APPENDIX D

Wetland Finding

Wetland Finding

PREPARED FOR: Colorado Department of Transportation

PREPARED BY: CH2M HILL

PROJECT: 158128; IM 0251-156; SA 12831

DATE: July 22, 2010

Introduction

The following is a wetland finding for the New Pueblo Freeway Project (IM-0251-156) and has been written in compliance with Executive Order 11990, *Protection of Wetlands* and is in accordance with 23 Code of Federal Regulations (CFR) 771, 23 CFR 777, and Technical Advisory T6640.8A. These regulations require that impacts to wetlands will be avoided wherever possible and minimized to the extent practicable. The Colorado Department of Transportation (CDOT) requires mitigation for all wetlands including non-jurisdictional wetlands.

CDOT proposes to reconstruct Interstate 25 (I-25) through portions of Pueblo (see Project Description below). The environmental review for this project is being conducted through the National Environmental Policy Act (NEPA) Environmental Impact Statement (EIS) process.

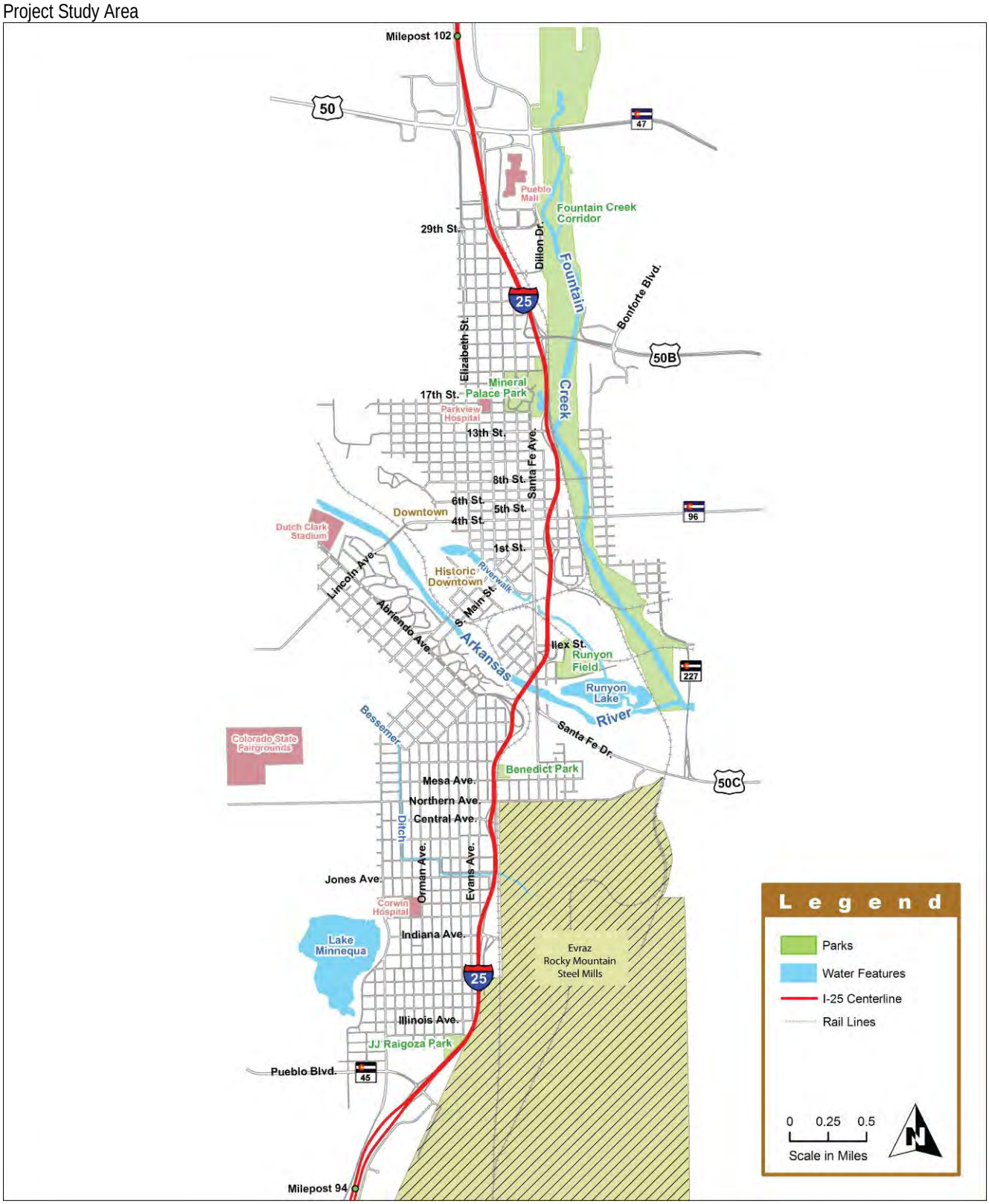
Project Location

The project area is located in the City of Pueblo, Pueblo County, Colorado. The project area extends along I-25 from just north of the United States Highway 50 (US 50)/State Highway (SH) 47 interchange (approximately milepost 102) to Pueblo Boulevard on the south side of Pueblo (approximately milepost 94). Specifically, the project is located in portions of Sections 24, 25, and 36, Township 20 South, Range 65 West; Sections 1, 12, 13, 23, and 24, Township 21 South, Range 65 West; Sections 19, 30 and 31, Township 20 South, Range 64 West; and Section 6, Township 21 South, Range 64 West on the United States Geological Survey 7.5-minute Northeast Pueblo and Southeast Pueblo quadrangle maps. The project area is illustrated on Exhibit 1

Project Description

The Federal Highway Administration (FHWA), in cooperation with CDOT, is preparing an EIS for the New Pueblo Freeway project, a proposal to improve a 7-mile segment of I-25 through Pueblo, Colorado. The proposed improvements include adding an additional lane to each direction of travel as well as interchange improvements. The proposed improvements are necessary to address a deteriorating roadway and bridges with inadequate geometrics, safety issues, and to accommodate existing and future traffic demand.

EXHIBIT 1
Project Study Area



Exhibits 2 through 4 show a plan view of the project area with wetland locations indicated.

Project Alternatives

Project Need

The purpose of the New Pueblo Freeway project is to improve safety by addressing deteriorating roadways and bridges and unsafe road characteristics on I-25 and improve local and regional mobility within and through the City of Pueblo to meet existing and future travel demands. I-25 within the project area contains high accident rates that exceed state averages, segments with narrow lanes, areas where shoulders are too narrow to safely accommodate a broken down vehicle, on and off ramps with inadequate lengths to maneuver vehicles, and inadequate spacing of interchanges to safely merge into highway traffic. In addition, there are interchanges that do not connect to appropriate city streets, areas of reduced speed, segments with congestion and a poor level of service, aging bridges with inadequate bridge sufficiency ratings, and conflicts with local and regional travel.

Alternatives

Alternatives under consideration include taking no action (No Action Alternative), reconstruction of the interstate on essentially the existing alignment (Existing I-25 Alignment Alternative), and reconstruction of the interstate on existing and new alignments (Modified I-25 Alignment Alternative). The alternatives are further described as follows:

- **No Action Alternative –** This alternative provides only for minor improvements, repairs, and other maintenance actions. The existing four-lane highway will otherwise remain unchanged.
- **Existing I-25 Alignment Alternative –** This alternative consists of reconstructing I-25 to six lanes on essentially the same location, reconfiguring and eliminating access points to the interstate to improve safety, and providing other improvements to the local street system to enhance system connectivity and traffic movement near the interstate.
- **Modified I-25 Alignment Alternative –** This alternative consists of rebuilding I-25 to six lanes and providing the other improvements included in the Existing Alignment Alternative, except the alignment would be shifted to accommodate different interchange configurations.

Avoidance and Minimization

Project impacts have been minimized to the extent practicable by locating the majority of the existing and modified alignments within the current alignment, and avoiding wetlands where feasible. New fill slopes have been steepened to 3:1 and the use of retaining walls will also be incorporated into the design in some locations to prevent new fill slopes from extending into wetland areas. This slope will allow vegetation to become established but will not pose a safety hazard to the motoring public. The alignment was shifted to the extent possible to reduce construction impacts into wetland areas.

Complete avoidance of wetlands was not possible. The project area is located in a highly urbanized corridor, with little room available to accommodate shifts in alignment due to the close proximity of residential and commercial structures. In some cases, avoiding wetlands would cause residential and commercial displacements and was not considered practicable. In other areas, wetlands exist along both sides of the roadway.

EXHIBIT 2
Wetlands in the North Area

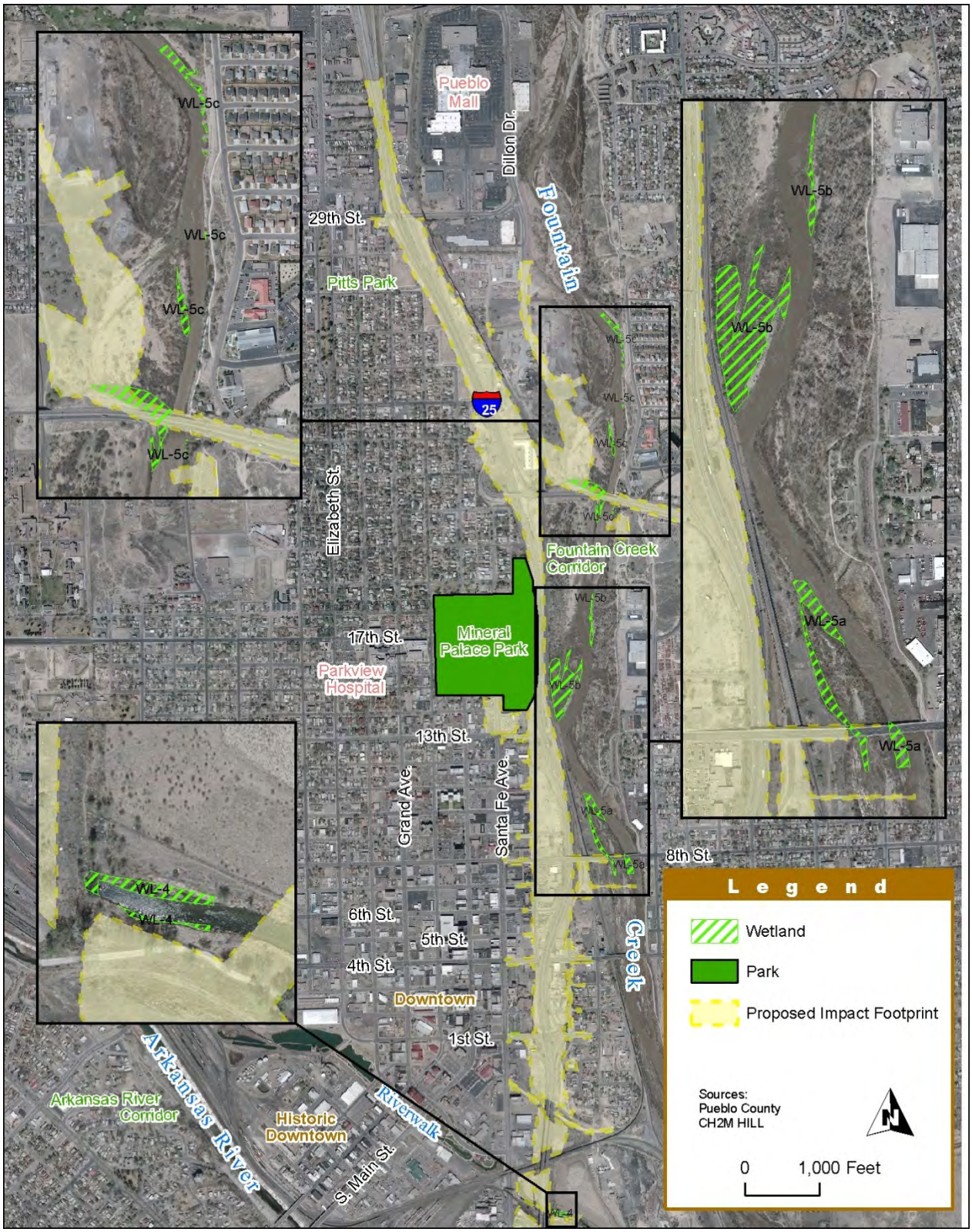


EXHIBIT 3A
Wetlands in the Central Area (Exisiting I-25 Alternative)

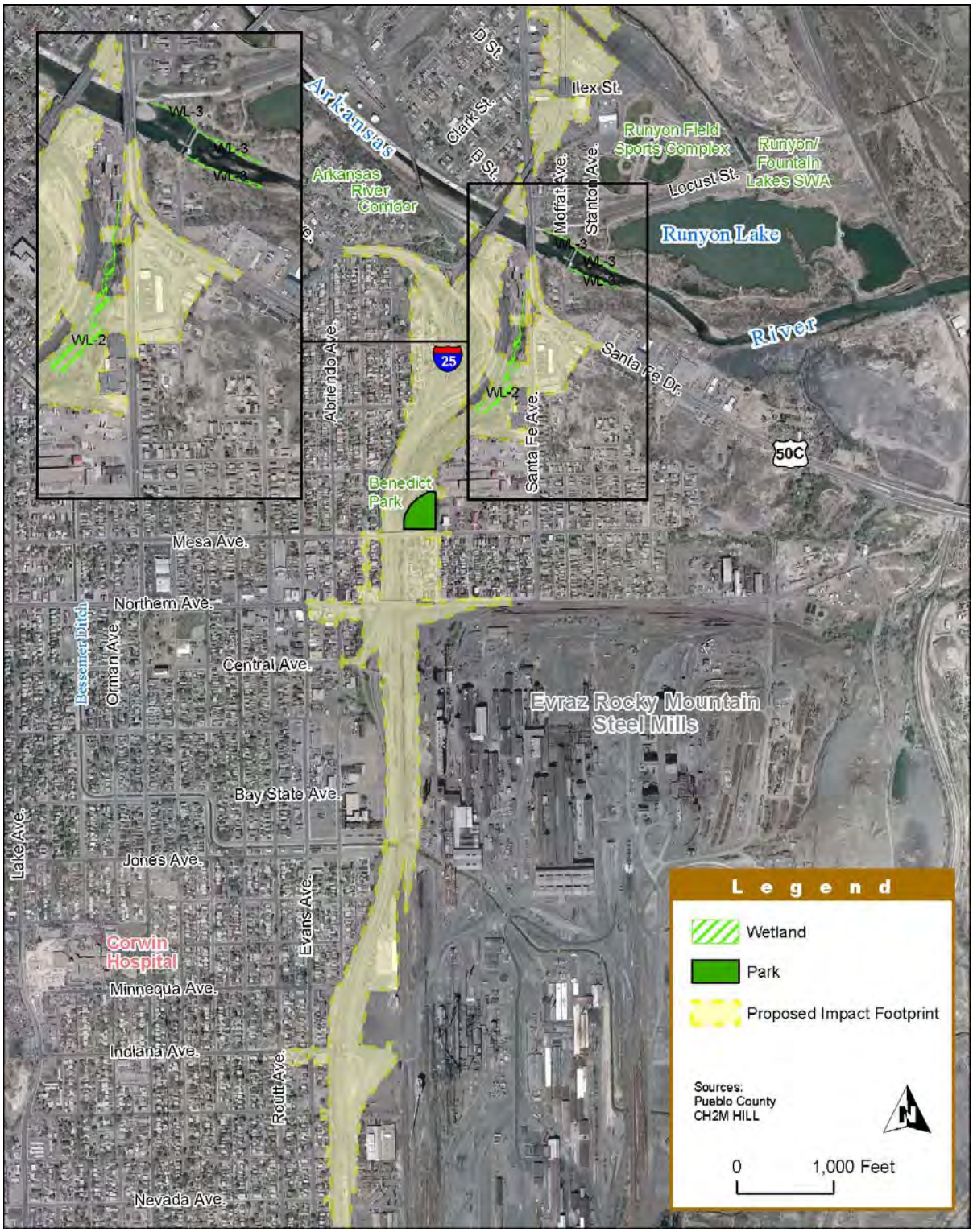


EXHIBIT 3B
Wetlands in the Central Area (Modified I-25 Alternative)

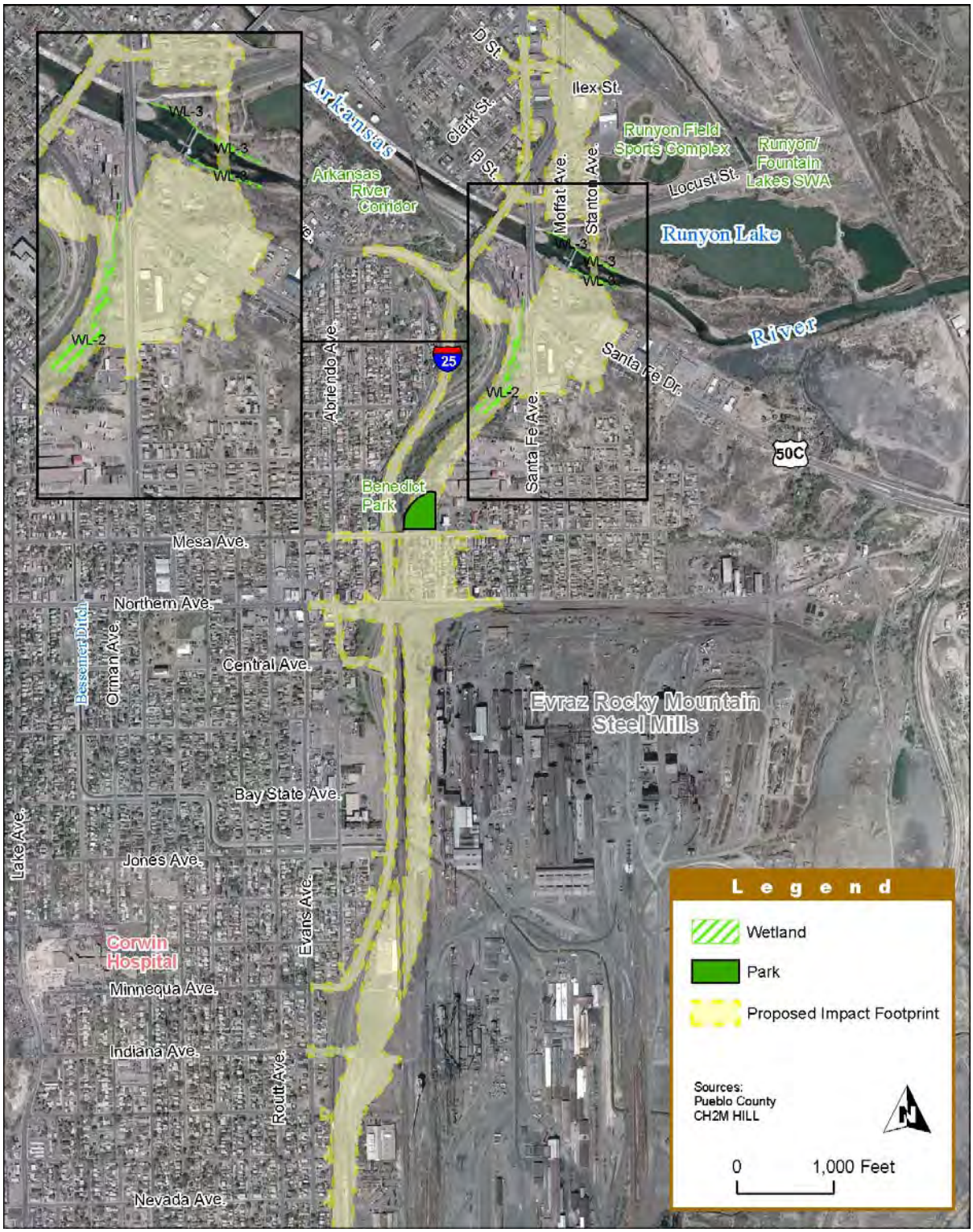


EXHIBIT 4
Wetlands in the South Area

Temporary and Indirect Impacts

Temporary impacts may occur during construction activities for either build alternative. These impacts may include sedimentation, increased turbidity, and runoff. Best management practices (BMP) will be used to control erosion and sedimentation during construction. In addition to construction BMPs, temporary impacts due to construction activities will be managed and minimized by the following actions:

- Construction impact boundaries will be clearly marked. Wetlands outside the authorized temporary impact areas will be clearly marked and fenced (silt fence) to prevent disturbance during construction.
- Excavated materials will be removed to a stabilized upland site to prevent erosion back into the wetland areas.
- Onsite storage of hazardous construction materials including fuels and oils will be located away from wetland and riparian areas to minimize the potential for spills or leaching into aquatic habitats.
- Compliance inspections during construction are recommended to ensure adherence to BMPs, including erosion and sedimentation controls, and minimization of construction impacts.
- All areas temporarily disturbed by construction activities will be restored and revegetated.
- Removal of all salt cedar and Russian olive within the construction area.

Wetlands

A field survey of the project area was conducted in September and October 2003 to verify the presence or absence of potential wetlands areas identified during the review of existing data and to identify any additional wetland areas located with the project area. Delineations were performed by Jessie Gourlie and John DuWalt. Wetlands in the study area were identified and boundaries delineated in accordance with the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (USACE, 1987). The wetland areas identified in the project area were classified according to Cowardin. Jurisdictional status and delineation boundaries were confirmed in the field by the USACE. Jurisdictional boundaries were recorded using a Trimble Geo XT GPS, which can record position data to sub-meter accuracy. Data were converted to GIS, and plotted on maps of the project area.

Prior to field surveys, study area boundaries and potential wetland areas were mapped on the United States Geological Survey (USGS) quadrangle maps (Northeast Pueblo 1974; Southeast Pueblo 1974) and recent aerial photographs using Geographic Information System (GIS) technology. National Wetlands Inventory (NWI) maps and the Pueblo County Soil Survey (United States Department of Agriculture, 1979) were also reviewed.

The Arkansas River and Fountain Creek are the prominent water features in the project area and are the primary sources of hydrology for area wetlands. To a lesser extent, groundwater seepage and stormwater runoff also provide a source wetland hydrology. The Arkansas River is channelized and lined in concrete at the I-25 crossing and the remainder of the Arkansas River adjacent to the project area becomes more natural with the adjacent banks

vegetated with grasses, forbs, shrubs, and trees. Fountain Creek flows through a wide, shallow floodplain subject to high flood events, and the main creek channel frequently meanders as the result of high sediment deposition. Wetland soils in the project area consisted primarily of silty clay loam.

A total of seven wetland areas were identified during the field survey. Of the seven identified wetlands, six were determined to be jurisdictional by the USACE. The remaining wetland (WL-1) was determined to be non-jurisdictional. The wetland locations are shown on Exhibits 2 through 4. Three waters of the United States were also identified: the Arkansas River, Fountain Creek, and Runyon Lake. Wetlands and Waters of the United States within the project area are shown in Exhibit 5.

EXHIBIT 5
Wetlands and Waters of the US within Project Area

Wetland Area	Jurisdictional Determination	Cowardin Classification System[1]	Acreage within Project Area
WL-1	Non-jurisdictional	PEM/PFO	4.04
WL-2	Jurisdictional	PEM/PFO	1.06
WL-3	Jurisdictional	PSS/PFO	0.39
WL-4	Jurisdictional	PEM	010
WL-5a	Jurisdictional	PSS/PFO	1.80
WL-5b	Jurisdictional	PEM/PFO	4.35
WL-5c	Jurisdictional	PEM	2.11
Arkansas River	Jurisdictional	Riverine	9.06
Fountain Creek	Jurisdictional	Riverine	25.76
Runyon Lake	Jurisdictional	PUBHh	2.42

Source: New Pueblo Freeway Project Team, 2010

Notes:

[1] The wetland areas were categorized by the Cowardin Classification System as follows:

Palustrine Emergent (PEM) - Characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants. All water regimes are included except subtidal and irregularly exposed.

Palustrine Scrub Shrub (PSS) - Includes wetland areas dominated by woody vegetation less than 6 meters (20 feet) tall. The species include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions. All water regimes except subtidal are included.

Palustrine Forested (PFO) - Similar to the PSS Classification however; the PFO Classification is characterized by woody vegetation that is 6 meters tall or taller.

Palustrine Unconsolidated Bottom (PUBHh) – Shallow and deepwater wetland habitat with less than 30% vegetation cover and a surface with greater than 25% of the particles smaller than stone.

Riverine - Includes all wetlands and deepwater habitats contained within a channel with the exception of wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens; and habitats with water containing ocean-derived salts in excess of 0.5 percent.

Within the project area, the wetlands adjacent to Fountain Creek have the greatest importance, specifically relative to the functions of wildlife habitat and potential habitat for

a state listed species. Additional functions include flood attenuation, and sediment and nutrient removal.

The Fountain Creek riparian area and wetlands provide a regionally important wildlife corridor and habitat, providing qualities including breeding, foraging, and cover. Fountain Creek is an important north/south riparian corridor and escape habitat for mammals, and breeding habitat for raptors and small fish. Fountain Creek connects to the Arkansas River linking a number of important habitat areas north, west, and south of Pueblo. The City of Pueblo is a barrier to animal movement between these areas, while the floodplain corridors of the Arkansas River and Fountain Creek provide passage through the city. The riparian areas and wetlands adjacent to the west bank of Fountain Creek north of 13th Street are high quality and relatively unique compared to similar areas in the project area. Disturbance has been minimal, although salt cedar has impacted almost all riparian areas adjacent to Fountain Creek. Within the project area, the majority of wildlife observations occurred in this area.

The wetlands and riparian areas along Fountain Creek provide the important function of high flood attenuation capacity. The creek channel typically fluctuates greatly, and several areas that appeared to be sand bars in previous channels were evident. The vegetation in the wetlands and the riparian areas stabilize the creek banks and attenuates floodwaters. It is evident from field review that previous high water and floods have deposited large quantities of sediment in the wetlands and riparian areas adjacent to Fountain Creek. The high rate of removal and settling of sediment in these areas improves water quality by reducing sediment and associated pollutants including nutrients and metals in the creek.

In May 2010, CDOT staff conducted a FACWet analysis of wetlands in the study area, resulting in a Functional Capacity Index (FCI) score for each wetland. FCI provides a comparison of how an individual wetland performs compared to others of its type. A score of 1 is optimal functional capacity, and a score of 0 is no functional capacity.

WL– 2 received a composite FCI score of 0.82. In terms of habitat connectivity and buffer capacity, it was determined that it was functioning impaired. For water distribution and water outflow it was determined to be highly functioning and functioning, respectively. Vegetation included noxious weeds, exotic or invasive species, and cattails. Other wetlands within the study area were assessed with scores roughly equal to that of WL–2 or lower. All of the wetland areas demonstrated the same concerns with exotic species and noxious weeds.

The wetland data and FACWet forms for each wetland are contained in Appendix A and B of this memo. Appendix C contains coordination with USACE conducted in 2006 to verify the validity of the 2003 delineations.

Jurisdictional Wetlands and Waters of the United States

There are six jurisdictional wetlands within the project area in addition to three waters of the United States as described below.

Arkansas River

The Arkansas River is a waters of the United States. Steep, high, concrete-lined banks characterize the Arkansas River under the existing bridge crossings for I-25 and Santa Fe Boulevard in the project area. A large portion of the jurisdictional area for the Arkansas River in the project area is defined by the OHWM where concrete lines the banks of the river. Flows at the time of the site survey were relatively low, resulting in areas of shallow water and exposed sand bars.

Fountain Creek

Fountain Creek is a waters of the United States. The creek channel is wide and variably heavily flooded, resulting in heavy sediment erosion and deposition, and frequent natural modifications to the main creek channel. Within the project area, the jurisdictional boundary for Fountain Creek is predominantly the OHWM.

Runyon Lake

Runyon Lake is a waters of the United States located within the project area. The lake is located east of the proposed impact footprint and would not likely be adversely impacted by project activities. The lake is immediately adjacent to the Arkansas River, downstream of the area with steep concrete-lined banks. The lake connects to the Arkansas River via a 30-foot-wide inlet/outlet.

Wetlands WL-5a, 5b, and 5c

These wetlands consist of narrow fringe wetlands associated with Fountain Creek. The majority of these wetlands are located between the 8th Street Bridge and the US 50 Bridge. Many of the wetlands are located immediately adjacent to the main channel of the creek, but some of the wetlands exist along the margins of secondary channels, in association with tributaries, or within meander scars.

Wetland WL-4

This wetland is an unnamed drainage located north of the Arkansas River and consists of a channelized discharge from the City's River Walk Park. The drainage, which is a Waters of the United States, currently crosses under I-25 via a large, concrete-lined culvert and eventually discharges to Runyon Lake east of the project area. The wetland exists only on the downstream side of the I-25 culvert. Water flow is swift in the narrow channel, and the banks are lined predominantly with mature elm and cottonwood trees.

Wetland WL-3

This wetland consists of the fringe wetland area adjacent to the Arkansas River. The river banks east of this pedestrian bridge are narrow wetland fringe areas and maintain a natural condition along the river. These wetlands are generally only flooded during high flow periods. Chinese elm and Russian olive characterize the upland transitional line for these wetland areas and are dominated by coyote willow, reed canary grass, and salt cedar.

Wetland WL-2

This wetland is an unnamed drainage located south of the Arkansas River. The wetland is located in a narrow ravine and is not indicated on the USGS or NWI maps. The wetland likely originates from seepage or a spring near the south end of the wetland area. Water flowing through the wetland area appears to be connected to the Arkansas River via a stormwater drain that runs under S. Santa Fe Avenue towards the river. The wetland is dominated by cattails, with an overstory of of mature cottonwoods, plums, Russian olives,

and other trees. Some earthwork has been done within the wetland, as indicated by the irregular mounds of disturbed earth near the northern end and placement of a culvert through a small portion of the area.

Non-jurisdictional Wetlands

Wetland WL-1

This wetland is a large, shallow, closed basin storm water pond and ditch receiving drainage from nearby development located near the Pueblo Boulevard interchange. This pond is not indicated on the USGS quad or NWI maps.

Wetland Impacts

Impacts from the project alternatives were determined using GIS calculations of GPS survey data. Permanent impacts to wetlands will be due mainly to widening of the road shoulder to accommodate the additional traffic lanes and drainage features, as well as placement of bridge abutments and erosion control features.

No Action Alternative

Under the No Action Alternative, the existing roadway would not be modified, and no impacts would occur to wetlands or waters of the United States.

Existing I-25 Alternative

Under the Existing I-25 Alternative, a total of 0.22 acres (0.09 hectares) of wetlands would be impacted and includes impacts to WL-1, WL-2, and WL-5c. Waters of the United States would not be impacted under this alternative. As shown below in Exhibit 6, wetland impacts represent a small amount of the total acreage identified for each wetland within the project area.

EXHIBIT 6
Summary of Existing Alignment Alternative Wetland Impacts

Wetland Area	Acreage within Project Area (acres/hectares)	Impacted Area (acres/hectares)
WL-1	4.04 (1.63)	0.02 (0.01)
WL-2	1.06 (0.43)	0.07 (0.03)
WL-5c	2.11 (0.85)	0.13 (0.05)
Total Impacted Area		**0.22 (0.09)**

Impacts to WL-1 would be limited to the loss of 0.02 acres (0.01 hectares) at the south end of the wetland channel that extends south out of WL-1. A box culvert will be required at the south end of that channel to accommodate the extension of Greenhorn Drive. Slightly north of that proposed crossing, a box culvert is currently in place where the existing Greenhorn Drive crosses the wetland channel and no impacts will occur to this area. Approximately 0.07 acres (0.03 hectares) of WL-2 would be lost due to construction activities associated with the extension of Abriendo Avenue to connect to Santa Fe Drive east of I-25. The

extension of Dillon Drive near US 50 would result in the loss of 0.13 acres (0.05 hectares) of WL-5c.

Modified I-25 Alternative

The Modified I-25 Alternative would result in the loss of 1.10 acres (0.45 hectares) of wetlands and waters of the United States as shown below in Exhibit 7. Similar to the Existing I-25 Alternative, impacts would occur to WL-1, WL-2, and WL-5c. The Modified I-25 Alternative would also result in impacts to the Arkansas River.

EXHIBIT 7
Summary of Modified Alignment Alternative Wetland and Open Water Impacts

Wetland Area	Acreage within Project Area (acres/hectares)	Impacted Area (acres/hectares)
WL-1	4.04 (1.63)	0.02 (0.01)
WL-2	1.06 (0.43)	0.93 (0.38)
WL-5c	2.11 (0.85)	0.13 (0.05)
Arkansas River	9.06 (3.67)	0.02 (0.01)
Total Impacted Area		1.10 (0.45)

Impacts to WL-1 and WL-5c under the Modified I-25 Alternative would be the same as those discussed above under the Existing I-25 Alternative. Impacts to WL-5c and the Arkansas River would be greater due to the realignment of I-25 to the east in this area as well as the increased number of piers required to span the Arkansas River. Under the Modified I-25 Alternative, WL-2 would almost be entirely removed to accommodate the extension of Abriendo Avenue and the realignment of I-25. A total of 88 piers would be required to span the Arkansas River.

Wetland Mitigation

To the extent practicable, impacts to wetlands were avoided as part of the alternatives development process as described in the Wetland Finding document. However, complete avoidance of the wetlands areas was not possible due to the developed nature of the project area and the limited options for realignment.

CDOT will work with USACE to identify suitable mitigation for impacts to wetlands and waters of the United States. The study area includes several locations that may be suitable for replacing the functional values affected by impacts to wetlands. Additionally, unless otherwise specified, the following mitigations apply to both the Existing I-25 Alternative and the Modified I-25 Alternative.

- Once funding for construction of the project is identified, wetland boundaries will be reevaluated to determine the need for additional delineations to confirm wetland boundaries.
- CDOT will obtain an Individual Section 404 from the USACE under Section 404 of the Clean Water Act prior to construction. The policy of CDOT is to replace non-jurisdictional wetlands on a 1:1 basis. A wetland mitigation plan will be prepared as

part of the Section 404 permitting process to mitigate for unavoidable impacts to area wetlands and Waters of the United States.

- Additional mitigation measures that were identified by the USACE during a 2006 field visit include:
  - Place tree cuttings at the trailhead near the mouth of Fountain Creek.
  - Place tree cuttings along Fountain Creek at SH 47.
  - Tree plantings near the Eagle Ridge interchange project.
- Following final design, CDOT will apply for a SB 40 Wildlife Certification, if the project does not fall within CDOT's Programmatic Agreement with CDOW, including detailed plans and specifications. CDOW will review the plans to make sure that they are technically adequate to protect and preserve fish and wildlife species and provide recommendations or alternative plans if the project would adversely affect riparian areas along the Arkansas River or Fountain Creek.

Closing Statement

Based on the above considerations, it is determined that there is no practicable alternative to the proposed new construction in wetlands and that the proposed action includes all practicable measures to minimize disturbance to wetlands which may result from such use.

References

U.S. Army Corps of Engineers (USACE) (1987). *U.S. Army Corps of Engineers Wetland Delineation Manual*. USACE Waterways Experiment Station, Vicksburg, MS.

U.S. Department of Agriculture (1979). *Soil Survey of Pueblo Area, Colorado*. Soil Conservation Service. U.S. Fish and Wildlife Service.

U.S. Department of Agriculture (1988) *National List of Plant Species that Occur in Wetlands: Colorado*. National Wetlands Inventory.

U.S. Fish and Wildlife Service (1979). *Classification of Wetlands and Deepwater Habitats of the United States*.

U.S. Geological Survey (1974). *Northeast and Southeast Pueblo Quadrangle*

APPENDIX A

Wetlands Data Forms

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: NPF Applicant/Owner: FHWA/ CDOT Investigator: J GOURLIE/ T DINWALDT	Date: 9/30/03 County: PUEBLO State: CO
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation)? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: SW Pond Transect ID: Plot ID: CH-WL-1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. TYPHA LATIFOLIA	H	O	9. UPLAND		
2. PHRAGMITES AUSTRALIS	H	FACW	10. AGROPYRON SMITHII	H	FACU
3. SCHOENOPLECTUS LACUSTRIS	H	O	11. " CRISTATUM	H	—
4. ELAEAGNUS ANGUSTIFOLIA	T	FAC	12.		
5. TAMARISK RAMOSISSIMA	T	FACU	13.		
6. SCHOENOPLECTUS PUNGENS	H	O	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100

Remarks: STORMWATER POND
PEM/FO

HYDROLOGY

✓ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ✓ Aerial Photographs
- ✓ Other
- ___ No Recorded Data Available

Field Observations:

Depth of Surface Water: ___ (in.)

Depth to Free Water in Pit: 10 (in.)

Depth to Saturated Soil: 6 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ✓ Inundated
- ✓ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ✓ Sediment Deposits
- ✓ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ✓ Oxidized Root Channels in Upper 12 Inches
- ✓ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: HYDROLOGY MAINLY STORM WATER RUNOFF

SOILS

Map Unit Name
(Series and Phase): MANZANILLA SILTY CLAY LOAM

Drainage Class: WELL DRAINED

Field Observations
Confirm Mapped Type? (Yes) No

Taxonomy (Subgroup): _____

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
12	A-B	10YR 3/2	7.5YR 5/6	COMMON, DISTINCT	SILTY, CONCRETIONS

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ✓ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ✓ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:
WET, SILTY SOILS

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	(Circle)
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:
C#-WL-1

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: NPF Applicant/Owner: FHWA / CDOT Investigator: J GOURLIE / J DUWALDT	Date: 10/1/03 County: PUEBLO State: CO
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation)? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: CA-WL-2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. TYPHA ANGUSTIFOLIA	H	O	9. UPLAND		
2. PHRAGMITES AUSTRALIS	H	O	10. PASPALUM SMITHII	H	FACW
3. MUHLENBERGIA ASPERIFOLIA	H	FACW	11.		
4. ELEOCHARIS PALUSTRIS	H	O	12.		
5. DISTICHLIS SPICATA	H	FAC	13.		
6. TAMARIX RAMOSISSIMA	T	FACW	14.		
7. JUNCUS BALTICUS	H	O	15.		
8. POPULUS DELTOIDES	T	—	16.		
ULMUS PUMILA	T	—			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100

Remarks:
WL NOT CONNECTED TO WUS - ISOLATED FROM ARK. R.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
✓ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)
Depth to Free Water in Pit: 6 (in.)
Depth to Saturated Soil: 4 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
✓ Inundated
✓ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
✓ Sediment Deposits
✓ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
✓ Oxidized Root Channels in Upper 12 Inches
✓ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: HYDROLOGY APPEARS TO BE GROUNDWATER SEEPAGE, NO SURFACE CONNECTION W/ ARKANSAS; DISCHARGE DISSIPATES INTO GROUND

SOILS

Map Unit Name (Series and Phase): KIM FINE SANDY LOAM

Drainage Class: WELL DRAINED

Field Observations Confirm Mapped Type? (Yes) No

Taxonomy (Subgroup):

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
6	A	10 YR 2/1	7.5 YR 4/6	COMMON, DISTINCT	SILTY

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ✓ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ✓ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: THIN LAYER OF SOIL OVER DARK HARDPAN

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	(Circle)
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

(Circle)

Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

CA-WL-2

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: NPF Applicant/Owner: FHWA/CDOT Investigator: J Gonarlin / S Dinkenbeldt	Date: 10/2/03 County: State:
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation)? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: ARKANSAS R. Transect ID: Plot ID: CHAN-3

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. SALIX EXIGUA	S/T	O	9. UPLAND		
2. FESTUCA PRATENSIS	H	FAC	10. AGROPYRON SMITHII	H	FACW
3. ULMUS PUMILA	T	—	11.		
4. SCHOENOPLECTUS PUNGENS	H	O	12.		
5. PHALARIDES ARUNDINACEA	H	FACW	13.		
6. POPULUS DELTOIDES	T	—	14.		
7. TAMARIX RAMOSISSIMA	T	FACW	15.		
8. PERSICARIA PENNSYLVANICA	H	FACW	16.		
EQUISETUM HYMALE	H	FACW			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 89%

Remarks: FRINGE WETLANDS ON N+S SIDES OF RIVER. CONCRETE ON SOME BANKS
MEADOW FESCUE IN TRANSITIONAL ZONE

HYDROLOGY

✓ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ✓ Aerial Photographs ___ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: ✓ Inundated ✓ Saturated in Upper 12 Inches ✓ Water Marks ✓ Drift Lines ___ Sediment Deposits ✓ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ✓ Oxidized Root Channels in Upper 12 Inches ✓ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: ___ (in.) Depth to Free Water in Pit: 10 (in.) Depth to Saturated Soil: 6 (in.)	

Remarks: RIVER FLOWS RELATIVELY LOW DUE TO DROUGHT CONDITIONS

SOILS

Map Unit Name (Series and Phase): MANZANOLA SILTY CLAY LOAM / GLENBERG-HANERSON FINE SANDY LOAM

Drainage Class: WELL DRAINED

Field Observations Confirm Mapped Type? (Yes) No

Taxonomy (Subgroup): _____

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
10	A+B	10YR 3/2	10YR 4/3	UNCOMMON/DISTINCT	SILTY

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ✓ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ✓ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: SOIL OVER COBBLES + GRAVEL

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	(Circle)
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

(Circle)

Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

CH-WL-3

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: NPF Applicant/Owner: FHWA/CDOT Investigator: J Jungle / J Dunnwidt	Date: 10/2/03 County: Pueblo State: CO
Do Normal Circumstances exist on the site? Yes No Is the site significantly disturbed (Atypical Situation)? Yes No Is the area a potential Problem Area? Yes No (If needed, explain on reverse.)	Community ID: Ditch Transect ID: Plot ID: CHWL-4

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. TYPHA LATIFOLIA	H	O	9. UPLAND		
2. SCHOENOPLECTUS PUNGENS	H	O	10.		
3. EQUISETUM HYEMALE	H	FACW	11. ASPERUGEAN CRISTATEUM	H	—
4. ULMUS PUMILA	T	—	12.		
5. POPULUS DELTOIDES	T	—	13.		
6. CARIX SP	H	FACW	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 83 %

Remarks: RIVER-WALK DITCH; VERY NARROW FRINGE WL ADJACENT TO FLOWING WATER IN DITCH

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____(in.)

Depth to Free Water in Pit: _____(in.)

Depth to Saturated Soil: _____(in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series and Phase): GLENBERG-HANERSON FSLOAM

Drainage Class: WELL DRAINED

Field Observations Confirm Mapped Type? Yes No

Taxonomy (Subgroup): _____

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No	(Circle)
Wetland Hydrology Present?	Yes	No	
Hydric Soils Present?	Yes	No	

(Circle)

Is this Sampling Point Within a Wetland? Yes No

Remarks:

CH-WL-4

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: NPE Applicant/Owner: FHWA / CDOT Investigator: J GOUPLE / J DUWALDT	Date: 10/27/03 County: PUEBLO State: CO
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation)? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: FOUNTAIN CREEK Transect ID: Plot ID: CH WL 5 (a) (WETLANDS @ 8th ST BRIDGE)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. SALIX EXIGUA	S/T	O	9.		
2. SCHOENOPLECTUS PUNGENS	H	O	10.		
3. TAMARIX RAMOSISSIMA	T	FACW	11.		
4. TYPHA LATIFOLIA	H	O	12.		
5. ELAEAGNUS ANGUSTIFOLIA	T	FAC	13.		
6. PHRAGMITES AUSTRALIS	H	FACW	14.		
7. JUNCUS BALTICUS	H	O	15.		
8. ELEOCHARIS PALUSTRIS	H	O	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks: OHWM ON E+W SIDE OF FOUNTAIN CR. LARGE SAND/COBBLE DEPOSITS INDICATE FREQUENT FLOODING, FEW WL AREAS.

HYDROLOGY

✓ Recorded Data (Describe in Remarks): __ Stream, Lake, or Tide Gauge ✓ Aerial Photographs __ Other __ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: ✓ Inundated ✓ Saturated in Upper 12 Inches ✓ Water Marks ✓ Drift Lines __ Sediment Deposits ✓ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ✓ Oxidized Root Channels in Upper 12 Inches ✓ Water-Stained Leaves __ Local Soil Survey Data __ FAC-Neutral Test __ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: ___ (in.) Depth to Free Water in Pit: 8 (in.) Depth to Saturated Soil: 4 (in.)	

Remarks: MEANDERING CHANNEL, LOW FLOWS @ TIME OF SURVEY

SOILS

Map Unit Name (Series and Phase): LAC ANIMAS FS LOAM

Drainage Class: POORLY DRAINED

Field Observations Confirm Mapped Type? (Yes) No

Taxonomy (Subgroup): _____

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
10	A-B	10YR 3/2	10YR 4/5	UNCOMMON/DISTINCT	SILTY SAND

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ✓ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ✓ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ✓ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: WATER-DEPOSITED SAND, GRAVEL & COBBLES

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No (Circle)	
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	
		(Circle)
Is this Sampling Point Within a Wetland?		(Yes) No

Remarks:

CH WL 5-a

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: NPF Applicant/Owner: FHWA/CDOT Investigator: J GOURLIE / T DUWALDT	Date: 10/27/03 County: PUEBLO State: CO
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation)? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: FOUNTAIN CREEK Transect ID: Plot ID: CH-WL-5(D)

(WETLANDS FROM SR 50 TO 8th ST)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. SALIX EXIGUA	T	O	9.		
2. TAMARIX RAMOSISSIMA	T	FACW	10.		
3. TYPHA LATIFOLIA	H	O	11.		
4. SCHOENOPLECTUS PUNGENS	H	O	12.		
5. ELAEAGNUS ANGUSTIFOLIA	T	FAC	13.		
6. PHRAGMITES AUSTRALIS	H	FACW	14.		
7. ELEOCHARIS PALUSTRIS	H	O	15.		
8. JUNCUS BALTICUS	H	O	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100

Remarks: OHWM E & W CREEK BANKS; SAND/COBBLE DEPOSITS FROM FLOODING
FEW WETLANDS; >> OF TAMARIX

HYDROLOGY

✓ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ✓ Aerial Photographs ___ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: ✓ Inundated ✓ Saturated in Upper 12 Inches ✓ Water Marks ✓ Drift Lines ✓ Sediment Deposits ✓ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ✓ Oxidized Root Channels in Upper 12 Inches ✓ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: ___ (in.) Depth to Free Water in Pit: 8 (in.) Depth to Saturated Soil: 4 (in.)	

Remarks: MEANDERING CHANNEL, LOW FLOWS

SOILS

BANKARD SAND
LIMON SILTY CLAY LOAM

FREQUENT FLOODING
WELL DRAINED

Map Unit Name (Series and Phase): LASANINAS FS LOAM

Drainage Class: " "

Field Observations Confirm Mapped Type? (Yes) No

Taxonomy (Subgroup):

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
10	AB	10YR 3/2	10YR 4/3	UNCOMMON/DISTINCT	SILTY SAND

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ✓ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ✓ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ✓ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	(Circle)
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

(Circle)

Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

CH WL-5b

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: NPF Applicant/Owner: FHWA/CDOT Investigator: J GOURLIE/J DUWALDT	Date: 10/28/03 County: PUEBLO State: CO
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation)? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: FOUNTAIN Transect ID: CREEK Plot ID: CH-WL-5C (N. OF SR 50)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. SALIX EXIGUA	T	O	9.		
2. TAMARIX RAMOSSISSIMA	T	FACW	10.		
3. SCHOENOPLECTUS PUNGENS	H	O	11.		
4. TYPHA LATIFOLIA	H	O	12.		
5. JUNCUS BALTICUS	H	O	13.		
6. PHRAGMITES AUSTRALIS	H	O	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 150

Remarks: DRAIN ALONG EAST CREEK BANKS, LOW AREA ON N SIDE OF BRIDGE ⇒ WL FEW WL

HYDROLOGY

✓ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ✓ Aerial Photographs ___ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: ✓ Inundated ✓ Saturated in Upper 12 Inches ✓ Water Marks ✓ Drift Lines ✓ Sediment Deposits ___ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ✓ Oxidized Root Channels in Upper 12 Inches ✓ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: ___ (in.) Depth to Free Water in Pit: 10 (in.) Depth to Saturated Soil: 6 (in.)	

Remarks: MEANDERING CREEK CHANNEL

SOILS

Map Unit Name (Series and Phase): BANKARD SAND FREQUENT FLOODING, WELL DRAINED / LAS ANIMAS FS LOAM

Drainage Class: WELL DRAINED

Field Observations Confirm Mapped Type? (Yes) No

Taxonomy (Subgroup):

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
12	A-B	10YR 3/2	10YR 4/5	[illegible]	SILTY SAND

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ✓ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors
- ✓ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ✓ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	(Circle)
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

(Circle)

Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

CH UL - 5C

Approved by HQUSACE 3/92

APPENDIX B

FACWet Data Forms

ADMINISTRATIVE CHARACTERIZATION

General Information			
		Date of Evaluation:	5/25/10
Site Name or ID:	Wetland 1	Project Name:	Pueblo Freeway
404 or Other Permit Application #:		Applicant Name:	CDOT
Evaluator Name(s):	Becky Pierce Rob Frei	Evaluator's professional position and organization:	Biologists, CDOT HQ & Reg. 2

Location Information:			
Site Location (Lat./Long. or UTM):	38°12'59.47"N 104°37'09.19"W	Geographic Datum Used (NAD 83	
USGS Quadrangle Map:	Southeast Pueblo	Map Scale: (Circle one)	1:24,000 1:100,000 Other 1:
Sub basin Name (8 digit HUC):	11020002	Wetland Ownership:	CDOT

Project Information:

This evaluation is being performed at: *(Check applicable box)*
- [x] *Project Wetland*
- [ ] *Mitigation Site*

Purpose of Evaluation (check all applicable):
- [x] *Potentially Impacted Wetlands*
- [ ] *Mitigation; Pre-construction*
- [ ] *Mitigation; Post-construction*
- [ ] *Monitoring*
- [ ] *Other (Describe)*

Intent of Project: *(Check all applicable)* ☐ Restortation ☐ Enhancement ☐ Creation

Total Size of Wetland Involved: (Record Area, Check and Describe Measurement Method Used)	ac.	☐ Measured ☐ Estimated					
Assessment Area (AA) Size (Record Area, check appropriate box. Additional spaces are used to record acreage when more than one AA is included in a single assessment)	ac.	☐ Measured	ac.	ac.	ac.	ac.
		☐ Estimated	ac.	ac.	ac.	ac.
Characteristics or Method used for AA boundary determination:							

Notes:
Elevation 4,813'
Salt creek ~ 1,000 meters southeast
Isolated wetland

ECOLOGICAL DESCRIPTION 1

Special Concerns

Check all that apply

- [ ] Organic soils including Histosols or Histic Epipedons are present in the AA (i.e., AA includes core fen habitat).
- [ ] Project will directly impact organic soil portions of the AA including areas possessing either Histosol soils or histic epipedons.
- [ ] Organic soils are known to occur anywhere within the contiguous wetland of which the AA is part.
- [ ] The wetland is a habitat oasis in an otherwise dry or urbanized landscape?
- [ ] Federally threatened or endangered species are **KNOWN** to occur in the AA? List Below.

_____

_____

- [ ] Federally threatened or endangered species are **SUSPECTED** to occur in the AA?

_____

_____

_____

- [ ] Species of concern according to the Colorado Natural Heritage (CNHP) are known to occur in the AA?
- [ ] The site is located within a potential conservation area or element occurrence buffer area as determined by CNHP?
- [ ] Other special concerns (please describe)

_____

HYDROGEOMORPHIC SETTING

- [ ] AA wetland maintains its fundamental natural hydrogeomorphic characteristics
- [ ] AA wetland has been subject to change in HGM classes as a result of anthropogenic modification

If the above is checked, please describe the original wetland type if discernable using the table below.

- [x] AA wetland was created from an upland setting.

	Historical Conditions				
Previous wetland typology	**Water source**	Surface flow	Groundwater	Precipitation	Unknown
	Hydrodynamics	Unidirectional	Vertical		
	Geomorphic Setting (Narrative Description)				
	Previous HGM Class	Riverine	Slope	Depressional	Lacustrine

Current Conditions

Describe the hydrogeomorphic setting of the wetland by circling all conditions that apply.

HGM Setting	**Water source**	Surface flow	Groundwater	Precipitation		Unknown
	Hydrodynamics	Unidirectional	Vertical			
	Wetland Gradient	0 - 2%	2-4%	4-10%	>10%	
	# Surface Inlets	Over-bank 0	1	2	3	>3
	# Surface Outlets	0	1	2	3	>3
	Geomorphic Setting (Narrative Description)					
	HGM class	Riverine	Slope	Depressional		Lacustrine

Notes (include information on charcteristics used to formulate reference standard):

Stormwater pond / stormwater fed wetland
Human induced

ECOLOGICAL DESCRIPTION 2

Vegetation Habitat Description

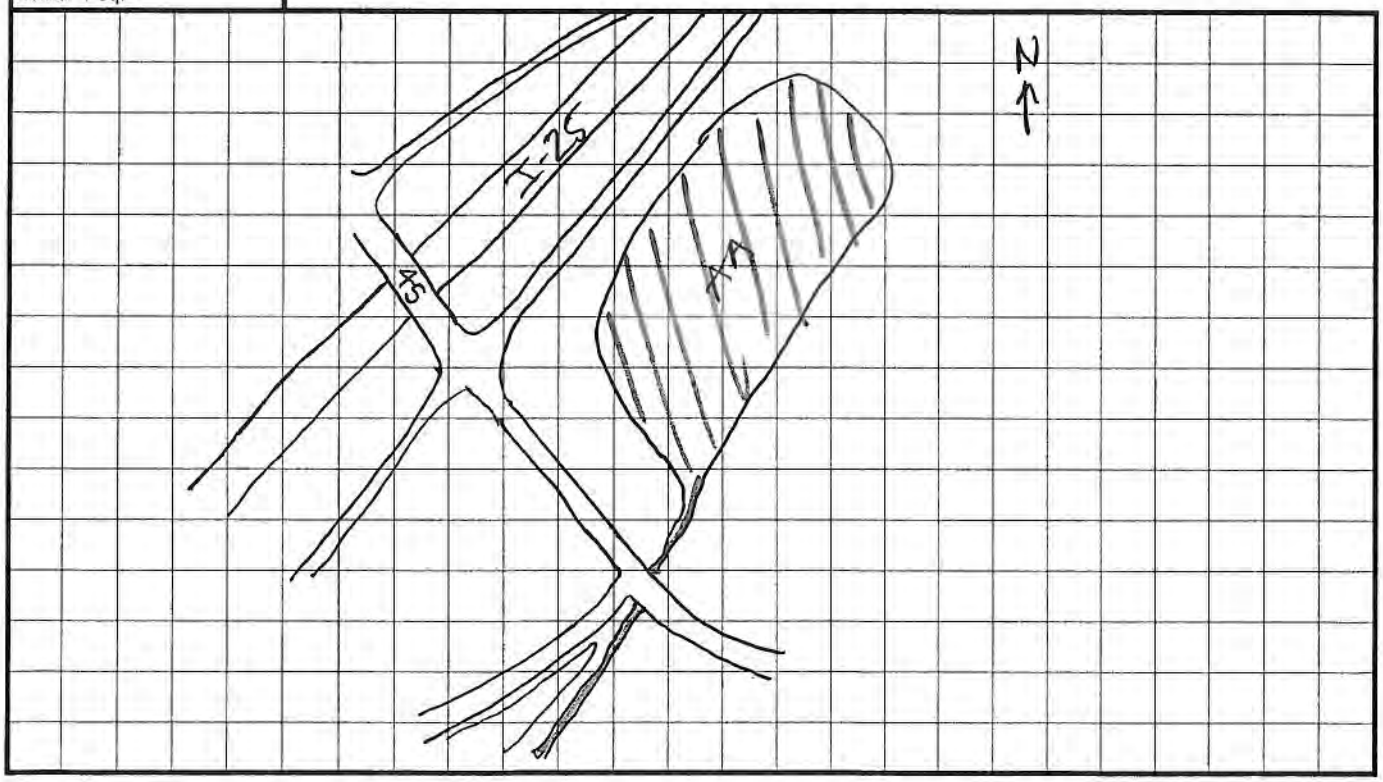
*US FWS habitat classification according as reported in Cowardin et. al (1979) - See also Appendix *** of FACWet User Guide.*

System	Subsystem	Class	Subclass	Water Regime	Other Modifiers	% AA
Lacustrine Palustrine Riverine	Littoral; Limnoral Palustrine Lower perennial; Upper perennial; Intermittent	Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Emergent(EM) Shrub-scrub(SS) Forested (FO)	Floating vascular; Rooted vascular; Algal; Persistent; Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel; Sand; Mud; Organic	**Examples** Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seas.-flood./sat.(E); Perm. flooded(F); Intermittently Flooded(G); Artificially Flooded(K); Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Hypersaline(7) ; Eusaline(8); Mixosaline(9); Fresh(0), Acid(a); Circumneutral(c); Alkaline/calcareous(i); Organic(g); Mineral(n); Beaver(b); Partially Drained/ditched(d); Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	

Site Map

Scale: 1 sq. =

Draw a sketch map of the site including relevant portions of the wetland, AA boundary, structures, habitat classes, and other significant features.



Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally- occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

1. On the aerial photo outline the area that is within 500 meters of the AA.
2. Identify obvious natural barriers within 500 m of the AA boundary.
   - *Natural barriers include continuous cliff bands, deep open water, etc.*
3. Draw the **Habitat Connectivity Envelope**(HCE) on the aerial image.
   - *The HCE is all the area within 500 meters of the AA that is not separated from it by a natural barrier.*
4. Outline the current extent of naturally occurring wetland and riparian habitat. Then outline areas where the habitats appear to have historically occurred.
   - *Use your knowledge of the history of the area and evident land use change. Additional research could be utilized to increase the accuracy of this estimate including consideratation of floodplain maps, historical aerials, etc.*

Variable Score	Condition Category	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	*Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats*
<0.9 - 0.8	*Highly Functioning*	*More than 80% of historical wetland habitat area within the HCE is still present (less than 20% historical wetland habitat area lost).*
<0.8 - 0.7	*Functioning*	*80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% historical wetland habitat area lost).*
<0.7 - 0.6	*Functioning Impaired*	*Less than 60 to 30% of historical wetland habitat area within the HCE is still present (more than 30 to 70% historical wetland habitat area lost).*
<0.6	*Non-functioning*	*Less than 30% of the historical wetland habitat area from within the HCE is now no longer in existence (more than 70% historical wetland habitat area lost).*

Variable 1 Score 0.95

Notes: The landscape in the area has limited Wetlands. No reason to believe HCE is any different. Area is not assumed to have wetland impacts. Down graded a bit b/c not certain

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the man-made barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

1. On the aerial photo, outline all existing wetland and riparian habitat areas (WHAs) within the HCE.

2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.

3. Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

Stressors = artificial barriers	✓	Stressors	Comments/description
		Major Highway	
		Secondary Highway	
		Tertiary Roadway	
		Railroad	
		Bike Path	
		Urban Development	
		Agricultural Development	
		Artificial Water Body	
		Fence	
		Ditch or Aqueduct	
		Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.
<0.9 - 0.8	*Highly Functioning*	Barriers impeding migration/dispersal between the AA and up to 33% of surrounding WHA highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. More significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding WHA.
<0.8 - 0.7	*Functioning*	Barriers to migration and dispersal retard the ability of many organisms/propagules to pass between the AA and up to 66% of WHA. Passage of organisms and propagules through such barriers is still possible, but it may be constrained to certain times of day, be slow, dangerous or require additional travel. Busy two-lane roads, culverted areas, small to medium artificial water bodies or small earthen dams would commonly rate a score in this range. More significant barriers (see "functioning impaired" category below) could affect migration to up to 10% of surrounding WHA.
<0.7 - 0.6	*Functioning Impaired*	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding WHA. Travel of those animals which can potential negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding WHA could be functionally isolated from the AA.
<0.6	*Non-functioning*	AA is essentially isolated from surrounding WHA by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and a WHA.

No other wetland/rip. areas in HCE

Variable 2 Score 0.95

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

1. On the aerial photograph, outline the buffer area as the zone within 250 meters of the outer boundary of the AA.
2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
3. Considering all of the identified stressors, their overall severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

Stressors = Land Use Changes	✓	Stressors	Comments/description
	✓	Industrial/commercial	settling ponds for industrial materials
	✓	Urban	department store
		Residential	
		Rural	
		Dryland Farming	
		Intensive Agriculture	
		Orchards or Nurseries	
		Livestock Grazing	
	✓	Transportation Corridor	Interstate 25 - adjacent on 2 sides
		Urban Parklands	
		Dams/impoundments	
		Artificial Water body	
		Physical Resource Extraction	
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	*Highly Functioning*	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, either because land use is not intensive, for example haying, light grazing, or nurseries, or more substantial changes occur in approximately less than 10% of the BA.
<0.8 - 0.7	*Functioning*	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. Moderate-intensity land uses such as dry-land farming, urban "green" corridors, or moderate cattle grazing would commonly be placed within this scoring range.
<0.7 - 0.6	*Functioning Impaired*	Land use within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	*Non-functioning*	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

Aerial shows herbaceous veg. around AA that adds to buffer.

Variable 3 score 0.70

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that alter the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 7.

Scoring rules:

1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.

2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

✓	Stressors	Comments/description
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
✓	Culverts or Constrictions	
✓	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
✓	Storm Drain/Urban Runoff	
✓	Impermeable Surface Runoff	
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Class	Depletion	Augmentation
1.0 - 0.9	*Reference Standard*	Unnatural drawdown events minor, rare or non-existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non-existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	*Highly Functioning*	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or natural capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or natural capacity of water to perform work.
<0.8 - 0.7	*Functioning*	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or natural capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial reduction of peak flows or natural capacity of water to perform work.
<0.7 - 0.6	*Functioning Impaired*	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or natural capacity of water to perform work. **Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.**	Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or natural capacity of water to perform work. **Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.**
<0.6	*Non-functioning*	Water source diminished enough to threaten jurisdictional classification of the AA.	Frequency, duration or magnitude of unnaturally high-water great enough to change the fundamental characteristics of the wetland.

Variable 4 Score .62

Variable 5: Water Distribution

This variable is concerned with hydrologic connectivity within the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally ***result*** *from geomorphic modifications. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within portions of the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In naturally confined rivers (i.e. canyons and gullies) floodplain width is generally very small, so these systems will tend to score high for this variable unless some gross stressor is present.*

Scoring rules:

1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.
2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

✓	Stressors	Comments/description
	Ditches	
✓	Ponding/Impoundment	
✓	Culverts	
✓	Road Grades S1	
	Channel Incision/Entrenchment	
✓	Hardened/Engineered Channel	In lift ditch
	Enlarged Channel	
✓	Artificial Banks/Shoreline	
	Weirs	
✓	Dikes/Levees/Berms	
	Diversions	
✓	Sediment/Fill Accumulation	

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	*Reference Standard*	Little or no alteration has been made to the way in which water is distributed throughout the wetland.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.
<0.9 - 0.8	*Highly Functioning*	Less than 10% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.
<0.8 - 0.7	*Functioning*	Between 10 and 33% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in a 4 in. (5 cm) or less change in mean growing season water table elevation.	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	*Functioning Impaired*	33 to 66% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less change in mean growing season water table elevation. Water table behavior must still meet jurisdictional criteria to merit this rating.	Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.
<0.6	*Non-functioning*	More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.

Variable 5 Score .60

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, and infiltration/groundwater recharge. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on how water, energy and associated materials are exported out of the AA.

Scoring rules:

1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.

2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials

✓	Stressors	Comments/description
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	*Highly Functioning*	High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.
<0.8 - 0.7	*Functioning*	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics mildly to moderately affected.
<0.7 - 0.6	*Functioning Impaired*	Outflow at all stages is moderately impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics significantly disrupted.
<0.6	*Non-functioning*	The natural outflow regime is severely disrupted. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.

Evaporation, Transpiration, Percolation

Variable 6 Score .80

Variable 7: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that alter the chemical environment. Because water quality frequently cannot be inferred directly, the presence of many stressors is identified via indirect indicators.

Scoring rules:

1. Stressors are grouped into categories which have a similar signature or set of causes.
2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
3. For each stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
   -If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
5. Determine the variable score by following the scoring guidelines.

Stressor Category	Stressor Indicator	✓	Comments	Sub-variable Score
Nutrient Enrichment/ Eutrophication/ Oxygen (D.O.)	Livestock			.95
	Agricultural Runoff			
	Septic/Sewage			
	Excessive Algae or Aquatic Veg.			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
Sedimentation/ Turbidity	Excessive Erosion			.85
	Excessive Deposition			
	Fine Sediment Plumes			
	Agricultural Runoff			
	Excessive Turbidity			
	Nearby Construction Site	✓	Industrial	
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
Toxic contamination/ pH	Recent Chemical Spills			.70
	Nearby Industrial Sites	✓	Steel Mill	
	Road Drainage/Runoff	✓		
	Livestock			
	Agricultural Runoff			
	Storm Water Runoff	✓		
	Fish/Wildlife Impacts			
	Vegetation Impacts		Salt Cedar	
	Cumulative Watershed NPS			
	Acid Mine Drainage			
	Point Source Discharge	✓		
	CDPHE Impairment/TMDL List			
Temperature	Excessive Temperature Regime			.95
	Lack of Shading			
	Reservoir/Power Plant Discharge			
	Industrial Discharge	✓		
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
Soil chemistry/ Redox potential	Unnatural Saturation/Desaturation	✓	Stormwater point	.82
	Mechanical Soil Disturbance			
	Dumping/introduced Soil			
	CDPHE Impairment/TMDL List			

Variable 7: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Stress indicators not present or trivial.
<0.9 - 0.8	*Highly Functioning*	Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.
<0.8 - 0.7	*Functioning*	Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.
<0.7 - 0.6	*Functioning Impaired*	Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA
<0.6	*Non-functioning*	Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system

Input each factor score from the stressor list and calculate the sum.

Nutrient enrichment/ Eutrophication/ Oxygen (D.O.)		Sedimentation/ Turbidity		Toxic contamination/ pH		Temperature		Soil chemistry/ Redox potential		Sum of Sub-variable Scores
.95	+	.85	+	.70	+	.85	+	.82	=	4.27

Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable Score	Condition Class	Scoring Rules		
		Single Factor		Composite Score
1.0 - 0.9	*Reference Standard*	No single factor scores < 0.9	or	The factor scores sum > 4.5
<0.9 - 0.8	*Highly Functioning*	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5
<0.8 - 0.7	*Functioning*	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0
<0.7 - 0.6	*Functioning Impaired*	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5
< 0.6	*Non-functioning*	Any single factor scores < 0.6	or	The factor scores sum < 3.0

Variable 7 Score .82

Variable 8: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration can also directly affect soil properties, such as near-surface texture, and the wetland chemical environment, such as the redox state or nutrient composition in the rooting zone. In rating this variable, do not include these resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The effects of geomorphic change are addressed by other variables. All alterations to the geomorphology should be evaluated including small-scale impacts such as pugging, hoof sheer, and sedimentation which can be significant, but not immediately apparent, impacts.

Scoring Rules:

1. Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist.
2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

✓		Stressors	Comments
	General	Dredging/Excavation/Mining	
		Fill, including dikes, road grades, etc.	
		Grading	
		Compaction	
		Plowing/Disking	
		Excessive Sedimentation	
		Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
	Channels Only	Channel Instability/Over Widening	
		Excessive Bank Erosion	
		Channelization	
		Reconfigured Stream Channels	
		Artificial Banks/Shoreline	
		Beaver Dam Removal	
		Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Topography essentially unaltered from the natural state, or alterations don't appear to have a minimal effect on wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.
<0.9 - 0.8	*Highly Functioning*	Alterations to topography result in small but detectable changes to habitat conditions throughout all or most of the AA; or changes causing more significant impacts but affecting less than 10% of the AA.
<0.8 - 0.7	*Functioning*	Changes to AA topography may be pervasive but generally mild. May include patches of more significant habitat alteration; or more significant alteration affecting less than 20 % of the AA.
<0.7 - 0.6	*Functioning Impaired*	At least one important surface type or landform has been eliminated or created; microtopography has been moderately altered throughout most or all of the AA, or more severe alterations affect less than 50% AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.
<0.6	*Non-functioning*	Geomorphic alterations have rendered the AA essentially unusable by *characteristic* wildlife species, or the physical setting no longer supports native plant communities.

Variable 8 Score .97

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

Rules for Scoring:

1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination. Check each present or suspected vegetation layer in the third row of the table.

2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.

3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required.

4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).

5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.

6. Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score".

7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".

8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

	Vegetation Layers				
Layers Scored *(check boxes to right to indicate scored layers)*	/	/	/		
Stressor	**Tree**	**Shrub**	**Herb**	**Aquatic**	**Comments**
Noxious Weeds	✓	✓	✓		Russian olive / tamarisk / [illegible]
Exotic/Invasive spp.			✓		
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization					
Dewatering					
Over Saturation					

Percent Cover of Layer	.05	+	.05	+	.9	+		= 1.0
	x		x		x		x	
Veg. Layer Sub-variable Score	.80		.80		.65			÷
	=		=		=		=	
Weighted Sub-variable Score	.04	+	.04	+	.59	+		= .67

See sub-variable scoring guidelines on following page

Variable 9 Score .67

FACWet Score Card

Scoring Procedure:

1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
3. Add the variable scores to calculate the total functional points achieved for each function.
4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, howe if a variable is added or subtracted to FCI equation the total possible points must be adjusted
5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

VARIABLE SCORE TABLE

Buffer & Landscape Context	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	.95
	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	.95
	Variable 3:	Buffer Capacity	.70
Hydrology	Variable 4:	Water Source	.62
	Variable 5:	Water Distribution	.60
	Variable 6:	Water Outflow	.80
Abiotic and Biotic Habitat	Variable 7:	Chemical Environment	.82
	Variable 8:	Geomorphology	.97
	Variable 9:	Vegetation Structure and Complexity	.67

Functional Capacity Indices

Function	Equation	Total Functional Points	Functional Capacity Index
Function 1 -- Support of Characteristic Wildlife Habitat	$V1_{wetloss}$ + $V2_{barriers}$ + $V3_{buffer}$ + (2 x $V9_{veg}$)	.95 + .95 + .7 + 1.34 = 3.94 ÷ 5	.79
Function 2 -- Support of Characteristic Fish/aquatic Habitat	(3 x $V4_{source}$) + (2 x $V5_{dist}$) + 2 x $V6_{outflow}$ + $V7_{chem}$ + $V8_{geom}$	1.86 + 1.2 + 1.6 + ~~1.6~~ .82 + .97 = 6.45 ÷ 9	.72
Function 3 -- Flood Attenuation	$V3_{buffer}$ + 2 x $V4_{source}$ + (2 x $V5_{dist}$) + 2 x $V6_{outflow}$ + $V8_{geom}$ + $V9_{veg}$	.70 + 1.24 + 1.20 + 1.6 + .97 + .67 = ~~5.77~~ 6.38 ÷ 9	.71
Function 4 -- Short- and Long-term Water Storage	V_{source} + (2 x $V5_{dist}$) + 2 x $V6_{outflow}$) $V8_{geom}$	.62 + 1.20 + 1.60 + .97 = 4.39 ÷ 6	.73
Function 5 -- Nutrient/Toxicant Removal	(2 x $V5_{dist}$) + $V7_{chem}$ + $V8_{geom}$	1.2 + .82 + .97 = 2.99 ÷ 4	.75
Function 6 -- Sediment Retention/Shoreline Stabilization	$V3_{buffer}$ + (2 x $V8_{geo}$) + (2 x $V9_{veg}$)	.70 + 1.94 + 1.34 = 3.98 ÷ 5	.80
Function 7 -- Production Export/Food Chain Support	$V1_{wetloss}$ + 2 x $V6_{outflow}$ + $V7_{chem}$ + $V8_{geo}$ + (2 x $V9_{veg}$)	.95 + 1.60 + .82 + .97 + 1.34 = 5.68 ÷ 7	.81

Sum of Individual FCI Scores 5.31

Divide by the Number of Functions Scored (usually 7) ÷ 7

Composite FCI Score .76

ADMINISTRATIVE CHARACTERIZATION

General Information			
		Date of Evaluation:	5/25/10
Site Name or ID:	Wetland 2	Project Name:	Pueblo Freeway
404 or Other Permit Application #:		Applicant Name:	CDOT
Evaluator Name(s):	Becky Pierce Rob Frei	Evaluator's professional position and organization:	CDOT HQ & Reg 2.

Location Information:			
Site Location (Lat./Long. or UTM):	38°15'02.63"N 104°36'26.86"W	Geographic Datum Used (NAD 83	
USGS Quadrangle Map:	Northeast Pueblo	Map Scale: (Circle one)	1:24,000 1:100,000 Other 1:
Sub basin Name (8 digit HUC):	11020002	Wetland Ownership:	Private

Project Information:			
This evaluation is being performed at: (Check applicable box)	[X] Project Wetland [ ] Mitigation Site	Purpose of Evaluation (check all applicable):	[X] Potentially Impacted Wetlands [ ] Mitigation; Pre-construction [ ] Mitigation; Post-construction [ ] Monitoring [ ] Other (Describe)

Intent of Project: (Check all applicable) [ ] Restortation [ ] Enhancement [ ] Creation

Total Size of Wetland Involved: (Record Area, Check and Describe Measurement Method Used)	ac.	[ ] Measured [ ] Estimated					
Assessment Area (AA) Size (Record Area, check appropriate box. Additional spaces are used to record acreage when more than one AA is included in a single assessment)	ac.	[ ] Measured	ac.	ac.	ac.	ac.
		[ ] Estimated	ac.	ac.	ac.	ac.
Characteristics or Method used for AA boundary determination:							

Notes: Township 21 South, Range 65 W

ECOLOGICAL DESCRIPTION 1

Special Concerns

Check all that apply

- ☐ Organic soils including Histosols or Histic Epipedons are present in the AA (i.e., AA includes core fen habitat).
- ☐ Project will directly impact organic soil portions of the AA including areas possessing either Histosol soils or histic epipedons.
- ☐ Organic soils are known to occur anywhere within the contiguous wetland of which the AA is part.
- ☐ The wetland is a habitat oasis in an otherwise dry or urbanized landscape?
- ☐ Federally threatened or endangered species are **KNOWN** to occur in the AA? List Below.

_____

_____

- ☐ Federally threatened or endangered species are **SUSPECTED** to occur in the AA?

_____

_____

_____

- ☐ Species of concern according to the Colorado Natural Heritage (CNHP) are known to occur in the AA?
- ☐ The site is located within a potential conservation area or element occurrence buffer area as determined by CNHP?
- ☐ Other special concerns (please describe)

_____

HYDROGEOMORPHIC SETTING

- ☐ AA wetland maintains its fundamental natural hydrogeomorphic characteristics
- ☐ AA wetland has been subject to change in HGM classes as a result of anthropogenic modification

If the above is checked, please describe the original wetland type if discernable using the table below.

- ☒ AA wetland was created from an upland setting.

	Historical Conditions				
Previous wetland typology	**Water source**	Surface flow	Groundwater	Precipitation	Unknown
	Hydrodynamics	Unidirectional	Vertical		
	Geomorphic Setting (Narrative Description)				
	Previous HGM Class	Riverine	Slope	Depressional	Lacustrine

Current Conditions

Describe the hydrogeomorphic setting of the wetland by circling all conditions that apply.

HGM Setting	**Water source**	Surface flow	Groundwater	Precipitation		Unknown
	Hydrodynamics	Unidirectional	Vertical			
	Wetland Gradient	0 - 2%	2-4%	4-10%	>10%	
	# Surface Inlets	Over-bank 0	1	2	3+	>3
	# Surface Outlets	0	1	2	3	>3
	Geomorphic Setting (Narrative Description)	Seep fed wetland likely more than 1 seep. Artificial valley				
	HGM class	Riverine	Slope	Depressional		Lacustrine

Notes (include information on charcteristics used to formulate reference standard):

ECOLOGICAL DESCRIPTION 2

Vegetation Habitat Description

*US FWS habitat classification according as reported in Cowardin et. al (1979) - See also Appendix *** of FACWet User Guide.*

System	Subsystem	Class	Subclass	Water Regime	Other Modifiers	% AA
Lacustrine	Littoral; Limnoral	Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Emergent(EM) Shrub-scrub(SS) Forested (FO)	Floating vascular; Rooted vascular; Algal; Persistent; Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel; Sand; Mud; Organic	**Examples** Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seas.-flood./sat.(E); Perm. flooded(F); Intermittently Flooded(G); Artificially Flooded(K); Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Hypersaline(7) ; Eusaline(8); Mixosaline(9); Fresh(0); Acid(a); Circumneutral(c); Alkaline/calcareous(i); Organic(g); Mineral(n); Beaver(b); Partially Drained/ditched(d); Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
Palustrine	Palustrine					
Riverine	Lower perennial; Upper perennial; Intermittent					

Site Map

Scale: 1 sq. =

Draw a sketch map of the site including relevant portions of the wetland, AA boundary, structures, habitat classes, and other significant features.

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally- occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

1. On the aerial photo outline the area that is within 500 meters of the AA.
2. Identify obvious natural barriers within 500 m of the AA boundary.
   - *Natural barriers include continuous cliff bands, deep open water, etc.*
3. Draw the **Habitat Connectivity Envelope**(HCE) on the aerial image.
   - *The HCE is all the area within 500 meters of the AA that is not separated from it by a natural barrier.*
4. Outline the current extent of naturally occurring wetland and riparian habitat. Then outline areas where the habitats appear to have historically occurred.
   - *Use your knowledge of the history of the area and evident land use change. Additional research could be utilized to increase the accuracy of this estimate including consideratation of floodplain maps, historical aerials, etc.*

Variable Score	Condition Category	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	*Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats*
<0.9 - 0.8	*Highly Functioning*	*More than 80% of historical wetland habitat area within the HCE is still present (less than 20% historical wetland habitat area lost).*
<0.8 - 0.7	*Functioning*	*80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% historical wetland habitat area lost).*
<0.7 - 0.6	*Functioning Impaired*	*Less than 60 to 30% of historical wetland habitat area within the HCE is still present (more than 30 to 70% historical wetland habitat area lost).*
<0.6	*Non-functioning*	*Less than 30% of the historical wetland habitat area from within the HCE is now no longer in existence (more than 70% historical wetland habitat area lost).*

Variable 1 Score 0.65

Notes: Assuming wetland/riparian community along the Arkansas River used to be present.

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the man-made barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

1. On the aerial photo, outline all existing wetland and riparian habitat areas (WHAs) within the HCE.

2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.

3. Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

Stressors = artificial barriers	✓	Stressors	Comments/description
	✓	Major Highway	I-25
		Secondary Highway	
	✓	Tertiary Roadway	Santa Fe Drive/Ave.
	✓	Railroad	Adjacent to AA
		Bike Path	
	✓	Urban Development	parking lots
		Agricultural Development	
		Artificial Water Body	
		Fence	
	✓	~~Ditch or Aqueduct~~ Step Banks	Artificial
		Aquatic Organism Barriers	
	✓	Residential	Single-family homes
	✓	Commercial	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.
<0.9 - 0.8	*Highly Functioning*	Barriers impeding migration/dispersal between the AA and up to 33% of surrounding WHA highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. More significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding WHA.
<0.8 - 0.7	*Functioning*	Barriers to migration and dispersal retard the ability of many organisms/propagules to pass between the AA and up to 66% of WHA. Passage of organisms and propagules through such barriers is still possible, but it may be constrained to certain times of day, be slow, dangerous or require additional travel. Busy two-lane roads, culverted areas, small to medium artificial water bodies or small earthen dams would commonly rate a score in this range. More significant barriers (see "functioning impaired" category below) could affect migration to up to 10% of surrounding WHA.
<0.7 - 0.6	*Functioning Impaired*	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding WHA. Travel of those animals which can potential negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding WHA could be functionally isolated from the AA.
<0.6	*Non-functioning*	AA is essentially isolated from surrounding WHA by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and a WHA.

Not high amt. of WHA w/in the HCE, but what is there is cut off

Variable 2 Score ~~0.68~~ .62

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

1. On the aerial photograph, outline the buffer area as the zone within 250 meters of the outer boundary of the AA.
2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
3. Considering all of the identified stressors, their overall severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

Stressors = Land Use Changes	✓	Stressors	Comments/description
	✓	Industrial/commercial	parking lots - chemicals
		Urban	
	✓	Residential	
		Rural	
		Dryland Farming	
		Intensive Agriculture	
		Orchards or Nurseries	
		Livestock Grazing	
	✓	Transportation Corridor	I-25, railroad, other roads
		Urban Parklands	
		Dams/impoundments	
		Artificial Water body	
		Physical Resource Extraction	
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	*Highly Functioning*	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, either because land use is not intensive, for example haying, light grazing, or nurseries, or more substantial changes occur in approximately less than 10% of the BA.
<0.8 - 0.7	*Functioning*	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. Moderate-intensity land uses such as dry-land farming, urban "green" corridors, or moderate cattle grazing would commonly be placed within this scoring range.
<0.7 - 0.6	*Functioning Impaired*	Land use within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	*Non-functioning*	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

Bad but not terrible buffering capacity

Variable 3 score 0.67

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that alter the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain.This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 7.

Scoring rules:

1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.

2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

✓	Stressors	Comments/description
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
	Culverts or Constrictions	
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
	Storm Drain/Urban Runoff	
	Impermeable Surface Runoff	
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Class	Depletion	Augmentation
1.0 - 0.9	*Reference Standard*	Unnatural drawdown events minor, rare or non-existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non-existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	*Highly Functioning*	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or natural capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or natural capacity of water to perform work.
<0.8 - 0.7	*Functioning*	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or natural capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial reduction of peak flows or natural capacity of water to perform work.
<0.7 - 0.6	*Functioning Impaired*	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or natural capacity of water to perform work. **Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.**	Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or natural capacity of water to perform work. **Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.**
<0.6	*Non-functioning*	Water source diminished enough to threaten jurisdictional classification of the AA.	Frequency, duration or magnitude of unnaturally high-water great enough to change the fundamental characteristics of the wetland.

Variable 4 Score .95

Variable 5: Water Distribution

This variable is concerned with hydrologic connectivity within the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally ***result*** *from geomorphic modifications. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within portions of the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In naturally confined rivers (i.e. canyons and gullies) floodplain width is generally very small, so these systems will tend to score high for this variable unless some gross stressor is present.*

Scoring rules:

1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.
2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

✓	Stressors	Comments/description
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
✓	Artificial Banks/Shoreline	Moderate influence
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
✓	Sediment/Fill Accumulation	Minor - Moderate Dep

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	*Reference Standard*	Little or no alteration has been made to the way in which water is distributed throughout the wetland.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.
<0.9 - 0.8	*Highly Functioning*	Less than 10% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.
<0.8 - 0.7	*Functioning*	Between 10 and 33% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in a 4 in. (5 cm) or less change in mean growing season water table elevation.	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	*Functioning Impaired*	33 to 66% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less change in mean growing season water table elevation. Water table behavior must still meet jurisdictional criteria to merit this rating.	Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.
<0.6	*Non-functioning*	More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.

Variable 5 Score .87

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, and infiltration/groundwater recharge. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on how water, energy and associated materials are exported out of the AA.

Scoring rules:

1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.

2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials

✓	Stressors	Comments/description
	Ditches	
	Dikes/Levees	
✓	Road Grades	Santa Fe
✓	Culverts	under Santa Fe
	Diversions	
✓	Constrictions	Artificial Fill
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	*Highly Functioning*	High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.
<0.8 - 0.7	*Functioning*	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics mildly to moderately affected.
<0.7 - 0.6	*Functioning Impaired*	Outflow at all stages is moderately impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics significantly disrupted.
<0.6	*Non-functioning*	The natural outflow regime is severely disrupted. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.

Variable 6 Score .80

Variable 7: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that alter the chemical environment. Because water quality frequently cannot be inferred directly, the presence of many stressors is identified via indirect indicators.

Scoring rules:

1. Stressors are grouped into categories which have a similar signature or set of causes.
2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
3. For each stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
   -If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
5. Determine the variable score by following the scoring guidelines.

Stressor Category	Stressor Indicator	✓	Comments	Sub-variable Score
Nutrient Enrichment/ Eutrophication/ Oxygen (D.O.)	Livestock			.95
	Agricultural Runoff			
	Septic/Sewage	✓	? Maybe Res-dev/wl	
	Excessive Algae or Aquatic Veg.			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
Sedimentation/ Turbidity	Excessive Erosion			.90
	Excessive Deposition			
	Fine Sediment Plumes			
	Agricultural Runoff			
	Excessive Turbidity			
	Nearby Construction Site	✓		
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
	Exposed Banks	✓		
Toxic contamination/ pH	Recent Chemical Spills	?		.90
	Nearby Industrial Sites			
	Road Drainage/Runoff	✓	Some	
	Livestock			
	Agricultural Runoff			
	Storm Water Runoff	✓		
	Fish/Wildlife Impacts			
	Vegetation Impacts			
	Cumulative Watershed NPS			
	Acid Mine Drainage			
	Point Source Discharge			
	CDPHE Impairment/TMDL List			
Temperature	Excessive Temperature Regime			.98
	Lack of Shading			
	Reservoir/Power Plant Discharge			
	Industrial Discharge			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
Soil chemistry/ Redox potential	Unnatural Saturation/Desaturation			.85
	Mechanical Soil Disturbance			
	Dumping/introduced Soil	✓		
	CDPHE Impairment/TMDL List			

Variable 7: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Stress indicators not present or trivial.
<0.9 - 0.8	*Highly Functioning*	Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.
<0.8 - 0.7	*Functioning*	Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.
<0.7 - 0.6	*Functioning Impaired*	Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA
<0.6	*Non-functioning*	Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system

Input each factor score from the stressor list and calculate the sum.

Nutrient enrichment/ Eutrophication/ Oxygen (D.O.)		Sedimentation/ Turbidity		Toxic contamination/ pH		Temperature		Soil chemistry/ Redox potential		Sum of Sub-variable Scores
.95	+	.90	+	.90	+	.98	+	.85	=	4.58

Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable Score	Condition Class	Scoring Rules		
		Single Factor		Composite Score
1.0 - 0.9	*Reference Standard*	No single factor scores < 0.9	or	The factor scores sum > 4.5
<0.9 - 0.8	*Highly Functioning*	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5
<0.8 - 0.7	*Functioning*	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0
<0.7 - 0.6	*Functioning Impaired*	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5
< 0.6	*Non-functioning*	Any single factor scores < 0.6	or	The factor scores sum < 3.0

Variable 7 Score .88

Variable 8: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration can also directly affect soil properties, such as near-surface texture, and the wetland chemical environment, such as the redox state or nutrient composition in the rooting zone. In rating this variable, do not include these resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The effects of geomorphic change are addressed by other variables. All alterations to the geomorphology should be evaluated including small-scale impacts such as pugging, hoof sheer, and sedimentation which can be significant, but not immediately apparent, impacts.

Scoring Rules:

1. Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist.
2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

✓		Stressors	Comments
	General	Dredging/Excavation/Mining	
✓	General	Fill, including dikes, road grades, etc.	
	General	Grading	
	General	Compaction	
	General	Plowing/Disking	
	General	Excessive Sedimentation	
✓	General	Dumping	
	General	Hoof Shear/Pugging	
	General	Aggregate or Mineral Mining	
	General	Sand Accumulation	
	Channels Only	Channel Instability/Over Widening	
	Channels Only	Excessive Bank Erosion	
	Channels Only	Channelization	
	Channels Only	Reconfigured Stream Channels	
	Channels Only	Artificial Banks/Shoreline	
	Channels Only	Beaver Dam Removal	
	Channels Only	Substrate Embeddedness	
	Channels Only	Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Topography essentially unaltered from the natural state, or alterations don't appear to have a minimal effect on wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.
<0.9 - 0.8	*Highly Functioning*	Alterations to topography result in small but detectable changes to habitat conditions throughout all or most of the AA; or changes causing more significant impacts but affecting less than 10% of the AA.
<0.8 - 0.7	*Functioning*	Changes to AA topography may be pervasive but generally mild. May include patches of more significant habitat alteration; or more significant alteration affecting less than 20 % of the AA.
<0.7 - 0.6	*Functioning Impaired*	At least one important surface type or landform has been eliminated or created; microtopography has been moderately altered throughout most or all of the AA, or more severe alterations affect less than 50% AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.
<0.6	*Non-functioning*	Geomorphic alterations have rendered the AA essentially unusable by *characteristic* wildlife species, or the physical setting no longer supports native plant communities.

Variable 8 Score .88

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

Rules for Scoring:

1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination. Check each present or suspected vegetation layer in the third row of the table.

2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.

3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required.

4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).

5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.

6. Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score".

7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".

8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

	Vegetation Layers				
Layers Scored *(check boxes to right to indicate scored layers)*	Y	Y	Y	Y	
Stressor	**Tree**	**Shrub**	**Herb**	**Aquatic**	**Comments**
Noxious Weeds	✓	✓	✓		Russian olive, Siberian Elm
Exotic/Invasive spp.	✓	✓	✓		~~[illegible]~~ Elm Tamarisk, Tree Lawn
Tree Harvest					Salsify, bindweed, Clean 1.5
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization			✓		Cattails
Dewatering					
Over Saturation					

Percent Cover of Layer	.20	+	.15	+	.95	+	.01	=	1.31
	x		x		x		x		
Veg. Layer Sub-variable Score	.72		.60		.80		.95		÷
	=		=		=		=		
Weighted Sub-variable Score	.14	+	.09	+	.76	+	.01	=	1.0

See sub-variable scoring guidelines on following page

Variable 9 Score .76

FACWet Score Card

Scoring Procedure:

1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
3. Add the variable scores to calculate the total functional points achieved for each function.
4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, howe if a variable is added or subtracted to FCI equation the total possible points must be adjusted
5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

VARIABLE SCORE TABLE

Buffer & Landscape Context	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	.65
	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	.62
	Variable 3:	Buffer Capacity	.67
Hydrology	Variable 4:	Water Source	.95
	Variable 5:	Water Distribution	.87
	Variable 6:	Water Outflow	.80
Abiotic and Biotic Habitat	Variable 7:	Chemical Environment	.88
	Variable 8:	Geomorphology	.88
	Variable 9:	Vegetation Structure and Complexity	.76

Functional Capacity Indices

Function	Equation	Total Functional Points	Functional Capacity Index
Function 1 -- Support of Characteristic Wildlife Habitat	$V1_{wetloss}$ + $V2_{barriers}$ + $V3_{buffer}$ + (2 x $V9_{veg}$)		
	.65 + .62 + .67 + 1.52 + + =	3.46 ÷ 5 =	.69
Function 2 -- Support of Characteristic Fish/aquatic Habitat	(3 x $V4_{source}$) + (2 x $V5_{dist}$) + 2 x $V6_{outflow}$ + $V7_{chem}$ + $V8_{geom}$		
	2.85 + 1.74 + 1.60 + .88 + .88 + =	7.95 ÷ 9 =	.88
Function 3 -- Flood Attenuation	$V3_{buffer}$ + 2 x $V4_{source}$ + (2 x $V5_{dist}$) + 2 x $V6_{outflow}$ + $V8_{geom}$ + $V9_{veg}$		
	.67 + 1.90 + 1.74 + 1.60 + .88 + .76 =	7.55 ÷ 9 =	.84
Function 4 -- Short- and Long-term Water Storage	V_{source} + (2 x $V5_{dist}$) + 2 x $V6_{outflow}$) $V8_{geom}$		
	.95 + 1.74 + 1.60 + .88 + + =	5.17 ÷ 6 =	.86
Function 5 -- Nutrient/Toxicant Removal	(2 x $V5_{dist}$) + $V7_{chem}$ + $V8_{geom}$		
	1.74 + .88 + .88 + + + =	3.5 ÷ 4 =	.88
Function 6 -- Sediment Retention/Shoreline Stabilization	$V3_{buffer}$ + (2 x $V8_{geo}$) + (2 x $V9_{veg}$)		
	.67 + 1.76 + 1.52 + + + =	3.95 ÷ 5 =	.79
Function 7 -- Production Export/Food Chain Support	$V1_{wetloss}$ + 2 x $V6_{outflow}$ + $V7_{chem}$ + $V8_{geo}$ + (2 x $V9_{veg}$)		
	.65 + 1.60 + .88 + .88 + 1.52 + =	5.53 ÷ 7 =	.79

Sum of Individual FCI Scores 5.73

Divide by the Number of Functions Scored (usually 7) ÷ 7

Composite FCI Score .82

FACWet Version 1.0
April 2009

ADMINISTRATIVE CHARACTERIZATION

General Information			
		Date of Evaluation:	5/25/10
Site Name or ID:	Wetland 3	Project Name:	Pueblo Freeway
404 or Other Permit Application #:		Applicant Name:	CDOT
Evaluator Name(s):	Becky Pierce Rob Frei	Evaluator's professional position and organization:	CDOT Reg 2 HQ &

Location Information:			
Site Location (Lat./Long. or UTM):	38°15'14.39" N 104°36'18.44" W	Geographic Datum Used (NAD 83	
USGS Quadrangle Map:	Northeast Pueblo	Map Scale: (Circle one)	1:24,000 1:100,000 Other 1:
Sub basin Name (8 digit HUC):	11020002	Wetland Ownership:	City of Pueblo

Project Information:			
This evaluation is being performed at: (Check applicable box)	☒ Project Wetland ☐ Mitigation Site	Purpose of Evaluation (check all applicable):	☒ Potentially Impacted Wetlands ☐ Mitigation; Pre-construction ☐ Mitigation; Post-construction ☐ Monitoring ☐ Other (Describe)

Intent of Project: (Check all applicable) ☐ Restortation ☐ Enhancement ☐ Creation

Total Size of Wetland Involved: (Record Area, Check and Describe Measurement Method Used)	ac.	☐ Measured ☐ Estimated					
Assessment Area (AA) Size (Record Area, check appropriate box. Additional spaces are used to record acreage when more than one AA is included in a single assessment)	ac.	☐ Measured ☐ Estimated	ac. ac.	ac. ac.	ac. ac.	ac. ac.	
Characteristics or Method used for AA boundary determination:							

Notes: Section 6, Township 21 South, Range 64 West

ECOLOGICAL DESCRIPTION 1

Special Concerns

Check all that apply

- [ ] Organic soils including Histosols or Histic Epipedons are present in the AA (i.e., AA includes core fen habitat).
- [ ] Project will directly impact organic soil portions of the AA including areas possessing either Histosol soils or histic epipedons.
- [ ] Organic soils are known to occur anywhere within the contiguous wetland of which the AA is part.
- [ ] The wetland is a habitat oasis in an otherwise dry or urbanized landscape?
- [ ] Federally threatened or endangered species are **KNOWN** to occur in the AA? List Below.

- [ ] Federally threatened or endangered species are **SUSPECTED** to occur in the AA?
- [ ] Species of concern according to the Colorado Natural Heritage (CNHP) are known to occur in the AA?
- [ ] The site is located within a potential conservation area or element occurrence buffer area as determined by CNHP?
- [ ] Other special concerns (please describe)

HYDROGEOMORPHIC SETTING

- [x] AA wetland maintains its fundamental natural hydrogeomorphic characteristics
- [ ] AA wetland has been subject to change in HGM classes as a result of anthropogenic modification
  If the above is checked, please describe the original wetland type if discernable using the table below.
- [ ] AA wetland was created from an upland setting.

	Historical Conditions				
Previous wetland typology	**Water source**	Surface flow	Groundwater	Precipitation	Unknown
	Hydrodynamics	Unidirectional	Vertical		
	Geomorphic Setting (Narrative Description)				
	Previous HGM Class	Riverine	Slope	Depressional	Lacustrine

Current Conditions

Describe the hydrogeomorphic setting of the wetland by circling all conditions that apply.

HGM Setting	**Water source**	Surface flow	Groundwater	Precipitation	Unknown		
	Hydrodynamics	Unidirectional	Vertical				
	Wetland Gradient	0 - 2%	2-4%	4-10%	>10%		
	# Surface Inlets	Over-bank	0	1	2	3	>3
	# Surface Outlets		0	1	2	3	>3
	Geomorphic Setting (Narrative Description)						
	HGM class	Riverine	Slope	Depressional	Lacustrine		

Notes (include information on charcteristics used to formulate reference standard):

Wetland on N and S side/bank of Arkansas River.

ECOLOGICAL DESCRIPTION 2

Vegetation Habitat Description

*US FWS habitat classification according as reported in Cowardin et. al (1979) - See also Appendix *** of FACWet User Guide.*

System	Subsystem	Class	Subclass	Water Regime	Other Modifiers	% AA
Riverine	Palustrine					

Lacustrine	Littoral; Limnoral	Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Emergent(EM) Shrub-scrub(SS) Forested (FO)	Floating vascular; Rooted vascular; Algal; Persistent; Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel; Sand; Mud; Organic	**Examples** Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seas.-flood./sat.(E); Perm. flooded(F); Intermittently Flooded(G); Artificially Flooded(K); Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Hypersaline(7) ; Eusaline(8); Mixosaline(9); Fresh(0); Acid(a); Circumneutral(c); Alkaline/calcareous(i); Organic(g); Mineral(n); Beaver(b); Partially Drained/ditched(d); Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
Palustrine	Palustrine					
Riverine	Lower perennial; Upper perennial; Intermittent					

Site Map

Scale: 1 sq. =

Draw a sketch map of the site including relevant portions of the wetland, AA boundary, structures, habitat classes, and other significant features.

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally- occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

1. On the aerial photo outline the area that is within 500 meters of the AA.
2. Identify obvious natural barriers within 500 m of the AA boundary.
   - *Natural barriers include continuous cliff bands, deep open water, etc.*
3. Draw the **Habitat Connectivity Envelope**(HCE) on the aerial image.
   - *The HCE is all the area within 500 meters of the AA that is not separated from it by a natural barrier.*
4. Outline the current extent of naturally occurring wetland and riparian habitat. Then outline areas where the habitats appear to have historically occurred.
   - *Use your knowledge of the history of the area and evident land use change. Additional research could be utilized to increase the accuracy of this estimate including consideratation of floodplain maps, historical aerials, etc.*

Variable Score	Condition Category	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	*Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats*
<0.9 - 0.8	*Highly Functioning*	*More than 80% of historical wetland habitat area within the HCE is still present (less than 20% historical wetland habitat area lost).*
<0.8 - 0.7	*Functioning*	*80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% historical wetland habitat area lost).*
<0.7 - 0.6	*Functioning Impaired*	*Less than 60 to 30% of historical wetland habitat area within the HCE is still present (more than 30 to 70% historical wetland habitat area lost).*
<0.6	*Non-functioning*	*Less than 30% of the historical wetland habitat area from within the HCE is now no longer in existence (more than 70% historical wetland habitat area lost).*

Variable 1 Score 0.65

Notes: More than 1/2 WHA along the Arkansas River are absent.

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the man-made barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

1. On the aerial photo, outline all existing wetland and riparian habitat areas (WHAs) within the HCE.

2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.

3. Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

Stressors = artificial barriers	✓	Stressors	Comments/description
	✓	Major Highway	
	✓	Secondary Highway	
		Tertiary Roadway	
	✓	Railroad	
		Bike Path	
	✓	Urban Development	ball fields, residential
		Agricultural Development	
		Artificial Water Body	
		Fence	
		Ditch or Aqueduct	
		Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.
<0.9 - 0.8	*Highly Functioning*	Barriers impeding migration/dispersal between the AA and up to 33% of surrounding WHA highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. More significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding WHA.
<0.8 - 0.7	*Functioning*	Barriers to migration and dispersal retard the ability of many organisms/propagules to pass between the AA and up to 66% of WHA. Passage of organisms and propagules through such barriers is still possible, but it may be constrained to certain times of day, be slow, dangerous or require additional travel. Busy two-lane roads, culverted areas, small to medium artificial water bodies or small earthen dams would commonly rate a score in this range. More significant barriers (see "functioning impaired" category below) could affect migration to up to 10% of surrounding WHA.
<0.7 - 0.6	*Functioning Impaired*	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding WHA. Travel of those animals which can potential negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding WHA could be functionally isolated from the AA.
<0.6	*Non-functioning*	AA is essentially isolated from surrounding WHA by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and a WHA.

Most WHA are not blocked by barriers

Variable 2 Score 0.80

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

1. On the aerial photograph, outline the buffer area as the zone within 250 meters of the outer boundary of the AA.
2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
3. Considering all of the identified stressors, their overall severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

Stressors = Land Use Changes	✓	Stressors	Comments/description
	✓	Industrial/commercial	Some industrial on west side of Santa Fe
		Urban	
	✓	Residential	
		Rural	
		Dryland Farming	
		Intensive Agriculture	
		Orchards or Nurseries	
		Livestock Grazing	
	✓	Transportation Corridor	
		Urban Parklands	
		Dams/impoundments	
		Artificial Water body	
		Physical Resource Extraction	
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	*Highly Functioning*	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, either because land use is not intensive, for example haying, light grazing, or nurseries, or more substantial changes occur in approximately less than 10% of the BA.
<0.8 - 0.7	*Functioning*	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. Moderate-intensity land uses such as dry-land farming, urban "green" corridors, or moderate cattle grazing would commonly be placed within this scoring range.
<0.7 - 0.6	*Functioning Impaired*	Land use within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	*Non-functioning*	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

Variable 3 score 0.78

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that alter the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 7.

Scoring rules:

1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.

2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

✓	Stressors	Comments/description
	Ditches or Drains (tile, etc.)	
✓	Dams	
✓	Diversions	
	Groundwater pumping	
	Draw-downs	
✓	Culverts or Constrictions	Levees
✓	Point Source (urban, ind., ag.)	
✓	Non-point Source	
	Increased Drainage Area	
✓	Storm Drain/Urban Runoff	
✓	Impermeable Surface Runoff	
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
✓	Transbasin Diversion	
✓	Actively Managed Hydrology	

Variable Score	Condition Class	Depletion	Augmentation
1.0 - 0.9	*Reference Standard*	Unnatural drawdown events minor, rare or non-existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non-existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	*Highly Functioning*	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or natural capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or natural capacity of water to perform work.
<0.8 - 0.7	*Functioning*	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or natural capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial reduction of peak flows or natural capacity of water to perform work.
<0.7 - 0.6	*Functioning Impaired*	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or natural capacity of water to perform work. **Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.**	Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or natural capacity of water to perform work. **Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.**
<0.6	*Non-functioning*	Water source diminished enough to threaten jurisdictional classification of the AA.	Frequency, duration or magnitude of unnaturally high-water great enough to change the fundamental characteristics of the wetland.

Variable 4 Score .75

Variable 5: Water Distribution

This variable is concerned with hydrologic connectivity within the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally ***result*** *from geomorphic modifications. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within portions of the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In naturally confined rivers (i.e. canyons and gullies) floodplain width is generally very small, so these systems will tend to score high for this variable unless some gross stressor is present.*

Scoring rules:

1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.
2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

✓	Stressors	Comments/description
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	
✓	Drop structure	

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	*Reference Standard*	Little or no alteration has been made to the way in which water is distributed throughout the wetland.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.
<0.9 - 0.8	*Highly Functioning*	Less than 10% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.
<0.8 - 0.7	*Functioning*	Between 10 and 33% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in a 4 in. (5 cm) or less change in mean growing season water table elevation.	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	*Functioning Impaired*	33 to 66% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less change in mean growing season water table elevation. Water table behavior must still meet jurisdictional criteria to merit this rating.	Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.
<0.6	*Non-functioning*	More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.

Variable 5 Score .85

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, and infiltration/groundwater recharge. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on how water, energy and associated materials are exported out of the AA.

Scoring rules:

1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.

2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials

✓	Stressors	Comments/description
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	*Highly Functioning*	High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.
<0.8 - 0.7	*Functioning*	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics mildly to moderately affected.
<0.7 - 0.6	*Functioning Impaired*	Outflow at all stages is moderately impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics significantly disrupted.
<0.6	*Non-functioning*	The natural outflow regime is severely disrupted. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.

Variable 6 Score .98

Variable 7: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that alter the chemical environment. Because water quality frequently cannot be inferred directly, the presence of many stressors is identified via indirect indicators.

Scoring rules:

1. Stressors are grouped into categories which have a similar signature or set of causes.
2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
3. For each stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
   -If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
5. Determine the variable score by following the scoring guidelines.

Stressor Category	Stressor Indicator	✓	Comments	Sub-variable Score
Nutrient Enrichment/ Eutrophication/ Oxygen (D.O.)	Livestock	✓	Minor	.95
	Agricultural Runoff			
	Septic/Sewage			
	Excessive Algae or Aquatic Veg.			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
Sedimentation/ Turbidity	Excessive Erosion			.90
	Excessive Deposition			
	Fine Sediment Plumes			
	Agricultural Runoff			
	Excessive Turbidity			
	Nearby Construction Site	✓	4th Street Bridge	
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
Toxic contamination/ pH	Recent Chemical Spills			.80
	Nearby Industrial Sites	✓		
	Road Drainage/Runoff	✓		
	Livestock			
	Agricultural Runoff			
	Storm Water Runoff	✓		
	Fish/Wildlife Impacts	✓	Fish Hatchery Intake.	
	Vegetation Impacts			
	Cumulative Watershed NPS			
	Acid Mine Drainage	✓	Clinton Mine – Headwaters	
	Point Source Discharge	✓		
	CDPHE Impairment/TMDL List			
Temperature	Excessive Temperature Regime			.88
	Lack of Shading			
	Reservoir/Power Plant Discharge	✓		
	Industrial Discharge			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
Soil chemistry/ Redox potential	Unnatural Saturation/Desaturation			.95
	Mechanical Soil Disturbance			
	Dumping/introduced Soil			
	CDPHE Impairment/TMDL List			

Variable 7: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Stress indicators not present or trivial.
<0.9 - 0.8	*Highly Functioning*	Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.
<0.8 - 0.7	*Functioning*	Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.
<0.7 - 0.6	*Functioning Impaired*	Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA
<0.6	*Non-functioning*	Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system

Input each factor score from the stressor list and calculate the sum.

Nutrient enrichment/ Eutrophication/ Oxygen (D.O.)		Sedimentation/ Turbidity		Toxic contamination/ pH		Temperature		Soil chemistry/ Redox potential		Sum of Sub-variable Scores
.95	+	.90	+	.80	+	.88	+	.95	=	4.48

Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable Score	Condition Class	Scoring Rules		
		Single Factor		Composite Score
1.0 - 0.9	*Reference Standard*	No single factor scores < 0.9	or	The factor scores sum > 4.5
<0.9 - 0.8	*Highly Functioning*	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5
<0.8 - 0.7	*Functioning*	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0
<0.7 - 0.6	*Functioning Impaired*	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5
< 0.6	*Non-functioning*	Any single factor scores < 0.6	or	The factor scores sum < 3.0

Variable 7 Score .85

Variable 8: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration can also directly affect soil properties, such as near-surface texture, and the wetland chemical environment, such as the redox state or nutrient composition in the rooting zone. In rating this variable, do not include these resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The effects of geomorphic change are addressed by other variables. All alterations to the geomorphology should be evaluated including small-scale impacts such as pugging, hoof sheer, and sedimentation which can be significant, but not immediately apparent, impacts.

Scoring Rules:

1. Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist.
2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

✓		Stressors	Comments
	General	Dredging/Excavation/Mining	
		Fill, including dikes, road grades, etc.	
		Grading	
		Compaction	
		Plowing/Disking	
		Excessive Sedimentation	
		Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
	Channels Only	Channel Instability/Over Widening	
		Excessive Bank Erosion	
✓		Channelization	
✓		Reconfigured Stream Channels	
		Artificial Banks/Shoreline	
		Beaver Dam Removal	
		Substrate Embeddedness	
✓		Lack or Excess of Woody Debris	m.zor

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Topography essentially unaltered from the natural state, or alterations don't appear to have a minimal effect on wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.
<0.9 - 0.8	*Highly Functioning*	Alterations to topography result in small but detectable changes to habitat conditions throughout all or most of the AA; or changes causing more significant impacts but affecting less than 10% of the AA.
<0.8 - 0.7	*Functioning*	Changes to AA topography may be pervasive but generally mild. May include patches of more significant habitat alteration; or more significant alteration affecting less than 20 % of the AA.
<0.7 - 0.6	*Functioning Impaired*	At least one important surface type or landform has been eliminated or created; microtopography has been moderately altered throughout most or all of the AA, or more severe alterations affect less than 50% AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.
<0.6	*Non-functioning*	Geomorphic alterations have rendered the AA essentially unusable by *characteristic* wildlife species, or the physical setting no longer supports native plant communities.

Variable 8 Score .65

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

Rules for Scoring:

1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination. Check each present or suspected vegetation layer in the third row of the table.

2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.

3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required.

4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).

5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.

6. Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score".

7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".

8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

	Vegetation Layers				
Layers Scored *(check boxes to right to indicate scored layers)*		Y	Y		
Stressor	**Tree**	**Shrub**	**Herb**	**Aquatic**	**Comments**
Noxious Weeds		✓			Russian olive, Tamarisk
Exotic/Invasive spp.		✓	✓		Siberian Elm
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization					
Dewatering					
Over Saturation					

Percent Cover of Layer		+	.40	+	.85	+		= 1.25
	x		x		x		x	
Veg. Layer Sub-variable Score			.60		.85			÷
	=		=		=		=	
Weighted Sub-variable Score		+	.24	+	.72	+		= .96

See sub-variable scoring guidelines on following page

Variable 9 Score .77

FACWet Score Card

Scoring Procedure:

1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
3. Add the variable scores to calculate the total functional points achieved for each function.
4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, howe if a variable is added or subtracted to FCI equation the total possible points must be adjusted
5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

VARIABLE SCORE TABLE

Buffer & Landscape Context	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	.65
	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	.80
	Variable 3:	Buffer Capacity	.78
Hydrology	Variable 4:	Water Source	.75
	Variable 5:	Water Distribution	.85
	Variable 6:	Water Outflow	.98
Abiotic and Biotic Habitat	Variable 7:	Chemical Environment	.85
	Variable 8:	Geomorphology	.65
	Variable 9:	Vegetation Structure and Complexity	.77

Functional Capacity Indices

Function	Equation	Total Functional Points	Functional Capacity Index
Function 1 -- Support of Characteristic Wildlife Habitat	$V1_{wetloss} + V2_{barriers} + V3_{buffer} + (2 \times V9_{veg})$ = .65 + .80 + .78 + 1.54	3.77	.75
Function 2 -- Support of Characteristic Fish/aquatic Habitat	$(3 \times V4_{source}) + (2 \times V5_{dist}) + 2 \times V6_{outflow} + V7_{chem} + V8_{geom}$ = 2.25 + 1.70 + 1.96 + 1.70 + .65	8.26	.92
Function 3 -- Flood Attenuation	$V3_{buffer} + 2 \times V4_{source} + (2 \times V5_{dist}) + 2 \times V6_{outflow} + V8_{geom} + V9_{veg}$ = .78 + 1.50 + 1.70 + 1.96 + .65 + .77	7.36	.82
Function 4 -- Short- and Long-term Water Storage	$V_{source} + (2 \times V5_{dist}) + 2 \times V6_{outflow}) \quad V8_{geom}$ = .75 + 1.70 + 1.96 + .65	5.06	.84
Function 5 -- Nutrient/Toxicant Removal	$(2 \times V5_{dist}) + V7_{chem} + V8_{geom}$ = 1.70 + .85 + .65	3.2	.80
Function 6 -- Sediment Retention/Shoreline Stabilization	$V3_{buffer} + (2 \times V8_{geo}) + (2 \times V9_{veg})$ = .78 + 1.30 + 1.54	3.62	.72
Function 7 -- Production Export/Food Chain Support	$V1_{wetloss} + 2 \times V6_{outflow} + V7_{chem} + V8_{geo} + (2 \times V9_{veg})$ = .65 + 1.96 + .85 + .65 + 1.54	5.65	.81

Sum of Individual FCI Scores 5.66

Divide by the Number of Functions Scored (usually 7) ÷ 7

Composite FCI Score .81

ADMINISTRATIVE CHARACTERIZATION

General Information			
		Date of Evaluation:	5/25/10
Site Name or ID:	Wetland 4	Project Name:	Pueblo Freeway
404 or Other Permit Application #:		Applicant Name:	CDOT
Evaluator Name(s):	Becky Pierce Rob Frei	Evaluator's professional position and organization:	CDOT HQ & Reg. 2

Location Information:			
Site Location (Lat./Long. or UTM):	38°15'41.82"N 104°36'16.17" W	Geographic Datum Used (NAD 83	
USGS Quadrangle Map:	Northeast Pueblo	Map Scale: (Circle one)	1:24,000 1:100,000 Other 1:
Sub basin Name (8 digit HUC):	11020002	Wetland Ownership:	City of Pueblo

Project Information:			
This evaluation is being performed at: (Check applicable box)	[X] Project Wetland [ ] Mitigation Site	Purpose of Evaluation (check all applicable):	[X] Potentially Impacted Wetlands [ ] Mitigation; Pre-construction [ ] Mitigation; Post-construction [ ] Monitoring [ ] Other (Describe)

Intent of Project: (Check all applicable) [ ] Restortation [ ] Enhancement [ ] Creation

Total Size of Wetland Involved: (Record Area, Check and Describe Measurement Method Used)	ac.	[ ] Measured [ ] Estimated					
Assessment Area (AA) Size (Record Area, check appropriate box. Additional spaces are used to record acreage when more than one AA is included in a single assessment)	ac.	[ ] Measured	ac.	ac.	ac.	ac.
		[ ] Estimated	ac.	ac.	ac.	ac.
Characteristics or Method used for AA boundary determination:							

Notes: Adjacent to Riverwalk Ditch that flows from Runyan Lake (jurisdictional)

ECOLOGICAL DESCRIPTION 1

Special Concerns

Check all that apply

- ☐ Organic soils including Histosols or Histic Epipedons are present in the AA (i.e., AA includes core fen habitat).
- ☐ Project will directly impact organic soil portions of the AA including areas possessing either Histosol soils or histic epipedons.
- ☐ Organic soils are known to occur anywhere within the contiguous wetland of which the AA is part.
- ☐ The wetland is a habitat oasis in an otherwise dry or urbanized landscape?
- ☐ Federally threatened or endangered species are **KNOWN** to occur in the AA? List Below.

_____

_____

- ☐ Federally threatened or endangered species are **SUSPECTED** to occur in the AA?

_____

_____

_____

- ☐ Species of concern according to the Colorado Natural Heritage (CNHP) are known to occur in the AA?
- ☐ The site is located within a potential conservation area or element occurrence buffer area as determined by CNHP?
- ☐ Other special concerns (please describe)

_____

HYDROGEOMORPHIC SETTING

- ☐ AA wetland maintains its fundamental natural hydrogeomorphic characteristics
- ☐ AA wetland has been subject to change in HGM classes as a result of anthropogenic modification
  If the above is checked, please describe the original wetland type if discernable using the table below.
- ☐ AA wetland was created from an upland setting.

	Historical Conditions				
Previous wetland typology	**Water source**	Surface flow	Groundwater	Precipitation	Unknown
	Hydrodynamics	Unidirectional	Vertical		
	Geomorphic Setting (Narrative Description)				
	Previous HGM Class	Riverine	Slope	Depressional	Lacustrine

Current Conditions

Describe the hydrogeomorphic setting of the wetland by circling all conditions that apply.

HGM Setting	**Water source**	Surface flow	Groundwater	Precipitation	Unknown		
	Hydrodynamics	Unidirectional	Vertical				
	Wetland Gradient	0 - 2%	2-4%	4-10%	>10%		
	# Surface Inlets	Over-bank	0	1	2	3	>3
	# Surface Outlets		0	1	2	3	>3
	Geomorphic Setting (Narrative Description)						
	HGM class	Riverine	Slope	Depressional	Lacustrine		

Notes (include information on charcteristics used to formulate reference standard):

ECOLOGICAL DESCRIPTION 2

Vegetation Habitat Description

*US FWS habitat classification according as reported in Cowardin et. al (1979) - See also Appendix *** of FACWet User Guide.*

System	Subsystem	Class	Subclass	Water Regime	Other Modifiers	% AA
Lacustrine	Littoral; Limnoral	Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Emergent(EM) Shrub-scrub(SS) Forested (FO)	Floating vascular; Rooted vascular; Algal; Persistent; Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel; Sand; Mud; Organic	**Examples** Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seas.-flood./sat.(E); Perm. flooded(F); Intermittently Flooded(G); Artificially Flooded(K); Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Hypersaline(7); Eusaline(8); Mixosaline(9); Fresh(0); Acid(a); Circumneutral(c); Alkaline/calcareous(i); Organic(g); Mineral(n); Beaver(b); Partially Drained/ditched(d); Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
Palustrine	Palustrine					
Riverine	Lower perennial; Upper perennial; Intermittent					

Site Map

Scale: 1 sq. =

Draw a sketch map of the site including relevant portions of the wetland, AA boundary, structures, habitat classes, and other significant features.

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally- occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

1. On the aerial photo outline the area that is within 500 meters of the AA.
2. Identify obvious natural barriers within 500 m of the AA boundary.
   - *Natural barriers include continuous cliff bands, deep open water, etc.*
3. Draw the **Habitat Connectivity Envelope**(HCE) on the aerial image.
   - *The HCE is all the area within 500 meters of the AA that is not separated from it by a natural barrier.*
4. Outline the current extent of naturally occurring wetland and riparian habitat. Then outline areas where the habitats appear to have historically occurred.
   - *Use your knowledge of the history of the area and evident land use change. Additional research could be utilized to increase the accuracy of this estimate including consideratation of floodplain maps, historical aerials, etc.*

Variable Score	Condition Category	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	*Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats*
<0.9 - 0.8	*Highly Functioning*	*More than 80% of historical wetland habitat area within the HCE is still present (less than 20% historical wetland habitat area lost).*
<0.8 - 0.7	*Functioning*	*80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% historical wetland habitat area lost).*
<0.7 - 0.6	*Functioning Impaired*	*Less than 60 to 30% of historical wetland habitat area within the HCE is still present (more than 30 to 70% historical wetland habitat area lost).*
<0.6	*Non-functioning*	*Less than 30% of the historical wetland habitat area from within the HCE is now no longer in existence (more than 70% historical wetland habitat area lost).*

Variable 1 Score 0.90

Notes: Narrow fringe of wetlands along ditch, and nothing else in HCE.

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the man-made barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

1. On the aerial photo, outline all existing wetland and riparian habitat areas (WHAs) within the HCE.

2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.

3. Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

Stressors = artificial barriers	✓	Stressors	Comments/description
	✓	Major Highway	I-25 and US 50
		Secondary Highway	
		Tertiary Roadway	
	✓	Railroad	
	✓	Bike Path	greenway
	✓	Urban Development	Industrial
		Agricultural Development	
		Artificial Water Body	
		Fence	
	✓	Ditch or Aqueduct	AA adjacent to ditch
		Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.
<0.9 - 0.8	*Highly Functioning*	Barriers impeding migration/dispersal between the AA and up to 33% of surrounding WHA highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. More significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding WHA.
<0.8 - 0.7	*Functioning*	Barriers to migration and dispersal retard the ability of many organisms/propagules to pass between the AA and up to 66% of WHA. Passage of organisms and propagules through such barriers is still possible, but it may be constrained to certain times of day, be slow, dangerous or require additional travel. Busy two-lane roads, culverted areas, small to medium artificial water bodies or small earthen dams would commonly rate a score in this range. More significant barriers (see "functioning impaired" category below) could affect migration to up to 10% of surrounding WHA.
<0.7 - 0.6	*Functioning Impaired*	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding WHA. Travel of those animals which can potential negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding WHA could be functionally isolated from the AA.
<0.6	*Non-functioning*	AA is essentially isolated from surrounding WHA by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and a WHA.

Thin fringe along ditch is continuous w/ AA mostly

Variable 2 Score 0.90

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

1. On the aerial photograph, outline the buffer area as the zone within 250 meters of the outer boundary of the AA.
2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
3. Considering all of the identified stressors, their overall severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

Stressors = Land Use Changes	✓	Stressors	Comments/description
	✓	Industrial/commercial	
	✓	Urban	
	✓	Residential	
		Rural	
		Dryland Farming	
		Intensive Agriculture	
		Orchards or Nurseries	
		Livestock Grazing	
	✓	Transportation Corridor	
		Urban Parklands	
		Dams/impoundments	
		Artificial Water body	
		Physical Resource Extraction	
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	*Highly Functioning*	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, either because land use is not intensive, for example haying, light grazing, or nurseries, or more substantial changes occur in approximately less than 10% of the BA.
<0.8 - 0.7	*Functioning*	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. Moderate-intensity land uses such as dry-land farming, urban "green" corridors, or moderate cattle grazing would commonly be placed within this scoring range.
<0.7 - 0.6	*Functioning Impaired*	Land use within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	*Non-functioning*	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

It appears that herbaceous veg. does exist north/northeast of AA that offers some buffering.

Variable 3 score 0.70

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that alter the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain.This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 7.

Scoring rules:

1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.

2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

✓	Stressors	Comments/description
	Ditches or Drains (tile, etc.)	
✓	Dams	
	Diversions	
	Groundwater pumping	
✓	Draw-downs	
✓	Culverts or Constrictions	
	Point Source (urban, ind., ag.)	
✓	Non-point Source	
	Increased Drainage Area	
✓	Storm Drain/Urban Runoff	
✓	Impermeable Surface Runoff	
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
✓	Actively Managed Hydrology	

Variable Score	Condition Class	Depletion	Augmentation
1.0 - 0.9	*Reference Standard*	Unnatural drawdown events minor, rare or non-existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non-existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	*Highly Functioning*	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or natural capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or natural capacity of water to perform work.
<0.8 - 0.7	*Functioning*	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or natural capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial reduction of peak flows or natural capacity of water to perform work.
<0.7 - 0.6	*Functioning Impaired*	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or natural capacity of water to perform work. **Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.**	Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or natural capacity of water to perform work. **Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.**
<0.6	*Non-functioning*	Water source diminished enough to threaten jurisdictional classification of the AA.	Frequency, duration or magnitude of unnaturally high-water great enough to change the fundamental characteristics of the wetland.

Variable 4 Score .65

Variable 5: Water Distribution

This variable is concerned with hydrologic connectivity within the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally ***result*** *from geomorphic modifications. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within portions of the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In naturally confined rivers (i.e. canyons and gullies) floodplain width is generally very small, so these systems will tend to score high for this variable unless some gross stressor is present.*

Scoring rules:

1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.
2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

✓	Stressors	Comments/description
	Ditches	
	Ponding/Impoundment	
✓	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
✓	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	*Reference Standard*	Little or no alteration has been made to the way in which water is distributed throughout the wetland.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.
<0.9 - 0.8	*Highly Functioning*	Less than 10% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.
<0.8 - 0.7	*Functioning*	Between 10 and 33% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in a 4 in. (5 cm) or less change in mean growing season water table elevation.	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	*Functioning Impaired*	33 to 66% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less change in mean growing season water table elevation. Water table behavior must still meet jurisdictional criteria to merit this rating.	Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.
<0.6	*Non-functioning*	More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.

Variable 5 Score .66

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, and infiltration/groundwater recharge. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on how water, energy and associated materials are exported out of the AA.

Scoring rules:

1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.

2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials

✓	Stressors	Comments/description
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
✓	Constrictions outlet	to Ringer Lake
✓	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	*Highly Functioning*	High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.
<0.8 - 0.7	*Functioning*	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics mildly to moderately affected.
<0.7 - 0.6	*Functioning Impaired*	Outflow at all stages is moderately impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics significantly disrupted.
<0.6	*Non-functioning*	The natural outflow regime is severely disrupted. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.

Variable 6 Score .68

Variable 7: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that alter the chemical environment. Because water quality frequently cannot be inferred directly, the presence of many stressors is identified via indirect indicators.

Scoring rules:

1. Stressors are grouped into categories which have a similar signature or set of causes.
2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
3. For each stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
   -If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
5. Determine the variable score by following the scoring guidelines.

Stressor Category	Stressor Indicator	✓	Comments	Sub-variable Score
Nutrient Enrichment/ Eutrophication/ Oxygen (D.O.)	Livestock	✓	minor	.72
	Agricultural Runoff	✓	landscaping	
	Septic/Sewage			
	Excessive Algae or Aquatic Veg.	✓		
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
Sedimentation/ Turbidity	Excessive Erosion			.95
	Excessive Deposition			
	Fine Sediment Plumes			
	Agricultural Runoff	✓	landscaping	
	Excessive Turbidity			
	Nearby Construction Site			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
Toxic contamination/ pH	Recent Chemical Spills			.70
	Nearby Industrial Sites			
	Road Drainage/Runoff	✓		
	Livestock	✓	minor	
	Agricultural Runoff	✓	landscaping	
	Storm Water Runoff	✓		
	Fish/Wildlife Impacts	✓	Idaho Lake	
	Vegetation Impacts			
	Cumulative Watershed NPS			
	Acid Mine Drainage	✓	Climax mine	
	Point Source Discharge			
	CDPHE Impairment/TMDL List			
Temperature	Excessive Temperature Regime			.82
	Lack of Shading	✓	few trees in AA	
	Reservoir/Power Plant Discharge			
	Industrial Discharge			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
	Slow moving water	✓		
Soil chemistry/ Redox potential	Unnatural Saturation/Desaturation	✓	Channel does +	.75
	Mechanical Soil Disturbance			
	Dumping/introduced Soil			
	CDPHE Impairment/TMDL List			

Variable 7: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Stress indicators not present or trivial.
<0.9 - 0.8	*Highly Functioning*	Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.
<0.8 - 0.7	*Functioning*	Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.
<0.7 - 0.6	*Functioning Impaired*	Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA
<0.6	*Non-functioning*	Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system

Input each factor score from the stressor list and calculate the sum.

Nutrient enrichment/ Eutrophication/ Oxygen (D.O.)		Sedimentation/ Turbidity		Toxic contamination/ pH		Temperature		Soil chemistry/ Redox potential		Sum of Sub-variable Scores
.72	+	.95	+	.70	+	.82	+	.75	=	3.94

Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable Score	Condition Class	Scoring Rules		
		Single Factor		Composite Score
1.0 - 0.9	*Reference Standard*	No single factor scores < 0.9	or	The factor scores sum > 4.5
<0.9 - 0.8	*Highly Functioning*	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5
<0.8 - 0.7	*Functioning*	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0
<0.7 - 0.6	*Functioning Impaired*	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5
< 0.6	*Non-functioning*	Any single factor scores < 0.6	or	The factor scores sum < 3.0

Variable 7 Score .78

Variable 8: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration can also directly affect soil properties, such as near-surface texture, and the wetland chemical environment, such as the redox state or nutrient composition in the rooting zone. In rating this variable, do not include these resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The effects of geomorphic change are addressed by other variables. All alterations to the geomorphology should be evaluated including small-scale impacts such as pugging, hoof sheer, and sedimentation which can be significant, but not immediately apparent, impacts.

Scoring Rules:

1. Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist.
2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

✓		Stressors	Comments
	General	Dredging/Excavation/Mining	
	General	Fill, including dikes, road grades, etc.	
	General	Grading	
	General	Compaction	
	General	Plowing/Disking	
	General	Excessive Sedimentation	
	General	Dumping	
	General	Hoof Shear/Pugging	
	General	Aggregate or Mineral Mining	
	General	Sand Accumulation	
	Channels Only	Channel Instability/Over Widening	
	Channels Only	Excessive Bank Erosion	
✓	Channels Only	Channelization	
	Channels Only	Reconfigured Stream Channels	
✓	Channels Only	Artificial Banks/Shoreline	
	Channels Only	Beaver Dam Removal	
✓	Channels Only	Substrate Embeddedness	
✓	Channels Only	Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Topography essentially unaltered from the natural state, or alterations don't appear to have a minimal effect on wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.
<0.9 - 0.8	*Highly Functioning*	Alterations to topography result in small but detectable changes to habitat conditions throughout all or most of the AA; or changes causing more significant impacts but affecting less than 10% of the AA.
<0.8 - 0.7	*Functioning*	Changes to AA topography may be pervasive but generally mild. May include patches of more significant habitat alteration; or more significant alteration affecting less than 20 % of the AA.
<0.7 - 0.6	*Functioning Impaired*	At least one important surface type or landform has been eliminated or created; microtopography has been moderately altered throughout most or all of the AA, or more severe alterations affect less than 50% AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.
<0.6	*Non-functioning*	Geomorphic alterations have rendered the AA essentially unusable by *characteristic* wildlife species, or the physical setting no longer supports native plant communities.

Variable 8 Score .62

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

Rules for Scoring:

1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination. Check each present or suspected vegetation layer in the third row of the table.

2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.

3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required.

4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).

5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.

6. Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score".

7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".

8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

	Vegetation Layers				
Layers Scored *(check boxes to right to indicate scored layers)*	[illegible]	Y	Y		
Stressor	**Tree**	**Shrub**	**Herb**	**Aquatic**	**Comments**
Noxious Weeds		✓	✓		tamarisk K, s-bear E/M
Exotic/Invasive spp.					cheatgrass,
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization		✓	✓		
Dewatering		✓	✓		
Over Saturation					

Percent Cover of Layer		+	.05	+	.98	+		= 1.03
	x		x		x		x	
Veg. Layer Sub-variable Score			.65		.80			÷
	=		=		=		=	
Weighted Sub-variable Score		+	.03	+	.78	+		= .81

See sub-variable scoring guidelines on following page

Variable 9 Score .79

FACWet Score Card

Scoring Procedure:

1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
3. Add the variable scores to calculate the total functional points achieved for each function.
4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, howe if a variable is added or subtracted to FCI equation the total possible points must be adjusted
5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

VARIABLE SCORE TABLE

Buffer & Landscape Context	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	.90
	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	.90
	Variable 3:	Buffer Capacity	.70
Hydrology	Variable 4:	Water Source	.65
	Variable 5:	Water Distribution	.66
	Variable 6:	Water Outflow	.68
Abiotic and Biotic Habitat	Variable 7:	Chemical Environment	.78
	Variable 8:	Geomorphology	.62
	Variable 9:	Vegetation Structure and Complexity	.79

Functional Capacity Indices

Function	Equation	Total Functional Points	Functional Capacity Index
Function 1 -- Support of Characteristic Wildlife Habitat	$V1_{wetloss} + V2_{barriers} + V3_{buffer} + (2 \times V9_{veg})$		
	.90 + .90 + .70 + 1.58 + + =	4.08 ÷ 5 =	.82
Function 2 -- Support of Characteristic Fish/aquatic Habitat	$(3 \times V4_{source}) + (2 \times V5_{dist}) + 2 \times V6_{outflow} + V7_{chem} + V8_{geom}$		
	1.95 + 1.32 + 1.36 + .78 + .62 + =	6.03 ÷ 9 =	.67
Function 3 -- Flood Attenuation	$V3_{buffer} + 2 \times V4_{source} + (2 \times V5_{dist}) + 2 \times V6_{outflow} + V8_{geom} + V9_{veg}$		
	.70 + 1.30 + 1.32 + 1.36 + .62 + .79 =	6.04 ÷ 9 =	.67
Function 4 -- Short- and Long-term Water Storage	$V_{source} + (2 \times V5_{dist}) + 2 \times V6_{outflow}) \quad V8_{geom}$		
	.65 + 1.32 + 1.36 + .62 + + =	3.95 ÷ 6 =	.66
Function 5 -- Nutrient/Toxicant Removal	$(2 \times V5_{dist}) + V7_{chem} + V8_{geom}$		
	1.32 + .78 + .62 + + + =	2.72 ÷ 4 =	.68
Function 6 -- Sediment Retention/Shoreline Stabilization	$V3_{buffer} + (2 \times V8_{geo}) + (2 \times V9_{veg})$		
	.70 + 1.24 + 1.58 + + + =	3.52 ÷ 5 =	.70
Function 7 -- Production Export/Food Chain Support	$V1_{wetloss} + 2 \times V6_{outflow} + V7_{chem} + V8_{geo} + (2 \times V9_{veg})$		
	.96 + 1.36 + .78 + .62 + 1.58 + =	5.24 ÷ 7 =	.75

Sum of Individual FCI Scores 4.95

Divide by the Number of Functions Scored (usually 7) ÷ 7

Composite FCI Score .71

ADMINISTRATIVE CHARACTERIZATION

General Information			
		Date of Evaluation:	5/25/10
Site Name or ID:	Wetland 5A, 5B, & 5C	Project Name:	Pueblo Freeway
404 or Other Permit Application #:		Applicant Name:	CDOT
Evaluator Name(s):	Becky Pierce Rob Frei	Evaluator's professional position and organization:	CDOT HQ & Reg. 2

Location Information:			
Site Location (Lat./Long. or UTM):	38°16'30.04"N 104°36'08.89"W	Geographic Datum Used (NAD 83	
USGS Quadrangle Map:	Northeast Pueblo	Map Scale: (Circle one)	1:24,000 1:100,000 Other 1:
Sub basin Name (8 digit HUC):	11020003	Wetland Ownership:	City of Pueblo

Project Information:			
This evaluation is being performed at: *(Check applicable box)*	☒ *Project Wetland* ☐ *Mitigation Site*	Purpose of Evaluation (check all applicable):	☒ *Potentially Impacted Wetlands* ☐ *Mitigation; Pre-construction* ☐ *Mitigation; Post-construction* ☐ *Monitoring* ☐ *Other (Describe)*

Intent of Project: *(Check all applicable)* ☐ Restortation ☐ Enhancement ☐ Creation

Total Size of Wetland Involved: (Record Area, Check and Describe Measurement Method Used)	ac.	☐ Measured ☐ Estimated					
Assessment Area (AA) Size (Record Area, check appropriate box. Additional spaces are used to record acreage when more than one AA is included in a single assessment)	ac.	☐ Measured	ac.	ac.	ac.	ac.
		☐ Estimated	ac.	ac.	ac.	ac.

Characteristics or Method used for AA boundary determination:

Notes: Wetlands along Fountain Creek, north and South of 8th Street – 2 distinct polygons

ECOLOGICAL DESCRIPTION 1

Special Concerns

Check all that apply

- [ ] Organic soils including Histosols or Histic Epipedons are present in the AA (i.e., AA includes core fen habitat).
- [ ] Project will directly impact organic soil portions of the AA including areas possessing either Histosol soils or histic epipedons.
- [ ] Organic soils are known to occur anywhere within the contiguous wetland of which the AA is part.
- [ ] The wetland is a habitat oasis in an otherwise dry or urbanized landscape?
- [ ] Federally threatened or endangered species are **KNOWN** to occur in the AA? List Below.

_____

_____

- [ ] Federally threatened or endangered species are **SUSPECTED** to occur in the AA?

_____

_____

_____

- [ ] Species of concern according to the Colorado Natural Heritage (CNHP) are known to occur in the AA?
- [ ] The site is located within a potential conservation area or element occurrence buffer area as determined by CNHP?
- [ ] Other special concerns (please describe)

_____

HYDROGEOMORPHIC SETTING

- [x] AA wetland maintains its fundamental natural hydrogeomorphic characteristics
- [ ] AA wetland has been subject to change in HGM classes as a result of anthropogenic modification
  If the above is checked, please describe the original wetland type if discernable using the table below.
- [ ] AA wetland was created from an upland setting.

	Historical Conditions				
Previous wetland typology	**Water source**	Surface flow	Groundwater	Precipitation	Unknown
	Hydrodynamics	Unidirectional	Vertical		
	Geomorphic Setting (Narrative Description)				
	Previous HGM Class	Riverine	Slope	Depressional	Lacustrine

Current Conditions

Describe the hydrogeomorphic setting of the wetland by circling all conditions that apply.

HGM Setting	**Water source**	Surface flow	Groundwater	Precipitation		Unknown
	Hydrodynamics	Unidirectional	Vertical			
	Wetland Gradient	0 - 2%	2-4%	4-10%	>10%	
	# Surface Inlets	Over-bank	0	1	2	3	>3
	# Surface Outlets		0	1	2	3	>3
	Geomorphic Setting (Narrative Description)					
	HGM class	Riverine	Slope	Depressional		Lacustrine

Notes (include information on charcteristics used to formulate reference standard):

ECOLOGICAL DESCRIPTION 2

Vegetation Habitat Description

*US FWS habitat classification according as reported in Cowardin et. al (1979) - See also Appendix *** of FACWet User Guide.*

System	Subsystem	Class	Subclass	Water Regime	Other Modifiers	% AA
Riv.	Pal.					
Lacustrine	Littoral; Limnoral	Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Emergent(EM) Shrub-scrub(SS) Forested (FO)	Floating vascular; Rooted vascular; Algal; Persistent; Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel; Sand; Mud; Organic	**Examples** Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seas.-flood./sat.(E); Perm. flooded(F); Intermittently Flooded(G); Artificially Flooded(K); Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Hypersaline(7) ; Eusaline(8); Mixosaline(9); Fresh(0); Acid(a); Circumneutral(c); Alkaline/calcareous(i); Organic(g); Mineral(n); Beaver(b); Partially Drained/ditched(d); Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
Palustrine	Palustrine					
Riverine	Lower perennial; Upper perennial; Intermittent					

Site Map

Scale: 1 sq. =

Draw a sketch map of the site including relevant portions of the wetland, AA boundary, structures, habitat classes, and other significant features.

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally- occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

1. On the aerial photo outline the area that is within 500 meters of the AA.
2. Identify obvious natural barriers within 500 m of the AA boundary.
   - *Natural barriers include continuous cliff bands, deep open water, etc.*
3. Draw the **Habitat Connectivity Envelope**(HCE) on the aerial image.
   - *The HCE is all the area within 500 meters of the AA that is not separated from it by a natural barrier.*
4. Outline the current extent of naturally occurring wetland and riparian habitat. Then outline areas where the habitats appear to have historically occurred.
   - *Use your knowledge of the history of the area and evident land use change. Additional research could be utilized to increase the accuracy of this estimate including consideratation of floodplain maps, historical aerials, etc.*

Variable Score	Condition Category	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	*Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats*
<0.9 - 0.8	*Highly Functioning*	*More than 80% of historical wetland habitat area within the HCE is still present (less than 20% historical wetland habitat area lost).*
<0.8 - 0.7	*Functioning*	*80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% historical wetland habitat area lost).*
<0.7 - 0.6	*Functioning Impaired*	*Less than 60 to 30% of historical wetland habitat area within the HCE is still present (more than 30 to 70% historical wetland habitat area lost).*
<0.6	*Non-functioning*	*Less than 30% of the historical wetland habitat area from within the HCE is now no longer in existence (more than 70% historical wetland habitat area lost).*

middle

Variable 1 Score 0.80

Notes: Aerials depict much of ~~Sand~~ Creek floodplain intact. Some of it has been filled in, so rated it functioning. ~80% intact. Fountain

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the man-made barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

1. On the aerial photo, outline all existing wetland and riparian habitat areas (WHAs) within the HCE.

2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.

3. Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

Stressors = artificial barriers	✓	Stressors	Comments/description
		Major Highway	
		Secondary Highway	
	✓	Tertiary Roadway	8th St. creates visual barrier
		Railroad	
		Bike Path	
		Urban Development	
		Agricultural Development	
		Artificial Water Body	
		Fence	
		Ditch or Aqueduct	
		Aquatic Organism Barriers	
	✓	Fountain Creek	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.
<0.9 - 0.8	*Highly Functioning*	Barriers impeding migration/dispersal between the AA and up to 33% of surrounding WHA highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. More significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding WHA.
<0.8 - 0.7	*Functioning*	Barriers to migration and dispersal retard the ability of many organisms/propagules to pass between the AA and up to 66% of WHA. Passage of organisms and propagules through such barriers is still possible, but it may be constrained to certain times of day, be slow, dangerous or require additional travel. Busy two-lane roads, culverted areas, small to medium artificial water bodies or small earthen dams would commonly rate a score in this range. More significant barriers (see "functioning impaired" category below) could affect migration to up to 10% of surrounding WHA.
<0.7 - 0.6	*Functioning Impaired*	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding WHA. Travel of those animals which can potential negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding WHA could be functionally isolated from the AA.
<0.6	*Non-functioning*	AA is essentially isolated from surrounding WHA by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and a WHA.

Largely intact bet. AA & WHA's in the HCE. Creek could be barrier to small mammals & herps to access east side of creek

Variable 2 Score 0.95

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

1. On the aerial photograph, outline the buffer area as the zone within 250 meters of the outer boundary of the AA.
2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
3. Considering all of the identified stressors, their overall severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

Stressors = Land Use Changes	✓	Stressors	Comments/description
	✓	Industrial/commercial	
	✓	Urban	
	✓	Residential	
		Rural	
		Dryland Farming	
		Intensive Agriculture	
		Orchards or Nurseries	
		Livestock Grazing	
	✓	Transportation Corridor	I-25
		Urban Parklands	
		Dams/impoundments	
		Artificial Water body	
		Physical Resource Extraction	
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	*Highly Functioning*	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, either because land use is not intensive, for example haying, light grazing, or nurseries, or more substantial changes occur in approximately less than 10% of the BA.
<0.8 - 0.7	*Functioning*	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. Moderate-intensity land uses such as dry-land farming, urban "green" corridors, or moderate cattle grazing would commonly be placed within this scoring range.
<0.7 - 0.6	*Functioning Impaired*	Land use within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	*Non-functioning*	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

High end of Functioning Impaired **Variable 3 score** 0.70

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that alter the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain.This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 7.

Scoring rules:

1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.

2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

✓	Stressors	Comments/description
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
	Culverts or Constrictions	
✓	Point Source (urban, ind., ag.)	Small impact
✓	Non-point Source	
	Increased Drainage Area	
✓	Storm Drain/Urban Runoff	low
✓	Impermeable Surface Runoff	low
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Class	Depletion	Augmentation
1.0 - 0.9	*Reference Standard*	Unnatural drawdown events minor, rare or non-existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non-existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	*Highly Functioning*	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or natural capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or natural capacity of water to perform work.
<0.8 - 0.7	*Functioning*	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or natural capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial reduction of peak flows or natural capacity of water to perform work.
<0.7 - 0.6	*Functioning Impaired*	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or natural capacity of water to perform work. **Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.**	Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or natural capacity of water to perform work. **Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.**
<0.6	*Non-functioning*	Water source diminished enough to threaten jurisdictional classification of the AA.	Frequency, duration or magnitude of unnaturally high-water great enough to change the fundamental characteristics of the wetland.

Variable 4 Score 0.78

Variable 5: Water Distribution

This variable is concerned with hydrologic connectivity within the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally ***result*** *from geomorphic modifications. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within portions of the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In naturally confined rivers (i.e. canyons and gullies) floodplain width is generally very small, so these systems will tend to score high for this variable unless some gross stressor is present.*

Scoring rules:

1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.
2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

✓	Stressors	Comments/description
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	*Reference Standard*	Little or no alteration has been made to the way in which water is distributed throughout the wetland.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.
<0.9 - 0.8	*Highly Functioning*	Less than 10% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.
<0.8 - 0.7	*Functioning*	Between 10 and 33% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in a 4 in. (5 cm) or less change in mean growing season water table elevation.	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	*Functioning Impaired*	33 to 66% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less change in mean growing season water table elevation. Water table behavior must still meet jurisdictional criteria to merit this rating.	Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.
<0.6	*Non-functioning*	More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.

Variable 5 Score 0.85

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, and infiltration/groundwater recharge. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on how water, energy and associated materials are exported out of the AA.

Scoring rules:

1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.

2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials

✓	Stressors	Comments/description
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	*Highly Functioning*	High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.
<0.8 - 0.7	*Functioning*	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics mildly to moderately affected.
<0.7 - 0.6	*Functioning Impaired*	Outflow at all stages is moderately impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics significantly disrupted.
<0.6	*Non-functioning*	The natural outflow regime is severely disrupted. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.

Variable 6 Score 0.92

Variable 7: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that alter the chemical environment. Because water quality frequently cannot be inferred directly, the presence of many stressors is identified via indirect indicators.

Scoring rules:

1. Stressors are grouped into categories which have a similar signature or set of causes.
2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
3. For each stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
   -If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
5. Determine the variable score by following the scoring guidelines.

Stressor Category	Stressor Indicator	✓	Comments	Sub-variable Score
Nutrient Enrichment/ Eutrophication/ Oxygen (D.O.)	Livestock	✓		0.65
	Agricultural Runoff	✓		
	Septic/Sewage	✓		
	Excessive Algae or Aquatic Veg.			
	Cumulative Watershed NPS	✓		
	CDPHE Impairment/TMDL List			
Sedimentation/ Turbidity	Excessive Erosion			0.78
	Excessive Deposition			
	Fine Sediment Plumes			
	Agricultural Runoff			
	Excessive Turbidity	✓	but higher than expected	
	Nearby Construction Site			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List	✓		
Toxic contamination/ pH	Recent Chemical Spills			0.80
	Nearby Industrial Sites			
	Road Drainage/Runoff	✓		
	Livestock			
	Agricultural Runoff	✓		
	Storm Water Runoff	✓		
	Fish/Wildlife Impacts			
	Vegetation Impacts			
	Cumulative Watershed NPS			
	Acid Mine Drainage			
	Point Source Discharge			
	CDPHE Impairment/TMDL List			
Temperature	Excessive Temperature Regime			0.90
	Lack of Shading			
	Reservoir/Power Plant Discharge			
	Industrial Discharge			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
			could have more trees	
Soil chemistry/ Redox potential	Unnatural Saturation/Desaturation			0.95
	Mechanical Soil Disturbance	✓	mitigation work last year	
	Dumping/introduced Soil			
	CDPHE Impairment/TMDL List			

Variable 7: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Stress indicators not present or trivial.
<0.9 - 0.8	*Highly Functioning*	Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.
<0.8 - 0.7	*Functioning*	Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.
<0.7 - 0.6	*Functioning Impaired*	Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA
<0.6	*Non-functioning*	Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system

Input each factor score from the stressor list and calculate the sum.

Nutrient enrichment/ Eutrophication/ Oxygen (D.O.)		Sedimentation/ Turbidity		Toxic contamination/ pH		Temperature		Soil chemistry/ Redox potential		Sum of Sub-variable Scores
.65	+	.78	+	.80	+	.90	+	.95	=	4.08

Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable Score	Condition Class	Scoring Rules		
		Single Factor		Composite Score
1.0 - 0.9	*Reference Standard*	No single factor scores < 0.9	or	The factor scores sum > 4.5
<0.9 - 0.8	*Highly Functioning*	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5
<0.8 - 0.7	*Functioning*	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0
<0.7 - 0.6	*Functioning Impaired*	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5
< 0.6	*Non-functioning*	Any single factor scores < 0.6	or	The factor scores sum < 3.0

Variable 7 Score .70

Variable 8: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration can also directly affect soil properties, such as near-surface texture, and the wetland chemical environment, such as the redox state or nutrient composition in the rooting zone. In rating this variable, do not include these resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The effects of geomorphic change are addressed by other variables. All alterations to the geomorphology should be evaluated including small-scale impacts such as pugging, hoof sheer, and sedimentation which can be significant, but not immediately apparent, impacts.

Scoring Rules:

1. Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist.
2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

✓		Stressors	Comments
✓	General	Dredging/Excavation/Mining	Mitigation work previously
✓		Fill, including dikes, road grades, etc.	
		Grading	
		Compaction	
		Plowing/Disking	
		Excessive Sedimentation	
		Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
✓	Channels Only	Channel Instability/Over Widening	minor
		Excessive Bank Erosion	
		Channelization	
		Reconfigured Stream Channels	
		Artificial Banks/Shoreline	
		Beaver Dam Removal	
		Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Topography essentially unaltered from the natural state, or alterations don't appear to have a minimal effect on wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.
<0.9 - 0.8	*Highly Functioning*	Alterations to topography result in small but detectable changes to habitat conditions throughout all or most of the AA; or changes causing more significant impacts but affecting less than 10% of the AA.
<0.8 - 0.7	*Functioning*	Changes to AA topography may be pervasive but generally mild. May include patches of more significant habitat alteration; or more significant alteration affecting less than 20 % of the AA.
<0.7 - 0.6	*Functioning Impaired*	At least one important surface type or landform has been eliminated or created; microtopography has been moderately altered throughout most or all of the AA, or more severe alterations affect less than 50% AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.
<0.6	*Non-functioning*	Geomorphic alterations have rendered the AA essentially unusable by *characteristic* wildlife species, or the physical setting no longer supports native plant communities.

Variable 8 Score 0.87

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

Rules for Scoring:

1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination. Check each present or suspected vegetation layer in the third row of the table.

2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.

3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required.

4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).

5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.

6. Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score".

7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".

8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

	Vegetation Layers				
Layers Scored *(check boxes to right to indicate scored layers)*	✓	✓	✓		
Stressor	**Tree**	**Shrub**	**Herb**	**Aquatic**	**Comments**
Noxious Weeds		✓	✓		salt cedar, chinese elm, kochia
Exotic/Invasive spp.			✓		yellow sweetclover, Russian-olive
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization	✓	✓			lack of willows, not ↑ native herbs
Dewatering					
Over Saturation					

Percent Cover of Layer	~~0.15~~ .20	+ 0.25	+ 0.90	+ —	=	1.35
	x	x	x	x		
Veg. Layer Sub-variable Score	~~0.74~~	0.68	0.6	—	÷	
	=	=	=	=		
Weighted Sub-variable Score	.15	+ .17	+ .54	+	=	.86

See sub-variable scoring guidelines on following page

Variable 9 Score .63

FACWet Score Card

Scoring Procedure:

1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
3. Add the variable scores to calculate the total functional points achieved for each function.
4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, howe if a variable is added or subtracted to FCI equation the total possible points must be adjusted
5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

VARIABLE SCORE TABLE

Buffer & Landscape Context	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	.80
	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	.95
	Variable 3:	Buffer Capacity	.70
Hydrology	Variable 4:	Water Source	.78
	Variable 5:	Water Distribution	.85
	Variable 6:	Water Outflow	.92
Abiotic and Biotic Habitat	Variable 7:	Chemical Environment	.70
	Variable 8:	Geomorphology	.87
	Variable 9:	Vegetation Structure and Complexity	.63

Functional Capacity Indices

Function	Equation	Total Functional Points	Functional Capacity Index
Function 1 -- Support of Characteristic Wildlife Habitat	$V1_{wetloss}$ + $V2_{barriers}$ + $V3_{buffer}$ + (2 x $V9_{veg}$)		
	.80 + .95 + .70 + 1.26 + / + / =	3.71	÷ 5 = .74
Function 2 -- Support of Characteristic Fish/aquatic Habitat	(3 x $V4_{source}$) + (2 x $V5_{dist}$) + 2 x $V6_{outflow}$ + $V7_{chem}$ + $V8_{geom}$		
	2.34 ~~4.56~~ + 1.70 + 1.84 + .70 + .87 + / =	7.45	÷ 9 = .83
Function 3 -- Flood Attenuation	$V3_{buffer}$ + 2 x $V4_{source}$ + (2 x $V5_{dist}$) + 2 x $V6_{outflow}$ + $V8_{geom}$ + $V9_{veg}$		
	.70 + 1.56 + 1.70 + 1.84 + .87 + .63 =	7.30	÷ 9 = .81
Function 4 -- Short- and Long-term Water Storage	V_{source} + (2 x $V5_{dist}$) + 2 x $V6_{outflow}$) $V8_{geom}$		
	.78 + 1.70 + 1.84 + .87 + / + / =	5.19	÷ 6 = .86
Function 5 -- Nutrient/Toxicant Removal	(2 x $V5_{dist}$) + $V7_{chem}$ + $V8_{geom}$		
	1.70 + .70 + .87 + / + / + / =	3.27	÷ 4 = .82
Function 6 -- Sediment Retention/Shoreline Stabilization	$V3_{buffer}$ + (2 x $V8_{geo}$) + (2 x $V9_{veg}$)		
	.70 + 1.74 + 1.26 + / + / + / =	3.70	÷ 5 = .74
Function 7 -- Production Export/Food Chain Support	$V1_{wetloss}$ + 2 x $V6_{outflow}$ + $V7_{chem}$ + $V8_{geo}$ + (2 x $V9_{veg}$)		
	.80 + 1.84 + .70 + .87 + 1.26 + / =	5.47	÷ 7 = .78

Sum of Individual FCI Scores 5.58

Divide by the Number of Functions Scored (usually 7) ÷ 7

Composite FCI Score .80

APPENDIX C

Correspondence

CH2M HILL
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Colorado Springs, CO 80903-1505
Tel 719.633.8805
Fax 719.633.2352

CH2MHILL

May 24, 2006

Anita Culp
Regulatory Project Manager
Southern Colorado Regulatory Office
US Army Corps of Engineers
720 North Main Street, Suite 300
Pueblo, Colorado 81003

Subject: New Pueblo Freeway Project

Dear Ms Culp:

This letter is being sent to request confirmation of the wetland boundaries delineated by CH2M HILL as part of the New Pueblo Freeway project located in the City of Pueblo, Colorado. As you recall, you and I visited the wetland areas on May 16, 2006. CH2M HILL also requests a determination as to the jurisdictional status of each wetland area.

As requested, please find enclosed two sets of graphics depicting the locations and boundaries of the wetland areas located within the project area. Also enclosed are two sets of the completed Data Forms.

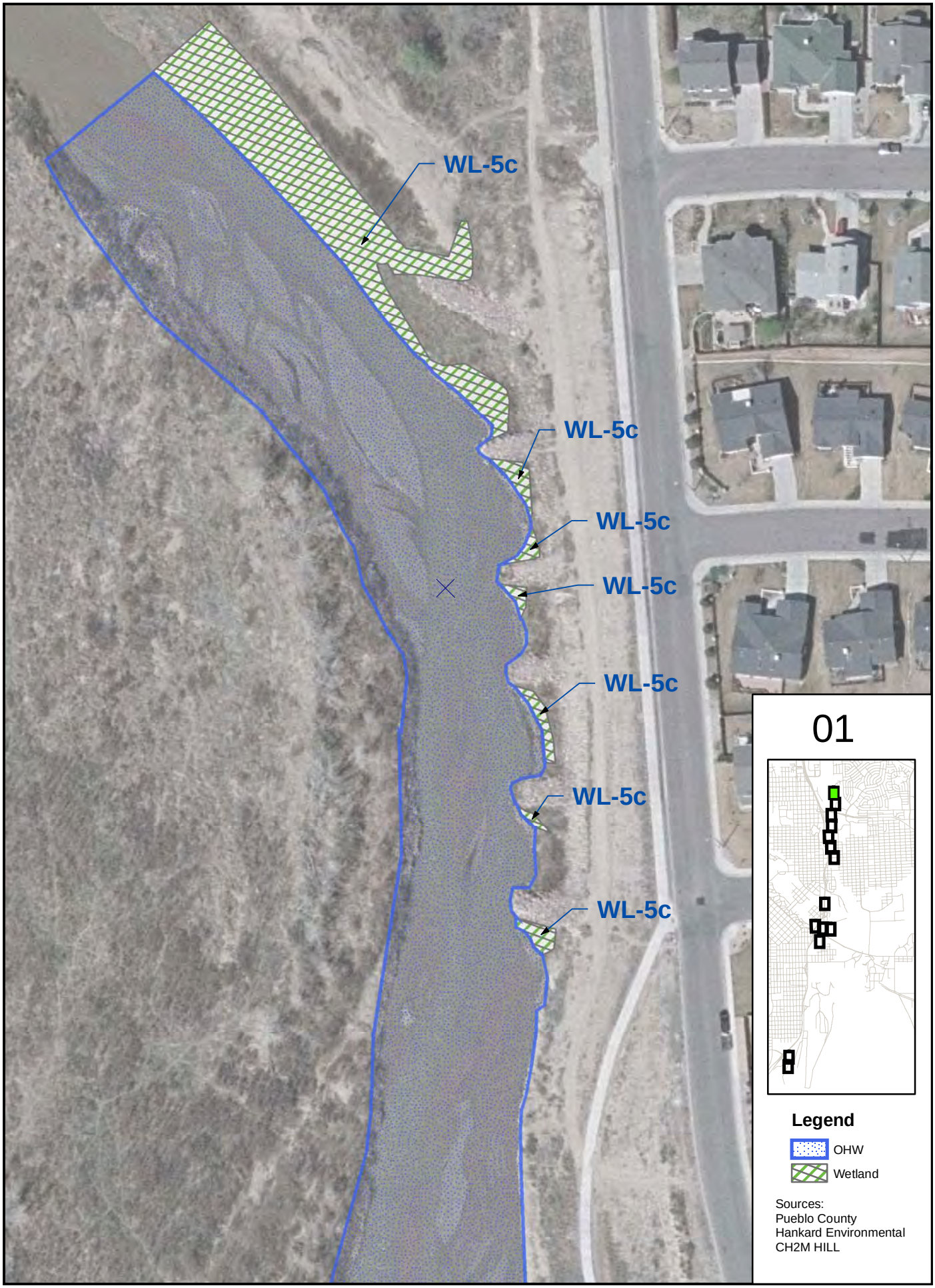
Please do not hesitate to contact me at 719-477-4926 should you have any questions or require any additional information.

Sincerely,

CH2M HILL

Brett Weiland
Environmental Planner

COS/Corps determination.doc
Enclosures


WL-5c
WL-5c
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WL-5c
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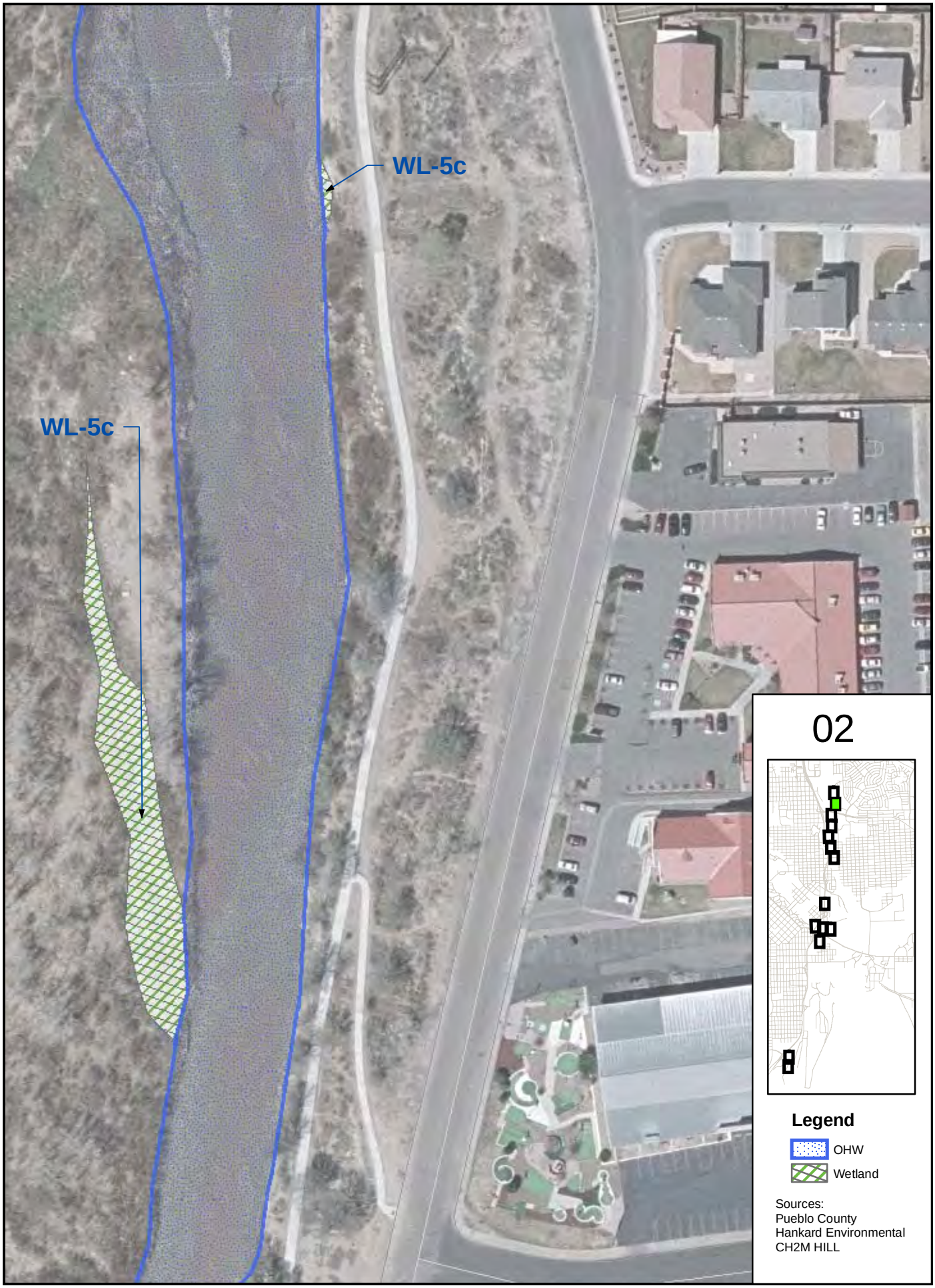
WL-5c
01
Legend
OHW
Wetland
Sources:
Pueblo County
Hankard Environmental
CH2M HILL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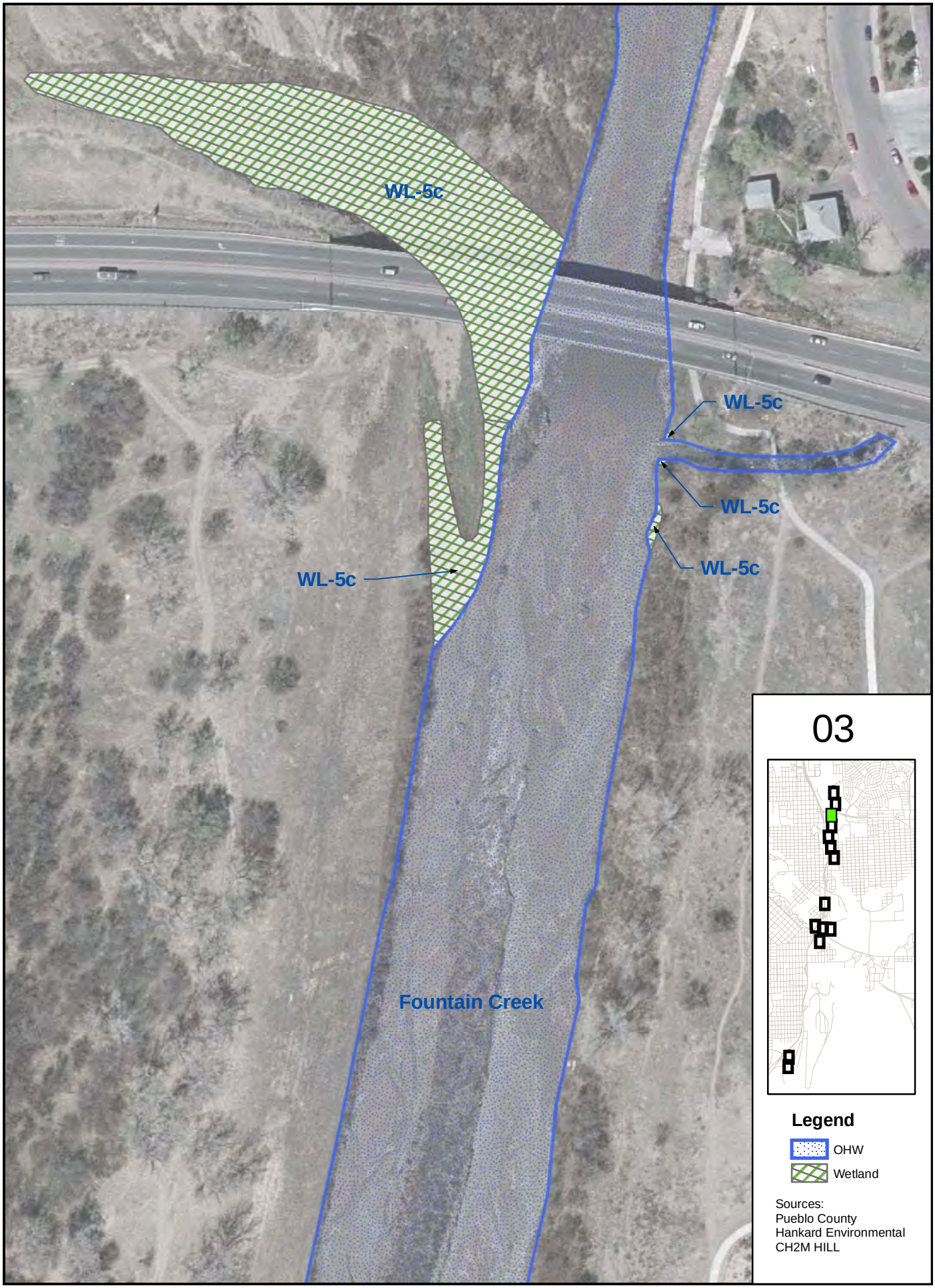
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WL-5c
WL-5c
WL-5c
WL-5c
Fountain Creek
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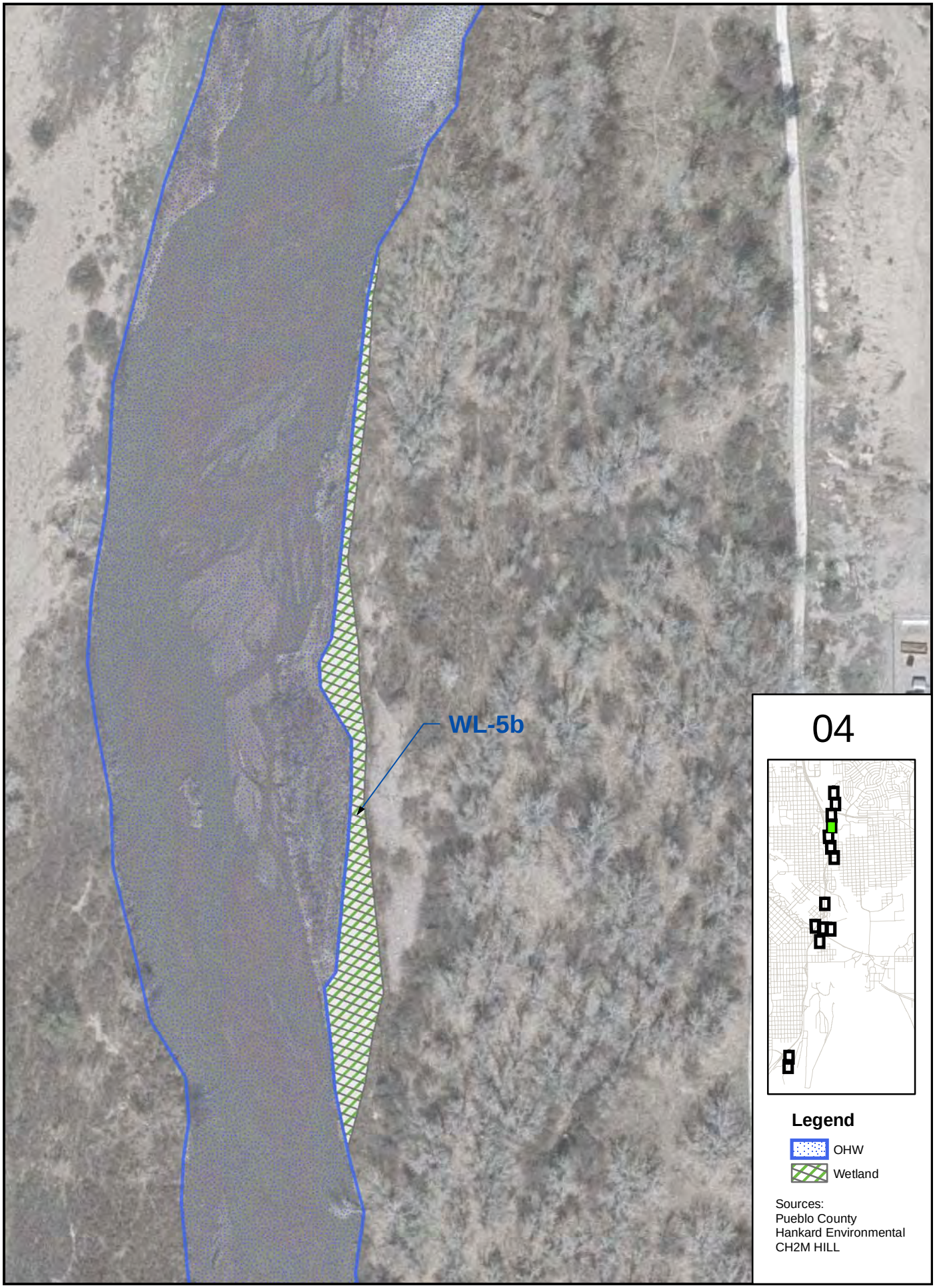
CH2M HILL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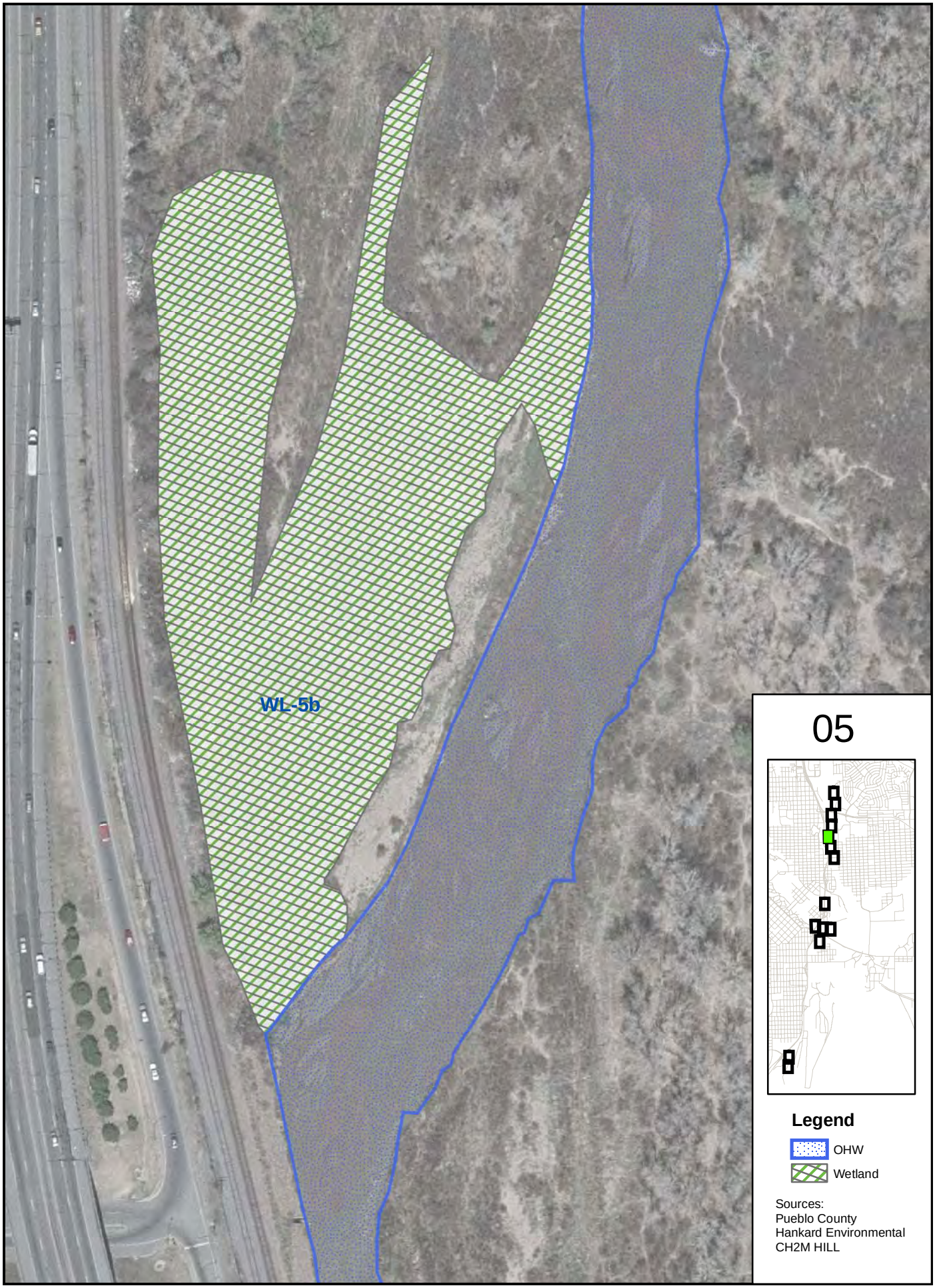
CH2M HILL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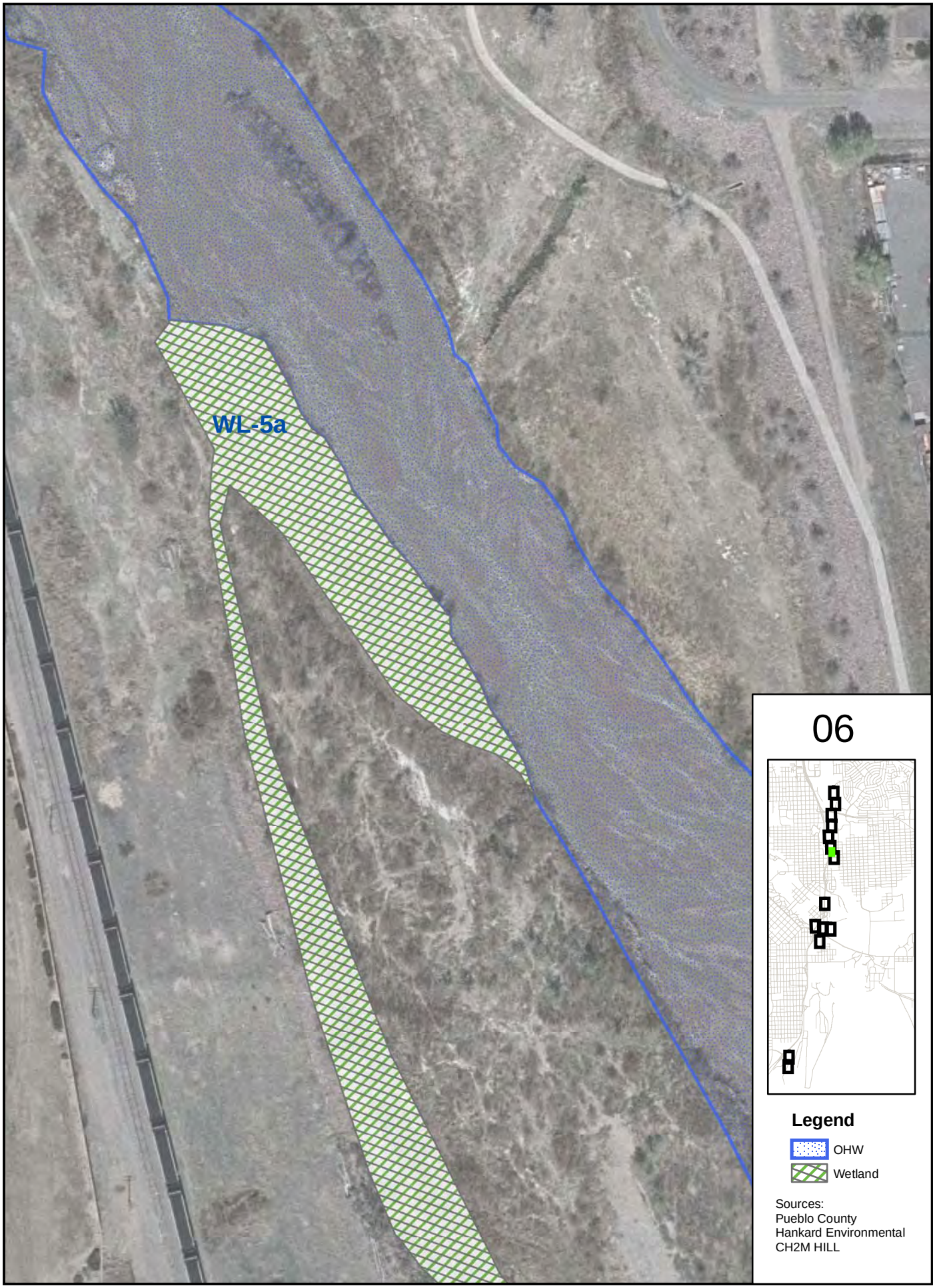
Hankard Environmental
CH2M HILL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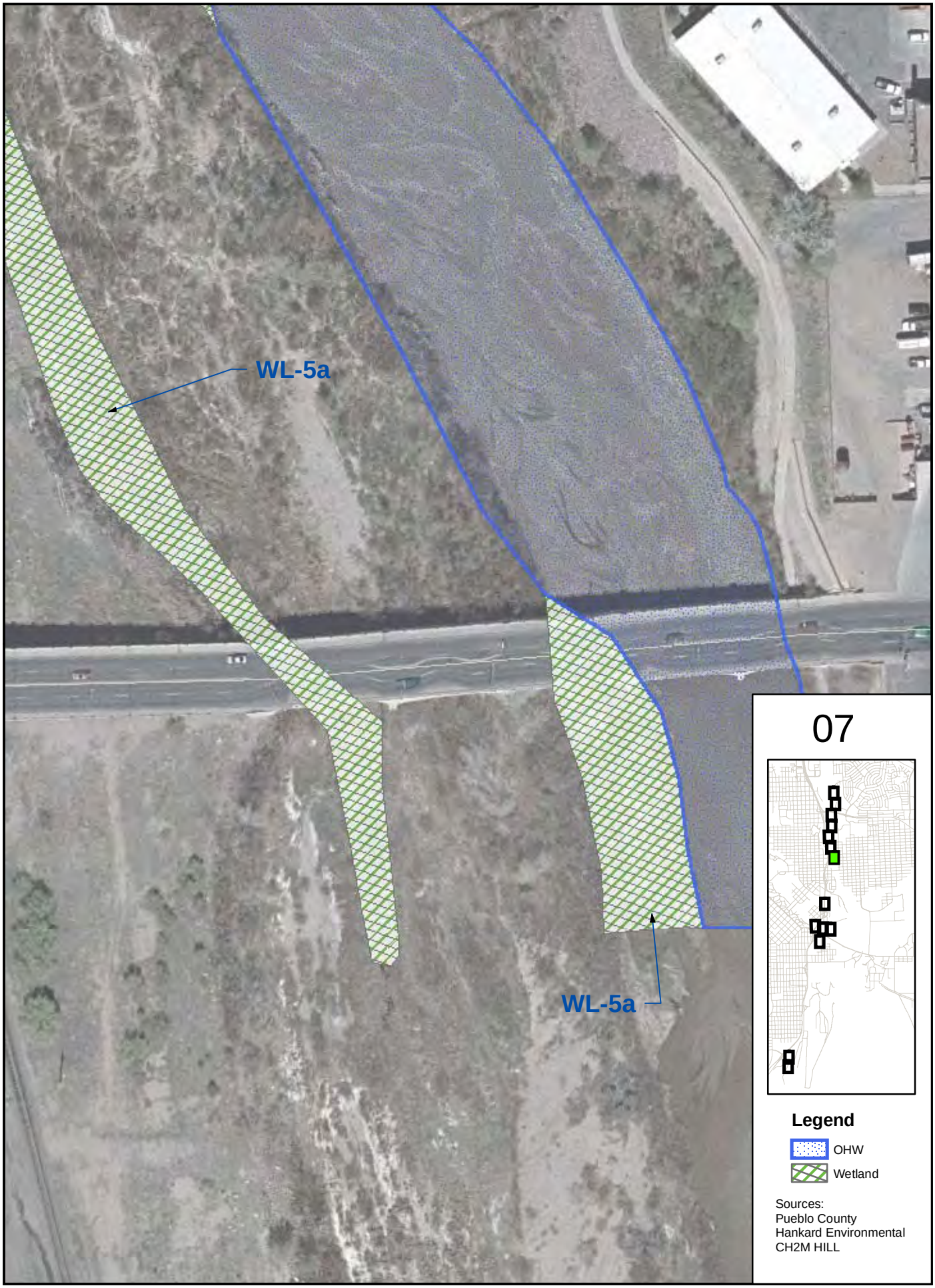
CH2M HILL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WL-5a
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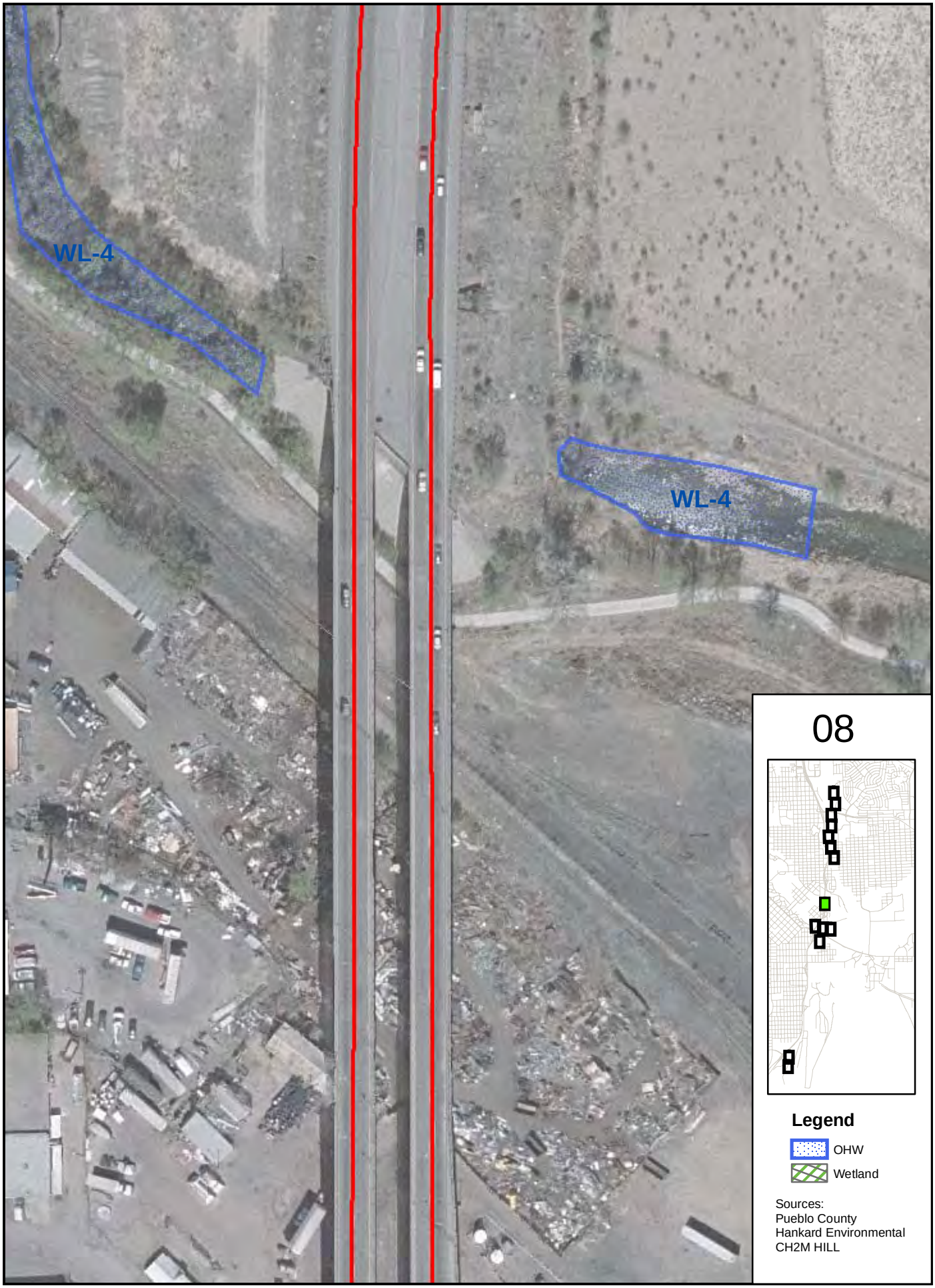
CH2M HILL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WL-4
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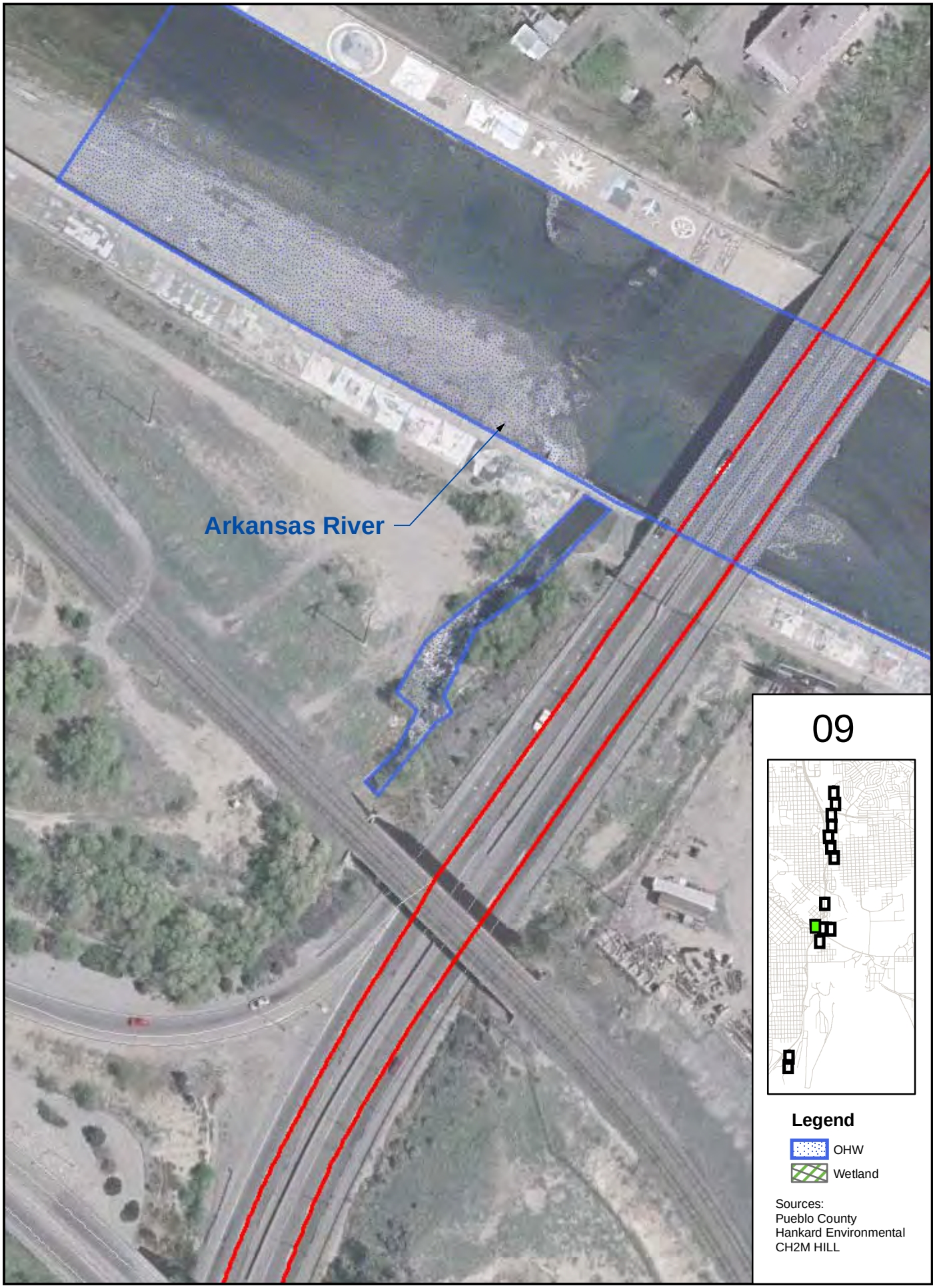
Hankard Environmental
CH2M HILL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Legend
OHW
Wetland
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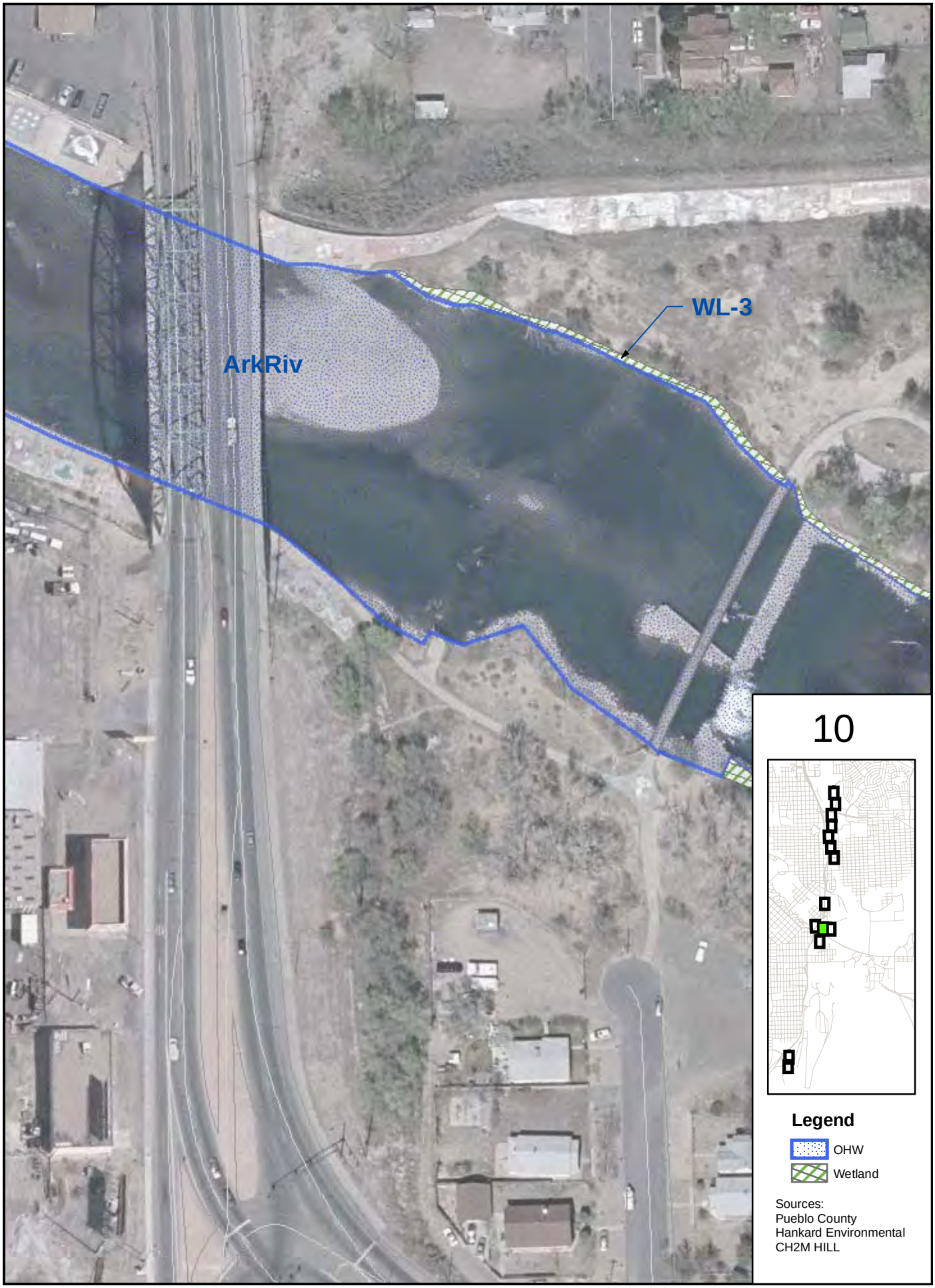
Pueblo County
Hankard Environmental
CH2M HILL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ArkRiv
10
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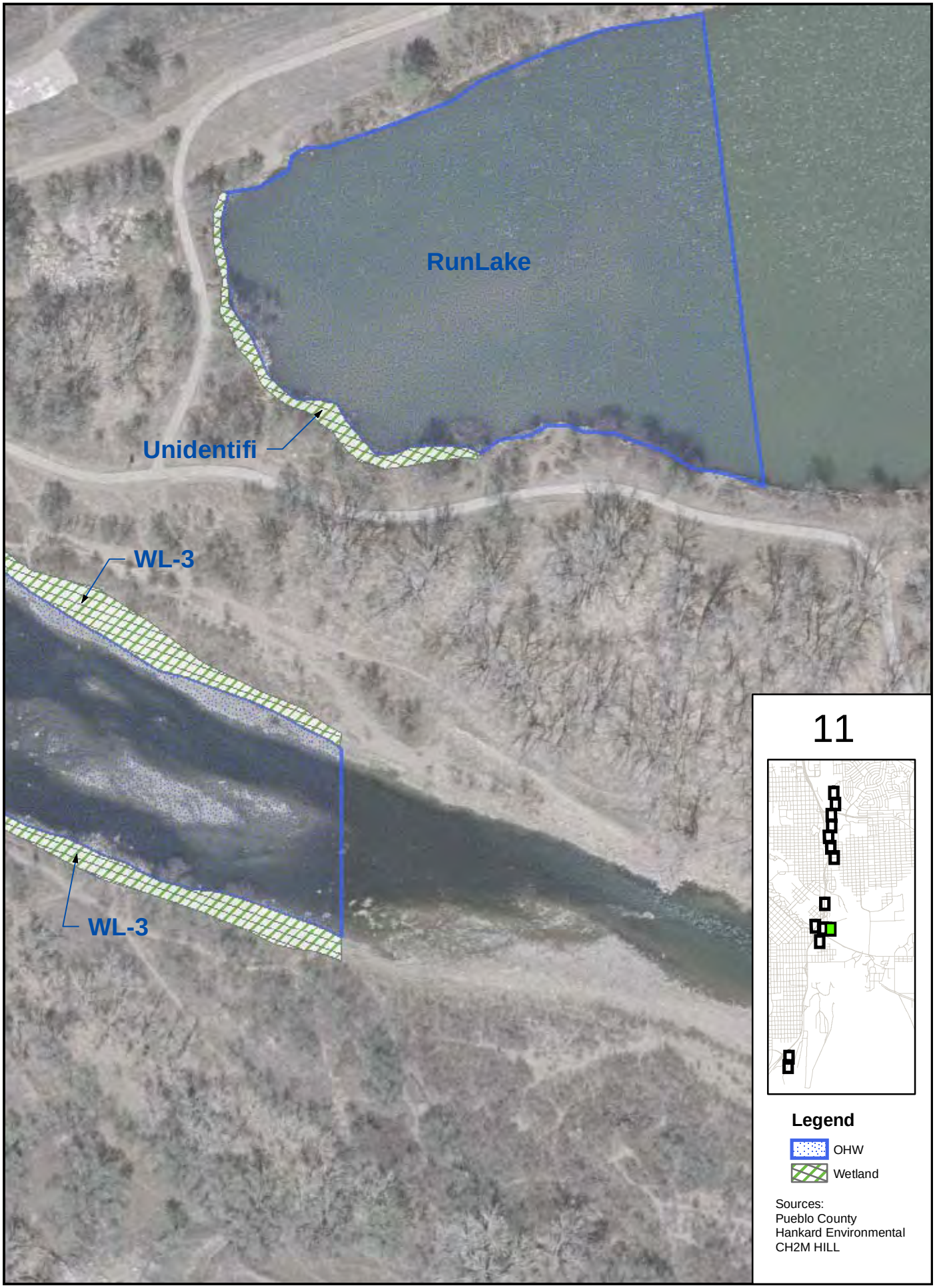
Hankard Environmental
CH2M HILL


RunLake
Unidentifi
WL-3
WL-3
11
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OHW
Wetland
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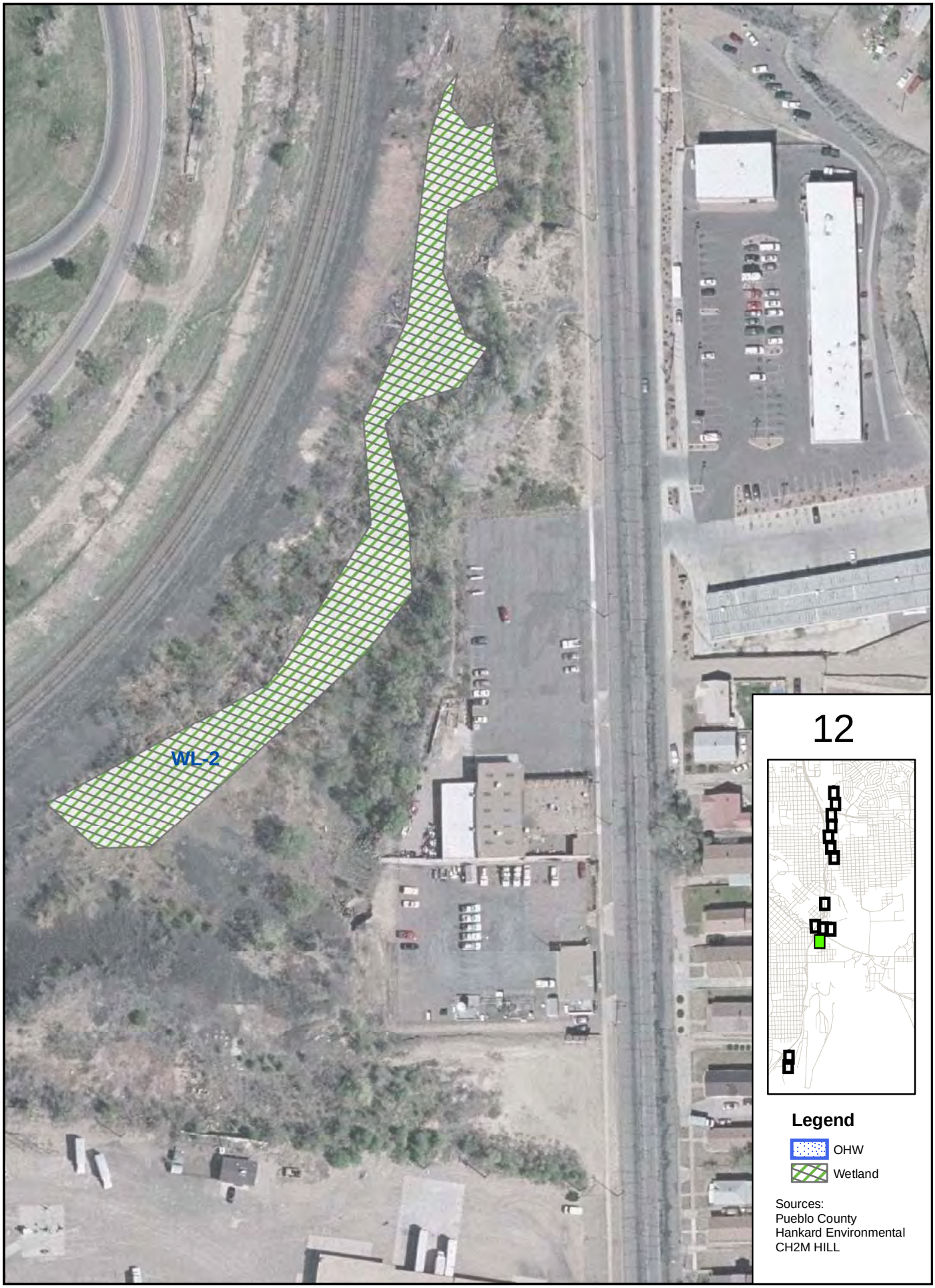
Pueblo County
Hankard Environmental
CH2M HILL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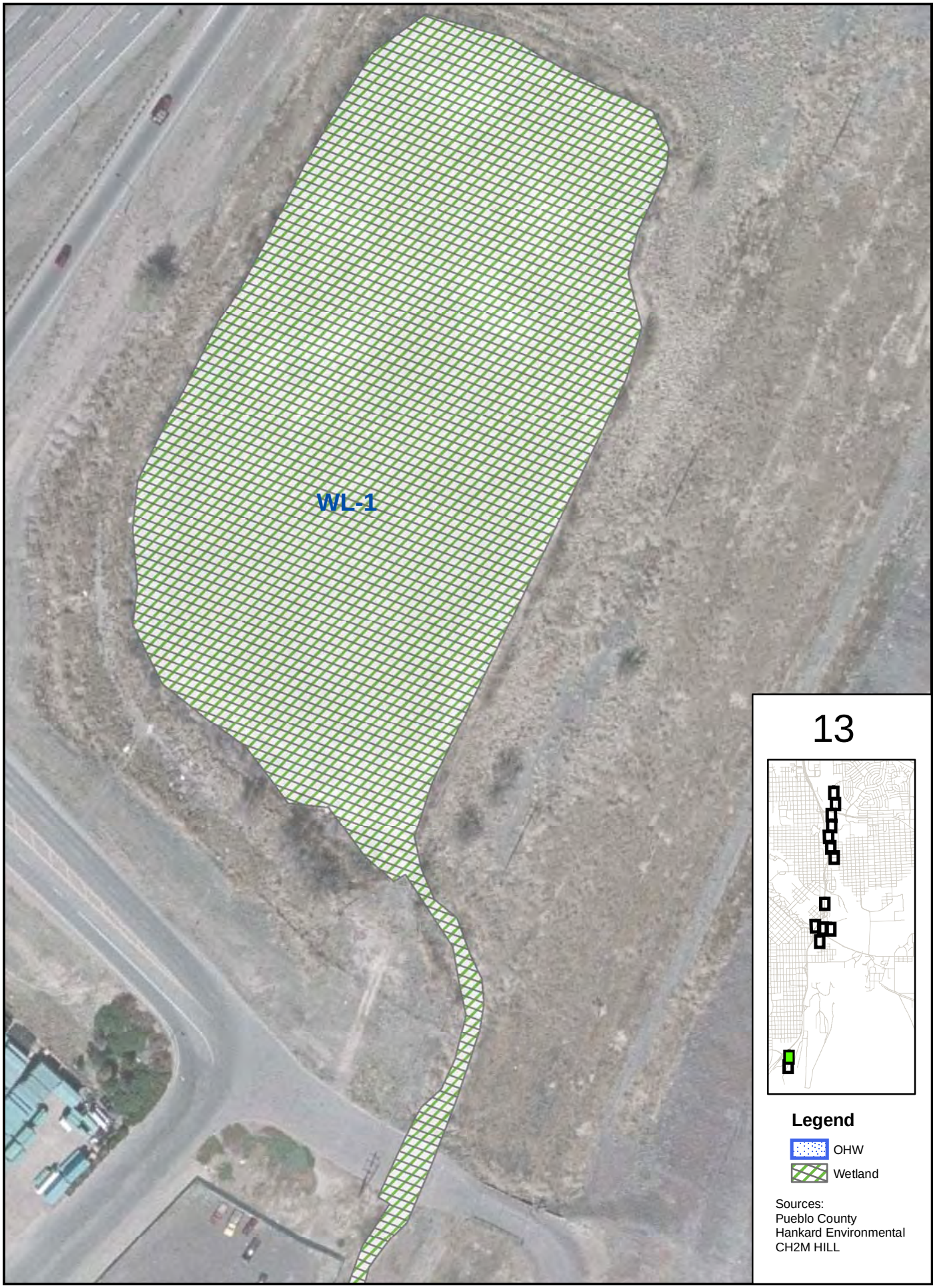
Hankard Environmental
CH2M HILL


WL-1
13
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OHW
Wetland
Sources:
Pueblo County
Hankard Environmental
CH2M HILL

WL-1
14
Legend
OHW
Wetland
Sources:
Pueblo County
Hankard Environmental
CH2M HILL

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
SOUTHERN COLORADO REGULATORY OFFICE
720 NORTH MAIN STREET SUITE 300
PUEBLO CO 81003-3047

May 26, 2006

Operations Division
Regulatory Branch

Mr. Brett Weiland
CH2M Hill
19 South Tejon, Suite 100
Colorado Springs, CO 80903-1505

Dear Mr. Weiland:

This replies to your May 24, 2006 letter requesting a Section 404 jurisdictional determination for waters of the United States for the proposed I-25 improvements in Pueblo in Fountain Creek, the Arkansas River and unnamed tributaries of the Arkansas River, and wetlands adjacent to these waters in Pueblo, Pueblo County, Colorado. We have assigned Action No. 2002 00267 to this request.

We have evaluated the information you provided and concur with your findings of waters of the United States within the project site. With your letter, you provided wetland data forms and sheets showing the boundaries of wetlands. I visited the site with you on May 16, 2006. The following waters are regulated under provisions of Section 404 of the Clean Water Act.

a. Fountain Creek and adjacent wetlands labeled WL-5c and located at the U.S. Highway 50-East crossing and upstream to about White Dove Court (Sheets 01, 02, and 03),

b. Fountain Creek and adjacent wetlands labeled WL-5b and located from U.S. Highway 50 east crossing downstream to 13th Street (Sheets 04 and 05),

c. Fountain Creek and adjacent wetlands labeled WL-5a and located from 13th Street downstream to and including the 8th Street crossing (Sheets 06 and 07),

d. An unnamed tributary of the Arkansas River, known locally as H.A.R.P. or Phelps Creek, and adjacent wetlands labeled WL-4 and located near "D" Street (Sheet 08),

e. The Arkansas River and adjacent wetlands labeled WL-3 and located at the I-25 crossing (Sheets 09, 10 and 11),

f. Runyon Lake and adjacent wetlands labeled "unidentifi" (Sheet 11), and

g. An unnamed wetland channel which is tributary to the Arkansas River, labeled WL-2 and located at Santa Fe Avenue and Haven Place intersection (Sheet 12).

The wetlands and other waters of U.S. jurisdictional boundaries are as shown on Sheets 01 - 12 with one exception. On Sheet 08 (paragraph "d" above) and mapped as WL-4; wetlands are found adjacent to the stream only downstream of the I-25 culvert. Upstream of the I-25 culvert, the stream has concrete-lined banks and wetlands were not present.

A detention pond and drainage ditch with wetlands labeled WL-1 and located at South Pueblo Boulevard and Greenhorn Drive (Sheets 13 and 14) are not considered to be waters of the U.S. The wetlands are located within a drainage ditch and a pond which were created by excavating dry land and which do not have any tributary connection to another jurisdictional water. The WL-4 wetlands are not regulated under Section 404 of the Clean Water Act and a permit would not be needed for activities in them.

This letter contains an approved jurisdictional determination for your subject site. If you object to this determination, you may request an administrative appeal under Corps' regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process and Request for Appeal form. If you request to appeal this determination you must submit a completed Appeal form to the Pacific Division Office at the following address:

Mr. Douglas R. Pomeroy
Division Review Office (ph 415-977-8035, fax 415-977-8047)
South Pacific Division
333 Market Street
San Francisco, CA 94105

In order for an Appeal to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the date of the Appeal form. Should you decide to submit an Appeal form, it must be received at the above address by July 25, 2006.

It is not necessary to submit an Appeal form to the Division office if you do not object to the determination in this letter.

This jurisdictional determination will be valid for 5 years from the date of this letter unless new information warrants revision of the determination before the expiration date. Please note that this Corps of Engineers' wetland delineation concurrence is specifically for Clean Water Act jurisdiction and does not serve the purposes of the Food Security Act or other federal, state, or local requirements.

A Department of the Army permit may be required for the discharge of dredged or fill material into these waters. If you have any questions about this determination or permit requirements, please feel free to contact me at (719) 543-6914 or by email at anita.e.culp@usace.army.mil.

Sincerely,

Anita E. Culp
Senior Project Manager

Enclosure

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Colorado Department of Transportation		File Number: 2002 00267	Date: 5-26-06
Attached is:			See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A
	PROFFERED PERMIT (Standard Permit or Letter of permission)		B
	PERMIT DENIAL		C
XX	APPROVED JURISDICTIONAL DETERMINATION		D
	PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the DISTRICT ENGINEER for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the DISTRICT ENGINEER within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the DISTRICT ENGINEER will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the DISTRICT ENGINEER will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the DISTRICT ENGINEER for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the DIVISION (not district) ENGINEER (address on reverse). This form must be received by the DIVISION ENGINEER within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the DIVISION (not district) ENGINEER. This form must be received by the DIVISION (not district) ENGINEER within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the DIVISION (not district) ENGINEER (address on reverse). This form must be received by the DIVISION ENGINEER within 60 days of the date of this notice. Exception: JD appeals based on new information must be submitted to the DISTRICT ENGINEER within 60 days of the date of this notice.

EXCEPTION: Appeals of Approved Jurisdictional Determinations based on new information must be submitted to the District engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:
DISTRICT ENGINEER
Albuquerque District, Corps of Engineers
Attn: CESPA-OD-R, Regulatory Branch
4101 Jefferson Plaza NE
Albuquerque, New Mexico 87109-3435
(505) 342-3283

If you only have questions regarding the appeal process you may also contact:
DIVISION ENGINEER
Army Engineer Division, South Pacific, CESPD-CM-O
Attn: Doug Pomeroy, Administrative Appeal Review Officer
333 Market Street, San Francisco, CA 94105 (415-977-8035)
(Use this address for submittals to the DIVISION ENGINEER)

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
_____ Signature of appellant or agent.		