ERO

Consultants in Natural Resources and the Environment

Natural Resources Assessment
Box Elder Creek Well Field 2
East Quincy Avenue to County Road 194
Arapahoe County, Colorado

Prepared for—

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ERO Project #20_054

June 13, 2024

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Executive Summary

Rangeview Metro District (Rangeview) retained ERO Resources Corporation (ERO) to provide a natural resources assessment for a proposed well field and associated pipeline infrastructure (project) running south to southeast of East Quincy Avenue to County Road 194 in Arapahoe County, Colorado (project area). ERO assessed the project area for potential wetlands and waters of the U.S. (WOTUS), threatened and endangered species, and general wildlife use. Below is a summary of the resources found in the project area and recommendations or future actions necessary based on the current site conditions and federal, state, and local regulations.

The natural resources and associated regulations described in this report are valid as of the date of this report and may be relied upon for the specific use for which it was prepared by ERO under contract to Rangeview. Because of their dynamic natures, site conditions and regulations should be reconfirmed by a qualified consultant before relying on this report for a use other than that for which ERO was contracted.

Wetlands and Other WOTUS – Box Elder Creek, an intermittent stream, occurs in the project area and contains wetlands and open water. Rangeview is in discussion with the U.S. Army Corps of Engineers (Corps) to determine the jurisdictional status of this segment of Box Elder Creek. If the Corps determines Box Elder Creek to be a jurisdictional WOTUS, a ***Clean Water Act Section 404 permit will be required for the placement of dredged or fill material in the wetlands or below the ordinary high water mark of Box Elder Creek.*** If Box Elder Creek is determined nonjurisdictional, a Section 404 permit would not be required; however, authorization from the State of Colorado would be required if permanent impacts exceeded 0.10 acre to wetlands or 0.03 acre to streambed.

Threatened and Endangered Species – The project area does not contain habitat for any federally listed threatened or endangered species. A viable population of Preble's meadow jumping mouse (Preble's) is unlikely to exist in the project area because the project area lacks dense riparian shrub habitat with an associated dense understory. The project area is not conducive to the establishment of Ute ladies'-tresses orchid (ULTO) because there is an abrupt transition from wetlands to uplands in the project area, and the project area lacks the mesic vegetation communities typically associated with ULTO. Additionally, the wetlands in the project area are heavily disturbed by active cattle grazing. ***If Box Elder Creek is determined to be nonjurisdictional, ERO recommends submitting a habitat assessment to the U.S. Fish and Wildlife Service (Service) requesting confirmation that the project area lacks habitat for Preble's and ULTO and a presence/absence survey would not be required.***

Prairie Dogs – The northern portion of the project area contained an active black-tailed prairie dog colony. If prairie dog removal becomes necessary, ***Colorado Parks and Wildlife (CPW) recommends removing them in a humane manner before any earthwork or construction takes place***. Currently, Arapahoe County does not have any regulations or policies pertaining to prairie dogs.

Burrowing Owls – Burrowing owls could be impacted by the project if work would occur within the CPW-recommended 0.125-mile (660-foot) buffer of any prairie dog burrows (CPW 2021c). ***If work would occur within the recommended buffer of any burrow during the breeding season (March through October), a burrowing owl survey should be conducted***. If owls are present in the project area, activities should be restricted within 660 feet of nest burrows until the owls have migrated from the site, which can be determined through monitoring.

Migratory Birds – No bird nests were observed during the 2024 site visit; however, trees, shrubs, and upland grasslands in the project area provide potential nesting habitat. The Eastern Colorado Field Office of the Service (Service 2022) and Colorado Department of Transportation (CDOT 2011) have identified the primary nesting season for migratory birds in eastern Colorado as occurring from April 1 to August 31. However, some birds, such as the red-tailed hawk and great horned owl, can nest as early as February or March. Based on the proposed construction schedule provided to ERO by Rangeview, construction of the project is scheduled to begin outside of the nesting and breeding season. If construction is delayed and does occur in the nesting and breeding season, ***ERO recommends a nest survey be conducted within one week prior to construction*** to determine if any active nests are present in the project area so they can be avoided. If active nests are found, any work that would destroy the nests should not be conducted until the birds have vacated the nests.

Other Wildlife and Habitats of Concern – The project area occurs in the overall range for black-tailed prairie dog, fringed myotis, little brown myotis, mountain lion, mule deer, olive-backed pocket mouse, Preble's, pronghorn, swift fox, white-tailed deer, white-tailed jackrabbit, and wild turkey. Additionally, the project area occurs in bald eagle winter concentration, winter range, and winter foraging area; burrowing owl breeding range; Canada goose winter range and foraging area; golden eagle breeding range; mountain lion peripheral range; mule deer concentration area, migration corridor, winter concentration area, and winter range; pronghorn concentration area, winter concentration area, winter range, and perennial water; white-tailed deer concentration area and winter range; and wild turkey winter range (NDIS 2021). On the Natural Diversity Information Source database, the project area is shown as a documented wildlife corridor for mule deer. The project area also intersects four High Priority Habitats including Native Aquatic Species Conservation Waters, Mule Deer Migration Corridor, Mule Deer Winter Concentration Area, and Pronghorn Winter Concentration Area (CPW 2021a). No other sensitive species occur in the project area that would be significantly adversely affected by the proposed project.

Overall, surrounding and continuing development contributes to a decline in the number and diversity of wildlife species nearby and to a change in species composition. A variety of wildlife likely use Box Elder Creek as a wildlife corridor. The proposed project may have a temporary impact on wildlife using the project area during construction; however, due to the small footprint of the proposed project area, it is unlikely the project would have a long-term permanent impact on surrounding wildlife.

Natural Resources Assessment
Box Elder Creek Well Field 2
East Quincy Avenue to County Road 194
Arapahoe County, Colorado

June 13, 2024

Introduction

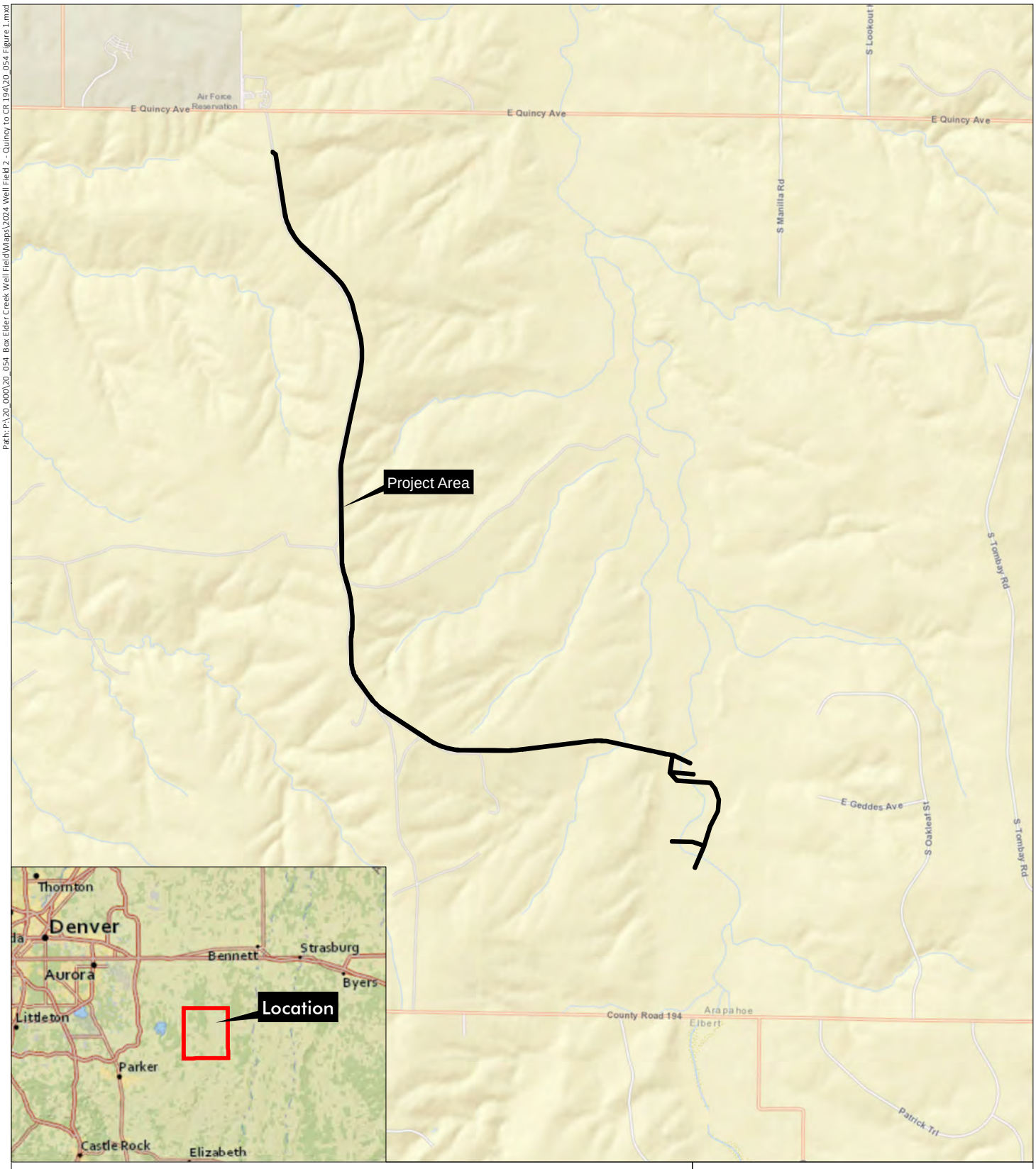
Rangeview Metro District (Rangeview) retained ERO Resources Corporation (ERO) to provide a natural resources assessment for a proposed well field and associated pipeline infrastructure (project) running south to southeast of East Quincy Avenue to County Road 194 in Arapahoe County, Colorado (project area; Figure 1). On April 23, 2024, Anna Wistrom and Marie Russo with ERO assessed the project area for natural resources (2024 site visit). During these assessments, activities included a formal jurisdictional wetland delineation, identification of potential federally listed threatened and endangered species habitat, and identification of other natural resources. This report provides information on existing site conditions and resources as well as current regulatory guidelines related to those resources. ERO assumes Rangeview is responsible for obtaining all federal, state, and local permits for construction of the project.

Project Area Location

The project area is in Section 8, Section 17, Section 20, Sections 27 through 29, and Section 34, Township 5 South, Range 64 West of the 6th Principal Meridian in Arapahoe County, Colorado (Figure 1). The UTM coordinates for the approximate center of the project area are NAD 538087mE, 4382585mN, Zone 13 North. The longitude/latitude of the project area is 104.556433°W/39.592142°N. The elevation of the project area is approximately 6,000 feet above sea level. Photo points of the project area are shown on Figure 2a through Figure 2f, and the photo log is in Appendix A.

Project Area Description

The U.S. Department of Agriculture (USDA) maps the project area in the southern part of the Central High Plains Major Land Resource Areas (MLRA), which is characterized by a flat to gently rolling landscape formed by glacial drift material and sediment deposition from the Rocky Mountains (USDA and Natural Resources Conservation Service (NRCS) 2006). This MLRA is part of the Colorado Piedmont section of the Great Plains physiographic province and ranges in elevation from 3,000 to 7,800 feet. The climate of the area is typical of mid-continental semiarid temperate zones, but the heavy rain shadow effect of the Southern Rocky Mountains makes the area somewhat drier. The average annual precipitation is 12 to 18 inches, most of which occurs from April through September. The mean annual temperature is 45°F to 55°F, with the annual number of frost-free days ranging from 135 to 190.



Box Elder Creek Well Field 2

Sections 8, 17, 20, 27-29, and 34, T5S, R64W; 6th PM

UTM NAD 83: Zone 13N; 538087mE, 4382585mN

Longitude 104.556433°W, Latitude 39.592142°N

USGS Watkins and Watkins SE, CO Quadrangles

Arapahoe County, Colorado

0 2,000 4,000 Feet

N

Figure 1
Vicinity Map

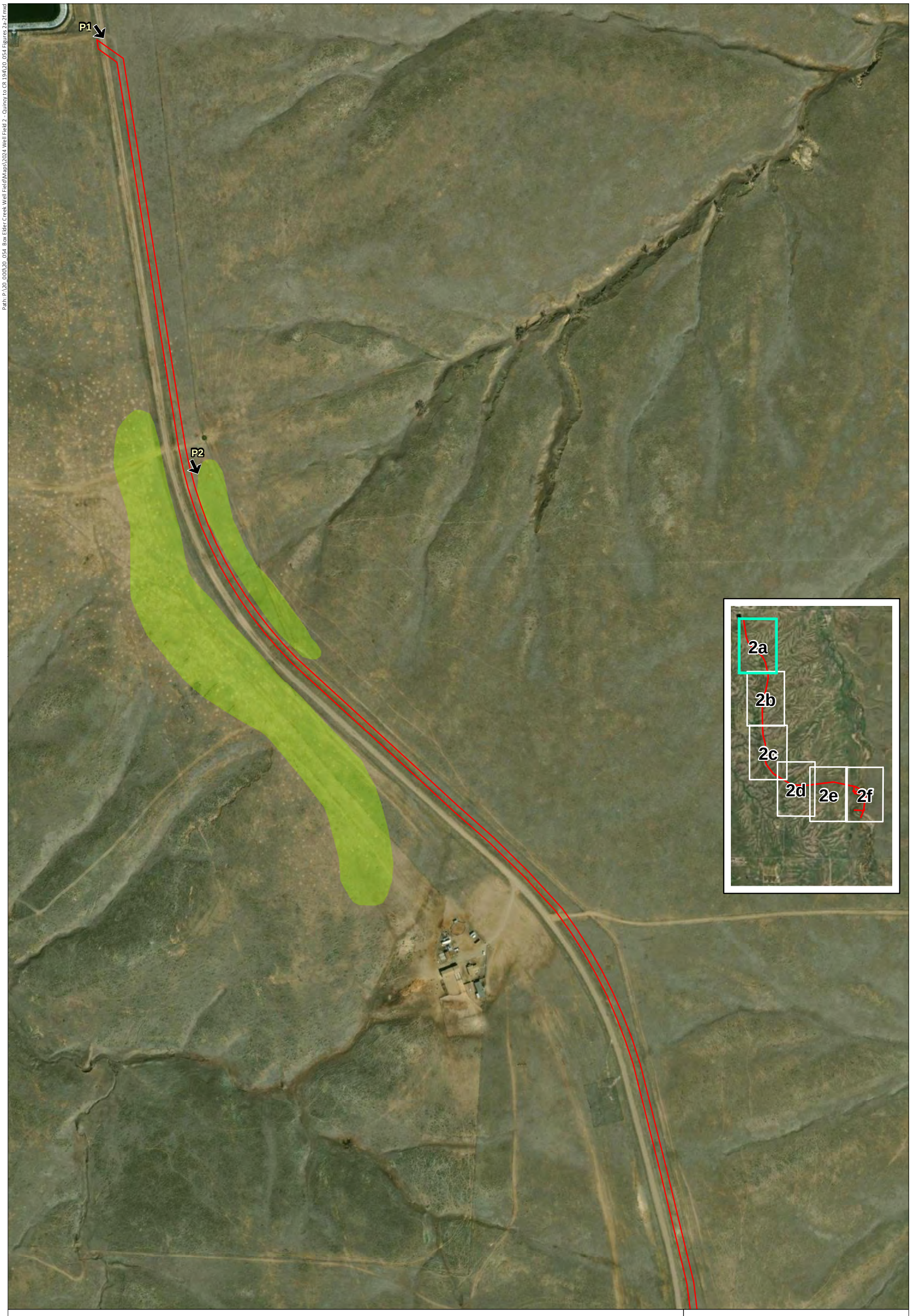
Prepared for: Rangeview Metro District

File: 20_054 Figure 1.mxd (GS)

June 3, 2024

ERO Resources Corp.

Path: P:\20_000\20_054_Box Elder Creek Well Field\Maps\2024 Well Field 2 - Quincy to CR 194\20_054 Figures 2a-2f.mxd



Box Elder Creek Well Field 2

Data Point
Photo Point
Upland Vegetated Swale
Limit of Delineation
Active Prairie Dog Colony
Project Area
Wetland (3.946 ac total, 0.283 ac in project area)
Ordinary High Water Mark (4.931 ac total, 0.432 ac in project area)

0 200 400 Feet

N

Image Source: Maxar Technologies©, March 23, 2023

Figure 2a
Existing Conditions

Prepared for: Rangeview Metro District
File: 20_054 Figures 2a-2f.mxd (GS)
June 7, 2024

ERO Resources Corp.

Path: P:\20_000\20_054_Box Elder Creek Well Field\Maps\2024 Well Field 2 - Quincy to CR 194\20_054 Figures 2a-2f.mxd

Box Elder Creek Well Field 2

Data Point
Photo Point
Upland Vegetated Swale
Limit of Delineation
Active Prairie Dog Colony
Project Area
Wetland (3.946 ac total, 0.283 ac in project area)
Ordinary High Water Mark (4.931 ac total, 0.432 ac in project area)

Image Source: Maxar Technologies©, March 23, 2023

0 200 400 Feet

N

Figure 2b
Existing Conditions

Prepared for: Rangeview Metro District
File: 20_054 Figures 2a-2f.mxd (GS)
June 7, 2024

ERO Resources Corp.

Path: P:\20_000\20_054_Box Elder Creek Well Field\Maps\2024 Well Field 2 - Quincy to CR 194\20_054 Figures 2a-2f.mxd

Box Elder Creek Well Field 2

Data Point
Photo Point
Upland Vegetated Swale
Limit of Delineation
Active Prairie Dog Colony
Project Area
Wetland (3.946 ac total, 0.283 ac in project area)
Ordinary High Water Mark (4.931 ac total, 0.432 ac in project area)

0 200 400 Feet

N

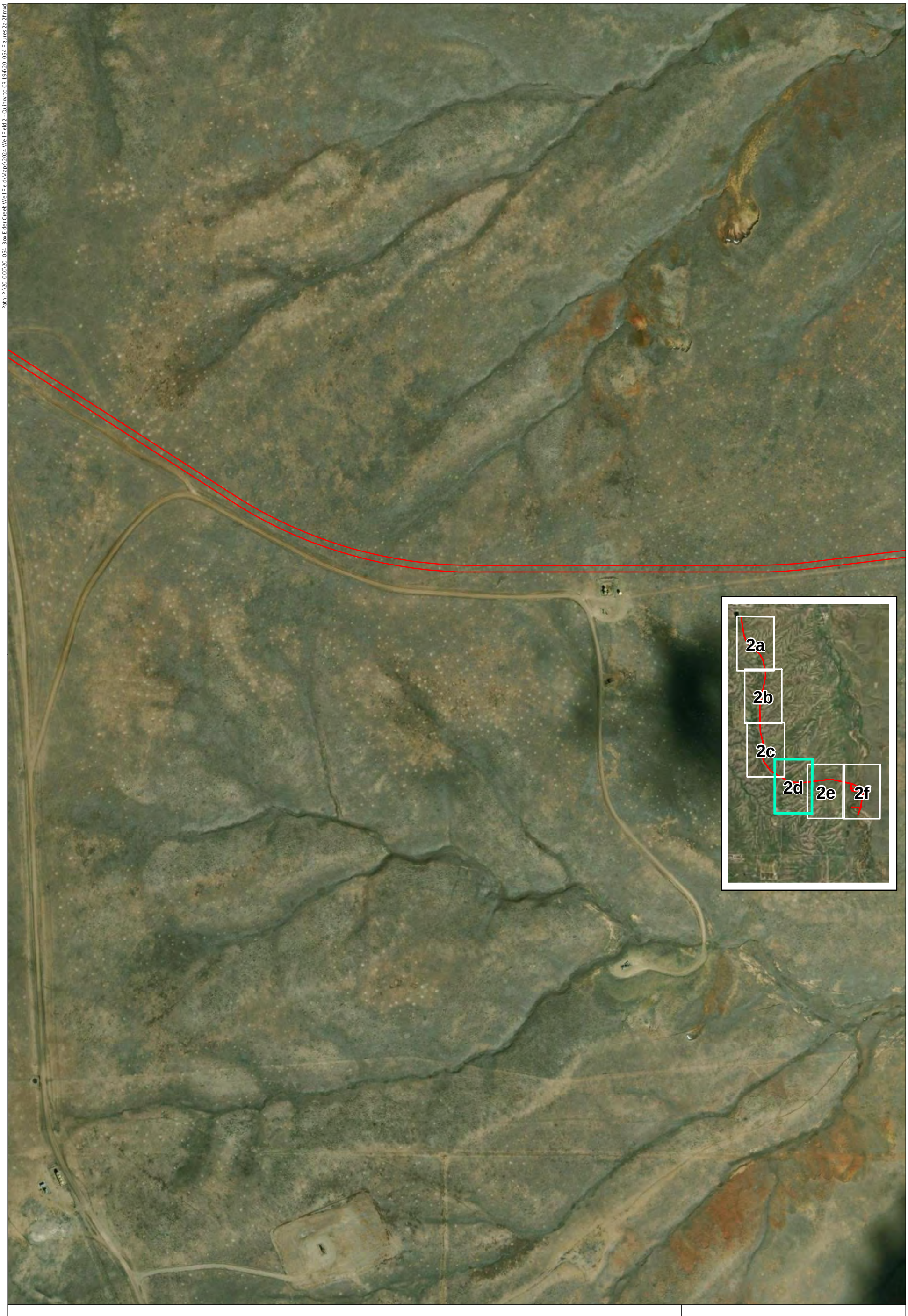
Image Source: Maxar Technologies©, March 23, 2023

Figure 2c
Existing Conditions

Prepared for: Rangeview Metro District
File: 20_054 Figures 2a-2f.mxd (GS)
June 7, 2024

ERO Resources Corp.

Path: P:\20_000\20_054_Box Elder Creek Well Field\Maps\2024 Well Field 2 - Quincy to CR 194\20_054 Figures 2a-2f.mxd



Box Elder Creek Well Field 2

- Data Point
- Photo Point
- Upland Vegetated Swale
- Limit of Delineation
- Active Prairie Dog Colony
- Project Area
- Wetland (3.946 ac total, 0.283 ac in project area)
- Ordinary High Water Mark (4.931 ac total, 0.432 ac in project area)

0 200 400 Feet

N

Image Source: Maxar Technologies©, March 23, 2023

Figure 2d
Existing Conditions

Prepared for: Rangeview Metro District
File: 20_054 Figures 2a-2f.mxd (GS)
June 7, 2024

ERO Resources Corp.

Path: P:\20_000\20_054_Box Elder Creek Well Field\Maps\2024 Well Field 2 - Quincy to CR 194\20_054 Figures 2a-2f.mxd

Box Elder Creek Well Field 2

- Data Point
- Photo Point
- Upland Vegetated Swale
- Limit of Delineation
- Active Prairie Dog Colony
- Project Area
- Wetland (3.946 ac total, 0.283 ac in project area)
- Ordinary High Water Mark (4.931 ac total, 0.432 ac in project area)

0 200 400 Feet

N

Image Source: Maxar Technologies©, March 23, 2023

Figure 2e
Existing Conditions

Prepared for: Rangeview Metro District
File: 20_054 Figures 2a-2f.mxd (GS)
June 7, 2024

ERO Resources Corp.

Path: P:\20_000\20_054_Box Elder Creek Well Field\Maps\2024 Well Field 2 - Quincy to CR 194\20_054 Figures 2a-2f.mxd

P7
DP3
DP2
P8
DP4
DP5
P6
P9
P10
P11

2a
2b
2c
2d
2e
2f

Box Elder Creek Well Field 2

Data Point
Photo Point
Upland Vegetated Swale
Limit of Delineation
Active Prairie Dog Colony
Project Area
Wetland (3.946 ac total, 0.283 ac in project area)
Ordinary High Water Mark (4.931 ac total, 0.432 ac in project area)

Image Source: Maxar Technologies©, March 23, 2023

0 200 400 Feet

N

Figure 2f
Existing Conditions

Prepared for: Rangeview Metro District
File: 20_054 Figures 2a-2f.mxd (GS)
June 7, 2024

ERO Resources Corp.

The project area is bounded by East Quincy Avenue to the north, undeveloped land on the east, undeveloped land and oil and gas well pads on the west, and County Road 194 to the south (Figure 1). The northern portion of the project area, that primarily runs south to southeast along the eastern boundary of South Imboden Road, consists of uplands dominated by native and nonnative grassland species such as smooth brome (*Bromus inermis*), crested wheatgrass (*Agropyron cristatum*), cheatgrass (*Bromus tectorum*), blue grama (*Bouteloua gracilis*), western wheatgrass (*Pascopyrum smithii*), common sunflower (*Helianthus annuus*), and kochia (*Bassia scoparia*) (Figure 2a through Figure 2d; Photo 1 through Photo 4). Less prevalent species observed throughout the project area consist of common mullein (*Verbascum thapsus*), common flixweed (*Descurainia sophia*), prairie sagewort (*Artemisia frigida*), alfalfa (*Medicago sativa*), yucca (*Yucca* sp.), and scotch thistle (*Onopordum acanthium*), a Colorado list B noxious weed species. Additionally, several active black-tailed prairie dog (*Cynomys ludovicianus*) burrows were observed in and adjacent to the northern portion of the project area along the eastern and western boundaries of South Imboden Road during the 2024 site visit (Figure 2a; Photo 2).

An unnamed drainage (Drainage 1) occurs in the central part of the project area and consists of an ephemeral upland vegetated swale (Figure 2e). Drainage 1 was dominated by western wheatgrass during the 2024 site visit (Photo 5). Box Elder Creek occurs in the southern portion of the project area (Figure 2f). The riparian corridor along Box Elder Creek is dominated by plains cottonwood (*Populus deltoides*) in the overstory and smooth brome in the understory where wetlands do not occur (Photo 6). Additionally, intermittent wetlands occur in and adjacent to Box Elder Creek and were dominated by Nebraska sedge (*Carex nebrascensis*) and reed canarygrass (*Phalaris arundinacea*) during the 2024 site visit (Figure 2f; Photo 7 through Photo 11).

Wetlands and Waters of the U.S. (WOTUS)

Regulatory Background

The Clean Water Act (CWA) protects the chemical, physical, and biological quality of WOTUS. The U.S. Army Corps of Engineers' (Corps) Regulatory Program administers and enforces Section 404 of the CWA. Under Section 404, a Corps permit is required for the discharge of dredged or fill material into wetlands and other WOTUS (streams, ponds, and other waterbodies). Since the regulatory program was initiated, the definition of WOTUS has changed frequently due to United States Supreme Court (Supreme Court) decisions and new rules proposed by presidential administrations. On August 29, 2023, the U.S. Environmental Protection Agency and Corps announced a final rule amending the 2023 definition of "waters of the U.S." to conform with the Supreme Court ruling under Sackett v. Environmental Protection Agency, No. 21-454. The amended rule reduces the jurisdiction of the CWA over wetlands adjacent to bodies of water that do not have a continuous surface connection to other known WOTUS, as well as streams that do not have continuous flowing or relatively permanent water. The amended rule removes the "significant nexus" standard that was created under Rapanos v. United States, removes interstate wetlands from the definition of WOTUS, and revises the definition of "adjacent" to mean "having a continuous surface connection." Wetlands that do not have a contiguous surface

connection to a jurisdictional traditionally navigable water or tributary are no longer jurisdictional, as well as ephemeral streams that do not have relatively permanent water. Potential rulings and guidance in the future could change the results of this report regarding the jurisdictional status of waters and wetlands in the project area. While ERO may provide its opinion on the likely jurisdictional status of wetlands and waters, the Corps will make the final determination of jurisdiction based on the current rulings.

State Dredge and Fill Program

On May 6, 2024, the Colorado Legislature passed House Bill 24-1379 which creates a dredge and fill permit program for the State of Colorado. The program will apply to all state waters, including wetlands, that are not protected under the CWA Section 404 program. If a CWA Section 404 permit is obtained from the Corps, or the project has a valid approved jurisdictional determination from the Corps that was issued prior to May 25, 2023, then authorization from the State would not be required. The program will require authorization from Colorado Department of Public Health and Environment for the placement of dredge or fill material into state waters where the wetlands or open water have been determined to not be waters of the U.S. CDPHE has until December 31, 2025, to go through rulemaking, which will create general and individual permits similar to the 404 permit program.

Until the program is in place, CDPHE has issued Clean Water Policy 17, which allows for enforcement discretion for activities in state waters that would have previously required a CWA Section 404 permit. If a project is impacting state waters that are no longer considered waters of the U.S. and require a CWA Section 404 permit, Clean Water Policy 17 applies. The policy allows for enforcement discretion if permanent impacts to state waters are under 0.10 acre to wetlands or 0.03 acre of streambed and notification is submitted to CDPHE. If impacts exceed those thresholds, HB 24-1379 states CDPHE may issue temporary authorizations for the activities if it would result in net increases in the function and services of state waters (only to stream impacts), or the applicant shows proof of purchase of mitigation bank credits that meet or exceed the compensatory mitigation requirements that would have been applicable under the federal nationwide or regional general permits.

Beginning January 1, 2025, CDPHE will use existing Nationwide and Regional General permits for compliance with impacts to state waters until rulemaking is completed and CDPHE has issued general authorizations. Applicants may submit a preconstruction notification as required under the Section 404 program for authorization. If compensatory mitigation is required, the applicant will be required to obtain temporary authorization from CDPHE as discussed above.

Methods

During the 2024 site visit, ERO surveyed the project area for wetlands, streambeds, and open waters. In addition to assessing the project area for potential isolated wetlands, jurisdictional wetlands, and other WOTUS, ERO conducted a jurisdictional wetland delineation during the 2024 site visit. Prior to the 2024 site visit, ERO reviewed U.S. Geological Survey (USGS) Watkins and Watkins Southeast quadrangle

topographic maps and aerial photography to identify mapped streams and areas of open water that could indicate wetlands or WOTUS.

ERO followed the methods for routine on-site wetland determinations as described in the 1987 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). ERO used methods in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)* (U.S. Army Corps of Engineers (Corps) 2010) to record data on vegetation, soils, and hydrology on routine determination forms (Appendix B). Wetlands were determined based on the presence of three wetland indicators: hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland boundaries were determined by a visible change in vegetation community, topographic changes, and other visible distinctions between wetlands and uplands.

The wetland indicator status of plant species was identified using the *National Wetland Plant List* (Corps 2020a), taxonomy was determined using *Colorado Flora: Eastern Slope* (Weber, Wittmann, and Müller-Wille 2012), and nomenclature was determined using the *PLANTS Database* (USDA, Natural Resources Conservation Service (NRCS) 2024). Wetlands were classified according to the U.S. Fish and Wildlife Service's (Service) Cowardin classification system (Cowardin et al. 1979) combined with a hydrogeomorphic approach (Brinson 1993). Hydric soils were identified using field observation for hydric soil indicators accepted by the Corps. A Munsell soil color chart was used to determine soil color. Wetland locations and classifications were supported by USGS topographic maps, aerial photography, and the Soil Survey (USDA, NRCS 2024b).

Intermittent, ephemeral, and perennial drainages with characteristics of a defined streambed, streambank, ordinary high water mark (OHWM), and other erosional features also were identified. The Corps defines "stream bed" as "the substrate of the stream channel between the OHWMs. The substrate may be bedrock or inorganic particles that range in size from clay to boulders." The Corps defines "ordinary high water mark" as "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear natural line impressed on the bank, shelving, changes in the soil character, destruction of terrestrial vegetation, presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (33 Code of Federal Regulations [CFR] 328.3[e]).

The dimensions of drainages with these characteristics and the boundaries of identified wetlands either were drawn onto aerial photographs or mapped using a Global Positioning System (GPS) unit. GPS data were differentially corrected using the CompassCom base station. All differential correction was completed using Trimble Pathfinder Office 5.9 software. GPS data were incorporated onto base mapping using ARC Geographic Information System software.

To assist the Corps in making a preliminary jurisdictional determination, ERO reviewed the proximity and potential surface water connection of wetlands to known jurisdictional WOTUS using aerial photo interpretation, landowner information, and information from the wetland survey. Potential WOTUS, including wetlands, identified in the project area are shown on Figure 2a through Figure 2f. Data were

collected in the project area to document the characteristics of uplands and potential wetlands. ERO applied the routine method by determining the plant community types in the project area and completed data forms for representative data points (DPs) in each community type. Wetland determination data forms from the Regional Supplement were completed for each representative DP to determine which community types were wetlands (Appendix B). Where wetlands bordered uplands, data were collected from a set of upland and wetland DPs, which determined indicators of the boundary between wetlands and nonwetlands. Each DP was assigned a unique label. Five DPs were completed in the wetland delineation area (DP1 through DP5) and were given labels that correspond to a location shown on Figure 2e and Figure 2f and a routine wetland determination form (Appendix B).

The following sections contain information on potential surface water connections of wetlands and other WOTUS in the project area.

Project Area Conditions

ERO assessed the project area for potential isolated wetlands, jurisdictional wetlands, and other WOTUS. Drainage 1 and Box Elder Creek were identified as occurring in the project area during the 2024 site visit (Figure 2e and Figure 2f). Drainage 1 and Box Elder Creek in the project area are shown on the National Hydrography Dataset (NHD) and the USGS Watkins and Watkins Southeast topographic quadrangle map as an intermittent stream and perennial artificial path/sandy wash, respectively. Directly south of the project area, Box Elder Creek is classified as an intermittent stream.

During the 2024 site visit, Drainage 1 was dominated by western wheatgrass (upland species) and did not contain any characteristics of a WOTUS such as a defined channel bed and bank, OHWM, and wetlands (Figure 2e; Photo 5).

Box Elder Creek in the project area contained an OHWM and wetlands during the 2024 site visit. The wetlands in and along Box Elder Creek occur in the southern portion of the project area and were dominated by reed canarygrass and Nebraska sedge during the 2024 site visit (Figure 2f; Photo 7 through Photo 11). ERO understands portions of Box Elder Creek have been previously determined nonjurisdictional.

Wetlands and WOTUS

During the 2024 site visit, ERO mapped a total of 3.946 acres of wetlands and 4.931 acres of OHWM in and directly adjacent to the project area. Within the project area, ERO mapped 0.283 acre of wetlands and 0.432 acre of OHWM. The wetlands in the project area that occur in and along the channel of Box Elder Creek are likely primarily supported by surface water from flows in Box Elder Creek and groundwater. The wetlands occurring in Box Elder Creek in the project area consist primarily of emergent wetlands.

Vegetation

The dominant species in the wetlands along Box Elder Creek consisted of reed canarygrass (facultative wetland [FACW]) and Nebraska sedge (obligate [OBL]) (DP2 and DP4). The vegetation at DP2 and DP4

met the dominance test for hydrophytic vegetation. The dominant species in the uplands consisted of western wheatgrass (facultative upland [FACU]) and smooth brome (upland) (DP1, DP3, and DP5). The vegetation at DP1, DP3, and DP5 did not meet any of the hydrophytic vegetation indicators.

Soils

Data were collected from five locations in the project area – two in wetlands (DP2 and DP4) and three uplands (DP1, DP3, and DP5). Soils at DP2 had a matrix color of 10YR 5/2 from 0 to 6 inches and matrix colors of 10YR 5/1 and 10YR 3/1 from 6 to 12 inches. DP2 met the depleted matrix hydric soil indicator. Soils at DP4 had a matrix color of 10YR 5/3 from 0 to 2 inches, a matrix color of 10YR 5/2 with a redox concentration of 7.5YR 5/8 from 2 to 4 inches, a matrix color of 10YR 5/2 with a redox concentration of 7.5YR 5/8, and a matrix color of 10YR 2/1 from 4 to 10 inches. DP4 met the depleted matrix hydric soil indicator. Soils at DP1 had a matrix color of 10YR 3/2 from 0 to 4 inches. DP1 did not meet any hydric soil indicators. Soils at DP3 were assumed nonhydric due to the lack of hydrology indicators and the dominance of upland species. Soils at DP5 had a matrix color of 10YR 5/4 from 0 to 3 inches and a matrix color of 10YR 2/2 from 3 to 10 inches. DP5 did not meet any hydric soil indicators. Soils at DP1, DP3, and DP5 did not meet any of the hydric soil indicators.

Hydrology

No primary hydrology indicators were observed at DP1. Secondary indicators observed at DP1 included geomorphic position. Primary hydrology indicators observed at DP2 included sediment deposits. Secondary hydrology indicators observed at DP2 included geomorphic position and a successful FAC neutral test. No primary or secondary hydrology indicators were observed at DP3. Primary hydrology indicators observed at DP4 included a high-water table, saturation, and sediment deposits. Secondary hydrology indicators were also observed at DP4 and included geomorphic position and a successful FAC neutral test. Primary hydrology indicators observed at DP5 included sediment deposits. Secondary hydrology indicators were also observed at DP4 and included geomorphic position.

Recommendations

Based on observations during the 2024 site visit, Drainage 1 was classified as an upland vegetated swale and did not contain characteristics of a WOTUS; therefore, no further action is necessary regarding Drainage 1. During the 2024 site visit, Box Elder Creek and its associated wetlands in the project area contained wetlands and an OHWM. Rangeview is in discussion with the U.S. Army Corps of Engineers (Corps) to determine the jurisdictional status of this segment of Box Elder Creek. If the Corps determines Box Elder Creek to be a jurisdictional WOTUS, a Clean Water Act Section 404 permit will be required for the placement of dredged or fill material in the wetlands or below the ordinary high water mark of Box Elder Creek**.** If this segment of Box Elder Creek is determined nonjurisdictional, then no Section 404 permit would be required from the Corps; however, authorization from the State of Colorado would be required if permanent impacts exceeded 0.10 acre to wetlands or 0.03 acre to streambed.

Threatened, Endangered, and Candidate Species

ERO assessed the project area for potential habitat for threatened, endangered, and candidate species under the Endangered Species Act (ESA). Federally listed threatened and endangered species are protected under the ESA of 1973, as amended (16 United States Code [U.S.C.] 1531 et seq.). Significant adverse effects on a federally listed species or its habitat require consultation with the Service under Section 7 or Section 10 of the ESA. The Service lists several threatened and endangered species with potential habitat in Arapahoe County or that would be potentially affected by projects in Arapahoe County (Table 1)

Table 1. Federally listened threatened, endangered, and candidate species potentially found in Arapahoe County or potentially affected by projects in Arapahoe County.

Common Name	Scientific Name	Status*	Habitat	Habitat Present
Mammals				
Preble's meadow jumping mouse (Preble's)	*Zapus hudsonius preblei*	T	Shrub riparian/wet meadows	No habitat
Tricolored bat (TCB)	*Perimyotis subflavus*	PE	Caves, abandoned mines, and road-associated culverts in the winter; forested habitats dominated by deciduous hardwood trees during the spring, summer, and fall	No habitat
Birds				
Piping plover**	*Charadrius melodus*	T	Sandy lakeshore beaches and river sandbars	No habitat and no depletions anticipated
Whooping crane**	*Grus americana*	E	Mudflats around reservoirs and in agricultural areas	No habitat and no depletions anticipated
Fish				
Pallid sturgeon**	*Scaphirhynchus albus*	E	Large, turbid, free-flowing rivers with a strong current and gravel or sandy substrate	No habitat and no depletions anticipated
Insects				
Monarch butterfly	*Danaus plexippus*	C	Dependent on milkweeds (*Asclepiadoideae*) as host plants and forage on blooming flowers; a summer resident	No habitat
Plants				
Ute ladies'-tresses orchid (ULTO)	*Spiranthes diluvialis*	T	Moist to wet alluvial meadows, floodplains of perennial streams, and around springs and lakes below 7,800 feet in elevation	No habitat
Western prairie fringed orchid**	*Platanthera praeclara*	T	Mesic and wet prairies, sedge meadows	No habitat and no depletions anticipated

*T = Federally Threatened Species; E = Federally Endangered Species; C = Candidate Species; PE = Proposed Endangered Species.
**Water depletions in the South Platte River may affect the species and/or critical habitat in downstream reaches in other counties or states.
Source: (Service 2024).

The proposed project would not directly affect the monarch butterfly because of the lack of habitat in the project area. The piping plover, whooping crane, pallid sturgeon, and western prairie fringed orchid are species that are affected by depletions to the Platte River system. Based on ERO's knowledge of the types of activities likely to be implemented as part of development of the project area, there would be no direct depletions to the South Platte River.

The TCB has been documented in Weld County and Adams County (Adams et al. 2018). The TCB has not been documented in Arapahoe County. While it is possible that the TCB could, at some point, become established in Arapahoe County, it is unlikely that the project would result in significant effects on suitable (contiguous) forested bat habitat. Furthermore, as a proposed species, TCBs are not currently protected under federal regulation.

Habitat for Preble's and ULTO is generally more prevalent in areas across the Front Range. Because these species are more likely to be addressed by local, state, and federal regulatory agencies, such as the Corps, a more detailed discussion is provided in the *Preble's Meadow Jumping Mouse* section and *Ute Ladies'-Tresses Orchid* section below.

Preble's Meadow Jumping Mouse

Species Background

Preble's was listed as a threatened species on May 13, 1998. Several petitions to delist Preble's have been filed with the Service since 2011. On March 30, 2017, a petition to delist Preble's was filed; the Service found that the petition did not present substantial scientific or commercial information indicating that delisting Preble's may be warranted (Service 2018). The Service refers to this finding as a "not substantial" petition finding (2018). On August 10, 2018, the Service announced the initiation of a 5-year status review for Preble's (Service 2018b). Until the completion of this 5-year finding, Preble's remains protected under the ESA. Preble's is found along the foothills of southeastern Wyoming and southward, along the eastern edge of the Colorado Front Range, to Colorado Springs (Clark and Stromberg 1987; Fitzgerald, Meaney, and Armstrong 1994). The semiarid climate in southeastern Wyoming and eastern Colorado limits the extent of riparian corridors and, therefore, restricts Preble's range, which is associated with these corridors.

Along Colorado's Front Range, Preble's is found below 7,800 feet in elevation, generally in lowlands with medium to high moisture along permanent or intermittent streams. Preble's prefer riparian areas featuring well-developed, multistoried, and horizontal cover with an understory of grasses and forbs (David M. Armstrong et al. 1997b; 1997a). Preble's typically inhabits areas characterized by plains riparian vegetation with relatively undisturbed grassland and a water source nearby (D. M. Armstrong, Fitzgerald, and Meaney 2011). High-use areas for Preble's tend to be close to creeks and are associated with a high percentage of shrubs, grasses, and woody debris (Trainor, Shenk, and Wilson 2007). Previous studies have suggested that Preble's may have a wider ecological tolerance than previously thought and that the requirement for diverse vegetation and well-developed cover can be met under a variety of circumstances (Meaney et al. 1997). Radio-tracking studies conducted by Colorado Parks and Wildlife

(CPW) have documented Preble's using upland habitat adjacent to wetlands and riparian areas (Shenk and Sivert 1999). Additional research by CPW has suggested that habitat quality for Preble's can be predicted by the amount of shrub cover available at a site (White and Shenk 2000). Mountain riparian sites may be surrounded by dense forest vegetation (such as ponderosa pine in Colorado), and sites on the plains have less woody vegetation.

Suitable Habitat and Effects

During the 2024 site visit, ERO assessed the project area for potential Preble's habitat. Portions of Box Elder Creek in and adjacent to the project area support riparian vegetation communities, which are potential Preble's habitat. Sandbar willow shrubs occur intermittently along Box Elder Creek in the project area and may provide the forage and cover that Preble's requires; however, portions of the riparian corridor and the areas surrounding the ditches have been heavily disturbed by cattle grazing activities. Additionally, the closest known Preble's capture locations are approximately 19 river miles southeast of the project area along Hay Gulch (Meaney et al. 1997).

Recommendations

Under existing regulations, some level of consultation with the Service for Preble's is required for any habitat-disturbing activities in areas determined to be potential Preble's habitat (generally riparian habitat along streams and ditches along the Colorado Front Range). Because of the riparian vegetation along portions of Box Elder Creek in the project area, there is potential for Preble's to be present in the project area. Should the project involve habitat-disturbing activities in wetland or riparian habitat, consultation with the Service would be required. If Box Elder Creek is determined to be nonjurisdictional, ERO recommends submitting a habitat assessment to the Service requesting confirmation that the project area is unlikely to support Preble's due to the distance of the project area from known Preble's populations and the level of cattle grazing activities in the project area and that the project would not affect the continued existence of Preble's. If a formal habitat assessment is not submitted to the Service and a Section 404 permit is required, ERO recommends including the above information regarding potential Preble's habitat in the project area to the Corps to assist with ESA compliance as part of the CWA Section 404 approval process.

Ute Ladies'-Tresses Orchid

Species Background

ULTO is federally listed as threatened. ULTO occurs at elevations below 7,800 feet in moist to wet alluvial meadows, floodplains of perennial streams, and around springs and lakes where the soil is seasonally saturated within 18 inches of the surface (Colorado Natural Heritage Program 2014); (Service 1992a). This species has also been found along irrigation canals, irrigated meadows, gravel pits, and other human-modified wetlands (Service 2019). Once thought to be fairly common in low-elevation riparian areas in the interior western United States, ULTO is now rare (Service 1992a). Known ULTO range is from Nevada to British Columbia. The largest known populations occur in Utah, followed by Colorado (NatureServe 2023).

In Colorado, the Service requires surveys in suitable habitat within the 100-year floodplain segments of the South Platte River, Fountain Creek, and Yampa River and their perennial tributaries, or in any area with suitable habitat in Boulder and Jefferson Counties. Since the protocols were submitted in 1992, ULTO has been found along the Roaring Fork River. Therefore, surveys should be conducted in suitable habitat in the floodplain of the Roaring Fork River and its tributaries. ULTO does not bloom until late July to early September (depending on the year), and the timing of surveys must be synchronized with blooming (U.S. Fish and Wildlife Service 1992b).

Suitable Habitat and Effects

During the 2024 site visit, ERO assessed the project area for potential ULTO habitat. The wetland vegetation found in the project area is dominated by reed canarygrass and some Nebraska sedge; Nebraska sedge is a species typically associated with ULTO habitat. Additionally, Box Elder Creek is classified as a perennial stream in the project area, and any perennial streams in Arapahoe County are potential ULTO habitat; therefore, Box Elder Creek in the project area does fall with the survey guidelines for potential ULTO habitat (Service 1992b). However, it is unlikely ULTO is present in the project area given the high level of cattle grazing on the property and dense stands of reed canarygrass in the wetlands.

Recommendations

If any work is planned in the wetlands and Box Elder Creek is determined nonjurisdictional, ERO recommends submitting a habitat assessment to the Service requesting confirmation that the project area is unlikely to support ULTO and that the proposed project is unlikely to adversely affect ULTO. If a formal habitat assessment is not submitted to the Service, ERO recommends including the above information regarding potential ULTO habitat in the project area to the Corps to assist with ESA compliance as part of the CWA Section 404 approval process.

Other Species and Habitats of Concern

Black-Tailed Prairie Dog

Species Background

The black-tailed prairie dog is a Colorado species of special concern (CPW 2021a). Black-tailed prairie dogs are important components of the short and mesic grasslands systems. Threats to this species include habitat loss and degradation, habitat fragmentation, disease (sylvatic plague), and lethal control activities. Typically, areas occupied by prairie dogs have greater cover and abundance of perennial grasses and annual forbs compared with unoccupied sites (Whicker and Detling 1988; Witmer et al. 2000).

Black-tailed prairie dogs are commonly considered a “keystone” species because their activities (burrowing and intense grazing) provide food and shelter for many other grassland species and have a large effect on community structure and ecosystem function (Power et al. 1996). Prairie dogs can contribute to overall landscape heterogeneity, affect nutrient cycling, and provide nest sites and shelter

for wildlife (Whicker and Detling 1988). Species, such as black-footed ferret, burrowing owl, prairie rattlesnake, and mountain plover, are closely linked to prairie dog burrow systems for food and cover. Prairie dogs also provide an important prey resource for numerous predators including American badger, coyote, red fox, bald eagle, golden eagle, ferruginous hawk, and other raptors. Prairie dogs also can denude the surface by clipping aboveground vegetation and contributing to exposed bare ground by digging up roots (Kuford 1958; Smith 1967).

Potential Habitat and Effects

ERO observed several active black-tailed prairie dog burrows in and adjacent to the northern portion of the project area along the eastern and western boundaries of South Imboden Road during the 2024 site visit (Figure 2a). Although prairie dogs are not protected under the ESA, CPW recommends attempting to remove or exterminate prairie dogs prior to bulldozing an active prairie dog town for humane reasons. Currently, Arapahoe County does not have any regulations or policies pertaining to prairie dogs.

Recommendations

If prairie dogs must be removed for any proposed activities, two options typically exist: relocation and extermination. Currently, relocation to other parts of Colorado is not an option due to limited resources for new populations, and CPW requires permits to move prairie dogs. Private companies can be hired to relocate prairie dogs, although relocation sites are difficult to secure. If extermination of prairie dogs is the only option, several independent companies provide treatments for prairie dog control. Prior to any work that would disturb a colony from March 1 through October 31, colonies should be surveyed for western burrowing owls. CPW recommends attempting to remove or exterminate prairie dogs prior to bulldozing an active prairie dog town for humane reasons.

Western Burrowing Owl

Species Background

The western burrowing owl (burrowing owl) (*Athene cunicularia*) is a small migrant owl listed by the state of Colorado as a threatened species (CPW 2021c) and is federally protected under the Migratory Bird Treaty Act (MBTA). Primary threats to the burrowing owl include habitat loss and fragmentation; anthropogenic sources of mortality, such as vehicular collisions; and loss of wintering grounds, largely in Mexico (McDonald, Korfanta, and Lantz 2004).

In general, burrowing owls are found in grasslands with vegetation less than 4 inches high and a relatively large proportion of bare ground (Gillihan and Hutchings 2000). In Colorado, burrowing owls are usually associated with black-tailed prairie dog colonies (Colorado Bird Atlas Partnership 2016; Andrews and Righter 1992). More than 70 percent of sightings reported in Colorado Breeding Bird Atlases were in prairie dog colonies (Colorado Bird Atlas Partnership 2016).

Burrowing owls usually arrive on their breeding grounds around mid-March to early April and remain until September (Haug and Oliphant 1990). Burrowing owls are typically present in Colorado from March

15 through October 31, with breeding from mid-April through early/mid-August (Andrews and Righter 1992; Colorado Bird Atlas Partnership 2016). CPW suggests conducting burrowing owl clearance surveys in prairie dog towns that are subject to poisoning or construction projects during the period from March 15 through October 31 (CPW 2021c).

Potential Habitat and Effects

The prairie dog burrows in and adjacent to the northern portion of the project area are potential habitat for burrowing owls. Inadvertent killing of burrowing owls could occur during prairie dog poisoning, construction, or earthmoving projects during the breeding period as well as up to a month before egg laying and several months after young have fledged. CPW has a recommended buffer of 0.125 mile (660 feet) surrounding active burrowing owl nests during the March 15 through August 31 nesting season (CPW 2021c). Burrowing owls could be impacted by the project if work would occur within CPW's recommended 660-foot buffer of any burrows.

Recommendations

A burrowing owl survey should be conducted if work would occur within the recommended buffer of any burrow from March 15 through October 31. Additionally, CPW recommends conducting burrowing owl clearance surveys in prairie dog towns that are subject to poisoning and construction projects during this period (March 15 through October 31) (CPW 2021c). If burrowing owls are present within 660 feet of the project area, activities should be restricted until the owls have migrated from the site, which can be determined through monitoring. Construction occurring from November 1 through March 14 would not require clearance surveys.

Raptors and Migratory Birds

Migratory birds, as well as their eggs and nests, are protected under the MBTA. The MBTA does not contain any prohibition that applies to the destruction of a bird nest alone (without birds or eggs), provided that no possession occurs during the destruction. While destruction of a nest by itself is not prohibited under the MBTA, nest destruction that results in the unpermitted take of migratory birds or their eggs is illegal and fully prosecutable under the MBTA (Service 2003). The regulatory definition of a take means to pursue, hunt, shoot, wound, kill, trap, capture, or collect; or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect (50 CFR 10.12).

Under the MBTA, the Service may issue nest depredation permits, which allow a permittee to remove an active nest. The Service, however, issues few permits and only under specific circumstances, usually related to human health and safety. Obtaining a nest depredation permit is unlikely and involves a process that takes, at a minimum, 8 to 12 weeks. The best way to avoid a violation of the MBTA is to remove vegetation outside of the active breeding season, which typically falls between March and August, depending on the species. MBTA enforcement actions are typically the result of a concerned member of the community reporting a violation.

CPW maintains a leadership role with respect to raptor management in Colorado; however, the primary authority for the regulation of take, and the ultimate jurisdiction for most of these species, rests with the Service under the MBTA and the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c).

Potential Habitat and Effects

ERO surveyed the project area for nests during the 2024 site visit. Additionally, prior to field work, ERO reviewed the CPW nest database for any known nests in the project area (Colorado Parks and Wildlife 2023). ERO did not observe any active migratory bird nests during the 2024 site visit; however, a wide variety of bird species use different habitat types in the project area and nearby riparian habitat bordering Box Elder Creek for shelter, breeding, wintering, and foraging at various times during the year. Riparian vegetation, wetlands, and upland grasslands in and adjacent to the project area are potential nesting habitat for migratory birds.

Recommendations

Although no active nests were observed during the 2024 site visit, ground-nesting birds and arboreal nests are difficult to detect and may be present in the grasslands and trees in the project area. To avoid destruction of potential migratory bird nests, vegetation removal should be conducted outside of the April 1 through August 31 breeding season. Based on the proposed construction schedule provided to ERO by Rangeview, construction of the project is scheduled to begin outside of the nesting and breeding season and surveys for migratory birds will not be required. If construction gets delayed and does occur in the nesting and breeding season, ERO recommends a nest survey be conducted within one week prior to construction to determine if any active nests are present in the project area so they can be avoided. If active nests are found, any work that would destroy the nests should not be conducted until the birds have vacated the nests.

Both the Eastern Colorado Field Office of the Service (Service 2022) and the Colorado Department of Transportation (CDOT) (CDOT 2011) have identified the primary nesting season for migratory birds in eastern Colorado as occurring from April 1 through August 31. However, a few species, such as bald eagles, great horned owls, and red-tailed hawks, can nest as early as December (eagles) or late February (owls and red-tailed hawks). Because of variability in the breeding seasons, ERO recommends that a nest survey be conducted within one week prior to construction to determine if any active nests are present in the project area so that they can be avoided. Additional nest surveys during the nesting season may also be warranted to identify active nesting species that may present additional development timing restrictions (e.g., eagles or red-tailed hawks).

If active nests are identified in or near the project area, activities that would directly affect the nests should be restricted. Habitat-disturbing activities (e.g., tree removal, grading, scraping, and grubbing) should be conducted during the nonbreeding season to avoid disturbing active nests, or to avoid a "take" of the migratory bird nests in the project area. Nests can be removed during the September 1 through March 31 nonbreeding season to preclude future nesting and avoid violations of the MBTA. There is no process for removing nests during the nonbreeding season; however, nests may not be collected under MBTA regulations. If the construction schedule does not allow vegetation removal

outside of the breeding season, a nest survey should be conducted immediately prior to vegetation removal to determine if the nests are active and by which species. If active nests are found, any work that would destroy the nests or cause the birds to abandon young in the nest could not be conducted until the birds have vacated the nests.

High Priority Habitat and Big Game

In 2021, CPW released a High Priority Habitat (HPH) table that identifies species and habitats as well as recommendations to avoid and minimize impacts on wildlife from land use development (CPW 2021b). ERO reviewed data from CPW map databases and determined that four HPH areas, Native Aquatic Species Conservation Waters, Mule Deer Migration Corridor, Mule Deer Winter Concentration Area, and Pronghorn Winter Concentration, overlap the project area (CPW 2021b). The Native Aquatic Species Conservation Waters HPH consists of all streams and/or lakes categorized by CPW as a Native Species Conservation Water, and CPW recommends no surface occupancy and no ground disturbance year-round within 500 feet of the OHWM of the stream and 0.5 mile of the OHWM of the lake (CPW 2021b). The HPH Mule Deer Migration Corridor, Mule Deer Winter Concentration Area, and Pronghorn Winter Concentration Area are discussed in more detail in the *Mule Deer* section and *Pronghorn* section below.

Aquatic Native Species Conservation Waters

Species Background

Aquatic native species are found throughout Colorado, wherever water resources are present. They are typically sensitive to changes in water quality factors such as temperature, dissolved oxygen, and turbidity. The health of a water resource can often be evaluated based on the presence or absence of certain aquatic species. A major threat to the aquatic native resources in Colorado is urban development which leads to consumptive water use and dams as well as aquatic nuisance species, which often outcompete native species for resources (CPW, n.d.).

Suitable Habitat and Effects

In the project area, Box Elder Creek coincides with the Aquatic Native Species Conservation Waters HPH (CPW 2021b). Box Elder Creek in the project area contained wetlands and open water during the 2024 site visit. The presence of water moving through Box Elder Creek provides suitable habitat for native species.

Recommendations

For any work conducted in areas mapped within the Aquatic Native Species Conservation Waters area associated with Box Elder Creek, ERO recommends contacting the local CPW district manager requesting concurrence that the proposed project would not likely affect native aquatic species. Any impacts on Box Elder Creek or its associated wetlands would require a Section 404 permit, which typically requires a combination of restoration and mitigation of impacts. Restoration or mitigation could provide resiliency to the Aquatic Native Species Conservation Waters area.

Mule Deer

Species Background

Mule deer (*Odocoileus hemionus*) are found in all ecosystems in Colorado from grasslands to alpine tundra. Spring and summer ranges are typically mosaics of meadows, aspen woodlands, alpine tundra-subalpine forest edges, or montane forest edges (Fitzgerald 1994). Seasonally, mule deer are relatively sedentary, although most will spend the summer at higher elevations and migrate to lower elevations in the winter. Mule deer diets vary seasonally but generally consist of browse from trees and shrubs, forbs, and grasses.

Potential Habitat and Effects

As discussed above, the project area overlaps Mule Deer Migration Corridor and Mule Deer Winter Concentration Area, which are designated as HPH (CPW 2021b). It is likely that mule deer forage and migrate through the project area year-round. Wildlife, including mule deer, could be temporarily displaced from the project area during construction.

Recommendations

For any work conducted within mule deer migration corridor or mule deer winter concentration areas, CPW recommends no permitted or authorized human activities be conducted from December 1 to April 30 (CPW 2021b); however, some construction may be allowable while protecting the identified resource values with special constraints. ERO recommends contacting the local CPW district manager. CPW recommends consultation with local CPW staff early in the planning phase of project proposals to assess and develop site-specific recommendations based on preexisting conditions.

Pronghorn

Species Background

The American pronghorn (*Antilocapra americana*) inhabits grasslands and semidesert shrublands on rolling topography that provides good visibility (Fitzgerald, Meaney, and Armstrong 1994). Pronghorn tend to favor vast expanses of open areas and are typically sensitive to human presence, including residential and commercial development and habitat loss (Sawyer and Lindzey 2000). Pronghorn primarily occupy grasslands, sagebrush plains, deserts, and foothills, and, in Colorado, pronghorn occur on the eastern plains, in large mountain parks and valleys, and in shrublands on the West Slope (Fitzgerald, Meaney, and Armstrong 1994, 199; NatureServe 2022). Big game wildlife species, such as deer and pronghorn, are considered economically important species in Colorado.

Pronghorn are considered browsers, typically feeding on sagebrush throughout the year in addition to leafy forage in summer (CPW 2017). They eat several plants that are unpalatable or toxic to livestock, which allows them to coincide in areas alongside cattle. Pronghorns generally live in social groups throughout the year (Byers 1997). Pronghorns typically mate in the fall from mid-September to mid-October, but, in the south, may start breeding as early as late July (CPW 2017; NatureServe 2022). In Colorado, pronghorn typically give birth in the first half of June (NatureServe 2022).

Potential Habitat and Effects

As discussed above, the project area overlaps a Pronghorn Winter Concentration Area, which is designated as HPH (CPW 2021b). It is likely that pronghorn forage and migrate through the project area year-round. Wildlife, including pronghorn, could be temporarily displaced from the project area during construction.

Recommendations

For any work conducted in Pronghorn Winter Concentration Areas, CPW recommends no permitted or authorized human activities be conducted from January 1 to April 30 (CPW 2021b); however, some construction may be allowable while protecting the identified resource values with special constraints. ERO recommends contacting the local CPW district manager. CPW recommends consultation with local CPW staff early in the planning phase of project proposals to assess and develop site-specific recommendations based on preexisting conditions.

Other Wildlife

The project area is surrounded by barbed wire fencing and is predominantly used for livestock and grazing. The project area and neighboring undeveloped area provide habitat for a variety of small mammals such as cottontail rabbits (*Sylvilagus* sp.), deer mice (*Peromyscus maniculatus*), voles (*Microtus* sp.), and pocket gophers (*Geomyidae*). Grassland habitat likely provides breeding habitat for numerous ground-nesting prairie bird species, and riparian ecosystems typically support many more species of native birds than surrounding grassland or shrubland communities (Knopf and Samson 1994). Additionally, Box Elder Creek and its riparian corridor in the project area likely provide foraging, sheltering, and dispersal habitat components for numerous species.

Carnivores, such as coyote (*Canis* sp.), raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), grey fox (*Urocyon cinereoargenteus*), and striped skunk (*Mephitis mephitis*), are also likely to occur in the project area. These species are typically observed in open grasslands and close to riparian corridors.

Additionally, the project area occurs in the overall range for black-tailed prairie dog, fringed myotis (*Myotis thysanodes*), little brown myotis (*Myotis lucifugus*), mountain lion (*Puma concolor*), mule deer, olive-backed pocket mouse (*Perognathus fasciatus*), Preble's, pronghorn, swift fox (*Vulpes velox*), white-tailed deer (*Odocoileus virginianus*), white-tailed jackrabbit (*Lepus townsendii*), and wild turkey (*Meleagris gallopavo*) (Natural Diversity Information Source (NDIS) 2021). Additionally, the project area occurs in bald eagle (*Haliaeetus leucocephalus*) winter concentration, winter range, and winter foraging area; burrowing owl breeding range; Canada goose (*Branta canadensis*) winter range and foraging area; golden eagle (*Aquila chrysaetos*) breeding range; mountain lion peripheral range; mule deer concentration area, migration corridor, winter concentration area, and winter range; pronghorn concentration area, winter concentration area, winter range, and perennial water; white-tailed deer concentration area and winter range; and wild turkey winter range (NDIS 2021). On the NDIS database, the project area is shown as a documented wildlife corridor for Mule Deer (NDIS 2021).

During the 2024 site visit, several white-tailed deer were observed in the riparian corridor of Box Elder Creek throughout the project area. It is likely that mule deer and white-tailed deer forage or migrate through the project area, and the project area is documented as a designated wildlife corridor for Mule Deer (NDIS 2021). During the 2024 site visit, several pronghorns were observed in the riparian corridor of Box Elder Creek throughout the project area. The proposed project may have a temporary impact on wildlife using the area during construction; however, due to the small footprint of the proposed project area, it is unlikely the project would have a long-term permanent impact on surrounding wildlife.

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Appendix A Photo Log

Photo Log
Natural Resources Assessment
Box Elder Creek Well Field 2 - East Quincy Avenue to County Road 194
Arapahoe County, Colorado
April 23, 2024

Photo 1 - Overview of uplands in the northern portion of the project area. View is to the southeast.

Photo 2 - Overview of uplands and active prairie dog colony in the northern portion of the project area. View is to the southeast.

Photo 3 - Overview of uplands in the northern portion of the project area. View is to the southeast.

Photo 4 - Overview of uplands in the central portion of the project area. View is to the southeast.

Photo 5 - Overview of Drainage 1 in the central portion of the project area. View is to the southwest.

Photo 6 - Overview of uplands in the riparian corridor along the eastern boundary of Box Elder Creek in the southern portion of the project area. View is to the west.

Photo 7 - Overview of wetlands along Box Elder Creek in the southern portion of the project area. View is to the south.

Photo 8 - Overview of wetlands along Box Elder Creek in the southern portion of the project area. View is to the south.

Photo 9 - Overview of wetlands along Box Elder Creek in the southern portion of the project area. View is to the northeast.

Photo 10 - Overview of wetlands along Box Elder Creek in the southern portion of the project area. View is to the west.

Photo 11 - Overview of Box Elder Creek in the southern portion of the project area. View is to the south.

Appendix B Routine Wetland Determination Forms

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Box Elder Well Field 2 City/County: Arapahoe County Sampling Date: 4/23/2024

Applicant/Owner: Rangeview Metro District State: CO Sampling Point: DP1

Investigator(s): A. Wistrom and M. Russo Section, Township, Range: SW 1/4 NW 1/4 Section 27, T5S, R64W

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

Subregion (LRR): G Lat: 39.586702°N Long: -104.545475°W Datum: NAD83

Soil Map Unit Name: NIB, Nunn loam, 0 to 3 percent slopes NWI classification: N/A

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

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

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

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

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

Remarks:

Ephemeral upland vegetated swale east of Box Elder Creek

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. Pascopyrum smithii	90	Y	FACU
2. Panicum virgatum	3	N	FAC
3. Bouteloua gracilis	3	N	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	96 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 4

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

SOIL

Sampling Point: DP1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					ClLo	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: hard/dry upland soil surface

Depth (inches): 4 inches

Hydric Soil Present? Yes ☐ No ☒

Remarks:

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)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Box Elder Well Field 2 City/County: Arapahoe County Sampling Date: 4/23/2024

Applicant/Owner: Rangeview Metro District State: CO Sampling Point: DP2

Investigator(s): A. Wistrom and M. Russo Section, Township, Range: NE 1/4 SW 1/4 Section 27, T5S, R64W

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

Subregion (LRR): G Lat: 39.585516°N Long: -104.540110°W Datum: NAD83

Soil Map Unit Name: Su, Sandy alluvial land NWI classification: N/A

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

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

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

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

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

Remarks:

PEM floodplain bench wetland along Box Elder. Cattle grazing along Box Elder throughout project area.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. Carex nebrascensis	25	Y	OBL
2. Phalaris arundinacea	25	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	50 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 50

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: DP2

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
0-6	10YR 5/2	100					Sand	
6-12	10YR 5/1	40					SaLo	
	10YR 3/1	60					SaLo	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Active floodplain with recent sand deposition.

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)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 6 inches

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

Saturation present at 6 inches with no water table. Active floodplain with recent sand deposition.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Box Elder Well Field 2 City/County: Arapahoe County Sampling Date: 4/23/2024

Applicant/Owner: Rangeview Metro District State: CO Sampling Point: DP3

Investigator(s): A. Wistrom and M. Russo Section, Township, Range: NE 1/4 SW 1/4 Section 27, T5S, R64W

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

Subregion (LRR): G Lat: 39.585553°N Long: -104.540318°W Datum: NAD83

Soil Map Unit Name: Lv, Loamy alluvial land NWI classification: N/A

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

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

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

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

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

Remarks:

Upland paired point for floodplain bench wetland (DP2) along Box Elder Creek. Cattle grazing throughout project area.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. Bromus inermis	60	Y	UPL
2. Bassia scoparia	10	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 30

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

SOIL

Sampling Point: DP3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

Did not dig a soil pit due to dominance of upland vegetation and lack of wetland hydrology indicators

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)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Box Elder Well Field 2 City/County: Arapahoe County Sampling Date: 4/23/2024

Applicant/Owner: Rangeview Metro District State: CO Sampling Point: DP4

Investigator(s): A. Wistrom and M. Russo Section, Township, Range: NE 1/4 SW 1/4 Section 27, T5S, R64W

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

Subregion (LRR): G Lat: 39.584805°N Long: -104.539923°W Datum: NAD83

Soil Map Unit Name: Su, Sandy alluvial land NWI classification: N/A

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

Are Vegetation Y, Soil Y, 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 [X] No [ ]	**Is the Sampled Area within a Wetland?** Yes [X] No [ ]
Hydric Soil Present?	Yes [X] No [ ]	
Wetland Hydrology Present?	Yes [X] No [ ]	

Remarks:

PEM wetland along Box Elder. Cattle grazing along Box Elder throughout project area.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	95	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

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:

SOIL

Sampling Point: DP4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 5/3	100					Sand	
2-4	10YR 5/2	95	7.5YR 5/8	5	C	M	Sand	
4-10	10YR 5/2	20	7.5YR 5/8	5	C	M	Sand	
	10YR 2/1	75					SaClLo	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Active floodplain with recent sand deposition. Cattle grazing throughout floodplain bench.

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)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

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

Water Table Present? Yes ☒ No ☐ Depth (inches): 4 inches

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): surface

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

Active floodplain with sand deposition.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Box Elder Well Field 2 City/County: Arapahoe County Sampling Date: 4/23/2024

Applicant/Owner: Rangeview Metro District State: CO Sampling Point: DP5

Investigator(s): A. Wistrom and M. Russo Section, Township, Range: NE 1/4 SW 1/4 Section 27, T5S, R64W

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

Subregion (LRR): G Lat: 39.584612°N Long: -104.539256°W Datum: NAD83

Soil Map Unit Name: Su, Sandy alluvial land NWI classification: Riverine

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

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

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

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

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

Remarks:

Riparian corridor dominated by plains cottonwood trees along Box Elder. Cattle grazing throughout project area.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1. Populus deltoides	45	Y	FAC
2.			
3.			
4.			
	45	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: 5')			
1. Bromus inermis	75	Y	UPL
2. Euphorbia esula	2	N	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	77	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 23

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	45	x 3 =	135
FACU species		x 4 =	
UPL species	77	x 5 =	385
Column Totals:	122 (A)		520 (B)

Prevalence Index = B/A = 4.26

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

SOIL

Sampling Point: DP5

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 5/4	100					Sand	
3-10	10YR 2/2	100					LoSa	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

Active floodplain with recent sand deposition.

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)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

Active floodplain with sand deposition.