

**Aquatic Resources Delineation Report  
Alkali Creek Bridge Replacement Project  
(CDOT 22521, BRO C320-004)  
Montezuma County, CO**



**Prepared For:**



**Montezuma County  
Road & Bridge Department  
1680 North Dolores Road  
Cortez, Colorado 81321**

**On behalf of:**

**BECHTOLT**

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**Bechtolt Engineering, Inc.  
3059 Main Avenue A  
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**Prepared By:**



**ENVIRONMENTAL CONSULTANTS  
679 East 2nd Avenue, Unit E2  
Durango, Colorado 81301**

**July 2020**

## EXECUTIVE SUMMARY

Wetlands and other Waters of the U.S. (WOUS) in the survey area were identified by SME Environmental, Inc. (SME) on March 25, 2019 using the methodology defined in the Routine Determination procedure set forth in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and *the Regional Supplement: Arid West Region (Version 2.0)*. Wetland boundaries were defined based on presence of hydrophytic vegetation, hydric soils, and hydrologic indicators that under normal conditions would indicate wetland conditions. Additionally, SME surveyed for the presence an ordinary high water mark (OHWM) in accordance with the *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2008) and *Regulatory Guidance Letter No. 05-05 Guidance on Ordinary High Water Mark Identification* (USACE 2005).

The Alkali Creek Bridge Replacement survey area is approximately 1.4 acres. Based on the site investigation, approximately 0.07 acres (3,265 sq. feet) of aquatic resources exist in the survey area. The survey area is located along Road (Rd) N approximately 1.5 miles west of U.S. Highway 491 (US 491), and is centered on Alkali Creek Bridge in Montezuma County, CO. The survey area is located just northwest of Cortez, CO. SME prepared this report for Montezuma County, on behalf of Bechtolt Engineering Inc., to document the boundaries of aquatic resources within the survey area of the Alkali Creek Bridge Replacement Project.

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## ACRONYMS AND ABBREVIATIONS

CDOT	Colorado Department of Transportation
CR	County Road
HUC	Hydrologic Unit Code
NAD	North American Datum
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
NWPL	National Wetland Plant List
OHWM	Ordinary high water mark
PEM	Palustrine emergent
PSS	Palustrine scrub-shrub
ROW	Right-of-way
R3UBH	Riverine Upper Perennial Unconsolidated Bottom Permanently Flooded
RPW	Relatively Permanent Water
SME	SME Environmental, Inc.
TNW	Traditional Navigable Water
US 491	U.S. Highway 491
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service

## 1.0 INTRODUCTION

**Project Name:** Alkali Creek Bridge Replacement Project

**USACE File #:** N/A, initial submittal

**CDOT #:** 22521, BRO C320-004 **SME #:** 180052

**Applicant:**

Montezuma County

1680 North Dolores Road, Cortez, CO 81321

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Phone: (970) 565 8666, Email: [renglehart@co.montezuma.co.us](mailto:renglehart@co.montezuma.co.us)

**Agent/Consultant:**

SME Environmental, Inc. (SME)

679 East 2nd Avenue, Unit E2, Durango, CO 81301

Contact: Mr. Sean Moore, Principal; Email: [smoore@sme-env.com](mailto:smoore@sme-env.com)

Phone: (970) 259-9595; Fax: (970) 259-0050

**Survey Area Description:** The area surveyed by SME in support of the project is along Road (Rd) N approximately 1.5 miles west of U.S. Highway 491 (US 491), and is centered on Alkali Creek Bridge in Montezuma County, CO. The survey area is located just northwest of Cortez, CO. Total size of the survey area is approximately 1.4 acres.

**Purpose:** The purpose of this report is to identify and describe aquatic resources within the survey area for a Clean Water Act Section 404 Nationwide Permit verification of use request.

## 2.0 PROJECT LOCATION

**Municipality:** N/A; **County:** Montezuma County; **State:** Colorado; **Street Address:** Alkali Creek Bridge located on CR N approximately 1.5 miles west of US 491.

**Section, Township, Range (New Mexico Principal Meridian):** Section 7, Township 36 North, Range 16 West.

**Lat/Long:** survey area centroid approximately latitude: 37.397714° and longitude: -108.649717° (NAD 83).

**USGS Quad Name:** Arriola, Colo.

**Directions:** The survey area is located directly along Rd N. From Cortez, take US 491 heading north for approximately 4 miles until the intersection with County Road (CR) N. Take a left and head west down CR N for approximately 1.2 miles before taking a slight left/southwest onto Rd N. Travel approximately 0.3 miles down Rd N until Alkali Creek Bridge (crosses over Alkali Creek). The survey area is centered on Alkali Creek Bridge. The survey area and highways are depicted on Figure B1 and a topographic map is provided as Figure B2.

### 3.0 DELINEATION METHODS

Aquatic resources in the survey area were identified on March 25, 2019 using the methodology defined in the Routine Determination procedure set forth in the *1987 U.S. Army Corps of Engineers Wetlands Delineation Manual* (USACE 1987), the *Regional Supplement to the USACE Wetland Delineation Manual: Arid West Region* (USACE 2008), *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2008), and *Regulatory Guidance Letter No. 05-05 Guidance on Ordinary High Water Mark Identification* (USACE 2005). Wetland boundaries were defined based on presence of hydrophytic vegetation, hydric soils, and hydrologic indicators that under normal conditions would indicate wetland conditions. In the absence of wetland conditions, the extent of aquatic resources was determined based on the lateral extent of the OHWM.

Prior to conducting the field survey, SME conducted a desktop survey of available publications covering the survey area including U.S. Geological Survey (USGS) 7.5' topographic quadrangles, U.S. Fish and Wildlife (USFWS) National Wetlands Inventory (NWI) data, U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soils data, and *USDA FSA NAIP* aerial imagery. The boundaries of aquatic resources, where permission was granted at the time of the field investigation, were survey-located by Bechtolt Engineering Inc. Additionally, some features were survey-located with a Trimble Geo XH 2008 GPS unit (sub-meter accuracy). All aquatic resource boundaries are depicted on [Figure A](#).

Photo point locations labeled as PP1, PP2, etc. on [Figure A](#) correspond to the photos provided in [Appendix C](#). Wetland Determination Data forms for the Arid West Region are included with this report as [Appendix E](#). Data point/Soil Boring locations have been labeled as DP1 (Data point 1) and DP2 on [Figure A](#).

### 4.0 EXISTING CONDITIONS

#### 4.1 Landscape Setting

**Size of Survey Area:** Approximately 1.4 acres.

**Watershed Name and Size (HUC 8):** McElmo, HUC 14080202, 702 square miles.

**Elevation Range of Site:** Approximately 6,170 to 6,200 feet above mean sea level (msl) ([Figure B2](#)).

**Geographic Setting:** The survey area is located northwest of Cortez, CO. Alkali Creek runs perpendicular to Rd N in the center of the survey area. The creek flows south through the survey area boundary before flowing generally south to McElmo Creek. Alkali Creek is mapped as an intermittent waterway on the USGS Arriola, Colo. 7.5-minute Topographic Quadrangle 1:24,000, Colorado map.

**Geology:** The geology of the survey area is comprised of Dakota Sandstone (Kd) from the Lower Cretaceous. (National Geologic Map Database 2020).

**Land Use:** The survey area is located along Rd N northwest of Cortez, CO about 1.5 miles west of US 491. The surrounding area is mostly undeveloped with a few farms, agricultural areas, and residential homes within the vicinity of the survey area. Rd N, which runs through the center of the survey area, does experience moderate vehicular traffic.

**Precipitation:** According the U.S. Drought Monitor, Southwestern Colorado was in an abnormally dry period during the site visit. Average annual precipitation near Cortez, CO is 12.95 inches/year (WRCC-Cortez). The average precipitation during the month of March is 1.04 inches. In the 24 days preceding the March 25, 2019 field survey, the area received 0.47 inches of precipitation, indicating below normal conditions at the time of survey (The Weather Channel-Cortez).

**Existing Field Conditions:** The field survey was conducted outside of the growing season before vegetation was mature. The 2018 growing season reflected lower than average precipitation and drought conditions. Alkali Creek did have flowing water within the channel and the palustrine emergent (PEM) and palustrine scrub-shrub (PSS) wetlands on site did have saturated soils during the March 2019 site visit.

## 4.2 Aquatic Resources

The survey area includes Alkali Creek (Area C), a USGS intermittent mapped stream, palustrine emergent (PEM) wetlands (Areas B, D and E) and a palustrine scrub-shrub (PSS) wetland (Area A). Please note that some delineated aquatic resources extend beyond the limits of the survey area; however, only the portions of aquatic resources within the survey area were delineated. [Table 1](#) below lists the acreage of the aquatic resource areas classified in accordance with the Cowardin Classification System for wetlands and deepwater habitats (Cowardin et al. 1979). The boundaries of aquatic resources are depicted on [Figure A](#). [Table 2](#) provides a breakdown of aquatic resources as evaluated for a Clean Water Act Section 404 Nationwide Permit verification of use request.

**Table 1. Cowardin Classification, Acreage, and Linear Footage of Aquatic Resources within the Survey Area.**

Waters of the U.S.	Square Feet	Acres	Linear Feet
Alkali Creek (R3UBH)	2,727	0.06	150
Palustrine Emergent (PEM) Wetlands	367	0.01	NA
Palustrine Scrub-Shrub (PSS) Wetlands	171	<0.01	NA
<b>TOTAL</b>	<b>3,265</b>	<b>0.07</b>	<b>150</b>

**Table 2. Characteristics of Aquatic Resources within the Survey Area.**

Name	Flow Frequency	Flows to	Rationale
Alkali Creek (Area C)	Perennial	McElmo Creek	Ordinary High Water Mark (OHWM)
PEM wetlands (Areas B,D, and E)	Seasonally saturated	Alkali Creek	Met the three parameters for wetland determination (i.e., vegetation, soils, and hydrology).

PSS wetlands (Area A)	Seasonally saturated	Alkali Creek	Met the three parameters for wetland determination (i.e., vegetation, soils, and hydrology).
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### 4.3 Vegetation

The PEM wetlands were dominated by swollen beaked sedge (*Carex rostrata*), fowl blue grass (*Poa palustris*), three square (*Schoenoplectus pungens*) and broadleaf cattail (*Typha latifolia*). PSS wetlands were dominated by narrowleaf willow (*Salix exigua*) with an herbaceous layer of broadleaf cattail and barnyard grass (*Echinochloa crus-galli*). Most of the upland areas (that did not meet the three parameters) were dominated by upland grasses and shrubs, primarily big sagebrush (*Artemisia tridentata*), rubber rabbitbrush (*Ericameria nauseosa*) and an herbaceous layer of smooth brome (*Bromus inermis*). However, some upland areas did have a presence of wetland vegetation such as narrowleaf willow and Baltic rush (*Juncus balticus*). [Appendix D](#) provides a list of dominant plant species observed during the field investigation. Wetland Determination Data forms for the Arid West Region are included with this report as [Appendix E](#) and include detailed information about the vegetation observed at each data point location.

### 4.4 Soils

Soil data for the survey area was obtained from the USDA NRCS. A soil map is included as [Figure B3](#). The survey area crosses two soil map units; a description of these units is derived from the USDA NRCS Soil Reports and is provided in [Appendix F](#).

The survey area is located within the mapped *Gladel-Pulpit complex 3-9% slopes* and *Ramper loam 0-3% slopes* soil units. None of the mapped soil units are considered hydric based off of major components in the map unit; however, the *Ramper loam 0-3% slopes* is on the hydric soils list due to hydric subcomponents (Aquents) (State Soil Data Access Hydric Soils List, NRCS 2020). Data collected from soil transects during the field investigation revealed primarily clay loam soils. The primary hydric soil indicator observed at the soil boring locations within the wetland areas was redoximorphic features (i.e., mottles) located within a dark soil matrix (F6-Redox Dark Surface) and soil saturation. Data from specific soil borings is presented on the data sheets in [Appendix E](#).

### 4.5 Hydrology

Alkali Creek (Area C) flows south through the center of the survey area before continuing south to meet with McElmo Creek. Alkali Creek is mapped as an intermittent stream (dashed blue line) on the Arriola, Colo. USGS 7.5-minute topographic quadrangle map; however, based on field investigation, it is classified as a perennial stream (R3UBH) for the purposes of this delineation as the stream exhibits signs of year-round flow and was flowing during the March 2020 site visit.

In addition to Alkali Creek, there are fringing PEM wetlands (Areas B,D, and E) and a PSS wetland (Area A), which directly abut Alkali Creek. Flowing water within Alkali Creek, as well as groundwater and precipitation, are the main sources of hydrology for the fringe/abutting wetlands along Alkali Creek. The primary forms of hydrology found in the wetland areas on site are the presence of oxidized rhizospheres along living roots as well as soil saturation. See the data forms in [Appendix E](#) for more detailed hydrology information at each of the data point locations depicted on [Figure A](#).



#### **4.6 Interstate Commerce**

Alkali Creek flows south to McElmo Creek, which is considered a Relatively Permanent Water (RPW). The term RPW is taken from the *USACE Jurisdictional Determination Form Instructional Guidebook* (2007) and implies a tributary with whose flow is year-round flow (or seasonally continuous) and that discharges directly or indirectly into a Traditional Navigable Water (TNW). McElmo Creek is a tributary to the San Juan River, which flows to the Navajo Reservoir which is a TNW.

#### **4.7 Limitations**

Field indicators can change with variations in hydrology and other factors. This report assesses the potential for aquatic resources at the site at the time of our review and does not address conditions at a given time in the future. Accordingly, on behalf of our client, SME reserves the right to revisit the jurisdictional status of boundaries of aquatic resources as presented herein, should any of this information warrant modifications. We make no other warranties, either expressed or implied, and our report is not a recommendation to buy, sell or develop the property. This report does not constitute a Jurisdictional Determination of Waters of the United States since such determinations must be verified by the USACE or the NRCS (as applicable) and are subject to review by the U.S. Environmental Protection Agency (USEPA).

## 5.0 REFERENCES – General and Cited

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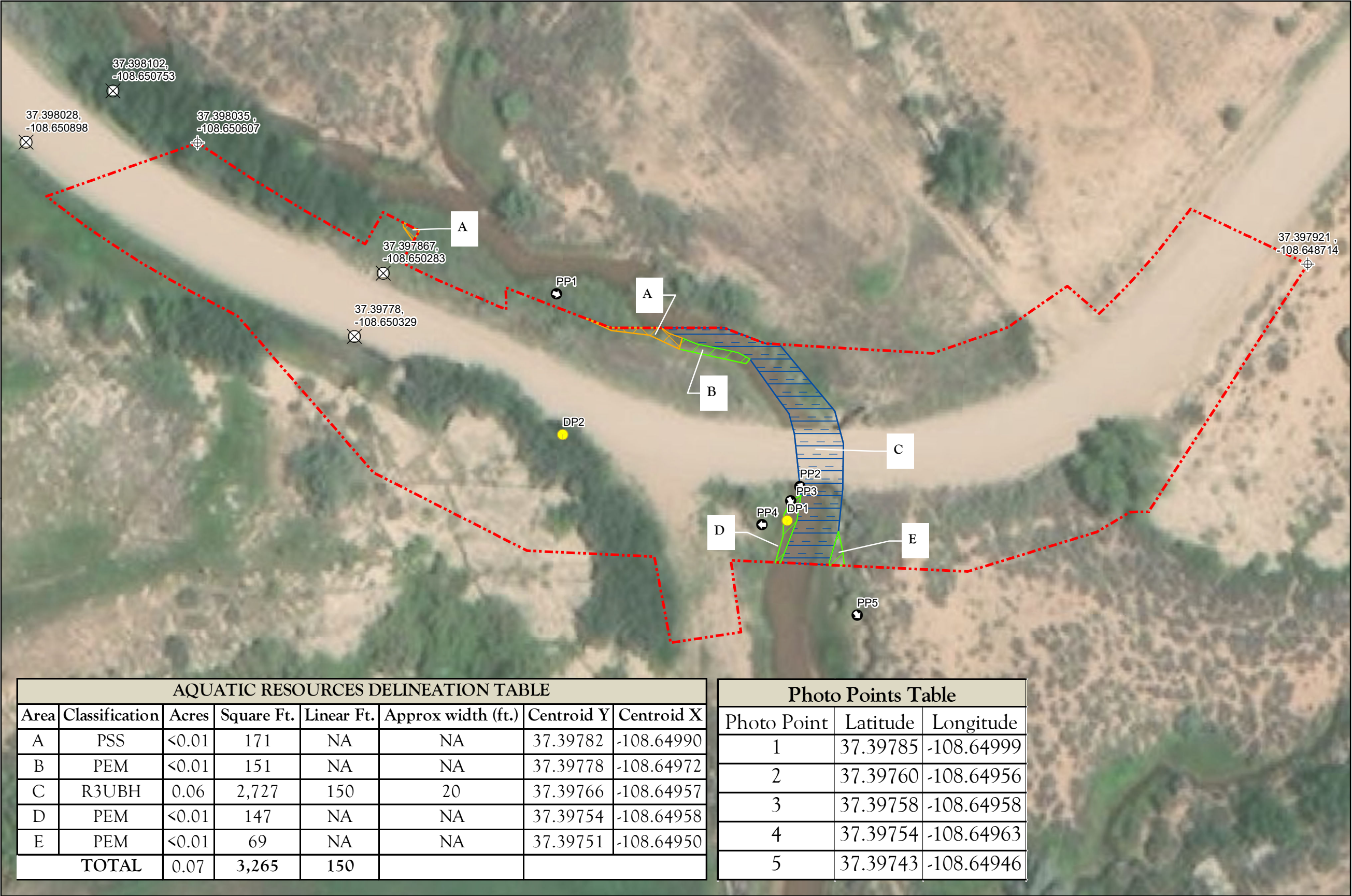
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**APPENDIX A**  
**Aquatic Resource Delineation Maps**

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Aquatic Resources Delineation Table							
Area	Classification	Acres	Square Ft.	Linear Ft.	Approx width (ft.)	Centroid Y	Centroid X
A	PSS	<0.01	171	NA	NA	37.39782	-108.64990
B	PEM	<0.01	151	NA	NA	37.39778	-108.64972
C	R3UBH	0.06	2,727	150	20	37.39766	-108.64957
D	PEM	<0.01	147	NA	NA	37.39754	-108.64958
E	PEM	<0.01	69	NA	NA	37.39751	-108.64950
TOTAL		0.07	3,265	150			

Photo Points Table		
Photo Point	Latitude	Longitude
1	37.39785	-108.64999
2	37.39760	-108.64956
3	37.39758	-108.64958
4	37.39754	-108.64963
5	37.39743	-108.64946

**GENERAL NOTES**

1. Survey area boundary created by SME Environmental, Inc. (SME) based on outer limits of disturbance provided by Bectolt Engineering.

2. SME staff visited the site on March 25, 2019 to assess and delineate the boundaries of the wetlands and other Waters of the U.S. (WOUS) in the area of interest using the methodology defined 1987 U.S. Army Corps of Engineers Wetlands Delineation Manual (USACE 1987), the Regional Supplement to the USACE Wetland Delineation Manual: Arid West Region (USACE 2008), Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (USACE 2008), and Regulatory Guidance Letter No. 05-05 Guidance on Ordinary High Water Mark Identification (USACE 2005).

3. Wetland boundaries were defined based on presence of hydrophytic vegetation, hydric soils, and hydrologic indicators that under normal conditions would indicate wetland conditions. Where wetland conditions did not occur adjacent to surface water, the jurisdictional boundary was identified based on evidence of the OHWM.

4. The boundaries of aquatic resources where survey permission was granted at the time of the survey were survey-located by Bechtolt Engineering Inc. Additionally, some

features were survey-located with a Trimble Geo XH 2008 GPS unit (sub-meter accuracy).

5. Areas which likely satisfy the USACE criteria as WOUS are labeled. Note that WOUS continue beyond the survey area boundary.

6. All WOUS boundaries, depicted hereon, are subject to modification until jurisdictional verification has been completed the USACE.

7. Please be aware that impacts to WOUS may require authorization from Local, State and/or Federal regulatory agencies.

8. Aquatic resources delineation table represents acreages, linear footage, square footage and centroid locations.



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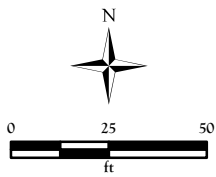
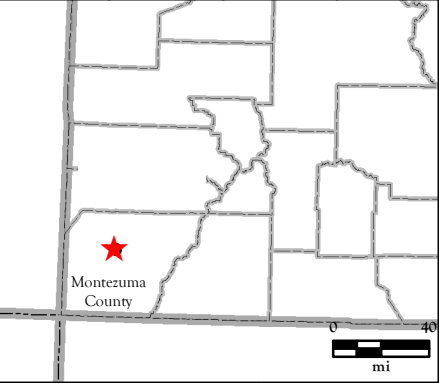
PRELIMINARY: NOT FOR  
CONSTRUCTION OR RECORDING

**AQUATIC RESOURCES  
DELINEATION MAP  
ALKALI CREEK BRIDGE  
REPLACEMENT PROJECT  
MONTEZUMA COUNTY,  
COLORADO**

Legend

- Survey Area
- PEM
- PSS
- R3UBH
- Culvert
- Control Points
- Photo Points
- Data Point

Drawn by:	S. Bohn	Date drawn:	8/17/2020
Rvwd. by:	KZ	Date rvsd.:	
Proj. No.	180052/22521	Scale:	1" = 49'



**FIGURE  
A**

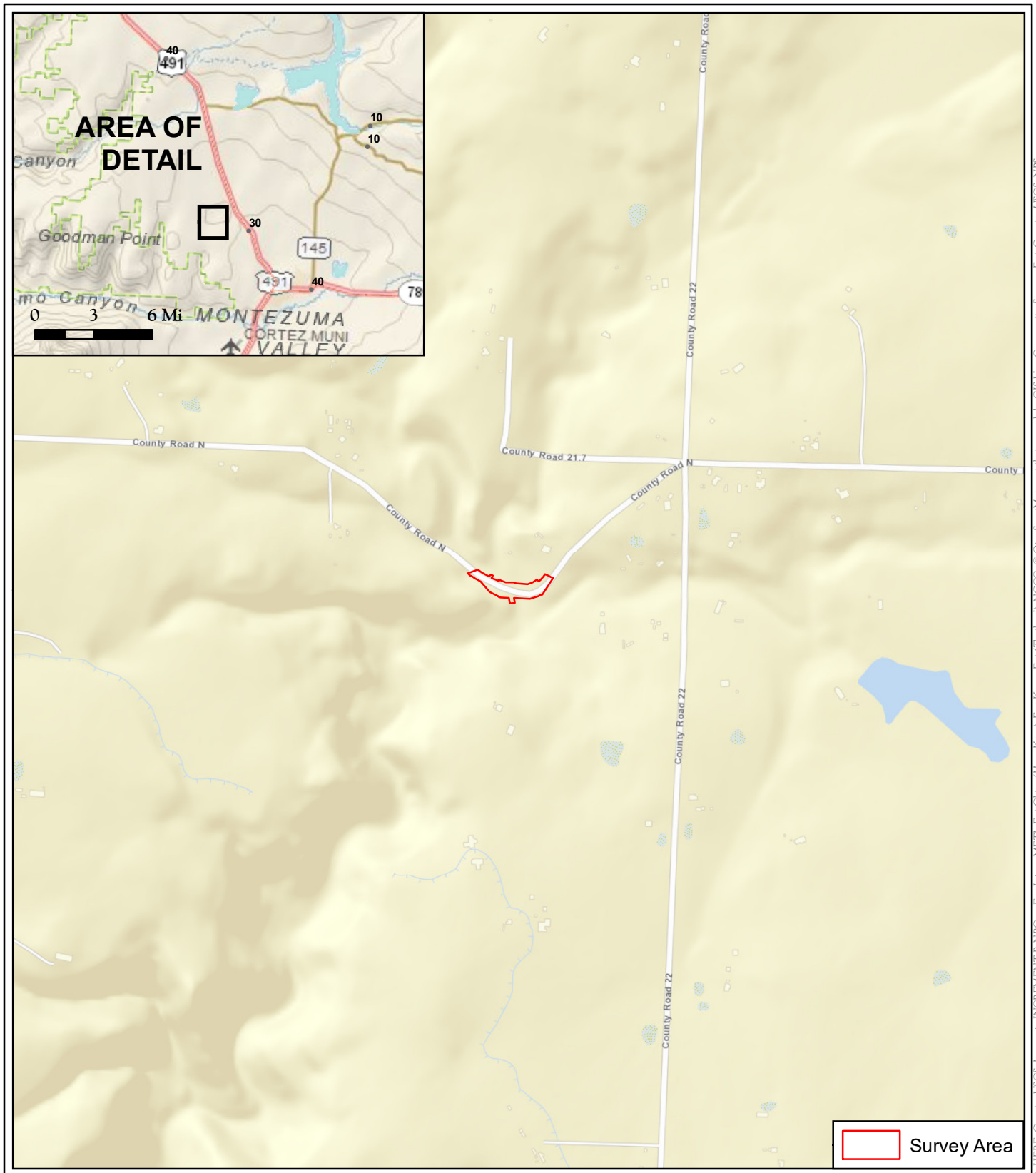
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## **APPENDIX B**

### **Supporting Maps**

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 <b>ENVIRONMENTAL CONSULTANTS</b>  679 East 2nd Ave. Unit E2, Durango, Colorado 81301 www.sme-env.com (970) 259-9595	Drawn by:	Rvwd. by:	Project No.:	<b>ROAD VICINITY MAP</b>	
	S. Bohn	KZ	180052		
	Date:	CDOT #:	Scale:	AQUATIC RESOURCES DELINEATION REPORT ALKALI CREEK BRIDGE REPLACEMENT MONTEZUMA COUNTY, CO.	
	6/26/2020	22521	1" = 1,000'		
		 Feet		<b>FIGURE B1</b>	

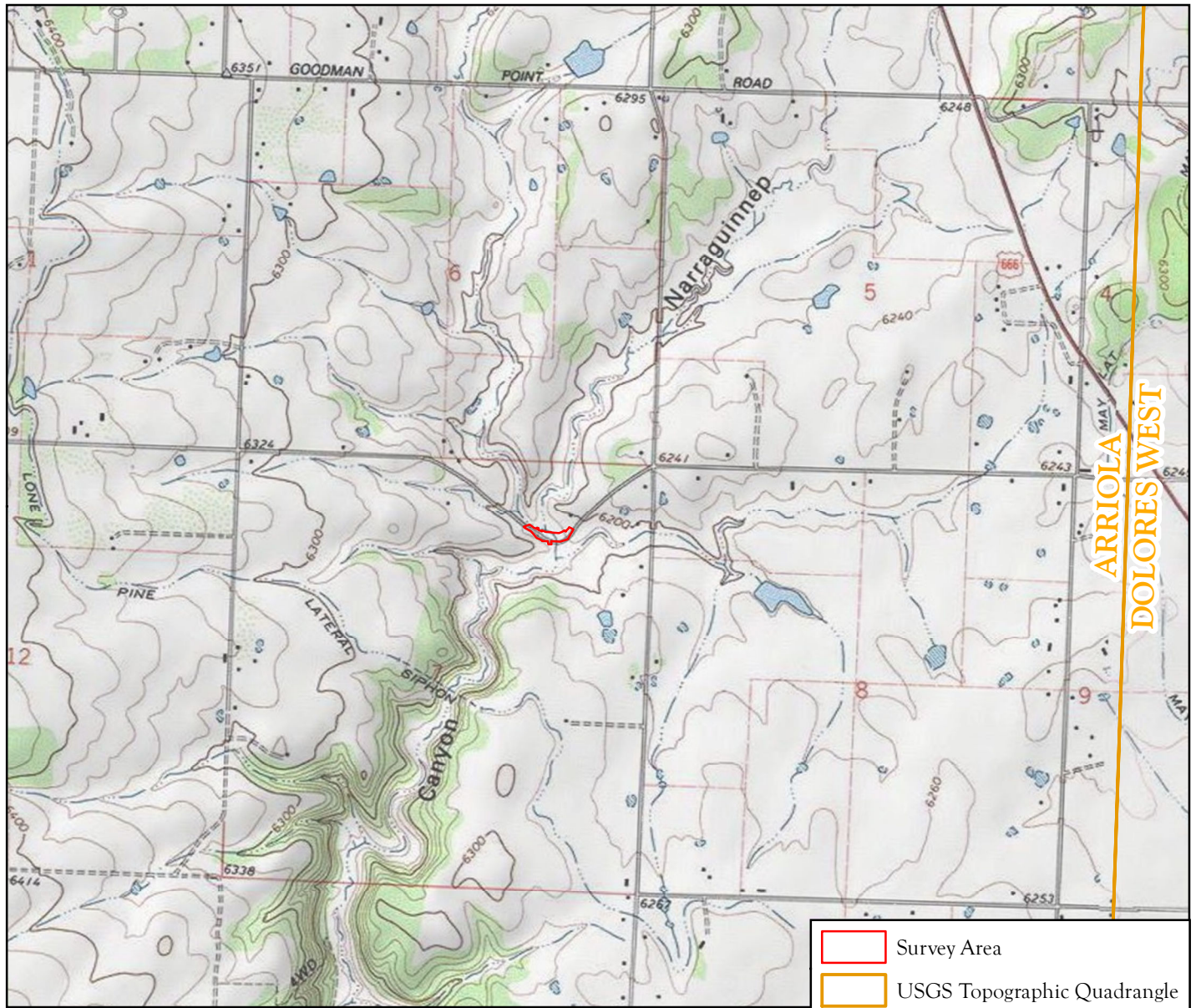
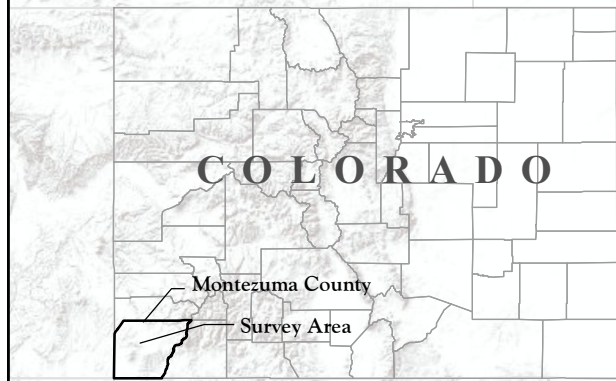
**PROJECT LOCATION:**

Township 36 North, Range 16 West, NE $\frac{1}{4}$ NE $\frac{1}{4}$ ,  
NW $\frac{1}{4}$ NE $\frac{1}{4}$ , Section 7;  
New Mexico Principal Meridian  
Montezuma County, Colorado.

**Survey Area Centroid (NAD 1983):**

Latitude: 37.397714°

Longitude: -108.649717°



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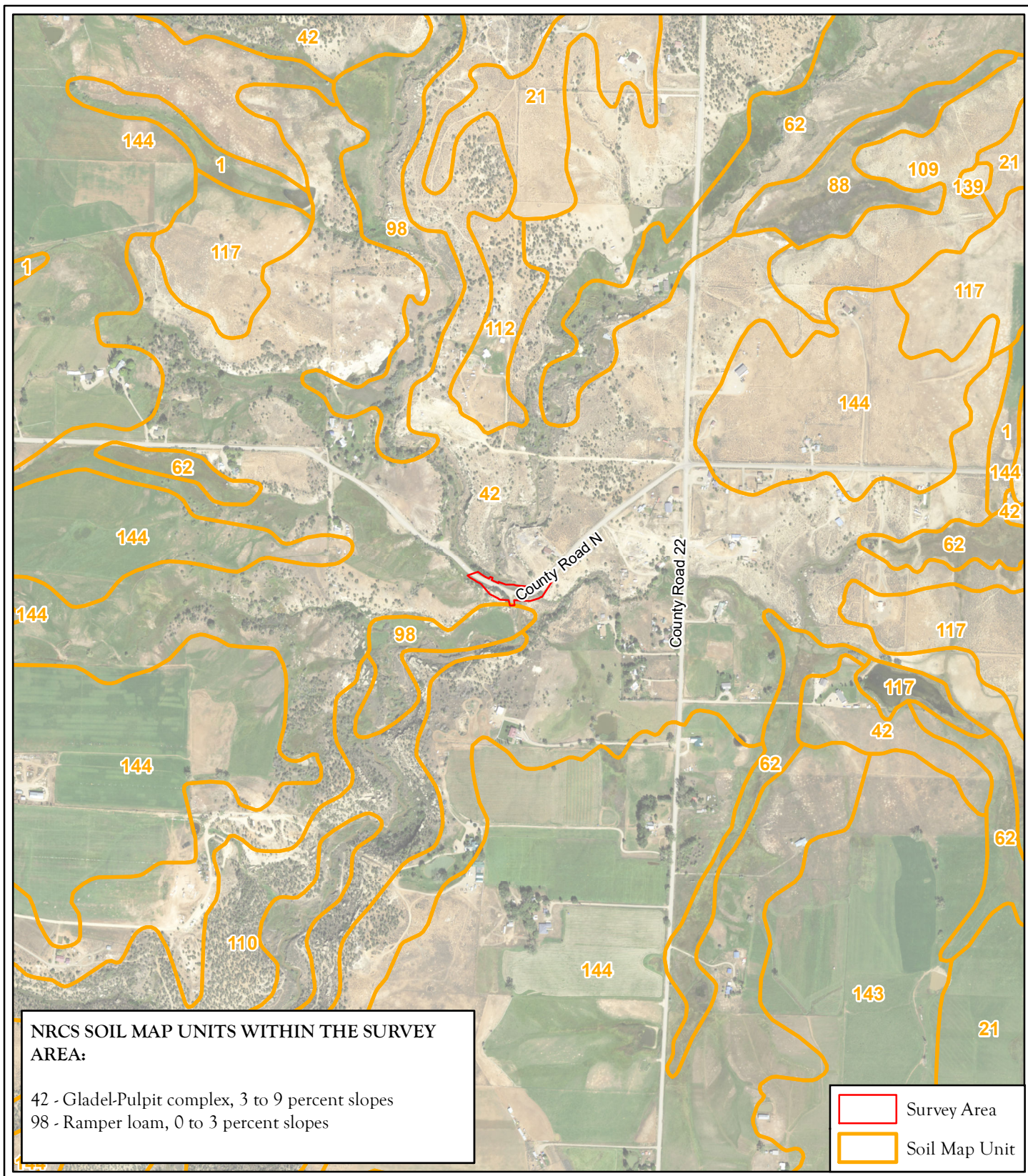
Drawn by:	Rvwd. by:	Project No.:
S. Bohn	KZ	180052
Date:	CDOT:	Scale:
6/26/2020	22521	1" = 2,000'
A north arrow pointing upwards and a scale bar showing 0, 1,000, and 2,000 feet.		



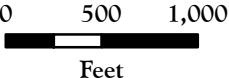
**TOPOGRAPHIC SITE LOCATION MAP**

AQUATIC RESOURCES  
DELINEATION REPORT  
ALKALI CREEK BRIDGE  
REPLACEMENT  
MONTEZUMA COUNTY, CO.

**FIGURE  
B2**





 <p><b>ENVIRONMENTAL CONSULTANTS</b></p> <p>679 East 2nd Ave. Unit E2, Durango, Colorado 81301        www.sme-env.com (970) 259-9595</p>	Drawn by: S. Bohn	Rvw'd. by: KZ	Project No.: 180052	<b>AERIAL SITE VICINITY MAP</b>	
	Date: 6/26/2020	CDOT: 22521	Scale: 1" = 1,000'		
	 			<b>FIGURE B3</b>	

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## **APPENDIX C**

### **Photo Documentation**

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**Select Photos from Field Delineation  
Alkali Creek Bridge Replacement Project**

Photos taken by Samantha Bohn, SME Wetland Scientist on March 25, 2019



Photo Point 1 (PP1) is looking southeast at a palustrine scrub-shrub (PSS) wetland (Area A) that is a fringe wetland along Alkali Creek (photo left) in the northern portion of the survey area.



PP2 is looking northeast at Alkali Creek (Area C) under the current bridge along County Road N (CR N).



**Select Photos from Field Delineation  
Alkali Creek Bridge Replacement Project**

Photos taken by Samantha Bohn, SME Wetland Scientist on March 25, 2019



PP3 is looking south at the portion of Alkali Creek (Area C) south of CR N near the existing bridge. Fringe wetlands (Areas D and E) are located on both sides of Alkali Creek throughout this area, to the west and east, respectively. Datapoint 1 (DP 1) is located just behind (north) of this photo.



PP4 is looking west at an area that characterizes the uplands in the western portion of the survey area. This area is dominated by upland shrubs, including rubber rabbitbrush (*Ericameria nauseosa*) and big sagebrush (*Artemisia tridentata*).



**Select Photos from Field Delineation**  
**Alkali Creek Bridge Replacement Project**

Photos taken by Samantha Bohn, SME Wetland Scientist on March 25, 2019



PP5 is looking southeast at an area that characterizes the uplands in the eastern portion of the survey area. This area is dominated by upland shrubs, including rubber rabbitbrush and big sagebrush.

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**APPENDIX D**  
**Plant List**

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**Appendix D: List of Dominant Plant Species Observed within the Survey Area.**

Scientific Name*	Common Name	Wetland Indicator Status**
<b>SHRUBS</b>		
<i>Artemisia tridentata</i>	Big sagebrush	NL/UPL
<i>Ericameria nauseosa</i>	Rubber rabbitbrush	NL/UPL
<i>Salix exigua</i>	Narrow-leaf willow	FACW
<b>HERBS</b>		
<i>Typha latifolia</i>	Broad-leaf cat-tail	OBL
<b>GRAMINOIDS</b>		
<i>Bromus inermis</i>	Smooth brome	FACU
<i>Carex rostrata</i>	Swollen beaked sedge	OBL
<i>Echinochloa crus-galli</i>	Large barnyard Grass	FACW
<i>Juncus balticus</i>	Baltic rush	FACW
<i>Poa palustris</i>	Fowl blue grass	FAC
<i>Schoenoplectus pungens</i>	Three-square	OBL

• OBL: Almost always is a hydrophyte, rarely in uplands

• FAC: Commonly occurs as either a hydrophyte or non-hydrophyte

• NL (Not Listed): generally indicates upland species

\* Scientific names according to Synonymized Checklist of the Vascular Flora of the United States, Canada, and Greenland (Kartesz 2009) and National Wetland Plant List (NWPL).

\*\* 2018 NWPL is regionalized along the 10 wetland delineation supplement regions. Wetland indicator status based on Arid West Region.

• FACW: Usually is a hydrophyte but occasionally found in uplands

• FACU: Occasionally is a hydrophyte but usually occurs in uplands

• N/A: Unable to identify to species due to time of year

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**APPENDIX E**  
**Wetland Determination Data Forms**

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# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Alkali Creek Bridge Replacement City/County: Montezuma County Sampling Date: 3/25/19  
 Applicant/Owner: Montezuma County State: CO Sampling Point: DP1  
 Investigator(s): SKB Section, Township, Range: Section 7, Township 36N, Range 16W  
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): 5  
 Subregion (LRR): D Lat: \_\_\_\_\_ Long: \_\_\_\_\_ Datum: WGS 84  
 Soil Map Unit Name: Gladel-Pulpit complex, 3-9% slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No ☒ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No _____		
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No _____		
Remarks:  According to the U.S. Drought Monitor, Colorado is in an abnormally dry period.			

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)	
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)	
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
4. _____	_____	_____	_____		
_____ = Total Cover					
Sapling/Shrub Stratum (Plot size: _____)				Prevalence Index worksheet:	
1. _____	_____	_____	_____	Total % Cover of: _____ Multiply by: _____	
2. _____	_____	_____	_____	OBL species _____ x 1 = _____	
3. _____	_____	_____	_____	FACW species _____ x 2 = _____	
4. _____	_____	_____	_____	FAC species _____ x 3 = _____	
5. _____	_____	_____	_____	FACU species _____ x 4 = _____	
_____ = Total Cover				UPL species _____ x 5 = _____	
Herb Stratum (Plot size: _____)				Column Totals: _____ (A) _____ (B)	
1. <u>Carex rostrata</u>	<u>50</u>	<u>Yes</u>	<u>OBL</u>	Prevalence Index = B/A = _____	
2. <u>Poa palustris</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>		
3. <u>Schoenoplectus pungens</u>	<u>10</u>	<u>No</u>	<u>OBL</u>		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
_____ = Total Cover					
Woody Vine Stratum (Plot size: _____)				Hydrophytic Vegetation Indicators:	
1. _____	_____	_____	_____	<input checked="" type="checkbox"/> Dominance Test is >50%	
2. _____	_____	_____	_____	<input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup>	
				<input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)	
				<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	
% Bare Ground in Herb Stratum <u>0</u> % Cover of Biotic Crust _____					

Remarks:

No tree, sapling/shrub, or woody vine strata were present at this data point.

# SOIL

Sampling Point: DP1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-2	10YR 4/2	100						Silty Clay Loam
2-12	10YR 4/2	90	7.5YR 5/8	10	C	M, PL		Silty Clay Loam

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)

- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

**Hydric Soil Present? Yes ☒ No ☐**

Remarks:

Possible manganese deposits and organic matter mixed in with the soil (black deposits)

# HYDROLOGY

**Wetland Hydrology Indicators:**

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)

- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☒ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

**Field Observations:**

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

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

Saturation Present? Yes ☒ No ☐ Depth (inches): 1

**Wetland Hydrology Present? Yes ☒ No ☐**

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

Remarks:

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Alkali Creek Bridge Replacement City/County: Montezuma County Sampling Date: 3/25/19  
 Applicant/Owner: Montezuma County State: CO Sampling Point: DP2  
 Investigator(s): SKB Section, Township, Range: Section 7, Township 36N, Range 16W  
 Landform (hillslope, terrace, etc.): Roadside swale Local relief (concave, convex, none): Concave Slope (%): 5  
 Subregion (LRR): D Lat: \_\_\_\_\_ Long: \_\_\_\_\_ Datum: WGS 84  
 Soil Map Unit Name: Gladel-Pulpit complex, 3-9% slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No ☒ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>	
Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	
Remarks:  According to the U.S. Drought Monitor, Colorado is in an abnormally dry period.	

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)  Total Number of Dominant Species Across All Strata: _____ (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum</b> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				<b>Hydrophytic Vegetation Indicators:</b> <input checked="" type="checkbox"/> Dominance Test is >50% _____ Prevalence Index is ≤3.0 <sup>1</sup> _____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.  <b>Hydrophytic Vegetation Present?</b> Yes _____ No <input checked="" type="checkbox"/>
<b>Herb Stratum</b> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
<b>Woody Vine Stratum</b> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum _____	% Cover of Biotic Crust _____			

Remarks:

No tree, sapling/shrub, herb, or woody vine strata were present at this data point (No vegetation was present within the swale)

# SOIL

Sampling Point: DP2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-12	10YR 3/3	100						Sandy Clay Loam

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)

- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

**Hydric Soil Present?** Yes \_\_\_\_\_ No ☒

Remarks:

Gravel

# HYDROLOGY

**Wetland Hydrology Indicators:**

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)

- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No ☒ Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No ☒ Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No ☒ Depth (inches): \_\_\_\_\_  
(includes capillary fringe)

**Wetland Hydrology Present?** Yes \_\_\_\_\_ No ☒

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

Remarks:

No hydrology or OHWM was present within the swale

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**APPENDIX F**  
**USDA NRCS Soils Report**

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**Appendix F: USDA NRCS Soils Report for soil units within the Survey Area**

***Cortez Area, Colorado, Parts of Dolores and Montezuma Counties***

**Map Unit: 42—Gladel-Pulpit complex, 3 to 9 percent slopes**

**Component: Gladel (45%)**

The Gladel component makes up 45 percent of the map unit. Slopes are 3 to 9 percent. This component is on dissected dip slopes on cuestas. The parent material consists of eolian deposits over residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 12 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R036XY141CO Shallow Loamy Mesa Top - (pinyon-juniper) ecological site. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 9 percent. There are no saline horizons within 30 inches of the soil surface.

**Component: Pulpit (35%)**

The Pulpit component makes up 35 percent of the map unit. Slopes are 3 to 9 percent. This component is on dissected dip slopes on cuestas. The parent material consists of eolian deposits over residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R036XY142CO Loamy Mesa Top - (pinyon-juniper) ecological site. Nonirrigated land capability classification is 4e. Irrigated land capability classification is 4e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 8 percent. There are no saline horizons within 30 inches of the soil surface.

**Component: Rock outcrop (10%)**

Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

**Component: Wetherill (5%)**

Generated brief soil descriptions are created for major soil components. The Wetherill soil is a minor component.

**Component: Dolcan (5%)**

Generated brief soil descriptions are created for major soil components. The Dolcan soil is a minor component.

**Map Unit: 98—Ramper loam, 0 to 3 percent slopes**

**Component: Ramper (90%)**

The Ramper component makes up 90 percent of the map unit. Slopes are 0 to 3 percent. This component is on flood plains, alluvial fans, drainageways. The parent material consists of alluvium derived from sandstone and shale. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is rarely flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R036XY405CO Loamy Bottom (ghost) ecological site. Nonirrigated land capability classification is 3c. Irrigated land capability classification is 3c. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 8 percent. The soil has a slightly saline horizon within 30 inches of the soil surface.

**Component:** Ackmen (5%)

Generated brief soil descriptions are created for major soil components. The Ackmen soil is a minor component.

**Component:** Sideshow (4%)

Generated brief soil descriptions are created for major soil components. The Sideshow soil is a minor component.

**Component:** Aquents (1%)

Generated brief soil descriptions are created for major soil components. The Aquents soil is a minor component.

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## **APPENDIX G**

### **Signed statement from property owner(s) allowing access**

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*Statement Regarding Access:* The majority of the survey area is located within existing road ROW, which is publicly accessible. However, the northern part of the survey area is comprised of a Temporary Construction Easement (TE). Please contact SME or Montezuma County regarding permissions if the U.S. Army Corps of Engineers (USACE) needs to access the TE portion of the survey area for the purpose of verifying aquatic resource boundaries.

SME Environmental, Inc. (SME)  
679 East 2nd Avenue, Unit E2, Durango, CO 81301  
Contact: Mr. Sean Moore, Principal; Email: [smoore@sme-env.com](mailto:smoore@sme-env.com)  
Phone: (970) 259-9595; Fax: (970) 259-0050

Montezuma County  
1680 North Dolores Road, Cortez, CO 81321  
Contact: Mr. Rob Englehart, Superintendent- Montezuma County Road and Bridge Department  
Phone: (970) 565 8666, Email: [renglehart@co.montezuma.co.us](mailto:renglehart@co.montezuma.co.us)



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## **APPENDIX H**

### **Aquatic Resource Excel Sheet (Provided digitally)**

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