



Wetland Delineation and Threatened & Endangered Species Habitat Report

Sabertooth BESS Project

Prepared For

Black Mountain Energy Storage



REVISION HISTORY

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COMMON ACRONYMS AND ABBREVIATIONS

| | |
|---------|--|
| AMSL | Above Mean Sea Level |
| BESS | Battery Energy Storage System |
| BMES | Black Mountain Energy Storage |
| BGEPA | Bald and Golden Eagle Protection Act |
| Canacre | Canacre LLC |
| CFR | Code of Federal Regulations |
| CWA | Clean Water Act |
| DP | Data Point |
| EPA | Environmental Protection Agency |
| ESA | Endangered Species Act |
| FEMA | Federal Emergency Management Agency |
| FIRM | Federal Insurance Rate Map |
| FGDC | Federal Geographic Data Committee |
| GNSS | Global Navigation Satellite System |
| IPaC | Information for Planning and Consultation |
| MBTA | Migratory Bird Treaty Act |
| MDC | Missouri Department of Conservation |
| MDNR | Missouri Department of Natural Resources |
| NHD | National Hydrography Dataset |
| NOI | Notice of Intent |
| NRCS | Natural Resources Conservation Service |
| NWI | National Wetlands Inventory |
| NWPL | National Wetland Plant List |
| NWSRS | National Wild and Scenic Rivers System |
| OHWM | Ordinary High-Water Mark |
| PCN | Pre-Construction Notification |
| PEM | Palustrine Emergent |
| PFO | Palustrine Forested |
| PLANTS | Plant List of Accepted Nomenclature, Taxonomy, and Symbols |
| PSS | Palustrine Scrub-Shrub |
| RHA | Rivers and Harbors Act |
| SDA | Soil Data Access |
| SWPPP | Stormwater Pollution Prevention Plan |
| UPL | Upland Point |
| USACE | U.S. Army Corps of Engineers |

| | |
|--------|--|
| USDA | U.S. Department of Agriculture |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Survey |
| WATERS | Watershed Assessment, Tracking, and Environmental Results System |
| WET | Wetland Point |
| WOTUS | Waters of the United States |

1. INTRODUCTION

Canacre LLC (Canacre) conducted a delineation of Waters of the United States (WOTUS), including wetlands for the Black Mountain Energy Storage (BMES) Sabertooth Battery Energy Storage System (BESS) Project (Project). The purpose of this investigation was to determine the presence and extent of WOTUS within the Project, identified as an approximately 33.2-acre possible site for the proposed BESS, that are subject to jurisdiction by the U.S. Army Corps of Engineers (USACE) Little Rock District, pursuant to Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act (RHA).

Additionally, a survey was conducted to identify if habitat with the potential to support threatened and endangered species subject to protection under the Endangered Species Act (ESA) administered by the U.S. Fish and Wildlife Service (USFWS) exists within the Project site. Field efforts for the WOTUS delineation and habitat assessment were conducted on March 21, 2023. This report presents the findings of the field efforts.

1.1. Project Description

The Project consists of the construction of a proposed battery energy storage facility located in Ozark, Christian County, Missouri. The Project is adjacent to Old Prospect Road, approximately 1.02 miles east of US Highway 55 North. According to aerial imagery, it appears that a majority of the site has been cleared since at least 1996. Additionally, it appears that two ponds have been present on the site since at least 1996. The full extent of the Project is depicted in the Vicinity Map presented in **Exhibit 1** of **Appendix A**.

2. METHODS

Prior to field surveys, desktop data for the Project site was reviewed including; 2023 Google Earth aerial photography, 7.5-minute U.S. Geological Survey (USGS) topographical quadrangle maps, USFWS National Wetlands Inventory (NWI) digital data, USGS National Hydrography Dataset (NHD) digital data, Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) digital data, Environmental Protection Agency (EPA) Watershed Assessment, Tracking, and Environmental Results System (WATERS) digital data, U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) web soil survey digital data, and National Wild and Scenic Rivers System (NWSRS) digital data. Additionally, resources from the Missouri Department of Conservation (MDC) and the USFWS Information for Planning and Consultation (IPaC) tool were reviewed by Canacre biologists.

WOTUS delineations were completed within the proposed Project site in accordance with the USACE 1987 Wetlands Delineation Manual (1987 Manual) (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0) (Regional Supplement) (USACE 2010). As required by existing regulations and defined by the 1987 Manual, the presence of three essential wetland characteristics (i.e., hydrophytic vegetation, wetland hydrology, and hydric soils) were evaluated. Characteristics for WOTUS, as defined by 33 Code of Federal Regulations (CFR) §328, were evaluated for ephemeral, intermittent, and perennial streams, navigable and non-navigable waterways, deep-water habitats, wetlands, and other special aquatic sites as listed in the 1987 Manual.

Vegetation, hydrology, and soils were evaluated and recorded in the field at each numbered data point (DP) during the WOTUS delineation survey. The DPs were further labeled as either a wetland point (WET) or an upland point (UPL), depending on the present vegetation, hydrology, and soils. Plant species were recorded at each DP by visually estimating the percent aerial cover of each species using nested sampling plots by strata in accordance with the Regional Supplement. The 2020 National Wetland Plant List (NWPL), Version 3.5 (USACE 2020) was used to determine the indicator status of plant species. Taxonomy of plant species follows Lichvar et al. (2020) and the USDA NRCS Plant List of Accepted Nomenclature, Taxonomy, and Symbols (PLANTS) Database (USDA NRCS 2023a). A shallow soil pit was dug at each DP to document soil characteristics and to examine subsurface hydrology. The soil pit was left open for at least 10 minutes to allow any free water in the soil to stabilize before recording the depth to standing water and the depth to saturated soil in the pit. Soil characteristics such as soil color(s), texture, structure, and presence of redoximorphic features, nodules, or concretions, and other hydric soil indicators were recorded at each DP. The moist matrix color, and when present, moist mottle color of soils, were recorded by soil horizon/strata utilizing the Munsell Soil Color Charts (Munsell Color 2009). DP locations were mapped with sub-meter accuracy using a Juniper Systems Global Navigation Satellite System (GNSS) Geode. The GNSS data was recorded in ArcGIS Field Maps.

Threatened and endangered species habitat assessments were conducted concurrently with WOTUS delineations. The Project site was surveyed for individual species and habitat with the potential to support the species. If present, species and habitat were mapped and recorded with the GNSS Geode.

3. RESULTS

3.1. Site Description

This Project is located in Christian County, Missouri. The topography of the Project site ranges from approximately 1,224 to 1,294 feet above mean sea level (AMSL). The USGS Topographic Map depicts the elevation contour lines within the Project site via aerial imagery and is presented in **Exhibit 2 of Appendix A**.

3.2. Vegetation

Based on the review of desktop analysis resources and field survey observations, the Project site consists of the Chert Upland Woodland Ecological Site (NRCS 2018). Representative photographs of the vegetative communities are presented as Representative Photographs in **Appendix B**.

3.2.1. Chert Upland Woodland Ecological Site

Chert Upland Woodlands are widely distributed on rolling hillslopes where streams have dissected the Springfield Plain. Soils are typically very deep, with an abundance of chert fragments. The reference plant community is woodland with an overstory dominated by white oak and black oak and a ground flora of native grasses and forbs (NRCS 2018).

3.2.2. Wetland Plant Indicator Statuses

The wetland indicator status categories are depicted in **Table 1** below. Each indicator status reflects a plant species' fidelity and preference for wetlands or uplands based upon its frequency and abundance in wetlands versus uplands and the availability of wetland habitat across the local to regional landscape (Lichvar and Minkin 2008).

TABLE 1. PLANT SPECIES WETLAND INDICATOR STATUS CATEGORIES

| Code | Category | Definition |
|------|---------------------|--|
| OBL | Obligate Wetland | Hydrophyte - Almost always occurs in wetlands |
| FACW | Facultative Wetland | Hydrophyte - Usually occurs in wetlands, but may occur in non-wetlands |
| FAC | Facultative | Hydrophyte - Occurs in wetlands and non-wetlands |
| FACU | Facultative Upland | Non-hydrophyte - Usually occurs in non-wetlands, but may occur in wetlands |
| UPL | Obligate Upland | Non-hydrophyte - Almost never occurs in wetlands |

Source: Lichvar RW, Banks DL, Kirchner WN, Melvin NC. 2020. The National Wetland Plant List: 2020 Wetland Ratings. Phytoneuron 2016-30: 1-17. ISSN 2153 733X. Available online at http://wetland_plants.usace.army.mil/.

The observed plant species and their wetland indicator statuses are included in **Table 2** below. Status indicators for wetland species were obtained from the NWPL: 2020 Update of Wetland Ratings (Lichvar et al. 2020). The resulting indicator status categories were used in determining dominance of hydrophytic versus non-hydrophytic vegetation at each DP.

TABLE 2. DOMINANT VEGETATION OBSERVED ACROSS THE PROJECT SITE

| Scientific Name | Common Name | Indicator Status |
|--------------------------------|----------------------|------------------|
| <i>Ulmus americana</i> | American elm | FACW |
| <i>Juniperus virginiana</i> | Eastern red cedar | FACU |
| <i>Lonicera japonica</i> | Japanese honeysuckle | FACU |
| <i>Carya glabra</i> | Pignut hickory | FACU |
| <i>Danthonia spicata</i> | Poverty oatgrass | UPL |
| <i>Stenotaphrum secundatum</i> | St. Augustine grass | FAC |

3.3. Soils

NRCS soil data was used to identify and characterize the soils occurring within the Project site. There are various soil conditions that may impact the design and construction of a project that are also described below, including the susceptibility of building materials to corrosion, the soil erosion factor, and suitability for site development.

3.3.1. Mapped Soils

There are two mapped soil units within the limits of the proposed Project site (USDA NRCS 2018). According to the USDA NRCS Soil Data Access (SDA) Hydric Soils List, both of the soil units contain hydric components (USDA NRCS 2023b). The NRCS Soil Map depicting the mapped soil units is presented in **Exhibit 3 of Appendix A**.

TABLE 3. MAPPED SOILS WITHIN THE PROJECT SITE

| Map Unit Name and Symbol | Hydric Component | Acres in AOI | Percent of AOI |
|---|------------------|--------------|----------------|
| Goss gravelly silt loam, 3 to 8 percent slopes (70008) | Yes | 13.9 | 41.7% |
| Goss gravelly silt loam, 8 to 15 percent slopes (70009) | Yes | 19.4 | 58.3% |

3.3.2. Soil Properties, Suitability, and Limitations for Use

The whole soil erosion factor (K value) and the “risk of corrosion” ratings for concrete and uncoated steel within the soils in the Project site are included in **Table 4**. The erosion K values indicate the susceptibility of a soil to sheet or rill erosion by water. Values of K range from 0.02 to 0.69, with higher values indicating higher susceptibility. The risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens a material. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. 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. Each risk rating is expressed as “low”, “moderate”, or “high” (USDA 2018).

TABLE 4. SOIL EROSION FACTOR AND RISK OF CORROSION

| Map Unit Name and Symbol | Erosion Factor (K Value) | Corrosion Risk (Concrete) | Corrosion Risk (Uncoated Steel) |
|--------------------------|--------------------------|---------------------------|---------------------------------|
|--------------------------|--------------------------|---------------------------|---------------------------------|

| | | | |
|---|------|----------|------|
| Goss gravelly silt loam, 3 to 8 percent slopes (70008) | 0.24 | Moderate | High |
| Goss gravelly silt loam, 8 to 15 percent slopes (70009) | 0.24 | Moderate | High |

The suitability of the soils for small commercial metal building development on concrete slab are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential) and compressibility. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock, and the amount and size of rock fragments (USDA 2018).

The ratings of the soils within the Project site reported in **Table 5** are both verbal and numerical as follows:

Verbal Rating

- “Not limited” indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected.
- “Somewhat limited” indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation.
- “Very limited” indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical Rating

Numerical ratings indicate the severity of individual limitations. The ratings are shown ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

TABLE 5. SOIL RATING FOR SMALL COMMERCIAL METAL BUILDING ON REINFORCED CONCRETE SLABS

| Map Unit Name and Symbol | Commercial Building Rating | Component Name (Percent) | Rating Reason (Numeric Value) |
|---|----------------------------|--------------------------|---|
| Goss gravelly silt loam, 3 to 8 percent slopes (70008) | Somewhat limited | Goss (90%) | Slope (0.52) |
| | | Alred (3%) | Slope (0.14), Shrink-swell (0.01) |
| | | Peridge (2%) | Slope (0.14) |
| Goss gravelly silt loam, 8 to 15 percent slopes (70009) | Very limited | Goss (85%) | Slope (1.00) |
| | | Lowassie (5%) | Ponding (1.00), Depth to saturated zone (1.00), Shrink-swell (1.00) |
| | | Alred (5%) | Slope (1.00) |

| | | | |
|--|--|--------------|--------------|
| | | Rueter (3%) | Slope (1.00) |
| | | Peridge (2%) | Slope (1.00) |

3.3.3. Observed Soils

Based on the criteria outlined in the 1987 Manual and Regional Supplement, none of the soils observed at the DPs throughout the Project site contained hydric soil indicators. Soils at the DPs exhibited a loamy/clayey texture. Soil profile colors included 10YR 4/3 (brown), 10YR 4/4 (dark yellowish brown), and 10YR 5/2 (grayish brown) (Munsell Color 2009). A detailed description of observed soils for each DP are presented in the Wetland Determination Data Forms in **Appendix C**.

3.4. Hydrology

No indicators of wetland hydrology were observed within the Project site during the field surveys.

3.5. Waters of the United States, including Wetlands

One stream and two ponds were identified within the Project site during the field survey. Surface tributaries within the Project site generally flow northwest to Finley Creek, which flows into James River, which ultimately flows southeast to the Gulf of Mexico. Detailed maps depicting online mapped WOTUS features, FEMA floodplain, and additional water features can be found in **Exhibit 4** and **Exhibit 5** of **Appendix A**. A detailed map depicting the delineated aquatic features and DPs can be found in **Exhibit 6** of **Appendix A**.

3.5.1. Streams

During field studies Canacre biologists surveyed for the presence of potentially jurisdictional streams within the Project site. One intermittent stream, identified as a tributary to Finley Creek, was identified within the northwest portion of the Project site. The stream exhibited a defined bed and bank at the time of the field survey with an ordinary high-water mark (OHWM) of 7 feet. If the construction of the proposed Project impacts this potentially jurisdictional stream, a permit under Section 404 of the CWA through USACE will likely be required. A further description of the stream is provided in **Table 6** below. The delineated stream is presented in a detailed Aquatic Features Map in **Exhibit 6** of **Appendix A**.

TABLE 6. OBSERVED STREAMS WITHIN THE PROJECT SITE

| Field Identification | Stream Name | Flow Regime | OHWM Width (ft.) | Stream Length |
|----------------------|-------------------|--------------|------------------|---------------|
| Stream 1 | Unnamed Tributary | Intermittent | 7 | 775 |

3.5.2. Wetlands

During field studies Canacre biologists surveyed for the presence of palustrine emergent (PEM) wetlands, palustrine forested (PFO) wetlands, and palustrine scrub-shrub (PSS) wetlands (FGDC 2013). No wetlands were identified. Therefore, no impacts to potentially jurisdictional wetlands are anticipated.

3.5.3. Ponds

Ponds in the area consisted of palustrine open water systems that were either excavated to hold water or were created by the construction of berms or dams to capture surface sheet flow or flow from a surface tributary. Ponds may be considered jurisdictional if they exhibit a surface connection (i.e., significant

nexus) to a waterbody potentially subject to Section 404 of the CWA and/or are located adjacent to a relatively permanent waterbody within the 100-year floodplain.

During field surveys Canacre biologists surveyed for the presence of palustrine open-water system ponds. Two freshwater ponds were identified within the Project site. However, the ponds lack connectivity to other potentially jurisdictional WOTUS and are not adjacent to a relatively permanent waterbody within the 100-year floodplain. Therefore, the ponds would likely not be considered jurisdictional. The extents of the delineated ponds are presented in a detailed Aquatic Features Map in **Exhibit 6 of Appendix A**.

TABLE 7. OBSERVED PONDS WITHIN THE PROJECT SITE

| Field Identification | Surface Connection | Feature Acreage |
|----------------------|--------------------|-----------------|
| Pond 01 | No | 0.08 |
| Pond 02 | No | 0.16 |
| Total Acreage | | 0.24 |

3.6. Threatened and Endangered Species

Results from the USFWS IPaC tool indicated four threatened or endangered species, two proposed threatened or endangered species, and one candidate species protected under the ESA that have the potential to occur within the Project site (USFWS 2023). These species include the endangered Gray Bat (*Myotis grisescens*), the endangered Indiana Bat (*Myotis sodalist*), the endangered Northern Long-eared Bat (*Myotis septentrionalis*), the proposed endangered Tricolored Bat (*Perimyotis subflavus*), the proposed endangered alligator snapping turtle (*Macrochelys temminckii*), and the candidate monarch butterfly (*Danaus plexippus*).

Detailed field surveys for the above-listed species and their habitats were conducted within the Project site. The Indiana Bat and Tricolored Bat are known to occur in fragmented forest habitats (USFWS 2019, USFWS 2022). Given that the southeast portion of the Project site is wooded and that there are multiple larger forested areas surrounding the site, Canacre recommends that the proposed BESS is constructed outside of the limits of the wooded area to avoid potential impacts to both species.

The Project site does not intersect existing or proposed critical habitat for the Indiana Bat (USFWS 1977). No critical habitat has been designated for the remaining above-listed species. Therefore, no impacts to USFWS critical habitat are anticipated as a result of the construction of the proposed Project.

The IPaC tool indicated ten migratory birds protected under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) with the potential to occur within the Project site. These species include the Bald Eagle (*Haliaeetus leucocephalus*), Bobolink (*Dolichonyx oryzivorus*), Chimney Swift (*Chaetura pelagica*), Eastern Whip-poor-will (*Antrostomus vociferus*), Field Sparrow (*Spizella pusilla*), Kentucky Warbler (*Oporornis formosus*), Lesser Yellowlegs (*Tringa flavipes*), Prothonotary Warbler (*Protonotaria citrea*), Red-headed Woodpecker (*Melanerpes erythrocephalus*), and Rusty Blackbird (*Euphagus carolinus*) (USFWS 2023).

Detailed field surveys for the above-listed migratory bird species and their habitats were conducted within the Project site. In addition, a desktop review of breeding and nesting requirements for the above-listed species was completed. To avoid potential impacts to migratory birds, a nest survey should be conducted if any tree removal is to occur within the nesting seasons of the above-listed species. A full summary of

the nesting seasons for MBTA species is included in the USFWS IPaC report in **Appendix D**. At this time, no impacts to the MBTA and BGEPA protected species are anticipated as a result of the construction of the proposed Project.

3.7 Local Detention & Retention Requirements

The Christian County Stormwater & Erosion Control Regulations report outlines the different methods of analysis that are to be used while designing detention facilities within the county. Facilities can be designed using either detailed analysis or simplified analysis. Additional information on detention/retention requirements and design criteria can be found online in the 2010 Stormwater & Erosion Control Regulations of Christian County, Missouri.

4. CONCLUSION

During the March field surveys, one stream and two ponds were identified within the Project site. To avoid impacts to these features, Canacre recommends that the final location of the Project site avoids the limits of the potentially jurisdictional stream and ponds. If impacts occur and are limited to less than 0.50 acres, the Project will likely operate under the USACE Section 404 of the CWA Nationwide Permit (NWP) 51—Land-Based Renewable Energy Generation Facilities without a Pre-Construction Notification (PCN).

No impacts to threatened and endangered species protected under the MBTA or BGEPA are anticipated. However, Canacre recommends that the BESS is constructed outside of the limits of the wooded area to avoid potential impacts to the Indiana Bat and Northern Long-eared Bat. Additionally, to avoid potential impacts to migratory birds, a nest survey should be conducted if any tree removal is to occur within the nesting seasons of the MBTA and BGEPA species. Should changes to the Project occur, a review of the changes should be made to ensure continued compliance.

Canacre makes no further recommendations regarding compliance with the CWA, ESA, MBTA, or BGEPA. No federal nexus was identified. At the federal level, it is anticipated that the Project would operate under Nationwide Permit 51 without a PCN. At the state level, it is anticipated that development of a Stormwater Pollution Prevention Plan (SWPPP) and submission of a Notice of Intent (NOI) with the Missouri Department of Natural Resources (MDNR) will be required.

The conclusions presented in this report represent the professional opinion of Canacre and are limited to the conditions observed at the Project site at the time and date of the field investigation. Although the conclusions presented in this report represent the professional opinion of Canacre regarding the jurisdictional status of aquatic resources within the Project site according to current USACE guidance, please note that the USACE and EPA are the final authority in determining whether an aquatic resource is jurisdictional.

5. REFERENCES

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APPENDIX A

MAPS

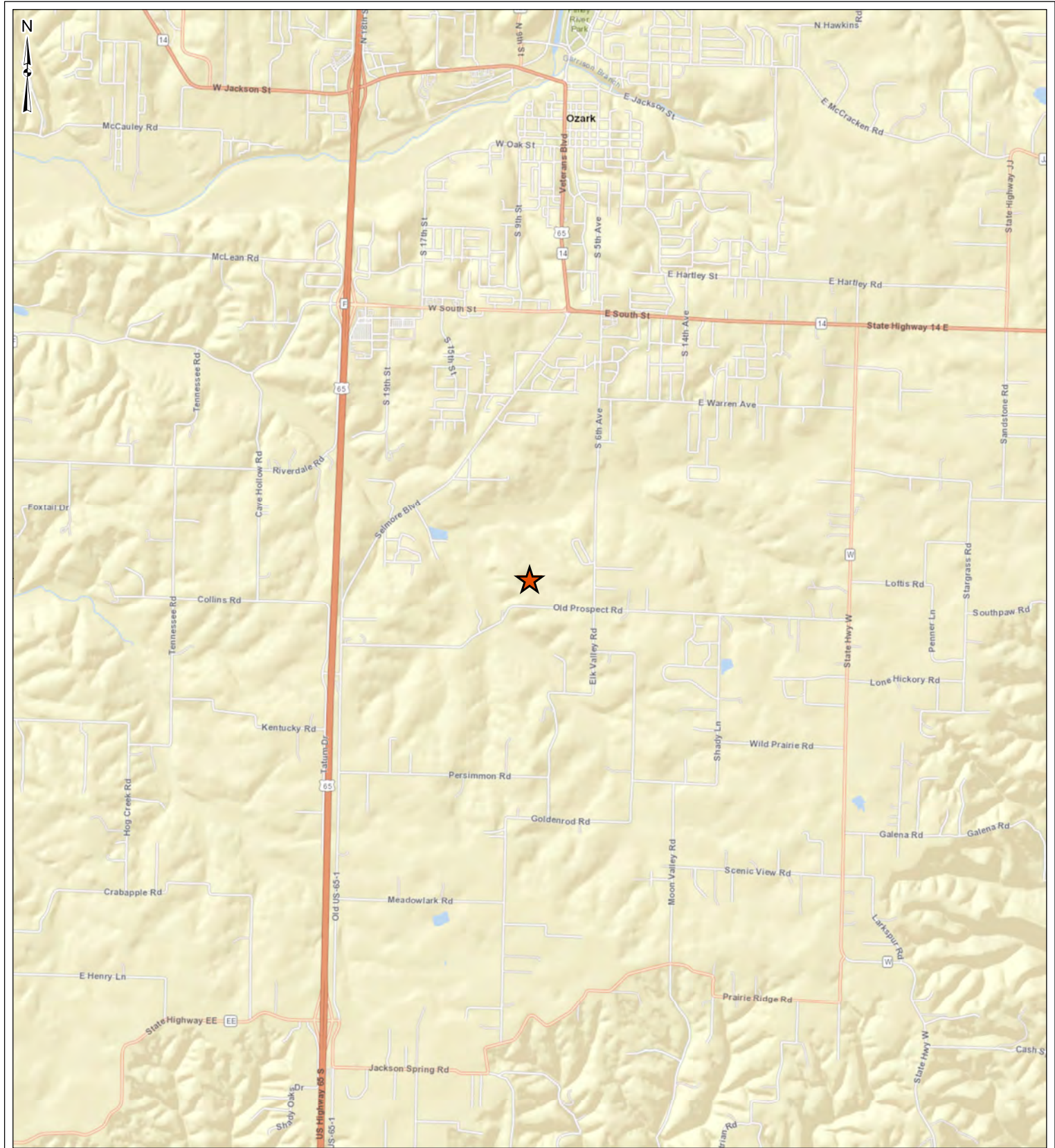




Exhibit 1
 Environmental Vicinity Map
Black Mountain Energy Storage
 Sabertooth BESS



 Project Location



Scale - 1:50,000



0 0.25 0.5 1 1.5 2
Miles

County: Christian County
State: Missouri
Date: April 2023
 Coordinate System: NAD 1983 BLM Zone 15N ftUS
 Projection: Transverse Mercator
 Datum: North American 1983
 Units: Foot US

Imagery Source: Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

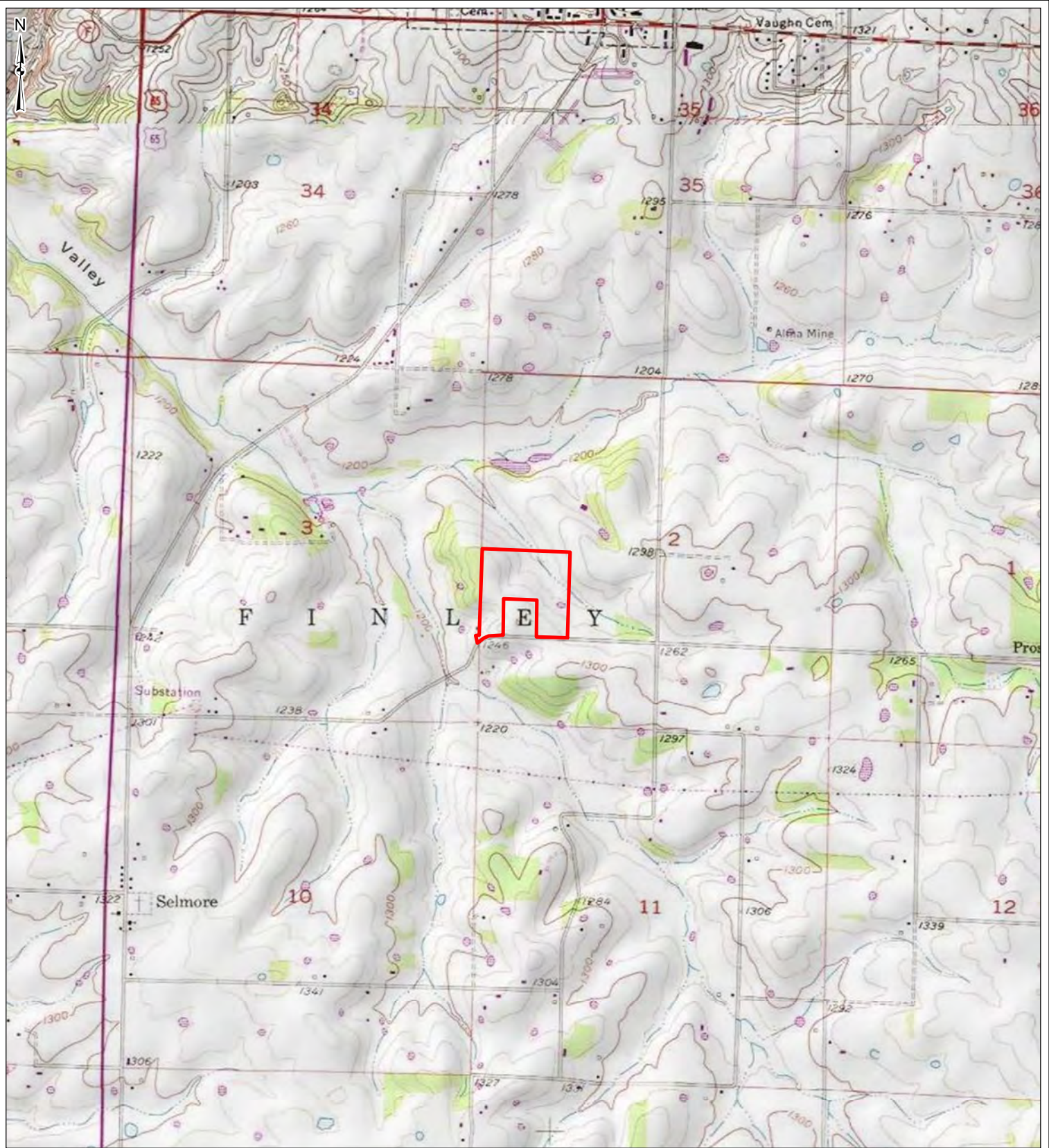



Exhibit 2
 USGS Topographic Map
Black Mountain Energy Storage Sabertooth BESS

 Project Boundary

Scale - 1:24,000
 0 500 1,000 2,000 3,000 4,000
 Feet

County: Christian County
 State: Missouri
 Date: April 2023
 Coordinate System: NAD 1983 BLM Zone 15N IJUS
 Projection: Transverse Mercator
 Datum: North American 1983
 Units: Foot US



Imagery Source: Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

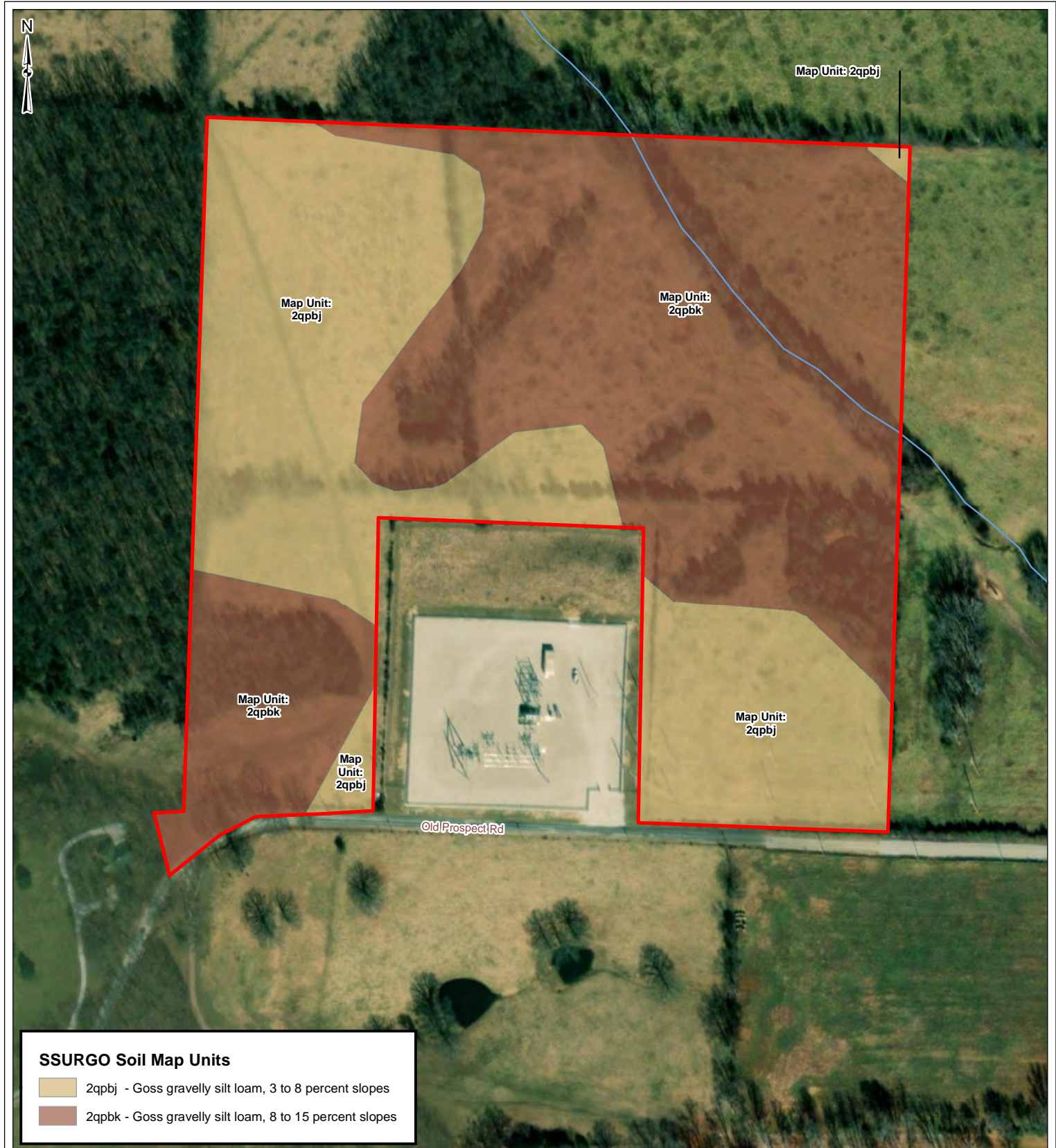


Exhibit 3
National Resources Conservation Service Soils Overview

Black Mountain Energy Storage Sabertooth BESS

- Project Boundary
- Watercourse/Drainage

Scale - 1:3,000

County: Christian County
State: Missouri
Date: April 2023

Coordinate System: NAD 1983 BLM Zone 15N ftUS
Projection: Transverse Mercator
Datum: North American 1983
Units: Foot US

Imagery Source: Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

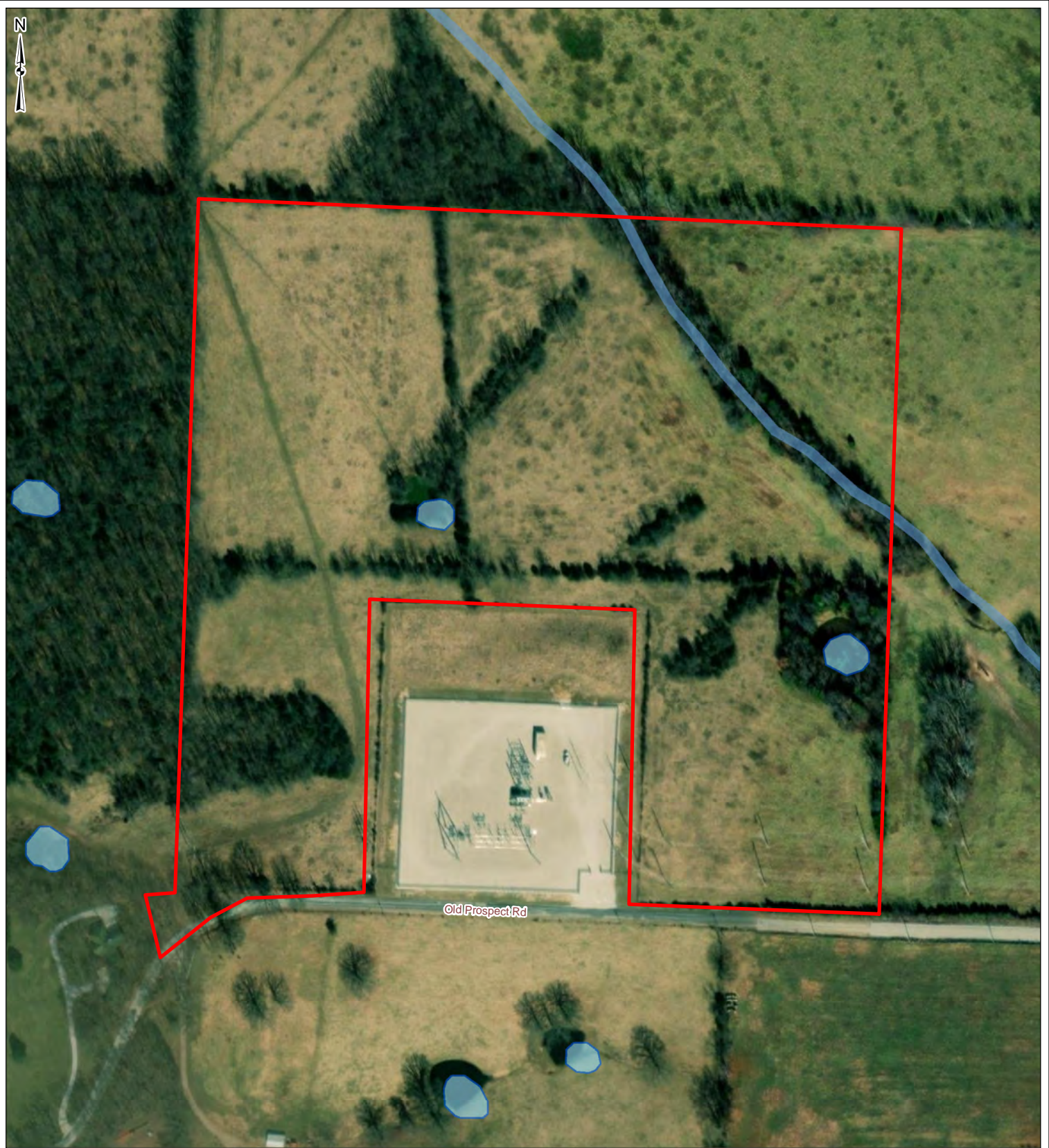


Exhibit 4
 National Wetlands Inventory (NWI) Map
Black Mountain Energy Storage Sabertooth BESS

- Project Boundary
- Freshwater Pond
- Riverine (NWI)

Scale - 1:3,000
 0 50 100 200 300 400
 Feet

County: Christian County
State: Missouri
Date: April 2023
 Coordinate System: NAD 1983 BLM Zone 15N ftUS
 Projection: Transverse Mercator
 Datum: North American 1983
 Units: Foot US



Imagery Source: Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

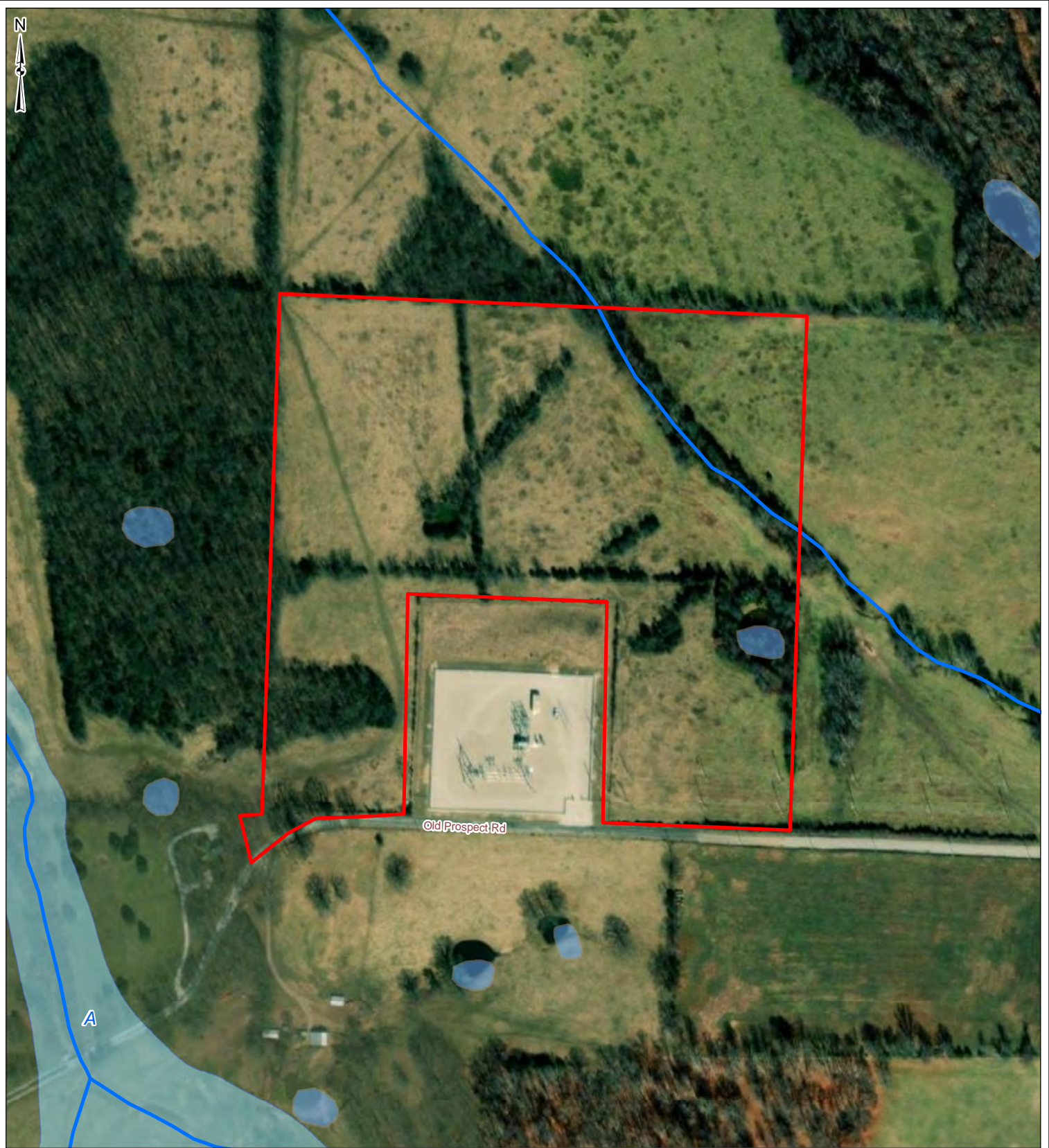







Exhibit 5
 FEMA Floodplain and
 NHD Map

**Black Mountain
 Energy Storage
 Sabertooth BESS**

-  Project Boundary
-  Riverine (NHD)
-  Waterbody (NHD)
-  100-Year FEMA Floodplain

Scale - 1:4,000

 Feet
County: Christian County
State: Missouri
Date: April 2023
 Coordinate System: NAD 1983 BLM Zone 15N ftUS
 Projection: Transverse Mercator
 Datum: North American 1983
 Units: Foot US



Imagery Source: Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

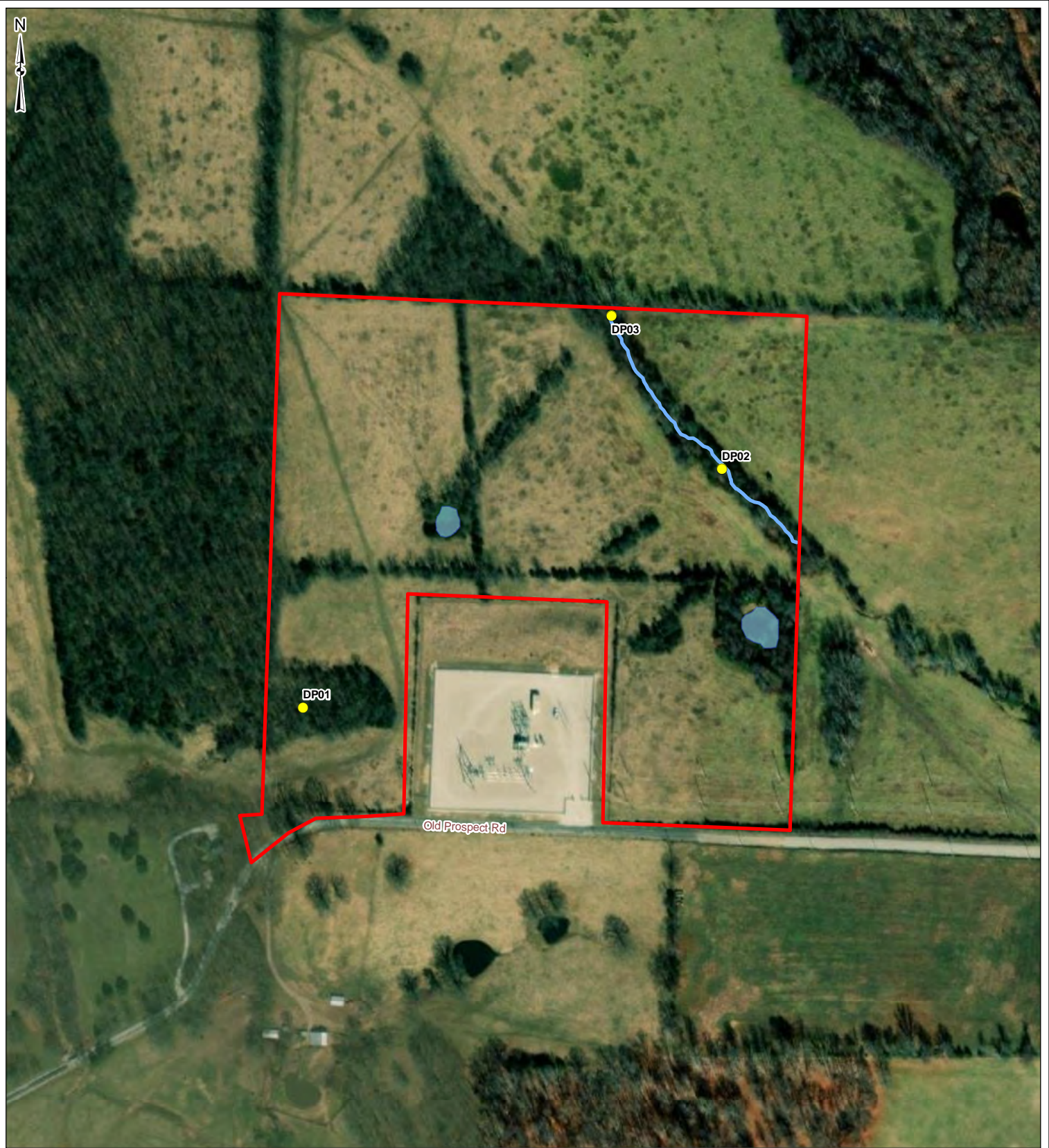





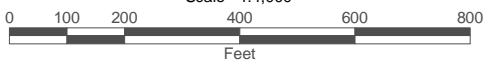


Exhibit 6
 Aquatic Features Map
Black Mountain Energy Storage Sabertooth BESS



-  Project Boundary
 -  Field Data Point
 -  Steam
 -  Delineated Pond
- 

Scale - 1:4,000



County: Christian County
State: Missouri
Date: April 2023
 Coordinate System: NAD 1983 BLM Zone 15N ftUS
 Projection: Transverse Mercator
 Datum: North American 1983
 Units: Foot US

Imagery Source: Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

APPENDIX B

REPRESENTATIVE PHOTOGRAPHS

Sabertooth BESS Project
Appendix B - Representative Photographs
Christian County, Missouri



Photo 1: Photo taken at DP01 facing north, showing the site representative soil matrix.



Photo 2: Photo taken at DP01 facing west, showing the present vegetation and its density.

Sabertooth BESS Project
Appendix B - Representative Photographs
Christian County, Missouri



Photo 3: Photo taken at DP02 facing northeast, showing the site representative soil matrix.



Photo 4: Photo taken at DP02 facing north, showing the present vegetation and its density.

Sabretooth BESS Project
Appendix B - Representative Photographs
Christian County, Missouri



Photo 5: Photo taken at DP03 facing northeast, showing the site representative soil matrix.



Photo 6: Photo taken at DP03 facing west, showing the present vegetation and adjacent Stream 01.

Sabertooth BESS Project
Appendix B - Representative Photographs
Christian County, Missouri



Photo 7: Photo taken at Pond 01 facing southeast, showing the standing water and surrounding vegetation.



Photo 8: Photo taken at Pond 02 facing west, showing the standing water and surrounding vegetation.

Sabertooth BESS Project
Appendix B - Representative Photographs
Christian County, Missouri



Photo 9: Photo taken at Stream 01 facing southeast, showing the stream features and intermittent flow regime.



Photo 10: Photo taken at Stream 01 facing northwest, showing the stream features and intermittent flow regime.

APPENDIX C

WETLAND DETERMINATION DATA FORMS

Project/Site: Sabertooth BESS City/County: Christian County Sampling Date: 3/21/2023
 Applicant/Owner: Black Mountain Energy Storage State: MO Sampling Point: DP01
 Investigator(s): J. Jonhson, A. Sherman Section, Township, Range: S2, T26, R21
 Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 2
 Subregion (LRR or MLRA): LRR N, MLRA 116B Lat: 36.979655 Long: -93.211896 Datum: NAD83
 Soil Map Unit Name: Goss gravelly silt loam, 8 to 15 percent slopes (70009) NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u> </u> No <u>X</u> Hydric Soil Present? Yes <u> </u> No <u>X</u> Wetland Hydrology Present? Yes <u> </u> No <u>X</u> | Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u> |
| Remarks: No hydrophytic vegetation, hydric soil, or wetland hydrology present. This point does not meet the criteria to be considered a wetland. | |

HYDROLOGY

| | |
|--|--|
| Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) | <u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) |
| Field Observations: Surface Water Present? Yes <u> </u> No <u>X</u> Depth (inches): <u> </u> Water Table Present? Yes <u> </u> No <u>X</u> Depth (inches): <u> </u> Saturation Present? Yes <u> </u> No <u>X</u> Depth (inches): <u> </u> (includes capillary fringe) | Wetland Hydrology Present? Yes <u> </u> No <u>X</u> |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Aerial imagery, U.S. drought monitor, NOAA rainfall monitor, NWI, NHD, NRCS Web Soil Survey, and USGS topo. | |
| Remarks: No wetland hydrology present. | |

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP01

| Tree Stratum (Plot size: <u>30</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>Ulmus americana</u> | <u>15</u> | <u>Yes</u> | <u>FACW</u> |
| 2. <u>Juniperus virginiana</u> | <u>15</u> | <u>Yes</u> | <u>FACU</u> |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| <u>30</u> = Total Cover | | | |
| 50% of total cover: <u>15</u> 20% of total cover: <u>6</u> | | | |

| Sapling/Shrub Stratum (Plot size: <u>30</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| _____ = Total Cover | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | |

| Herb Stratum (Plot size: <u>30</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. <u>Lonicera japonica</u> | <u>15</u> | <u>Yes</u> | <u>FACU</u> |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| 10. _____ | _____ | _____ | _____ |
| 11. _____ | _____ | _____ | _____ |
| <u>15</u> = Total Cover | | | |
| 50% of total cover: <u>8</u> 20% of total cover: <u>3</u> | | | |

| Woody Vine Stratum (Plot size: <u>30</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| _____ = Total Cover | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | |

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or 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 <u>0</u> | x 1 = <u>0</u> |
| FACW species <u>15</u> | x 2 = <u>30</u> |
| FAC species <u>0</u> | x 3 = <u>0</u> |
| FACU species <u>30</u> | x 4 = <u>120</u> |
| UPL species <u>0</u> | x 5 = <u>0</u> |
| Column Totals: <u>45</u> (A) | <u>150</u> (B) |
| Prevalence Index = B/A = <u>3.33</u> | |

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

| | | | |
|-----|-----------|----|----------|
| Yes | <u> </u> | No | <u>X</u> |
|-----|-----------|----|----------|

Remarks: (Include photo numbers here or on a separate sheet.)
 No hydrophytic vegetation present.

Project/Site: Sabertooth BESS City/County: Christian County Sampling Date: 3/21/2023
 Applicant/Owner: Black Mountain Energy Storage State: MO Sampling Point: DP02
 Investigator(s): J. Jonhson, A. Sherman Section, Township, Range: S2, T26, R21
 Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0
 Subregion (LRR or MLRA): LRR N, MLRA 116B Lat: 36.981305 Long: -93.208303 Datum: NAD83
 Soil Map Unit Name: Goss gravelly silt loam, 8 to 15 percent slopes (70009) NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u> </u> No <u>X</u> Hydric Soil Present? Yes <u> </u> No <u>X</u> Wetland Hydrology Present? Yes <u> </u> No <u>X</u> | Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u> |
| Remarks: No hydrophytic vegetation, hydric soil, or wetland hydrology present. This point does not meet the criteria to be considered a wetland. | |

HYDROLOGY

| | |
|--|---|
| Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) | Secondary Indicators (minimum of two required) |
| <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) | <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) |

| | |
|--|---|
| Field Observations: Surface Water Present? Yes <u> </u> No <u>X</u> Depth (inches): <u> </u> Water Table Present? Yes <u> </u> No <u>X</u> Depth (inches): <u> </u> Saturation Present? Yes <u> </u> No <u>X</u> Depth (inches): <u> </u> (includes capillary fringe) | Wetland Hydrology Present? Yes <u> </u> No <u>X</u> |
|--|---|

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
 Aerial imagery, U.S. drought monitor, NOAA rainfall monitor, NWI, NHD, NRCS Web Soil Survey, and USGS topo.

Remarks:
 No wetland hydrology present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP02

| Tree Stratum (Plot size: <u>30</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------|------------------------------|------------------------------|------------------|
| 1. <u>Carya glabra</u> | <u>10</u> | <u>Yes</u> | <u>FACU</u> |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| | <u>10</u> = Total Cover | | |
| | 50% of total cover: <u>5</u> | 20% of total cover: <u>2</u> | |

| Sapling/Shrub Stratum (Plot size: <u>30</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---------------------------|---------------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| | _____ = Total Cover | | |
| | 50% of total cover: _____ | 20% of total cover: _____ | |

| Herb Stratum (Plot size: <u>30</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------|-------------------------------|-------------------------------|------------------|
| 1. <u>Danthonia spicata</u> | <u>40</u> | <u>Yes</u> | <u>UPL</u> |
| 2. <u>Lonicera japonica</u> | <u>10</u> | <u>Yes</u> | <u>FACU</u> |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| 10. _____ | _____ | _____ | _____ |
| 11. _____ | _____ | _____ | _____ |
| | <u>50</u> = Total Cover | | |
| | 50% of total cover: <u>25</u> | 20% of total cover: <u>10</u> | |

| Woody Vine Stratum (Plot size: <u>30</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|---------------------------|---------------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| | _____ = Total Cover | | |
| | 50% of total cover: _____ | 20% of total cover: _____ | |

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
 Total Number of Dominant Species Across All Strata: 3 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|--------------------------------------|------------------|
| OBL species <u>0</u> | x 1 = <u>0</u> |
| FACW species <u>0</u> | x 2 = <u>0</u> |
| FACU species <u>20</u> | x 4 = <u>80</u> |
| UPL species <u>40</u> | x 5 = <u>200</u> |
| Column Totals: <u>60</u> (A) | <u>280</u> (B) |
| Prevalence Index = B/A = <u>4.67</u> | |

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0¹
- 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Four Vegetation Strata:

- Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
- Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
- Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
- Woody Vine** – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes No X

Remarks: (Include photo numbers here or on a separate sheet.)
 No hydrophytic vegetation present.

| | |
|--|---|
| U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R | <i>OMB Control #: 0710-0024, Exp:11/30/2024</i> <i>Requirement Control Symbol EXEMPT:</i> <i>(Authority: AR 335-15, paragraph 5-2a)</i> |
|--|---|

Project/Site: Sabertooth BESS City/County: Christian County Sampling Date: 3/21/2023
 Applicant/Owner: Black Mountain Energy Storage State: MO Sampling Point: DP03
 Investigator(s): J. Jonhson, A. Sherman Section, Township, Range: S2, T26, R21
 Landform (hillside, terrace, etc.): Hillside Local relief (concave, convex, none): Convex Slope (%): 6
 Subregion (LRR or MLRA): LRR N, MLRA 116B Lat: 36.982359 Long: -93.209254 Datum: NAD83
 Soil Map Unit Name: Goss gravelly silt loam, 8 to 15 percent slopes NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u> </u> No <u>X</u> Hydric Soil Present? Yes <u> </u> No <u>X</u> Wetland Hydrology Present? Yes <u> </u> No <u>X</u> | Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u> |
| Remarks: No hydrophytic vegetation, hydric soil, or wetland hydrology present. This point does not meet the criteria to be considered a wetland. | |

HYDROLOGY

| | |
|--|--|
| Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) | <u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) |
|--|--|

| | |
|--|---|
| Field Observations: Surface Water Present? Yes <u> </u> No <u>X</u> Depth (inches): <u> </u> Water Table Present? Yes <u> </u> No <u>X</u> Depth (inches): <u> </u> Saturation Present? Yes <u> </u> No <u>X</u> Depth (inches): <u> </u> (includes capillary fringe) | Wetland Hydrology Present? Yes <u> </u> No <u>X</u> |
|--|---|

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
 Aerial imagery, U.S. drought monitor, NOAA rainfall monitor, NWI, NHD, NRCS Web Soil Survey, and USGS topo.

Remarks:
 No wetland hydrology present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP03

| Tree Stratum (Plot size: <u>30</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------|------------------------------|------------------------------|------------------|
| 1. <u>Carya glabra</u> | <u>8</u> | <u>Yes</u> | <u>FACU</u> |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| | <u>8</u> = Total Cover | | |
| | 50% of total cover: <u>4</u> | 20% of total cover: <u>2</u> | |

| Sapling/Shrub Stratum (Plot size: <u>30</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---------------------------|---------------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| | _____ = Total Cover | | |
| | 50% of total cover: _____ | 20% of total cover: _____ | |

| Herb Stratum (Plot size: <u>30</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------|-------------------------------|------------------------------|------------------|
| 1. <u>Stenotaphrum secundatum</u> | <u>40</u> | <u>Yes</u> | <u>FAC</u> |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| 10. _____ | _____ | _____ | _____ |
| 11. _____ | _____ | _____ | _____ |
| | <u>40</u> = Total Cover | | |
| | 50% of total cover: <u>20</u> | 20% of total cover: <u>8</u> | |

| Woody Vine Stratum (Plot size: <u>30</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|---------------------------|---------------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| | _____ = Total Cover | | |
| | 50% of total cover: _____ | 20% of total cover: _____ | |

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|--------------------------------------|------------------|
| OBL species <u>0</u> | x 1 = <u>0</u> |
| FACW species <u>0</u> | x 2 = <u>0</u> |
| FAC species <u>40</u> | x 3 = <u>120</u> |
| FACU species <u>8</u> | x 4 = <u>32</u> |
| UPL species <u>0</u> | x 5 = <u>0</u> |
| Column Totals: <u>48</u> (A) | <u>152</u> (B) |
| Prevalence Index = B/A = <u>3.17</u> | |

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

| | | | |
|-----|-----------|----|----------|
| Yes | <u> </u> | No | <u>X</u> |
|-----|-----------|----|----------|

Remarks: (Include photo numbers here or on a separate sheet.)
 No hydrophytic vegetation present.

APPENDIX D

USFWS IPAC REPORT

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Christian County, Missouri



Local office

Missouri Ecological Services Field Office

☎ (573) 234-2132

📠 (573) 234-2181

101 Park Deville Drive

10110 Main Building Drive
Suite A

Columbia, MO 65203-0057

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

-
1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

| NAME | STATUS |
|--|---------------------|
| <p>Gray Bat <i>Myotis grisescens</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6329</p> | Endangered |
| <p>Indiana Bat <i>Myotis sodalis</i> Wherever found There is final critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/5949</p> | Endangered |
| <p>Northern Long-eared Bat <i>Myotis septentrionalis</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045</p> | Endangered |
| <p>Tricolored Bat <i>Perimyotis subflavus</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515</p> | Proposed Endangered |

Reptiles

| NAME | STATUS |
|--|---------------------|
| <p>Alligator Snapping Turtle <i>Macrochelys temminckii</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4658</p> | Proposed Threatened |

Insects

| NAME | STATUS |
|------|--------|
|------|--------|

Monarch Butterfly *Danaus plexippus*

Candidate

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/9743>

Flowering Plants

NAME

STATUS

Virginia Sneezeweed *Helenium virginicum*

Threatened

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/6297>

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation->

[measures.pdf](#)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\)](#) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

| NAME | BREEDING SEASON |
|---|-------------------------|
| <p>Bald Eagle <i>Haliaeetus leucocephalus</i></p> <p>This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.</p> | Breeds Sep 1 to Jul 31 |
| <p>Bobolink <i>Dolichonyx oryzivorus</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> | Breeds May 20 to Jul 31 |
| <p>Chimney Swift <i>Chaetura pelagica</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> | Breeds Mar 15 to Aug 25 |
| <p>Eastern Whip-poor-will <i>Antrostomus vociferus</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> | Breeds May 1 to Aug 20 |
| <p>Field Sparrow <i>Spizella pusilla</i></p> <p>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA</p> | Breeds Mar 1 to Aug 15 |

Kentucky Warbler *Oporornis formosus*

Breeds Apr 20 to Aug 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Lesser Yellowlegs *Tringa flavipes*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9679>

Prothonotary Warbler *Protonotaria citrea*

Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker *Melanerpes erythrocephalus*

Breeds May 10 to Sep 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Rusty Blackbird *Euphagus carolinus*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

- To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
- The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

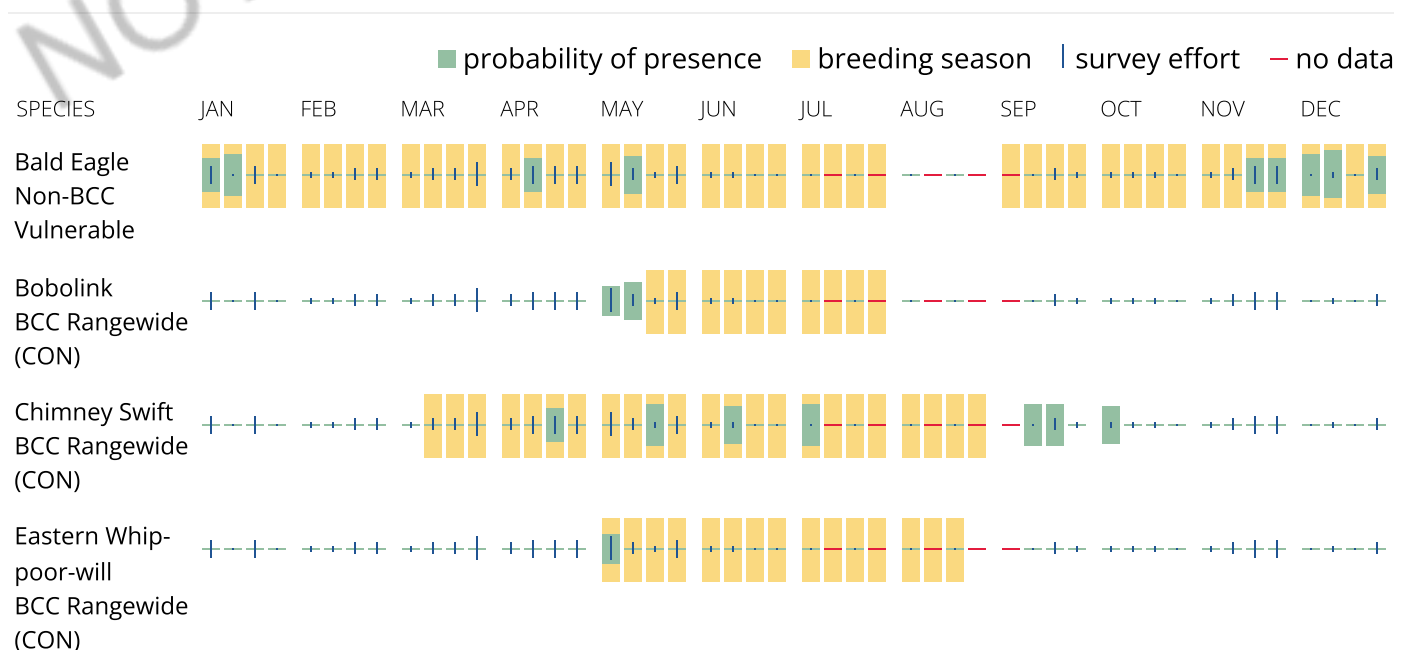
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

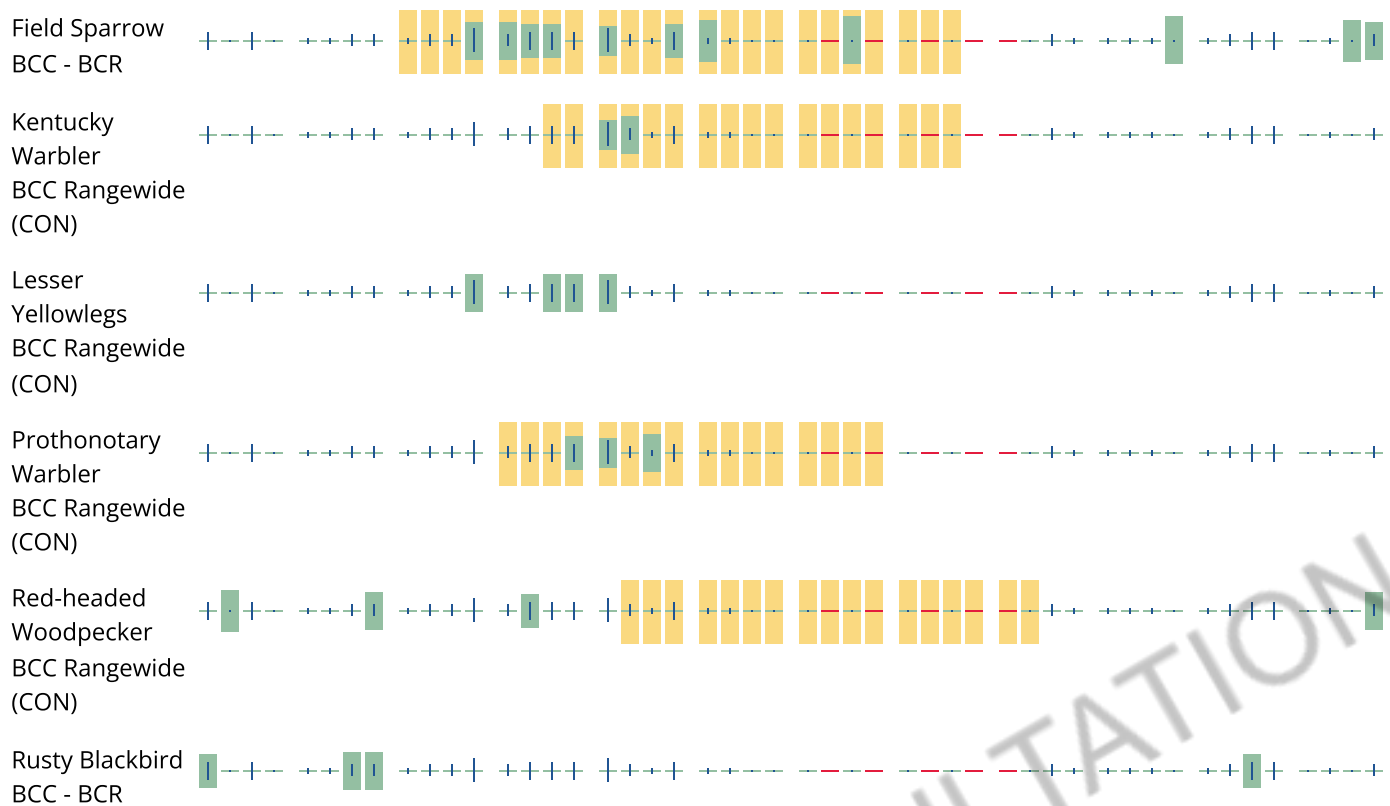
No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact

[Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the [NWI map](#) to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local

government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION