an oxidation catalyst to control emissions of CO. To minimize the emissions of SO_2 and $PM/PM_{10}/PM_{2.5}$, the SCGT emissions will be controlled through the use of pipeline quality natural gas and good combustion practices as specified by the manufacturer. Greenhouse gas emissions will be minimized with the use of natural gas as the only fuel, with fuel oil only being used in emergencies.

The potential emissions from the SCGT were analyzed at 100%, 75% and 30% load on natural gas, and 100% and 70% on fuel oil. The overall emissions were compared to the Prevention of Significant (PSD) Significant Emission Rate Thresholds (SER). If a pollutant exceeds the SER, then that pollutant will trigger the need for PSD review for that pollutant, which includes air dispersion modeling, Best Available Control Technology (BACT) analysis, and other permitting tasks.

The worst-case, future potential-to-emit calculations were performed for each pollutant for the Project and are listed Table 3-7. Because the potential emissions of criteria pollutants are below the PSD permitting threshold, the Project does not trigger the PSD permitting process. Accordingly, no BACT analysis was required. However, as the potential emissions for CO, NO_x, SO_2, and $PM/PM_{10}/PM_{2.5}$ are above the permitting exemption threshold, the Project does not meet the definition of a Permit Exempt Facility as defined by Oklahoma Administrative Code (O.A.C) 252:100-7-1.1. The Project is expected to exceed the 100 tpy threshold for at least two criteria pollutants and therefore will be considered a Part 70 Major source per O.A.C 252:100-8-2. AECI has elected to meet the permitting requirements of O.A.C 252:100-8-4 through 6 by **the submission of a Tier II construction permit application** which received a completeness determination from ODEQ on March 26, 2024. AECI will apply for a Part 70 operating permit at the appropriate time. As required, a state-level BACT and modeling analysis was submitted as part of the permit application package.

Table 3-7: Total Project Emission Summary

Pollutant[a]	Potential Project Emissions (Tons per Year [TPY])[b]	PSD Significant Emission Rate Thresholds (TPY)	PSD Review Applicable (Yes, No)	Permitting Exemption[e] Threshold (TPY)	Minor New Source Review Analysis Applicable (Yes, No)
NO_X	249[f]	250	No	40	Yes
CO	228	250	No	40	Yes
SO_2	46	250	No	40	No
VOC	28	250	No	40	No
PM/PM_{10}[c]/$PM_{2.5}$[c]	61	250	No	40	Yes/Yes
CO_2e	824,886[g]	75,000[d]	No	N/A	N/A

(a) NO_x = nitrogen oxides; CO = carbon monoxide; SO_2 = sulfur dioxide; VOC = volatile organic compounds; PM= total particulate matter; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
(b) Numbers in bold indicate the Significant Emission Rate significance level is exceeded.
(c) Filterable plus condensable
(d) If the Project does not trigger PSD for any other pollutant, the CO_2e PSD threshold does not apply per Utility Air Regulatory Group vs EPA (Case#12-1146, June 23, 2014 before the Supreme Court of the United States Court).
(e) Oklahoma DEQ Air Quality Division Permit Applicability
(f) The project will take a limit of 249 tpy NO_x.
(g) CO_2e based on 40 CFR TTTT restrictions.

NESHAP are contained in 40 CFR Part 63. NESHAP are emissions standards set by the U.S. Environmental Protection Agency (EPA) for specific source categories. The NESHAP require the maximum degree of emission reduction of certain hazardous air pollutant (HAP) emissions that the EPA determines to be achievable, which is known as the MACT standards.

The facility is expected to be a minor source of HAPs (less than 25 tons per year of total HAPs and less than 10 tons per year of any single HAP). Therefore, the facility is not subject to MACT standard Subpart YYYY: National Emission Standards for HAPS for Stationary Combustion Turbines.

The acid rain provisions of the CAA Amendments are specified in 40 CFR Part 72 through 78. The requirements are applicable to utilities and other facilities that combust fossil fuel (mainly coal) and generate electricity for wholesale or retail sale. Often referred to as the Acid Rain Program, the program establishes the reduction of emissions of acid rain forming pollutants, specifically, SO_2 and NO_x emissions. AECI will be subject to the Acid Rain Program for the natural gas-fired combustion turbine located at the facility.

The Project will be subject to the Acid Rain Program because the combustion turbines are considered a utility unit under the program definition and do not meet the exemptions listed in 40 CFR 72.6(b). The Acid Rain Program requires that the Project hold allowances for SO_2 per 40 CFR 72.9(c)(1) and conduct recordkeeping and reporting per 72.9(f). The continuous emission monitoring requirements of 40 CFR Part 75 establish requirements for the monitoring, recordkeeping, and reporting of SO_2, NO_x, and CO_2 per 40 CFR Part 75.1(a).

3.9.2.2 No Action Alternative

The No Action Alternative would have no short- or long-term impacts to air quality at or in the vicinity of the Project because no construction or operation would occur. However, there will still be a need for power capacity that will be obtained elsewhere, likely from existing fossil-fueled sources or new PPAs with fossil-fueled sources.

3.9.3 Mitigation

Construction activities will have air emissions, but are anticipated to be minimal outside of the construction areas, and are temporary in nature. The majority of the construction emissions will be from fugitive sources and construction equipment. Fugitive dust control measures could include, but are not limited to, the following:

- Applications of water;
- Paving or watering of roadways after completion of grading;
- Reduction in speed on unpaved roadways to 15 miles per hour or less; and
- Seeding of areas within 30 days of final grading establishment

For operations, the air emissions calculations have determined that the Project will not be a major PSD source but will require a Part 70 Major Source operating permit. All equipment will meet all applicable NSPS and NESHAP limits. The Project will include an SCR system to control NO_x emissions and an oxidation catalyst to control CO and VOC emissions. Good combustion practices and the use of clean fuels will mitigate emissions of SO_2, PM_{10} and $PM_{2.5}$. AECI submitted an air permit application for the Project to the ODEQ in December 2023 and will adhere to the conditions and requirements of the permit during operation of the Project.

3.10 Climate Change and GHG

Executive Order (EO) 14008, *Tackling the Climate Crisis at Home and Abroad*, was signed by President Biden on January 27, 2021. The EO focuses on prioritizing climate in foreign policy and national security and taking a government-wide approach to the climate crisis. The EO also establishes the National Climate Task Force, which "shall facilitate the organization and deployment of a Government-wide approach to combat the climate crisis. This Task Force shall facilitate planning and implementation of key Federal actions to reduce climate pollution; increase resilience to the impacts of environmental justice; and spur well-paying union jobs and economic growth."

EO 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*, was signed by President Biden on January 20, 2021. This EO directed the Council on Environmental Quality (CEQ) to rescind its draft guidance entitled *Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions* (84 Federal Register ["FR"] 30097). This previous draft guidance limited the consideration of long-term GHG emissions to expedite the NEPA process. The CEQ was also directed to review and update its guidance entitled *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews* (81 FR 51866). The CEQ issued additional guidance on January 9, 2023, titled, *National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change* (88 FR 1196) directing Federal agencies to consider all available tools and resources in assessing GHG emissions and climate change

effects of their proposed actions under NEPA. The public comment period was open until April 10, 2023.

This section describes the affected environment and potential environmental consequences related to GHGs and the potential implications of these emissions to influence climate change. Existing conditions and environmental consequences associated with other air emissions are addressed in Section 3.10 Air Quality of this document. Sources of GHGs include, but are not limited to, emissions from the construction of the power plant natural gas delivery infrastructure, upstream emissions from natural gas or fuel oil extraction and delivery pipelines, and additions to the local electrical transmission network.

Human activities such as the combustion of fossil fuels could contribute GHG emissions to the surrounding study area. Increases in GHG emissions have been proposed to change atmospheric chemistry, potentially leading to changes in climate, particularly a trend toward increased average temperatures around the globe. This Project will result in increased GHG emissions as shown in Table 3-8, below. However, when the project emissions are compared to state-wide GHG emissions, the increase in GHG emissions from this Project are minimal.

This section describes the affected environment and potential environmental consequences related to GHGs and the potential implications for these emissions to influence climate change. Existing conditions and environmental consequences associated with other criteria air pollutant emissions are addressed in Section 3.9 of this document.

3.10.1 Affected Environment

The Project would be located on a greenfield site in an area surrounded by a mix of undeveloped lands, residences, and agricultural activities. Air emission sources from the land uses surrounding the Site would include vehicular and agricultural activities. These activities generate a variety of air pollutants, many of which are identified, tracked, and regulated by the EPA under the Clean Air Act. In addition, several components of these emissions are identified as GHGs.

GHGs have been identified as contributing to the earth's temperature. Called the "greenhouse" effect, this is a naturally occurring phenomenon in which various gases in the earth's atmosphere (classified as GHGs) play a role in determining the earth's temperature. Solar radiation enters the earth's atmosphere from space and a portion of the radiation is absorbed by the earth's surface. The earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. GHGs, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are CO_2, methane (CH_4), nitrous oxide (N_2O), and fluorinated gases. Primary GHGs are discussed, as follows:

3.10.1.1 Carbon Dioxide (CO_2)

CO_2 is a colorless, odorless gas. It is emitted both naturally and through human activities. CO_2 is naturally present in the atmosphere as part of the earth's carbon cycle (the natural circulation of carbon among the atmosphere, oceans, soil, plants, and animals). While CO_2

emissions come from a variety of natural sources, an increase in CO_2 emissions has been recorded in the atmosphere since the industrial revolution. CO_2 is the primary GHG emitted through human activities, largely from the combustion of fossil fuels such as coal, oil, and gas. The transportation and energy sectors are the largest CO_2 emitters in the United States (EPA, 2023a). Energy production and support, agricultural production, and manufacturing are the biggest CO_2 emitters in the Project area (EPA, 2022).

3.10.1.2 Methane (CH_4)

CH_4 is a colorless, odorless gas that is not flammable under most circumstances. CH_4 is the major component of natural gas, about 87 percent by volume. In 2021, CH_4 accounted for about 12 percent of all United States GHGs from human activities (EPA, 2023a). Human activities emitting CH_4 include leaks from natural gas systems and the raising of livestock. CH_4 is also emitted by natural sources such as decomposition of vegetation, particularly in anerobic environments such as wetlands. In addition, natural processes in soil and chemical reactions in the atmosphere help remove CH_4 from the atmosphere. CH_4's lifetime in the atmosphere is much shorter than CO_2, but CH_4 is more efficient at trapping radiation than CO_2. Pound for pound, the comparative impact of CH_4 is more than 28 times greater than CO_2 over a 100-year period (EPA, 2023a). Methane is the primary GHG emitted during the extraction and production of natural gas and is a significant driver of current warming (Lackner et al., 2021). The largest sources of CH_4 in the project area are the transportation, energy, and agricultural sectors.

In addition to the transportation and use of natural gas, there are several agricultural areas near the Site. Agricultural activities that contribute to CH_4 are the combustion of fossil fuels in automobiles traversing the agricultural fields and in heavier farming machinery.

3.10.1.3 Nitrous Oxide (N_2O)

N_2O is a clear, colorless gas with a slightly sweet odor. In 2021, N_2O accounted for about 6 percent of all United States GHGs emissions from human activities (EPA, 2023a). Human activities such as agriculture, fuel combustion, wastewater management, and industrial processes are increasing the amount of N_2O in the atmosphere and are the largest sources of N_2O in the Project area. N_2O is also naturally present in the atmosphere as part of the earth's nitrogen cycle and has a variety of natural sources. N_2O molecules stay in the atmosphere for an average of 114 years before being removed by a sink or destroyed through chemical reactions. The impact of 1 pound of N_2O on warming the atmosphere is almost 265 times that of 1 pound of CO_2 (EPA, 2023a).

3.10.1.4 Fluorinated Gases

Unlike many other GHGs, fluorinated gases have no natural sources and only come from human-related activities. They are emitted through their use as substitutes for ozone-depleting substances (e.g., as refrigerants) and through a variety of industrial processes such as aluminum and semiconductor manufacturing. Many fluorinated gases have very high global warming potentials (GWPs) relative to other GHGs, so small atmospheric concentrations can have disproportionately large effects on global temperatures (EPA, 2023a). They can also have long atmospheric lifetimes—in some cases, lasting thousands of years. Like other long-lived GHGs, most fluorinated gases are well-mixed in the atmosphere, spreading around the world after they are emitted. Many fluorinated gases are removed from the atmosphere only

when they are destroyed by sunlight in the far upper atmosphere. In general, fluorinated gases are the most potent and longest lasting type of GHGs emitted by human activities.

There are four main categories of fluorinated gases—hydrofluorocarbons (HFC), perfluorocarbons (PFC), sulfur hexafluoride (SF_6), and nitrogen trifluoride. The major emissions source of HFC compounds is their use as refrigerants—for example, in air conditioning systems in both vehicles and buildings. These chemicals were developed as a replacement for chlorofluorocarbons because they do not deplete the stratospheric ozone layer. PFCs are produced as a byproduct of aluminum production and are used in the manufacturing of semiconductors. PFCs generally have long atmospheric lifetimes and GWPs near 10,000. SF_6 is used in magnesium processing and semiconductor manufacturing, as well as a tracer gas for leak detection. SF_6 is also used as an insulating gas in electrical transmission equipment, including circuit breakers. The GWP of SF_6 is 22,800, making it the most potent GHG that the Intergovernmental Panel on Climate Change has evaluated (EPA, 2017). There is not currently a practical alternative to SF_6 as an insulating gas.

3.10.1.5 Global Warming Potentials

GHGs vary widely in the power of their climatic effects; therefore, climate scientists have established GWPs . The GWP of a gas is a measure of both potency and lifespan in the atmosphere as compared to CO_2. The GWP of CO_2 is set to equal 1. CH_4 and N_2O are approximately 25 and 298 times more powerful than CO_2, respectively, in their ability to trap heat in the atmosphere; thus, they have GWPs of 25 and 298, respectively. CO_2e is a quantity that enables all GHG emissions to be considered as a group despite their varying GWPs. The GWP of each GHG is multiplied by the prevalence of that gas to produce CO_2e. The atmospheric lifetime and GWP of selected GHGs are summarized in Table 3-8.

Table 3-8: Global Warming Potentials and Atmospheric Lifetimes

Greenhouse Gas	Atmospheric Lifetime (years)[1]	Global Warming Potential (100-year time horizon)[2]
Carbon dioxide (CO_2)	50–200	1
Methane (CH_4)	12	25
Nitrous oxide (N_2O)	114	298
Sulfur hexafluoride (SF_6)	3,200	22,800

Sources:
(1) IPCC, 2007
(2) 40 CFR 98 Subpart A

3.10.1.6 Potential Effects of Greenhouse Gases

An increase in GHGs released to the atmosphere has been linked to warming of the earth on a global scale. Earth's average temperature has risen by 1.5 degrees Fahrenheit (°F) over the past century and is projected to rise another 0.5 to 8.6 °F over the next hundred years. Rising global temperatures have been accompanied by changes in weather and climate. Many places have seen changes in rainfall, resulting in more droughts, floods/intense rain as well as heat waves. Oceans are warming and becoming more acidic (EPA, 2021). Ice caps and glaciers are melting, causing sea levels to rise. Other effects include, but are not limited to, the spread of diseases out of their normal range, habitat loss, negative impacts to agriculture production,

increased air pollution episodes, and impacts to the economy are expected to result from climate change (EPA, 2021).

3.10.2 Environmental Consequences

The following sections provide potential environmental consequences of the proposed Action Alternatives and No Action Alternative related to climate change and GHG.

3.10.2.1 Proposed Action Alternative

Unlike criteria pollutants, there is no standard methodology to determine how a project's relatively small incremental contribution to GHGs will translate into physical effects on the global environment. As a result, this section focuses on the level of GHG from Project emissions.

Construction

During construction of the turbine small amounts of air pollutants, including GHGs, would be temporarily generated. The largest source of GHG emissions during construction is the combustion of fuels such as gasoline or diesel by construction equipment. These construction emissions would be temporary in nature, would fall off rapidly with distance from construction areas, and are not anticipated to result in long-term impacts. Once the construction activities are completed, construction-related emissions would cease.

Operation

A variety of emissions resulting from Project operation are considered GHGs. GHG emissions from the Project equipment are due to CO_2, CH_4, SF_6, and N_2O emissions. These calculated GHG emissions were ratioed with their appropriate GWP shown in Table 3-8.

Table 3-8 and summed to obtain the overall project CO_2e emissions. Consistent with Oklahoma and EPA guidance, air dispersion modeling of CO_2e will not be conducted since there is no modeling threshold for this pollutant.

The simple-cycle unit are limited to generating their design efficiency or 50%, whichever is less, of their potential electric output, under the New Source Performance Standard (NSPS), Subpart TTTT. The vendor has estimated that the design efficiency of the units to be 43%, and the proposed turbine will meet these efficiency limits. Additionally, Subpart TTTT establishes a standard for CO_2, limiting emissions for these units to 120 lb CO_2/MMBtu heat input. The maximum CO_2 emissions provided by the vendor are anticipated to meet this value.

The proposed simple-cycle turbine will operate on natural gas with fuel oil backup. Currently, hydrogen fuel is not available at Site. Natural gas is considered a low-carbon fuel; due to this classification, firing natural gas is considered a control technology for turbines.

Each of the new circuit breakers will contain SF_6. SF_6 is a potent greenhouse gas with a global warming potential of 22,800 times that of CO_2. The new circuit breakers are state-of-the-art and will be sealed and SF_6 leakage will be minimized. The circuit breakers will each be equipped with a two-stage pressure switch with a low-pressure alarm to indicate a potential leak. Modern circuit breakers and switches are designed as totally enclosed, pressure containing systems with far lower potential for SF_6 emissions than older circuit breakers. The current International Electrotechnical Commission (IEC) standards are that new equipment be

built to low leakage limits (less than 0.5 percent per year). The effectiveness of these leak-tight closed systems is further enhanced by equipping them with an alarm that provides a warning when SF_6 has leaked from the breaker. The Project will also include disconnect switches at each substation site; however, the switches are open air type switches and do not contain SF_6.

Potential GHG emissions from the Project are shown in Table 3-9.

Table 3-9: Project Emissions of Greenhouse Gases

Source	Air Emissions (tons per year, tpy)				
	CO_2	CH_4	N_2O	SF_6	CO_2e
Combustion turbine[a]	824,056	15.14	1.51	--	824,886
Breakers (4 Units)	--	--	--	$5.80x10^{-05}$	1.32
Total	824,056	15.14	1.51	$5.80x10^{-05}$	824,887

Source: Air Construction Permit Application (December 2023)
(a) Represents worse-case emissions scenario.
(b) Dashes indicate no emissions expected for this source.

Potential GHG emissions are greater than the PSD significance level of 75,000 tons per year; however, since none of the criteria pollutants triggered a PSD analysis, one is not required for CO_2e.

To put the CO_2e emissions into perspective, the GHG emissions for the State of Oklahoma were reviewed, utilizing the Greenhouse Gas Inventory Data Explorer (EPA, 2023b). This interactive tool provides public access to the EPA's annual *Inventory of U.S. Greenhouse Gas Emissions and Sinks* and the new *U.S. Greenhouse Gas Emissions and Sinks by State* reports. The last five years of available greenhouse gas emission data was pulled for the State of Oklahoma; since the most recent year available in the tool is 2021, emissions data from 2017 to 2021 was reviewed. The tool reports data in million metric tons. To directly compare the emissions data to the project emissions, these values were converted into US short tons. US short tons are used for the CO_2e emissions utilized in the air permit application, the air emissions in Section 3.10, and this section. The average state-wide CO_2e emissions for the most recent 5 years of data available (2017-2021) was determined to be 158,255,328 tons per year (EPA, 2023b). The project CO_2e emissions, as shown above, are calculated to be 824,887 tons per year. This equates to 0.5% of the statewide CO_2e emissions.

Social Cost of Carbon

Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990 published February 2021 by the United States Interagency Working Group (IWG) on Social Cost of Greenhouse Gases (IWG Report) was used to determine the social cost of carbon (greenhouse gases). This report contains interim estimates of the social cost of greenhouse gases (SC-GHG) split to reflect the cost of carbon, methane, and nitrous oxide emissions individually (SC-CO_2, SC-CH_4, and SC-N_2O). SC-GHG is defined as the monetary value of the net harm to a society from emitting one metric ton of that GHG to the atmosphere each year. These estimates are provided by the IWG to allow analysts to

incorporate – when appropriate – net social benefits or costs of GHG emissions in benefit-cost analyses and in policy decision making processes.

In the 2021 IWG Interim Report, the SC-GHG monetary values were developed using discount rates of 5 percent, 3 percent, 2.5 percent. Discount rates are used to determine how much weight is placed on impacts that occur in the future. High discount rates reflect future effects of an action, in this case the emission of greenhouse gases, as less significant than present effects. Low discount rates reflect that future and present impacts are closer to equally significant. Discount rates are used to convert the damages of future actions into present-day values. A fourth value, the 95th percentile of damages estimated, applying a 3% annual discount rate for future economic effects represents higher-than-expected economic impacts from climate change. This is a low probability, but high damage scenario. For consistency with the methodology presented in the IWG report the results of this SC-GHG analysis are discounted to the present value in base year 2028, the expected operational start year. Results throughout this section are presented in 2020 dollars.

For this analysis, the build scenario represents the operation of the proposed plant (Project). The no-build scenario represents a greenfield site and, therefore, a zero-emission scenario. The operation start date for the proposed plant is targeted for 2026. The IWG projections are limited to 2050. Therefore, this analysis calculates the SC-GHG from 2026-2050 (analysis lifespan). Projected run hours for the SCGT were provided for the years 2026 to 2043. For years where projection data was unavailable, an average from the latest 5-years of available data was utilized. It was assumed that the unit will operate at 3674 MMBtu/hr for all expected natural gas actual operational hours and 500 hours of fuel oil operation. Standard emission factors for natural gas and fuel oil combustion were sourced from Table C-1 to Subpart C of Part 98, Title 40. These calculated annual emission values were used in conjunction with the social cost estimates provided in the IWG Report to calculate the SC-CO_2, SC-CH_4, SC-N_2O for the analysis lifespan.

Presenting greenhouse gas emissions as a monetary value allows for the ability to directly compare social costs to the economic benefits provided by the Project. Annual SC-CO_2, SC-CH_4, SC-N_2O values for were calculated for discount rates of 5 percent, 3 percent, 2.5 percent, and 95th percentile 3 percent for years 2028-2050. These values were then summed to represent a lifespan total cost of greenhouse gases emitted by the site in 2020 dollars. These values are presented in Table 3-10. Results are displayed by discount rate. For discount rates high to low over the analysis lifespan the SC-GHG was calculated to be approximately $105, $321, and $459 million in 2020 dollars if the Project is constructed and operational compared to the no build (no emissions) scenario. The 95th percentile 3 percent discount rate has an SC-GHG scenario estimated value of $975 million.

Table 3-10: Present Value (in Base Year 2026) of Estimated SC-GHG for GHG emissions (2020$)

Discount Rates	5%	3%	2.5%	3%
Statistic	Average	Average	Average	95th Percentile
Build Scenario SC-GHG	$104,948,220	$320,732,626	$459,174,109	$975,138,570

(a) Analysis lifespan is from 2028 to 2050, based on the limits/duration of the IWG tables utilized in the analysis.
(b) This analysis does not incorporate upstream, downstream, or construction emissions, SC-GHG is the sum SC-CO2, SC-CH4, SC-N2O.

Detailed tables showing calculation results on an annual basis and by GHG (CO_2, CH_4, N_2O) are included in Appendix E to this document.

Upstream GHG Emissions

Upstream GHG emissions from the transportation of natural gas on the EOIT gas pipeline were estimated as a part of the climate change analysis. AECI consulted the EPA Inventory of U.S. GHG Emissions and Sinks (USEPA, 2023c)[1] as well as the EPA's "Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from Combustion Turbine Electric Generating Unit" (USEPA, 2021b), for use to determine an emission factor for upstream natural gas transportation losses. Additionally, Northwest Power and Conservation Council's "Upstream Methane Emissions and Power Planning (NPCC, 2020) and Center for Climate and Energy Solutions "Natural Gas" (C2ES, 2021) were consulted to confirm the loss rates. These losses are not caused by the Project but are associated with natural gas delivery to the site. The facilities transporting this gas are currently in-place, aside from a new tap line and metering and regulation station onsite the plant will use. AECI determined a 1.5 percent methane loss during transportation of natural gas was appropriate based on the available data on methane loss. This 1.5% value was taken from the "Available and Emerging Technologies for Reducing Greenhouse Gas emissions from Combustion turbine Electric Generating Unit" document mentioned above. The other two documents confirmed that a leak rate of approximately 1.5% is appropriate for use in these types of analyses. To calculate annual CO_2e emissions from upstream transportation of natural gas, an annual million British thermal units/year (MMBtu/year) of natural gas usage was utilized based on the maximum possible run hours/load for each turbine. The annual natural gas use by the proposed SCGT was estimated to be 12,373,212 MMBtu/year. A 1.5 percent leakage for this amount of natural gas was calculated to equate to 16.9 lb CO_2e/MMBtu of natural gas. Multiplying this natural gas leakage rate by the total estimated annual natural gas use provided a natural gas leakage emissions estimate of 94,867metric tons CO_2e per year. Upstream emissions from fuel oil were estimated from emission factors produced by NETL's Upstream Dashboard v3 and the estimated annual fuel oil consumption. Therefore, upstream emissions were calculated to be a total of 1,509,362 tons CO_2e per year.

3.10.2.2 No Action Alternative

The No Action Alternative will result in no new greenhouse gas emissions at the greenfield site. However, there will still be a need for power capacity that will be obtained elsewhere, likely from existing fossil-fueled sources or new PPAs with fossil-fueled sources.

3.10.3 Mitigation

During construction, steps will be taken to prevent excess emissions of GHG resulting from construction activities and vehicular traffic. These steps may include reducing the idling of construction vehicles.

AECI submitted an air permit application for the Project to ODEQ in December 2023 and received a completeness determination from ODEQ on February 6, 2024, with the only deficiency identified was the application fee payment. Payment was submitted via electronic fund transfer on February 13, 2024. AECI will adhere to the conditions and requirements of the permit during operation of the Project. Additionally, AECI will also follow a dust control

[1] https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks

plan that will, in turn, assist with reducing GHG emissions during construction. These proposed work practices are consistent with best practices as identified above and in the air construction permit application.

3.11 Socio-Economic Impact Assessment/Environmental Justice

3.11.1 Affected Environment

To identify general socioeconomic patterns in the Project area, various socioeconomic characteristics have been reviewed, including population growth trends, racial and ethnic characteristics, employment data, and economic indicators.

Population Growth Trends

The Site is in Payne County, Oklahoma, a predominantly rural county that has experienced an increase in population over the last 10 years. Table 3-11 presents the population trends near the Project.

Table 3-11: Population Trends

	Oklahoma	Payne County
2010 Census (population)	3,751,351	77,350
2020 Census (population)	3,959,353	81,646
% Change 2020-2021	5.3%	5.3%
2021 Estimate (population)	3,986,639	82,794

Source: U.S. Census Bureau (USCB, 2019 and USCB, 2021)

Racial and Ethnic Characteristics

The U.S. Census Bureau has published demographic, housing, and employment estimates for 2020 for all counties and the state as a whole. These estimates, along with the 2020 Census Block data for the area immediately around the Site, are presented in Table 3-12. The Census Tract and Block Group that the Site is located in are shown in Table 3-12: 2020 Racial Characteristics.

Table 3-12: 2020 Racial Characteristics

	Oklahoma	Payne County	Census Tract 111.01	Census Block 3104 Group 3
Total Population 2020	3,959,353	81,912	5,507	2
White	2,809,792	62,800	4,374	2
Hispanic or Latino	431,467	3,908	262	0
American Indian and Alaskan Native	303,791	7,084	221	0
Other	119,704	3,839	94	0
Black or African American	287,856	4,127	42	0
Pacific Islander	6,418	154	4	0

Source: U.S. Census Bureau (USCB, 2020a)

Based on these estimates, the 2020 racial makeup of Payne County is composed of 76.7 percent White, 4.8 percent Hispanic or Latino, 5 percent African American, and 8.6 percent American Indian, 0.8 percent Pacific Islander, and 4.1 percent of Payne County's population considers itself other. For the area around the Site, the 2020 Census population estimates by census tract and block data were reviewed and are listed in Table 3-12 for comparison with Payne County and state population estimates. According to the 2020 Census estimates, the total population of Oklahoma in 2020 was composed of 70.1 percent White, 10.9 percent Hispanic or Latino, 7.3 percent African American, 7.7 percent American Indian, 0.16 percent Pacific Islander, and 3.8 percent as other.

Employment and Income

In 2020, Payne County's resident labor force, defined as the population aged 16 and over, was 67,663 individuals, or 83 percent of the total population (81,646); 37,079 of these workers were employed, resulting in an annual unemployment rate of (for the civilian labor force) of 2.2 percent (U.S. Census Bureau 2020). Major industries in Payne County include educational service, health care, and social services. Table 3-13 provides the employment characteristics for the state, county, and local community.

Table 3-13: 2020 Employment Data

	Oklahoma	Payne County	Census Tract 111.01	Census Block 3103 Group 3
Population 16 years and over	3,097,358	67,663	3,957	N/A
In labor force	1,893,873	38,770	2,588	N/A
Employed (civilian labor force)	1,779,157	37,079	2,502	N/A
Unemployed (civilian labor force)	95,441	1,488	78	N/A
Armed forces	19,275	135	8	N/A
Not in labor force	1,203,485	28,893	1,369	N/A
Percent unemployed (civilian labor force)	5.1%	2.2%	3.0%	N/A
Top occupation	Management, business, science, and arts occupations	Management, business, science, and arts occupations	Management, business, science, and arts occupations	N/A
Top industry	Educational services, and health care and social services	Educational services, and health care and social services	Educational services, and health care and social services	N/A

Source: U.S. Census Bureau (USCB, 2020b)

The unemployment rate and poverty rate in Payne County is slightly lower than that of Oklahoma as a whole.

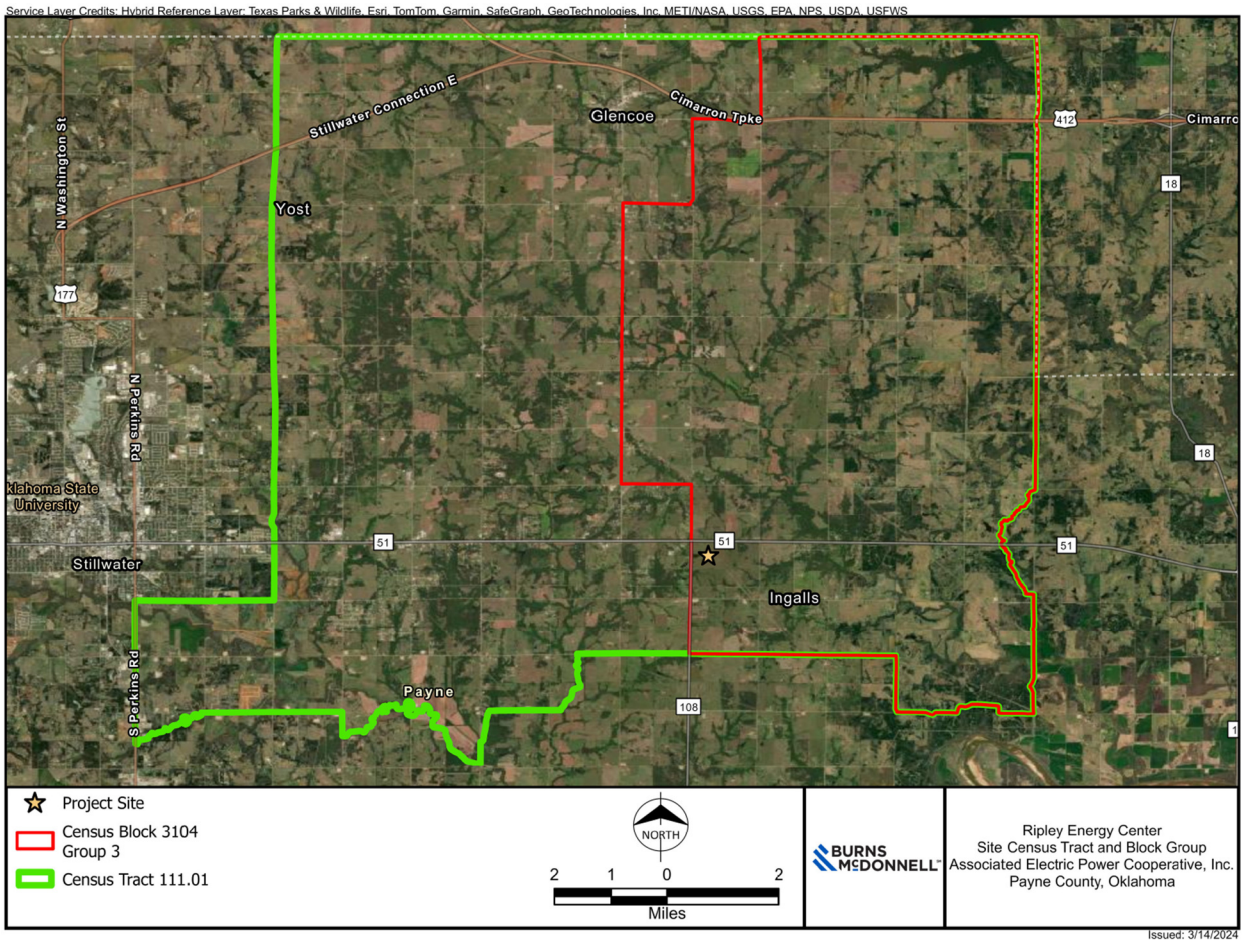
Census Block 3103 Group 3 of Census Tract 111.01 in eastern central Payne County has two residents that live within the Block Group. Census Tract 111.01 has lower unemployment rates and poverty rates than the state; however, it has slightly higher unemployment rates than Payne County. No income or employment data exists for Census Block 3103 Group 3. Table 3-14 shows income and poverty data for the state, county, and local community.

Table 3-14: 2020 Income and Poverty

	Oklahoma	Payne County	Census Tract 111.01	Census Block 3103 Group 3
Median household income in 2020 dollars	$53,840	$43,686	$60,795	N/A
Families and people whose income in the past 12 months is below the poverty level	11.2%	11.3%	6.8%	N/A

Source: U.S. Census Bureau (USCB, 2020c and USCB, 2020d)

Figure 3-1: Census Tract and Block Groups



Housing

Payne County has 36,599 housings units with 31,329 occupied housing units and 5,270 vacant housing units. Fifty-two percent of the occupied housing units are owner-occupied. The median value of owner-occupied housing in Payne County was $172,700, versus the state-wide median value of owner-occupied housing of $142,400.

Area Public Service and Utilities

Educational Facilities

The closest school to the Site is Highland Park Elementary, approximately 6.7 miles west of the Site within Stillwater, Oklahoma. The next closest schools are Skyline Elementary and Stillwater Junior High School, approximately 7.7 miles northwest of the Site.

Medical Facilities

The closest hospital to the Site is Stillwater Medical Center in Stillwater, Oklahoma, about 9.4 miles west of the Site. Stillwater Medical Center has a 24-hour level one trauma emergency room with physicians trained in Advanced Trauma Life Support and Advanced Cardiac Life Support. The medical center also has cardiopulmonary services, a radiology department, and an urgent care clinic.

During construction, the EPC is responsible for the emergency response plan. The plan will have a site map showing areas for assembly, location of emergency stations, and site evacuation route.

The site will have on-site safety professionals during working hours for non-life-threatening injuries and first aid treatment. The local medical treatment facility will be used for medical services beyond that scope.

Fire Protection

The closest fire department to the Site is located approximately 8.4 miles northwest of the Site located in Stillwater, Oklahoma.

Police Protection

Because the Site lies within a rural area, it is served by the Payne County Sheriff's Department, located in Stillwater, Oklahoma, approximately 8.4 miles west of the Site. The City of Stillwater does have a full-time police department.

Potable Water, Sanitary Sewer, Electricity, Gas, and Solid Waste

The Site is in a rural area. It is served by the 51 East Rural water supply. Electricity to the Site will be supplied by the electrical grid. Natural gas will be supplied to the site by Enable Oklahoma Intrastate Transmission LLC. Solid waste will be disposed of through a local service provider and sanitary waste will utilize on on-site septic system with lateral line fields.

Recreation and Open Space

Public recreational land does exist near the Site. Couch Park, which is located approximately 7.6 miles to the west, includes picnic areas, hiking, and wildlife viewing opportunities. There is a historical marker for the Outlaw Battle located approximately 0.5 miles to the east of the site. The sign indicates the battle took place another 1 mile southeast of the marker.

Environmental Justice

Environmental Justice concerns may arise from human health or environmental effects of a Project on minority or low-income populations. The need to identify environmental justice issues is stated in EO 12898, entitled *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*, and expanded on in EO 14008, *Tackling the Climate Crisis at Home and Abroad*. The EOs state that Federal agencies shall make achieving environmental justice part of their missions. By identifying and addressing disproportionately high and adverse human health or environmental effects of its programs,

policies, and activities on minority populations and low-income populations." A Presidential Memorandum accompanying the Executive Order directed agencies to incorporate environmental justice concerns into their NEPA processes and practices.

Environmental Justice issues are identified by first determining whether minority or low-income populations are present. If so, then disproportionate effects on these populations would be considered. The CEQ guidance states that minority populations should be identified when the percentage of minority residents in the affected area exceeds 50 percent or is meaningfully greater than the percentage of minority residents in the general population (CEQ, 1997). If the percentage of minority residents of the population in the area census tract exceeds the county level by more than 10 percent, it is "meaningfully greater" for the purposes of this analysis. The CEQ guidance also states that the low-income populations should be identified based on poverty thresholds as reported by the U.S. Census Bureau. If the poverty rate for the population of the area census tract exceeds the county poverty rate by more than 10 percent, it is considered an area of environmental justice concern for the purposes of this analysis.

Based on this methodology, the proposed Project area – within Census Tract 111.01 – is not considered an area of Environmental Justice concern. As identified in Table 3-15, the percentage of minority residents in Census Tract 2.03, Block Group 1 does not exceed the level of Payne County by 10 percent.

To further analyze the Environmental Justice impacts on the nearby communities, a 2-mile radius was placed around the project area in EPA's EJSCREEN tool. None of the nearby populations exhibit a socioeconomic indicator rate higher than 80% for any of the environmental justice indexes. The EJSCREEN Community Report is attached as Appendix F.

Table 3-15: 2020 Minority and Low-Income Populations near the Project

	Oklahoma	Payne County	Census Tract 111.01	Census Block 3103 Group 3
Minority Population	26%	23.3%	11.3%	0%
Low-income Population	11.4%	7.2%	3.1%	NA

Source: U.S. Census Bureau (USCB, 2020a and USCB, 2020e)

Also identified in Table 3-15, the poverty rate for the proposed Project area census block group data is not available.

3.11.2 Environmental Consequences

The following sections summarize potential environmental consequences of the proposed Action Alternatives and No Action Alternative related to the local population.

3.11.2.1 Proposed Action Alternative

The current capital cost estimate for the improvements is approximately $500 million. Some of this cost could be distributed locally due to construction activities temporarily stimulating the local community. Additional jobs in the construction trades such as pipefitters,

electricians, insulators, construction management personnel, laborers, and carpenters may be available. Peak construction labor force for the Project is expected to be approximately 400 employees. The length of peak employment will range from a few weeks to several months, depending on skill or specialty.

Gas stations, convenience stores, and restaurants in nearby communities and in Stillwater could experience increases in business during the construction period in response to activity from construction workers.

The construction workforce required for the proposed Project may have an impact on the availability of temporary housing. Construction workers may seek temporary housing for varying time periods based on their individual roles in the proposed Project. Payne County has a limited supply of temporary housing units available for use by construction workers relocating to the area on a temporary basis. Short-term housing is likely to experience the largest increase in demand due to the transient nature of construction workers and their limited duration in the proposed Project area. Generally, housing options for construction crews will consist of area hotels or RV camps.

The proposed Project will be located in a rural area with relatively few homes and businesses within close proximity to the proposed Project. Adverse human impacts as a result of the proposed Project will include additional noise and traffic impacts during construction, temporary visual impacts during construction, and changes in long-term visual impacts during operation. However, because the local area is not characterized by a high minority or low-income population, no disproportionate impacts will occur as a result of the proposed Project.

3.11.2.2 No Action Alternative

The No Action Alternative would have no short- or long-term impacts on the local population at or in the vicinity of the Project because no construction or operation would occur.

3.11.3 Mitigation

The Project is not located in an environmental justice area, and impacts are expected to be insignificant. Therefore, no mitigation measures are required for socioeconomic impacts.

3.12 Noise

3.12.1 Affected Environment

The Project is located in Payne County, Oklahoma, just outside of Stillwater and 6.5 miles north of Ripley. Surrounding the immediate Project site is agricultural fields and some residential structures. There are five residences within 0.5 miles of the proposed construction activity and Project equipment. Primary existing noise sources in the area include traffic from Highway 51 and Highway 108

<u>Noise Regulations</u>

The area immediately surrounding the proposed Project is unincorporated residential and agricultural. There are residential properties to the north, west, and east of the Project property and agricultural fields on all sides of the Project.

Applicable Federal, state, county, and municipal noise ordinances were reviewed for the Project and surrounding area. The Project is outside of any municipalities, and the State of Oklahoma and Payne County do not have noise ordinances with applicable numerical sound level limits for the Project.

3.12.2 Environmental Consequences

The following sections summarize potential environmental consequences of the proposed Action Alternatives and No Action Alternative related to noise.

3.12.2.1 Proposed Action Alternative

Construction

Project construction would result in temporary and minor noise impacts to the surrounding area. Construction-related sounds would vary in intensity and duration depending on specific stages and activities of construction but would not be permanent. Nearby residences (nearest residence is approximately 1/4 to 1/3 of a mile away) may temporarily experience increased noise during construction.

Construction of the proposed Project is expected to last approximately 12-18 months and will involve Project site preparation, excavation, placement of concrete and other typical industrial construction practices. Construction schedules are anticipated to be able to construct on a 7-day per week 24-hours per day schedule in order to minimize the length of calendar time that temporary construction impacts affect the area. There are certain operations that, due to their nature or scope, must be accomplished in part outside typical working hours. Such work generally consists of activities that must occur continuously, once begun (such as pouring concrete foundations).

The impacts that various construction-related activities might have will vary considerably based on the proximity to the property line. Generic sound data ranges are available for various types of equipment at certain distances. Table 3-16 lists generic activities and their minimum and maximum instantaneous sound levels at 50 feet.

Table 3-16: Range of Typical Construction Equipment Noise Levels in A weighted decibel (dBA)

Generic Construction Equipment	Minimum Noise at 50 feet	Maximum Noise at 50 feet
Backhoes	74	92
Compressors	73	86
Concrete Mixers	76	88
Cranes (movable)	70	94
Dozers	65	95
Front Loaders	77	96
Generators	71	83
Graders	72	91
Jack Hammers and Rock Drills	80	98
Pumps	69	71
Scrapers	76	95
Trucks	83	96

Source: FHWA Highway Construction Noise.

The types of equipment listed in the table above may be used at various times and for various amounts of time. Construction of the Project may involve driving piles. Equipment noise will be addressed during construction, and sound dampening material may be used if necessary. Most activities will not occur at the same time. There will be periods when concrete needs to dry and no construction occurs. Sound levels are expected to be quieter for areas where activities are occurring at distances greater than 50 feet from the property line.

Noise from construction is expected to be localized and temporary. The actual noise levels generated by construction will vary on a daily and hourly basis, depending on the activity that is occurring, and the types and number of pieces of equipment that are operating. Noise resulting from construction will vary with equipment type and age, type of work being done, distance from receptor, and meteorological conditions. It is expected that most construction will be done during the daytime when receptors are less sensitive to noise and that the noise will be intermittent. Any excessive construction noise should be of short duration and have minimal adverse long-term effects on land uses or activities associated with the Project area.

Operation

A noise study was completed for the Project operational sound levels based on the expected equipment. The noise study is provided in Appendix G and included background sound monitoring and acoustical modeling for the Project.

The Project could operate day or night. Base operational sound levels for the Project indicate that the Project will be audible during periods of low traffic and are expected to cause a significant increase to existing nighttime sound levels of approximately 19 dBA at the worst-case receptor. A summary of the existing ambient sound levels and the predicted Project-

generated sound levels during operation are shown in Table 3-17 below for the nearest noise-sensitive receptors.

Table 3-17: Project Background and Operational Sound Levels

Receptor Location	Lowest Existing Hourly Daytime Sound Levels (dBA)	Lowest Existing Hourly Nighttime Sound Levels (dBA)	Predicted Project Sound Levels (dBA)
R1	65	55	64
R2	60	48	67
R3	60	48	66
R4	65	55	61
R5	65	55	64

Even though there are no limits in the area to comply with, these predicted unmitigated impacts are likely to have moderate to high adverse effects on the nearby neighbors.

3.12.2.2 No Action Alternative

The No Action Alternative would have no short- or long-term impacts to noise at or in the vicinity of the Project because no construction or operation would occur.

3.12.3 Mitigation

Sound mitigation measures are not required for the Project since there are no applicable noise limits for the Project. Occupational Safety and Health Administration (OSHA) standards will be met onsite. Details of any optional mitigation measures are to be determined, but it is anticipated that stack silencers will be utilized to reduce impacts to the surrounding properties.

3.13 Transportation

3.13.1 Affected Environment

The Project Site is bordered by State Highway 51 (SH-51) and State Highway 108 (SH-108). SH-51 is a two lane, asphalt paved highway that intersects with SH-108 another two lane, asphalt paved highway at the northwest corner of the project site. Per ODOT.org Interactive Annual Average Daily Traffic (AADT) Map, the 2022 AADT for SH-51 is approximately 7,500 vehicles per day and the AADT for SH-18 is approximately 1,700 vehicles per day near the project site. A traffic study will be completed by the EPC for the Project to verify road adequacy and flow parameters.

3.13.2 Environmental Consequences

The following sections summarize potential environmental consequences of the proposed Action Alternatives and No Action Alternative related to transportation.

3.13.2.1 Proposed Action Alternative

Existing highways and county roads will be used to provide Site access during construction. Within the Site property boundary, an access road will be constructed for use as the primary construction access road. Traffic will include equipment and material deliveries and the construction labor force. The frequency of onsite vehicular traffic will be proportionate to the onsite construction labor projections.

The peak construction labor force for the construction Project is anticipated to be approximately 400 employees. This labor, along with equipment and material deliveries in support of the Project, is expected to increase daily vehicle and truck traffic (above current operation) by approximately 400 round trips per day during peak construction periods. Construction material deliveries may occur during the day during off-peak travel times and will typically not interfere with worker shift changes and commuter traffic.

Although additional vehicular traffic will result from the construction of the proposed Project, the impacts will be temporary. Traffic impacts will be greatest along Highway 51 and vary according to construction delivery and construction labor shift changes. The roadway capacity of any route and level of service to the traveling public will not be substantially impacted in all other areas.

The construction entrance to the site will be on SH-108. It is estimated that 90% of the imported material, concrete etc. will be coming from Stillwater (west) to the project on SH-51. Approximately 70% of the craft/staff traffic will be coming from Stillwater/Oklahoma City (west) and the remaining 30% from the Tulsa area (east). The project will evaluate staggered start times to reduce peak flow on SH-51 as necessary. Operating permits will be issued by the state or county for oversized truck movements, as required. Based on current projections, the roads, bridges, and crossings in the area are sufficient for the Project's delivery and transportation needs. No adverse impacts are anticipated.

3.13.2.2 No Action Alternative

The No Action Alternative would have no short- or long-term impacts to transportation at or in the vicinity of the Project because no construction or operation would occur.

3.13.3 Mitigation

As construction and operation of the proposed Project will have only temporary impacts on transportation, no mitigation measures are planned. Existing roads damaged by construction traffic will be repaired once construction is complete. Plans to control traffic during peak times may be required.

3.14 Human Health and Safety

3.14.1 Affected Environment

Two potential human health and safety concerns associated with the Project are to be considered: electromagnetic fields (EMF) and risk management associated with hazardous materials.

EMF are associated with high-voltage electric transmission lines and substations. All of the offsite high-voltage transmission lines and substations necessary for the proposed Project are

in place. The Project will require a minor transmission line interconnection, a rebuild of the existing transmission line back to the substation, and then substation modifications to accommodate the Project and connect to the AECI's grid. The Facility's access will generally be restricted to AECI employees and contractors, and substations are surrounded by security fencing to limit access to the area.

A core value of AECI is the safety of its employees and contractors. As such, AECI has identified certain hazards associated with power production. There are a number of risks to human health and safety possible in the course of constructing and operating a power plant, including hazards such as fire, slips, trips, falls, electrical hazards, confined space entry, and many others. Additionally, hazardous substances or wastes may be released, generated, or required for construction and operation of the Facility. Examples may include the use and storage of fuels, lubricating oils, chemicals, and other materials that may be considered hazardous.

3.14.2 Environmental Consequences

The following sections summarize potential environmental consequences of the proposed Action Alternatives and No Action Alternative related to transportation.

3.14.2.1 Proposed Action Alternative

EMF will be strongest directly under the transmission line and will decrease with increasing distance from the transmission line ROW. The proposed Project requires modification of the existing transmission lines outside of the Site boundary, with a line passing through several housing areas. The upgrades are not anticipated to increase risks due to EMF along the current transmission ROW.

During construction, the Project will be managed to prevent harm to the general public. The general public will not be allowed to enter any construction areas associated with the proposed Project. The major risk to the general public will be from an increase in traffic volume on the roadways near the proposed Project as a result of commuting construction workers and transportation of equipment and materials.

Construction and operation of the proposed Project will also involve the use and storage of regulated and hazardous materials. During construction, diesel fuel, gasoline, and lubricating oils from heavy equipment and vehicles may accidentally leak or spill. Hydraulic fluid, paints, and solvents will likely be used during the construction phase as well. Additionally, the presence of aboveground fuel storage tanks and oil-filled equipment present the potential to release into the environment.

3.14.2.2 No Action Alternative

The No Action Alternative would have no short- or long-term impacts on human health or safety at or in the vicinity of the Project because no construction or operation would occur.

3.14.3 Mitigation

A comprehensive safety program is in place at AECI. For instance, safety bulletins are distributed weekly, and procedures are frequently reviewed and updated. Also, a safety briefing is required annually for employees and upon entry for contractors. Adequate training for human health and safety concerns will be mandatory for all construction workers on the

Project Site. Personal safety equipment such as hard hats, ear and eye protection, and safety boots will be required for all workers onsite. Accidents and injuries will be reported to the designated safety officer onsite.

During construction and operation, all used oil generated at the proposed Project Site and other potentially hazardous materials (automotive fluids, spray paint cans, etc.) will be collected and properly handled by a licensed/permitted recycler.

Construction-related hazards will be effectively mitigated by complying with all applicable federal and state occupational safety and health standards, applicable National Electrical Safety Code regulations, and utility design and safety standards.

Risk management associated with hazardous materials is an additional human health and safety concern. To reduce the potential for a release of regulated or hazardous materials during the construction phase of the proposed Project, work will be planned and performed in accordance with OSHA standards and protocols addressing the use of potentially hazardous materials and applicable federal and state environmental regulations. If a hazardous release were to occur, emergency response, cleanup, management, and disposal of contaminated soils will be conducted according to EPA and state standards. Conformance to these standards and procedures will reduce the potential for significant impacts resulting from the release of hazardous materials during the construction phase.

3.15 Summary of Impacts

The following table (Table 3-18) provides a summary of potential impacts by Alternative.

Table 3-18: Summary of Potential Impacts

Resource	Impacts from Proposed Action	No Action Alternative
Air Quality	The existing air quality in the Payne County area is designated as attainment or unclassifiable in regard to the NAAQS for all criteria pollutants. Construction of the Project will generate air emissions that are low and temporary in nature and will not lead to long-term impacts. It is anticipated that the Project would not affect the attainment status for Payne County. The Owners would comply with the issued ODEQ construction air permit that would include emission limitations, monitoring requirements, and other terms and conditions.	The PPAs required to meet load requirements could lead to increased power production from coal-fired facilities, which would lead to worsened air quality.
Biological Resources	The Project will not result in short- or long-term impacts to protected species or their critical habitats for federally endangered or threatened species. Construction and operation of the Project would not result in a significant change to the amount or type of vegetation onsite as it has been continuously hayed and disturbed.	No unique impacts anticipated for this alternative
Cultural Resources	Based on the distance from NRHP properties and the concurrence from SHPO that no historic properties would be affected, it is anticipated that the Project would not have adverse impacts on cultural resources.	No unique impacts anticipated for this alternative.
Geology and Soils	The Project site would need to be graded and grading design would change the topography to facilitate storm water drainage patterns. Storm water runoff on the Site would be collected and directed to an onsite storm water detention pond. The Site will require excavation for underground utilities and deep structures such as pump pits. For the transmission line, foundation construction would occur after vegetation clearing is complete. Excavated soils from foundation drilling would be used for foundation backfill if appropriate. Surplus soils would be spread within upland areas of the right of way and stabilized. After all line construction is complete, the ROW is restored. Soils at the Project site would be converted to plant site development with much of the area occupied by the facilities and covered by concrete and gravel areas. The transmission line corridor would be cleared but only soil areas at the structure locations would be permanently excavated. Other areas of hydric and statewide important soils would remain largely unaffected by construction and following any necessary stabilization would be available for agriculture and other activities.	No unique impacts anticipated for this alternative.
Infrastructure, Transportation, Public Health and Safety, and	*Utilities:* Outages would be required to update the transmission line and to allow for interconnection of the new transmission line. The Project would require minor construction of a water pipeline to connect with the municipal system.	No unique impacts anticipated for this alternative

Resource	Impacts from Proposed Action	No Action Alternative
Hazardous Materials	*Transportation:* The daily automobile traffic to the site would increase from approximately 25 to 50 vehicles per day in the initial stages of construction to approximately 400 vehicles per day during peak. The traffic would begin to decrease until it reaches approximately 25 vehicles per day near construction completion. No permanent changes to existing roads are anticipated as part of this Project. No permanent damage to roads is anticipated with the implementation of mitigation measures. *Public health and safety:* Access roads would be blocked from public access. Existing healthcare facilities are anticipated to be sufficient for the Project during construction and operation, and no necessary improvements are anticipated. The Project would have fire suppression measures of its own, as well as facilities for the storage of hazardous materials. No City fire department improvements are anticipated. Police protection would be provided by the Payne County Sherriff's Department during both construction and operations, and no improvements are anticipated. *Waste management:* Local waste disposal and sanitation facilities are not anticipated to be adversely affected by the additional waste streams generated during construction and operation of the Project. No additional solid wastes would be generated by the Project as byproducts from the production of electricity.	
Land Use, Recreation, Farmland, and Coastal Facilities	*Land use:* Construction and operation of the Project would impact the existing grassland land use, however, it will not have a significant impact on prime farmland. *Recreation:* No direct impacts to parks are anticipated. While the Sites may be visible from these parks, several streets with homes, combined with nearby commercial and industrial areas provide visual and sound buffers between the Sites and the existing parks. The transmission line routes primarily extend existing ROW. Construction traffic and any road closures would be temporary in nature and cease after construction is complete. *Farmland*: No farming activities currently occur at either Site. No farming has occurred in the recent past. No known agricultural buildings and animal dairy confinement operations are located near the Project. In addition, the Project's electrical clearances and ROW width are designed to limit neutral-to-earth and induced voltages that can create concern with livestock operations. *Coastal:* No coastal facilities are located within the Project Study Area or macro-corridors. No impacts to coastal facilities are anticipated due to the Project	No unique impacts anticipated for this alternative
Noise	Project construction would result in temporary and minor noise impacts in the	No unique impacts anticipated for

Resource	Impacts from Proposed Action	No Action Alternative
	surrounding area. Construction-related sounds would vary in intensity and duration depending on specific stages and activities of construction but would not be permanent. Nearby residences may temporarily experience increased noise during construction. Minor temporary disturbances to wildlife could occur. A preliminary noise study was conducted. The results of this study showed noise levels are likely to have moderate to high adverse effects on nearby neighbors. AECI plans to install stack silencers to reduce impacts to the surrounding properties that would be in excess of EPA noise guideline levels.	this alternative
Socioeconomics and Environmental Justice	During construction, the Project would create up to 400 jobs during peak activity. The number of workers onsite would begin at nominal levels at the beginning of construction and steadily increase over time, declining as major construction activities are completed. Local businesses near the Facility, such as gas stations, convenience stores, and restaurants, may experience increases in business during construction due to construction workers onsite. This increased demand would cease after construction is complete and would not add considerably to the demand on existing business, services, or community facilities. The Project would create up to 25 full-time permanent jobs. These new permanent employees may be from the local workforce or may relocate to the area for the position. Considering the population of the City of Stillwater and Payne County, the addition of 25 jobs is not anticipated to considerably increase demand for housing, schools, or other local services. The Project would not directly impact any residences, public facilities, farming structures, cemeteries, religious facilities, or other structures. Temporary disruptions to normal traffic may occur during construction as equipment and employees commute to and from the Project. The frequency of the daily workforce automobile traffic would follow the Project workforce numbers onsite at a given time. The daily automobile traffic to the site would increase from approximately 25 to 50 vehicles in the initial stages of construction to approximately 400 vehicles for peak months. The traffic would decrease until it reaches approximately 25 vehicles near construction completion and during operation.	No unique impacts anticipated for this alternative
Visual Resources	The aesthetics of the surrounding area would be altered by the Project. Vegetation would need to be cleared permanently for the Project Site. The Project site would require lighting for safety and security. Light emissions at the Project Site would increase compared to current levels of light emissions as a result of facility lighting. The dominant visual features of the Project would be a stack and other facility equipment at the Project Site.	No unique impacts anticipated for this alternative

Resource	Impacts from Proposed Action	No Action Alternative
	The transmission line upgrades will occur either in or parallel to existing ROW.	
Water Resources	*Surface Water*: The Site has been chosen to avoid permanently impacting surface water sources. *Groundwater*: No groundwater is located on the Site and no groundwater will be used for the Project. Therefore, there would be no impacts to groundwater. *Floodplain*: The Site is not within 100- or 500-year floodplains. *Wetlands/Riparian:* The Project Site has been selected to avoid and minimize wetland impacts as much as practical. All laydown and staging areas necessary for construction have been selected to avoid any wetland impacts. Transmission lines will span all wetlands with no fill discharged to the wetlands. *Wastewater*: Facility waste streams from the Project will be directed to an onsite septic system. Process water from the Project and stormwater will be discharged to an onsite settling pond.	No unique impacts anticipated for this alternative.

4.0 Cumulative Impacts

The CEQ defines cumulative impacts (40 CFR 1508.7) as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.

The following resources were determined to have no direct effects, therefore no cumulative effects, and will not be further evaluated in this section:

- Land Use, Formally Classified Lands, Geology, Soils, and Farmland
- Floodplains
- Water Resources
- Coastal Resources
- Biological Resources
- Historic and Cultural Resources
- Socioeconomics/Environmental Justice
- Transportation
- Human Health and Safety

4.1 Region of Influence

To determine cumulative effects, impacts on each resource are analyzed for a geographic scope that includes an area footprint appropriate for the resource. Various areas of Payne County were analyzed for regional cumulative impacts. Local utility webpages (https://51erwi.com/current-projects) were accessed. The Oklahoma Department of Transportation interactive GIS website was accessed (https://oklahoma.gov/odot/programs-and-projects0/8-year-construction-work-plan.html) to determine if any road projects are occurring in the area. News articles were researched, and discussions were held with local agencies. The identified actions are described in the following section.

4.2 Past, Present, and Reasonably Foreseeable Future Actions

Past actions that have affected the resources of the area include:

- Private agriculture near the Site is now common, which resulted in the removal of native vegetation;
- Railroad development took place, setting aside land for rail and removing it from other uses;
- Construction of roadways removed land from use and created on-going air and noise sources;
- Construction of the existing transmission line directly south of the proposed Ripley Energy Center took land out of use and spanned several wetlands;
- Construction of the existing Stillwater Substation took land out of use;
- Construction of the existing water pipeline near the proposed Ripley Energy Center took land out of use.

Present actions that have affected the resources of the area may include:

- Asphalt plant to the northwest of Ripley Energy Center will impact its immediate footprint for various resources; and
- Transmission line upgrades independent of the Proposed Action have the potential to locally affect various resources.

Reasonably foreseeable actions that may affect the resources of the area include the following:

- The State of Oklahoma has established a Priority Action Plan (PAP) that was submitted to EPA on February 29, 2024 (ODEQ, 2024)[2], as part of the Inflation Reduction Act grant process. The PAP presents the State's intention to reduce GHG emissions by following "Priority Measures" that support the development of solar farms and increase grid resiliency.
- Transmission line upgrades to accommodate the Proposed Action, but not associated with the Proposed Action have the potential to locally affect various resources.
- Highway projects including resurfacing SH-108 adjacent to the Site will have minimal effects during construction but no additional long-term effects are anticipated.

The various entities involved in implementing each of these actions would have been and are required to obtain their own permits, clearances, and/or licenses prior to construction and operation of their respective actions. These entities would also be responsible for the on-going maintenance and compliance of their actions. The potential cumulative impacts on each resource are described in the following sections.

4.2.1 Wetlands and Water Bodies

As discussed in Section 3.3.1, several wetlands and water bodies were identified for the Project Area, and there are more adjacent to the site. Due to their abundance in the Study Area, it seems likely that past projects may have impacted and likely altered wetland and water bodies in the region. Present and future actions are subject to federal permitting requirements that may not have existed previously. While the identified present and future actions in the area may also have the potential to impact wetlands and water bodies, each of the entities undertaking those actions will be required to survey, permit, and/or mitigate impacts to wetlands, implementing what the USACE determines is appropriate. It is anticipated that wetlands impacts will mostly be avoidable for these other actions. Therefore, there are not anticipated to be significant cumulative impacts to wetlands in the area.

4.2.2 Aesthetics

The landscape of Payne County has been altered by residential and business development, and agriculture. Construction of identified past activities required vegetation clearing and in some instances, built permanent visual features into the viewshed (e.g., existing transmission line and other community infrastructure).

The aesthetics of the surrounding area could be altered by reasonably foreseeable future actions. Vegetation could need to be cleared and light emissions from construction could occur. However, none of the identified future actions are likely to cause long-term effects,

[2] https://www.deq.ok.gov/wp-content/uploads/air-division/CPRGOK_Priority_Action_Plan.pdf

having a limited footprint. Overall, the aesthetics of the area are not anticipated to significantly change.

4.2.3 Air Quality

Past actions would have contributed to construction emissions and vehicle emissions in the area. Present actions have the potential to temporarily impact air quality during construction and operation. Construction activities are typically intermittent and temporary in nature, ceasing after construction is complete. During operation, the asphalt plant is likely to have air emissions, but would get an air permit to operate.

The identified future actions are reasonably actions are expected to have minimal and temporary air emissions during construction, but minimal additional emissions in the long term. The State of Oklahoma does not have any definitive GHG emissions reduction goals (C2ES, 2023)[3], but as mentioned, it has submitted a PAP with actionable Priority Measures as part of the Inflation Reduction Act grant process. The Ripley Energy Center fosters these Priority Measures by providing reliable, fast-start capacity to cover solar shortfalls and improved transmission facilities.

There is no current state policy mandating GHG emissions reductions, and the PAP presents anticipated GHG emissions levels in 2050 that are very similar to the projected existing levels (i.e., "Business As Usual"). The increases associated with the Ripley Energy Center will be minimal over current levels (~0.5% of State total GHG). Cumulatively, emissions are not anticipated to substantially impact the overall air quality in the region, as the ODEQ and EPA regulate activities to maintain ambient air quality. Therefore, no adverse cumulative impacts to air quality are anticipated as a result of the identified actions.

4.2.4 Noise

Existing residential and agricultural activities, and associated traffic all currently contribute to noise in the Study Area. Identified past actions may have increased existing noise during construction, and the addition of large roadways has created a long-term source of noise in the area. The identified present and future actions will have temporary construction noise associated with them.

Operational impacts from most of the actions are anticipated to be negligible long-term. The asphalt plant and existing substation will have localized noise impacts and the roadways are a long-term source of noise in the community. There have been localized cumulative noise impacts near the Project Site from the various actions, but none are currently considered adverse cumulative noise impacts because most of the actions are expected to have no long-term impact or are far enough away to not create cumulative impacts.

[3] https://www.c2es.org/document/greenhouse-gas-emissions-targets/

5.0 Summary of Mitigation

The following Table 5-1 is a summary of mitigation proposed for the Project by resource.

Table 5-1: Summary of Mitigation

Resource	Potential Environmental Consequences	Mitigation Measures Required	Intensity of Residual Effects
Land Use, Formally Classified Lands, Geology, Soils, and Farmland	Construction and operation of the Project will occur on previously disturbed land within the Facility boundary. Land use within the area is expected to change from agricultural to industrial for a small portion of the site, and land not used for facilities will likely still be hayed.	No mitigation measures are anticipated.	Minimal
Floodplains	Construction will not occur in any floodplains.	No mitigation measures are anticipated.	None
Wetlands and Water Bodies	11.53 acres of wetlands and eight streams are present within the construction zone and have the potential to be impacted by the Project and associated transmission line construction.	All wetlands will be spanned by transmission structures and no fill will enter any waterways. No other mitigation measures are anticipated.	Low
Water Resources	A new 8-inch water pipeline will supply water to the facility and connect to an existing water transmission main.	Facility will have its own dedicated water supply. No mitigation is necessary.	Not Applicable
	Soil erosion and stormwater runoff into nearby streams and rivers may impact waterways during construction.	Before construction activities commence, AECI's EPC contractor will apply for the appropriate ODEQ NPDES Construction Stormwater permit and will follow all requirements of the permit. AECI's EPC contractor will prepare a SWP3 that will describe the BMPs to be implemented during construction.	Minimal
	Stormwater runoff into nearby streams and rivers may impact waterways during operation.	Once the EPC files the Notice of Termination (NOT) and ODEQ inspects the site and it passes, that will conclude the construction stormwater permit obligation. AECI's operational runoff for the plant will be covered in the facility's water permit.	Minimal
Threatened and Endangered Species	The Project may affect but is not likely to adversely affect the tricolored bat or monarch butterfly.	Tree clearing will occur outside of tricolor bat roosting season.	Minimal

Resource	Potential Environmental Consequences	Mitigation Measures Required	Intensity of Residual Effects
	Potential bird strikes on transmission lines may occur.	There is no suitable habitat for migratory birds or eagles on the Project Site, and no forest clearing will be undertaken. AECI/KAMO will install bird diverters on the transmission lines where they cross water features, thereby reducing the likelihood of collisions.	None
Vegetation	Construction will occur on previously disturbed soils on an active hay field.	No mitigation measures are anticipated.	Not Applicable
	It is not expected that construction related disturbances will provide an opportunity for the establishment of invasive species as the area will not be conducive to the growth of vegetation.	No mitigation measures are anticipated.	None
Wildlife	Facility will be built on an existing hay field. Habitat and foraging characteristics will be permanently removed before and after the Project.	No mitigation measures are anticipated.	Minimal
	During construction, noise and activity may drive wildlife out of the area immediately surrounding the Project.	No mitigation is needed. After construction ends, wildlife will return.	Minimal
	Construction activities will not introduce or spread invasive species in the area.	No mitigation measures are anticipated.	None
Historical and Cultural Properties	Construction will occur on previously disturbed soils and no eligible resources were identified.	No mitigation measures are anticipated. An Unanticipated Discovery Plan has been created.	Minimal
Aesthetics	There will likely be visual contrast from the new Facility.	General landscaping and No mitigation measures are anticipated.	None

Resource	Potential Environmental Consequences	Mitigation Measures Required	Intensity of Residual Effects
Air Quality	Air emissions from construction are low and temporary in nature, fall off rapidly with distance from the construction site, and will not result in any long-term impacts.	Fugitive dust control measures will include, but are not limited to, the following: • Applications of water; • Paving or watering of roadways after completion of grading; • Reduction in speed on unpaved roadways to 15 miles per hour or less; • Use of sweepers or water trucks to remove mud at points of public street access; and • Stabilization of dirt storage piles by seedling and mulching, tarps, or barrier fencing.	Minimal
	Emissions from construction activities can be difficult to quantify, as they are dependent on the number and type of construction vehicles in operation at any given point during construction, the number of construction workers driving to and from the site, and the number and type of construction activities occurring, etc.	Air emissions from construction equipment are low and temporary in nature, fall off rapidly with distance from the construction site, and will not result in any long-term impacts. No mitigation is anticipated.	Minimal
	Emissions will occur from operation of the Project	Air emission calculations have determined that the Project will not be a major PSD source and only requires a construction permit through the minor source permitting process. All equipment will meet the applicable NSPS and NESHAP limits. The Project will include an SCR system to control NO_x emissions and an oxidation catalyst to control emissions of CO. Good combustion practices and the use of clean fuels will mitigate emissions of PM_{10} and $PM_{2.5}$. AECI will comply with the requirements in the air construction permit, once received. A Title V operating permit will be applied for within 12 months after the commercial operation date.	Low
Socioeconomic and Community Resources	Project will generally have a positive impact on the socioeconomics of the surrounding areas. Project is not located within an environmental justice area.	No mitigation measures are anticipated.	None

Resource	Potential Environmental Consequences	Mitigation Measures Required	Intensity of Residual Effects
Noise	Noise will be produced from the construction equipment and activities. Actual noise levels generated by construction will vary on a daily and hourly basis, depending on the activity that is occurring, and the types and number of pieces of equipment that are operating.	Any excessive construction noise should be of short duration and have minimal adverse long-term effects on land uses or activities associated with the Project area.	Minimal
	Noise will be produced from the operation of the Project.	Sound mitigation measures will be included in the base design of the Project. Details of these measures will be determined as the Project proceeds.	Minimal
Transportation	Construction of the Project will cause increased traffic in the area surrounding the Project.	As construction and operation of the proposed Project will have only temporary impacts on transportation, no mitigation measures are anticipated.	Minimal
	Damage to existing roads during construction.	Roadways will not be purposefully damaged. In the event this does occur, repairs for damage caused by construction activities will be made when appropriate.	Minimal
Human Health and Safety	EMF will be strongest directly under the transmission line and decreases with increasing distance from the transmission line ROW. The proposed Project is not anticipated to significantly increase the existing EMF levels in the current transmission corridor.	No mitigation necessary.	None
	During construction, the site will be managed to prevent harm to the general public. The general public will not be allowed to enter any construction areas associated with the proposed Project. The major risk to the general public will be from an increase in traffic volume on the roadways near the proposed Project as a result of commuting construction workers and transportation of equipment and materials.	Perimeter fences and controlled access will remain in place throughout the construction and future operation of the Project. Increases in traffic will be temporary in nature and following construction will decrease to acceptable, safe travel levels.	Minimal

Resource	Potential Environmental Consequences	Mitigation Measures Required	Intensity of Residual Effects
	There are a number of risks to human health and safety possible in the course of constructing and operating a power plant including hazards such as fire, slips, trips, falls, electrical hazards, confined space entry, and many others. Additionally, hazardous substances or wastes may be released, generated, or required for construction and operation of the Facility.	A comprehensive safety program is in place at AECI. For instance, a safety briefing is required annually for employees and upon entry for contractors. Adequate training for human health and safety concerns will be mandatory for all construction workers on the Project site. Personal safety equipment such as hard hats, ear and eye protection, and safety boots will be required for all workers onsite. Accidents and injuries will be reported to the designated safety officer onsite.	Minimal
	Construction and operation of the proposed Project will also involve the use and storage of regulated and hazardous materials. During construction, diesel fuel, gasoline, and lubricating oils from heavy equipment and vehicles may accidentally leak or spill. Hydraulic fluid, paints, and solvents will likely be used during the construction phase as well. Additionally, the presence of aboveground fuel storage tanks and oil-filled equipment present the potential to release into the environment.	Risk management associated with hazardous materials is an additional human health and safety concern. To reduce the potential for a release of regulated or hazardous materials during the construction phase of the proposed Project, work will be planned and performed in accordance with OSHA standards and protocols addressing the use of potentially hazardous materials and applicable federal and state environmental regulations. If a hazardous release were to occur, emergency response, cleanup, management, and disposal of contaminated soils will be conducted according to EPA and State standards. Conformance to these standards and procedures will reduce the potential for significant impacts resulting from the release of hazardous materials during the construction phase.	Minimal

6.0 Coordination, Consultation, and Correspondence

The following sections detail the agency and tribal coordination efforts completed for the Project and public involvement plan.

6.1 Public Involvement

The AECI Project team met with the Mayor of Ripley on November 3, 2023. The mayor expressed no concerns about the project.

A public open house was held on December 14, 2023, at the Payne County Expo Center Heritage Hall in Stillwater, OK. Several methods of outreach were used to inform the public of this meeting. Approximately 3,000 email invitations and 4,000 postcards were sent, and a social media campaign was conducted which reached 5,903 people. At the public open house, there were 66 in-person attendees. No written comments were received at the meeting; however, two email inquiries were received regarding career opportunities.

Prior to the public open house, members of AECI met with Blaine Arthur, the Oklahoma Secretary of Agriculture and Kaleb Hoffman, the Superintendent of Ripley Public Schools. Ms. Author and Mr. Hoffman expressed concern about the location of the project being slightly outside the Ripley school district, which would limit tax benefits for the Ripley community.

6.2 Agency Consultation

Letters were sent to agencies to inform agency contacts that AECI had engaged RUS and was requesting financing for the Project. The letter provided a Project description and explained that the action triggers an EA. The agencies were provided with this information on the Project as an opportunity to ask questions and provide initial feedback. Agency correspondence is provided in Appendix D. Table 6-1 provides a list of agencies who received letters.

Table 6-1: RUS Scoping Letter Distribution

Agency	Date(s)	Contact	Response
Federal Agencies			
USACE[1]	June 9, 2023 March 25, 2024	Tulsa District	Response to Approved Jurisdictional Determination request received May 1, 2024, indicating four non-jurisdictional wetlands onsite and no permit required.
USEPA[2]	June 8, 2023	Earthea Nance	No response received
USDA - NRCS	June 8, 2023	Stacy Riley/Jacob Bushong	Project required Form AD-1006 Farmland Conversion Impact Rating be filled out. Follow up resulted in score well below the Farmland Protection Policy Act thresholds.
USFWS[3]	June 8, 2023	Laurence Lavesque	Also spoke with Matt Fullerton in the Tulsa office regarding bats; he stated no consultation required.
FAA	June 8, 2023	Luke Wray	

State Agencies			
OK SHPO	June 8, 2023 June 16, 2023	Lynda Ozan	Follow-up letter sent with Cultural Resources Report resulted in finding that no historic properties affected by Project.
OK DOT	June 8, 2023	Dawn Sullivan/Emily Pehrson	Email response stated no conflicting construction projects in the area.
OK Corporate Commission	June 8, 2023	Matt Skinner	No response received
OK Archaeological Survey	June 8, 2023 June 16, 2023	Kary Stackelbeck	Follow-up letter sent with Cultural Resources Report resulted in concurrence with findings of the SHPO.
OK Water Resources Board	June 8, 2023	Chris Neel	Phone call follow up resulted in no concern regarding Project.
OK DEQ	June 8, 2023	Scott Thompson/Jon Roberts	Email response stated no adverse environmental impacts under DEQ jurisdiction.
OK Dept of Wildlife	June 8, 2023	J.D. Strong	No response received
Local Agencies			
Payne County Administrator	June 8, 2023	Chris Reding	No response received

[1] United States Army Corps of Engineers
[2] Environmental Protection Agency
[3] United States Fish and Wildlife Service

Agencies that responded expressed no concern regarding the Project. In general, agencies responded that the Project should obtain permits if needed prior to any construction.

6.2.1 Federal Permitting

Appendix H provides the Federal permits and approvals required for the Project.

6.2.2 State Agency Coordination

The following sections provide details about specific State agency coordination and correspondence, as well as a list of state permits required for the Project.

6.2.2.1 Oklahoma Department of Energy

AECI met with Oklahoma Secretary of Energy, Ken McQueen, and the on April 27, 2023. The purpose and need of the project was discussed along with the proposed location and a potential project schedule. No concerns were expressed at the time.

6.2.2.2 Oklahoma Archaeological Society

The Oklahoma Archaeological Survey (OAS) was sent a letter on June 8, 2023, with details about the Project. Upon review, the OAS determined that an archaeological field inspection was necessary along portions of the transmission line to be upgraded. The archaeological field inspection was deemed necessary due to the topographic and hydrologic setting of the Project.

Findings from the inspection were provided to OAS, with a recommended finding of no effect. The OAS concurred with this finding.

6.2.2.3 Oklahoma Department of Environmental Quality

The ODEQ Director, Business & Regulatory Affairs also met with AECI on April 27, 2023. The meeting provided a general overview of the proposed project along with a permitting matrix that outlined the expected permits that would be needed for the project. ODEQ was also sent a letter on June 8, 2023, with details about the Project, to which ODEQ responded via email on June 16, 2023. ODEQ did not anticipate any adverse environmental impacts under ODEQ jurisdiction.

6.2.2.3.1 Air Permitting

AECI and their contractor held several project pre-application meetings concerning air permitting with ODEQ representatives, including Phillip Fielder (Chief Engineer) and Joseph Wills (Dispersion modeling lead), over the course of the project. Pursuant to the requirements specified in the Oklahoma Administrative Code Title 252, Chapter 100, to which AECI submitted a construction air permit application on 12/22/23. A notice of administrative completion for the application was received on 3/26/24. Comments will be accepted during the 30-day public comment period after the draft permit has been completed. The ODEQ provided notification of the air permit approval and will issue the final permit after all comments are addressed.

6.2.3 Oklahoma State Historic Preservation Office

A letter was sent to the Oklahoma SHPO on June 8, 2023, providing preliminary information about the Project. The SHPO concurred with all findings in the cultural survey and subsequent correspondence.

6.2.4 State Permitting

Appendix H provides the State permits and approvals required for the Project. The table includes permits that are related to the overall AECI Project, including permits that are the responsibility of entities other than AECI.

6.3 Tribal Coordination

On June 16, 2023, Section 106 Consultation Letters that provided preliminary Project details were mailed by RUS to the tribes listed below.

- Apache Tribe of Oklahoma
- Cherokee Nation
- Cheyenne and Arapaho Tribes, Oklahoma
- Muscogee (Creek) Nation
- Osage Nation
- Otoe-Missouria Tribe of Indians, Oklahoma
- Wichita and Affiliated Tribes (Wichita, Keechi, Waco, and Tawakonie), Oklahoma

Section 106 Consultation Letters containing further details about the Project were mailed to the tribes listed above on November 29, 2023. The expected 30-day timeline for the second round of letters was January 5, 2023. The Osage Nation contacted RUS after this date to request changes to the cultural report and the Unanticipated Discovery Plan. The changes were made and a response was submitted to the Osage Nation on February 27, 2024. The Osage Nation sent a letter of concurrence on March 1, 2024.

6.4 Local Coordination

AECI held a phone call on February 28, 2024, with the neighboring landowner due west of the project boundary, whose pond would ultimately receive the effluent water leaving the facility. AECI provided an overview of the Project and explained that with the current design his pond would receive the Project's effluent water after it was discharged from the constructed process pond and then flowed through the series of two existing ponds on AECI property. It was explained that the facility will have a NPDES permit from the ODEQ regulating the limits of any pollutants in the discharge water. AECI provided information on expected NPDES permit limits related to similar simple cycle units. Further questions from the landowner are included in the following table (Table 6-2).

Table 6-2: Landowner Communication

Question	AECI Response
Has AECI built other plants like this facility in other locations?	Yes, AECI provided an overview of all the power plants AECI owns and then provided information on the power plants AECI owns that are Peaker units like this proposed facility. Additional information was provided explaining what a Peaker unit was and that it would be limited to a run time capacity of 43%
What percentage of run time on natural gas versus fuel oil has AECI experienced at their similar facilities?	A very low percentage and running off fuel oil only happens when natural gas prices get very high and exceed the price of fuel oil. Recent winter storms over the last several years have created these scenarios, but overall run time on fuel oil is 1% or less and the facilities are allotted limited hours on the air permit to run on fuel oil.
What has AECI's experience been when running on fuel oil related to smoke emissions?	The facility will be outfitted with emissions controls, such as Selective Catalytic Reduction (SCR) controls, oxidation catalyst, and water injection to control Nitric Oxides (NOx). Further, the facility's air permit would limit the opacity of the emissions. While there may be a brief period of visible emissions during a cold start-up on fuel oil or during the switch from natural gas to fuel oil, there should not be a noticeable difference in emissions once running at operating level on fuel oil.
What can he expect for noise at his property?	The project is targeting 60DB or less at nearby rural residential homes.
What has AECI's research shown to how the project will impact property values?	AECI does not have any information on how the facility would impact his property values but understood the landowners concern that most people do not want to live across the road of an industrial facility.
What kind of water use does AECI expect at the facility?	Simple cycle plants, versus other types of power plants, use relatively little water. The amount of process water discharged is expected to vary with operation and weather. While detailed design is not complete, preliminary modeling shows discharged process water while the plant is operating to be in the range of 7GPM to 25GPM.

The following coordination occurred related to the Proposed Action, outside of AECI's public outreach meeting:

- Throughout the fall of 2023 AECI met with:
  - Mayor of Ripley, Oklahoma to discuss the Project and provided stakeholder information through a slide deck.
  - Oklahoma Energy Secretary, ODEQ Director of Economic Development.
  - Hosted a call with Ripley School Superintendent and County Commissioner to share Project information slide deck.
- February 2024
  - Hosted call with neighboring landowner to the west of the Project. The Project was discussed, and questions were answered that the neighbor had related to the Project including air, noise, and water effluent.

6.5 Locations for Public Review of EA

This EA was made available to the public for a 14-day public review and comment period beginning on August 1, 2024. Notice of Availability of the document for review and comment was published in the following newspapers:

- Cushing Citizen (July 31, 2024)
- Yale News (August 1, 2024)

Copies of the EA were made available for public review at RUS, 1400 Independence Avenue, SW, Washington DC 20250-3201; on the RUS website at https://www.rd.usda.gov/resources/environmental-studies/assessment/ripley-energy-center; at the headquarters of AECI at 2814 South Golden Avenue, Springfield, Missouri 65807; and at the following libraries:

Cushing Public Library
215 North Steele Avenue
Cushing, Oklahoma 74023

Yale Public Library
213 North Main Street
Yale, Oklahoma 74085

All comments from reviewers were directed to be sent via email to RUSPublicComments@usda.gov or via mail addressed to:

Environmental and Historic Preservation Division
USDA, Rural Utilities Service
Environmental Protection Specialist
1400 Independence Avenue SW
Room 2244, Stop 1571
Washington, DC 20250-1571

RUS received no comments on the draft EA. Should RUS choose to issue a FONSI for the Proposed Action, a newspaper notice will be published informing the public of the RUS finding and the availability of the EA and FONSI. The notice shall be prepared in accordance with RUS guidance.

7.0 References

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8.0 List of Preparers

The environmental review for the Project was prepared by RUS, AECI, and Burns & McDonnell Engineering Company, Inc. The following is a list of preparers of this document.

Rural Utilities Services

- Environmental and Historic Preservation Division

Associated Electric Cooperative Inc.

- Rob LeForce, Environmental Analyst Land & Water Resources
- Blake Pinkerton, Manager Air Quality

Burns & McDonnell Engineering Company, Inc.

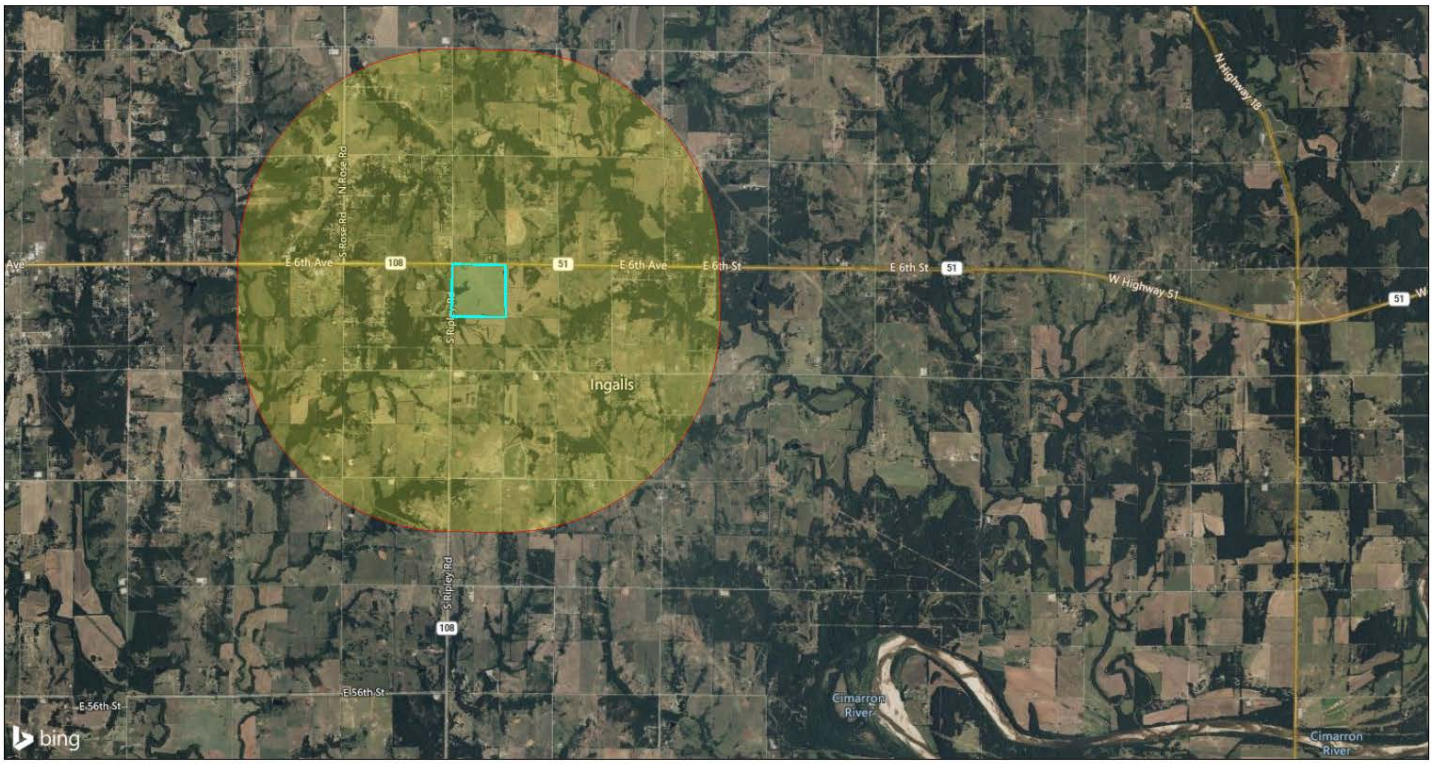
- Chris Howell, Project Manager
- Chris Mallott, Assistant Environmental Scientist
- Taylor Volkers, Assistant Environmental Engineer
- Jessi Schoolcraft, Assistant Environmental Engineer
- Tess Fuller, Senior Environmental Engineer
- Michael Davis, Senior Cultural Resources Specialist
- Christa Wisniewski, Section Manager Natural and Cultural Resources

APPENDIX A – NEPASSIST

NEPAssist Report

Ripley Energy Center

A3 Landscape



March 18, 2024

Project Buffer

Ripley Energy Center

1:66,166

0 0.5 1 2 mi

0 1 2 4 km

Input Coordinates: 36.116555,-96.907951,36.116382,-96.899111,36.109396,-96.899025,36.109448,-96.908144,36.116555,-96.907951	
Project Area	0.24 sq mi
Within 2 miles of an Ozone 1-hr (1979 standard) Non-Attainment/Maintenance Area?	no
Within 2 miles of an Ozone 8-hr (1997 standard) Non-Attainment/Maintenance Area?	no
Within 2 miles of an Ozone 8-hr (2008 standard) Non-Attainment/Maintenance Area?	no
Within 2 miles of an Ozone 8-hr (2015 standard) Non-Attainment/Maintenance Area?	no
Within 2 miles of a Lead (2008 standard) Non-Attainment/Maintenance Area?	no
Within 2 miles of a SO2 1-hr (2010 standard) Non-Attainment/Maintenance Area?	no
Within 2 miles of a PM2.5 24hr (2006 standard) Non-Attainment/Maintenance Area?	no
Within 2 miles of a PM2.5 Annual (1997 standard) Non-Attainment/Maintenance Area?	no
Within 2 miles of a PM2.5 Annual (2012 standard) Non-Attainment/Maintenance Area?	no
Within 2 miles of a PM10 (1987 standard) Non-Attainment/Maintenance Area?	no
Within 2 miles of a CO Annual (1971 standard) Non-Attainment/Maintenance Area?	no
Within 2 miles of a NO2 Annual (1971 standard) Non-Attainment/Maintenance Area?	no
Within 2 miles of a Federal Land?	no
Within 2 miles of an impaired stream?	yes
Within 2 miles of an impaired waterbody?	no
Within 2 miles of a waterbody?	yes
Within 2 miles of a stream?	yes
Within 2 miles of an NWI wetland?	Available Online
Within 2 miles of a Brownfields site?	no

Within 2 miles of a Superfund site?	no
Within 2 miles of a Toxic Release Inventory (TRI) site?	no
Within 2 miles of a water discharger (NPDES)?	no
Within 2 miles of a hazardous waste (RCRA) facility?	no
Within 2 miles of an air emission facility?	yes
Within 2 miles of a school?	no
Within 2 miles of an airport?	no
Within 2 miles of a hospital?	no
Within 2 miles of a designated sole source aquifer?	no
Within 2 miles of a historic property on the National Register of Historic Places?	no
Within 2 miles of a Land Cession Boundary?	yes
Within 2 miles of a tribal area (lower 48 states)?	no
Within 2 miles of the service area of a mitigation or conservation bank?	yes
Within 2 miles of the service area of an In-Lieu-Fee Program?	yes
Within 2 miles of a Public Property Boundary of the Formerly Used Defense Sites?	no
Within 2 miles of a Munitions Response Site?	no
Within 2 miles of an Essential Fish Habitat (EFH)?	no
Within 2 miles of a Habitat Area of Particular Concern (HAPC)?	no
Within 2 miles of an EFH Area Protected from Fishing (EFHA)?	no
Within 2 miles of a Bureau of Land Management Area of Critical Environmental Concern?	no
Within 2 miles of an ESA-designated Critical Habitat Area per U.S. Fish & Wildlife Service?	no
Within 2 miles of an ESA-designated Critical Habitat river, stream or water feature per U.S. Fish & Wildlife Service?	no

Created on: 3/18/2024 5:17:22 PM

APPENDIX B – WETLANDS REPORT

March 22, 2024

Mr. Rob LeForce, B.W.
Environmental Analyst, Land and Water Resources
Associated Electric Cooperative, Inc.
2814 S. Golden Ave
Springfield, MO 65801

Re: Ripley Energy Center Wetland Delineation Report

Dear Mr. LeForce:

Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) was retained by Associated Electric Cooperative, Inc. (AECI) to provide wetland delineation services for the proposed Ripley Energy Center (Project) in Payne County, Oklahoma (Figure A-1, Appendix A). The following summarizes the proposed Project and the results of the wetland delineation effort.

INTRODUCTION

AECI plans to construct a simple cycle combustion turbine in Payne County, Oklahoma. The proposed project would include construction of a simple cycle combustion turbine, transmission line rebuild, transmission lead line, water line, distribution line, and other appurtenant facilities. The Project is located approximately 8 miles east of Stillwater, Oklahoma.

The Project has the potential to impact wetlands or other water bodies that may be under the jurisdiction of the U.S. Army Corps of Engineers (USACE) as designated by Section 404 of the Clean Water Act. Burns & McDonnell conducted a wetland delineation for the Project to evaluate the presence of wetlands and other water bodies, including streams, drainages, and ponds. The delineation was conducted based on the proposed Project layout (Survey Area). The Survey Area included in this report and displayed in the accompanying figures is based on the latest Project design and encompasses approximately 228 acres.

METHODS

The following discussions summarize the methods used for the review of existing data and the wetland delineation.

Existing Data Review

Burns & McDonnell reviewed available background information for the area containing the Survey Area prior to conducting a site visit. This available background information included 2018 U.S. Geological Survey (USGS) 7.5-minute topographic maps (Ripley quadrangle), USGS National Hydrography Dataset (NHD), U.S. Fish & Wildlife Service (USFWS) National Wetland Inventory (NWI) maps, National Agriculture Imagery Program (NAIP) aerial photography (2019), and U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) 2017 Soil Survey Geographic (SSURGO) digital data for Payne County, Oklahoma. Figures A-2 and A-3 in Appendix A depict this data. The USACE

Antecedent Precipitation Tool was used to evaluate climate conditions during the time of survey (Appendix D).

Wetland presence based only on NWI maps cannot be assumed to be an accurate assessment of potentially occurring jurisdictional wetlands. Wetland identification criteria differ between the USFWS and the USACE. As a result, wetlands shown on an NWI map may not be under the jurisdiction of the USACE, and all USACE-jurisdictional wetlands are not always included on NWI maps. Therefore, a field visit was conducted to identify any wetlands or other aquatic resources that may be present within the proposed Project.

Wetland Delineation Field Survey

Burns & McDonnell wetland scientists completed onsite wetland delineations on June 21 to 22, 2023, July 25 to 26, 2023, and October 24 to 26, 2023. The delineation was completed following the 1987 *Corps of Engineers Wetlands Delineation Manual* (1987 Manual) and the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains – Version 2.0* (Regional Supplement).

Sample plots were established at multiple locations, and Wetland Determination Data Forms from the Regional Supplement were completed to characterize the Survey Area (Appendix B). Vegetation, soil conditions, and hydrologic indicators were recorded at each sample plot. Locations of sample plots and other identified features were recorded using a sub-meter accurate global positioning system (GPS) unit. Natural color photographs were taken onsite and are included in Appendix C.

RESULTS

The following sections describe the results of the existing data review and the completed wetlands delineation.

Existing Data Review

The existing USGS topographic maps were reviewed to familiarize Burns & McDonnell wetland personnel with the topography of the Survey Area and potential locations of wetlands and other aquatic resources (Figure A-2). The USGS topographic maps indicate that the majority of the Survey Area is relatively flat and generally sloping to the southwest, with gently rolling hills.

The NWI data indicates one palustrine scrub-shrub (PSS) wetland, one palustrine forested (PFO) wetland, two palustrine unconsolidated bottom (PUB) wetlands, one palustrine unconsolidated shore (PUS), and four riverine wetlands are located within the Survey Area. The NHD data indicates twelve stream crossings within the Survey Area. The 2018 aerial photography indicates that the Project Area consists primarily of grassland and a maintained transmission line right-of-way (Figure A-3 and Figure A-4). According to the FEMA Flood Hazard Rate map for Payne

County, there are zone A and AE designated floodways and floodplains located within the Survey Area (Figure A-2).

The NRCS SSURGO digital data indicates that a portion of twenty-seven soil map units are located within the Survey Area (Figure A-3). None of these soils are on local and national hydric soil lists (Figure A-3; Soils Series Legend).

The USACE Antecedent Precipitation Tool indicates that the area near the Survey Area experienced normal conditions during the three months prior to the June 21-22 and October 26 survey, wetter than normal conditions prior to the July 25-26 survey, and drier than normal conditions prior to the October 24 survey (Appendix D).

Wetland Delineation Field Survey
On June 21 to 22, July 25 to 26, and October 24 to 26, 2023, a two-person team comprised of a wetland scientist and a wetland scientist/GPS specialist, both with Burns & McDonnell, conducted a wetland delineation of the Survey Area. The land cover and delineated wetlands and other aquatic resources are discussed in detail below.

Vegetation. The Survey Area was comprised mainly of grassland. The dominant vegetation in the upland areas in the Survey Area included Johnson grass (*Sorghum halepense*), cheatgrass (*Bromus tectorum*), field brome (*Bromus arvensis*), big bluestem (*Andropogon gerardii*), little false bluestem (*Schizachyrium scoparium*), yellow bluestem (*Bothriochloa ischaemum*), yellow indian grass (*Sorghastrum nutans*), Bermuda grass (*Cynodon dactylon*), beaked cut-throat grass (*Coleataenia anceps*), yellow bristle grass (*Setaria pumila*), Carolina joint-tail grass (*Coelorachis cylindrica*), white sagebrush (*Artemisia ludoviciana*), sawtooth raspberry (*Rubus argutus*), coral-berry (*Symphoricarpos orbiculatus*), prairie bundle-flower (*Desmanthus illinoensis*), prairie broomweed (*Amphiachyris dracunculoides*), annual ragweed (*Ambrosia* artemisiifolia), rough buttonweed (*Hexasepalum teres*), blue grama (*Bouteloua gracilis*), hairy crab grass (*Digitaria sanguinalis*), common persimmon (*Diospyros virginiana*), and rough-leaf dogwood (*Cornus drummondii*). Common vegetation observed within delineated wetland areas is described below and species are indicated on the Data Forms in Appendix B.

Soils. Typical upland soils ranged from dark reddish brown (5YR 3/3) to dark yellowish brown (10YR 4/4) in color and sandy clay loam to clay in texture. Typical wetland soils ranged from pinkish grey (5YR 6/2) to very dark grey (7.5YR 3/1) in color and sandy loam to clay in texture. Redoximorphic features were typically present in wetland soils, but they were uncommon in typical upland soils.

Hydrology. The primary source of hydrology for the wetlands was from precipitation and overland flow. Indicators of hydrology within the wetlands included surface water, high water

table, saturation, drift deposits, oxidized rhizospheres along living roots, drainage patterns, crayfish burrows, geomorphic position, and a positive FAC-neutral test.

Delineated Areas
Twenty-one wetlands and ten streams were identified during the wetland delineation. The wetlands and stream are described by type below, and their locations are shown on Figure A-4 in Appendix A. Sample plots were located in the wetlands and adjacent uplands. Data forms of these sample plots are included in Appendix B. Photographs of sample plots, wetlands, and streams are included in Appendix C.

Wetlands
Table 1 provides the type and size of each wetland delineated within the Survey Corridor. Delineated wetland types included palustrine emergent (PEM), PSS, PUB, and palustrine aquatic bed (PAB); each type is described in more detail below.

A total of eight PEM wetlands, encompassing 1.42 acres, were delineated. Vegetation in the wetlands was dominated by flat-stem spike rush (*Eleocharis compressa*), blunt spike-rush (*Eleocharis obtusa*), false daisy (*Eclipta prostrata*), little bluestem (*Schizachyrium scoparium*), bog rush (*Juncus marginatus*), golden crown grass (*Paspalum dilatatum*), narrow-leaf cat-tail (*Typha angustifolia*), hard-stem club-rush (*Schoenoplectus acutus*), globe flat sedge (*Cyperus echinatus*), axil-flower (*Mercardonia acuminata*), common persimmon (*Diospyros virginiana*), and eastern cottonwood (*Populus deltoides*). Observed indicators of wetland hydrology included surface water, high water table, saturation, crayfish burrows, oxidized rhizospheres along living roots, drainage patterns, geomorphic position, and a positive FAC-neutral test. Soils ranged from pinkish grey (5YR 6/2) to very dark grey (7.5YR 3/1) in color and contained redoximorphic concentrations. Soils ranged from sandy loam to clay in texture. Hydric soil was mostly indicated by Depleted Matrix (F3) and Redox Dark Surface (F6).

One PSS wetland, encompassing 0.43 acre, was delineated. Vegetation in the wetland was dominated by blunt spike-rush, American germander (*Teucrium canadense*), and green ash (*Fraxinus pennsylvanica*). Observed indicators of wetland hydrology included drift deposits, drainage patterns, geomorphic position, and a positive FAC-neutral test. Soil was very dark grey (7.5YR 3/1) in color and contained redoximorphic concentrations. Soil was clay loam in texture. Hydric soil was mostly indicated by Redox Dark Surface (F6).

Eleven PUB wetlands, encompassing 8.75 acres, were delineated. PUB wetlands were open water ponds characterized by a combined areal cover of less than 30 percent of vegetation. Vegetation surrounding the wetlands included sawtooth blackberry, narrow-leaf cattail, black willow (*Salix nigra*), eastern red cedar (*Juniperus virginiana*), and common persimmon.

One PAB wetland, encompassing 0.93 acre, was delineated. The PAB wetland was an open water pond characterized by a combined areal cover of 30 percent or more of vegetation. Vegetation surrounding the wetland included Johnson grass, annual ragweed, and American lotus (*Nelumbo lutea*).

Table 1: Delineated Wetlands

Wetland ID	Wetland Type[a]	Delineated Area (acre)	Associated Photos in Appendix C	Figure A-4 Page Number
W-1	PUB	0.25	C-28	18
W-2	PUB	5.16	C-29	20
W-3	PEM	0.04	C-1	20
W-4	PEM	0.78	C-3	21
W-5	PSS	0.43	C-6	19
W-6	PUB	0.56	C-30	22
W-7	PEM	0.14	C-9	22
W-8	PEM	0.08	C-12	16
W-9	PEM	0.01	C-14	15
W-10	PAB	0.93	C-31	12,13,14
W-11	PUB	0.04	C-32	11
W-12	PUB	0.08	C-33	11
W-13	PUB	0.25	C-34	10
W-14	PUB	1.46	C-35	9
W-15	PEM	0.10	C-16	7
W-16	PEM	0.20	C-18	6
W-17	PUB	0.19	C-36	5
W-18	PUB	0.44	C-37	3
W-19	PEM	0.07	C-20	1
W-20	PUB	0.07	C-38	2
W-21	PUB	0.25	C-39	2,3
	TOTAL:	**11.53**		

(a) Symbols for wetland type: PEM = palustrine emergent, PSS= palustrine scrub-shrub, PUB = palustrine unconsolidated bottom, PAB = palustrine aquatic bed

Streams
Table 2 provides the type and delineated length of the stream recorded within the Survey Area.

Eight ephemeral stream crossings, extending for a delineated length of 1,049 feet, were identified. The ephemeral streams were characterized by a defined bed and bank but had limited or no flow during the site visit, indicating that the stream largely carries water only during and after precipitation events. The ephemeral streams ranged from approximately 0.75 to 5 feet wide at the ordinary high-water mark (OHWM) and 2 to 15 feet wide at the top of bank. Bank heights ranged from 1 to 10 feet. The depth from the OHWM ranged from 0.25 to 0.75 foot. These stream crossings flowed through a maintained transmission right-of-way and forested riparian corridor within the Survey Area, where common riparian vegetation included cheatgrass, big bluestem, tall goldenrod (*Solidago altissima*), Johnson grass, and eastern red cedar.

One intermittent stream crossing, extending for a delineated length of 1,014 feet, was identified. The Intermittent stream was characterized by the presence of a limited volume of flow at the time of the site visit, indicating that the stream is partially fed by groundwater but that the streams may not flow during dry periods. The intermittent stream was approximately 5 feet wide at the OHWM and 8 feet wide at the top of bank. Bank height was approximately 4 feet. The depth from the OHWM was approximately 0.50 foot. The intermittent stream flowed through a maintained transmission line right-of-way within the Survey Area, where common riparian vegetation included Johnson grass and common greenbrier (*Smilax rotundifolia*).

One perennial stream crossing, extending for a total delineated length of 105 feet, was identified. The perennial stream was characterized by the presence of a substantial volume of flow at the time of the site visit, indicating that water likely flows year-round. The perennial stream was approximately 8 feet wide at the OHWM and 80 feet wide at the top of bank. Bank height was approximately 30 feet. The depth from the OHWM was approximately 1 foot. The perennial stream flowed through a maintained transmission line right-of-way within the Survey Area, where common riparian vegetation included Johnson grass.

Table 2: Delineated Streams

Stream ID	Stream Type	Delineated Length (feet)	Associate Photos in Appendix C	Figure A-4 Page Number
S-1	Ephemeral	323	C-40	20
S-2	Intermittent	1,014	C-41	12,13
S-3	Ephemeral	127	C-42	12
S-4	Ephemeral	114	C-43	11

Stream ID	Stream Type	Delineated Length (feet)	Associate Photos in Appendix C	Figure A-4 Page Number
S-5	Perennial	105	C-44	8
S-6	Ephemeral	157	C-45	8
S-7	Ephemeral	103	C-46	5
S-8	Ephemeral	117	C-47	4
S-9	Ephemeral	58	C-48	17
S-10	Ephemeral	50	C-49	14
	TOTAL:	**2,168**		

SUMMARY

Burns & McDonnell conducted a wetland delineation of the Survey Area to identify the presence of wetlands and other aquatic resources. A total of twenty-one wetlands and ten streams were identified during the delineation efforts. To avoid the need for a Section 404 Permit from the USACE, the proposed Project should be designed to avoid all impacts to potentially jurisdictional waters. If impacts to jurisdictional features cannot be completely avoided, they should be minimized, and a Section 404 Nationwide Permit from the USACE would be required.

If you have any questions or require additional information, please feel free to contact Sam Stewart by telephone at (816) 591-8658 or by email at smstewart@burnsmcd.com.

Sincerely,

Sam Stewart
Environmental Scientist

Attachments:

Appendix A - Figures
Appendix B - Routine Wetland Determination Data Forms
Appendix C - Ground Photographs
Appendix D - Antecedent Precipitation Tool Results

cc: Chris Howell, Burns & McDonnell

APPENDIX A -FIGURES

APPENDIX B -WETLAND DETERMINATION DATA FORMS

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Service Layer Credits: World Street Map: Texas Parks & Wildlife, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

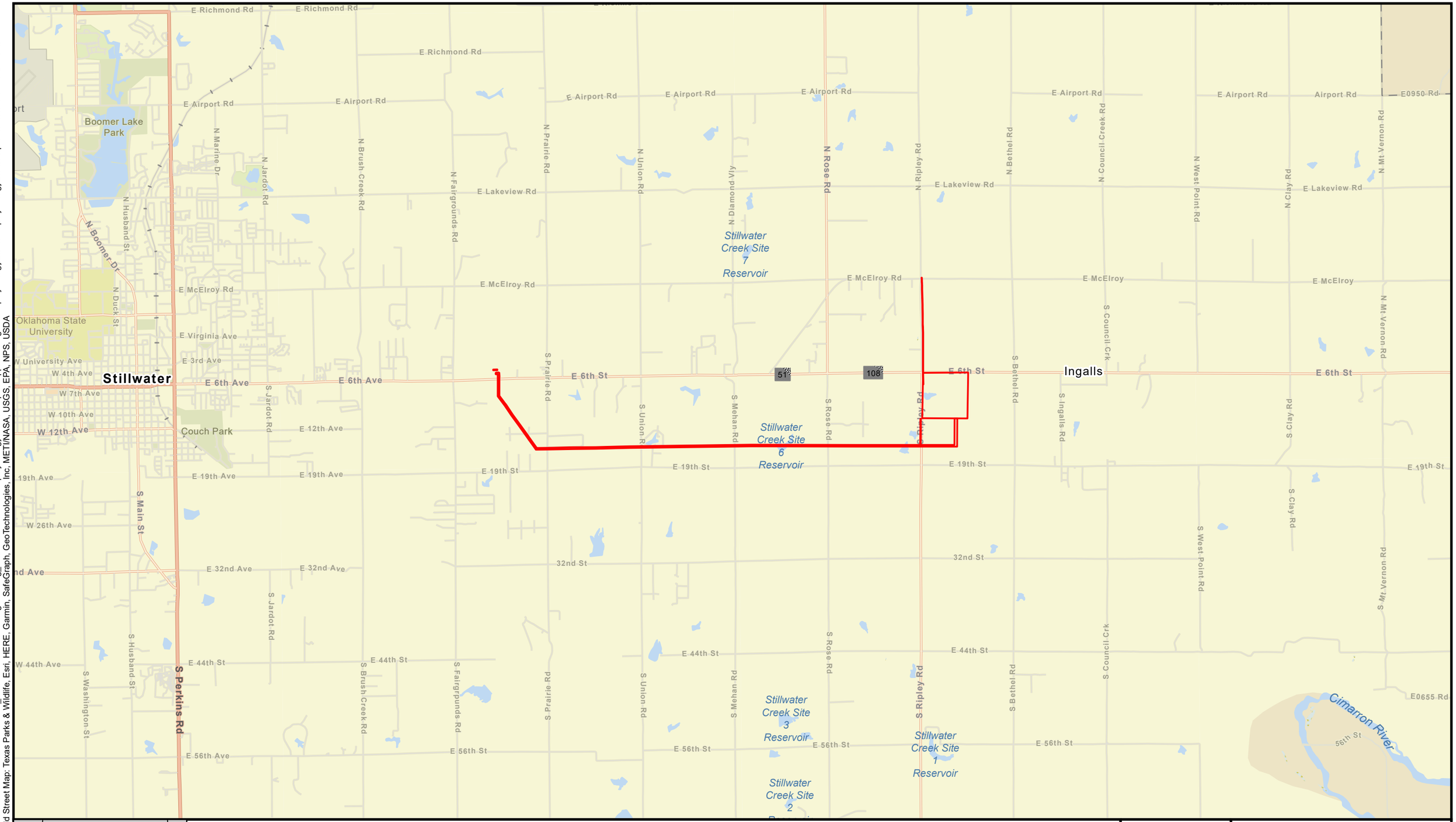

Figure A-1
General Location Map
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK

Source: ESRI, Associated Electric Cooperative, Inc., and Burns & McDonnell

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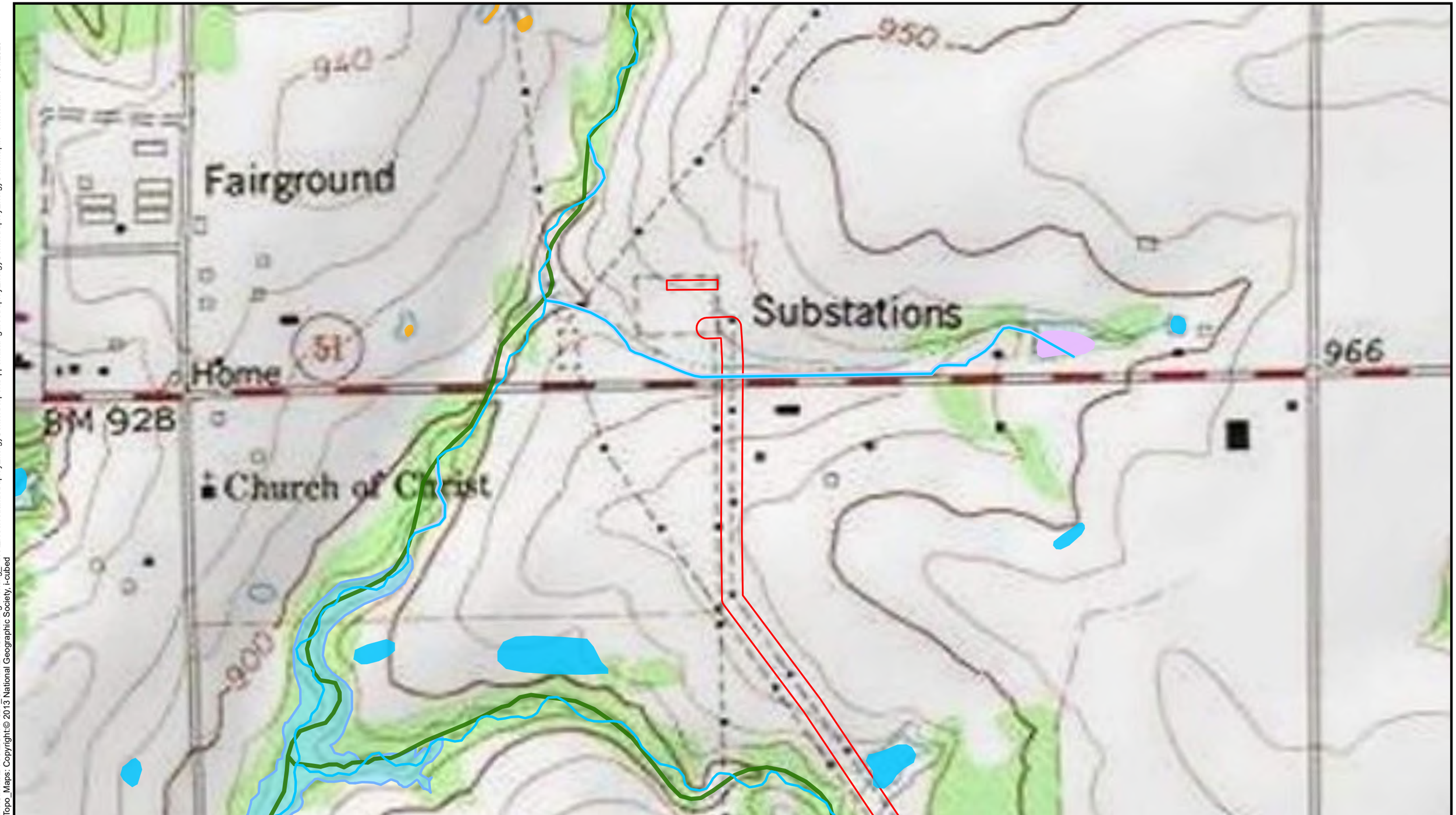

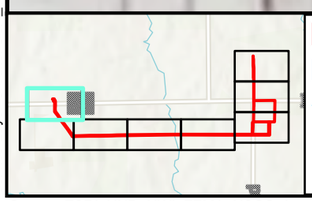

Survey Area
FEMA Floodplain
NHD Stream

NWI Wetland Type
PEM
PSS
PFO
PUB
PAB
PUS
Riverine

NORTH

400 200 0 400
Feet

BURNS McDONNELL

Figure A-2
NHD, NWI, FEMA Floodplain, and USGS Topographic Map
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
Page 1 of 8

Source: ESRI, NHD, NWI, FEMA, USGS, Associated Electric Cooperative, Inc., and Burns & McDonnell

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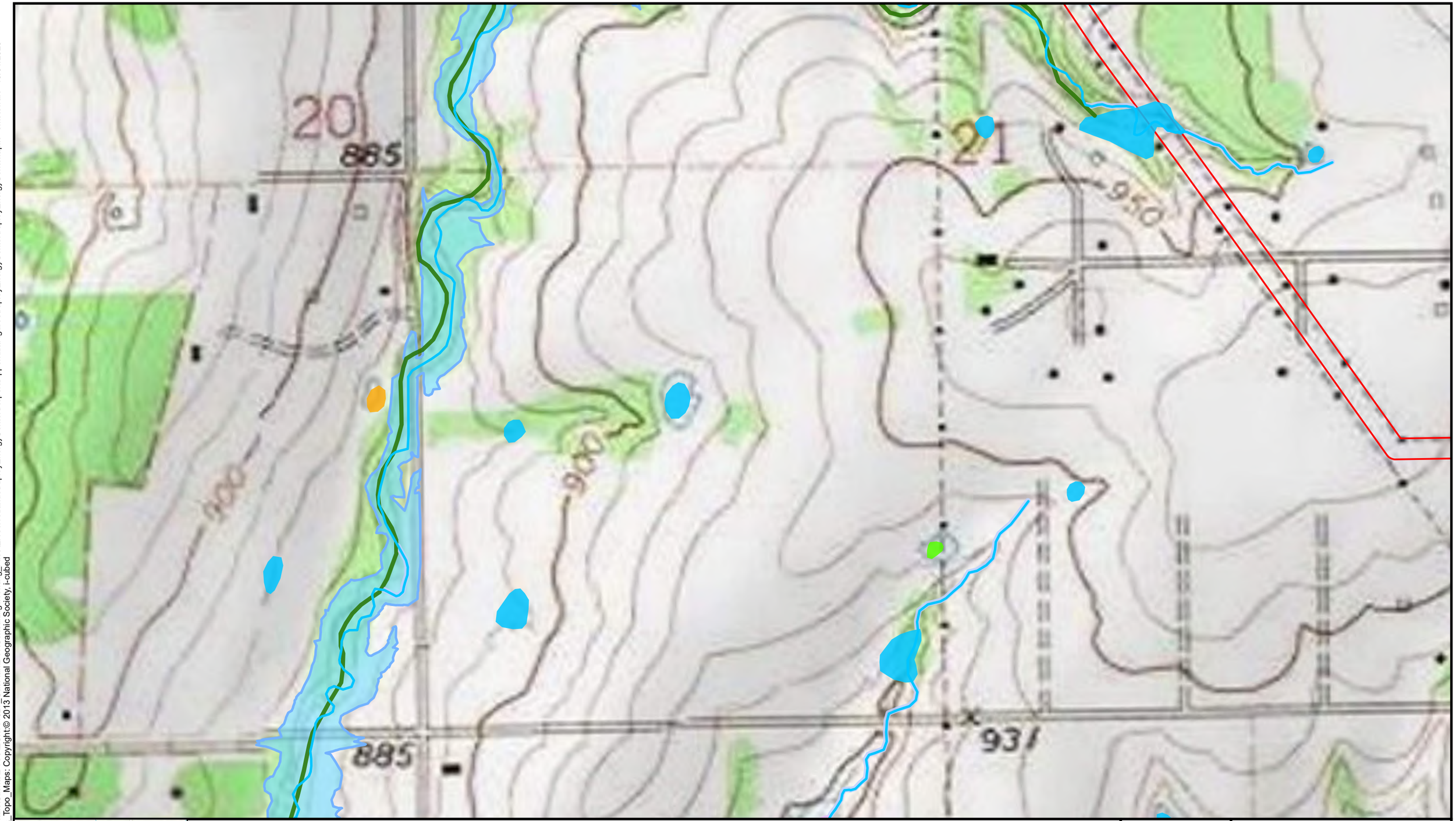

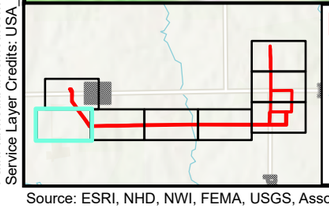

Survey Area
FEMA Floodplain
NHD Stream

NWI Wetland Type

PEM
PSS
PFO
PUB
PAB
PUS
Riverine

NORTH

400 200 0 400
Feet

BURNS McDONNELL

Figure A-2
NHD, NWI, FEMA Floodplain, and USGS Topographic Map
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
Page 2 of 8

Source: ESRI, NHD, NWI, FEMA, USGS, Associated Electric Cooperative, Inc., and Burns & McDonnell

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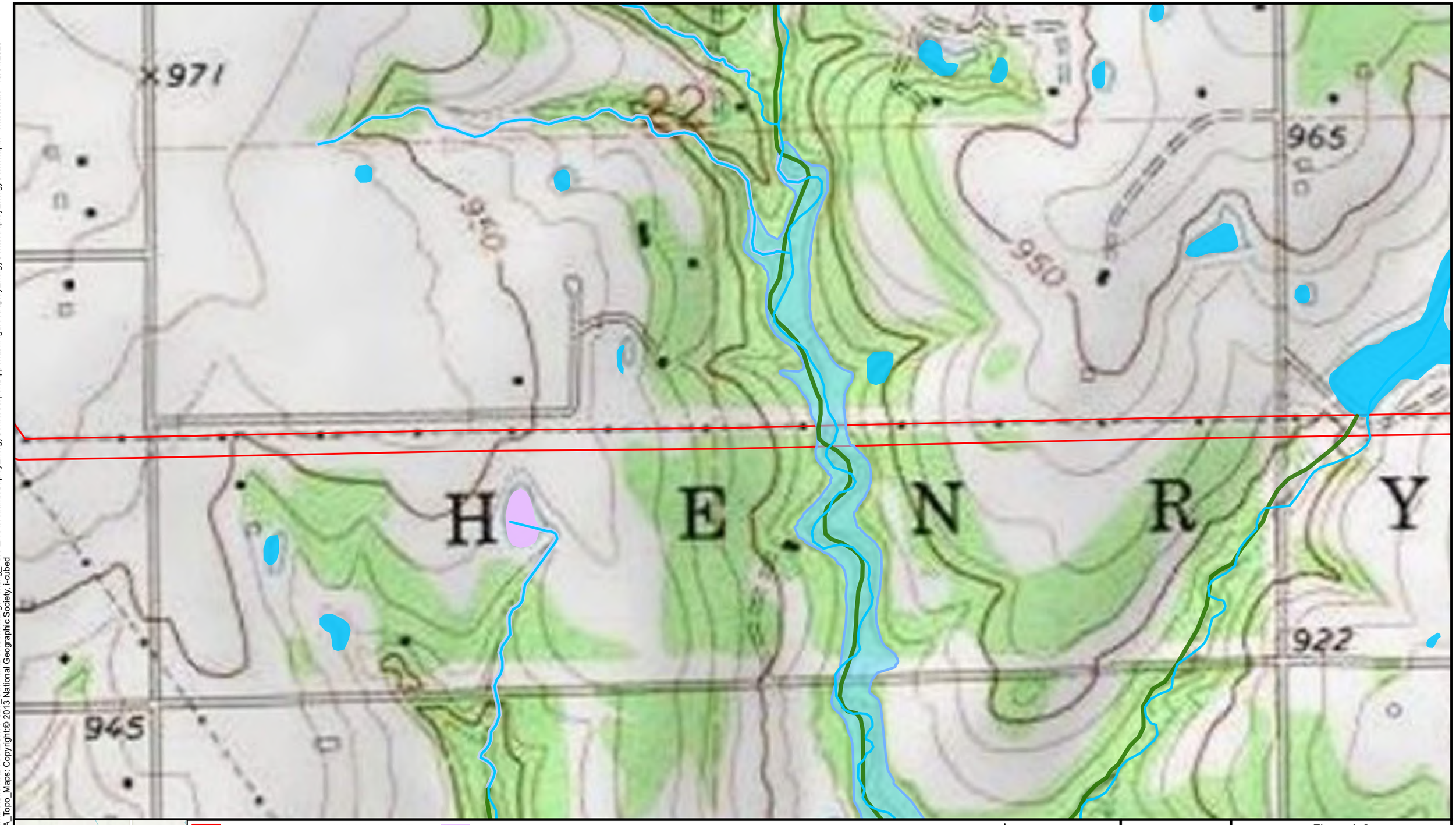

Survey Area
FEMA Floodplain
NHD Stream

NWI Wetland Type
PEM
PSS
PFO
PUB
PAB
PUS
Riverine

NORTH
400 200 0 400
Feet

BURNS McDONNELL

Figure A-2
NHD, NWI, FEMA Floodplain, and USGS Topographic Map
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
Page 3 of 8

Source: ESRI, NHD, NWI, FEMA, USGS, Associated Electric Cooperative, Inc., and Burns & McDonnell

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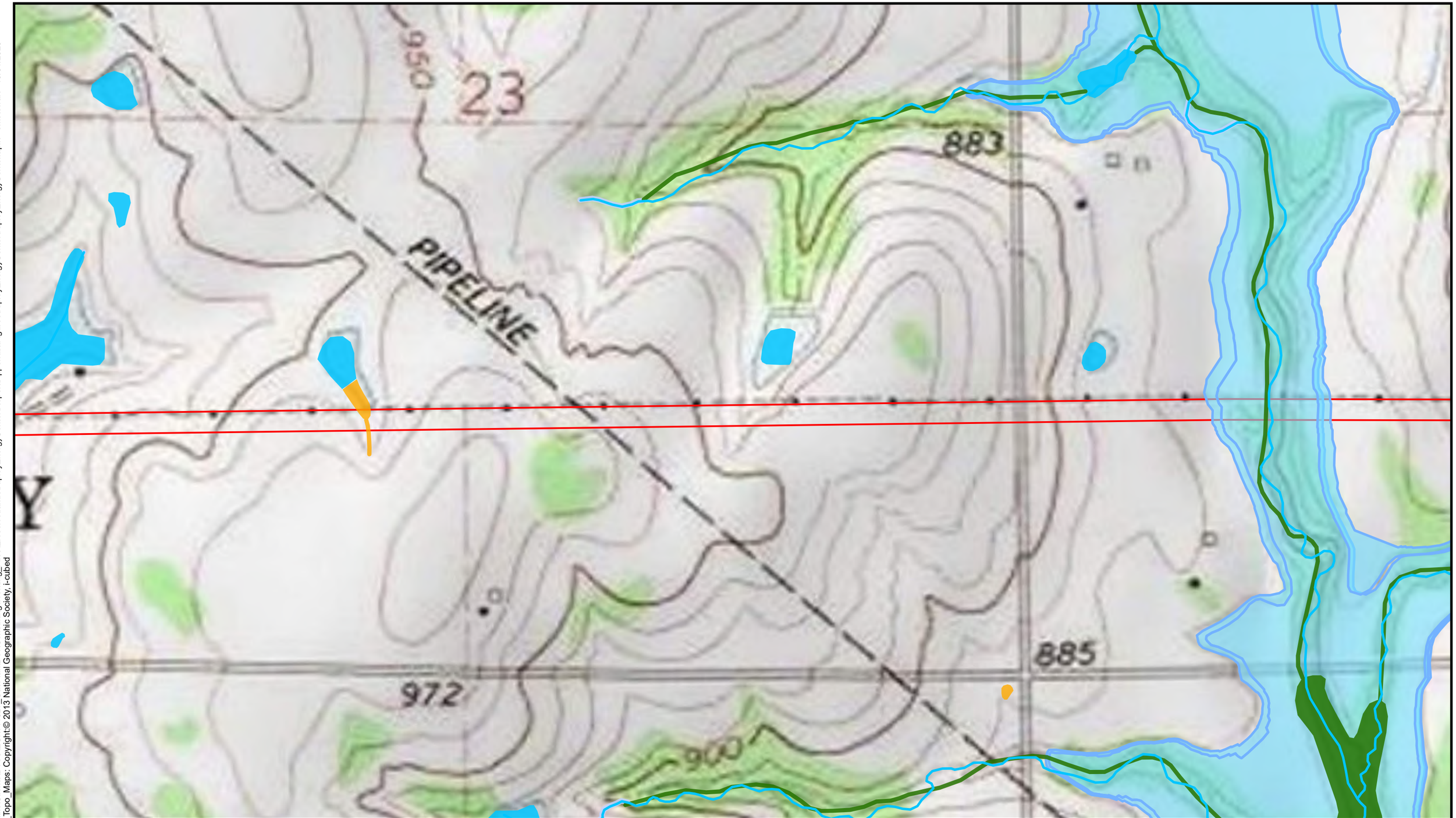

Survey Area
FEMA Floodplain
NHD Stream

NWI Wetland Type

PEM
PSS
PFO
PUB
PAB
PUS
Riverine

NORTH

400 200 0 400

Feet

BURNS McDONNELL

Figure A-2
NHD, NWI, FEMA Floodplain, and USGS Topographic Map
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Associated Electric Cooperative, Inc.
Payne County, OK
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Source: ESRI, NHD, NWI, FEMA, USGS, Associated Electric Cooperative, Inc., and Burns & McDonnell

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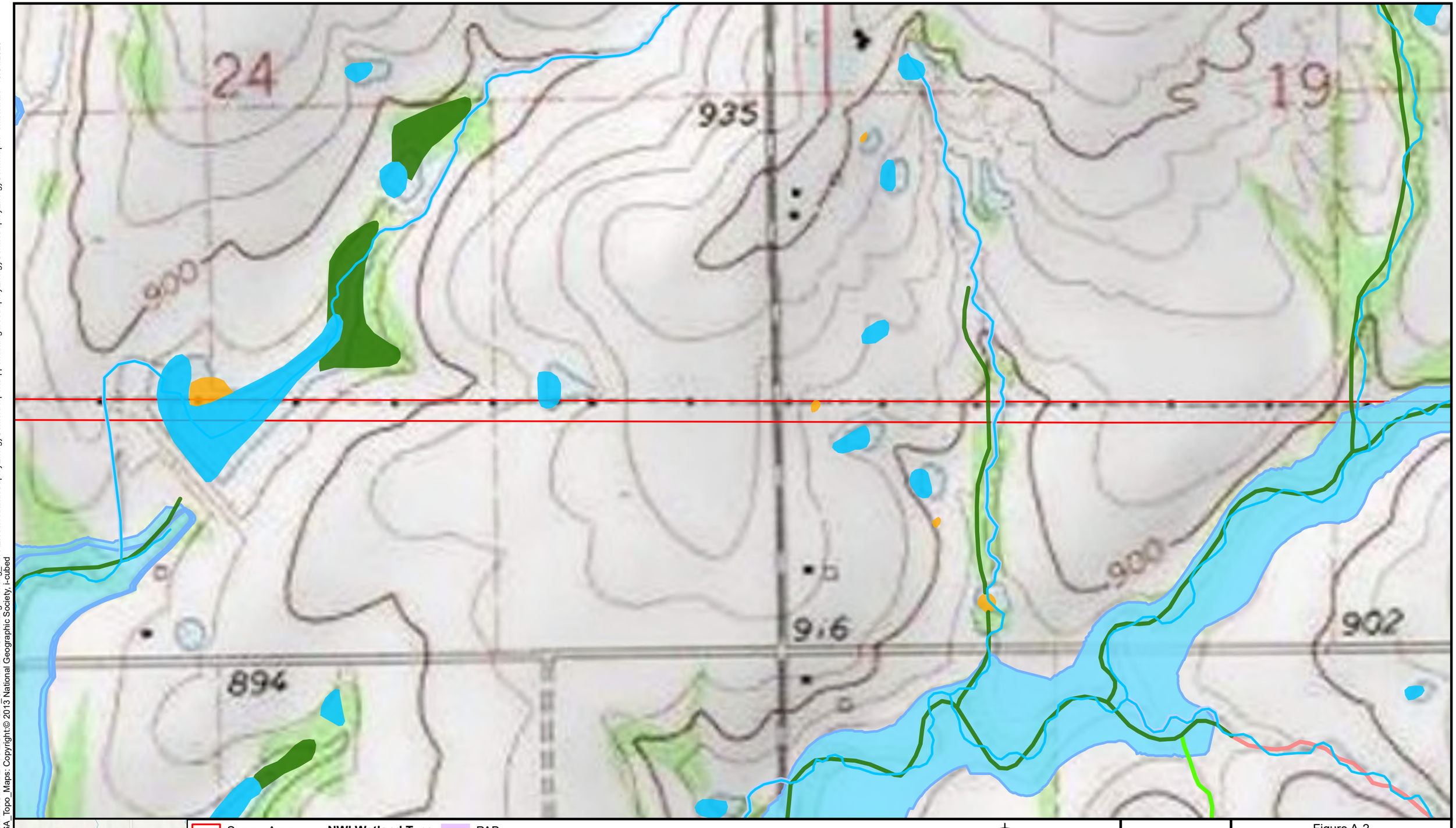

Survey Area
FEMA Floodplain
NHD Stream

NWI Wetland Type

PEM
PSS
PFO
PUB
PAB
PUS
Riverine

NORTH

400 200 0 400

Feet

BURNS McDONNELL

Figure A-2
NHD, NWI, FEMA Floodplain, and USGS Topographic Map
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
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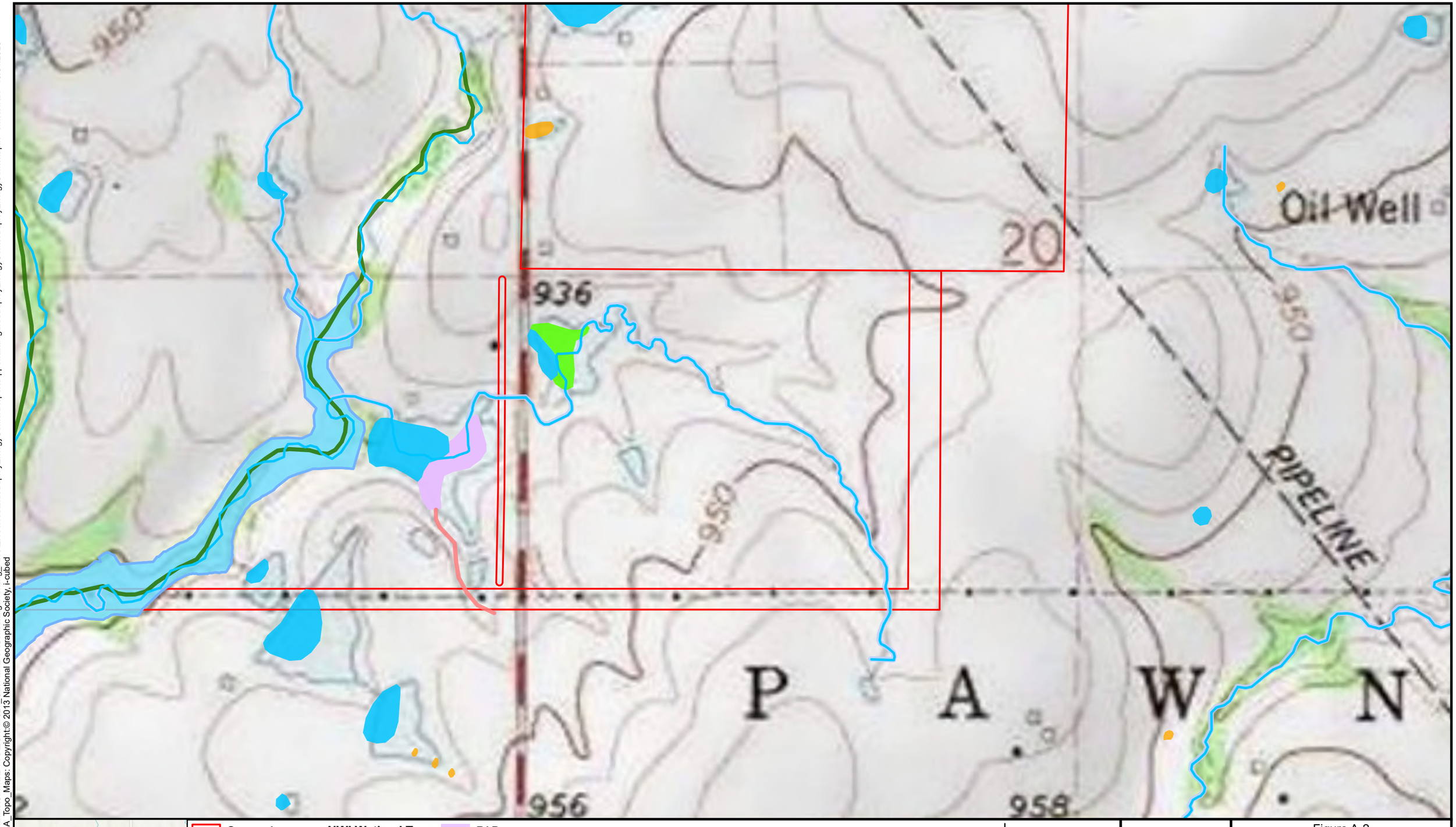

Survey Area
FEMA Floodplain
NHD Stream

NWI Wetland Type

PEM
PSS
PFO
PUB
PAB
PUS
Riverine

NORTH

400 200 0 400

Feet

BURNS McDONNELL

Figure A-2
NHD, NWI, FEMA Floodplain, and USGS Topographic Map
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
Page 6 of 8

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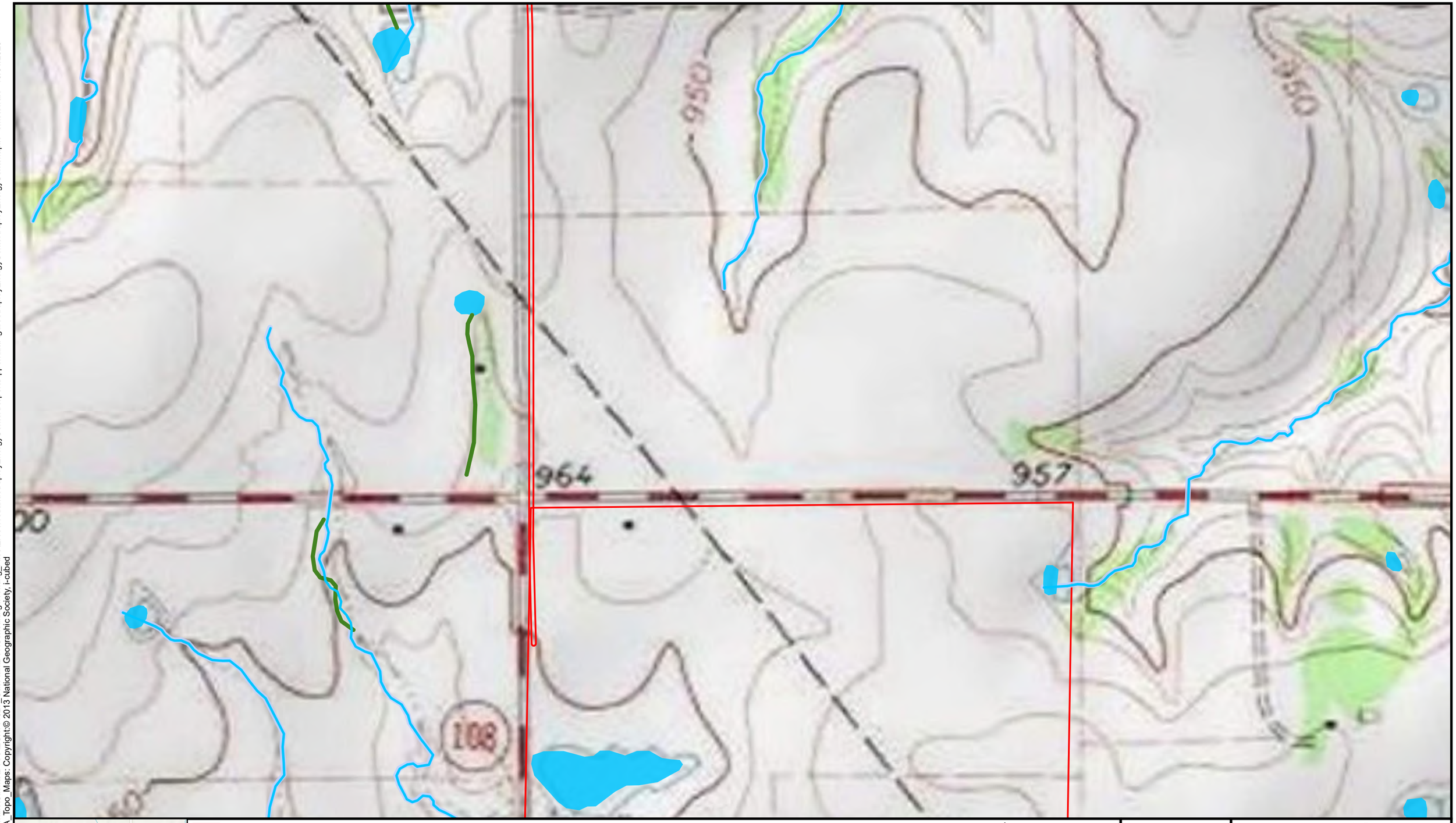

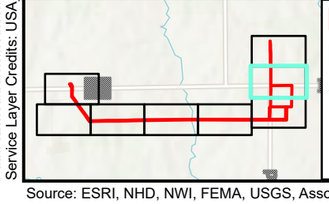

Survey Area
FEMA Floodplain
NHD Stream

NWI Wetland Type

PEM
PSS
PFO
PUB
PAB
PUS
Riverine

NORTH

400 200 0 400

Feet

BURNS McDONNELL

Figure A-2
NHD, NWI, FEMA Floodplain, and USGS Topographic Map
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
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Source: ESRI, NHD, NWI, FEMA, USGS, Associated Electric Cooperative, Inc., and Burns & McDonnell

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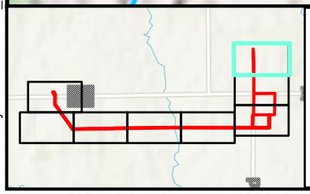

Survey Area
FEMA Floodplain
NHD Stream

NWI Wetland Type
PEM
PSS
PFO
PUB
PAB
PUS
Riverine

NORTH

400 200 0 400
Feet

BURNS McDONNELL

Figure A-2
NHD, NWI, FEMA Floodplain, and USGS Topographic Map
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
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Source: ESRI, NHD, NWI, FEMA, USGS, Associated Electric Cooperative, Inc., and Burns & McDonnell

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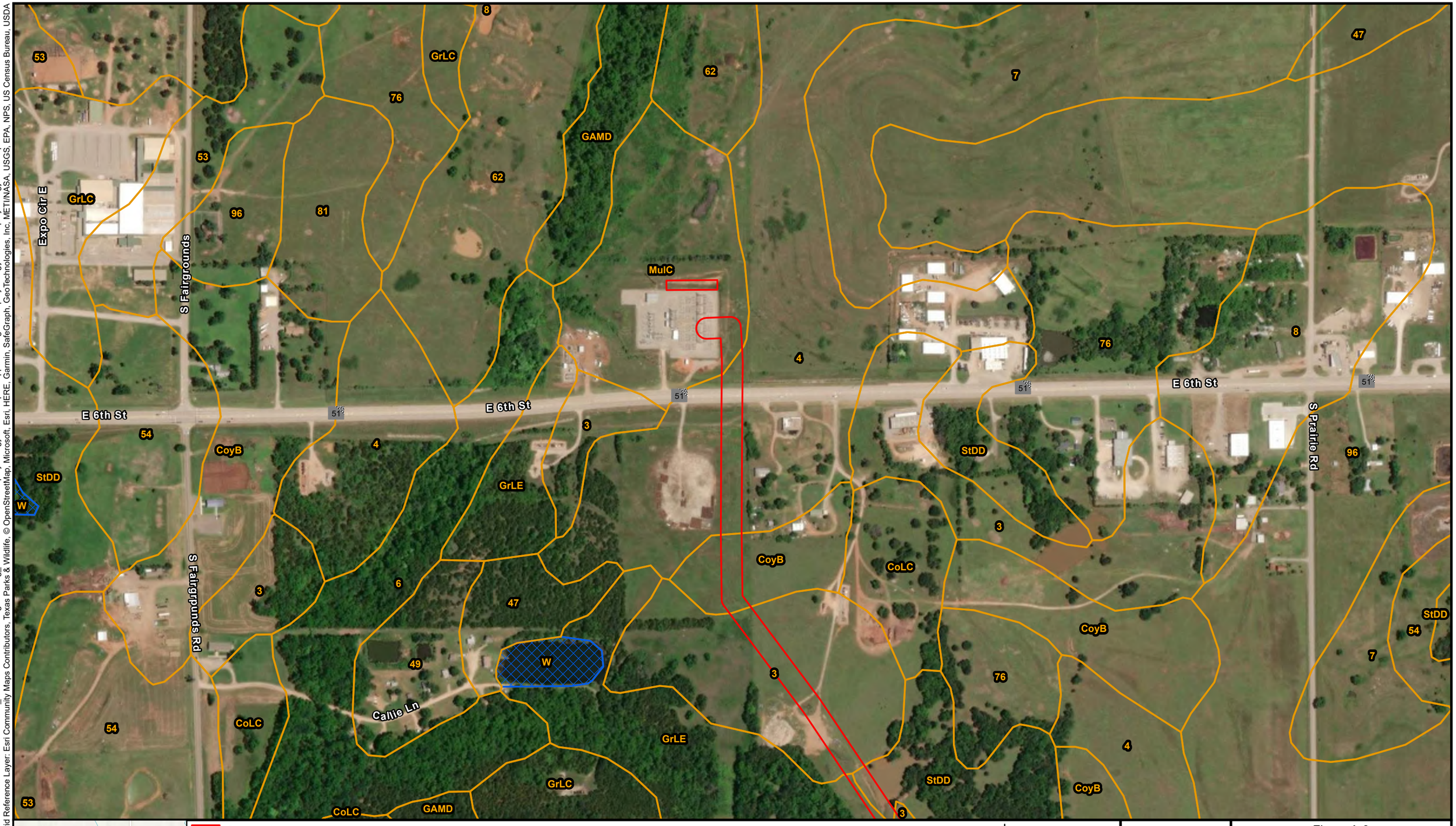

Survey Area
Non-Hydric Soil
Water

*See attached Soils Index for soil names

NORTH

400 200 0 400

Feet

BURNS McDONNELL

Figure A-3
NRCS Soils and Aerial Imagery Map
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
Page 1 of 8

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Source: ESRI, SSURGO, Associated Electric Cooperative, Inc., and Burns & McDonnell

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Survey Area
Non-Hydric Soil
Water

*See attached Soils Index for soil names

NORTH

400 200 0 400

Feet

BURNS McDONNELL

Figure A-3
NRCS Soils and Aerial Imagery Map
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
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Source: ESRI, SSURGO, Associated Electric Cooperative, Inc., and Burns & McDonnell

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Survey Area
Non-Hydric Soil
Water

*See attached Soils Index for soil names

NORTH
400 200 0 400
Feet

BURNS McDONNELL

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Associated Electric Cooperative, Inc.
Payne County, OK
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Survey Area
Non-Hydric Soil
Water

*See attached Soils Index for soil names

NORTH

400 200 0 400

Feet

BURNS McDONNELL

Figure A-3
NRCS Soils and Aerial Imagery Map
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
Page 4 of 8

Source: ESRI, SSURGO, Associated Electric Cooperative, Inc., and Burns & McDonnell

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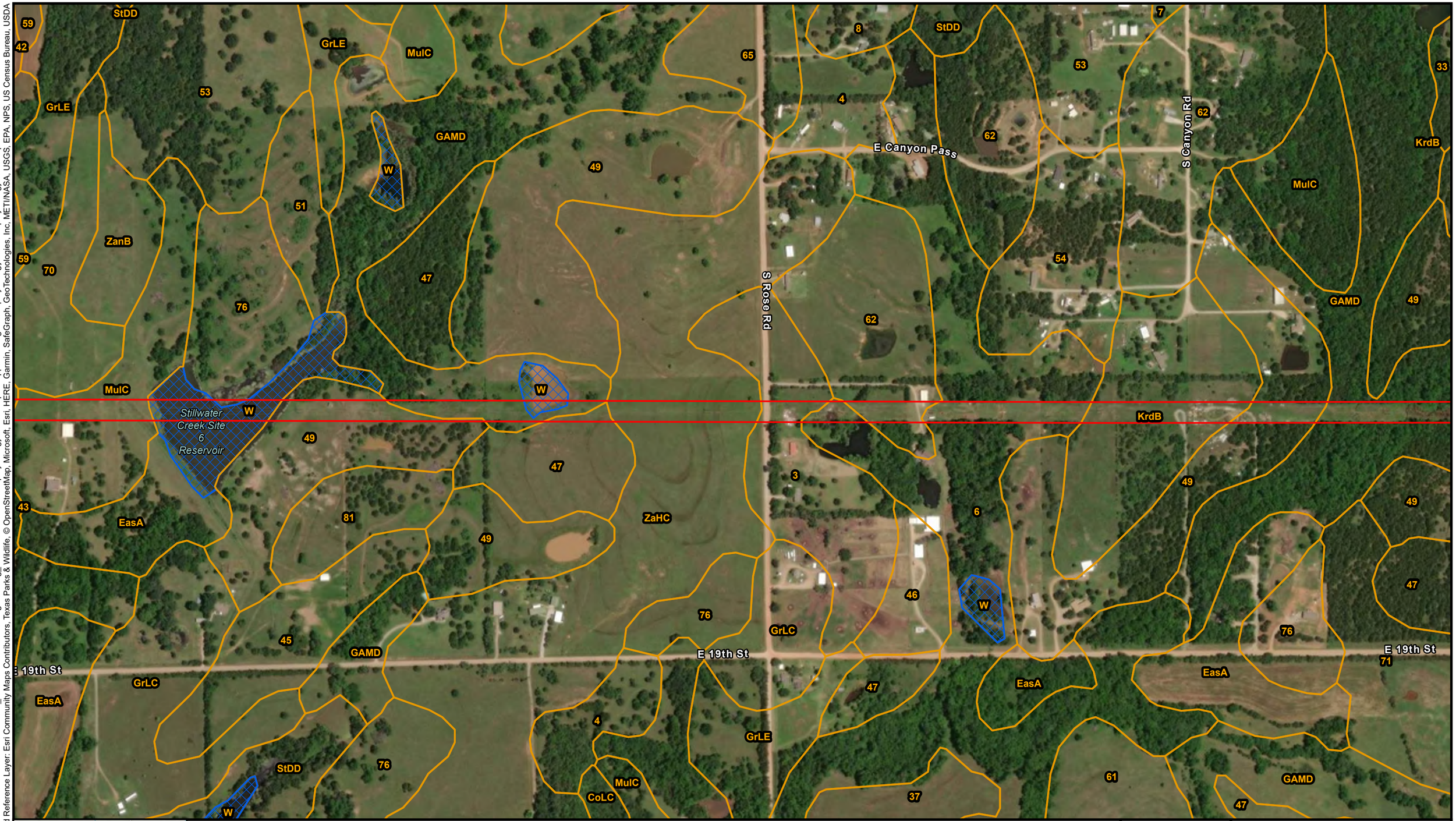

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Figure A-3
NRCS Soils and Aerial Imagery Map
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
Page 5 of 8

Source: ESRI, SSURGO, Associated Electric Cooperative, Inc., and Burns & McDonnell

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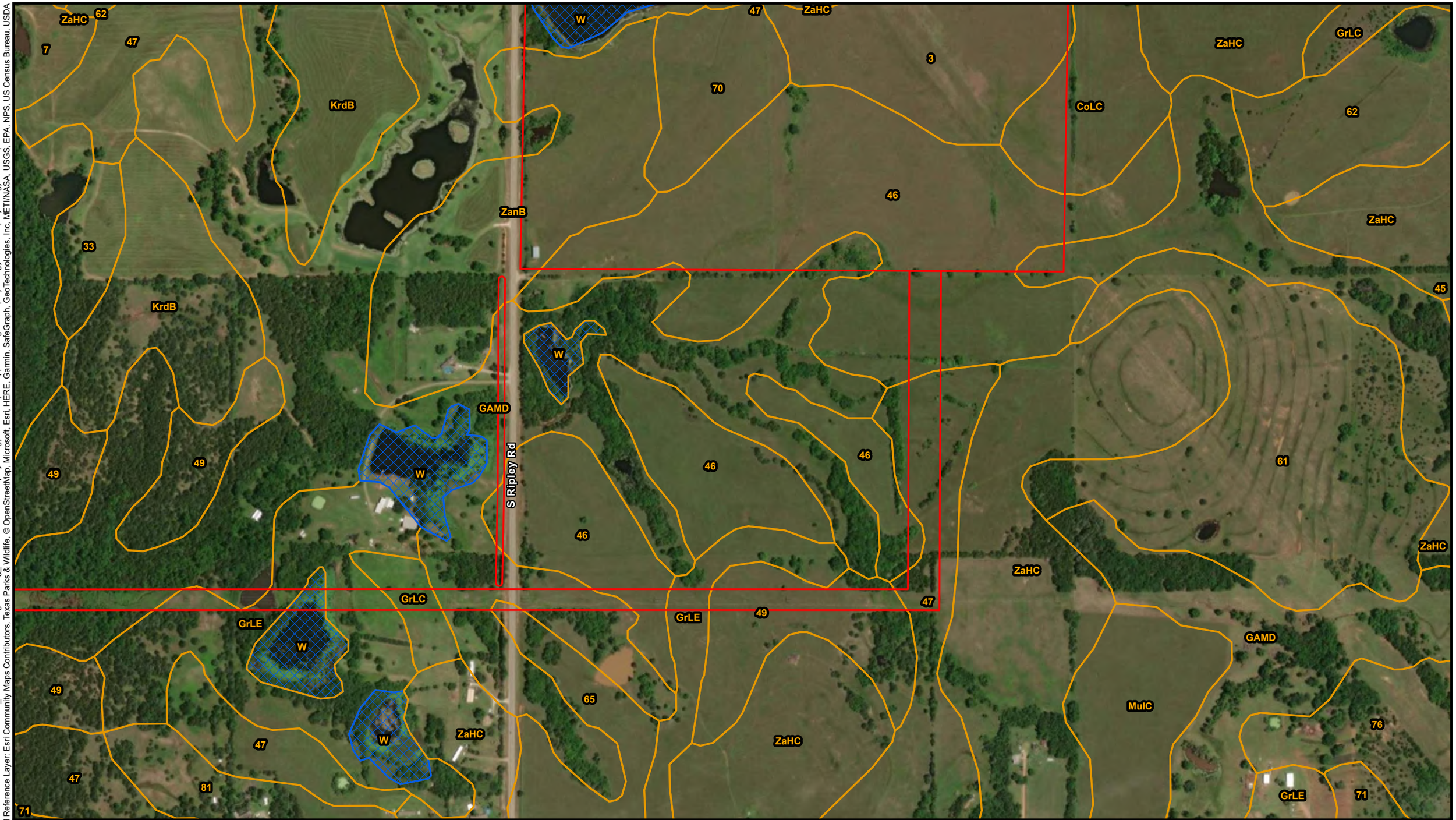

Survey Area
Non-Hydric Soil
Water

*See attached Soils Index for soil names

NORTH

400 200 0 400

Feet

BURNS McDONNELL

Figure A-3
NRCS Soils and Aerial Imagery Map
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
Page 6 of 8

Source: ESRI, SSURGO, Associated Electric Cooperative, Inc., and Burns & McDonnell

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Survey Area
Non-Hydric Soil
Water

*See attached Soils Index for soil names

NORTH

400 200 0 400

Feet

BURNS McDONNELL

Figure A-3
NRCS Soils and Aerial Imagery Map
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
Page 7 of 8

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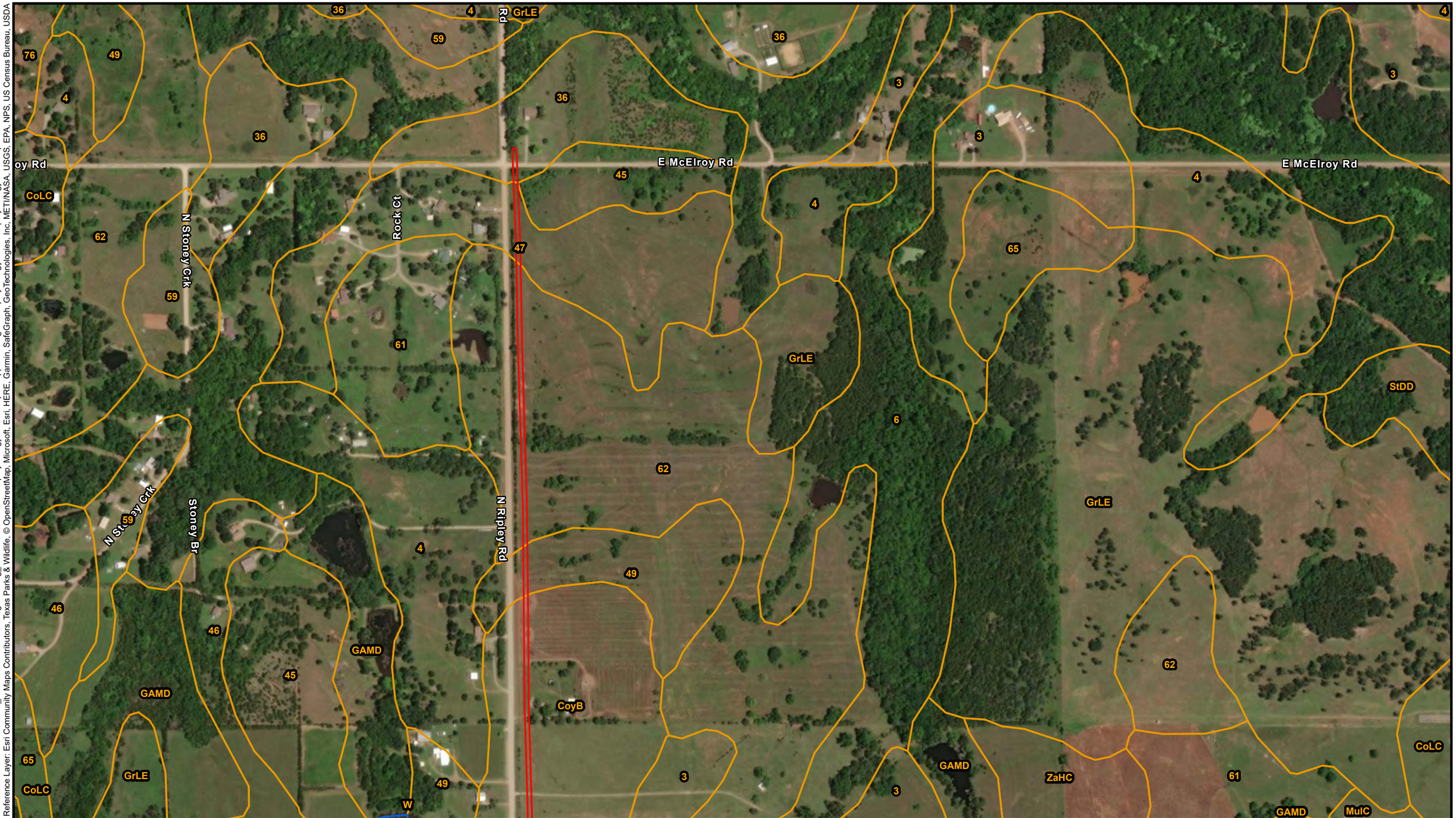

Survey Area
Non-Hydric Soil
Water

*See attached Soils Index for soil names

NORTH

400 200 0 400

Feet

BURNS McDONNELL

Figure A-3
NRCS Soils and Aerial Imagery Map
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
Page 8 of 8

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Source: ESRI, SSURGO, Associated Electric Cooperative, Inc., and Burns & McDonnell

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Figure A-3 Soils Index

Soil Map Symbol		Map Unit Name
CoLC	-	Coyle-Lucien complex, 1 to 5 percent slopes
76	-	Coyle and Zaneis soils, 3 to 5 percent slopes, severely eroded
CoyB	-	Coyle loam, 1 to 3 percent slopes
3	-	Coyle loam, 3 to 5 percent slopes
4	-	Coyle loam, 3 to 5 percent slopes, eroded
96	-	Doolin silt loam, 1 to 3 percent slopes
EasA	-	Easpur loam, 0 to 1 percent slopes, occasionally flooded
GAMD	-	Grainola-Ashport frequently flooded-Mulhall complex, 0 to 8 percent slopes
GrLC	-	Grainola-Lucien complex, 1 to 5 percent slopes
GrLE	-	Grainola-Lucien complex, 5 to 12 percent slopes
65	-	Grainola clay loam, 3 to 5 percent slopes
81	-	Huska silt loam, 1 to 3 percent slopes
KrdB	-	Kirkland silt loam, 1 to 3 percent slopes
59	-	Konawa and Teller soils, 3 to 8 percent slopes, eroded
36	-	McLain silt loam, 0 to 1 percent slopes, rarely flooded
MulC	-	Mulhall loam, 3 to 5 percent slopes
61	-	Mulhall loam, 3 to 5 percent slopes, eroded
62	-	Mulhall loam, 3 to 5 percent slopes, gullied
6	-	Pulaski fine sandy loam, 0 to 1 percent slopes, frequently flooded
43	-	Pulaski fine sandy loam, 0 to 1 percent slopes, occasionally flooded
49	-	Renfrow and Grainola soils, 3 to 8 percent slopes, severely eroded
47	-	Renfrow loam, 3 to 5 percent slopes, eroded
46	-	Renfrow silt loam, 3 to 5 percent slopes
StDD	-	Stephenville-Darnell complex, 3 to 8 percent slopes, rocky
ZaHC	-	Zaneis-Huska complex, 1 to 5 percent slopes
ZanB	-	Zaneis loam, 1 to 3 percent slopes
70	-	Zaneis loam, 3 to 5 percent slopes

Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
Aquatic Resources
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
Page 1 of 25

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Source: ESRI, Associated Electric Cooperative, Inc., and Burns & McDonnell

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Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
Aquatic Resources
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
Page 2 of 25

Source: ESRI, Associated Electric Cooperative, Inc., and Burns & McDonnell

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Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other Aquatic Resources
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
Page 3 of 25

Source: ESRI, Associated Electric Cooperative, Inc., and Burns & McDonnell

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Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
Aquatic Resources
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
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Source: ESRI, Associated Electric Cooperative, Inc., and Burns & McDonnell

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Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
Aquatic Resources
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
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Source: ESRI, Associated Electric Cooperative, Inc., and Burns & McDonnell

Issued: 10/31/2023

Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
Aquatic Resources
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
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Source: ESRI, Associated Electric Cooperative, Inc., and Burns & McDonnell

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Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
Aquatic Resources
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
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Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
Aquatic Resources
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
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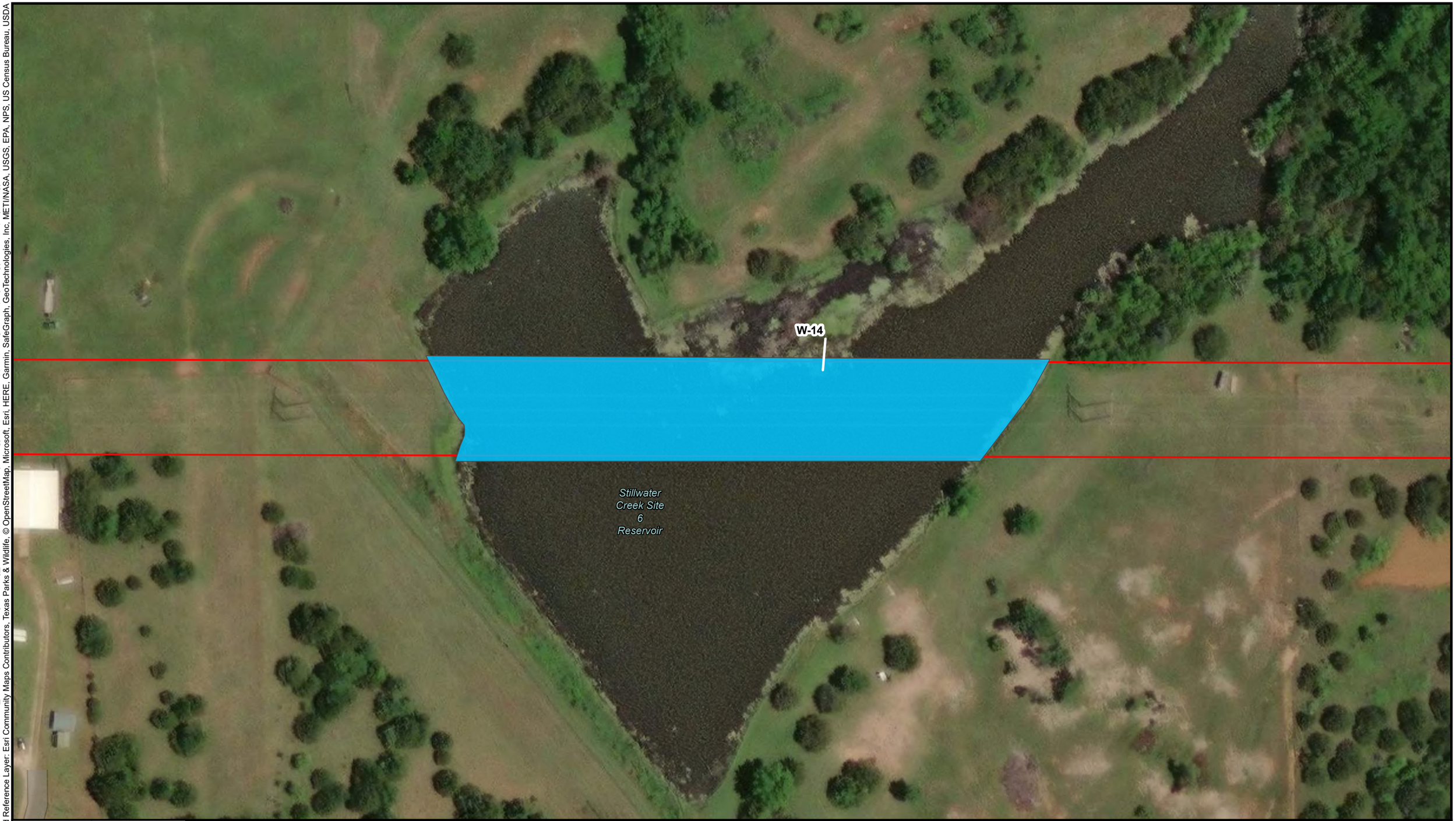

Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
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Ripley Energy Center
Associated Electric Cooperative, Inc.
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Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
Aquatic Resources
Ripley Energy Center
Associated Electric Cooperative, Inc.
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Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other Aquatic Resources
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Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
Aquatic Resources
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
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Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
Aquatic Resources
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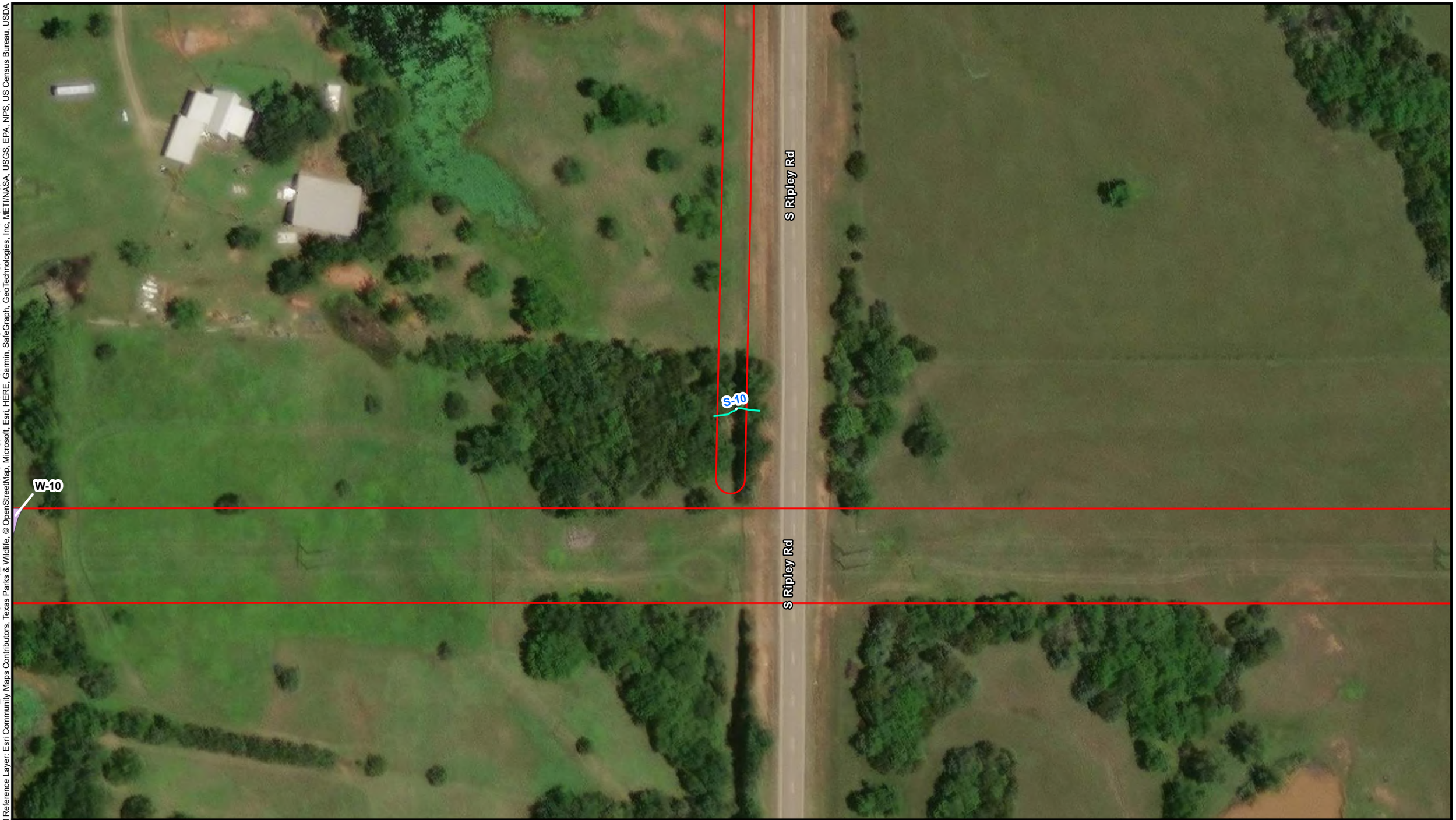

Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
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Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
Aquatic Resources
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Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
Aquatic Resources
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
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Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
Aquatic Resources
Ripley Energy Center
Associated Electric Cooperative, Inc.
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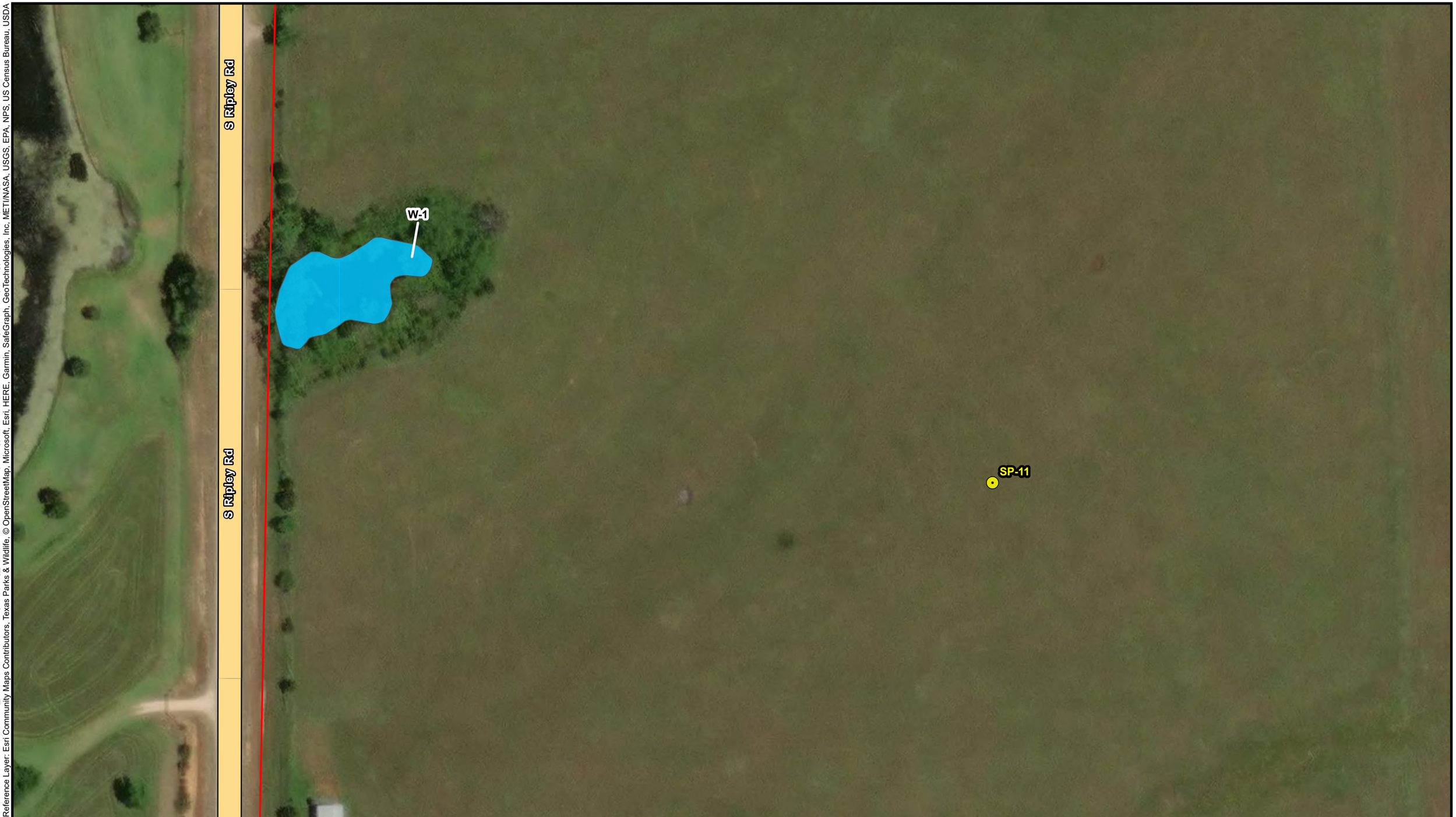

Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
Aquatic Resources
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
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Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
Aquatic Resources
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK

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Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other Aquatic Resources
Ripley Energy Center
Associated Electric Cooperative, Inc.
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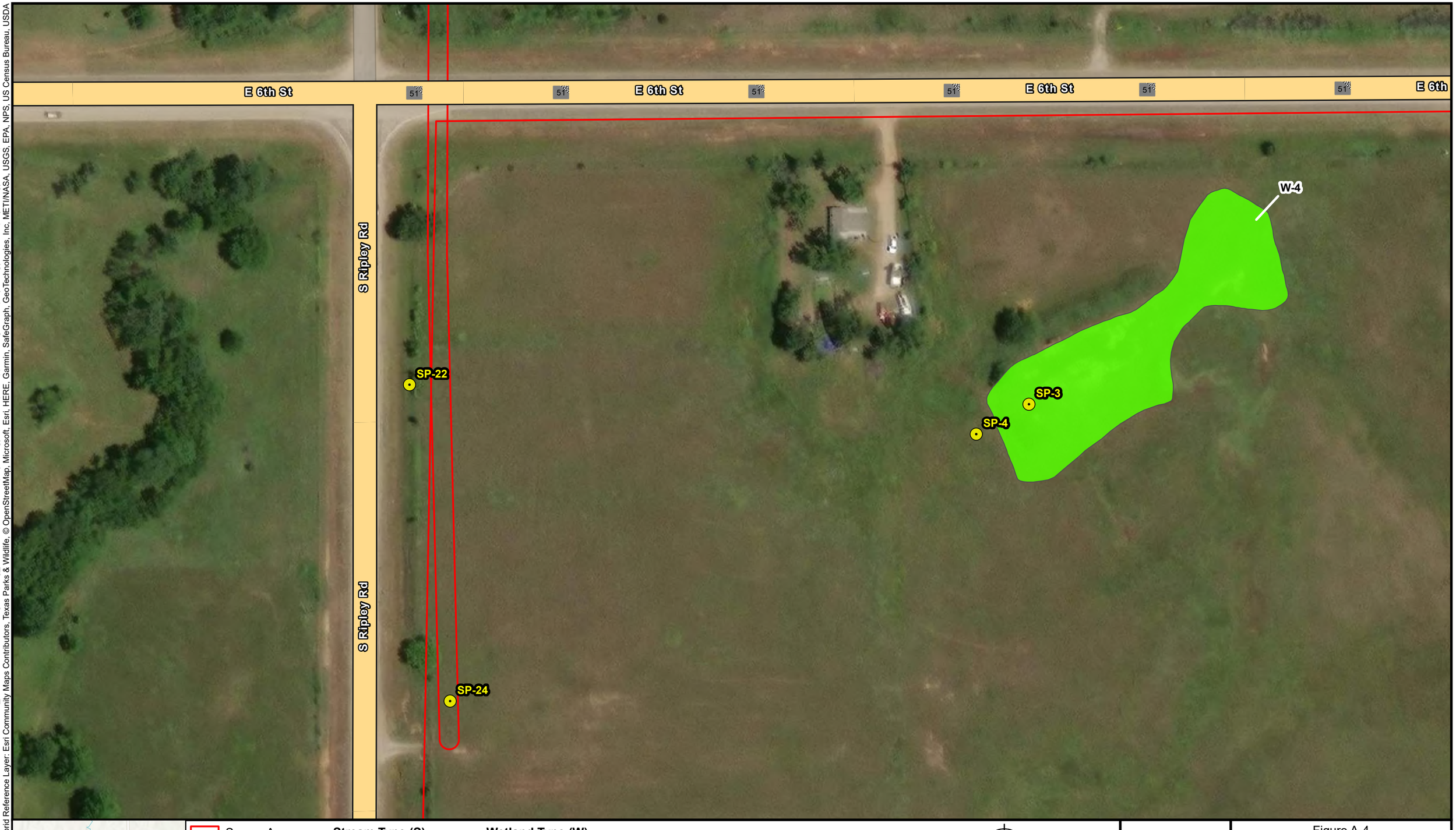

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Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
Aquatic Resources
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK

Source: ESRI, Associated Electric Cooperative, Inc., and Burns & McDonnell

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Survey Area
Sample Plot (SP)

Stream Type (S)
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PEM
PSS
PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
Aquatic Resources
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
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Survey Area
Sample Plot (SP)

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Perennial Stream

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PEM
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PUB
PAB

NORTH
50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
Aquatic Resources
Ripley Energy Center
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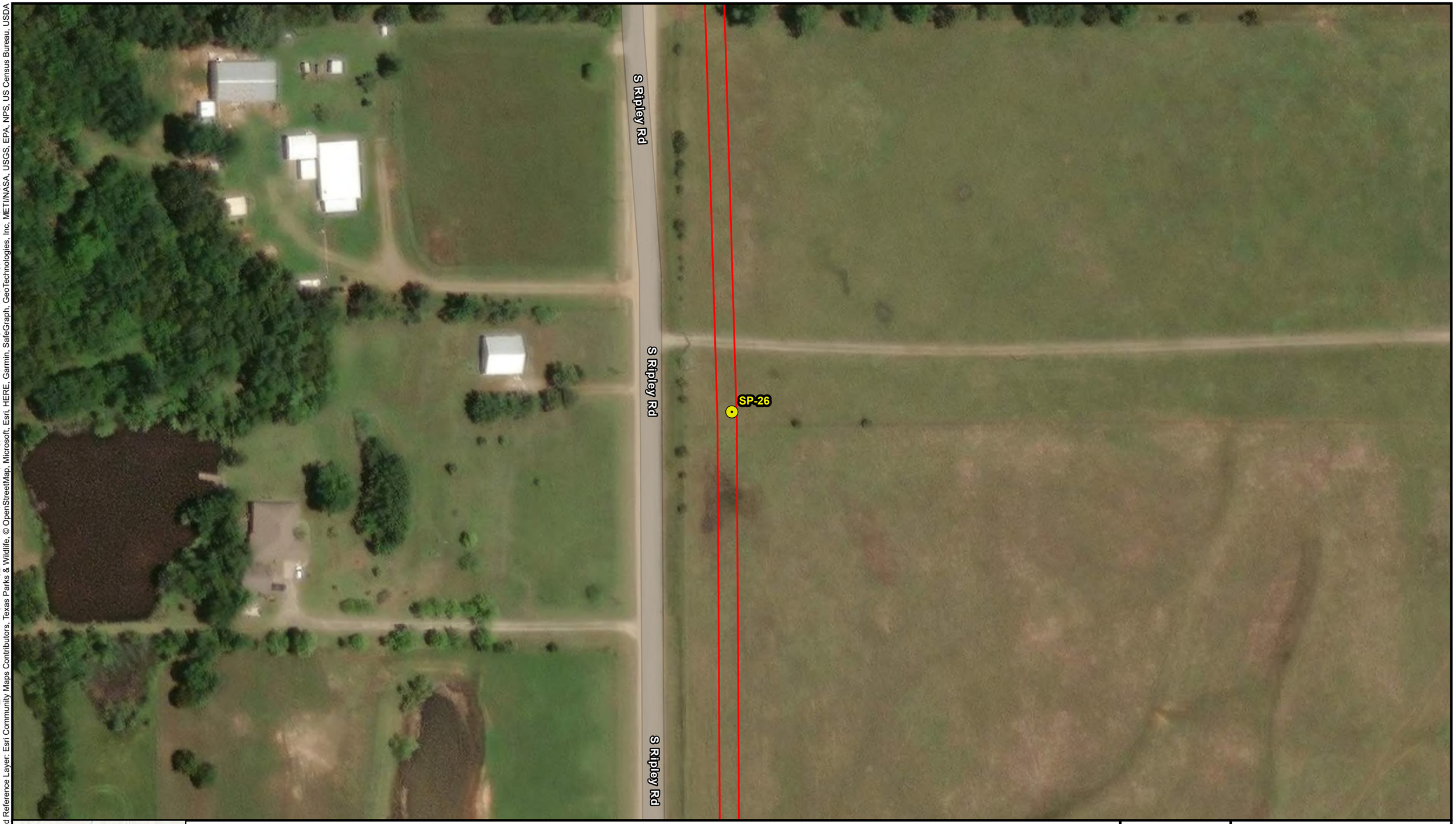

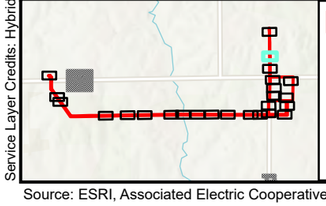

Survey Area
Sample Plot (SP)

Stream Type (S)
Ephemeral Stream
Intermittent Stream
Perennial Stream

Wetland Type (W)
PEM
PSS
PUB
PAB

NORTH

50 25 0 50
Feet

BURNS McDONNELL

Figure A-4
Wetlands and Other
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Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
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PSS
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Feet

BURNS McDONNELL

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Wetlands and Other Aquatic Resources
Ripley Energy Center
Associated Electric Cooperative, Inc.
Payne County, OK
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Source: ESRI, Associated Electric Cooperative, Inc., and Burns & McDonnell

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WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-06-21

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-1

Investigator(s): S. Stewart, R. Oltjenbruns Section, Township, Range: S20 T19N R4E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): H 80A Lat: 36.114146 Long: -96.905487 Datum: NAD 83

Soil Map Unit Name: 47 - Renfrow loam, 3 to 5 percent slopes, eroded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Wetland sample plot within PEM W-3. The USACE Antecedent Precipitation Tool indicates normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus deltoides	15	✔	FAC
2.			
3.			
4.			
	15 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Diospyros virginiana	15	✔	FAC
2.			
3.			
4.			
5.			
	15 = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Eleocharis compressa	40	✔	FACW
2. Rubus argutus	3		FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	43 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 60.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	33	x 3 =	99
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	73 (A)		179 (B)

Prevalence Index = B/A = 2.45

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

Dominance test is passed.

See Photo C-1.

SOIL

Sampling Point: SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 24	5YR 4/2	60	5YR 4/6	40	C	PL / M	Clay Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** _____

Remarks:

Indicator F3 is met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ✔ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✔ Geomorphic Position (D2)
- ✔ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Indicators C3, B10, D2, and D5 are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-06-21

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-2

Investigator(s): S. Stewart, R. Oltjenbruns Section, Township, Range: S20 T19N R4E

Landform (hillslope, terrace, etc.): Sideslope Local relief (concave, convex, none): None Slope (%): 2

Subregion (LRR): H 80A Lat: 36.114204 Long: -96.905348 Datum: NAD 83

Soil Map Unit Name: 47 - Renfrow loam, 3 to 5 percent slopes, eroded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation ✔, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✔

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Upland sample plot adjacent to PEM W-3. The USACE Antecedent Precipitation Tool indicates normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus tectorum	30	✔	UPL
2. Sorghum halepense	15	✔	FACU
3. Schedonorus arundinaceus	10		FACU
4. Rudbeckia hirta	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	60% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 40.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	30	x 4 =	120
UPL species	30	x 5 =	150
Column Totals:	60 (A)		270 (B)

Prevalence Index = B/A = 4.5

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

No test is passed. Vegetation is disturbed due to being within an active hay field.
See Photo C-2.

SOIL

Sampling Point: SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 18	7.5YR 3/3	100					Silty Clay Loam	
18 - 24	7.5YR 3/4	100					Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✔

Remarks:

No indicators are met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-06-21

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-3

Investigator(s): S. Stewart, R. Oltjenbruns Section, Township, Range: S20 T19N R4E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): H 80A Lat: 36.115714 Long: -96.905671 Datum: NAD 83

Soil Map Unit Name: ZaHC - Zaneis-Huska complex, 1 to 5 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation ✔, Soil ✔, or Hydrology ✔ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✔

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔ No _____	
Wetland Hydrology Present?	Yes ✔ No _____	

Remarks:

Wetland sample plot within PEM W-4. The USACE Antecedent Precipitation Tool indicates normal climatic conditions three months prior to survey. Sample plot is disturbed due to being within an old well pad.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus deltoides	10	✔	FAC
2.			
3.			
4.			
	10%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____	= Total Cover	
Herb Stratum (Plot size: 5 ft r)			
1. Eleocharis obtusa	30	✔	OBL
2. Eclipta prostrata	20	✔	FACW
3. Echinochloa crus-galli	10		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	60%	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____	= Total Cover	

% Bare Ground in Herb Stratum 40.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	20	x 2 =	40
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	70 (A)		130 (B)

Prevalence Index = B/A = 1.86

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

Dominance test is passed.

See Photo C-3.

SOIL

Sampling Point: SP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 20	5YR 6/2	55	5YR 4/6	45	C	PL / M	Sandy Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ No ___

Remarks:

Indicator F3 is met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✔ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ✔ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✔ Geomorphic Position (D2)
- ✔ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✔ No ___ Depth (inches): .25

Water Table Present? Yes ✔ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✔ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Indicators A1, A2, A3, C3, D2, and D5 are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-06-21

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-4

Investigator(s): S. Stewart, R. Oltjenbruns Section, Township, Range: S20 T19N R4E

Landform (hillslope, terrace, etc.): Sideslope Local relief (concave, convex, none): None Slope (%): 2

Subregion (LRR): H 80A Lat: 36.11563 Long: -96.905857 Datum: NAD 83

Soil Map Unit Name: ZaHC - Zaneis-Huska complex, 1 to 5 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation ✔, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✔

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Upland sample plot adjacent to PEM W-4. The USACE Antecedent Precipitation Tool indicates normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus tectorum	60	✔	UPL
2. Ambrosia artemisiifolia	10		FACU
3. Asclepias viridis	10		UPL
4. Achillea millefolium	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	85% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 15.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	15	x 4 =	60
UPL species	70	x 5 =	350
Column Totals:	85 (A)		410 (B)

Prevalence Index = B/A = 4.8

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

No test is passed. Vegetation is disturbed due to being within an active hay field.
See Photo C-4.

SOIL

Sampling Point: SP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 15	5YR 3/2	100					Sandy Clay Loam	
15 - 20	5YR 4/4	100					Clay	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✔

Remarks:

No indicators are met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-06-22

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-5

Investigator(s): S. Stewart, R. Oltjenbruns Section, Township, Range: S20 T19N R4E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): H 80A Lat: 36.110869 Long: -96.903685 Datum: NAD 83

Soil Map Unit Name: 46 - Renfrow silt loam, 3 to 5 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Upland confirmation sample plot. The USACE Antecedent Precipitation Tool indicates normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Cornus drummondii	15	✔	FAC
2.			
3.			
4.			
5.			
	15% = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Rubus argutus	20	✔	FAC
2. Symphoricarpos orbiculatus	15	✔	FACU
3. Andropogon gerardii	10		FACU
4. Toxicodendron radicans	5		FACU
5. Juncus tenuis	2		FAC
6.			
7.			
8.			
9.			
10.			
	52% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 50.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	37	x 3 =	111
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	67 (A)		231 (B)

Prevalence Index = B/A = 3.45

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

No test is passed.

See Photo C-5.

SOIL

Sampling Point: SP-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 10	7.5YR 3/1	95	7.5YR 4/6	5	C	M	Clay Loam	
10 - 24	7.5YR 3/1	95	7.5YR 4/6	5	C	M	Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** _____

Remarks:

Indicator F6 is met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✔ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Indicators B10 and D2 are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-06-22

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-6

Investigator(s): S. Stewart, R. Oltjenbruns Section, Township, Range: S20 T19N R4E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): H 80A Lat: 36.109539 Long: -96.903028 Datum: NAD 83

Soil Map Unit Name: GAMD - Grainola-Ashport frequently flooded-Mulhall complex, 0 to 8 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔ No _____	
Wetland Hydrology Present?	Yes ✔ No _____	

Remarks:

Wetland sample plot within PSS W-5. The USACE Antecedent Precipitation Tool indicates normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Fraxinus pennsylvanica	40	✔	FAC
2.			
3.			
4.			
5.			
	40% = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Eleocharis obtusa	20	✔	OBL
2. Teucrium canadense	15	✔	FACW
3. Helianthus annuus	5		FACU
4. Phalaris arundinacea	5		FACW
5. Ambrosia artemisiifolia	3		FACU
6.			
7.			
8.			
9.			
10.			
	48% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 50.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	20	x 2 =	40
FAC species	40	x 3 =	120
FACU species	8	x 4 =	32
UPL species	0	x 5 =	0
Column Totals:	88 (A)		212 (B)

Prevalence Index = B/A = 2.41

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

Dominance test is passed.

See Photo C-6.

SOIL

Sampling Point: SP-6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 24	7.5YR 3/1	90	7.5YR 4/6	10	C	PL / M	Clay Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** _____

Remarks:

Indicator F6 is met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ✔ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ✔ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✔ Geomorphic Position (D2)
- ✔ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Indicators B3, C3, B10, D2, and D5 are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-06-22

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-7

Investigator(s): S. Stewart, R. Oltjenbruns Section, Township, Range: S20 T19N R4E

Landform (hillslope, terrace, etc.): Sideslope Local relief (concave, convex, none): None Slope (%): 3

Subregion (LRR): H 80A Lat: 36.109712 Long: -96.903081 Datum: NAD 83

Soil Map Unit Name: GAMD - Grainola-Ashport frequently flooded-Mulhall complex, 0 to 8 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation ✔, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✔

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Upland sample plot adjacent to PSS W-5. The USACE Antecedent Precipitation Tool indicates normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Andropogon gerardii	30	✔	FACU
2. Coelorachis cylindrica	30	✔	FAC
3. Desmanthus illinoensis	30	✔	FACU
4. Asclepias viridis	5		UPL
5. Solidago altissima	5		FACU
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	65	x 4 =	260
UPL species	5	x 5 =	25
Column Totals:	100 (A)		375 (B)

Prevalence Index = B/A = 3.75

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

No test is passed. Vegetation is disturbed due to being within an active hay field.
See Photo C-7.

SOIL

Sampling Point: SP-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 8	7.5YR 4/4	100					Clay Loam	
8 - 24	2.5YR 4/6	100					Clay	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✔

Remarks:

No indicators are met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-06-22

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-8

Investigator(s): S. Stewart, R. Oltjenbruns Section, Township, Range: S20 T19N R4E

Landform (hillslope, terrace, etc.): Sideslope Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR): H 80A Lat: 36.110593 Long: -96.9005 Datum: NAD 83

Soil Map Unit Name: 46 - Renfrow silt loam, 3 to 5 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation ✔, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✔

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Upland confirmation sample plot. The USACE Antecedent Precipitation Tool indicates normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Andropogon gerardii	40	✔	FACU
2. Coelorachis cylindrica	15	✔	FAC
3. Castilleja indivisa	10		FAC
4. Desmanthus illinoensis	10		FACU
5. Panicum virgatum	10		FAC
6. Sorghum halepense	10		FACU
7. Coreopsis tinctoria	5		FAC
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	100 (A)		360 (B)

Prevalence Index = B/A = 3.6

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

No test is passed. Vegetation was disturbed due to being within an active hay field.
See Photo C-8.

SOIL

Sampling Point: SP-8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 8	7.5YR 3/2	100					Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Compact Soil

Depth (inches): 8

Hydric Soil Present? Yes ____ No ✔

Remarks:

No indicators are met. Excavation below 8" was prevented by compact soil. Multiple locations attempted.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✔ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ____ No ✔ Depth (inches): ____

Water Table Present? Yes ____ No ✔ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No ✔ Depth (inches): ____

Wetland Hydrology Present? Yes ____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Indicator D2 is met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-06-22

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-9

Investigator(s): S. Stewart, R. Oltjenbruns Section, Township, Range: S20 T19N R4E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): H 80A Lat: 36.115165 Long: -96.90055 Datum: NAD 83

Soil Map Unit Name: CoLC - Coyle-Lucien complex, 1 to 5 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation ✔, Soil ✔, or Hydrology ✔ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✔

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔ No _____	
Wetland Hydrology Present?	Yes ✔ No _____	

Remarks:

Wetland sample plot within PEM W-7. The USACE Antecedent Precipitation Tool indicates normal climatic conditions three months prior to survey. Sample plot is disturbed due to gravel within the soil.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Eleocharis obtusa	60	✔	OBL
2. Schizachyrium scoparium	20	✔	FACU
3. Juncus marginatus	15		FACW
4. Melilotus albus	5		UPL
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x 1 =	60
FACW species	15	x 2 =	30
FAC species	0	x 3 =	0
FACU species	20	x 4 =	80
UPL species	5	x 5 =	25
Column Totals:	100 (A)		195 (B)

Prevalence Index = B/A = 1.95

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

✔ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

Prevalence Index is passed. Vegetation is deserved due to being within an active hay field. See Photo C-9.

SOIL

Sampling Point: SP-9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 6	5YR 3/3	100					Silty Clay Loam	
6 - 24	7.5YR 5/2	80	5YR 5/6	20	C	M	Silty Clay Loam	Gravel within soil layer
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ No ___

Remarks:

Indicator F3 is met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✔ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): _____

Water Table Present? Yes ✔ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✔ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Indicators A2, A3, D2, and D5 are met. Surface water present within the wetland but not within the sample plot.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-06-22

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-10

Investigator(s): S. Stewart, R. Oltjenbruns Section, Township, Range: S20 T19N R4E

Landform (hillslope, terrace, etc.): Sideslope Local relief (concave, convex, none): None Slope (%): 2

Subregion (LRR): H 80A Lat: 36.115153 Long: -96.900629 Datum: NAD 83

Soil Map Unit Name: CoLC - Coyle-Lucien complex, 1 to 5 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation ✔, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✔

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Upland sample plot adjacent to PEM W-7. The USACE Antecedent Precipitation Tool indicates normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Andropogon gerardii	60	✔	FACU
2. Panicum virgatum	15		FAC
3. Coreopsis tinctoria	5		FAC
4. Melilotus albus	3		UPL
5.			
6.			
7.			
8.			
9.			
10.			
	83% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 20.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	60	x 4 =	240
UPL species	3	x 5 =	15
Column Totals:	83 (A)		315 (B)

Prevalence Index = B/A = 3.8

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

No test is passed. Vegetation is disturbed due to being within an active hay field.
See Photo C-10.

SOIL

Sampling Point: SP-10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	7.5YR 3/3	100					Sandy Loam	
12 - 22	5YR 4/4	80	5YR 4/1	20	D	M	Sandy Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✔

Remarks:

No indicators are met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-06-22

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-11

Investigator(s): S. Stewart, R. Oltjenbruns Section, Township, Range: S20 T19N R4E

Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): H 80A Lat: 36.110670 Long: -96.905405 Datum: NAD 83

Soil Map Unit Name: 70 - Zaneis loam, 3 to 5 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation ✔, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✔

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Upland confirmation sample plot. The USACE Antecedent Precipitation Tool indicates normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Andropogon gerardii	30	✔	FACU
2. Coelorachis cylindrica	20	✔	FAC
3. Achillea millefolium	10		FACU
4. Solidago altissima	10		FACU
5. Asclepias viridis	5		UPL
6. Amorpha canescens	3		UPL
7.			
8.			
9.			
10.			
	78% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 25.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	50	x 4 =	200
UPL species	8	x 5 =	40
Column Totals:	78 (A)		300 (B)

Prevalence Index = B/A = 3.85

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

No test is passed. Vegetation is disturbed due to being within an active hay field.
See Photo C-11.

SOIL

Sampling Point: SP-11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 22	7.5YR 3/3	100					Clay Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✔

Remarks:

No indicators are met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-07-25

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-12

Investigator(s): S. Stewart, C. Rogers Section, Township, Range: S20 T19N R4E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): H 80A Lat: 36.107733 Long: -96.901427 Datum: NAD 83

Soil Map Unit Name: 47 - Renfrow loam, 3 to 5 percent slopes, eroded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔ No _____	
Wetland Hydrology Present?	Yes ✔ No _____	

Remarks:

Wetland sample plot within PEM W-8. The USACE Antecedent Precipitation Tool indicates wetter than normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	5	✔	FACW
2.			
3.			
4.			
	5%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____	= Total Cover	
Herb Stratum (Plot size: 5 ft r)			
1. Juncus marginatus	30	✔	FACW
2. Paspalum dilatatum	20	✔	FAC
3. Coreopsis tinctoria	15		FAC
4. Cyperus echinatus	15		FAC
5. Setaria viridis	5		UPL
6.			
7.			
8.			
9.			
10.			
	85%	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____	= Total Cover	

% Bare Ground in Herb Stratum 15.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	35	x 2 =	70
FAC species	50	x 3 =	150
FACU species	0	x 4 =	0
UPL species	5	x 5 =	25
Column Totals:	90 (A)		245 (B)

Prevalence Index = B/A = 2.72

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

Dominance Test is passed.

See Photo C-12.

SOIL

Sampling Point: SP-12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 24	10YR 3/2	90	7.5YR 4/4	10	C	PL	Clay Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ **No** ___

Remarks:

Indicator F6 is met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ✔ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✔ Geomorphic Position (D2)
- ✔ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): _____

Water Table Present? Yes ___ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes ✔ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Indicators C3, D2, and D5 are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-07-25

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-13

Investigator(s): S. Stewart, C. Rogers Section, Township, Range: S20 T19N R4E

Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): H 80A Lat: 36.107509 Long: -96.901697 Datum: NAD 83

Soil Map Unit Name: 47 - Renfrow loam, 3 to 5 percent slopes, eroded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____ No ✔	
Wetland Hydrology Present?	Yes _____ No ✔	

Remarks:

Upland sample plot adjacent to PEM W-8. The USACE Antecedent Precipitation Tool indicates wetter than normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Andropogon gerardii	60	✔	FACU
2. Coelorachis cylindrica	20	✔	FAC
3. Achillea millefolium	10		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 10.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	70	x 4 =	280
UPL species	0	x 5 =	0
Column Totals:	90 (A)		340 (B)

Prevalence Index = B/A = 3.78

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

No test is passed.

See Photo C-13.

SOIL

Sampling Point: SP-13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 20	10YR 3/3	100					Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✔

Remarks:

No indicators are met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-07-25

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-14

Investigator(s): S. Stewart, C. Rogers Section, Township, Range: S20 T19N R4E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR): H 80A Lat: 36.105210 Long: -96.902468 Datum: NAD 83

Soil Map Unit Name: 49 - Renfrow and Grainola soils, 3 to 8 percent slopes, severely eroded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Wetland sample plot within PEM W-9. The USACE Antecedent Precipitation Tool indicates normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Paspalum dilatatum	30	✔	FAC
2. Juncus marginatus	20	✔	FACW
3. Coreopsis tinctoria	5		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	55% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 45.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	35	x 3 =	105
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	55 (A)		145 (B)

Prevalence Index = B/A = 2.64

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

Dominance Test is passed.

See Photo C-14.

SOIL

Sampling Point: SP-14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 4/1	95	10YR 5/8	5	C	PL	Clay	
8 - 24	7.5YR 4/6	100					Sand	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

Indicator F3 is met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ✔ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ✔ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✔ Geomorphic Position (D2)
- ✔ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): _____

Water Table Present? Yes ___ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✔ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Indicators C3, C8, D2, and D5 are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-07-25

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-15

Investigator(s): S. Stewart, C. Rogers Section, Township, Range: S20 T19N R4E

Landform (hillslope, terrace, etc.): Plateau Local relief (concave, convex, none): None Slope (%): 2

Subregion (LRR): H 80A Lat: 36.105192 Long: -96.902468 Datum: NAD 83

Soil Map Unit Name: 49 - Renfrow and Grainola soils, 3 to 8 percent slopes, severely eroded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Upland sample plot adjacent to PEM W-9. The USACE Antecedent Precipitation Tool indicates wetter than normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Ambrosia artemisiifolia	30	✔	FACU
2. Andropogon gerardii	30	✔	FACU
3. Coelorachis cylindrica	5		FAC
4. Coreopsis tinctoria	5		FAC
5.			
6.			
7.			
8.			
9.			
10.			
	70% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 30.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	70 (A)		270 (B)

Prevalence Index = B/A = 3.86

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

No test is passed.

See Photo C-15.

SOIL

Sampling Point: SP-15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 20	7.5YR 3/3	100					Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✔

Remarks:

No indicators are met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-07-26

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-16

Investigator(s): S. Stewart, C. Rogers Section, Township, Range: S23 T19N R3E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): H 80A Lat: 36.105569 Long: -96.944525 Datum: NAD 83

Soil Map Unit Name: 62 - Mulhall loam, 3 to 5 percent slopes, gullied NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Wetland sample plot within PEM W-15. The USACE Antecedent Precipitation Tool indicates wetter than normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Cyperus echinatus	60	✔	FAC
2. Eleocharis compressa	20	✔	FACW
3. Juncus marginatus	5		FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	85% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 15.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	25	x 2 =	50
FAC species	60	x 3 =	180
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	85 (A)		230 (B)

Prevalence Index = B/A = 2.71

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

Dominance Test is passed.

See Photo C-16.

SOIL

Sampling Point: SP-16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 20	10YR 3/2	60	7.5YR 4/4	40	C	M	Sandy Clay Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** _____

Remarks:

Indicator F6 is met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ✔ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✔ Geomorphic Position (D2)
- ✔ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Indicators C8, D2, and D5 are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-07-26

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-17

Investigator(s): S. Stewart, C. Rogers Section, Township, Range: S23 T19N R3E

Landform (hillslope, terrace, etc.): Sideslope Local relief (concave, convex, none): None Slope (%): 5

Subregion (LRR): H 80A Lat: 36.105546 Long: -96.944583 Datum: NAD 83

Soil Map Unit Name: 62 - Mulhall loam, 3 to 5 percent slopes, gullied NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____ No ✔	
Wetland Hydrology Present?	Yes _____ No ✔	

Remarks:

Upland sample plot adjacent to PEM W-15. The USACE Antecedent Precipitation Tool indicates wetter than normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Hexasepalum teres	60	✔	UPL
2. Andropogon gerardii	10		FACU
3. Juniperus virginiana	3		UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	73% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 27.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	63	x 5 =	315
Column Totals:	73 (A)		355 (B)

Prevalence Index = B/A = 4.86

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

No test is passed.

See Photo C-17.

SOIL

Sampling Point: SP-17

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 5	10YR 4/4	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Compact Soil

Depth (inches): 5

Hydric Soil Present? Yes _____ No ✔

Remarks:

No indicators are met. Excavation below 5" was prevented by compact soil. Multiple locations attempted.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-07-26

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-18

Investigator(s): S. Stewart, C. Rogers Section, Township, Range: S23 T19N R3E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): H 80A Lat: 36.105504 Long: -96.954414 Datum: NAD 83

Soil Map Unit Name: GAMD - Grainola-Ashport frequently flooded-Mulhall complex, 0 to 8 percent slopes NWI classification: PUSAh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Wetland sample plot within PEM W-16. The USACE Antecedent Precipitation Tool indicates wetter than normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Typha angustifolia	60	✔	OBL
2. Schoenoplectus acutus	20	✔	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 20.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	80	x 1 =	80
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	80 (A)		80 (B)

Prevalence Index = B/A = 1.0

Hydrophytic Vegetation Indicators:

✔ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

Rapid Test is passed.

See Photo C-18.

SOIL

Sampling Point: SP-18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 22	10YR 6/1	60	5YR 4/4	40	C	M	Clay	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ No ___

Remarks:

Indicator F3 is met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✔ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✔ Geomorphic Position (D2)
- ✔ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ✔ No ___ Depth (inches): 3

Water Table Present? Yes ✔ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✔ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Indicators A1, A2, A3, B10, D2, and D5 are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-07-26

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-19

Investigator(s): S. Stewart, C. Rogers Section, Township, Range: S23 T19N R3E

Landform (hillslope, terrace, etc.): Sideslope Local relief (concave, convex, none): None Slope (%): 5

Subregion (LRR): H 80A Lat: 36.105416 Long: -96.954777 Datum: NAD 83

Soil Map Unit Name: GAMD - Grainola-Ashport frequently flooded-Mulhall complex, 0 to 8 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____ No ✔	
Wetland Hydrology Present?	Yes _____ No ✔	

Remarks:

Upland sample plot adjacent to PEM W-16. The USACE Antecedent Precipitation Tool indicates wetter than normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Andropogon gerardii	60	✔	FACU
2. Ambrosia artemisiifolia	20	✔	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 20.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	80	x 4 =	320
UPL species	0	x 5 =	0
Column Totals:	80 (A)		320 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

No test is passed.

See Photo C-19.

SOIL

Sampling Point: SP-19

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 10	7.5YR 3/4	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Compact Soil

Depth (inches): 10

Hydric Soil Present? Yes _____ No ✔

Remarks:

No indicators are met. Excavation below 10" was prevented by compact soil. Multiple locations attempted.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-07-26

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-20

Investigator(s): S. Stewart, C. Rogers Section, Township, Range: S16 T19N R3E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): H 80A Lat: 36.117725 Long: -96.989751 Datum: NAD 83

Soil Map Unit Name: MulC - Mulhall loam, 3 to 5 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Wetland sample plot within PEM W-19. The USACE Antecedent Precipitation Tool indicates wetter than normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Mecardonia acuminata	60	✔	FACW
2. Eleocharis obtusa	20	✔	OBL
3. Andropogon gerardii	5		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	85% = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 15.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	60	x 2 =	120
FAC species	0	x 3 =	0
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	85 (A)		160 (B)

Prevalence Index = B/A = 1.88

Hydrophytic Vegetation Indicators:

✔ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

Rapid Test is passed.

See Photo C-20.

SOIL

Sampling Point: SP-20

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 6	5YR 5/2	60	2.5YR 4/8	40	C	M	Clay	
6 - 22	2.5YR 4/6	90	10YR 8/2	10	D	M	Clay	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ✔ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ No ___

Remarks:

Indicators F3 and TF2 are met. Probable source of red parent material is red Permian sandstones or shales found in MLRA 80A - Central Rolling Red Prairies.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ✔ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✔ Geomorphic Position (D2)
- ✔ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): _____

Water Table Present? Yes ___ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes ✔ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Indicators C8, D2, and D5 are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-07-26

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-21

Investigator(s): S. Stewart, C. Rogers Section, Township, Range: S16 T19N R3E

Landform (hillslope, terrace, etc.): Sideslope Local relief (concave, convex, none): None Slope (%): 3

Subregion (LRR): H 80A Lat: 36.117781 Long: -96.989772 Datum: NAD 83

Soil Map Unit Name: MulC - Mulhall loam, 3 to 5 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Upland sample plot adjacent to PEM W-19. The USACE Antecedent Precipitation Tool indicates wetter than normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft r)			
1. Bouteloua gracilis	20	✔	UPL
2. Digitaria sanguinalis	15	✔	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	35	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 65.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	15	x 4 =	60
UPL species	20	x 5 =	100
Column Totals:	35 (A)		160 (B)

Prevalence Index = B/A = 4.57

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

No test is passed.

See Photo C-21.

SOIL

Sampling Point: SP-21

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 5	10YR 4/4	100					Clay Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Compact Soil

Depth (inches): 5

Hydric Soil Present? Yes _____ No ✔

Remarks:

No indicators are met. Excavation below 5" was prevented by compact soil. Multiple locations attempted.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-10-23

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-22

Investigator(s): R. Oltjenbruns, J. Ramirez Section, Township, Range: S20 T19N R4E

Landform (hillslope, terrace, etc.): Side Slope Local relief (concave, convex, none): None Slope (%): 3

Subregion (LRR): H 80A Lat: 36.11579 Long: -96.907847 Datum: NAD 83

Soil Map Unit Name: 47 - Renfrow loam, 3 to 5 percent slopes, eroded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✔ (If no, explain in Remarks.)

Are Vegetation ✔, Soil ✔, or Hydrology ✔ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✔

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No ✔	**Is the Sampled Area within a Wetland?** Yes ____ No ✔
Hydric Soil Present?	Yes ____ No ✔	
Wetland Hydrology Present?	Yes ____ No ✔	

Remarks:

Upland confirmation sample plot. The USACE Antecedent Precipitation Tool indicates drier than normal climatic conditions three months prior to survey. Sample plot was disturbed due to being within a mowed ditch.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Diospyros virginiana	25	✔	FAC
2.			
3.			
4.			
5.			
	25 = Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Bromus arvensis	10	✔	FACU
2. Artemisia ludoviciana	5	✔	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	15 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 5.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	25	x 3 =	75
FACU species	10	x 4 =	40
UPL species	5	x 5 =	25
Column Totals:	40 (A)		140 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✔

Remarks:

No test is passed. Vegetation was disturbed due to being within a mowed ditch.
See Photo C-22.

SOIL

Sampling Point: SP-22

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 8	7.5YR 4/3	100					Clay Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Compact Soil

Depth (inches): 8

Hydric Soil Present? Yes _____ No ✔

Remarks:

No indicators are met. Excavation below 8" was prevented by compact soil. Multiple locations attempted.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-10-23

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-23

Investigator(s): R. Oltjenbruns, J. Ramirez Section, Township, Range: S20 T19N R4E

Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): H 80A Lat: 36.107793 Long: -96.908285 Datum: NAD 83

Soil Map Unit Name: GAMD - Grainola-Ashport frequently flooded-Mulhall complex, 0 to 8 percent slopes NWI classification: R5UBF

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No ✔ (If no, explain in Remarks.)

Are Vegetation ✔, Soil ✔, or Hydrology ✔ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✔

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Upland confirmation sample plot. The USACE Antecedent Precipitation Tool indicates drier than normal climatic conditions three months prior to survey. Sample plot was disturbed due to being within a mowed ditch.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft r)			
1. Sorghum halepense	25	✔	FACU
2. Cirsium altissimum	5		UPL
3. Desmanthus illinoensis	2		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	32	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 15.0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	27	x 4 =	108
UPL species	5	x 5 =	25
Column Totals:	32 (A)		133 (B)

Prevalence Index = B/A = 4.16

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

No test is passed. Vegetation was disturbed due to being within a mowed ditch.
See Photo C-23.

SOIL

Sampling Point: SP-23

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	5YR 4/4	100					Clay Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Rock

Depth (inches): 12

Hydric Soil Present? Yes _____ No ✔

Remarks:

No indicators are met. Excavation below 12" was prevented by rock. Multiple locations attempted.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-10-26

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-24

Investigator(s): J. Jorgensen Section, Township, Range: S20 T19N R4E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 5

Subregion (LRR): H 80A Lat: 36.114886 Long: -96.907717 Datum: NAD 83

Soil Map Unit Name: ZaHC - Zaneis-Huska complex, 1 to 5 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Upland confirmation sample plot. The USACE Antecedent Precipitation Tool indicates normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft r)			
1. Sorghastrum nutans	55	✔	FACU
2. Coleataenia anceps	25	✔	FAC
3. Bothriochloa ischaemum	20	✔	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	25	x 3 =	75
FACU species	55	x 4 =	220
UPL species	20	x 5 =	100
Column Totals:	100 (A)		395 (B)

Prevalence Index = B/A = 3.95

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

No test is passed.

See Photo C-24.

SOIL

Sampling Point: SP-24

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/3	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Compact Soil

Depth (inches): 12

Hydric Soil Present? Yes _____ No ✔

Remarks:

No indicators are met. Excavation below 12" was prevented by compact soil. Multiple locations attempted.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-10-26

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-25

Investigator(s): J. Jorgensen Section, Township, Range: S17 T19N R4E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 5

Subregion (LRR): H 80A Lat: 36.119059 Long: -96.907704 Datum: NAD 83

Soil Map Unit Name: 4 - Coyle loam, 3 to 5 percent slopes, eroded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Upland confirmation sample plot. The USACE Antecedent Precipitation Tool indicates normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft r)			
1. Bothriochloa ischaemum	60	✔	UPL
2. Sorghastrum nutans	20	✔	FACU
3. Schizachyrium scoparium	20	✔	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	40	x 4 =	160
UPL species	60	x 5 =	300
Column Totals:	100 (A)		460 (B)

Prevalence Index = B/A = 4.60

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

No test is passed.

See Photo C-25.

SOIL

Sampling Point: SP-25

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 5	5YR 3/4	100					Clay Loam	
5 - 15	5YR 3/4	60	5YR 2.5/1	40	D	M	Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✔

Remarks:

No indicators are met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-10-26

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-26

Investigator(s): J. Jorgensen Section, Township, Range: S17 T19N R4E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 5

Subregion (LRR): H 80A Lat: 36.122805 Long: -96.90765 Datum: NAD 83

Soil Map Unit Name: CoyB - Coyle loam, 1 to 3 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Upland confirmation sample plot. The USACE Antecedent Precipitation Tool indicates normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft r)			
1. Cynodon dactylon	100	✔	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

No test is passed.

See Photo C-26.

SOIL

Sampling Point: SP-26

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 15	10YR 3/3	100					Clay Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✔

Remarks:

No indicators are met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators are met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Ripley Energy Center City/County: Payne County Sampling Date: 2023-10-26

Applicant/Owner: Associated Electric Cooperative, Inc. State: Oklahoma Sampling Point: SP-27

Investigator(s): J. Jorgensen Section, Township, Range: S17 T19N R4E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 10

Subregion (LRR): H 80A Lat: 36.130233 Long: -96.907745 Datum: NAD 83

Soil Map Unit Name: 47 - Renfrow loam, 3 to 5 percent slopes, eroded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Upland confirmation sample plot. The USACE Antecedent Precipitation Tool indicates normal climatic conditions three months prior to survey.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft r)			
1. Ambrosia artemisiifolia	15	✔	FACU
2. Setaria pumila	5	✔	FACU
3. Amphiachyris dracunculoides	5	✔	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	25	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	20	x 4 =	80
UPL species	5	x 5 =	25
Column Totals:	25 (A)		105 (B)

Prevalence Index = B/A = 4.20

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

No test is passed.

See Photo C-27.

SOIL

Sampling Point: SP-27

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 15	7.5YR 3/4	90	5YR 4/6	10	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✔

Remarks:

No indicators are met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators are met.

APPENDIX C -GROUND PHOTOGRAPHS

Photograph C-1: View of Sample Plot (SP)-1 within PEM Wetland (W)-3, facing southwest.

Photograph C-2: View of upland SP-2 adjacent to PEM W-3, facing southwest.

Photograph C-3: View of SP-3 within PEM W-4, facing east.

Photograph C-4: View of upland SP-4 adjacent to PEM W-4, facing east.

Photograph C-5: View of upland confirmation SP-5, facing south.

Photograph C-6: View of SP-6 within PSS W-5, facing south.

Photograph C-7: View of upland SP-7 adjacent to PSS W-5, facing south.

Photograph C-8: View of upland confirmation SP-8, facing north.

Photograph C-9: View of SP-9 within PEM W-7, facing south.

Photograph C-10: View of upland SP-10 adjacent to PEM W-7, facing east.

Photograph C-11: View of upland confirmation SP-11, facing northwest.

Photograph C-12: View of SP-12 within PEM W-8, facing north.

Photograph C-13: View of upland SP-13 adjacent to PEM W-8, facing north.

Photograph C-14: View of SP-14 within PEM W-9, facing west.

Photograph C-15: View of upland SP-15 adjacent to PEM W-9, facing east.

Photograph C-16: View of SP-16 within PEM W-15, facing west.

Photograph C-17: View of upland SP-17 adjacent to PEM W-15, facing east.

Photograph C-18: View of SP-18 within PEM W-16, facing west.

Photograph C-19: View of upland SP-19 adjacent to PEM W-16, facing east.

Photograph C-20: View of SP-20 within PEM W-19, facing east.

Photograph C-21: View of upland SP-21 adjacent to PEM W-19, facing east.

Photograph C-22: View of upland confirmation SP-22, facing north.

Photograph C-23: View of upland confirmation SP-23, facing north.

Photograph C-24: View of upland confirmation SP-24, facing north.

Photograph C-25: View of upland confirmation SP-25, facing north.

Photograph C-26: View of upland confirmation SP-26, facing north.

Photograph C-27: View of upland confirmation SP-27, facing south.

Photograph C-28: View of PUB W-1, facing north.

Photograph C-29: View of PUB W-2, facing north.

Photograph C-30: View of PUB W-6, facing north.

Photograph C-31: View of PAB W-10, facing south.

Photograph C-32: View of PUB W-11, facing southwest.

Photograph C-33: View of PUB W-12, facing southwest.

Photograph C-34: View of PUB W-13, facing north.

Photograph C-35: View of PUB W-14, facing southwest.

Photograph C-36: View of PUB W-17, facing north.

Photograph C-37: View of PUB W-18, facing west.

Photograph C-38: View of PUB W-20, facing southeast.

Photograph C-39: View of PUB W-21, facing north.

Photograph C-40: View of ephemeral Stream (S)-1, facing west.

Photograph C-41: View of intermittent S-2, facing south.

Photograph C-42: View of ephemeral S-3, facing east.

Photograph C-43: View of ephemeral S-4, facing south.

Photograph C-44: View of perennial S-5, facing west.

Photograph C-45: View of ephemeral S-6, facing east.

Photograph C-46: View of ephemeral S-7, facing southeast.

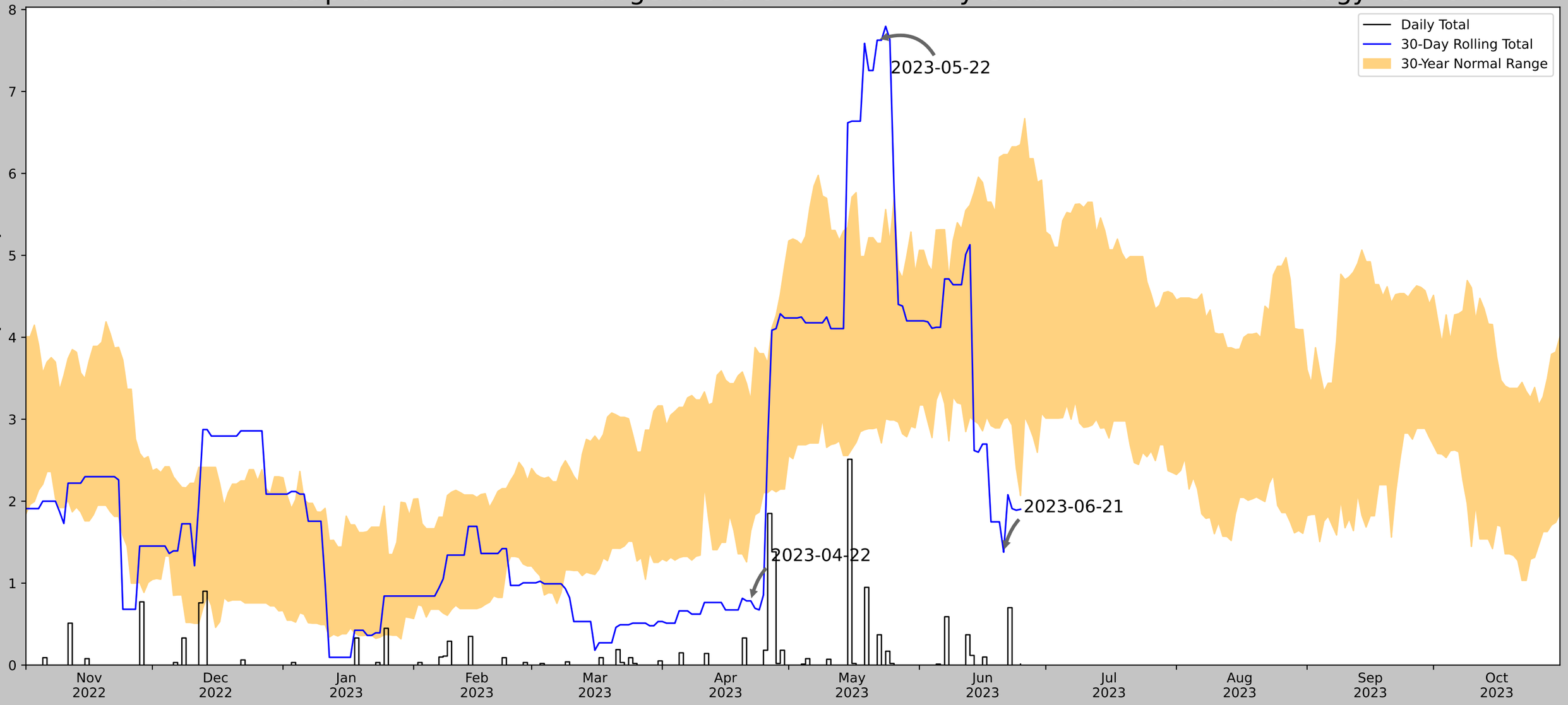
Photograph C-47: View of ephemeral S-8, facing north.

Photograph C-48: View of ephemeral S-9, facing west.

Photograph C-49: View of ephemeral S-10, facing east.

APPENDIX D - ANTECEDENT PRECIPITATION TOOL RESULTS

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	36.1130098, -96.9034325
Observation Date	2023-06-21
Elevation (ft)	971.565
Drought Index (PDSI)	Incipient drought (2023-05)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-06-21	3.003937	6.230709	1.377953	Dry	1	3	3
2023-05-22	2.899606	5.146457	7.625984	Wet	3	2	6
2023-04-22	1.640551	3.233071	0.783465	Dry	1	1	1
Result							Normal Conditions - 10

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
STILLWATER 2 W	36.1175, -97.095	895.013	10.697	76.552	5.633	11204	88
STILLWATER MESONET	36.1208, -97.0953	892.06	0.229	2.953	0.104	19	0
STILLWATER 5 WNW	36.1347, -97.1083	888.123	1.401	6.89	0.64	73	2
STILLWATER RGNL AP	36.1625, -97.0894	960.958	3.125	65.945	1.612	4	0
PERKINS	35.9742, -97.0269	892.06	10.607	2.953	4.804	53	0

Coordinates	36.1130098, -96.9034325
Observation Date	2023-06-22
Elevation (ft)	971.565
Drought Index (PDSI)	Incipient drought (2023-05)
WebWIMP H_2O Balance	Dry Season

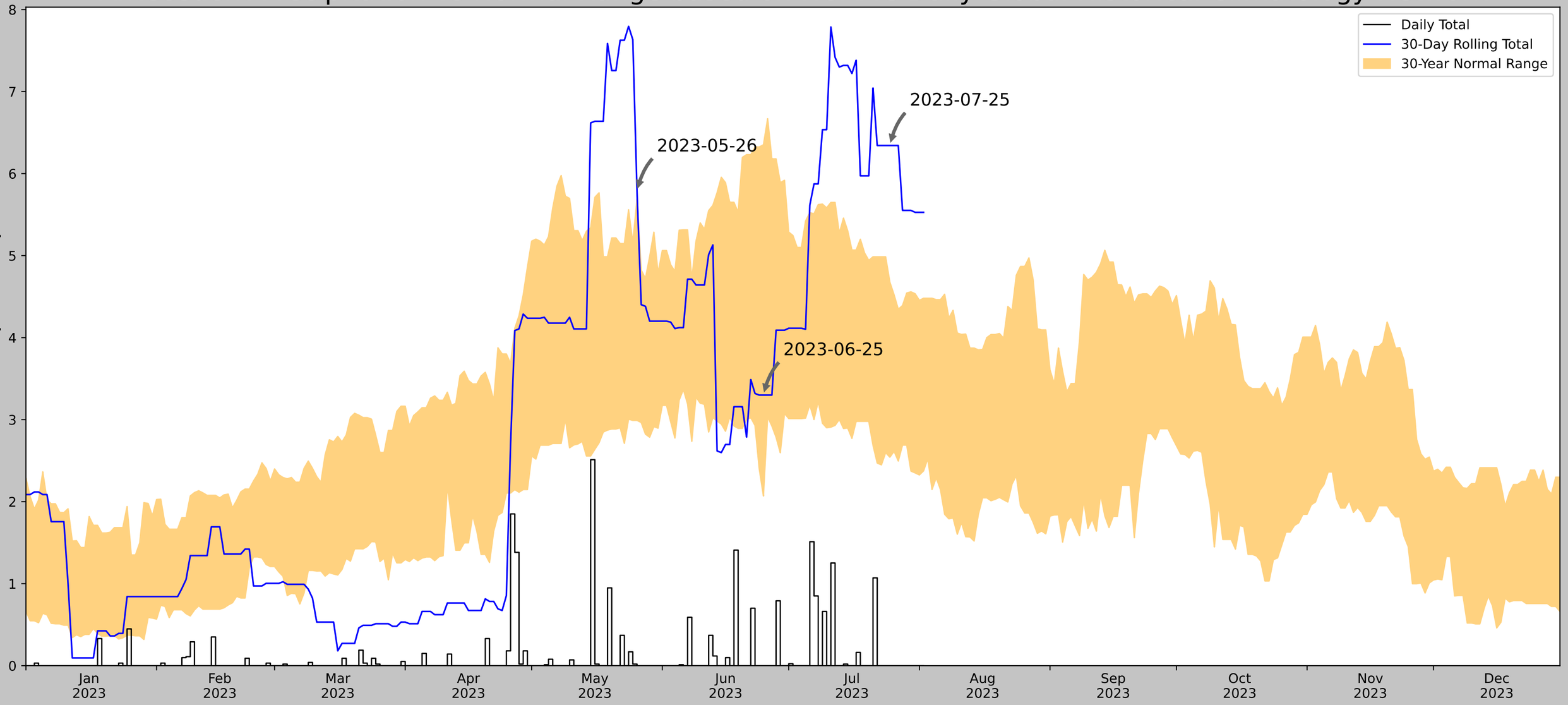
30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-06-22	3.024016	6.230709	2.07874	Dry	1	3	3
2023-05-23	2.710236	5.146457	7.625984	Wet	3	2	6
2023-04-23	1.833858	3.876378	0.692913	Dry	1	1	1
Result							Normal Conditions - 10

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
STILLWATER 2 W	36.1175, -97.095	895.013	10.697	76.552	5.633	11204	88
STILLWATER MESONET	36.1208, -97.0953	892.06	0.229	2.953	0.104	19	0
STILLWATER 5 WNW	36.1347, -97.1083	888.123	1.401	6.89	0.64	73	2
STILLWATER RGNL AP	36.1625, -97.0894	960.958	3.125	65.945	1.612	4	0
PERKINS	35.9742, -97.0269	892.06	10.607	2.953	4.804	53	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	36.11067, -96.905405
Observation Date	2023-07-25
Elevation (ft)	952.267
Drought Index (PDSI)	Incipient drought (2023-06)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-07-25	2.542126	4.676378	6.34252	Wet	3	3	9
2023-06-25	2.068504	6.351181	3.299213	Normal	2	2	4
2023-05-26	2.990551	5.689764	5.783465	Wet	3	1	3
Result							Wetter than Normal - 16

US Army Corps of Engineers.

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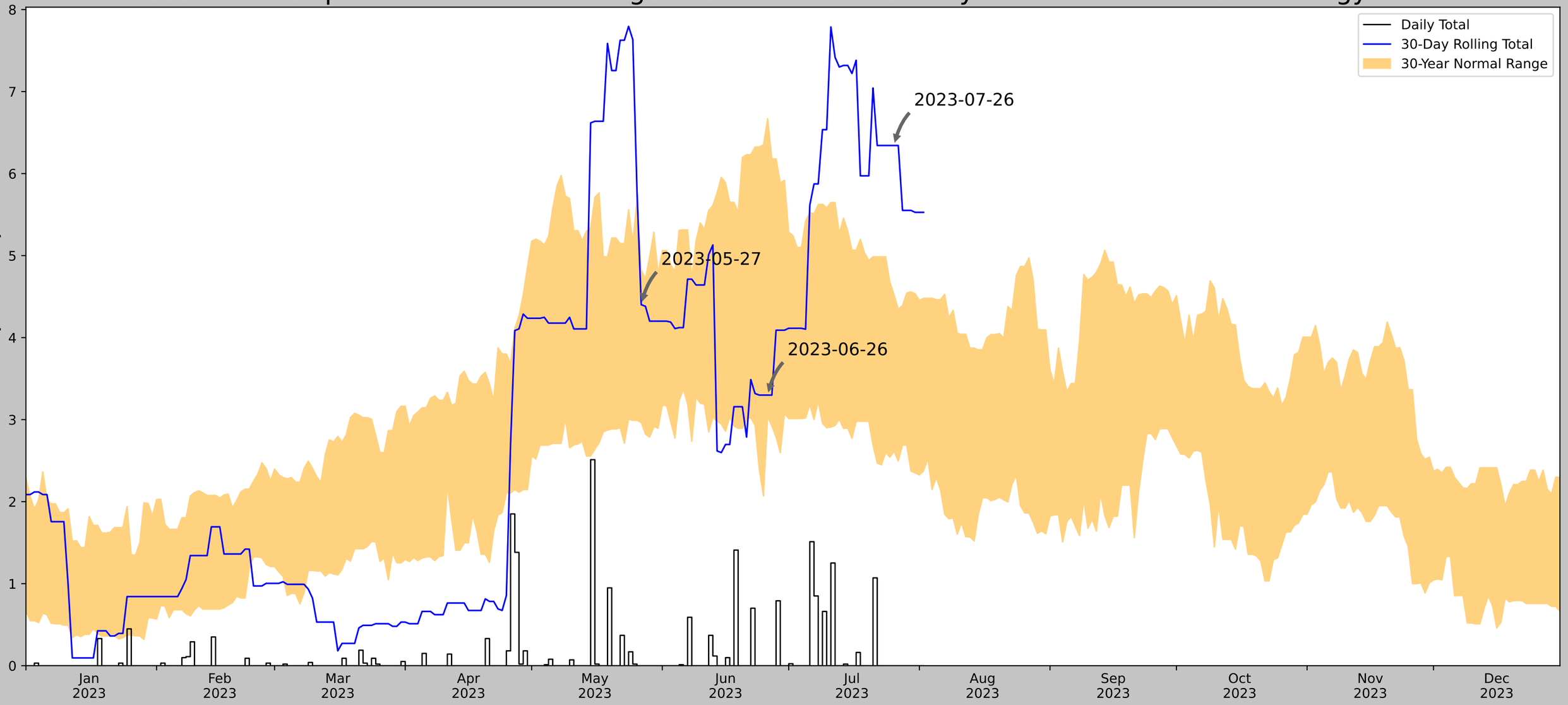
Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
STILLWATER 2 W	36.1175, -97.095	895.013	10.593	57.254	5.373	11204	84
STILLWATER MESONET	36.1208, -97.0953	892.06	0.229	2.953	0.104	19	0
STILLWATER 5 WNW	36.1347, -97.1083	888.123	1.401	6.89	0.64	73	6
STILLWATER RGNL AP	36.1625, -97.0894	960.958	3.125	65.945	1.612	4	0
PERKINS	35.9742, -97.0269	892.06	10.607	2.953	4.804	53	0



Coordinates	36.11067, -96.905405
Observation Date	2023-07-26
Elevation (ft)	952.267
Drought Index (PDSI)	Incipient drought (2023-06)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-07-26	2.61378	4.522441	6.34252	Wet	3	3	9
2023-06-26	3.034252	6.669685	3.299213	Normal	2	2	4
2023-05-27	2.964961	4.823622	4.401575	Normal	2	1	2
Result							Wetter than Normal - 15

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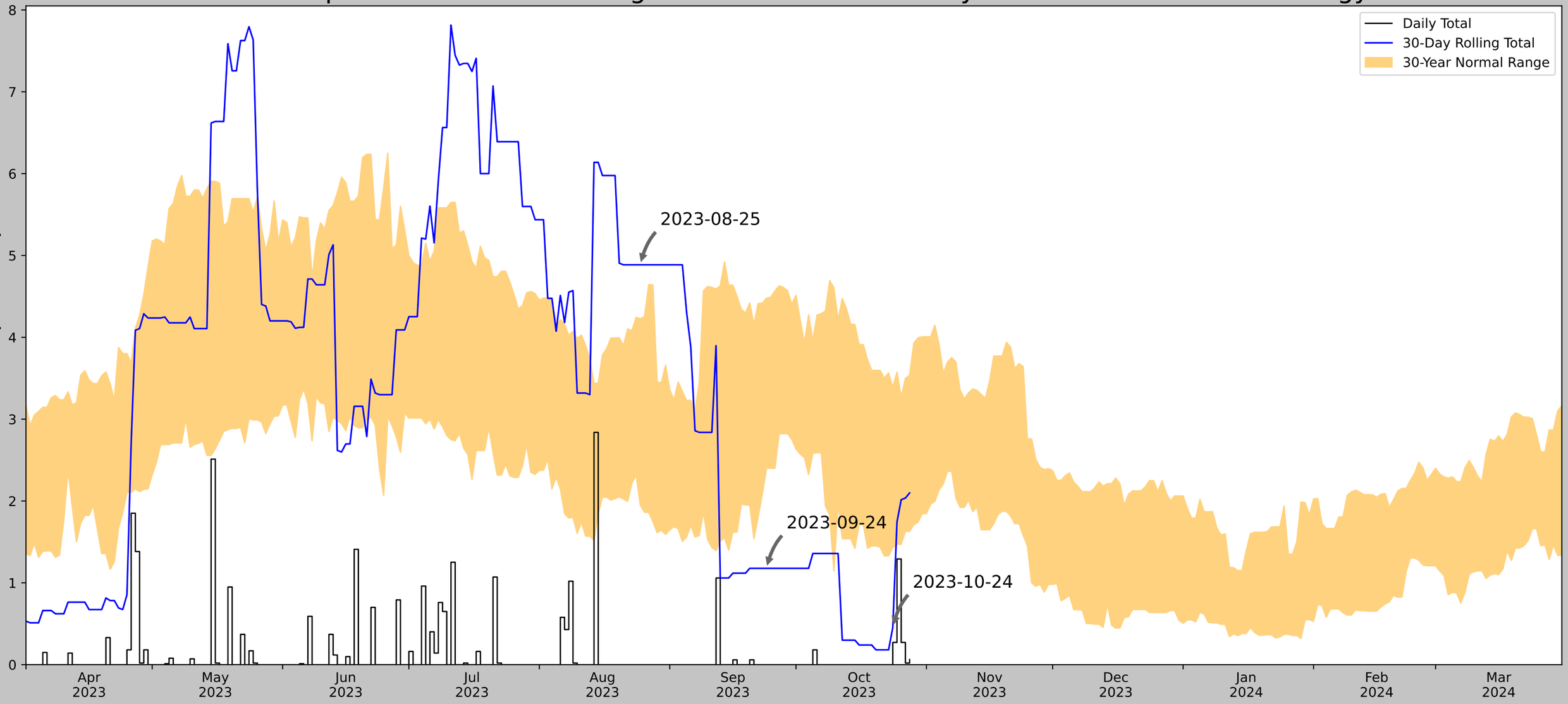
Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
STILLWATER 2 W	36.1175, -97.095	895.013	10.593	57.254	5.373	11204	84
STILLWATER MESONET	36.1208, -97.0953	892.06	0.229	2.953	0.104	19	0
STILLWATER 5 WNW	36.1347, -97.1083	888.123	1.401	6.89	0.64	73	6
STILLWATER RGNL AP	36.1625, -97.0894	960.958	3.125	65.945	1.612	4	0
PERKINS	35.9742, -97.0269	892.06	10.607	2.953	4.804	53	0



Coordinates	36.111841, -96.907982
Observation Date	2023-10-24
Elevation (ft)	937.967
Drought Index (PDSI)	Mild wetness (2023-09)
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-10-24	1.433465	3.388976	0.452756	Dry	1	3	3
2023-09-24	2.399606	4.479528	1.177165	Dry	1	2	2
2023-08-25	1.948425	4.225984	4.885827	Wet	3	1	3
Result							Drier than Normal - 8

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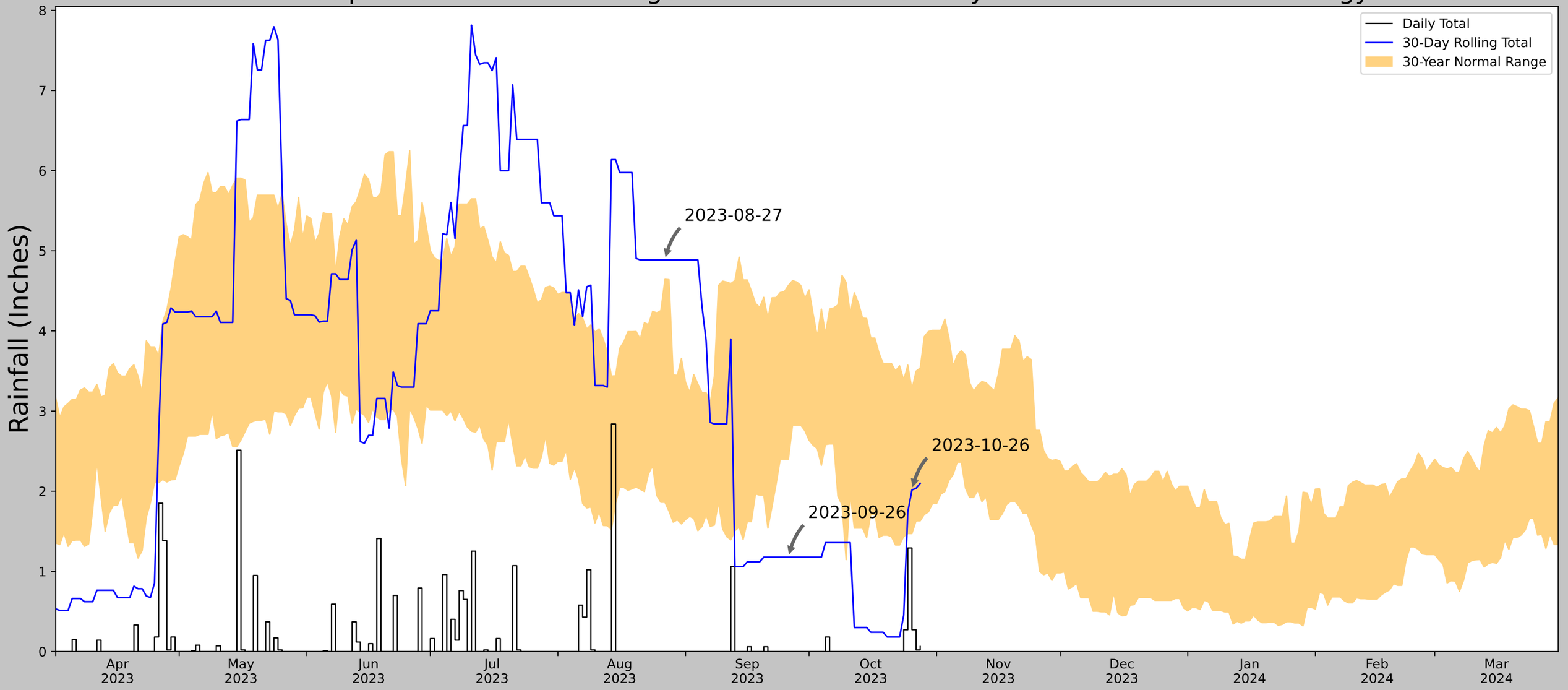
Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
STILLWATER 2 W	36.1175, -97.095	895.013	10.446	42.954	5.149	11203	90
STILLWATER MESONET	36.1208, -97.0953	892.06	0.229	2.953	0.104	19	0
STILLWATER 5 WNW	36.1347, -97.1083	888.123	1.401	6.89	0.64	75	0
STILLWATER RGNL AP	36.1625, -97.0894	960.958	3.125	65.945	1.612	4	0
PERKINS	35.9742, -97.0269	892.06	10.607	2.953	4.804	51	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	36.136415, -96.920876
Observation Date	2023-10-26
Elevation (ft)	944.561
Drought Index (PDSI)	Mild wetness (2023-09)
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-10-26	1.470866	3.272835	2.015748	Normal	2	3	6
2023-09-26	2.399606	4.568504	1.177165	Dry	1	2	2
2023-08-27	1.861024	4.644882	4.885827	Wet	3	1	3
Result							Normal Conditions - 11

US Army Corps of Engineers.

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Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
STILLWATER 2 W	36.1175, -97.095	895.013	9.805	49.548	4.898	11203	90
STILLWATER MESONET	36.1208, -97.0953	892.06	0.229	2.953	0.104	19	0
STILLWATER 5 WNW	36.1347, -97.1083	888.123	1.401	6.89	0.64	75	0
STILLWATER RGNL AP	36.1625, -97.0894	960.958	3.125	65.945	1.612	4	0
PERKINS	35.9742, -97.0269	892.06	10.607	2.953	4.804	51	0