Aquatic Resources Delineation Report for the Fair Oaks Ranch 104-Acre Property Project, Wagoner County, Oklahoma

JULY 2023

PREPARED FOR

PartnerTulsa

PREPARED BY

SWCA Environmental Consultants

AQUATIC RESOURCES DELINEATION REPORT FOR THE FAIR OAKS RANCH 104-ACRE PROPERTY PROJECT, WAGONER COUNTY, OKLAHOMA

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1 INTRODUCTION AND PURPOSE

SWCA Environmental Consultants (SWCA) was retained by PartnerTulsa to complete an aquatic resources delineation and report for the Fair Oaks Ranch 104-Acre Property Project (project). The project consists of approximately 104 acres of privately owned land (project area) approximately 0.25 mile east of 193rd East Avenue on 11th Street, in Tulsa, Wagoner County, Oklahoma (Figure 1).

The purpose of the aquatic resources delineation was to identify aquatic resources within the project area, determine whether the aquatic resources would be considered potential waters of the U.S. (WOTUS) by the U.S. Army Corps of Engineers (USACE), and assist PartnerTulsa in complying with Section 404 of the Clean Water Act (CWA) for project-related impacts to potential WOTUS. This aquatic resources delineation report describes the methods used to conduct the aquatic resources delineation and WOTUS evaluation, summarizes results of the delineation, and provides a summary conclusion regarding the potential jurisdictional status of aquatic resources identified during the delineation. The results and conclusions provided in this report represent SWCA's professional opinion based on our knowledge and experience with the USACE, including related regulatory guidance, documents, and manuals.

2 METHODS

SWCA received project data from PartnerTulsa on March 29, 2023. These data were used to conduct a background review and an aquatic resources delineation within the project area on June 20, 2023.

Prior to and in support of conducting the aquatic resources delineation within the project area, SWCA reviewed background information using publicly available information from the sources listed below.

- U.S. Geological Survey (USGS): 7.5-minute quadrangle maps (Mingo, Oklahoma; Catoosa, Oklahoma) (USGS 2018) and National Hydrography Dataset (NHD) viewer (USGS 2022)
- USACE: Antecedent Precipitation Tool (APT) (USACE 2020a)
- Natural Resources Conservation Service (NRCS): Web Soil Survey (NRCS 2019)
- Esri: ArcGIS Map Services (Esri 2022)
- Federal Emergency Management Agency (FEMA): National Flood Hazard Layer data for Wagoner County (FEMA 2021) and Estimated Base Flood Elevation Viewer (FEMA 2022)
- U.S. Fish and Wildlife Service (USFWS): National Wetlands Inventory (NWI) (USFWS 2022)

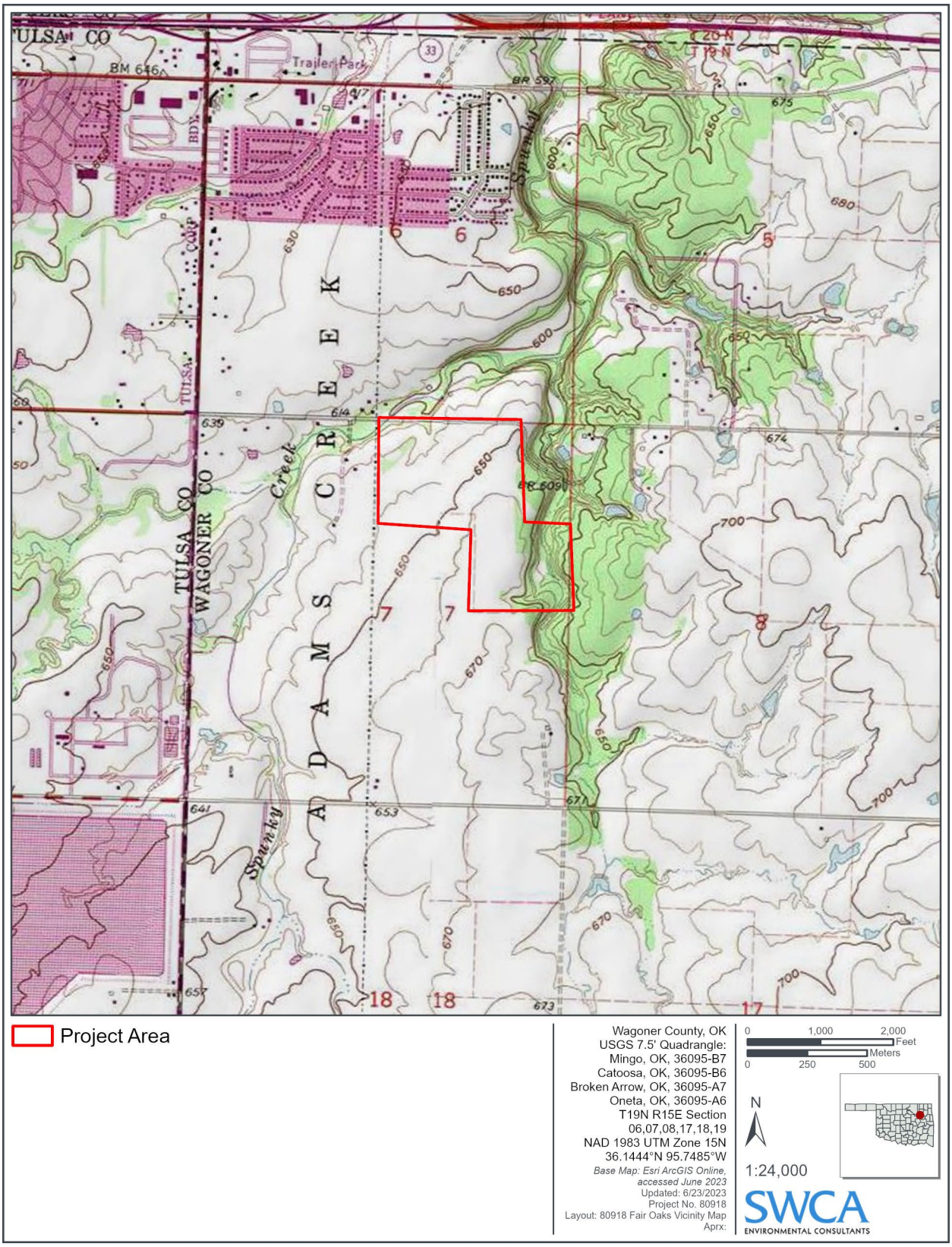

Figure 1. Project area location map.

SWCA conducted the aquatic resources delineation within the project area on June 20, 2023. The delineation was conducted in accordance with, and with respect to, guidance and information available from the sources listed below.

- USACE:
  - The National Wetland Plant List, 2020 Wetland Ratings (USACE 2020b)
  - Regulatory Guidance Letter 05-05 (USACE 2005), which presents guidance on ordinary high water mark identification
  - *Corps of Engineers Wetlands Delineation Manual* (1987 Manual) (Environmental Laboratory 1987)
  - *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region* (Version 2.0) (MWR) (USACE 2010)
  - Nationwide Permit Program (33 U.S. Code [USC] 401 et seq.; 33 USC 1344; 33 USC 1413; 33 Code of Federal Regulations [CFR] 330; Federal Register 72:11092, 72:26082, and 86:2744–2877) (USACE 2021)
- NRCS:
  - *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils* (Version 8.2) (NRCS 2018)
  - PLANTS Database (NRCS 2023)
- USFWS:
  - Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979)

During the aquatic resource delineation, SWCA recorded data points to document the presence, or lack thereof, of the three required indicators of a wetland, as defined in the 1987 Manual and Regional Supplement and identified below (Environmental Laboratory 1987; USACE 2012).

- **Hydrophytic vegetation:** determined by identification of dominant species and their USACE-designated wetland indicator status (USACE 2020b).
- **Wetland hydrology:** determined by visual inspection with consideration from APT results and excavation of soil pits.
- **Hydric soils:** determined by characterizing soil features (i.e., color and texture) from soil pits.

SWCA used a Samsung Active Tab 2 and Juniper Geode real-time, differentially corrected global positioning system (GPS) unit with sub-meter accuracy to geographically reference features such as data points, wetland boundaries, and ordinary high-water marks. Areas that were designated to be possible aquatic resources from NHD and NWI data but lacked the criteria in the field or have changed, were documented with data points and/or photo points. SWCA used geographic information system (GIS) software to analyze collected features, calculate areas, and generate figures. All point, line, and polygon data collected using the GPS unit and displayed in figures are for review purposes only and do not represent a professional civil survey.

2.1 Potential Waters of the U.S. Determination

The USACE makes determinations on which aquatic resources are considered WOTUS through a process referred to as approved jurisdictional determination (AJD). USACE AJDs are guided by agency rules and

policy. Accordingly, aquatic resources may be considered non-jurisdictional (i.e., not a WOTUS) if they are found to be excluded waters under current rules and policy.

The U.S. Environmental Protection Agency (EPA) and the USACE are interpreting the phrase "waters of the U.S." consistent with the U.S. Supreme Court's May 25, 2023, decision in the case of *Sackett v. EPA* (i.e.; Sackett Decision) (EPA 2023a). However, the agencies are currently reviewing the decision to determine next steps. The Sackett Decision is thought to be a narrower interpretation of the aquatic resources that are considered WOTUS when compared to the previous definition which followed the U.S. Supreme Court's Decision in *Rapanos v. United States & Carabell v. United States* and resulted in the joint agency memorandum titled "*Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States*" (2008 Guidance) (EPA 2008).

The Sackett Decision focused on wetlands and the agencies use of the significant nexus test with little mention or reference to waterways. Due to guidance yet to be issued for how the agencies will interpret the Sackett Decision pertaining to waterways, SWCA evaluated the potential jurisdictional status of waterways within the project area using the 2008 Guidance minus the significant nexus test. The potential jurisdictional status for wetlands within the project area were evaluated with consideration to the Sackett Decision (EPA 2023b).

3 PROJECT AREA DESCRIPTION

The project area is located within the Osage Cuestas (ecoregion 40b) subdivision of the Central Irregular Plains Level III ecoregion (Woods et al. 2005). The Osage Cuestas ecoregion occurs on mostly flat to irregular plains, separated by low hills and east-facing cuestas. Ecoregion 40b is primarily underlain by Pennsylvanian-age sandstone and shale interbedded with western-dipping coal and limestone. Perennial streams occur throughout the Osage Cuestas, with most streams possessing pools of sand, mud, or gravel substrates. Natural vegetation consists of tall grass prairie, including little bluestem, switchgrass, and Indiangrass, that gradually mixes with oak-hickory forests in the eastern portion of the ecoregion. Additionally, oak woodlands and oak forests occur on rocky hills. Ground elevation within the project area ranges from approximately 603 to 669 feet above mean sea level. Current land use within the project area is dominated by undeveloped deciduous forest bordered by cropland, rangeland, and residential homes.

The project area is located within the Spunky Creek sub-watershed (Oklahoma Water Resources Board 2022). The primary source of surface water within the project area is precipitation runoff (overland flow). The FEMA Flood Insurance Rate Map panels 40145C0020J and 40145C0040J for this region indicate that the project area intersects approximately 0.53 acre of flood zone AE and 0.05 acre of flood zone X. Although flood zone X represents areas of minimal flood hazard, flood zone AE is designated within 100-year floodplains (FEMA 2021). As such, in accordance with the Flood Insurance Program, a floodplain development permit may be required for the development of the Fair Oaks 104-acre Property within Wagoner County, Oklahoma.

3.1 Vegetation

SWCA identified a predominance of forested-vegetation community within the project area during the aquatic resources delineation; no wetland-vegetation communities were found. Dominant plant species observed in the upland, forested vegetation community are listed below. Appendices A and B contain a photographic log and MWR Supplement data forms, respectively, of representative data point locations for each of the vegetation communities observed in the project area.

- **Forested Upland:** The forested upland vegetation community consisted of a tree stratum dominant in sugarberry (*Celtis laevigata*), American elm (*Ulmus americana*), and pecan (*Carya illinoinensis*). Additional tree species occurring are eastern red ceder (*Juniperus virginiana*), chinquapin oak (*Quercus muehlenbergii*), Mexican plum (*Prunus mexicana*), and American persimmon (*Diospyros virginiana*). The dominant species in the sapling/shrub stratum are possumhaw (*Ilex decidua*) and coralberry (*Symphoricarpos orbiculatus*), with a scattered presence of pecan. The herbaceous stratum consists of slender bush clover (*Lespedeza virginica*), Japanese honeysuckle (*Lonicera japonica*), and Arkansas sedge (*Carex arkansana*).

3.2 Soils

According to the NRCS, the project area contains 5 soil map units (Table 1). The majority of the mapped soil units within the project area consist of silt loam or silty clay loam, with or without gravel. Of the 5 soil map units, only one possesses a minor soil component that is classified as hydric (Radley silt loam, 0 to 1 percent slopes, frequently flooded) (NRCS 2019).

Table 1. Soil Map Units Within the Project Area

Soil Map Unit Name	Soil Description	Hydric Soil	Acres within Project Area	Percentage of Project Area
Catoosa-Shidler-Rock outcrop complex, 1 to 8 percent slopes	Loamy residuum weathered from limestone or cherty limestone occurring on interfluves on loamy or shallow limestone uplands.	No	42.6	40.4%
Hector-Enders complex, 5 to 30 percent slopes	Clayey residuum weathered from shale or residuum weathered from sandstone occurring on hillslopes on loamy uplands.	No	11.4	10.9%
Lula silt loam, 1 to 3 percent slopes	Silty residuum weathered from limestone occurring on interfluves on loamy uplands.	No	20.1	20.2%
Radley silt loam, 0 to 1 percent slopes, frequently flooded	Silty alluvium occurring on floodplain steps on loamy floodplains.	Yes*	6.4	6.1%
Summit silty clay loam, 1 to 3 percent slopes	Calcareous clayey colluvium and/or residuum weathered from shale occurring on interfluves on loamy uplands.	No	23.5	22.4%
Total			**104**	**100.0**

Source: NRCS (2019)

* Minor components of soil map unit are considered hydric.

4 AQUATIC RESOURCES

During the June 2023 aquatic resources delineation, SWCA identified 4 waterways, 1 waterbody, and no wetlands within the project area. The aquatic resources are discussed further in Sections 4.1 through 4.3. Representative photographs of identified aquatic resources are provided in Appendix A, and data forms are provided in Appendix B.

According to the APT (Appendix C), the aquatic resources delineation was performed during the dry season and the project area's corresponding climatological division was experiencing mild drought conditions. At the project area scale, the rainfall condition at the time of the aquatic resources delineation was calculated as normal on June 20, 2023 (USACE 2020a).

Figure 2 displays an overview of the aquatic resources mapped during the delineation.

4.1 Waterways

SWCA identified 1 perennial waterway, 1 intermittent waterway, and 2 ephemeral waterways within the project area (see Table 2; see Figure 2). The perennial waterway, known as Spunky Creek, was classified as perennial because it appears to carry water continuously throughout the year. The intermittent waterway, an unnamed tributary to Spunky Creek, was classified as intermittent because it appears to carry water during most of the year but may cease to flow a few times a year or seasonally. The ephemeral waterways, both unnamed tributaries to Spunky Creek, were classified as ephemeral because they appear to only convey water in direct response to precipitation events. Ephemeral waterways that were isolated and observed to lack any connectivity to other surface waters within the project area are likely not considered potential WOTUS as they do not contribute ephemeral flow to tributaries of traditional navigable WOTUS or other potentially jurisdictional WOTUS. Conversely, ephemeral waterways that were observed to have a hydrologic connection to potential WOTUS are considered potential WOTUS. Table 2 provides a summary of the waterways within the project area, including resource identification, classification, and potential WOTUS status.

Table 2. Summary of Waterways Within the Project Area

Resource ID	Classification	Area (acres)	Mapped Length (feet)	Potential WOTUS Under 2008 Guidance
SA011	Perennial Stream	0.10	123.02	Yes
SA012	Ephemeral Stream	0.03	671.01	Yes
SA013	Ephemeral Stream	0.02	452.22	Yes
SA014	Intermittent Stream	0.70	1,536.92	Yes

4.2 Waterbodies

SWCA identified 1 waterbody within the project area, an unnamed and isolated pond. Table 3 provides a summary of the waterbody delineated within the project area, including resource identification, classifications, and potential WOTUS status.

Table 3. Summary of Waterbodies Within the Project Area

Resource ID	Classification	Area (acres)	Potential WOTUS Under 2008 Guidance
PA009	Pond	0.05	No*

* Based on aquatic resources delineation data, SWCA's understanding of the USACE's process for AJDs, and review of recent AJDs for similarly situated aquatic resources, isolated upland constructed ponds would likely not be considered WOTUS

4.3 Wetlands

SWCA did not identify any wetlands during the aquatic resource delineation due to lack of adequate wetland indicators, including hydrophytic vegetation, wetland hydrology, and hydric soils. One datapoint was taken within the project area, DPA008_U, that did not meet these wetland criteria. Figure 2 identifies the location of the upland datapoint, which serves as a representative assessment of the habitat and

potential for wetland characteristics within the project area. Photographs and data forms associated with the datapoint can be found in Appendices A and B, respectively.

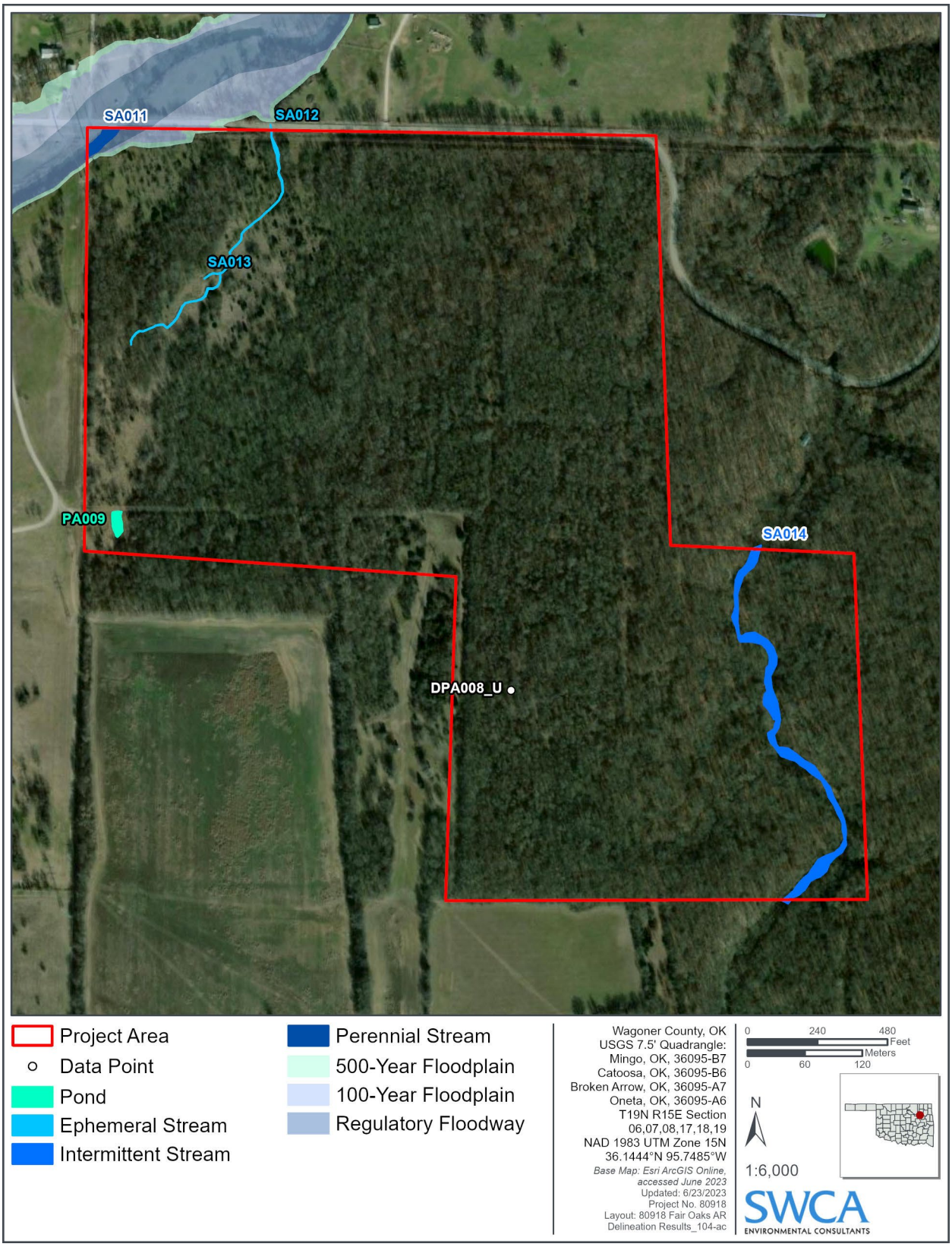

Figure 2. Aquatic resources delineation results overview map.

5 CONCLUSIONS

SWCA identified a total of 5 aquatic resources within the project area during the aquatic resources delineation on June 20, 2023. Of these 5 aquatic resources within the project area, 4 waterways (see Table 2) would likely be considered WOTUS under Section 404 of the CWA and would be regulated by the USACE Tulsa District. However, only the USACE and EPA can make official determinations regarding the jurisdictional status or limits under Section 404 of the CWA for the aquatic resources identified during the aquatic resources delineation.

Certain activities (i.e., discharge of dredge or fill materials) within WOTUS require authorization from the USACE. Regulated activities within WOTUS could be authorized under the general terms and conditions of Nationwide Permits (NWPs) 51 (Land-Based Renewable Energy Generation Facilities), 14 (Linear Transportation Projects), or 57 (Electric Utility Line and Telecommunications Activities). The NWPs may authorize project impacts resulting in a loss of up to 1/2 of an acre of WOTUS. However, depending on project design and the activities proposed within WOTUS, a pre-construction notification (PCN) to the USACE Tulsa District could be required. A PCN is generally required under all three NWPs if the project will result in a loss exceeding 1/10 of an acre of WOTUS, or if other conditions of the NWPs are not met (such as if the project impacts cultural resources or may affect threatened or endangered species). Once the project design is known, SWCA can calculate impacts, analyze proposed activities as they pertain to the general terms and conditions of the Nationwide Permit(s), and assist PartnerTulsa in determining if a PCN to the USACE would be required.

6 LITERATURE CITED

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States.* U.S. Fish and Wildlife Service, FWS/OBS-79/31.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual,* Technical Report Y-87-1. Vicksburg, Mississippi: U.S. Army Corps of Engineers Waterways Experiment Station.

Esri. 2023. Esri Map Services—ArcGIS Desktop, Version 10.6. Redlands, California: Environmental Systems Research Institute. Accessed June 2023.

Federal Emergency Management Agency (FEMA). 2021. National Flood Hazard Layer (NFHL) Viewer. Available at: https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd. Updated December 2021. Accessed June 2023.

———. 2023. Estimated Base Flood Elevation (estBFE) Viewer. Available at: https://webapps.usgs.gov/infrm/estBFE/. Accessed June 2023.

Natural Resources Conservation Service (NRCS). 2018. *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils* (Version 8.2). Prepared in cooperation with the National Technical Committee for Hydric Soils, edited by G.W. Hurt and L.M. Vasilas. Washington, D.C.: U.S. Department of Agriculture, Natural Resources Conservation Service.

———. 2019. Web Soil Survey. Available at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed June 2023.

———. 2023. PLANTS Database. Available at: http://plants.usda.gov. Accessed June 2023.

Oklahoma Water Resources Board. 2023. Oklahoma Water Resources Board General Viewer. Available at https://owrb.maps.arcgis.com/apps/webappviewer/index.html?id=d735090843144751b7373a9b5b8db3bc. Accessed June 2023.

U.S. Army Corps of Engineers (USACE). 2005. Regulatory Guidance Letter No. 05-05, dated December 7, 2005. Available at: https://www.nap.usace.army.mil/Portals/39/docs/regulatory/rgls/rgl05-05.pdf. Accessed June 2023.

———. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)*.

———. 2020a. Antecedent Precipitation Tool, Version 1.0 (APT). Written by Jason C. Deters. Available at: https://github.com/jDeters-USACE/Antecedent-Precipitation-Tool/releases/tag/v1.0.23. Accessed June 2023.

———. 2020b. National Wetland Plant List, version 3.5. Hanover, New Hampshire: USACE Research and Development Center, Cold Regions Research and Engineering Laboratory. Available at: https://wetland-plants.usace.army.mil/nwpl_static/v34/home/home.html. Accessed June 2023.

———. 2021. 2021 Nationwide Permits, Index of 2021 Nationwide Permits, Conditions, District Engineer's Decision, Further Information, and Definitions. Available at: https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll7/id/20099. Accessed June 2023.

U.S. Environmental Protection Agency (EPA). 2008. Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States* & *Carabell v. United States*. Available at: https://www.epa.gov/sites/default/files/2016-02/documents/cwa_jurisdiction_following_rapanos120208.pdf. Accessed June 2023.

———. 2021. Final Rule: The Navigable Waters Protection Rule. Available at: https://www.epa.gov/wotus/final-rule-navigable-waters-protection-rule. Accessed June 2023.

———. 2023a. Definition of "Waters of the United States": Rule Status and Litigation Update. Available at: https://www.epa.gov/wotus/definition-waters-united-states-rule-status-and-litigation-update. Accesses June 2023.

———. 2023b. Sackett Opinion Available at: https://www.epa.gov/system/files/documents/2023-05/Sackett%20Opinion.pdf. Accessed June 2023.

U.S. Fish and Wildlife Service (USFWS). 2022. National Wetlands Inventory. Available at: https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/. Accessed June 2023.

U.S. Geological Survey (USGS). 2018. Mingo, Oklahoma; Catoosa, Oklahoma. 1:24,000. 7.5 Minute Series. Reston, Virginia: U.S. Department of the Interior.

———. 2023. The National Map Viewer: National Hydrography Dataset. Data refreshed April 2023. Available at: https://apps.nationalmap.gov/viewer/. Accessed June 2023.

Woods, A.J., Omernik, J.M., Butler, D.R., Ford, J.G., Henley, J.E., Hoagland, B.W., Arndt, D.S., and Moran, B.C., 2005, Ecoregions of Oklahoma (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,250,000).

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APPENDIX A

Photographic Log

Figure A1. Representative photo of forested upland vegetative community within the project area, facing north (DPA008_U).

Figure A2. Representative photo of forested upland vegetative community within the project area, facing east (DPA008_U).

Figure A3. Representative photo of forested upland vegetative community within the project area, facing south (DPA008_U).

Figure A4. Representative photo of forested upland vegetative community within the project area, facing west (DPA008_U).

Figure A5. Representative photo of perennial stream Spunky Creek within the project area, facing upstream (SA011).

Figure A6. Representative photo of intermittent stream within the project area, facing downstream (SA014).

Figure A7. Representative photo of ephemeral stream within the project area, facing upstream (SA012).

Figure A8. Representative photo of ephemeral stream within the project area, facing upstream (SA013).

Figure A9. Representative photo of man-made pond within the project area, facing southeast (PA009).

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APPENDIX B

U.S. Army Corps of Engineers
Wetland Determination Data Forms
Midwest Region

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Fair Oaks Ranch 104-acre Property | County: Wagoner | Sampling Date: June 20, 2023
Applicant/Owner: PartnerTulsa | State: OK | Sampling Point: DPA008_U
Investigator(s): Anthony Thornton and Krista McClure | Section, Township, Range: 17-T19N-R15E
Landform (hillslope, terrace, etc.): N/A | Local relief (concave, convex, none): None
Slope (%): 0-5% | Lat: -95.74808 | Long: 36.14280 | Datum: NAD 1983 UTM Zone 15N
Soil Map Unit Name: Lula silt 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 **X** (If no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 **X**	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:
This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology.
The survey area was determined to be drier than normal at the time of survey.

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *Celtis laevigata*	40	Yes	FACW
2. *Ulmus americana*	20	Yes	FACW
3. *Carya illinoinensis*	10	No	FACW
4. *Juniperus virginiana*	5	No	FACU
5. *Diospyros virginiana*	5	No	FAC
	80 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *Carya illinoinensis*	5	No	FACW
2. *Ilex decidua*	10	No	FACW
3. *Symphoricarpos orbiculatus*	70	Yes	FACU
4.			
5.			
	85 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Lespedeza virginica*	20	No	UPL
2. *Lonicera japonica*	40	Yes	FACU
3. *Carex arkansana*	60	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	120 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: **5** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **60%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**85**	x 2 =	**170**
FAC species	**65**	x 3 =	**195**
FACU species	**115**	x 4 =	**460**
UPL species	**20**	x 5 =	**100**
Column Totals:	**285** (A)		**925** (B)

Prevalence Index = B/A = **3.25**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 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 **X** No ____

Remarks:
A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

SOIL

Sampling Point: **DPA008_U**

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
0-22"	10YR 3/2	100	None	—	—	—	Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators:

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ 2 cm Muck (A10)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ 5 cm Mucky Peat or Peat (S3)
- ____ 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)

Indicators for Problematic Hydric Soils[3]:

- ____ Coast Prairie Redox (A16)
- ____ Dark Surface (S7)
- ____ Iron-Manganese Masses (F12)
- ____ 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** **X**

Remarks:

No positive indication of hydric soils was observed.

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 Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Gauge or Well Data (D9)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No **X**	Depth (inches):	**N/A**
Water Table Present?	Yes _____	No **X**	Depth (inches):	**>20**
Saturation Present? (includes capillary fringe)	Yes _____	No **X**	Depth (inches):	**>20**

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

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

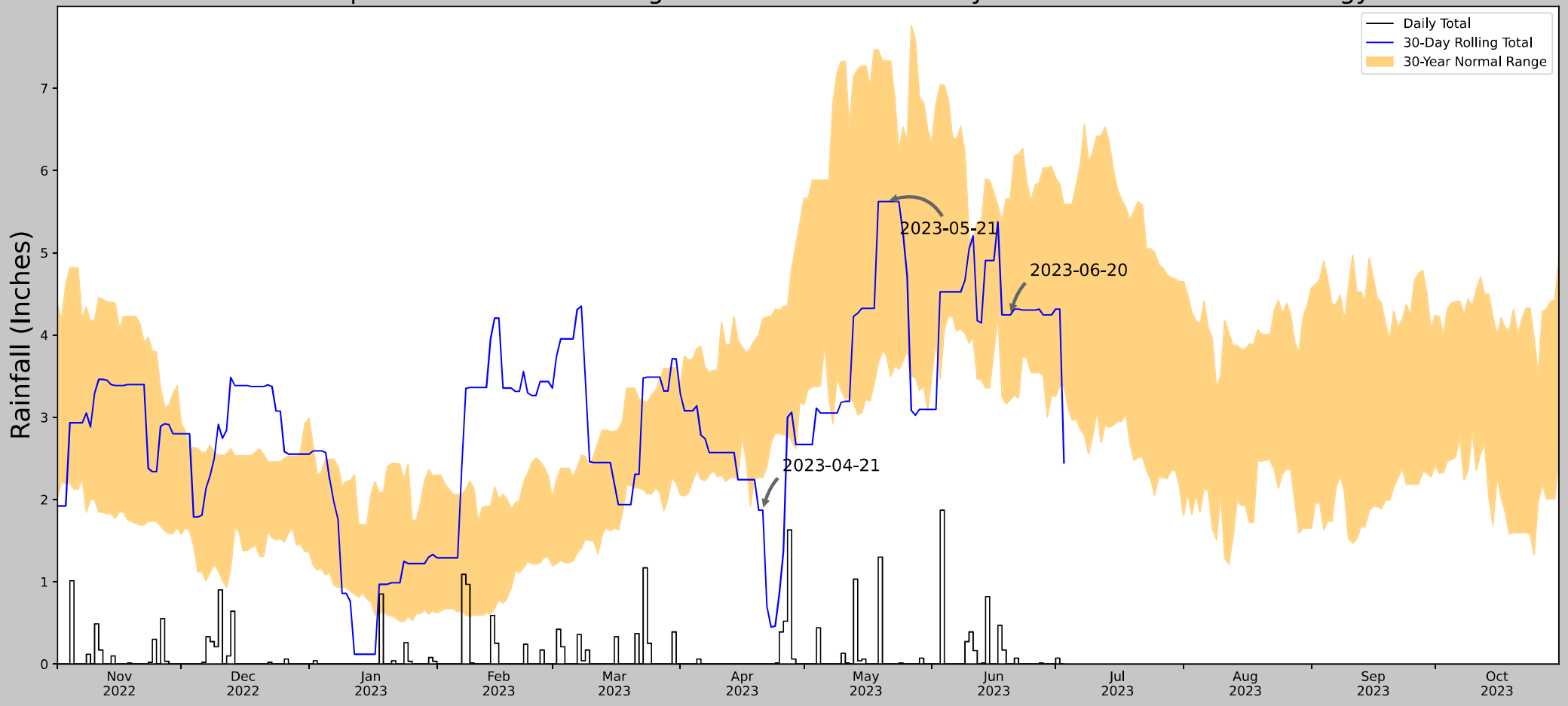
Remarks:

No positive indication of wetland hydrology was observed.

APPENDIX C

Antecedent Precipitation Tool

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	36.143925, -95.748037
Observation Date	2023-06-20
Elevation (ft)	664.957
Drought Index (PDSI)	Mild drought (2023-05)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-06-20	3.212205	5.655906	4.244095	Normal	2	3	6
2023-05-21	3.748425	7.332677	5.622047	Normal	2	2	4
2023-04-21	2.266929	4.197638	1.870079	Dry	1	1	1
Result							Normal Conditions - 11

US Army Corps of Engineers

ERDC

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
TULSA INTL AP	36.1986, -95.8783	639.108	8.189	25.849	3.897	11342	90
TULSA RICHARD L JONES JR AP	36.0425, -95.9903	620.079	12.466	19.029	5.847	1	0
SKIATOOK	36.365, -96.0028	645.013	13.426	5.905	6.121	10	0

APPENDIX D

Delineator Resumes

KRISTA MCCLURE, B.A., ASSISTANT STAFF BIOLOGIST

Krista McClure is an assistant staff biologist who has been working remotely for SWCA's Arlington, Texas office, for excess of one year. She is certified to conduct wetland delineations, with guidance from USACE regional supplements, as of March 2023. Ms. McClure has served as a field crew member in Oklahoma and Texas on a multitude of natural resource surveys, including aquatic resource delineations, habitat assessments for threatened and endangered species, aerial and on-the-ground raptor nest surveys, and Phase I environmental site assessments. Her experience in environmental consulting also entails biological resource desktop reviews, prey base assessment ground-truthing, and extensive stormwater pollution prevention plan (SWPPP) inspections associated with oil and natural gas pipeline construction and transmission line re-builds.

YEARS OF EXPERIENCE

1+

EXPERTISE

Field data collection, including notetaking and GPS data (using Juniper Geode)

Wetland and stream delineation

Raptor nest surveys

Natural resources and habitat surveys

Environmental compliance monitoring

Desktop reviews

EDUCATION

B.A., Sustainability Studies; University of Texas at Austin, TX; December 2021

B.A., Geography; University of Texas at Austin, TX; 2021

REGISTRATIONS / CERTIFICATIONS

Certified Wetland Delineator; Wetland Training Institute, Inc.; 2023

SELECTED PROJECT EXPERIENCE (* denotes project experience prior to SWCA)

Pittsburg to Johnston County; American Electric Power; Johnston County, Oklahoma. SWCA is conducting various cultural and natural resources services for a transmission line rebuild. *Role: Assistant Staff Biologist. Performed wetland delineation and habitat suitability surveys for American Burying Beetle as crew member.*

Barnsdall to Skiatook Transmission Line; American Electric Power; Osage County, Oklahoma. SWCA managed the protected species investigations, mitigation plan, and stormwater pollution prevention plan (SWPPP) for a transmission line rebuild. *Role: Assistant Staff Biologist. Performed SWPPP inspections and generated inspection reports with photologs. Assisted with American Burying Beetle presence surveys.*

Daytona Pipeline; Confidential Client and Location. SWCA managed the Section 404 aquatic resources delineation, cultural resources investigations, and protected species investigations prior to construction of a natural gas pipeline. *Role: Assistant Staff Biologist. Performed wetland delineation and T&E species field surveys as crew member for proposed project and associated access roads.*

Beaver Creek Delineation; Confidential Client and Location. SWCA provided environmental support via Section 404 aquatic resources delineation for a proposed solar project. *Role: Natural Resource Technician. Performed wetland delineation as GPS technician for the proposed project.*

Buzz Solar; Confidential Client and Location. SWCA was engaged to prepare a Phase I environmental site assessment, Section 404 aquatic resources delineation, and wildlife habitat assessment for a proposed solar project. *Role: Natural Resource Technician. Recorded field observations and photos for Phase I environmental site assessment. Performed wetland delineation as crew member.*

Wagon Wheel; Confidential Client and Location. SWCA provided environmental services that included bat, raptor, and prey base assessment surveys for a proposed wind project. *Role: Natural Resource Technician. Assisted with aerial eagle (and other raptor) nest surveys. Conducted ground-truthing surveys for prey base (e.g., prairie dogs) assessment.*

ANTHONY THORNTON, M.S., STAFF BIOLOGIST

Mr. Thornton is a staff biologist with over 8 years of experience, including 1 year of experience working in SWCA's Arlington, Texas, office. His project responsibilities include serving as crew lead for aquatic resources delineations and threatened and endangered (T&E) species surveys for habitat analysis. He has led multiple crews for aquatic resources delineation surveys within the Arid West, Great Plains, and Atlantic and Gulf Coastal Plains U.S. Army Corps of Engineers (USACE) wetland delineation regions. His versatility as a staff biologist also includes experience with Phase I environmental site assessments and report and permitting preparation. He is also certified to conduct aquatic resources delineations nationwide, following the USACE manual.

YEARS OF EXPERIENCE

8+

EXPERTISE

Plant identification and T&E species surveys with habitat assessment

Stream and wetland delineation per USACE manual with Richard Chinn Environmental Training, Inc., certification

Field data collection, including taking adequate notes and using Juniper Geode

Phase I environmental site assessments

American burying beetle surveys

Raptor nest surveys

Invertebrate and fish sampling for stream health assessment as part of Oklahoma's Blue Thumb program

Water and soil testing, vegetation surveys, and wetland delineation as part of development of the Oklahoma Rapid Assessment for Floodplain Wetlands

EDUCATION

M.S., Natural Resource Ecology and Management; Oklahoma State University; Stillwater; 2021

REGISTRATIONS / CERTIFICATIONS

Certified Wetland Delineator; Richard Chinn Environmental Training, Inc.; 2022

SELECTED PROJECT EXPERIENCE

AEP Rock Falls Wind Farm PCMM; American Electric Power, Kay County, Oklahoma. SWCA is conducting Post Construction Mortality Monitoring for an established wind farm. *Role: Staff Biologist. Performed searcher efficiency trials, carcass persistence trials, and collected bat acoustic recordings for the project.*

Pittsburg to Johnston County; American Electric Power; Johnston County, Oklahoma. SWCA is conducting various cultural and natural resources services for a transmission line rebuild. *Role: Staff Biologist. Performed aquatic delineation and habitat suitability surveys for American burying beetle as field lead.*

Barnsdall to Skiatook Transmission Line; American Electric Power; Osage County, Oklahoma. *SWCA managed the protected species investigations, mitigation plan, and stormwater pollution prevention plan (SWPPP) for a transmission line rebuild. Role: Staff Biologist. Performed SWPPP inspections and generated inspection reports with photologs. Assisted with American burying beetle presence/absence surveys.*

Natural Gas Pipeline; Confidential Client and Location. SWCA managed the Section 404 aquatic resources delineation, cultural resources investigations, and protected species investigations prior to construction of a natural gas pipeline. *Role: Staff Biologist. Performed wetland delineation and T&E species field surveys as field lead for proposed project and associated access roads.*

Beaver Creek Delineation; Confidential Client and Location. SWCA provided environmental support via Section 404 aquatic resources delineation for a proposed solar project. *Role: Staff Biologist. Performed aquatic delineation as field lead for the proposed project.*

Buzz Solar; Confidential Client and Location. SWCA was engaged to prepare a Phase I environmental site assessment, Section 404 aquatic resources delineation, and wildlife habitat assessment for a proposed solar project. *Role: Staff Biologist. Recorded field observations and photos for Phase I environmental site assessment. Performed aquatic delineation as field lead.*

Wagon Wheel; Confidential Client and Location. SWCA provided environmental services that included bat, raptor, and prey base assessment surveys for a proposed wind project. *Role: Staff Biologist. Conducted aerial eagle (and other raptor) nest surveys.*