



October 22, 2015

Mr. Van Truan
U.S. Army Corps of Engineers
Albuquerque District-Southern Colorado Regulatory Office
200 South Santa Fe Avenue, Suite 301
Pueblo, Colorado 81003

CORE Consultants, Inc. Project Number 15-001

Subject: Individual Permit Application for the Sterling Ranch Residential Development Project

Dear Mr. Truan:

On behalf of Morely-Bentley Investments, LLC (Applicant) CORE Consultants (CORE) respectfully submits the enclosed Application for Department of the Army Permit (ENG Form 4345) for your review for the proposed Sterling Ranch residential development project (Project) located in unincorporated El Paso County, Colorado on portions of Sections 25, 31, 33 in Township 12 South, Range 65 West and parcel numbers 5200000364, 5228000030, 5228000031, 5233000008, 5300000173, and 5233000009 (see **Appendix I: Sterling Ranch Site Location Map**). One main drainage traverses the Project site, namely Sand Creek and its two western tributaries. Project components include development of residential homes, installation of utility lines, development of two permanent residential access roads, development of three off-line stormwater detention ponds, and multiple channel improvements throughout the main channel of Sand Creek (see **Appendix II: Eng Form 4345** for permanent impact quantities and **Appendix III: Sterling Ranch Channel Improvement and Mitigation Plans**). Permanent impacts to jurisdictional waters would result from the development of permanent access roads and associated culverts and the development of residential units. Refer to **Appendix II: Eng Form 4345** for impact details and **Appendix IV: Sterling Ranch Wetland Impact Location Map** for areas of permanent impacts to jurisdictional waters.

Construction of utility lines and channel improvements would result in temporary impacts to jurisdictional waters and wetlands within the Project site. Additional temporary impacts would result from channel widening and grading in association with multiple mitigation areas



Mr. Van Truan
U.S. Army Corps of Engineers
Albuquerque District-Southern Colorado Regulatory Office
200 South Santa Fe Avenue, Suite 301
Pueblo, Colorado 81003

throughout the main channel of Sand Creek. **Appendix II: Eng Form 4345-Project Description Attachment** for temporary impact details.

A formal wetland delineation was conducted in February and March of 2015. The results of wetland delineations are provided in this submittal package. Refer to **Appendix V: Sterling Ranch Wetland Delineation Report**. An approved JD was issued on April 14, 2008 under USACE File No. SPA-2007-00551-SCO. The JD determined that the entirety of the main channel of Sand Creek and its main western tributary (western tributary) should be considered jurisdictional Waters of the U.S. (WOUS). As such, CORE considered impacts throughout the main channel of Sand Creek and its western tributary (see **Appendix II** for impact details). CORE is formally requesting the authority to proceed on development of the aforementioned Project components under the jurisdiction of an Individual Permit. As such, CORE submits the enclosed documents that follow in order to obtain a Section 404 Permit for impacts to jurisdictional wetlands and WOUS located on the Project.

- Sterling Ranch Site Location Map
- ENG Form 4345 and Project Description Attachment
- Sterling Ranch Channel Improvement and Mitigation Plans
- Sterling Ranch Wetland Impact Location Map
- Sterling Ranch Wetland Delineation Report
- Sterling Ranch Threatened and Endangered Species (TES) Review
- Sterling Ranch Conceptual Mitigation Plan
- Sterling Ranch Alternatives Analysis

CORE respectfully requests your review of the enclosed documents for IP application submittal. If you have any questions, concerns or require additional information, please feel free to contact Dan Maynard at 303.703.4444 x122 or at maynard@corecivil.com, or Chris Haas (project manager) at 303.703.4444 x121 or haas@corecivil.com.

Sincerely,
CORE Consultants, Inc.



Mr. Van Truan
U.S. Army Corps of Engineers
Albuquerque District-Southern Colorado Regulatory Office
200 South Santa Fe Avenue, Suite 301
Pueblo, Colorado 81003

A handwritten signature in black ink, appearing to read 'Daniel Maynard', written in a cursive style.

Daniel Maynard
Senior Ecologist/Project Coordinator

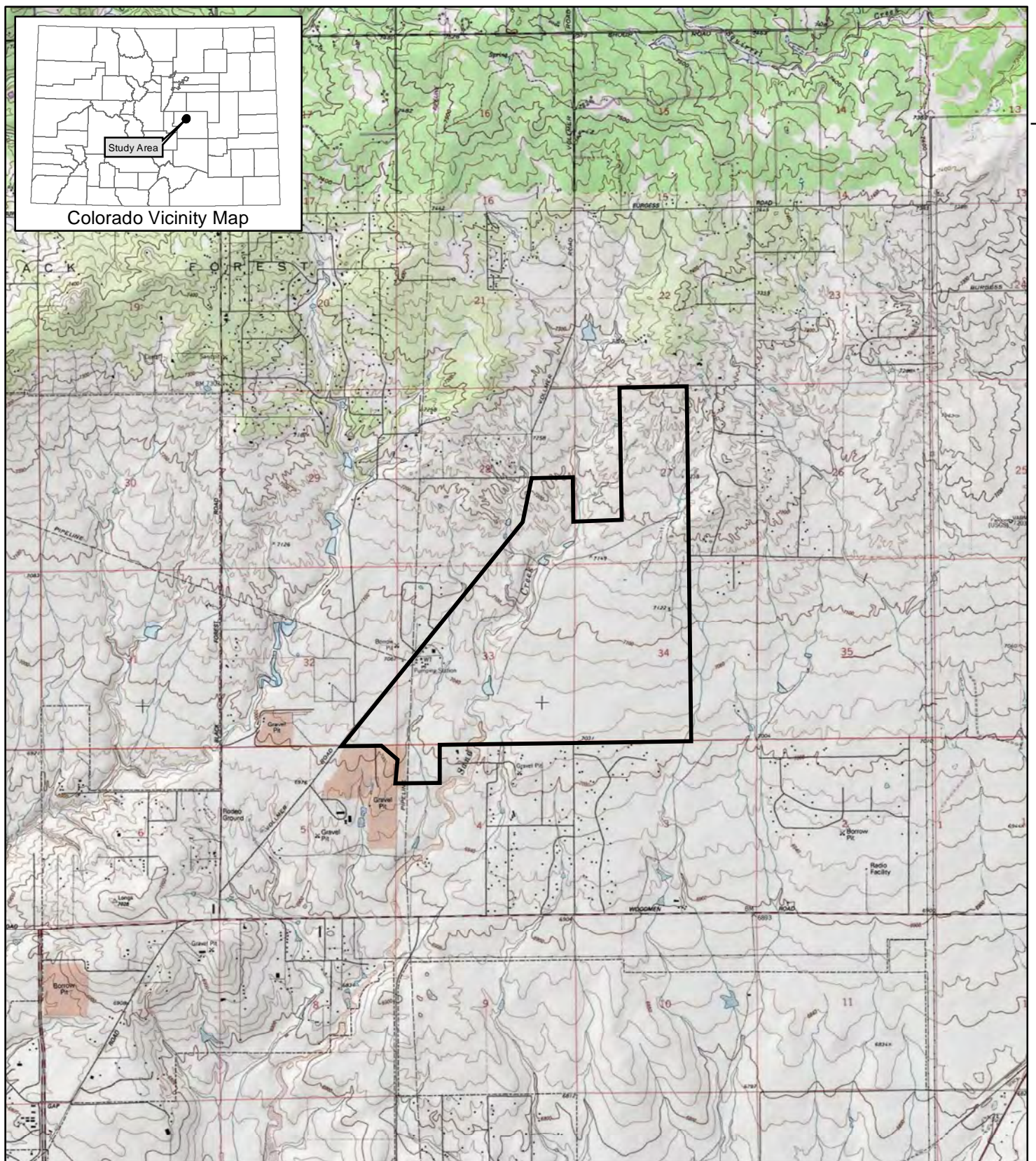
CC: Virgil Sanchez, M&S Civil Consultants; Jim Morley, Morley-Bentley Investments; and Chris Haas, CORE Consultants

Attachments:


- **Appendix I:** *Site Location Map*
- **Appendix II:** *ENG Form 4345 and Impact Details*
- **Appendix III:** *Sterling Ranch Channel and Improvement and Mitigation Exhibits*
- **Appendix IV:** *Sterling Ranch Wetland Impact Location Map*
- **Appendix V:** *Sterling Ranch Wetland Delineation Report*
- **Appendix VI:** *Sterling Ranch Threatened and Endangered Species (TES) Review*
- **Appendix VII:** *Sterling Ranch Due Diligence Cultural Resources Records Review*
- **Appendix VIII:** *Sterling Ranch Conceptual Mitigation Plan*
- **Appendix IX:** *Sterling Ranch Alternatives Analysis*



Appendix I:
Site Location Map



Sterling Ranch **Site Location Map** El Paso County, Colorado

 Study Area

0 2,000 4,000
 Feet
 1 inch = 4,000 feet

Date: 5/20/2015
 Project #: 15-001



CORE
 CONSULTANTS

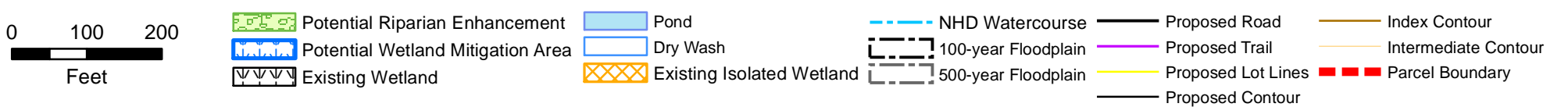
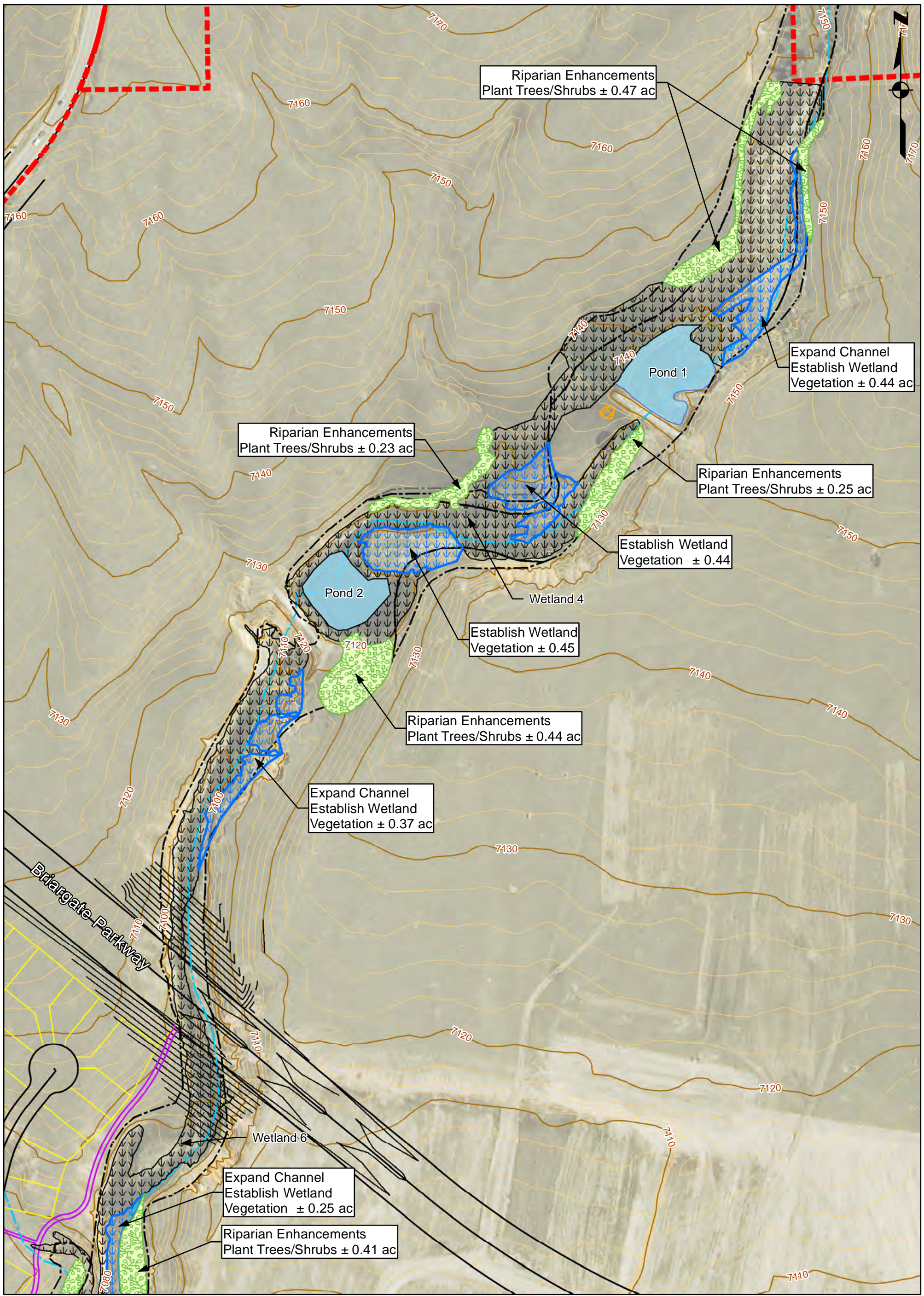
CIVIL ENGINEERING
 DEVELOPMENT CONSULTING
 LAND SURVEYING
 303.703.4444
 1950 W. Littleton Blvd., Ste. 109
 Littleton, CO 80120

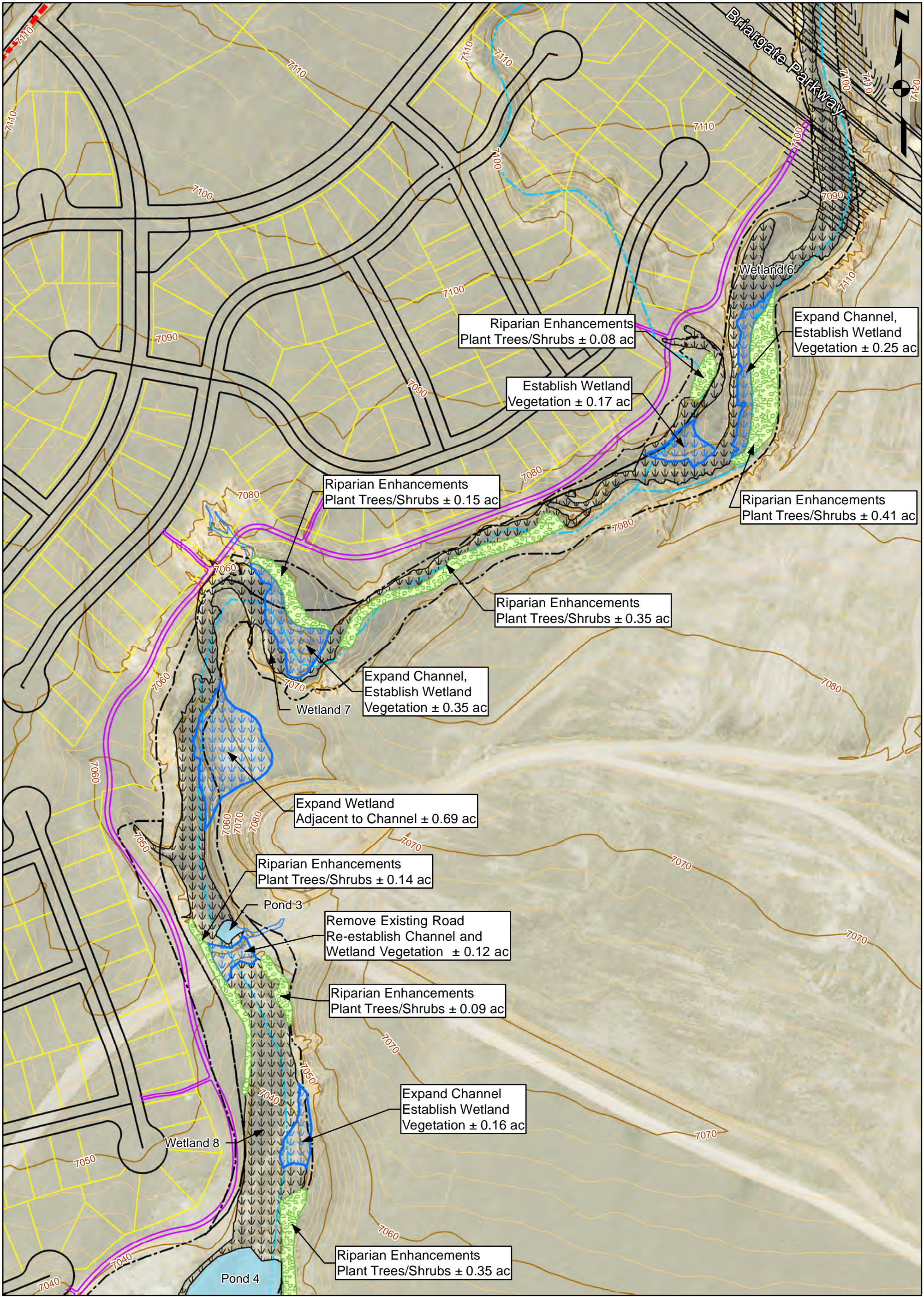


Appendix II:
ENG Form 4345 and Project Description Attachment



Appendix III:
Sterling Ranch Channel and Improvement and Mitigation Exhibits





0 100 200
Feet

Potential Riparian Enhancement
Potential Wetland Mitigation Area
Existing Wetland

Pond
Dry Wash
Existing Isolated Wetland

NHD Watercourse
100-year Floodplain
500-year Floodplain

Proposed Road
Proposed Trail
Proposed Lot Lines
Proposed Contour

Index Contour
Intermediate Contour
Parcel Boundary



CIVIL ENGINEERING
DEVELOPMENT CONSULTING
LAND SURVEYING
303.703.4444
1950 W. Littleton Blvd., Ste. 109
Littleton, CO 80120

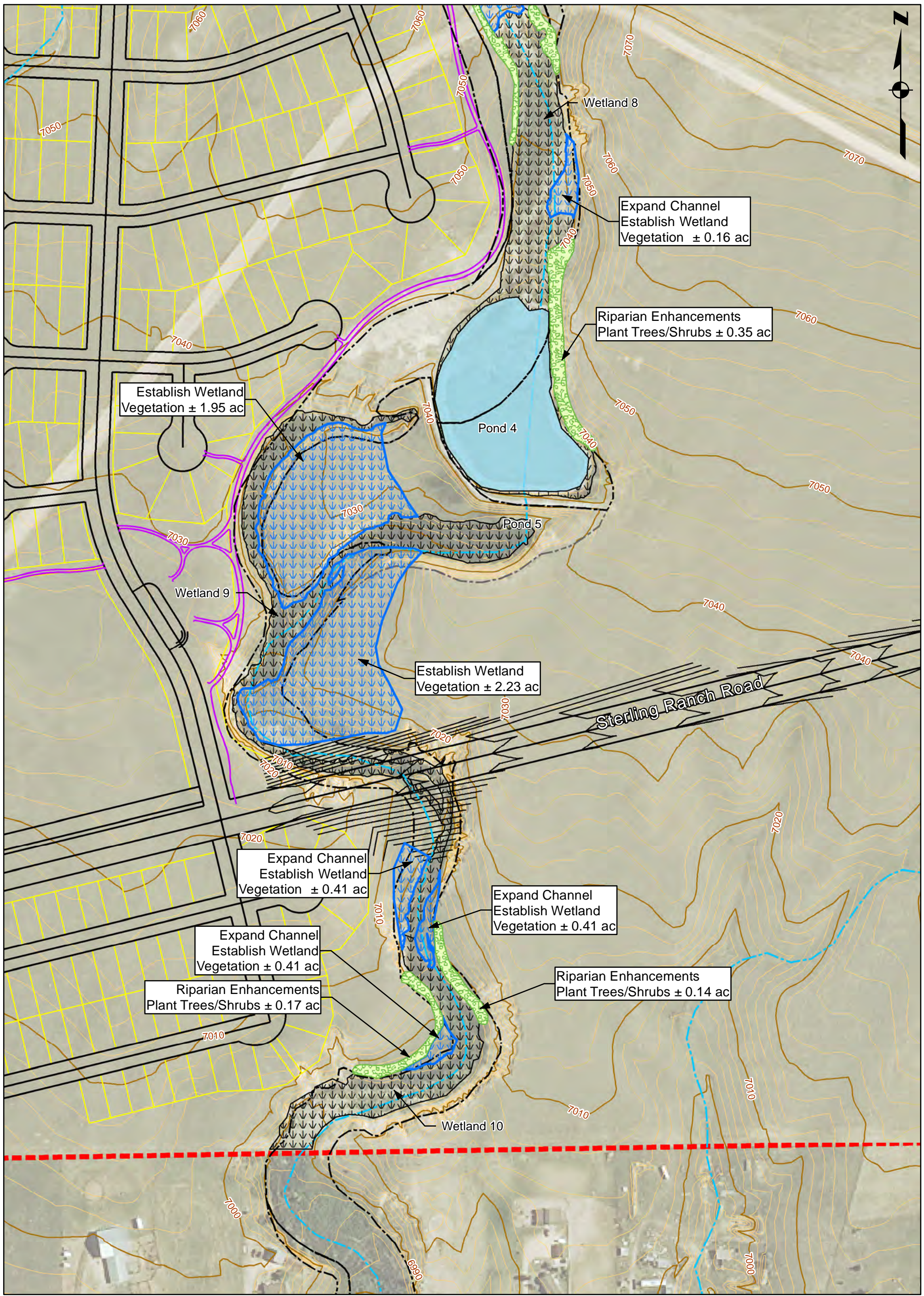
Sterling Ranch

Channel Improvements & Mitigation Plan

Sheet 2

El Paso County, Colorado

Date: 10/13/2015
Project #: 15-001



0 100 200
Feet

Potential Riparian Enhancement
Potential Wetland Mitigation Area
Existing Wetland

Pond
Dry Wash
Existing Isolated Wetland

NHD Watercourse
100-year Floodplain
500-year Floodplain

Proposed Road
Proposed Trail
Proposed Lot Lines
Proposed Contour
Index Contour
Intermediate Contour
Parcel Boundary



CIVIL ENGINEERING
DEVELOPMENT CONSULTING
LAND SURVEYING
303.703.4444
1950 W. Littleton Blvd., Ste. 109
Littleton, CO 80120

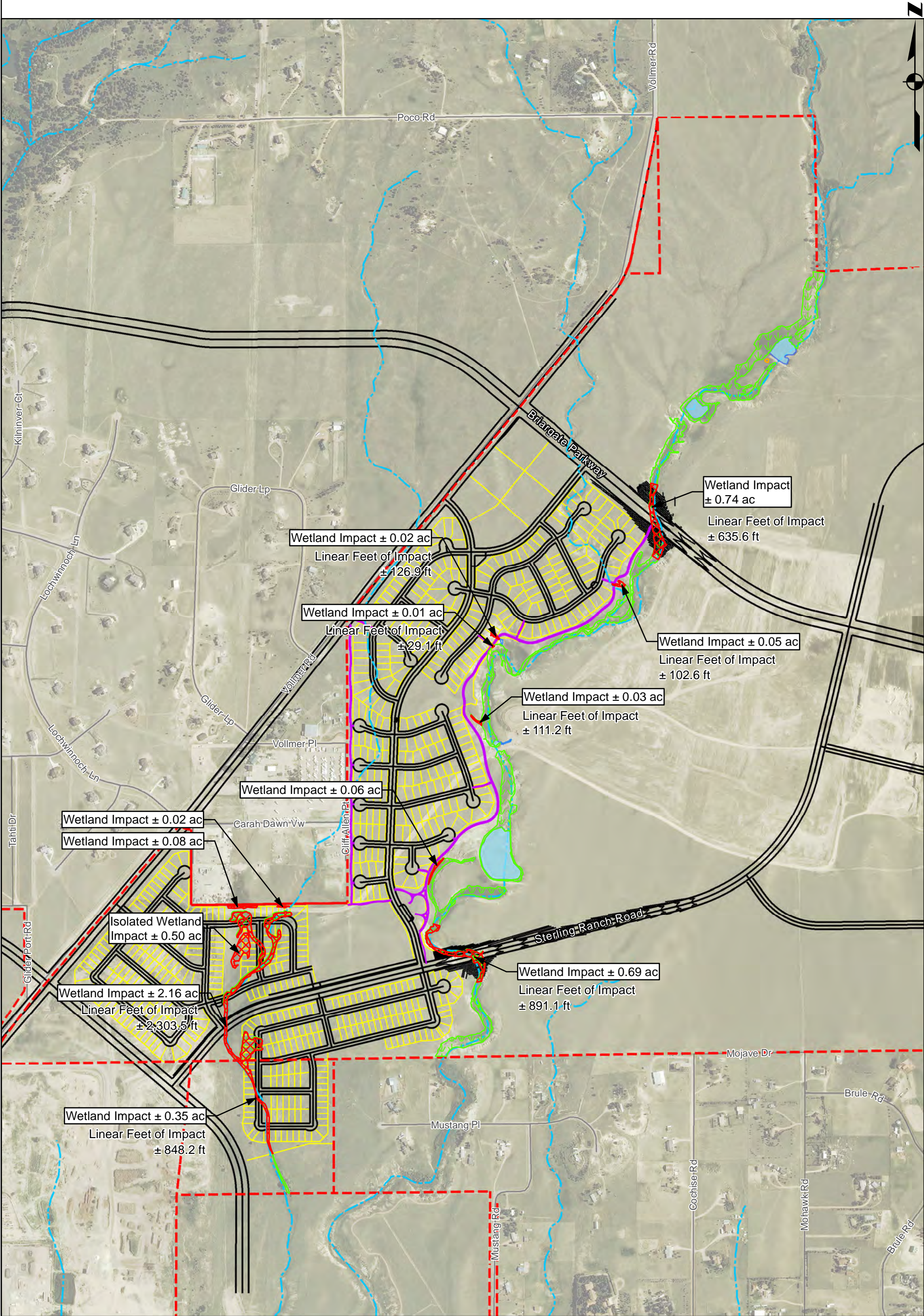
Sterling Ranch Channel Improvements & Mitigation Plan Sheet 3

El Paso County, Colorado

Date: 10/13/2015
Project #: 15-001



Appendix IV:
Sterling Ranch Wetland Impact Location Map



0 500 1,000
Feet

- | | | | |
|---------------------------|-----------------|--------------------|------------------|
| Permanent Impact | Pond | Proposed Road | Proposed Contour |
| Existing Wetland | Dry Wash | Proposed Trail | Parcel Boundary |
| Existing Isolated Wetland | NHD Watercourse | Proposed Lot Lines | |



CIVIL ENGINEERING
DEVELOPMENT CONSULTING
LAND SURVEYING
303.703.4444
1950 W. Littleton Blvd., Ste. 109
Littleton, CO 80120

Sterling Ranch

Wetland Impact Location Map

El Paso County, Colorado

Date: 10/13/2015
Project #: 15-001



Appendix V:
Sterling Ranch Wetland Delineation Report



**WETLAND DELINEATION
FOR THE
STERLING RANCH DEVELOPMENT PROJECT**

EL PASO COUNTY, CO
PROJECT No. 15-001

PREPARED FOR:

M&S CIVIL CONSULTANTS
102 E. PIKES PEAK AVE, SUITE 306
COLORADO SPRINGS, COLORADO 80901
PHONE: 719-491-0818
CONTACT: VIRGIL SANCHEZ

PREPARED BY:

CORE CONSULTANTS, INC.
1950 W. LITTLETON BOULEVARD, SUITE 109
LITTLETON, CO 80201
PHONE: 303-703-4444
CONTACT: DAN MAYNARD
CORE PROJECT NUMBER: 15-001

MAY 7, 2015



TABLE OF CONTENTS

EXECUTIVE SUMMARY	IV
1.0 INTRODUCTION	5
2.0 METHODS.....	5
2.1 Scope of Services	6
3.0 SITE DESCRIPTION	7
4.0 BACKGROUND DOCUMENTATION REVIEW	7
4.1 Aerial Photograph Review	8
4.2 National Wetlands Inventory Map Review.....	8
4.3 USGS Topographic Map Review	8
4.4 FEMA FIRM Floodplain Review.....	9
4.5 County Soil Survey Map Review	9
5.0 RESULTS	10
5.1 Watercourses including WOUS.....	10
5.2 Wetlands.....	11
5.3 Soils	12
5.4 Hydrology.....	13
5.5 Vegetation	14
6.0 CONCLUSIONS AND RECOMMENDATIONS	15
7.0 GENERAL COMMENTS	17
REFERENCES.....	18
COMMON WETLAND DELINEATION DEFINITIONS	19



LIST OF APPENDICES

APPENDIX I –

Sterling Ranch Site Location Map
Sterling Ranch Wetland Delineation Map
Sterling Ranch Soil Associations Map
National Wetland Inventory Map
FEMA Flood Insurance Rate Map

APPENDIX II –

Photographic Log

APPENDIX III –

Wetland Delineation Data Forms



EXECUTIVE SUMMARY

Core Consultants, Inc. (CORE) was retained by MS Civil Consultants, Inc. (Client) to perform a Wetland Delineation for the proposed Sterling Ranch Project (Project). The Project is located on 1,443.7 acres in unincorporated El Paso County (County), Colorado (Project Area). The Project includes 5,500 residential units, 56 acres of commercial development, 57 acres of school sites, 210 acres of parks, and two-acres of utilities. The County Board of Commissioners initially approved this project on November 10, 2008. The Project Area encompasses a portion of the perennial stream Sand Creek, its western tributaries, and adjacent uplands.

This Executive Summary is intended to be taken in context with the following report and is not designed to be used as a separate document. The following summarizes the results of the wetland delineation.

This document is an assessment of the potential regulatory status of wetlands, significant bodies of water, watercourses, and/or floodplains located within the Project Area, based on Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. The wetland delineation was performed in accordance with the US Army Corps of Engineers (USACE) Great Plains Regional Supplement (Version 2.0) (USACE 2010) and the 1987 USACE Wetland Delineation Manual (USACE 1987).

CORE conducted a site visit to assess the presence of wetlands, watercourses or other similar features within the Project Area, and, if identified, delineate their boundaries. Field work was conducted on February 4th and 5th and on March 10th, 11th, 16th, and 22nd, 2015. An earlier wetland delineation was conducted by Walsh Environmental Scientists and Engineers, LLC (Walsh) in 2009. A Jurisdictional Determination (JD) request was submitted to the USACE at that time. An approved JD was issued on April 14, 2008 under USACE File No. SPA-2007-00551-SCO. Observations of hydric soils, wetland vegetation, and hydrology aided in CORE's determination of the potential regulatory status of wetlands and Waters of the U.S. (WOUS) within the Project Area.

Based on the field reconnaissance and document review, it is the opinion of CORE that Sand Creek, the western tributary, in-line ponds, and abutting wetlands will maintain their status as jurisdictional waters of the U.S. (WOUS) due to a connection with downstream waters and the presence of a defined bed and bank system. Per Section 404 of the Clean Water Act, a USACE permit is required for the discharge of dredged or fill material into WOUS and mitigation is often necessary.



1.0 INTRODUCTION

Core Consultants, Inc. (CORE) was retained by MS Civil Consultants, Inc. (Client) to perform a wetland delineation for the proposed Sterling Ranch (Project). This report presents the results of the wetland delineation for the Project Area.

The Project is located on 1,443.7 acres in unincorporated El Paso County (County), Colorado. Refer to the *Site Location Map* in **Appendix I**. The Property is on the United States Geological Survey (USGS) Falcon Quadrangle on portions of Sections 27, 28, 32, 33, and 34 in Township 12 South, Range 65 West and the northwest portion of Section 4, Township 13 South, Range 65 West. The approximate coordinates of the project center are 39.964483 latitude and -104.664944 longitude (WGS 84 datum). Project Area elevation ranges from 7,337 feet in the northeast to 6,979 feet on the southern edge. The Project is in the Arkansas River drainage basin.

The proposed Project includes 5,500 residential units, 56 acres of commercial development, 57 acres of school sites, 210 acres of parks, two-acres of utilities, and associated infrastructure such as sewers and roads. The County Board of Commissioners initially approved this project on November 10, 2008. In April 2007, Walsh Environmental Scientists and Engineers, LLC (Walsh) completed a wetland delineation in support of the project (Walsh 2009). A Jurisdictional Determination (JD) request was submitted to the US Army Corps of Engineers (USACE) on June 8, 2007. An approved JD was issued April 14, 2008 under USACE File No. SPA-2007-00551-SCO. At that time, Sand Creek and one western tributary were determined to be under USACE jurisdiction.

2.0 METHODS

The purpose of the wetland delineation was to provide an update to the information gathered about the site in 2009 by Walsh; to determine if wetlands watercourses, or other bodies of water are still present within the Project Area in similar size and location; and wherever found, to delineate and survey the boundaries of these features and determine if they have the potential to fall under the jurisdiction of the USACE, based on Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.

Identification of watercourses was initially performed utilizing existing mapping of known watercourses, including the National Hydrography Dataset (NHD) and topographic maps. Additionally, a review of current and historical

documentation, which included available aerial photographs, US Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps, soil survey maps, and floodplain maps, was performed in order to evaluate overall water resource characteristics of the Project Area. Watercourses and other water features identified in the preliminary desktop analysis were inspected in the field to assess their jurisdictional potential.

Core visited the Project Area to delineate wetlands on February 4th and 5th, and on March 10th, 11th, 16th, and 22nd, 2015. This wetland delineation was performed in accordance with the Great Plains Regional Supplement (Version 2.0) (USACE 2010) to the 1987 USACE Wetland Delineation Manual (USACE 1987).

The determination of a wetland depends on three basic parameters: 1) presence of hydrophytic vegetation, 2) presence of hydric soils, and 3) wetland hydrology for a specific period of time. Vegetation, soils, and hydrology were analyzed for the determination of the presence of wetlands, watercourses, and similar features. A wetland boundary delineation was conducted along potential WOUS, including wetlands, within the Project Area. Boundaries were mapped using a Trimble Geo 7X global positioning system (GPS) unit with sub-foot accuracy. Photographs depicting conditions at the time of the field reconnaissance are provided in **Appendix II**. Results of the field assessment and descriptions of observed features are included below, and in **Appendix III: Wetland Delineation Data Forms**.

2.1 Scope of Services

The Scope of Services for the wetland delineation included the following components:

- Background documentation review of aerial photographs (US Department of Agriculture [USDA] 2010), NWI Maps (USFWS 2014), U.S. Geological Survey Topographic Maps (USGS 1994), FEMA Flood Insurance Rate Maps (FIRM) (FEMA 2005), and associated data.
- Field reconnaissance that evaluates specific water resource characteristics and features within the Project Area.
- Generation of a Property Features Map, a Soils Survey Map, an NWI Map, and a FEMA Flood Zone Map illustrating the location of the surveyed wetland boundaries and other notable features in relation to the proposed Project Area boundary.



- Preparation and submittal of this report summarizing the findings of the above-described tasks.

3.0 SITE DESCRIPTION

The Sterling Ranch Project Area comprises approximately 1,500 acres of undeveloped land immediately northeast of the intersection of Vollmer Road and Black Forest Road in El Paso County, Colorado. Within the property, the Project Area encompasses stretches of the perennial stream Sand Creek, its nearest western tributary, and adjacent undeveloped land. The center of the property has been disturbed by some sand and gravel mining activities. The Project Area is predominantly bordered by undeveloped land, with sparse residential development to the west, northeast and south.

Sterling Ranch is located in the Foothill Grasslands (Level IV Ecoregion) of the Southwestern Tablelands (Level III Ecoregion) of Colorado (Chapman et al. 2006). The Foothill Grasslands are characterized by dissected and irregular plains and some scattered pine woodlands. Soils in the region are largely sandy and clayey loams which formed from arkosic sedimentary rock, alluviums, and weathered sandstone and shales. Currently, the region is dominated by rangeland land use with scattered cropland and increasing urban development. Historically, vegetation consisted of big and little bluestem (*Andropogon gerardii*) and (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), fescues (*Festuca* spp.), prairie Junegrass (*Koeleria macrantha*), bluebunch wheatgrass (*Pseudoroegneria spicata*), needle-and-thread (*Hesperostipa comata*), slender wheatgrass (*Elymus trachycaulus*), western wheatgrass (*Pascopyrum smithii*), sideoats grama (*Bouteloua curtipendula*), and galleta grass (*Pleuraphis* sp.) (Chapman et al. 2006).

Hydrology of the main channel of Sand Creek has likely been affected by increasing development at the western boundary of the project and by an apparent quarry which exists in the south-central portion of the site. Additionally, manmade detention ponds have also altered the natural hydrology through this stretch of Sand Creek.

4.0 BACKGROUND DOCUMENTATION REVIEW

A review of Project Area background documentation was performed utilizing aerial photographs, NWI Maps, USGS Topographic Maps, FEMA FIRM Maps, and county Soil Survey Maps. A discussion of each evaluation process follows.

4.1 Aerial Photograph Review Results

Aerial photographs dated 1999, 2003, 2004, 2005, 2006, 2008, 2011, and 2013 were obtained from the U.S. Department of Agriculture Farm Service Agency (USDA 2010). Aerial photograph interpretation was conducted to identify potential wetlands or other landscape features within the property. Visible landscape features include a watercourse (Sand Creek), three manmade stock ponds within the main channel of Sand Creek, apparent grassland areas with scattered shrubs, and a large (approximately 120 ac.) quarry area in the south-central portion of the site (operations commenced between 2003 and 2004)(USDA 2010). Residential development to the west, south, and northeast of the property appears to have been initiated prior to 1999, and development has increased until present time. Sand Creek appears to have undergone limited changes during the time period reviewed, as construction of manmade ponds occurred prior to 1999.

4.2 National Wetlands Inventory Map Review

A review of NWI Maps (USFWS 2014) was conducted to determine the likely presence, location, size, and type of wetlands potentially located within the Project Area. The USFWS generates NWI Maps through aerial photograph interpretation. NWI maps may not show accurately the extent or existence of wetland systems in a specific area, nor do they always correctly identify wetlands, if present. Therefore, the maps were utilized for preliminary analysis only. Field reconnaissance was conducted to better determine the extent and type of wetlands located within the Project Area.

According to NWI data, three mapped wetlands are located within the property. Three potential PUBF (Palustrine Unconsolidated Bottom, Semi-permanently Flooded) freshwater ponds are located in-line with the main channel of Sand Creek and correspond to the three manmade stock ponds depicted in aerial imagery. Additional potential PUBF wetlands are located in the vicinity of the Project. Additional NWI mapped features in the vicinity of the Project Area include two potential R4SBA (Riverine, Intermittent Streambed, Temporarily Flooded) wetlands located east and west of the property. Field observations generally confirmed the presence of NWI wetlands in the Project Area; refer to the *National Wetland Inventory Map* in **Appendix I** for more details regarding NWI mapped wetlands.

4.3 USGS Topographic Map Review

The USGS 7.5-Minute Topographic map – Falcon NW Quadrangle (USGS 1965, Revised 1994) indicates that elevations within the Sterling Ranch property range between approximately 7,290 and 6,980 feet above mean sea level (AMSL). The map shows the property generally sloping from higher elevations in the northeast to

lower elevations in the southwest. Topographic maps do not depict any buildings or structures within the property with the exception of a pumping station on the central western boundary of the property. One watercourse, Sand Creek, is depicted within the property, with an unnamed western tributary located in the northwest quadrant of the site. Three manmade stock ponds are depicted within the main channel of Sand Creek. In general, the features indicated on the topographic maps correspond with field observations, except that further development than what is depicted in these maps has occurred in the vicinity of the Project Area.

4.4 FEMA FIRM Floodplain Review

A review of FEMA FIRM floodplain maps (FEMA 2005) was conducted to determine the existence, location, and extent of floodplains which may be located within the Project Area. The FIRM maps show floodplain areas along rivers and tributaries. The maps record the following data: 100-year (1% chance of annual flooding) and 500-year (0.2% annual chance of flooding) floodplains, the height of the base flood (Base Flood Elevations), and the risk premium zones developed from topographical information across a floodplain. The FEMA generates FIRM floodplain maps for flood insurance purposes.

FEMA Floodplain maps for El Paso County (FEMA 2005) were reviewed and indicate portions of the Project Area within and adjacent to the main channel of Sand Creek are located within a designated Zone A Special Flood Hazard Area, and are at risk of inundation by a 100-year flood with base flood elevations undetermined. The remainder of the property is identified as Zone X flood zones, which consist of areas of minimal flood risk "outside the 1-percent and 0.2-percent-annual-chance floodplains" (FEMA 2005). The presence of a Zone A floodplain indicates that certain limited floodplain constraints may be anticipated for this project. Coordination with the local floodplain administrator is recommended to assess the extent of potential floodplain constraints and potential permitting requirements. Refer to the *FEMA Flood Insurance Rate Map* in **Appendix I** for additional information regarding floodplains located within the Sterling Ranch property.

4.5 County Soil Survey Map Review

The El Paso County Soil Survey indicates the dominant soil associations comprising the Project Area are Columbine gravelly sandy loam (0 to 3 percent slopes), Pring coarse sandy loams (3 to 8 percent slopes), and Blakeland loamy sand (1 to 9 percent slopes). These soil series are classified as hydric soils by the Natural



Resources Conservation Service (NRCS) with the exception of Pring coarse sandy loams (NRCS 2015).

5.0 RESULTS

5.1 Watercourses including WOUS

The information gathered from desktop review and the field reconnaissance indicates that one perennial stream (Sand Creek) and one intermittent western tributary constitute the main watercourses on the site. See **Appendix I: Wetland Delineation Map**.

Sand Creek generally flows from north to south through the middle of the property. The creek is located within a deeply incised and sinuous channel that ranges in width from approximately 50 to 100 feet. In some areas the channel is canyon-like with nearly vertical walls that are 10 to 20 feet high. Many of the banks are denuded and perched high above the streambed. The flowing creek and associated wetlands are located in the bottom of the channel. In most sections, the creek is shallow and wide with two to three inches of slowly flowing water in a 10 to 20 foot-wide main channel. There is dense cover of herbaceous wetland plants and in some areas the creek is braided with sandy upland in-stream islands. In a few sections, the creek is narrow with short drops and micro pools. There are five ponded areas along Sand Creek; three manmade ponds with earthen dams (Ponds 1, 2, and 4), a ponded area created by a road crossing (Pond 3), and the small Pond 5 created by flow exiting Pond 4. Culverts preserve hydrologic connection throughout the site.

The western tributary to Sand Creek is a narrow, forked channel that meanders through uplands before joining the main channel to the south (off-site). Water (two inches) was present in most of the northern half of the channel at the time of the site visit, although water may only be seasonally present. A fence splits the western tributary roughly in half. The southern half of the western tributary is different than the northern half. The channel is narrower, drier, and there was no surface water. Bed and bank are relatively poorly defined, however there is hydrophytic vegetation along the channel bed.

Both Sand Creek and the main western tributary were thought to be jurisdictional WOUS following the on-site investigation. Hydrologic connection was maintained throughout the property, including through the three manmade ponds which have outflows built into the berms in the form of culverts. Sand Creek flows into Fountain Creek (a jurisdictional waterway) further downstream and south of the city of Colorado Springs.

5.2 Wetlands

Potentially jurisdictional wetlands were observed throughout both the main channel of Sand Creek and the western tributary. Soils, hydrologic indicators, and vegetation were examined on site to determine the presence or absence of wetlands.

Wetlands associated with Sand Creek are generally 20 to 80 feet wide and occupy 50 to 90 percent of the channel bottom (Wetlands 6-10 on the *Wetland Delineation Map*, **Appendix I**). Wetland 4 in the vicinity of Pond 1 is atypical in that the wetland is split into two areas. The western wetlands are in a broad, low area and appear to be remnant wetlands associated with the historic creek location. Some water flows over the southwest edge of Pond 1 and contributes to hydrology in this area. Along the east side, two ditches seem to function as the low flow channel for the Creek. A shallow ditch appears to have been cut to direct water into Pond 1, water flows beneath the dam via a culvert, then south for approximately 200 feet via a wide ditch or modified natural channel, and then rejoins the main channel of Sand Creek. There is one small isolated wetland (Wetland 5) located south of the dam for Pond 1.

Wetlands associated with the northern half of the western tributary are generally 15 to 30 feet wide and occupy a broad swale (Wetland 1). The northern ends of the western tributary (Wetlands 11 and 12) are separated from the main channels by a dirt access road (see hydrology section for additional details). Wetland 3 is an isolated wetland located west of Wetland 1. Along the south half of the western tributary, Wetland 2 is narrower and drier. A small copse of trees marks the southern boundary of the property along the western tributary, with a dense thicket of shrubs lining the banks for several hundred feet along the southern (downstream) end.

Table 1 below describes the locations and types of wetlands on the Project that may be impacted by the construction of roadways.

Table 1. *Wetland Location Points**

Wetland Number	Location	LATITUDE	LONGITUDE	Wetland Type
WL 1	Western Tributary	38.95605° N	-104.68106° W	PEMC (Palustrine Emergent)
WL 2	Western Tributary	38.95469° N	-104.68043° W	PSSC (Palustrine Scrub-Shrub)

WL 3 (Isolated)	Near Western Tributary	38.95755° N	-104.68055° W	PEMC (Palustrine Emergent)
WL 4	Sand Creek (North)	38.97032° N	-104.66583° W	PEMCh (Palustrine Emergent)
WL 5 (Isolated)	Sand Creek (North)	38.97102° N	-104.66483° W	PEMC (Palustrine Emergent)
WL 6	Sand Creek (Middle)	38.96711° N	-104.66814° W	R4SBC (Riverine Intermittent)
WL 7	Sand Creek (Middle)	38.96273° N	-104.67327° W	R4SBC (Riverine Intermittent)
WL 8	Sand Creek (South)	38.96108° N	-104.67268° W	R4SBC (Riverine Intermittent)
WL 9	Sand Creek (South)	38.95743° N	-104.67466° W	R4SBC (Riverine Intermittent)
WL 10	Sand Creek (South)	38.95586° N	-104.67339° W	R4SBC (Riverine Intermittent)
WL 11	Western Tributary	38.95849° N	-104.68049° W	PEMC (Palustrine Emergent)
WL 12	Western Tributary	38.95849° N	-104.67928° W	PEMC (Palustrine Emergent)

*For the location of WL 42 coordinates were taken at the point where wetland vegetation transitioned from emergent (WL 1) to scrub-shrub

5.3 Soils

The following section discusses the Natural Resources Conservation Service (NRCS) soils series that were mapped in the Project Area (USDA, 2015). Refer to **Appendix I: Sterling Ranch Soil Associations Map**. Dominant soil series included:

- Columbine gravelly sandy loam, 0 to 3 percent slopes, covers much of the southeast upland areas and is the most abundant soil in the Project Area (approximately 47 percent [~47%] of the Project Area).
- Pring coarse sandy loam, 3 to 8 percent slopes, is mapped along Sand Creek and is also common (~44%).
- Blakeland loamy sand, 1 to 9 percent slopes, is mapped west of the tributary and east of Sand Creek (~9%).

- Blakeland-Fluvaquentic Haplaquolls are mapped along much of the Western Tributary (~1%).

All of the mapped soil series are on the NRCS Hydric Soils List (NRCS, 2014). Each of the soil series are described as having dark A-horizons with dry soil chromas of 2 or 3.

Soil samples were taken at each of the nine sampling points (refer to **Appendix I: Wetland Delineation Map** and **Appendix III: Wetland Delineation Data Forms**). All soil pits were dug near the suspected wetland/non-wetland boundary as indicated by the presence of hydrophytes. Soils observed at sampling points were generally consistent with the mapped types, including the presence of a dark A-horizon in upland areas. Refer to the wetland delineation data sheets in **Appendix III** for complete soil profiles.

5.4 Hydrology

Flows from Sand Creek and its western tributary are the primary hydrologic sources for wetlands in the Project Area. Based on the extent of wetland vegetation beyond areas with surface water, and the presence of saturated sand at a depth of two-inches at SP-8, Sand Creek likely has significant sub-surface flows. Runoff from naturally occurring events (i.e. snowmelt and precipitation) flows into these areas. Artificial sources of hydrology were not observed on the Project, although hydrology has been altered by construction. Hydrologic indicators observed at wetlands on the site included surface water, high water table, saturation, water stained leaves, hydrogen sulfide odor, oxidized rhizospheres on living roots, and presence of reduced iron (see **Appendix III: Wetland Delineation Data Forms**).

The hydrology of Sand Creek has been altered by the construction of earthen dams to create three stock ponds (Ponds 1, 2, and 4). These three ponds are identified by the NWI as Palustrine Unconsolidated Bottom (PUBF). The Pond 4 outfall culvert drains into another small (approximately six-foot diameter) open water area. Finally, a fifth ponded area, Pond 3, appears to have been created by construction of a road. Standpipes and culverts are used to drain the ponds. They also appear to limit the volume of water that flows through Sand Creek, so in most areas the active channel is almost flat with slowly flowing water.

The hydrology of the western tributary to Sand Creek appears to have been altered by construction of an industrial facility to the north (upstream). Based on aerial photographs, it appears this facility was constructed on top of wet swales that historically drained into the western tributary, thus likely reducing flow. Two



channels flow onto the Project Area from this facility (Wetlands 11 and 12), immediately flow under an access road via culverts (into Wetland 1), and then converge within the Project Area approximately 400 feet south of the property boundary. However, the culvert for the eastern channel (downstream and south of Wetland 12) now appears to be clogged, water is ponding along the north side of the road, and does not appear to flow into Wetland 2. Thus, the portion of the western tributary (Wetland 1) near the road appears to be drying up, but there appears to be well-developed wetland hydrology in the rest of Wetland 1 as indicated by surface water and surface saturation. Wetland 3 is an isolated wetland located in a low area west of Wetland 1. The southern/downstream portion (Wetland 2) of the western tributary is narrower and drier at the surface than the northern portion. Surface conditions might be drier because there is proportionally more subsurface flows due to different soils or less soil compaction by cattle.

5.5 Vegetation

Vegetation in the upland areas consists of short- and mid-grass prairie dominated by blue grama (*Bouteloua gracilis*). Other species include fringed sage (*Artemisia frigida*), mountain muhly (*Muhlenbergia montana*), western wheatgrass, purple three-awn (*Aristida purpurea*) and prairie Junegrass. Cattle were present in most of the project area in February, but were gone in March.

Wetlands along the Sand Creek channel are dominated by herbaceous species. Areas along the stream were heavily grazed in February, but the cattle had been removed prior to the March site visits and new growth was visible. Plants observed in wetlands on the site ranged in wetland indicator status from OBL (obligate wetland plants) to UPL (upland plants), though plants rated OBL and FACW (facultative wetland plants) were dominant. The wettest areas are dominated by Nebraska and beaked sedge (*Carex nebrascensis* and *C. utriculata*), along with Rocky mountain rush (*Juncus saximontanus*). Other dominant hydrophytes are arctic rush (*Juncus arcticus*) and redtop (*Agrostis gigantea*). Other common wetland species include panicled bulrush (*Scirpus microcarpus*), saltgrass (*Distichlis spicata*), and switchgrass (*Panicum virgatum*). Slender wheatgrass (*Elymus trachycaulus*) was common on slopes just above the wetlands.

Along Sand Creek, there are some patches of sandbar willow (*Salix exigua*) with overall cover of roughly ten percent. Wetland vegetation associated with the ponds is similar to that found along the main channel of Sand Creek. The exception to this is Pond #2 which also has areas of dense emergent wetland vegetation dominated by, broadleaf cattail (*Typha latifolia*) and hardstem bulrush (*Schoenoplectus acutus*).



Wetlands along the northern portion of the western tributary (Wetland 1) are dominated by herbaceous species. The wettest areas are dominated by sedges. In drier wetland areas, rushes and grasses are dominant. The southern half of the western tributary (Wetland 2) is a relatively dry wetland that does not appear to have been grazed in the past year. There are few sedges and more common species include redtop, arctic rush, and Canada wildrye (*Elymus canadensis*). At the southern end of the western tributary there is a small scrub-shrub wetland where snowberry (*Symphoricarpos occidentalis*), peachleaf willow (*Salix amygdaloides*), and plains and narrowleaf cottonwood (*Populus deltoides*, *P. angustifolia*) are associated with the channel.

6.0 CONCLUSIONS AND RECOMMENDATIONS

A wetland delineation was completed by Walsh Environmental Scientists and Engineers, LLC (Walsh) and included an assessment of the previous project design. A Jurisdictional Determination (JD) request was submitted to the USACE at that time. An approved JD was issued April 14, 2008 under USACE File No. SPA-2007-00551-SCO. At that time, Sand Creek and one western tributary were determined to be under USACE jurisdiction. The same conclusions were reached by CORE in 2015.

In summary, one watercourse, Sand Creek, and its western tributaries are located within the Sterling Ranch property. Sand Creek is a perennial stream with a defined bed and bank and appears to flow into Fountain Creek downstream. The western tributary to Sand Creek also has a somewhat nebulous, though mostly defined bed and bank. A site visit with the USACE on February 19, 2015 provided clarification on the status of the western tributary, with USACE liaison Christopher Grosso generally agreeing with Core's assessment of the site. As such, both Sand Creek and its primary western tributary are expected to still be considered jurisdictional WOUS by the USACE. Accordingly, impacts to these channels or associated in-stream or adjacent wetlands would require permitting through the USACE under Section 404 of the Clean Water Act.

The USACE typically has jurisdiction over navigable or traditionally navigable waters, relatively permanent waters, and wetlands that abut such waters, and determines jurisdiction over other waters based predominantly on their significant nexus to navigable or traditionally navigable waters (i.e. WOUS). Impacts to WOUS should be avoided and minimized to the extent possible. A permit under Section 404 of



the Clean Water Act is required for the discharge of dredged or fill material into WOUS and mitigation is typically required.

While the USACE regulates only those activities resulting in a discharge of dredge or fill material into waters of the U.S., the Colorado Department of Public Health and Environment (CDPHE) has the authority to regulate activities resulting in a discharge of pollutants into state waters. The CDPHE conducts Section 401 certification reviews of projects in Colorado requiring a CWA Section 404 permit from the USACE. The purpose of these certification reviews is to determine whether a proposed discharge will comply with Colorado water quality standards.

In Colorado, joint Section 404 and 401 permitting is utilized through the Nationwide Permit (NWP) program, as NWPs are certified by statute. A NWP is a general permit intended to apply throughout the United States and is designed to eliminate the need to issue an individual permit for specific small-scale activities which minimally affect wetlands. NWPs allow certain activities to take place in WOUS which may result in minimal impacts to WOUS, including wetlands.

Should impacts to WOUS require the loss of greater than 0.5 acre and/or 300 linear feet of stream bed, a residential development project would be permitted under an Individual Permit (IP). A pre-construction notification (PCN) is not required for activities permitted under an IP. Rather, IPs require a 30-day public notice period, and a separate 401 Water Quality Certification process will be required through CDPHE.

The Project Area encompasses portions of the perennial stream Sand Creek, a minor tributary to the west, and adjacent undeveloped upland. It is anticipated that there will be unavoidable impacts to jurisdictional waters associated with the main channel of Sand Creek and its main western tributary. Core understands that the project will likely be constructed in phases. Impacts for each phase would be permitted under one of the two aforementioned Section 404/401 permitting processes depending on the type of work and impacts to WOUS. The first stage of the project is road construction. The resulting impacts to WOUS are expected to be permitted under Nationwide Permit 14 for Linear Transportation Crossings. As the project moves forward, additional USACE permitting will be required.



7.0 GENERAL COMMENTS

This report was intended to provide general information regarding the Project Area, using readily-available published information, agency databases, and field reconnaissance. A wetland delineation such as the one performed for this Project Area, is of limited scope, is noninvasive and cannot eliminate the potential that environmental concerns are present at the Project Area beyond what is identified by the limited scope of this report.

This report was performed in accordance with generally accepted practices of this profession undertaken in similar studies at the same time and in the same geographical area. This report has been prepared for the exclusive use and reliance of our Client for the specific application as discussed.

Should you have any questions regarding this or any other matter, please feel free to contact our office at (303) 703-4444.

Sincerely,
CORE Consultants

A handwritten signature in black ink, appearing to read 'Daniel Maynard', written in a cursive style.

Daniel Maynard,
Project Coordinator/Ecologist

REFERENCES

Chapman, S.S., Griffith, G.E., Omernik, J.M., Price, A.B., Freeouf, J., and Schrupp, D.L., 2006, Ecoregions of Colorado. Reston, Virginia, U.S. Geological Survey (map scale 1:1,200,000). ftp://ftp.epa.gov/wed/ecoregions/co/co_front.pdf

Federal Emergency Management Agency. 2005. El Paso County, Colorado
FEMA Flood Insurance Rate Maps. Map 08041C0535F.

Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. The National Wetland Plant List: 2014 Update of Wetland Ratings. *Phytoneuron* 2014-41: 1-42.

Natural Resources Conservation Service (NRCS). 2014. List of Hydric Soils. Available at: <http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/>

U.S. Army Corps of Engineers (USACE). 1987. Wetlands Delineation Manual.

USACE. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Regional Supplement (Version 2).

U.S. Department of Agriculture. 2010. Farm Service Agency – National Agricultural Imagery Program.

U.S. Fish and Wildlife Service. 2015. National Wetland Inventory.
Available at: <http://www.fws.gov/wetlands/>.

U.S. Geological Survey 7.5-Minute Topographic Maps. 1994. Falcon NW Quadrangle – Colorado.

Walsh Environmental Scientists and Engineers, LLC. 2009. Wetland Impact Report for the Sterling Ranch Property in El Paso County. Prepared for Morely-Bentley Investments, Inc. April 13, 2009.



COMMON WETLAND DELINEATION DEFINITIONS

Atypical wetland: This term refers to areas in which one or more parameters (vegetation, soil and/or hydrology) have been sufficiently altered by human activities or natural events to preclude the presence of wetland indicators of the parameter.

Emergent Wetland: Vegetation classification of a wetland system where the dominant vegetation consists of rooted herbaceous plant species that have parts extending above a water surface.

100-year flood: A flood with a magnitude that has a 1% chance of occurring or being exceeded in any given year.

Floodplain: The area of land adjoining a river or stream that will be inundated by a 100-year flood.

Floodway: The channel of a river or stream and the portions of the floodplain adjoining the channel that is reasonably required to carry and discharge a 100-year flood.

Inland lake or stream: "...any natural or artificial lake, pond or impoundment which has a surface area of 5 acres or greater; a river, stream or creek which may or may not be serving as a drain; any body of water which has definite banks, a bed and visible evidence of a continued flow or continued occurrence of water..." as defined by Part 301, Inland Lakes and Streams, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

Hydric soil: Soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part (1991 National Technical Committee on Hydric Soils definition).

Hydrophytes: Plant species that grows in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content; plants typically found in wet habitats.

Scrub-Shrub Wetland: Vegetation classification of a wetland system where the dominant vegetation consists of woody plants less than 3 inches in diameter but greater than 3 feet in height.

Typical situation: That which normally, usually, or commonly occurs.

Vernal Pool: Shallow, intermittently-flooded forested wetland, generally dry for most of the summer and fall.

Wooded (Forested) Wetland: Vegetation classification of a wetland system where the dominant vegetation consists of woody plants 3 inches in diameter or greater regardless of height.

Wetland: "...land characterized by the presence of water at a frequency and duration sufficient to support and that under normal circumstances does support wetland vegetation or aquatic life and is commonly referred to as a bog, swamp, or marsh..." as defined by Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451.

Wetland hydrology: Hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season.

Wetland Indicator Status:

OBL: Obligate wetland plant that occurs almost always, 99% of the time, in wetlands under natural conditions, but which rarely occur in non-wetlands.

FACW: Facultative wetland plant that occurs usually, 67% to 99% of the time, in wetlands, but also occurs 1% to 33% of the time in non-wetlands.

FAC: Facultative plant that occurs in both wetlands and non-wetlands 33% to 67% of the time.

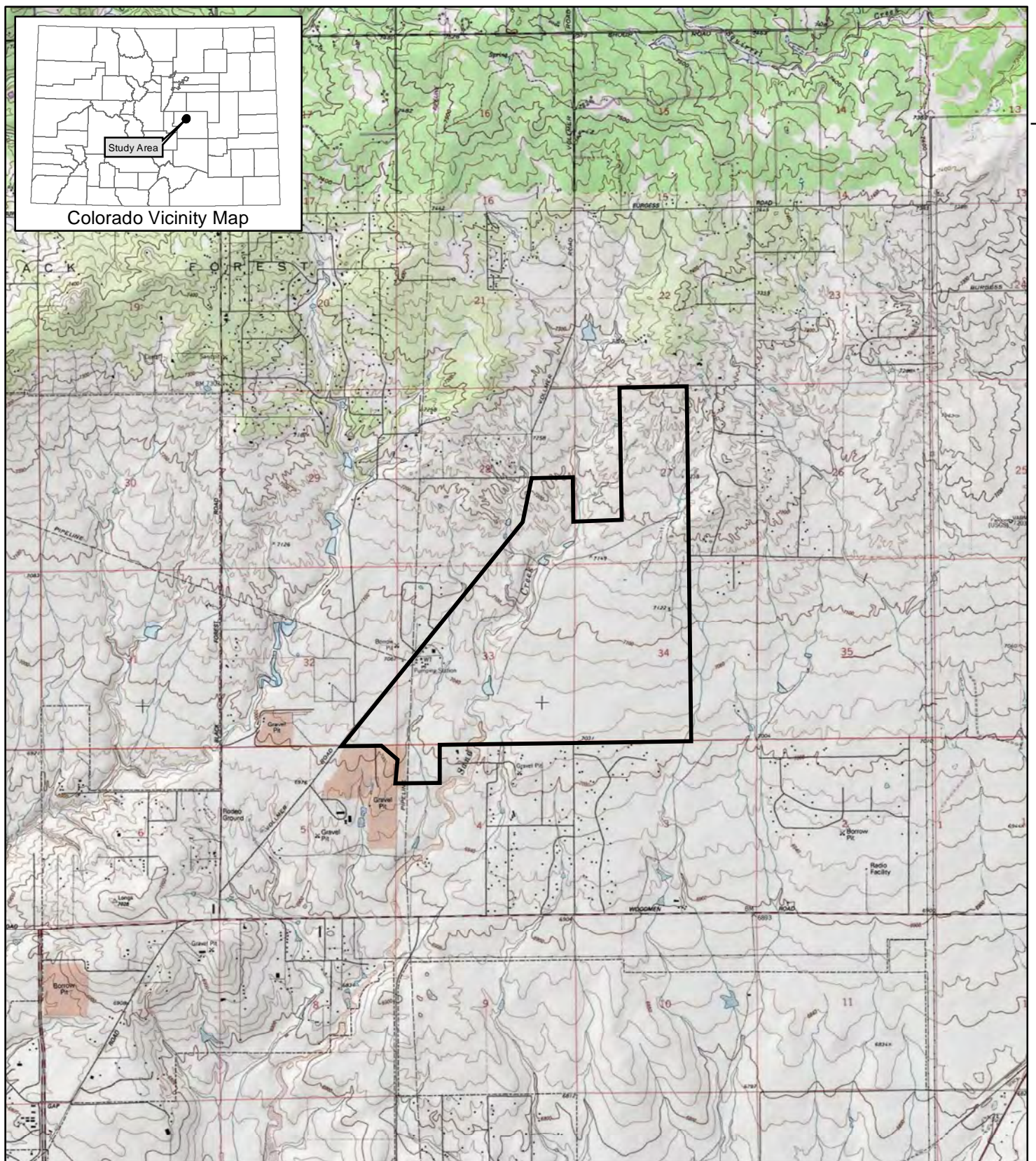
FACU: Plant that occurs sometimes, 1% to 33% of the time, in wetlands but occurs more often, 67% to 99% of the time, in non-wetlands.

UPL: Plant that occurs almost always, 99% of the time, in uplands under natural conditions, but which rarely occurs in wetlands.




APPENDIX I

Sterling Ranch Site Location Map
Sterling Ranch Wetland Delineation Map
Sterling Ranch Soil Series Map
National Wetland Inventory Map
FEMA Flood Insurance Rate Map



Sterling Ranch **Site Location Map** El Paso County, Colorado

 Study Area

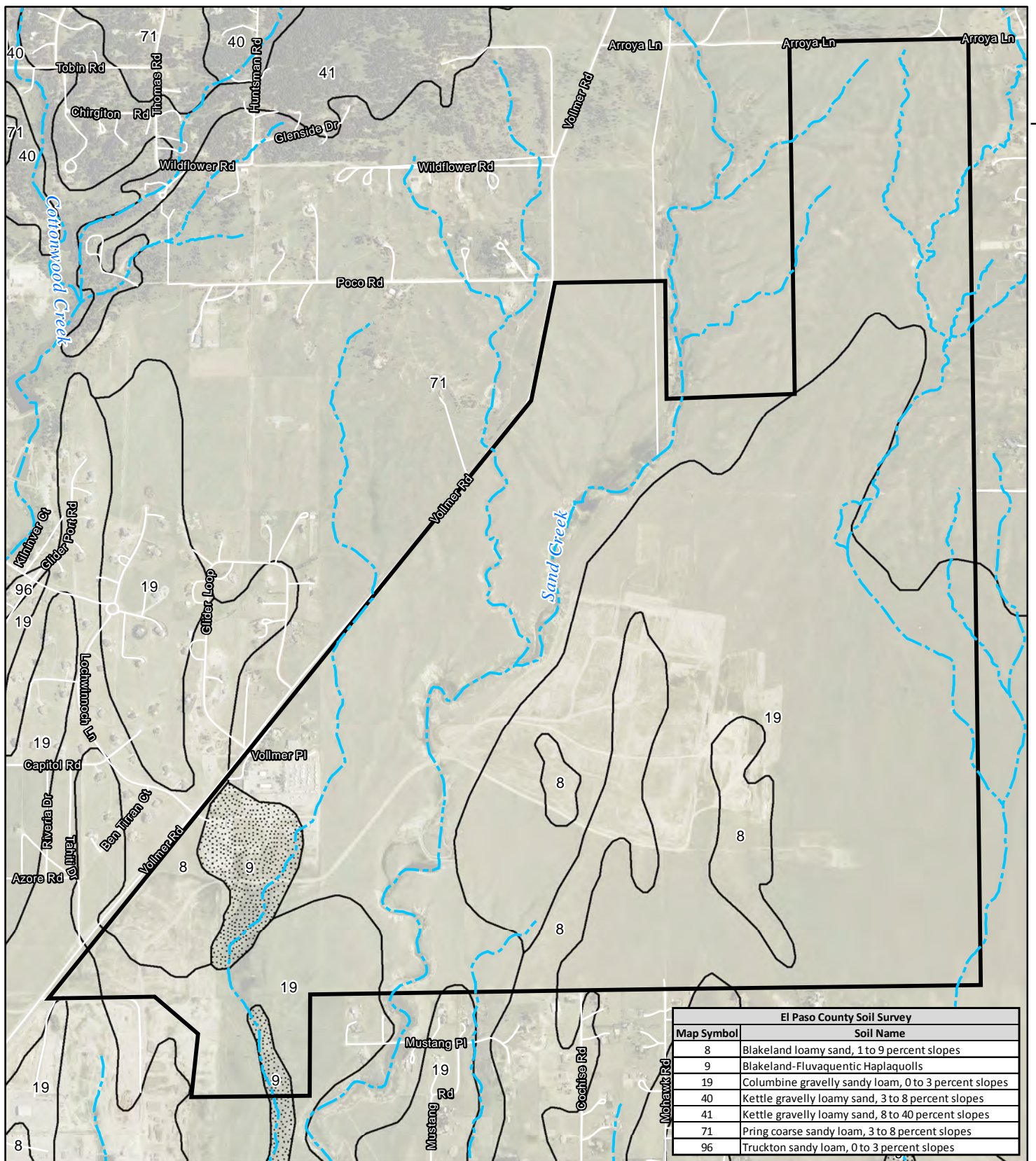
0 2,000 4,000
 Feet
 1 inch = 4,000 feet

Date: 5/20/2015
 Project #: 15-001



CORE
 CONSULTANTS

CIVIL ENGINEERING
 DEVELOPMENT CONSULTING
 LAND SURVEYING
 303.703.4444
 1950 W. Littleton Blvd., Ste. 109
 Littleton, CO 80120



Sterling Ranch County Soil Survey Map

El Paso County, Colorado

- Study Area
- NHD Watercourse
- Hydric Soil

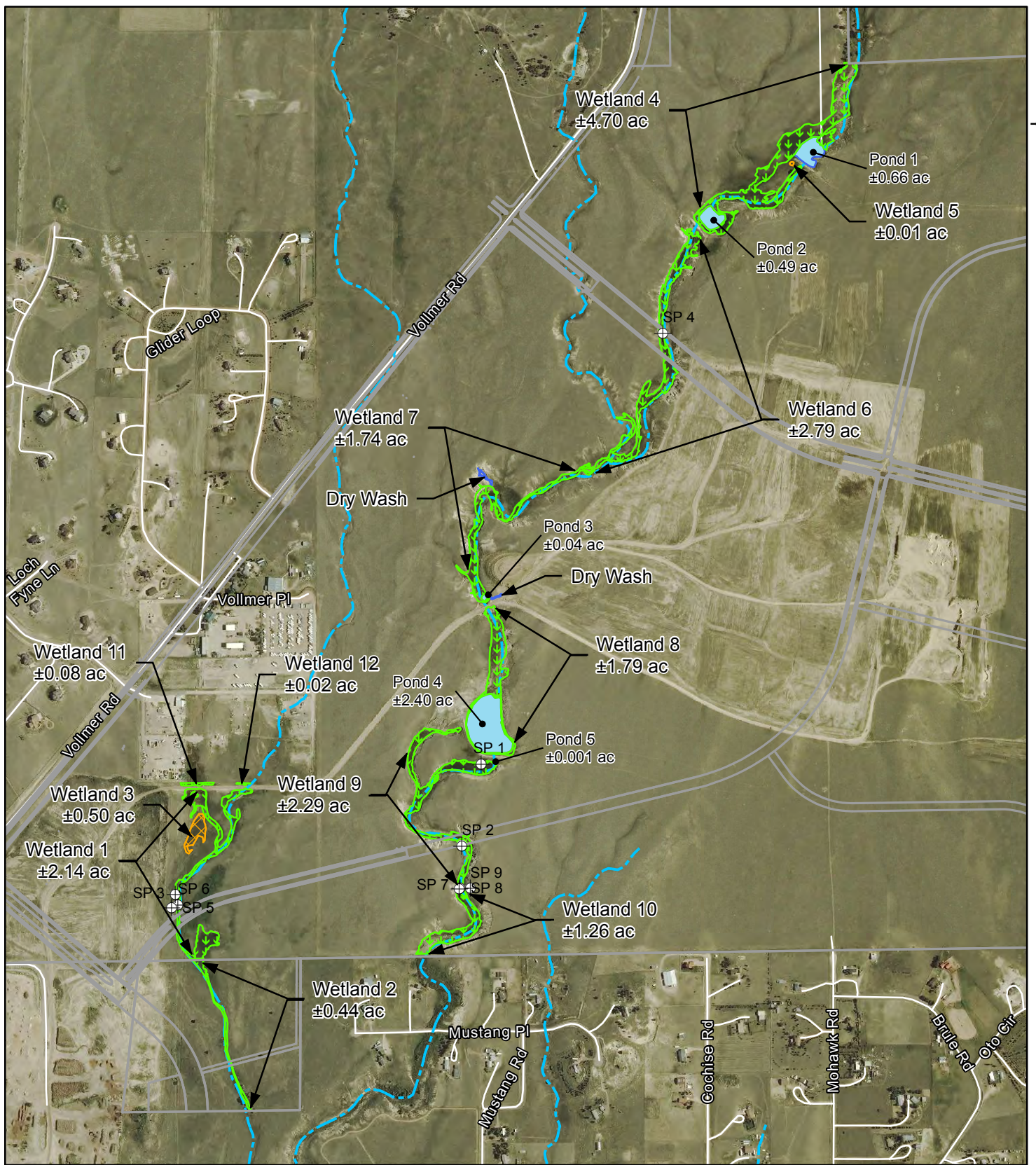
0 1,000 2,000
Feet
1 inch = 1,500 feet

Date: 5/20/2015
Project #: 15-001



CORE
CONSULTANTS

CIVIL ENGINEERING
DEVELOPMENT CONSULTING
LAND SURVEYING
303.703.4444
1950 W. Littleton Blvd., Ste. 109
Littleton, CO 80120



Sterling Ranch

Wetland Delineation Map

El Paso County, Colorado

0 500 1,000
Feet
1 inch = 1,000 feet

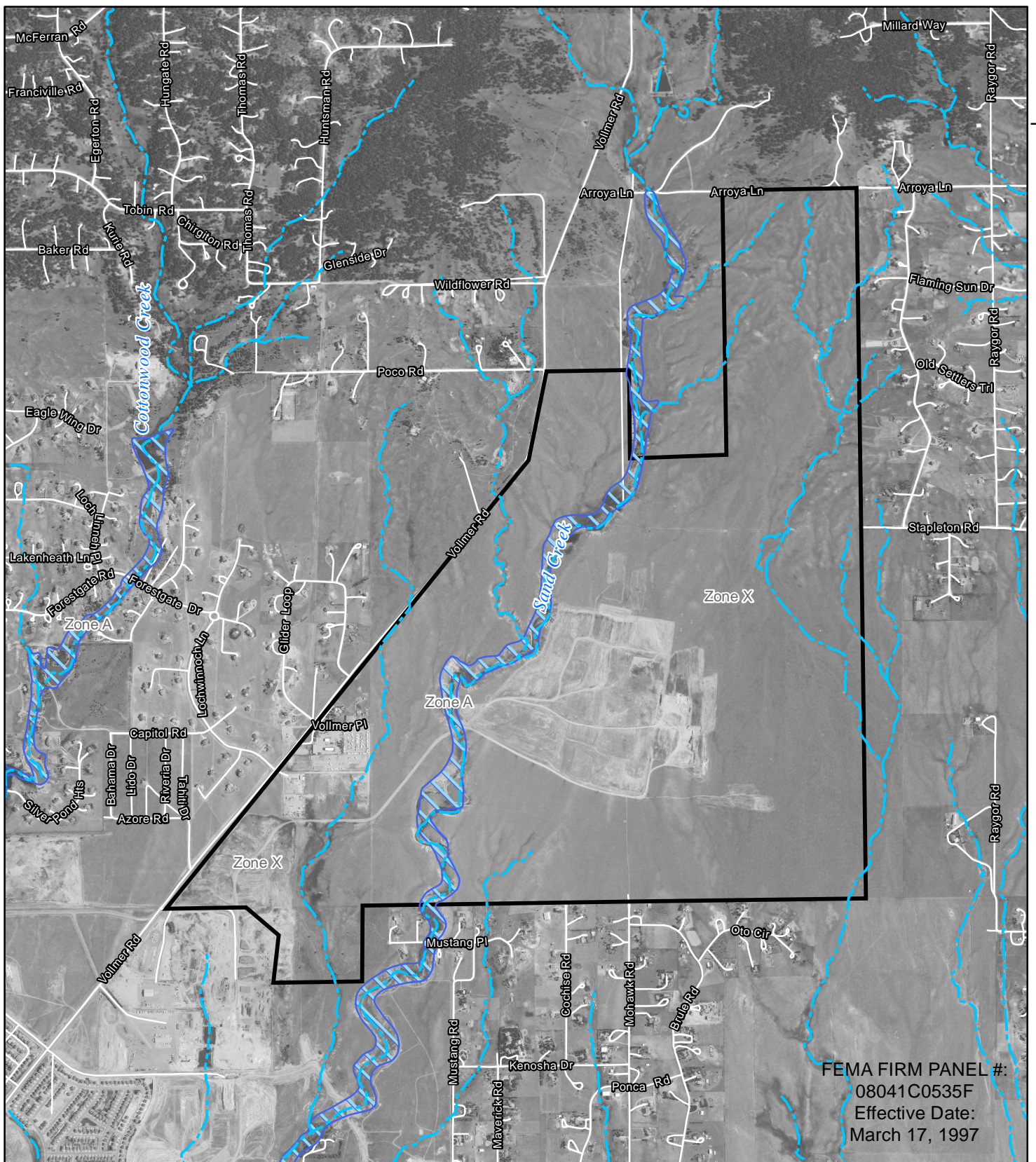
Date: 4/28/2015
Project #: 15-001



CORE
CONSULTANTS

CIVIL ENGINEERING
DEVELOPMENT CONSULTING
LAND SURVEYING
303.703.4444
1950 W. Littleton Blvd., Ste. 109
Littleton, CO 80120

- Isolated Wetland
- Wetland
- Open Water
- Dry Wash
- Sample Point
- NHD Watercourse
- Project Boundary



FEMA FIRM PANEL #:
08041C0535F
Effective Date:
March 17, 1997

Sterling Ranch **FEMA Flood Insurance Rate Map** El Paso County, Colorado

- Study Area
- NHD Watercourse
- Zone A: 100-year floodplain

0 1,000 2,000
Feet
1 inch = 2,000 feet

Date: 5/19/2015
Project #: 15-001



CORE
CONSULTANTS

CIVIL ENGINEERING
DEVELOPMENT CONSULTING
LAND SURVEYING
303.703.4444
1950 W. Littleton Blvd., Ste. 109
Littleton, CO 80120



APPENDIX II
Photo Log



Sampling Point 1 (SP 1) Vicinity – Looking south down Sand Creek from just south of Pond 4. Typical Sand Creek stream channel characteristics and vegetation. 2/5/15



Sampling Point 2 Vicinity – Looking northwest (upstream) from proposed Sterling Ranch Road crossing. Typical Sand Creek stream channel characteristics and vegetation.

2/5/15



Sampling Point 3 Vicinity– Looking north along western tributary (Wetland 1) from proposed Sterling Ranch Road crossing. Area is typical of the northern half of the western tributary. Photo taken on 2/5/15 when cattle were still on the site.



Sampling Point4 Vicinity – Near proposed Briargate Parkway crossing of Wetland 6. Typical Sand Creek stream channel characteristics and vegetation.
2/5/15



Sampling Point 5 – Upland near Western Tributary, facing southeast towards Western Tributary. 3/10/15



Sampling Point 6 – West side of Western Tributary wetland, looking south along Wetland 1 swale. Photo taken on 3/10/15; cattle had been removed 2-3 weeks earlier.



Sampling Point 7 – Wetland vegetation in Sand Creek, facing northwest. Note shallow, standing water on left side of photo. 3/11/15



Sampling Point 8 – Wetland on low bench along east side of Sand Creek, facing west towards SP 7. 3/11/15



Sampling Point 8 – Upland above Sand Creek, facing west towards SP 7 and 8.
3/11/15



Pond 1 – Looking north from west end of the dam. Water flows out of the pond on this southwest corner and there is also a culvert in the dam center that drains south into the main channel of Sand Creek. The distant cottonwoods are growing along Sand Creek just north of the Project Area. 3/22/15



Pond 2 – Looking north from dam. Sand Creek enters the pond on left side of the photo. Pond has well-developed fringe of emergent vegetation. 3/16/15



Pond 3 – Looking north from the road, across a shallow ponded area and up Sand Creek (Wetland 7). Water from the adjacent uplands flows into this area via a sandy channel partially visible on the right (east) side of the photo. 3/16/15



Pond 4 – Looking northwest from dam. This deep pond has a sparse, narrow wetland fringe. The pond drains via the standpipe, to a culvert under the dam, and into Pond 5. Pond 5 is a small open water area (~6' diameter). 3/16/15



Western Tributary, Wetland 2 – Southern half of the western tributary to Sand Creek, facing north along the poorly defined channel with a narrow band of wetland vegetation. 3/10/15



APPENDIX III

Wetland Delineation Data Forms

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Sterling Ranch South City/County: El Paso Co. Sampling Date: 2/5/15
 Applicant/Owner: MS Civil Consultants State: CO Sampling Point: 1
 Investigator(s): DAN MAYNARD Section, Township, Range: Sec. 33, T12S R65W
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 1-2%
 Subregion (LRR): LRR G Lat: 38.95886° N Long: -104.67310° W Datum: NAD 83
 Soil Map Unit Name: Pring (Aridic Haplustolls) NWI classification:
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation Y, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation N, Soil N, or Hydrology N 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 <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: <u>Vegetation is disturbed by heavy cattle grazing</u>		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. _____				
2. _____				
3. _____				
4. _____				
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: _____)				
1. _____				
2. _____				
3. _____				
_____ = Total Cover				
Herb Stratum (Plot size: <u>5' x 5'</u>)				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Juncus arcticus</u>	<u>75</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
2. <u>Carex utriculata</u>	<u>8</u>		<u>OBL</u>	
3. <u>Rosa woodsii</u>	<u>10</u>		<u>FACU</u>	
4. <u>Poa trivialis</u>	<u>15</u>		<u>FACW</u>	
5. <u>Cirsium arvense</u>	<u>2</u>		<u>FACU</u>	
6. _____				
7. _____				
8. _____				
9. _____				
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____				
2. _____				
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				

Remarks:

Sampling Point: _____

HYDROLOGY

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

- | | | |
|--|--|---|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Surface Soil Cracks (B6) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) |
| <input checked="" type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | (where tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | (where not tilled) | <input type="checkbox"/> Crayfish Burrows (C8) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input checked="" type="checkbox"/> Presence of Reduced Iron (C4) | <input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Thin Muck Surface (C7) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Water-Stained Leaves (B9) | | <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) |

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

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

Saturation Present? Yes ☒ No ☒ Depth (inches): 10"

(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Sterling Ranch South City/County: El Paso Co. Sampling Date: 2/5/15
 Applicant/Owner: MS Civil Consultants State: CO Sampling Point: 2
 Investigator(s): DAN MAYNARD Section, Township, Range: Sec. 33, T12S R65W
 Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 1-2%
 Subregion (LRR): LRR G Lat: 38.95719° N Long: -104.67362° W Datum: WGS 84
 Soil Map Unit Name: Pring (Aridic Haplostolls) NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation N, Soil N, or Hydrology N 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:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66%</u> (A/B)														
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table border="1"> <thead> <tr> <th>Total % Cover of:</th> <th>Multiply by:</th> </tr> </thead> <tbody> <tr> <td>OBL species <u>25</u></td> <td>x 1 = <u>25</u></td> </tr> <tr> <td>FACW species <u>30</u></td> <td>x 2 = <u>60</u></td> </tr> <tr> <td>FAC species <u>—</u></td> <td>x 3 = <u>—</u></td> </tr> <tr> <td>FACU species <u>36</u></td> <td>x 4 = <u>144</u></td> </tr> <tr> <td>UPL species <u>2</u></td> <td>x 5 = <u>10</u></td> </tr> <tr> <td>Column Totals: <u>93</u></td> <td>(A) <u>239</u> (B)</td> </tr> </tbody> </table> Prevalence Index = B/A = <u>2.57</u>	Total % Cover of:	Multiply by:	OBL species <u>25</u>	x 1 = <u>25</u>	FACW species <u>30</u>	x 2 = <u>60</u>	FAC species <u>—</u>	x 3 = <u>—</u>	FACU species <u>36</u>	x 4 = <u>144</u>	UPL species <u>2</u>	x 5 = <u>10</u>	Column Totals: <u>93</u>	(A) <u>239</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>25</u>	x 1 = <u>25</u>																	
FACW species <u>30</u>	x 2 = <u>60</u>																	
FAC species <u>—</u>	x 3 = <u>—</u>																	
FACU species <u>36</u>	x 4 = <u>144</u>																	
UPL species <u>2</u>	x 5 = <u>10</u>																	
Column Totals: <u>93</u>	(A) <u>239</u> (B)																	
Sapling/Shrub Stratum (Plot size: _____)	_____	_____	_____	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input checked="" type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input checked="" type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
_____ = Total Cover																		
Herb Stratum (Plot size: <u>5' x 5'</u>)	_____	_____	_____															
1. <u>Festuca arizonensis pratensis</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
2. <u>Schizachyrium scoparium</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. <u>Carex utriculata</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
4. <u>Juncus arifolius</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
5. <u>Koeleria macrantha</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>NI</u>															
6. <u>Mullein (Verbascum thapsus)</u>	<u>2</u>	<input checked="" type="checkbox"/>	<u>UPL</u>															
7. <u>Pasc. smithii</u>	<u><1</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
_____ = Total Cover																		
Woody Vine Stratum (Plot size: _____)	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
_____ = Total Cover																		
% Bare Ground in Herb Stratum <u>10</u>	_____ = Total Cover																	

Remarks: At wetland boundary in a small swale at an oxbow; vegetation is highly varied in vicinity

SOIL

Sampling Point: 2

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 ¹	Loc ²		
0-3"	7.5YR 3/2	100					Loamy sand (Med)	
3-5"	10YR 3/3	100					Sand (coarse)	
5-8"	10YR 7/2	70	5YR 4/6	30	C	PL	SiC	
8-12"	6.5Y 6/N	85	5YR 4/6	15	C	PL	Loamy Sand (Fine)	

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

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

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

Indicators for Problematic Hydric Soils³:

<input checked="" type="checkbox"/> 1 cm Muck (A9) (LRR I, J)
<input checked="" type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)
<input checked="" type="checkbox"/> Dark Surface (S7) (LRR G)
<input checked="" type="checkbox"/> High Plains Depressions (F16)
(LRR H outside of MLRA 72 & 73)
<input checked="" type="checkbox"/> Reduced Vertic (F18)
<input checked="" type="checkbox"/> Red Parent Material (TF2)
<input checked="" type="checkbox"/> Very Shallow Dark Surface (TF12)
<input checked="" type="checkbox"/> Other (Explain in Remarks)

³Indicators 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:

HYDROLOGY

Wetland Hydrology Indicators:

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

<input checked="" type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Salt Crust (B11)
<input checked="" type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Aquatic Invertebrates (B13)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input checked="" type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Dry-Season Water Table (C2)
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input checked="" type="checkbox"/> Drift Deposits (B3)	(where not tilled)
<input checked="" type="checkbox"/> Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Presence of Reduced Iron (C4)
<input checked="" type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Thin Muck Surface (C7)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	

Secondary Indicators (minimum of two required)

<input checked="" type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
(where tilled)
<input checked="" type="checkbox"/> Crayfish Burrows (C8)
<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input checked="" type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____Water Table Present? Yes ☐ No ☒ Depth (inches): _____Saturation Present? Yes ☒ No ☐ Depth (inches): 8"

(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Sterling Ranch South City/County: El Paso Co. Sampling Date: 2/5/15
 Applicant/Owner: MS Civil Consultants State: CO Sampling Point: 3
 Investigator(s): DAN MAYNARD Section, Township, Range: Sec. 33, T12S R65W
 Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 1%
 Subregion (LRR): LRR G Lat: 38.95625°N Long: -104.68113°W Datum: NAD 83
 Soil Map Unit Name: Blakeland (Torriorthentic Haplustolls) NWI classification: _____
 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: <u>Cattle grazing has disturbed vegetation</u>		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)														
1. _____																		
2. _____																		
3. _____																		
4. _____																		
_____ = Total Cover				Prevalence Index worksheet: <table border="1"> <thead> <tr> <th>Total % Cover of:</th> <th>Multiply by:</th> </tr> </thead> <tbody> <tr><td>OBL species _____</td><td>x 1 = _____</td></tr> <tr><td>FACW species _____</td><td>x 2 = _____</td></tr> <tr><td>FAC species _____</td><td>x 3 = _____</td></tr> <tr><td>FACU species _____</td><td>x 4 = _____</td></tr> <tr><td>UPL species _____</td><td>x 5 = _____</td></tr> <tr><td>Column Totals: _____</td><td>(A) _____ (B) _____</td></tr> </tbody> </table> Prevalence Index = B/A = _____	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) _____
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) _____																	
Sapling/Shrub Stratum (Plot size: _____)				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														
1. _____																		
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
8. _____																		
9. _____																		
_____ = Total Cover																		
Herb Stratum (Plot size: <u>5' x 5'</u>)																		
1. <u>Carex nebrascensis</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
2. <u>Carex utriculata</u>	<u>20</u>		<u>OBL</u>															
3. <u>Suncus arcticus</u>	<u>35</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
4. <u>Agrostis gigantea</u>	<u>20</u>		<u>FACW</u>															
5. <u>Cirsium arvense</u>	<u>5</u>		<u>FACU</u>															
6. <u>Aster (Symphyotrichum sp.)</u>	<u>5</u>		<u>?</u>															
7. _____																		
8. _____																		
9. _____																		
10. _____																		
<u>110</u> = Total Cover																		
Woody Vine Stratum (Plot size: _____)																		
1. _____																		
2. _____																		
_____ = Total Cover																		
% Bare Ground in Herb Stratum <u>15</u>	_____ = Total Cover																	
Remarks: _____																		

SOIL

Sampling Point: 3

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 ¹	Loc ²		
0-9"	10YR 2/1	100					SC (Fine)	
9-18"	10YR 7/2	85	7.5YR 4/6	15	C	M	Loamy sand (coarse)	

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

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

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

Indicators for Problematic Hydric Soils³:

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

³Indicators 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:

HYDROLOGY

Wetland Hydrology Indicators:

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

- | | |
|---|--|
| <input checked="" type="checkbox"/> Surface Water (A1) | <input checked="" type="checkbox"/> Salt Crust (B11) |
| <input checked="" type="checkbox"/> High Water Table (A2) | <input checked="" type="checkbox"/> Aquatic Invertebrates (B13) |
| <input checked="" type="checkbox"/> Saturation (A3) | <input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input checked="" type="checkbox"/> Water Marks (B1) | <input checked="" type="checkbox"/> Dry-Season Water Table (C2) |
| <input checked="" type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input checked="" type="checkbox"/> Drift Deposits (B3) | (where not tilled) |
| <input checked="" type="checkbox"/> Algal Mat or Crust (B4) | <input checked="" type="checkbox"/> Presence of Reduced Iron (C4) |
| <input checked="" type="checkbox"/> Iron Deposits (B5) | <input checked="" type="checkbox"/> Thin Muck Surface (C7) |
| <input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input checked="" type="checkbox"/> Other (Explain in Remarks) |
| <input checked="" type="checkbox"/> Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

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

Field Observations:

 Surface Water Present? Yes ☒ No ☐ Depth (inches): 2"
 Water Table Present? Yes ☐ No ☒ Depth (inches): _____
 Saturation Present? Yes ☒ No ☐ Depth (inches): 9"
 (includes capillary fringe)
Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Sterling Ranch South City/County: El Paso Co. Sampling Date: 2/5/15
 Applicant/Owner: MS Civil Consultants State: CO Sampling Point: 4
 Investigator(s): Dan Maynard Section, Township, Range: Sec. 33, T12S R65W
 Landform (hillslope, terrace, etc.): Drainage Local relief (concave, convex, none): Concave Slope (%): 1%
 Subregion (LRR): LRR G Lat: 38.96760° N Long: -104.66824° W Datum: NAD 83
 Soil Map Unit Name: Brng CAndic Haplostolls NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation N, Soil N, or Hydrology N 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:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Sapling/Shrub Stratum (Plot size: <u>15'x15'</u>) _____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>Salix irrorata</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Herb Stratum (Plot size: <u>5'x5'</u>) _____ = Total Cover				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% _____ 3 - Prevalence Index is ≤3.0 ¹ _____ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Bulrush (Scirpus microcarpus)</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
2. <u>Carex nebrascensis</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
3. <u>Juncus arcticus</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
4. <u>Aster (Symphyotrichum sp.)</u>	<u>5</u>	_____	<u>?</u>	
5. <u>Juncus mertensianus</u>	<u>10</u>	_____	<u>OBL</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
Woody Vine Stratum (Plot size: _____) _____ = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	_____
% Bare Ground in Herb Stratum <u>5</u> _____ = Total Cover				

Remarks:

Sampling Point: 4

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

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

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

Indicators for Problematic Hydric Soils³:

Histosol (A1)	Sandy Gleyed Matrix (S4)	1 cm Muck (A9) (LRR I, J)
Histic Epipedon (A2)	Sandy Redox (S5)	Coast Prairie Redox (A16) (LRR F, G, H)
Black Histic (A3)	Stripped Matrix (S6)	Dark Surface (S7) (LRR G)
Hydrogen Sulfide (A4)	Loamy Mucky Mineral (F1)	High Plains Depressions (F16)
Stratified Layers (A5) (LRR F)	Loamy Gleyed Matrix (F2)	(LRR H outside of MLRA 72 & 73)
1 cm Muck (A9) (LRR F, G, H)	Depleted Matrix (F3)	Reduced Vertic (F18)
Depleted Below Dark Surface (A11)	Redox Dark Surface (F6)	Red Parent Material (TF2)
Thick Dark Surface (A12)	Depleted Dark Surface (F7)	Very Shallow Dark Surface (TF12)
Sandy Mucky Mineral (S1)	Redox Depressions (F8)	Other (Explain in Remarks)
2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	High Plains Depressions (F16)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present.
5 cm Mucky Peat or Peat (S3) (LRR F)	(MLRA 72 & 73 of LRR H)	

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

Restrictive Layer (if present):

Type: N/A

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Wetland Hydrology Indicators:

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

<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3)	(where not tilled)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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 – Great Plains Region

Project/Site: Sterling Ranch City/County: El Paso County Sampling Date: 3/10/15
 Applicant/Owner: MS Civil Consultants State: CO Sampling Point: 5
 Investigator(s): Julia Auckland Section, Township, Range: Section 33, T12S, R65W
 Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): convex Slope (%): 3
 Subregion (LRR): G-Western Great Plains Lat: 38.955981 Long: -104.681231 Datum: WGS 84
 Soil Map Unit Name: Blakeland-Fluvaquentic Haplaquolls NWI classification: _____

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

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

Hydrophytic Vegetation Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
Remarks: Upland on gentle slope, ~20' west and ~3' higher than wetland sampling point #6. Snow cover until 3/9, 99% melted today.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 Ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
0 = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = <u>0</u> FACW species _____ x 2 = <u>0</u> FAC species _____ x 3 = <u>0</u> FACU species _____ x 4 = <u>0</u> UPL species _____ x 5 = <u>0</u> Column Totals: <u>0</u> (A) <u>0</u> (B) Prevalence Index = B/A = <u>NaN</u>
Sapling/Shrub Stratum (Plot size: <u>15 Ft radius</u>) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 0 = Total Cover				
Herb Stratum (Plot size: <u>5 Ft radius</u>) 1. <u>Bouteloua gracilis</u> 73 Y UPL 2. <u>Artemisia frigida</u> 10 N UPL 3. <u>Aster sp.</u> 5 N 4. <u>Juncus articus (balticus)</u> 1 N FACW 5. <u>Aristida purpurea</u> 1 N UPL 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 90 = Total Cover				
Woody Vine Stratum (Plot size: <u>15 Ft radius</u>) 1. _____ 2. _____ _____ = Total Cover				
% Bare Ground in Herb Stratum <u>10</u> <u>90</u> = Total Veg Cover				
Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation <small>All dominants are FACW and/or OBL.</small> ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes _____ No <u>X</u>				
Remarks: D5 - FAC Neutral Test for hydrology. Drop all FAC, cross examine all other dominants. If > 50% remaining are FACW to OBL, then YES to D5.				

SOIL

Sampling Point: 5

[illegible]

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one required; check all that apply)</u>			<u>Secondary Indicators (minimum of two required)</u>		
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)			
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)			Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:					
Remarks: No wetland hydrology indicators.					

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Sterling Ranch City/County: El Paso County Sampling Date: 3/10/15
 Applicant/Owner: MS Civil Consultants State: CO Sampling Point: 6
 Investigator(s): Julia Auckland Section, Township, Range: Section 33, T12S, R65W
 Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 1
 Subregion (LRR): G-Western Great Plains Lat: 38.956039 Long: -104.681067 Datum: WGS 84
 Soil Map Unit Name: Blakeland Fluvaquentic Haplaquolls NWI classification: _____

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

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: Western tributary to Sand Creek. Shallow swale with ~15 foot wide swath of wetland vegetation. Snow cover until 3/9, 99% melted today.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 Ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A/B)														
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
0 = Total Cover				Prevalence Index worksheet: <table border="0"> <tr> <td>Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species <u>65</u></td> <td>x 1 = <u>65</u></td> </tr> <tr> <td>FACW species <u>25</u></td> <td>x 2 = <u>50</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>5</u></td> <td>x 4 = <u>20</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>95</u> (A)</td> <td><u>135</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.4210526315789473</u>	Total % Cover of:	Multiply by:	OBL species <u>65</u>	x 1 = <u>65</u>	FACW species <u>25</u>	x 2 = <u>50</u>	FAC species _____	x 3 = <u>0</u>	FACU species <u>5</u>	x 4 = <u>20</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>95</u> (A)	<u>135</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>65</u>	x 1 = <u>65</u>																	
FACW species <u>25</u>	x 2 = <u>50</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species <u>5</u>	x 4 = <u>20</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>95</u> (A)	<u>135</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 Ft radius</u>) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 0 = Total Cover																		
Herb Stratum (Plot size: <u>5 Ft radius</u>) 1. <u>Carex nebrascensis</u> <u>45</u> <u>Y</u> <u>OBL</u> 2. <u>Juncus articus (balticus)</u> <u>25</u> <u>Y</u> <u>FACW</u> 3. <u>Carex utriculata</u> <u>20</u> <u>Y</u> <u>OBL</u> 4. <u>Elymus trachycaulus</u> <u>5</u> <u>N</u> <u>FACU</u> 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 95 = Total Cover																		
Woody Vine Stratum (Plot size: <u>15 Ft radius</u>) 1. _____ 2. _____ _____ = Total Cover % Bare Ground in Herb Stratum _____ <u>95</u> = Total Veg Cover																		
Remarks: Moss~5%. Carex spp. dominant in center of swale. Along wetland perimeter, Juncus is dominant and there are scattered Elymus trachycaulus. Other species observed along the wetland perimeter beyond sampling radius: Agrostis gigantea, Distichlis spicata, and Panicum virgatum.																		

SOIL

Sampling Point: 6

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 ¹	Loc ²		
0-1	10 YR 3/2	100					sandy loam	10% fine to medium gravel, similar to SP1
1-8	Gley 1 2.5/N	81	Gley 1 6/10Y	5	D	M	loamy sand	depleted areas are light "greenish gray" clay w PL
			7.5 YR 5/6	1	C	PL		prominent
			White N/9	3	C	M		white salt crystals
	10YR 4/3	10						not depleted, brown
8-16	Gley 1 2.5/N	100						

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

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

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

Indicators for Problematic Hydric Soils³:

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

³Indicators 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:

Slightly blacker than upland soil at SP1. Moss 5%.

HYDROLOGY

Wetland Hydrology Indicators:

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

- | | |
|--|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input checked="" type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3) | (where not tilled) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input checked="" type="checkbox"/> Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____
Water Table Present? Yes ☒ No ☐ Depth (inches): 15
Saturation Present? Yes ☒ No ☐ Depth (inches): surface
(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

~1-2 inches of standing water in the center of the swale (3 feet east of SP), likely snow melt on top of partially frozen ground.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Sterling Ranch City/County: El Paso County Sampling Date: 3/11/15
 Applicant/Owner: MS Civil Consultants State: CO Sampling Point: 7
 Investigator(s): Julia Auckland Section, Township, Range: Section 33, T12S, R65W
 Landform (hillslope, terrace, etc.): Sand Creek Local relief (concave, convex, none): concave Slope (%): 1
 Subregion (LRR): G-Western Great Plains Lat: 38.956325 Long: -104.673700 Datum: WGS 84
 Soil Map Unit Name: Columbine gravelly sandy loam NWI classification: _____

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

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

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

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: Sand Creek is a shallow swale with an ~20 foot-wide swath of wetland vegetation. The creek is located in the flat bottom of an approximately 60 foot side canyon-like depression. Along the west side of the depression, the steep, bare, sandy wall is approximately 20 feet high. The vegetated east side slopes up more gradually (towards SP 9).	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 Ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A/B)														
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
0 = Total Cover				Prevalence Index worksheet: <table border="0"> <tr> <td>Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species <u>50</u></td> <td>x 1 = <u>50</u></td> </tr> <tr> <td>FACW species <u>45</u></td> <td>x 2 = <u>90</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>95</u> (A)</td> <td><u>140</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.4736842105263157</u>	Total % Cover of:	Multiply by:	OBL species <u>50</u>	x 1 = <u>50</u>	FACW species <u>45</u>	x 2 = <u>90</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>95</u> (A)	<u>140</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>50</u>	x 1 = <u>50</u>																	
FACW species <u>45</u>	x 2 = <u>90</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>95</u> (A)	<u>140</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 Ft radius</u>) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 0 = Total Cover																		
Herb Stratum (Plot size: <u>5 Ft radius</u>) 1. <u>Carex nebrascensis</u> <u>25</u> Y OBL 2. <u>Carex utriculata</u> <u>25</u> Y OBL 3. <u>Juncus saximontanus (J. ensifolius in Culver and Lemly)</u> <u>20</u> Y FACW 4. <u>Juncus articus (balticus)</u> <u>20</u> Y FACW 5. <u>Juncus dudleyi (tenuis)</u> <u>5</u> N FACW 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 95 = Total Cover																		
Woody Vine Stratum (Plot size: <u>15 Ft radius</u>) 1. _____ 2. _____ _____ = Total Cover % Bare Ground in Herb Stratum <u>5</u> <u>95</u> = Total Veg Cover																		
Hydrophytic Vegetation Indicators: <u>X</u> 1 - Rapid Test for Hydrophytic Vegetation <small>All dominants are FACW and/or OBL.</small> <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																		
Hydrophytic Vegetation Present? Yes <u>X</u> No _____																		
Remarks: Sampling point vegetation is characteristic of the wetter areas along Sand Creek; vegetation is dominated by Carex spp. and Juncus spp.																		

SOIL

Sampling Point: 7

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 ¹	Loc ²		
0-3	2.5Y 3/1	100					clay loam	
3-6	Gley 1 5/10Y	80	Gley 2 2.5/10PB	20	D	M	clay loam	
6-9	Gley 1 4/N	100					loamy sand	20% fine to medium sand
9-16	Gley 1 4/10Y	100					loamy sand	sandier than above, fine sand

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

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

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

Indicators for Problematic Hydric Soils³:

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

³Indicators 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:

Slightly brownish on top 3", then more reduced (gleyed).

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1) ☐ Salt Crust (B11)
☒ High Water Table (A2) ☐ Aquatic Invertebrates (B13)
☒ Saturation (A3) ☐ Hydrogen Sulfide Odor (C1)
☐ Water Marks (B1) ☐ Dry-Season Water Table (C2)
☐ Sediment Deposits (B2) ☐ Oxidized Rhizospheres on Living Roots (C3)
☐ Drift Deposits (B3) (where not tilled)
☐ Algal Mat or Crust (B4) ☐ Presence of Reduced Iron (C4)
☐ Iron Deposits (B5) ☒ Thin Muck Surface (C7)
☐ Inundation Visible on Aerial Imagery (B7) ☐ Other (Explain in Remarks)
☒ Water-Stained Leaves (B9)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes _____ No ☒ Depth (inches): _____Water Table Present? Yes ☒ No _____ Depth (inches): 6Saturation Present? Yes ☒ No _____ Depth (inches): surface
(includes capillary fringe)Wetland Hydrology Present? Yes ☒ No _____

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

Remarks:

~2-3 inches of standing water in the center of the swale (2 feet west of SP).

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Sterling Ranch City/County: El Paso County Sampling Date: 3/11/15
 Applicant/Owner: MS Civil Consultants State: CO Sampling Point: 8
 Investigator(s): Julia Auckland Section, Township, Range: Section 33, T12S, R65W
 Landform (hillslope, terrace, etc.): Sand Creek Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR): G-Western Great Plains Lat: 38.956338 Long: -104.673674 Datum: WGS 84
 Soil Map Unit Name: Columbine gravelly sandy loam NWI classification: _____

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

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: Transitional wetland on slightly raised bench along Sand Creek. Sampling point is ~10' NE of SP7 and 18-24" above water in Sand Creek. Dug pit to check soils and hydrology in an area with a mix of <i>Juncus balticus</i> , <i>Agrostis gigantea</i> , and <i>Elymus trachycaulus</i> ; a common species assemblage along the wetland edge.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 Ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A/B)														
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
<u>0</u> = Total Cover				Prevalence Index worksheet: <table border="0"> <tr> <td>Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>70</u></td> <td>x 2 = <u>140</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>30</u></td> <td>x 4 = <u>120</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>100</u> (A)</td> <td><u>260</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.6</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>70</u>	x 2 = <u>140</u>	FAC species _____	x 3 = <u>0</u>	FACU species <u>30</u>	x 4 = <u>120</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>100</u> (A)	<u>260</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>70</u>	x 2 = <u>140</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species <u>30</u>	x 4 = <u>120</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>100</u> (A)	<u>260</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 Ft radius</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
<u>0</u> = Total Cover																		
Herb Stratum (Plot size: <u>5 Ft radius</u>)																		
1. <i>Juncus saximontanus</i> (ensifolius in Culver and Lemly)	<u>50</u>	<u>Y</u>	<u>FACW</u>															
2. <i>Agrostis gigantea</i>	<u>20</u>	<u>Y</u>	<u>FACW</u>															
3. <i>Schizachyrium scoparium</i>	<u>10</u>	<u>N</u>	<u>FACU</u>															
4. <i>Elymus trachycaulus</i>	<u>10</u>	<u>N</u>	<u>FACU</u>															
5. <i>Juncus articus</i> (balticus)	<u>10</u>	<u>N</u>	<u>FACW</u>															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
<u>100</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>15 Ft radius</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
_____ = Total Cover																		
% Bare Ground in Herb Stratum <u>0</u> <u>100</u> = Total Veg Cover																		
Hydrophytic Vegetation Indicators: <u>X</u> 1 - Rapid Test for Hydrophytic Vegetation <small>All dominants are FACW and/or OBL</small> <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤3.0 ¹ _____ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain)																		
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																		
Hydrophytic Vegetation Present? Yes <u>X</u> No _____																		
Remarks: Sampling point vegetation is characteristic of the transitional wetland areas along Sand Creek where vegetation is typically dominated by <i>Juncus</i> spp. and <i>Agrostis gigantea</i> with lesser coverage of a mix of FACU grasses.																		

SOIL

Sampling Point: 8

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 ¹	Loc ²		
0-2	2.5Y 3/1	77	5YR 4/6	3	C	PL	clay loam	
			2.5Y 4/1	20	D	M		
2-6	10YR 4/1	70	5YR 4/6	10	C	PL& M	clay loam	C spread beyond PL and into matrix
6-18	10YR 4/3	100					sand	coarse super-saturated sand

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

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

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

Indicators for Problematic Hydric Soils³:

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

³Indicators 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:

Much sandier than SP 7.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1) ☐ Salt Crust (B11)
☐ High Water Table (A2) ☐ Aquatic Invertebrates (B13)
☒ Saturation (A3) ☐ Hydrogen Sulfide Odor (C1)
☐ Water Marks (B1) ☐ Dry-Season Water Table (C2)
☐ Sediment Deposits (B2) ☒ Oxidized Rhizospheres on Living Roots (C3)
☐ Drift Deposits (B3) **(where not tilled)**
☐ Algal Mat or Crust (B4) ☐ Presence of Reduced Iron (C4)
☐ Iron Deposits (B5) ☒ Thin Muck Surface (C7)
☐ Inundation Visible on Aerial Imagery (B7) ☐ Other (Explain in Remarks)
☒ Water-Stained Leaves (B9)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes _____ No ☒ Depth (inches): _____Water Table Present? Yes ☒ No _____ Depth (inches): 16Saturation Present? Yes ☒ No _____ Depth (inches): 2
(includes capillary fringe)Wetland Hydrology Present? Yes ☒ No _____

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

Remarks:

Saturated at 2", super-saturated sand at 6". Wet sandy soil is closer to the surface (6"), expected it to be deeper since sampling point is 18-24" above standing water level in Sand Creek.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Sterling Ranch City/County: El Paso County Sampling Date: 3/11/15
 Applicant/Owner: MS Civil Consultants State: CO Sampling Point: 9
 Investigator(s): Julia Auckland Section, Township, Range: Section 33, T12S, R65W
 Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): convex Slope (%): 1-2
 Subregion (LRR): G-Western Great Plains Lat: 38.956326 Long: -104.673410 Datum: WGS 84
 Soil Map Unit Name: Columbine gravelly sandy loam, 0-3% slopes NWI classification: _____

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

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

Hydrophytic Vegetation Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
Remarks: Upland on slope above Sand Creek, ~60' east and ~8' higher than wetland sampling point #8.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 Ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Sapling/Shrub Stratum (Plot size: <u>15 Ft radius</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = <u>0</u> FACW species _____ x 2 = <u>0</u> FAC species _____ x 3 = <u>0</u> FACU species _____ x 4 = <u>0</u> UPL species _____ x 5 = <u>0</u> Column Totals: <u>0</u> (A) <u>0</u> (B) Prevalence Index = B/A = <u>NaN</u>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Herb Stratum (Plot size: <u>5 Ft radius</u>)				Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Bouteloua gracilis</u>	<u>79</u>	<u>Y</u>	<u>UPL</u>	
2. <u>Artemisia frigida</u>	<u>10</u>	<u>N</u>	<u>UPL</u>	
3. <u>Coryphantha vivipara (cactus)</u>	<u>1</u>	<u>N</u>	<u>UPL</u>	
4. <u>Hesperostipa comata</u>	<u>10</u>	<u>N</u>	<u>UPL</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
Woody Vine Stratum (Plot size: <u>15 Ft radius</u>)				Hydrophytic Vegetation Present? Yes _____ No <u>X</u>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
% Bare Ground in Herb Stratum <u>0</u> _____ = Total Veg Cover				

Remarks: typical short grass prairie upland

D5 - FAC Neutral Test for hydrology. Drop all FAC, cross examine all other dominants. If > 50% remaining are FACW to OBL, then YES to D5.

SOIL

Sampling Point: 9

[illegible]

HYDROLOGY

Wetland Hydrology Indicators:		
<div> <div> Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) </div> </div>		
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
<div> <div> Field Observations: </div> </div>		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: No wetland hydrology indicators.		



Appendix VI:
Sterling Ranch Threatened and Endangered Species (TES) Review



Mr. Van Truan-U.S. Army Corps of Engineers
Albuquerque District-Southern Colorado Regulatory Office
200 South Santa Fe Avenue, Suite 301

October 29, 2015

CORE Consultants, Inc. Project Number 15-001

**RE: Threatened and Endangered Species Review
Sterling Ranch Residential Development Project
El Paso County, Colorado**

Dear Mr. Truan:

On behalf of M&S Civil Consultants, Inc. (Client), CORE Consultants, Inc. (CORE) has prepared a Threatened and Endangered Species Review for the Sterling Ranch Residential Development Project (Project). CORE reviewed federally listed threatened and endangered species (TES), associated habitat requirements, and any designated critical habitats for said species. This review was conducted in accordance with requirements set forth by Section 7 consultation (Section 7(a)(2) of the Endangered Species Act) with the U.S. Fish and Wildlife Service (USFWS, Service) in association with an Individual Permit (IP) application submitted to the U.S. Army Corps of Engineers (USACE). Project development will result in both temporary and permanent impacts to jurisdictional waters including Sand Creek and its western tributary. The Project includes construction of multiple residential units, associated utilities, two permanent residential access roads, construction of three off-line detention ponds, and various channel improvements to the main channel of Sand Creek.

The Project is located northeast of the intersection of Vollmer Road and Black Forest Road, in unincorporated El Paso County (County), Colorado and encompasses 1,335 acres (see **Appendix I: Site Location Map**) on portions of Sections 25, 31, and 33 in Township 12 South, Range 65 West. The property is bordered by sparse residential development on the western and southern boundaries and by mostly undeveloped land to the north and east.

Previous ESA Consultations

In accordance with recommendations from the USFWS, habitat assessments and other wildlife surveys were completed in 2007 by Walsh Environmental Scientists and Engineers, LLC (Walsh, 2007). Walsh conducted site reconnaissance to determine the suitability of the site for the federally threatened Preble's meadow jumping mouse (Preble's, PMJM). At the conclusion of the 2007 habitat assessment, the Service determined that development was "not likely to adversely affect" (NLAA) Preble's or its associated habitat.

Environmental Setting

Land cover types were determined through a desktop review of the U.S. Geological Survey (USGS) National Gap Analysis Program (GAP) land cover classification system. The review indicated that the Project falls within the Foothills Grasslands Level IV ecoregion of the Southwestern Tablelands ecoregion Level III (USGS 2011). The Foothills Grasslands contains a mix of grasslands extending east from the Rocky Mountains. Tall and mid-grasses are prominent here as a result of increased moisture from mountain runoff (USGS 2011). Big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), yellow Indiangrass (*Sorghastrum nutans*), and switchgrass (*Panicum virgatum*) are the dominant grasses, along with foothill grassland communities, and scattered pine woodlands.

A review of the National Hydrography Dataset (NHD) indicates that the Project lies within the Fountain watershed (8-digit HUC 11020003). Sand Creek and its associated western tributaries traverse the site. Sand Creek is defined as a riverine intermittent stream channel. Wetlands occur throughout the main channel of Sand Creek and its western tributary located in the southern portion of the Project site.

Endangered Species

The USFWS Information, Planning, and Conservation System (IPAC) was used to determine the potential for federally listed TES species within the proposed Project area. The IPAC query listed five species including one bird, one fish, one flowering plant, one insect, and one mammal. An additional five species were listed under a conditional effects analysis including three birds, one fish, and one flowering plant. Field efforts were subsequently completed to ground-truth for any potentially suitable TES habitat. Federally listed TES species flagged in IPAC are listed in **Table 1** and discussed below.

Table 1. Potential TES affected by Project Development

COMMON	SCIENTIFIC NAME	STATUS	LIKELIHOOD OF OCCURENCE
Effects Analysis			
Greenback cutthroat trout	<i>Oncorhynchus clarki stomias</i>	FT	Unlikely; no suitable water flow through Sand Creek. Genetic sampling has confirmed that the only remaining native pure strain population occurs in a four mile stretch of creek outside of its native range in Bear Creek, a small tributary in the Arkansas River Basin (Metcalf et al., 2012; CPW, 2014).
Mexican spotted owl	<i>Strix occidentalis lucida</i>	FT	Unlikely; requires mixed-conifer stands and narrow canyons (Gutiérrez et al., 1995). Designated critical habitat occurs > 5 miles from the site; lack of habitat connectivity.

Preble's meadow jumping	<i>Zapus hudsonius preblei</i>	FT	Suitable habitat present; however, unlikely to occur. See discussion below.
Pawnee montane skipper	<i>Hesperia leonardus montana</i>	FT	Unlikely; species requires dry, open, ponderosa pine woodlands on moderately steep slopes with soils derived from Pikes Peak granite (USFWS, 2014).
Ute ladies'-tresses	<i>Spiranthes diluvialis</i>	FT	Unlikely; drainage channel does not exhibit seasonally inundated, gently sloping bank features such as oxbow or braided channels. Rather, steeply incised channels on site are frequently scoured during rain events.
Conditional Effects Analysis			
Least tern	<i>Sternula antillarum</i> (interior population)	FE	Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska. However, Project will not affect water within S. Platte river shed. Additionally, species requires large water bodies for forage (Thompson et al., 1997).
Pallid sturgeon	<i>Scaphirynchus albus</i> (entire population)	FE	Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska. However, Project will not affect water within S. Platte river shed. Additionally require large silty rivers with a natural hydrograph.
Piping plover	<i>Charadrius melodus</i> (except Great Lakes watershed)	FT	Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska. However, Project will not affect water within S. Platte river shed. Additionally, species require open, sparsely vegetated areas with low to zero slope
Western prairie fringed orchid	<i>Platanthera praeclara</i>	FT	Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska. However, Project will not affect water within S. Platte river shed. Additionally, project location does not fall within species range.

Whooping crane	<i>Grus americana</i>	FE	Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska. However, Project will not affect water within S. Platte river shed. Additionally, species requires large surface waters for migration stop over. Project Site does not fall within migration corridor (Lewis et al., 1995).
----------------	-----------------------	----	--

FE=Federally Endangered, FT=Federally Threatened

Greenback Cutthroat Trout

Greenback cutthroat trout are listed as federally and state threatened. Habitat requirements vary throughout life stages; however, all life stages require clear, cold, well-oxygenated water. Juveniles require protective cover and low-velocity flow found in side channels and small tributaries. Adults require habitat composed of both low and high velocity flows for resting and feeding, respectively. Spawning occurs in higher elevations where females utilize gravel substrate to create egg pits 3-8 inches deep. Greenbacks originally inhabited all zones of the Arkansas and South Platte River systems. The population has declined severely due to overfishing, stocking of competitive trout in Greenback habitat, and destruction of habitat resulting from logging, overgrazing, water diversions and municipal and industrial pollution. Genetic sampling has confirmed that the only remaining native pure strain population occurs in a four mile stretch of creek outside of its native range in Bear Creek, a small tributary in the Arkansas River Basin (Metcalf et al., 2012; CPW, 2014). Outside of Bear Creek, an agency re-introduction effort occurred on August 11, 2014. Twelve-hundred greenback cutthroat trout were stocked in Zimmerman Lake within the South Platte River Basin. Additional introductions are planned over the next five years within the South Platte River Basin (CPW, 2014). Desktop review of site characteristics and site reconnaissance have determined that Project development would not affect greenback cutthroat trout.

Mexican Spotted Owl

The Mexican spotted owl is a federally and state threatened species. Preferred habitat includes mature forests with diverse and complex structural components, cliff faces, and canyon habitats. Owls will roost and forage in stands of mixed-conifer, ponderosa pine, pine-oak, pinyon-juniper, and/or riparian vegetation. Adults require habitat that includes mixed conifer stands and narrow canyons (Gutiérrez et al., 1995). Water sources adjacent to roosting habitat are typical and include perennial streams, creeks, springs, or ephemeral sources. Diet consists of small rodents including mice, moles, and woodrats. Nesting occurs March through August during which time pairs defend their breeding territory. Most Mexican spotted owls occur on U.S Forest Service Lands in Arizona and New Mexico. It is poorly understood why Colorado does not support a larger population of Mexican spotted owls (CPW, 2014). Suitable habitat structure does not occur within or adjacent to the Project area.

Preble's meadow jumping mouse

The PMJM is a small, long-tailed rodent found along the Front Range between 4,600 and 7,600 feet in Colorado (USFWS, 2015). PMJM occupy riparian stream corridors located within a variety of habitats, including grassland, shrubland, forest, and mixed vegetation types along the Front Range in Colorado. El Paso County contains extensive areas of suitable habitat as well as Service designated critical habitat for Preble's. Desktop review and site reconnaissance indicated that no suitable habitat occurs within the Project area. Since 2007, the Service has expanded the Colorado Springs area PMJM block clearance zone to include the Project Area (See **Appendix II**). Severe incision and erosion to the main channel of Sand Creek has created consistently steep, bare banks unsuitable for PMJM movement through the central portion of the Project area. Upland vegetation characteristics may be suitable as a mix of forbs and grasses were present at the time of the site visit. However, consistently steep banks throughout the majority of the main channel make the adjacent upland habitat inaccessible to PMJM. Further, steep banks nullify the possibility of riparian habitat. Given the site characteristics, the Service concurred that Project development is not likely to adversely affect Preble's or its associated habitat. See **Appendix III: USFWS NLAA PMJM Determination**.

Pawnee Montane skipper

The Pawnee Montane skipper is a federally threatened butterfly belonging to the *Hesperiidae* family. The species requires dry, open, ponderosa pine woodlands on moderately steep slopes with soils derived from Pikes Peak granite (USFWS, 2014). Required vegetation includes blue grama (*Bouteloua gracilis*) during the larval stage, and Prairie gayfeather (*Liatris spicata*) for nectar forage. The butterfly occurs between 6000 to 7500 feet; however their known occupied range is within Ponderosa pine woodlands west of the Project area (USFWS, 2015).

Ute ladies'-tresses

Ute ladies'-tresses is a perennial orchid listed federally as threatened. The forb has ivory flower clusters arranged in a spike growing approximately 8-20 inches tall. The flower is known to occur in parts of Colorado, Wyoming, Idaho, Montana, Nebraska, Utah, and Washington. The plant typically occurs within features associated with river floodplains including riparian edges, gravel bars, old oxbows, and moist to wet meadows along perennial streams (USFWS 2015). The plant requires gently sloping zones of river channels through which braided and meandering perennial surface water features flow. Such areas should receive seasonal inundation during which alluvial deposits create the braided river bank features that are typical of the species.

Suitable habitat does not occur adjacent to Sand Creek in the Project Area. Portions of the northern reaches of the main channel of Sand Creek do exhibit gently sloping banks but perennial flowing water is not present. The majority of the main channel of Sand Creek is deeply incised. As such, alluvium is frequently scoured from the channel preventing creation of suitable soil substrates.



Mr. Van Truan-U.S. Army Corps of Engineers
Albuquerque District-Southern Colorado Regulatory Office
200 South Santa Fe Avenue, Suite 301

FINDINGS

Upon completion of a desktop review and site reconnaissance, CORE finds that the proposed Sterling Residential Development will have "no effect" to TES with the potential to occur in the Project area. We kindly request the review of the enclosed materials in support of the Sterling Ranch Individual Permit application submitted to the Albuquerque District-Southern Colorado Regulatory Office.

Please contact me with any questions/comments at haas@corecivil.com or phone: (303) 703-4444 x 121.

Sincerely,

A handwritten signature in blue ink, appearing to read "Chris Haas", with a horizontal line underneath it.

Chris Haas
Project Manager

CORE Consultants Inc.

Appendix I: *Sterling Ranch Site Location Map*

Appendix II: *Sterling Ranch PMJM Block Clearance Map*

Appendix III: *USFWS NLAA PMJM Determination*

REFERENCES

Colorado Parks and Wildlife (CPW). 2014. *Colorado's Native Greenback Cutthroat Trout Stocked at Zimmerman Lake*. Accessed September 29, 2014. <http://dnr.state.co.us/newsapp/press.asp?pressid=9112>

Colorado Parks and Wildlife (CPW). 2015. *Species Profiles*. Available online: <http://cpw.state.co.us/learn/Pages/SpeciesProfiles.aspx>

Gutiérrez, R. J., A. B. Franklin and W. S. Lahaye. 1995. Spotted Owl (*Strix occidentalis*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/179>

Lewis, James C. 1995. Whooping Crane (*Grus americana*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/153> doi:10.2173/bna.153

Metcalf, J. L., S. Love Stowell, C. M. Kennedy, K. B. Rogers, D. McDonald, J. Epp, K. Keepers, A. Cooper, J. J. Austin, and A. P. Martin. "Historical Stocking Data and 19th Century DNA Reveal Human-Induced Changes to Native Diversity and Distribution of Cutthroat Trout." *Molecular Ecology* 21, no. 21 (November 1, 2012): 5194–5207. doi:10.1111/mec.12028.

United States Fish and Wildlife Service (USFWS). 2015. Endangered Species Program. Species by County Report. Available online <http://www.fws.gov/endangered/?s8fid=112761032793&s8fid=112762573903&countyName=iknjin>. Accessed August 2015.

US Geological Survey, Gap Analysis Program (GAP). August 2011. National Land Cover, Version 2.

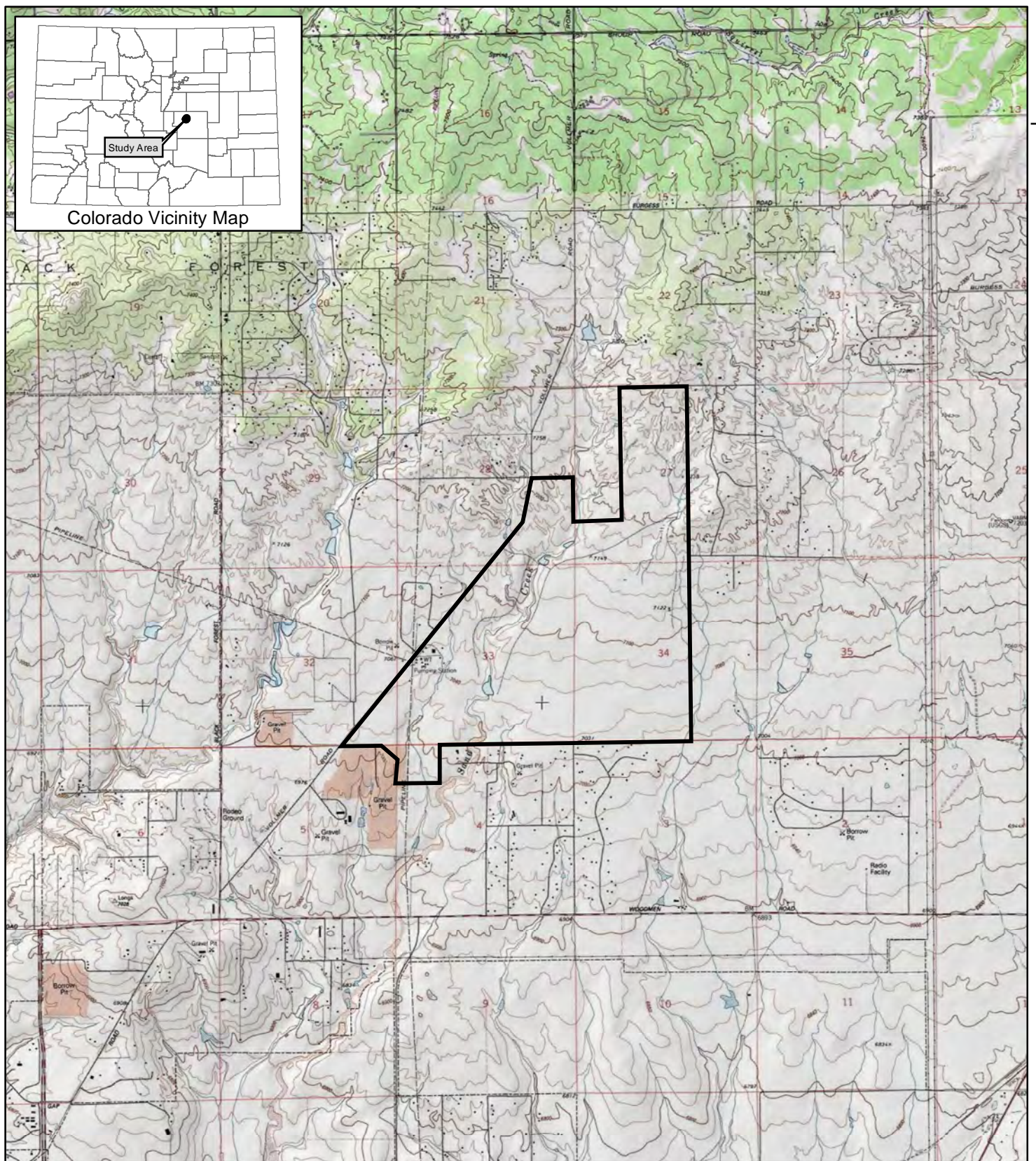
Walsh Engineering. 2007. *Sterling Ranch Site Disqualification Report*.



Mr. Van Truan-U.S. Army Corps of Engineers
Albuquerque District-Southern Colorado Regulatory Office
200 South Santa Fe Avenue, Suite 301


APPENDIX I:

Sterling Ranch Site Location Map



Sterling Ranch Site Location Map

El Paso County, Colorado

 Study Area

0 2,000 4,000
Feet
1 inch = 4,000 feet

Date: 5/20/2015
Project #: 15-001

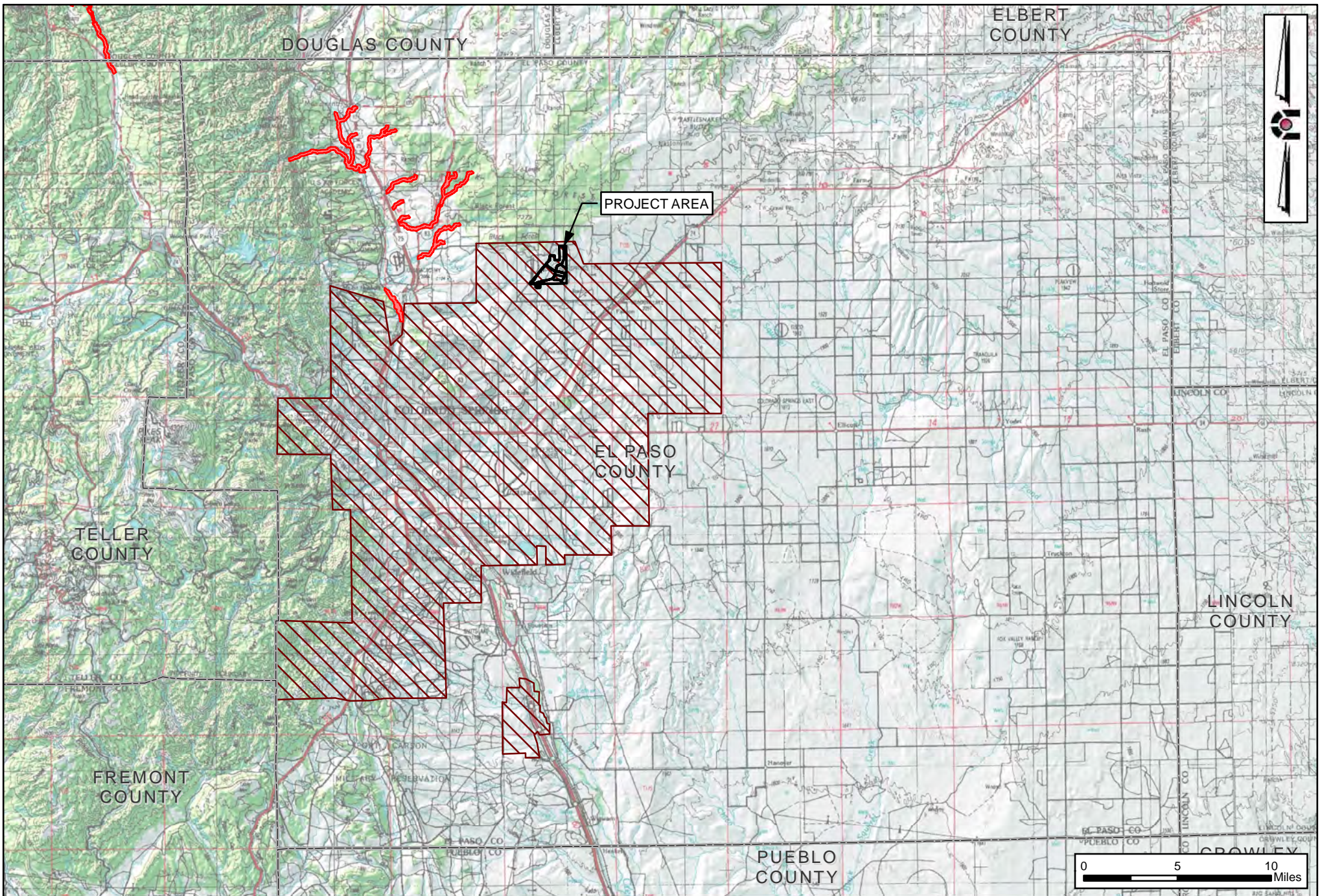




CORE
CONSULTANTS

CIVIL ENGINEERING
DEVELOPMENT CONSULTING
LAND SURVEYING
303.703.4444
1950 W. Littleton Blvd., Ste. 109
Littleton, CO 80120

Appendix II:

Sterling Ranch PMJM Block Clearance Map



- Project Area
-  USFWS PMJM Critical Habitat
-  USFWS PMJM Block Clearance Area

Sterling Ranch
Preble's Meadow Jumping Mouse Habitat Map
El Paso County, Colorado

Appendix III:

USFWS NLAA PMJM Determination



2015-7A0848

U.S. FISH AND WILDLIFE SERVICE	
<input type="checkbox"/> NO CONCERNS	
<input checked="" type="checkbox"/> CONCUR NOT LIKELY TO ADVERSELY AFFECT	
<input type="checkbox"/> NO COMMENT	
JUL 20 2015	
DRUE L. DEBERRY, ACTING	DATE
COLORADO FIELD SUPERVISOR	

Ms. Susan Linner
U.S. Fish and Wildlife Service
Ecological Services Field Office
134 Union Boulevard, Suite 670
Denver, Colorado 80228-1807

RE: ESA Consultation for Federally Listed Preble's Meadow Jumping Mouse

Dear Ms. Linner:

M&S Civil Consultants, Inc. (M&S Civil or Client), is in the process of permitting the first phase of the Sterling Ranch Residential Development Project (Project) in El Paso County, Colorado. Phase I will include the development of a temporary haul road, stormwater detention pond with outflow structure, utility infrastructure (including water and sewer lines), and construction of a portion of the residential development.

Prior to issuance of permits for the Project, El Paso County has requested documentation demonstrating compliance with the Endangered Species Act (ESA), specifically that the project will not adversely affect the federally threatened Preble's Meadow Jumping Mouse (PMJM or Preble's). Core Consultants, Inc. (Core), on behalf of M&S Civil, is herein seeking consultation with the U.S. Fish and Wildlife Service (USFWS or Service) on the likelihood of the Project to impact Preble's. We note that in 2007, in correspondence with the Service, M&S Civil received a "Not Likely to Adversely Affect" (NLAA) status for the Project (see **Appendix I: USFWS PMJM Disqualification Letter**). M&S Civil and Core are herein seeking an updated PMJM disqualification letter for the Project, to serve as supporting documentation for the El Paso County permitting process.

Project Location

The Project encompasses approximately 1,500 acres northeast of the intersection of Vollmer Road and Black Forest Road in unincorporated El Paso County, Colorado. The property is bordered by sparse residential development on the western and southern boundaries, and by mostly undeveloped land to the north and east. Aerial imagery displays a large, approximately 145 acres sand and gravel mining operation in the central portion of the property. There is one principal drainage within the Project, namely Sand Creek, as well as two of its western tributaries. The Project lies within Sections 27, 28, 32, 33, and 34 of Township 13S, Range 65W, and Sections 3, and 4 of Township 12S, Range 65W as referenced from the Public Land Survey System (PLSS).

Previous ESA Consultations

In accordance with recommendations from the USFWS, habitat assessments and other wildlife surveys were initiated in 2007 by Walsh Environmental Scientists and Engineers, LLC (see **Appendix II: Walsh Site Disqualification Report**). An initial desktop review by Walsh revealed that large portions of Sand Creek had been block-cleared for PMJM by the Service. Specifically, the Sand Creek drainage was block-cleared downstream from the southern boundary of the Project Area, approximately 0.5 mile south of Woodmen Road. Additionally, Walsh found the Sand Creek drainage unsuitable habitat for PMJM, as flows are minimal and intermittent and vegetation is sparse with scattered or nominal shrub, grass, and forb coverage. Since 2007, the Service has expanded the PMJM block clearance zone to include the current Project area, which is located in the northeastern portion of the block-clearance zone (see **Appendix III: PMJM Habitat Map**).





Appendix VII:
Sterling Ranch Conceptual Mitigation Plan



CONCEPTUAL MITIGATION PLAN

FOR

STERLING RANCH RESIDENTIAL DEVELOPMENT

EL PASO COUNTY, CO

PROJECT NO. 15-001

PREPARED FOR:

MORLEY-BENTLEY INVESTMENTS, LLC
20 BOULDER CRESCENT, 2ND FLOOR
COLORADO SPRINGS, COLORADO 80903
PHONE: 719-491-0818
CONTACT: VIRGIL SANCHEZ

PREPARED BY:

CORE CONSULTANTS, INC.
1950 W. LITTLETON BOULEVARD, SUITE 109
LAKEWOOD, CO 80228
PHONE: 303-703-4444
CONTACT: CHRIS HAAS, PROJECT MANAGER
CORE PROJECT NUMBER: 15-001

OCTOBER 29, 2015



TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	4
1.0 INTRODUCTION	5
2.0 WATERSHED APPROACH.....	5
3.0 CONCEPTUAL MITIGATION PLAN.....	6
3.1 Objectives.....	6
3.2 Mitigation Area Selection	6
3.3 Mitigation Area Protection	7
3.4 Baseline Information.....	7
3.5 Mitigation Area Preparation.....	8
3.8 Performance Standards and Monitoring Requirements	9
4.0 LONG-TERM MANAGEMENT PLAN.....	11
4.1 <i>Adaptive Management Strategy</i>	12
5.0 GENERAL COMMENTS	13
REFERENCES.....	14



LIST OF APPENDICES

APPENDIX I – *SITE LOCATION MAP*

APPENDIX II– *EXAMPLE DEED RESTRICTION*

APPENDIX III – *MITIGATION PLAN EXHIBIT*



EXECUTIVE SUMMARY

Core Consultants, Inc. (CORE) was retained by Morley-Bentley Investments, LLC (Applicant) to prepare a Conceptual Mitigation Plan for the proposed Sterling Ranch Residential Development. The Project is located in unincorporated El Paso County, Colorado. A single drainage traverses the property from north to south, namely Sand Creek and its western tributaries. The project consists of the development of two attendant road crossings and associated culverts, three off-line stormwater detention ponds with outlet structures, various channel improvements, and the fill of the southernmost western tributary to Sand Creek (Project).

This Executive Summary is intended to be taken in context with the following report and is not designed to be used as a separate document. The following conceptual mitigation plan details proposed mitigation for the loss of 4.21 acres of wetland and 5,046 linear feet of Waters of the U.S. (WOUS), as submitted to the USACE for this project.

This document does not entail an assessment of the potential regulatory status of wetlands, significant bodies of water, watercourses, and/or floodplains located within the Project Area, based on Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. An initial formal wetland delineation of the property was conducted in 2007 and a request for Jurisdictional Determination (JD) was submitted to the U.S. Army Corps of Engineers on June 8, 2007. An approved JD was issued on April 14, 2008 under USACE File No. SPA-2007-00551-SCO that determined the entirety of Sand Creek and its western tributary are jurisdictional.

Project development would result in the permanent impact to wetlands from construction of the road crossings and associated culverts and fill of the western tributary to Sand Creek. Temporary impacts would result from grading to widen the channel and improve overall hydrology. As such, this document proposes a conceptual mitigation plan that would establish 4.21 acres of emergent wetland throughout the Project site. Specifically, wetlands would be reestablished adjacent to the main channel of Sand Creek. This Conceptual Mitigation Plan establishes performance standards that the Applicant will be expected to meet for the duration of the wetland mitigation area monitoring period, defined as five years from the commencement of construction activities. An adaptive management strategy will be used to adjust management practices of the mitigation area on an as-needed basis. Part of the management strategy will include maintaining proper site hydrology, and the removal of invasive and weedy species as necessary in order to promote the growth and healthy functioning of the wetland.



1.0 INTRODUCTION

Core Consultants, Inc. (CORE) was retained by Morley-Bentley Investments, LLC (Applicant) to provide a Conceptual Mitigation Plan for the proposed Sterling Ranch residential development project (Project). The Project is located within the City of Colorado Springs, El Paso County, Colorado. The Project consists of development of two attendant road crossings and associated culverts, three off-line stormwater detention ponds with outlet structures, various channel improvements, and the fill of the southernmost western tributary to Sand Creek (Project). The site encompasses a portion of the main channel of the perennial stream Sand Creek and its southernmost western tributary (western tributary). This report presents the mitigation plan for the establishment and management of wetland mitigation areas on the Sterling Ranch development project which will offset losses of wetlands and waters resulting from Project development.

The Project is located northeast of the intersection of Black Forest Road and Vollmer Road in portions of sections 25, 31, and 33, Township 12 South, Range 65 West (see **Appendix I: Site Location Map**).

The scope of this report is to present a conceptual mitigation plan for mitigation of impacts resulting from development of the proposed Project. An approved JD was issued on April 14, 2008 under USACE File No. SPA-2007-00551-SCO which determined that the entirety of the main channel of Sand Creek and its western tributary are jurisdictional. A formal wetland delineation was conducted on February 5 and March 10 and 11 2015 to quantify impacts from the development of the Project.

2.0 WATERSHED APPROACH

The USACE has indicated that a watershed approach is the preferred form of permittee-responsible compensatory mitigation. As such, the proposed mitigation is to occur within the impacted watershed and is intended to contribute to the sustainability and proper function of the watershed. The project area and proposed mitigation site are located within the Middle Fountain Creek watershed (HUC 1102000303).

Wetlands to be impacted by the Project are located on the northeastern edge of the Fountain Creek watershed. The wetlands and drainages within the project area are hydrologically connected to Fountain Creek drainage approximately 14 miles downstream of the southern boundary of the Project. The Fountain Creek drainage is classified by the USACE as a jurisdictional Section 404 Water Body and a Traditional Navigable Water of the United States.

E. Coli is listed as a primary pollutant concern for the Fountain Creek Watershed (EPA, 2012). Primary needs for the watershed include mechanisms to reduce nutrient and waste runoff



and mechanisms to capture and uptake excess nutrients and waste. The mitigation proposed is anticipated to provide a means to assist in the removal of excess nutrients and prevent additional nutrient runoff through the creation of wetlands. Creation of wetlands will improve local habitats and water quality through improved runoff filtration. Improved water quality within the watershed is expected to result since the proposed mitigation wetlands will be located throughout the main channel of Sand Creek, where wetlands would serve to filter runoff released from proposed off-line detention ponds and any additional runoff not captured by the detention facilities.

3.0 CONCEPTUAL MITIGATION PLAN

An approved JD was issued on April 14, 2008 under USACE File No. SPA-2007-00551-SCO. The JD determined that the entirety of the main channel of Sand Creek and its western tributary should be considered Waters of the U.S. (WOUS). Proposed road crossings of the main channel of Sand Creek (two) and fill of the western tributary would result in 4.21 acres of permanent impacts to jurisdictional wetlands and 5,048 linear feet of WOUS. This plan has been prepared to describe methods of compensation for project-related losses of wetland habitat.

3.1 Objectives

Mitigation for impacts to wetlands and WOUS on the Sterling Ranch project site is proposed within the Middle Fountain Creek watershed. Specifically, mitigation will involve the following:

- Creation of 4.21 acres of emergent wetlands located within and adjacent to the main channel of Sand Creek.
- Channel improvements throughout the main channel of Sand Creek which would allow for construction of wetland channel and reestablishment through natural succession.

3.2 Mitigation Area Selection

Performing mitigation at the site of impacts will allow for mitigation to directly offset the on-site impacts and ensure that mitigation compensates the watershed where impacts occur. Moreover, on-site mitigation ensures that hydrologic and soil conditions are conducive to successful mitigation implementation. Hydrology for the mitigation area will be supplied in part by retained runoff from adjacent properties since three off-line detention ponds would release runoff at three locations approximately equidistant apart throughout the main channel. Soils on the property are identified by the NRCS as hydric. Accordingly, retention of on-site soils will further facilitate the establishment and longevity of the proposed mitigation. Additionally, surface hydrologic connectivity between the mitigation area and



downstream waters will be maintained, while simultaneously providing a mechanism for filtering runoff from the project area and adjacent properties.

The proposed mitigation areas would consist of multiple emergent wetlands within and adjacent to the main channel of Sand Creek. Temporary impacts would result from grading at these locations to widen and broaden the channel where necessary to allow for improved grade and bank stability, thereby increasing the likelihood of wetland success. By establishing the mitigation areas throughout the channel, wetland filtration capacity would be improved while allowing for channel improvements to the main channel and grading for the proposed road crossings and associated culverts. Additionally, wetland mitigation areas would be established at points of greatest impact to facilitate mitigation offsets of impacted wetlands.

3.3 Mitigation Area Protection

Mitigation areas are owned by the Client and access will require permission from the Client. According to the *USACE Guidance for Mitigation and Mitigation Banking in the Albuquerque District* (2005), mitigation areas require protection of the site in the form of a deed restriction, easement, or similar legally-binding document. A deed restriction will be prepared to provide for long-term protection of the mitigation areas. Refer to the example deed restriction provided in **Appendix II**.

3.4 Baseline Information

Proposed mitigation includes development of multiple areas of emergent wetland within and adjacent to the main channel of Sand Creek. The proposed mitigation areas will consist of 4.21 acres of emergent wetland located within and adjacent to the main channel (See **Appendix III: Wetland Mitigation Exhibit**). Wetland mitigation areas will increase wetland filtration capacity and aid in bank stabilization while allowing for channel improvements and grading for the proposed road crossings and culverts. Presently, wetland vegetation is dominant throughout the jurisdictional wetlands within and adjacent to the main channel and consists of Nebraska and beaked sedge (*Carex nebrascensis* and *C. utriculata*), along with Rocky Mountain rush (*Juncus saximontanus*). Other dominant hydrophytes are Arctic rush (*Juncus arcticus*) and redtop (*Agrostis gigantea*). Other common wetland species included panicled bulrush (*Scirpus microcarpus*), saltgrass (*Distichlis spicata*), and switchgrass (*Panicum virgatum*). Construction of the Project would include the loss of 4.21 acres of emergent wetland throughout the site; the proposed mitigation will offset the loss of these wetlands (refer to **Appendix IV**).

3.5 Mitigation Area Preparation

Channel improvements would widen multiple areas adjacent to the main channel. Grading would establish a slope conducive to wetland reestablishment. Reseeding would be utilized as needed to promote wetland revegetation. Historic stream flow velocity and volume would be obtained by improved grade of the channel at areas of greatest erosion and incision. Increased wetland acreage adjacent to the main channel would increase capacity for stormwater filtration, thereby improving water quality. Drainage patterns would be further modified through the development of three off-line detention pond facilities. Detention ponds would release stormwater runoff at historic flow rates through an outlet structure. These mitigation measures would modify hydrology of the channel to create a water level sufficient to create hydric soils within wetland mitigation areas.

Native wetland plant communities would be established within mitigation areas through natural succession. The presence of existing wetlands within close proximity to the proposed wetland mitigation areas would facilitate rapid establishment of wetland vegetation. Additional transplanting of wetland vegetation from neighboring wetlands may be utilized to increase and expedite establishment of vegetative cover if monitoring indicates it is necessary. Additional overseeding and/or the planting of plugs is not expected to be necessary.

3.6 Mitigation Area Work Plan

Mitigation work will begin immediately following the completion of construction activities. Project construction is anticipated to commence in the winter of 2015. Implementation of mitigation is expected to be finalized within two months of the completion of project construction. Construction of access roads and off-line detention ponds is expected to be completed in summer/fall of 2016; restoration and mitigation measures would be completed by late fall/early winter 2016. An estimated schedule for mitigation implementation is outlined below:

- Year 1
 - Grading, clearing, and other site preparation as needed for construction of the wetland mitigation site
 - Documentation of benchmark conditions and seeding of uplands
- Year 2
 - Monitoring and management: set up monitoring locations and collect relevant data, control noxious weeds (if needed), and transplant wetland vegetation from existing on-site wetlands (if needed)



- Years 3, 4, and 5
 - Determine whether performance standards are met and request concurrence
 - If standards are not met, continue monitoring and management until they are met

3.7 Operation and Maintenance

The Applicant will be responsible for the activities at the proposed mitigation areas throughout the life of the facility. The Client, or an authorized representative of the Client, familiar with wetland ecology, will monitor the condition of the mitigation sites and make adjustments on an as-needed basis in accordance with USACE mitigation requirements and permit conditions.

3.8 Performance Standards and Monitoring Requirements

Performance standards will be used to assess the success of mitigation measures implemented in the project area. Performance standards are required and must be met in order for mitigation activities to be approved by the USACE. The mitigation areas will be monitored for a period of five years, or until performance standards are met, whichever comes first. If performance standards are met during the first year of monitoring, additional monitoring will not be required; only sites where standards are not met will continue to be assessed. Performance standards should be met by the end of the five-year monitoring period; if standards are not met within five years, additional monitoring may be required at the request of the USACE.

The mitigation plan for the Sterling Ranch residential development will be determined successful and complete when the following standards of performance are met:

1. Wetland vegetation areas will have a vegetation cover of at least 80 percent, and the vegetation must be composed of at least 50 percent emergent wetland species (i.e., species rated facultative, facultative wetland, or obligate wetland plant species on the National Wetland Plant List). Vegetation maintenance activities for locations not meeting these requirements may include transplanting the appropriate wetland species and eradication of invasive species if necessary.
2. Upland vegetation establishment (if any) will be determined successful when after completion of required monitoring, ground cover of native species is equal to or greater than 85 percent (species rated upland, facultative upland, or facultative plants on the National Wetland Plant List) with less than 1 percent invasive species documented at each monitoring location. Vegetation maintenance activities for sample locations not meeting ground cover requirements will include re-seeding or planting of the appropriate native species and eradication of invasive species if necessary.

3. Coverage of species considered noxious (see **Table 1** below) shall not exceed more than 5 percent of the total vegetative cover within the mitigation area.

TABLE 1. EL PASO COUNTY NOXIOUS WEEDS

LIST A	
Cypress spurge	<i>Euphorbia cyparissias</i>
Dyer's woad	<i>Isatis tinctoria</i>
Bohemian knotweed	<i>Polygonum bohemicum</i>
Giant knotweed	<i>Polygonum sachalinense</i>
Japanese knotweed	<i>Polygonum cuspidatum</i>
Myrtle spurge	<i>Euphorbia myrsinites</i>
Orange hawkweed	<i>Hieracium aurantiacum</i>
Purple loosestrife	<i>Lythrum salicaria</i>
LIST B	
Absinth wormwood	<i>Artemisia absinthium</i>
Bouncingbet	<i>Saponaria officinalis</i>
Bull thistle	<i>Cirsium vulgare</i>
Canada thistle	<i>Cirsium arvense</i>
Chinese clematis	<i>Clematis orientalis</i>
Common teasel	<i>Dipsacus fullonum</i>
Dalmatian toadflax	<i>Linaria dalmatica</i>
Dame's rocket	<i>Hesperis matronalis</i>
Diffuse knapweed	<i>Centaurea diffusa</i>
Hoary cress	<i>Cardaris draba</i>
Houndstongue	<i>Cynoglossum officinale</i>
Leafy spurge	<i>Euphorbia esula</i>
Musk thistle	<i>Carduus nutans</i>
Russian knapweed	<i>Acroptilon repens</i>
Russian olive	<i>Elaeagnus angustifolia</i>
Scentless chamomile	<i>Matricaria perforata</i>
Scotch thistle	<i>Onopordum acanthium</i>
Scotch thistle	<i>Onopordum tauricum</i>



Spotted knapweed	<i>Centaurea maculosa</i>
Salt cedar	<i>Tamarix chinensis</i>
Salt Cedar	<i>Tamarix parviflora</i>
Salt Cedar	<i>Tamarix ramosissima</i>
Yellow toadflax	<i>Linaria vulgaris</i>
LIST C	
Common mullein	<i>Verbascum thapsus</i>
Field bindweed	<i>Convolvulus arvensis</i>
Puncturevine	<i>Tribulus terrestris</i>

El Paso County Noxious Weeds and Control Methods, 2015

Monitoring will be conducted by qualified personnel experienced in wetland ecology and mitigation. Results of monitoring visits will be used to assess and modify maintenance and operations plans as appropriate and implement adaptive management strategies as necessary. Monitoring will entail annual site visits to assess progress in meeting performance standards, and to evaluate establishment, development, and maintenance of the mitigation areas. The mitigation area will be monitored to ensure the establishment of desirable wetland characteristics. To confirm the dominance of emergent wetland species at the wetland mitigation location, standardized transects will be established and monitoring will be conducted each year in the spring. A report detailing the results of each monitoring survey will be submitted to the USACE within 2 months of any site visit. In addition to standardized sampling, the site will be monitored incidentally while walking between sampling points. During incidental observations, areas of concern will be noted, including areas of erosion, significant areas of bare ground, and areas where invasive species have become established. Observations will be included in the annual report and will be considered for maintenance and adaptive management.

Photo monitoring points will also be established in the first year of monitoring in order to document the progress of mitigation areas. Photos will be taken each site visit in the same locations and facing the same direction. Additional photos will be taken as needed to document any concerns or other features not captured in standard site photos. A map will document the locations of sampling transects and photo monitoring points.

4.0 LONG-TERM MANAGEMENT PLAN

Funding for the management of the mitigation plan will be provided by the Applicant/Owner and the Applicant will be responsible for the monitoring and long-term management of the mitigation area. Since the mitigation site will be located on Applicant's property, access to the site can be controlled to protect the area. In addition to regular



monitoring of the site, periodic inspections will be conducted by the Applicant or by Applicant's authorized staff to ensure that the desired site characteristics are being maintained including maintaining proper hydrology through the mitigation area, controlling invasive plants (if any), and other maintenance as needed. If invasive species are detected during inspections, invasive species control measures will be implemented. Where invasive plants are limited, control methods will consist of removal by hand or mechanical methods. If invasive plants become established beyond the ability of mechanical methods to control, chemical control methods will be used. Appropriate herbicides will be selected based on target species and will be applied in accordance with manufacturer and invasive species control recommendations. Herbicide application will not occur when rain is forecasted, or during or immediately following precipitation events to prevent herbicides from washing into sensitive water features. Invasive species control will be conducted in order to minimize impacts to desirable species to the extent practicable. Where significant infestations have occurred, following appropriate control and removal the area will be transplanted with local wetland plant sources, or re-seeded with desirable vegetation. Alternative methods of invasive species control will be utilized as appropriate based on target species. For example, prolonged flooding followed by heavy seeding has been documented to control Johnsongrass (*Sorghum halepense*). Wetland and transitional vegetation will be mowed on an as-needed basis; signage may also be used along the boundaries of the mitigation area identifying the area as such. If control of the development were to transfer to a different entity, that entity would become responsible through the deed restriction for the maintenance and upkeep of the mitigation area.

The principal management concerns for the mitigation area are maintaining suitable hydrology to support wetland growth and maintenance of vegetation including the control of invasive and weedy species. Operation and maintenance activities will generally ensure compliance with the conditions of the USACE permit. Project area management needs will be assessed during monitoring sessions and on an as-needed basis. Operation and maintenance activities will be modified as appropriate in accordance with principles of adaptive management and based on observations during mitigation monitoring activities.

4.1 Adaptive Management Strategy

Adaptive management is a principle of resource management that dictates that management approaches and techniques be flexible to revision and modification based on success in order to meet goals. Management objectives and techniques may be modified in response to feedback such as monitoring results. Adaptive management is based on the idea that we have an incomplete understanding of natural systems, and should allow new information to influence the potential re-evaluation of strategies for management.



Adaptive management is a critical component of this mitigation plan, where maintenance and operation activities will be continually re-assessed and re-evaluated for their effectiveness. Management will be modified as appropriate to ensure performance standards are met, based on monitoring and incidental observations. Potential management modifications or corrective actions that may be taken to ensure standards are met include: alternative vegetation management, modification of hydrology, alternative control measures for invasive species, re-seeding or planting, stabilization for banks or other areas, etc.

Should the compensatory mitigation area fail to meet performance standards as stated in the monitoring plan, corrective action will be taken if necessary/appropriate, corrective action may be taken prior to the end of the monitoring period of five years.

5.0 GENERAL COMMENTS

This report was completed in accordance with generally accepted practices of this profession undertaken in similar studies at the same time and in the same geographical area. This report has been prepared for the exclusive use and reliance of our client (Applicant) for the specific application as discussed, and represents our service to you as of the report date and constitutes our final document; its text may not be altered after final issuance. Findings in this report are based upon the site's current utilization and from other activities described herein; such information is subject to change.

Should you have any questions regarding this or any other matter, please feel free to contact our office at (303) 703-4444.

Sincerely,

CORE Consultants

A handwritten signature in blue ink, appearing to read 'Daniel Maynard'.

Daniel Maynard,
Ecologist

A handwritten signature in blue ink, appearing to read 'Chris Haas'.

Chris Haas,
Project Manager

REFERENCES

Chapman, S.S., Griffith, G.E., Omernik, J.M., Price, A.B., Freeouf, J., and Schrupp, D.L., 2006, Ecoregions of Colorado. Reston, Virginia, U.S. Geological Survey (map scale 1:1,200,000). ftp://ftp.epa.gov/wed/ecoregions/co/co_front.pdf

El Paso County. (2015). *Noxious Weeds and Control Methods*.

Environmental Protection Agency (EPA). 2012. *Watershed Assessment, Tracking, and Environmental Results System*. Available Online at: http://water.epa.gov/scitech/datait/tools/waters/docs/basic_information.cfm Accessed October 2015.

Natural Resources Conservation Service. 2015. List of Hydric Soils.

U.S. Army Corps of Engineers (USACE). 1987. Wetlands Delineation Manual.

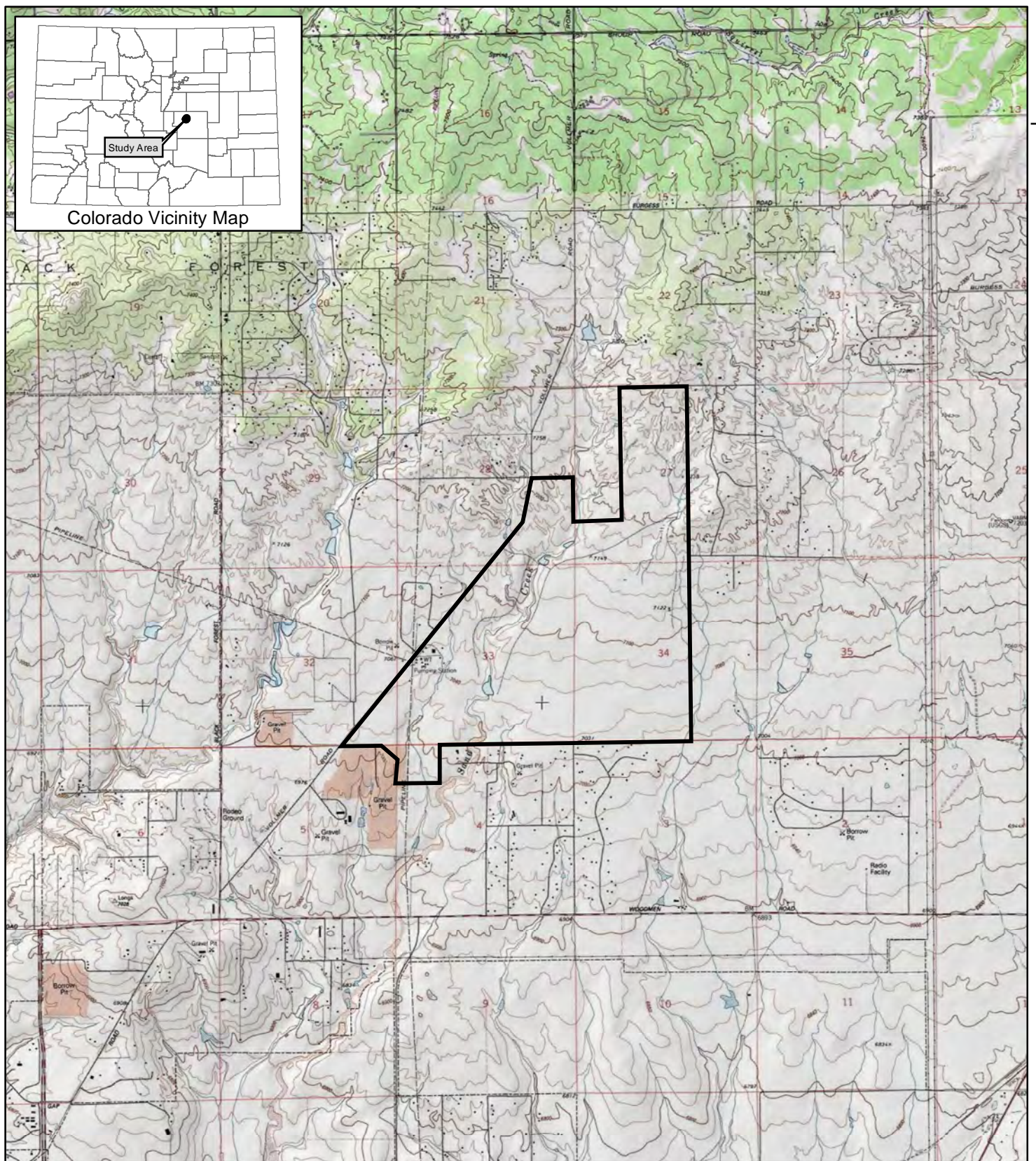
USACE. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2).

USACE. 2013. Regulatory In-lieu fee and Bank Information Tracking System (RIBITS).


USACE. 2005. Guidance for Compensatory Mitigation and Mitigation Banking. Albuquerque District



Appendix I – *Site Location Map*



Sterling Ranch **Site Location Map** El Paso County, Colorado

 Study Area

0 2,000 4,000
 Feet
 1 inch = 4,000 feet

Date: 5/20/2015
 Project #: 15-001



CORE
 CONSULTANTS

CIVIL ENGINEERING
 DEVELOPMENT CONSULTING
 LAND SURVEYING
 303.703.4444
 1950 W. Littleton Blvd., Ste. 109
 Littleton, CO 80120



Appendix II – *Example Deed Restriction*

Appendix II: Deed Restriction

COVENANT OF DEDICATION

(PERMITTEE) now stipulates to the following statements of fact, and further agrees to restrict the use and title of the realty described in Attachment 1 to this document (hereinafter referred to as the "Land") in accordance with the terms and conditions set forth herein.

STIPULATIONS OF FACT

1. That (PERMITTEE) is the applicant for Department of the Army permit number (NUMBER) to place fill material in the wetlands located in (LEGAL DESCRIPTION); and that the U.S. Army Corps of Engineers has regulatory jurisdiction over the discharge of dredged or fill material into said wetlands pursuant to Section 404 of the Clean Water (33 USC 1344).

2. That (PERMITTEE) is the owner in fee of the real estate described in Attach 1.

3. That (PERMITTEE) and the Omaha District of the U.S. Army Corps of Engineers have reached an agreement whereby (PERMITTEE) will be permitted to discharge fill material in wetlands in accordance with the terms and conditions of Department of the Army permit number (NUMBER); and that in consideration for said discharge of fill material in the wetland, (PERMITTEE) will provide mitigation for the adverse environmental effects resulting from the placement of fill material in the wetland by dedicating the realty described in Attachment 1 for perpetual use as a conservancy area in accordance with the terms and conditions of this document and the above-mentioned permit.

4. That the above-mentioned dedication shall consist of the execution of this document by all parties necessary to restrict the use and title of the land; and that this document shall be recorded in the Office of the Register of Deeds for (COUNTY), (STATE).

5. That upon receipt of a certified copy of this document, as recorded in the Office of the County Register of Deeds for (COUNTY), (STATE), the District Engineer of the Omaha District of the U.S. Army Corps of Engineers will issue a validated permit, number (NUMBER) to (PERMITTEE); and that said permit shall be issued in consideration for the execution of this Covenant.

6. That the terms and conditions of this Covenant of Dedication shall, as of the date of execution of this document, bind (PERMITTEE) to the extent of his legal and/or equitable interest in the land; and that this Covenant shall run with the land and be binding on (PERMITTEE) and its successors and assigns forever.

7. That the terms and conditions of this Covenant shall be both implicitly and explicitly included in any transfer, conveyance, or encumbrance of the Land or any part thereof, and that any instrument of transfer, conveyance, or encumbrance affecting all or any part of the Land shall set forth the terms and conditions of this document either by reference to this document or set forth in full text.

DEED AND USE RESTRICTIONS

(PERMITTEE) hereby warrants that he is the owner in fee of the realty described in Attachment 1; and that the Land is hereby dedicated in perpetuity for use as a conservancy area.

(PERMITTEE) hereby agrees to restrict the use and title of the Land as follows:

1. There shall be no construction or placement of structures or mobile homes, fences, signs, billboards or other advertising material, or other structures, whether temporary or permanent, on the land.

2. There shall be no filling, draining, excavating, dredging, mining, drilling or removal of topsoil, loam, peat, sand, gravel, rock, minerals or other materials.

3. There shall be no building of roads or paths for vehicular or pedestrian travel or any change in the topography of the land.

4. There shall be no removal, destruction, or cutting of trees or plants; spraying with biocides, insecticides, or pesticides; grazing of animals, farming, tilling of soil, or any other agricultural activity. Management activities are acceptable upon approval from the Corps.

5. There shall be no operation of all-terrain vehicles or any other type of motorized vehicle on the land.

6. This Covenant of Dedication may be changed, modified or revoked only upon written approval of the District Engineer of the Omaha District of the U.S. Army Corps of Engineers. To be effective, such approval must be witnessed, authenticated, and recorded pursuant to the law of the State of (STATE).

This Covenant needs to be reviewed by the Corps of Engineers prior to signature to assure compliance with permit conditions.

COE representative's initial _____

7. This Covenant is made in perpetuity such that the present owner and its heirs and assigns forever shall be bound by the terms and conditions set forth herein.

By:

(PERMITTEE)

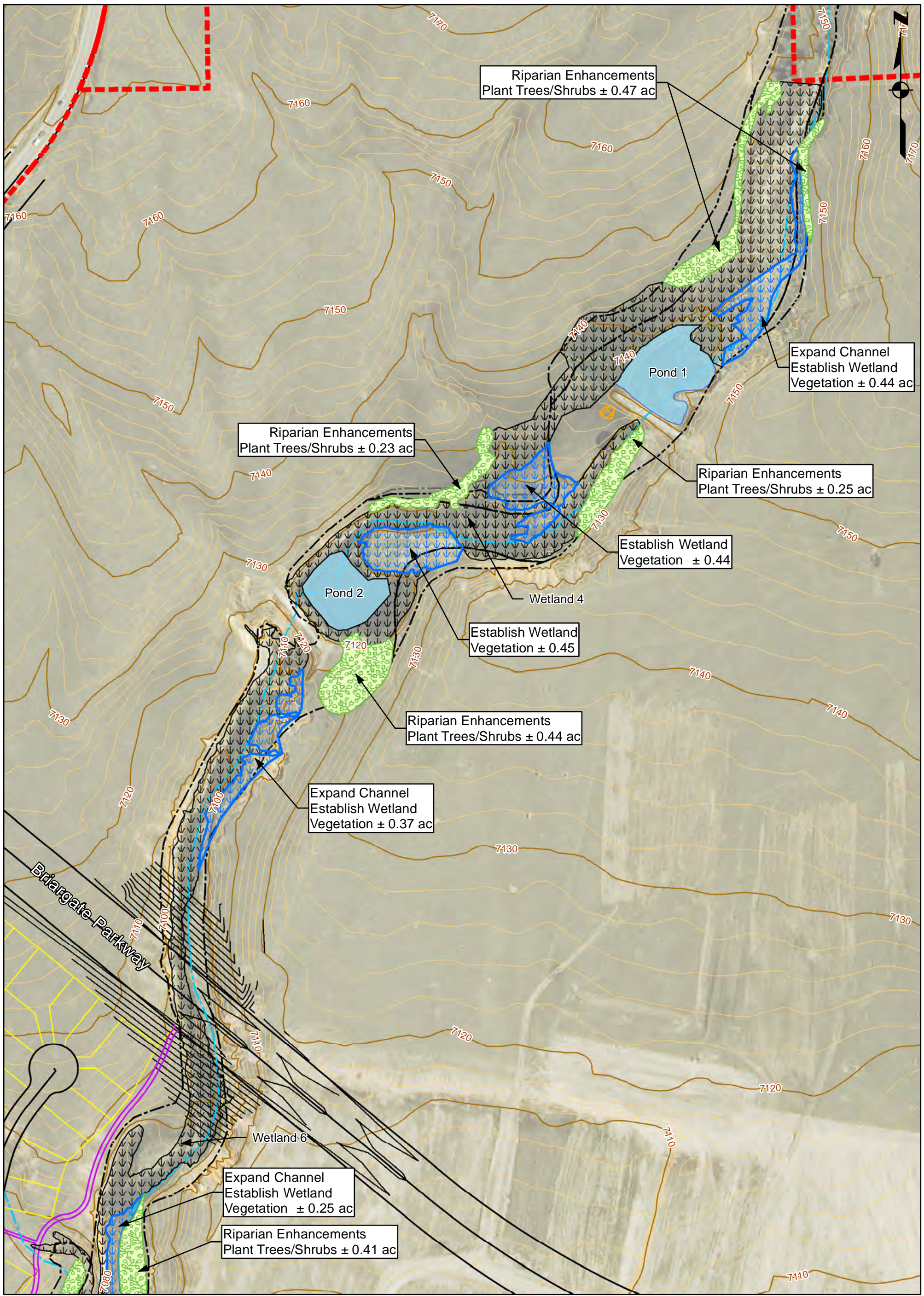
Executed before me this ____ day of _____, 20, by (PERMITTEE) who is personally known to me.

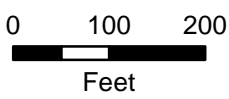
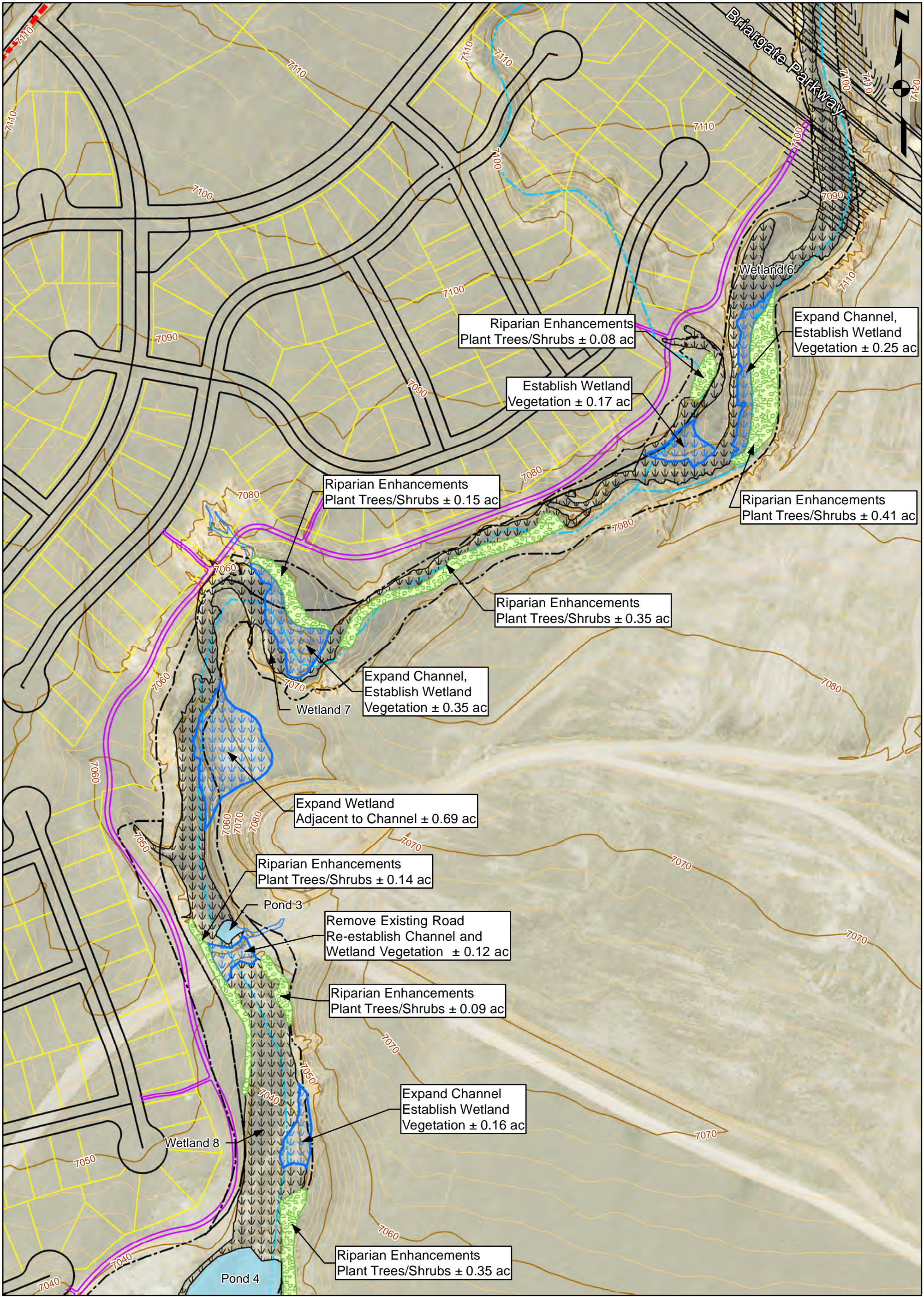
Notary Public

My commission expires _____



Appendix III – *Mitigation Plan Exhibit*





- Potential Riparian Enhancement
- Potential Wetland Mitigation Area
- Existing Wetland

- Pond
- Dry Wash
- Existing Isolated Wetland

- NHD Watercourse
- 100-year Floodplain
- 500-year Floodplain

- Proposed Road
- Proposed Trail
- Proposed Lot Lines
- Proposed Contour

- Index Contour
- Intermediate Contour
- Parcel Boundary



CIVIL ENGINEERING
DEVELOPMENT CONSULTING
LAND SURVEYING
303.703.4444
1950 W. Littleton Blvd., Ste. 109
Littleton, CO 80120

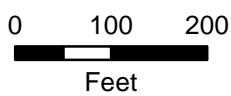
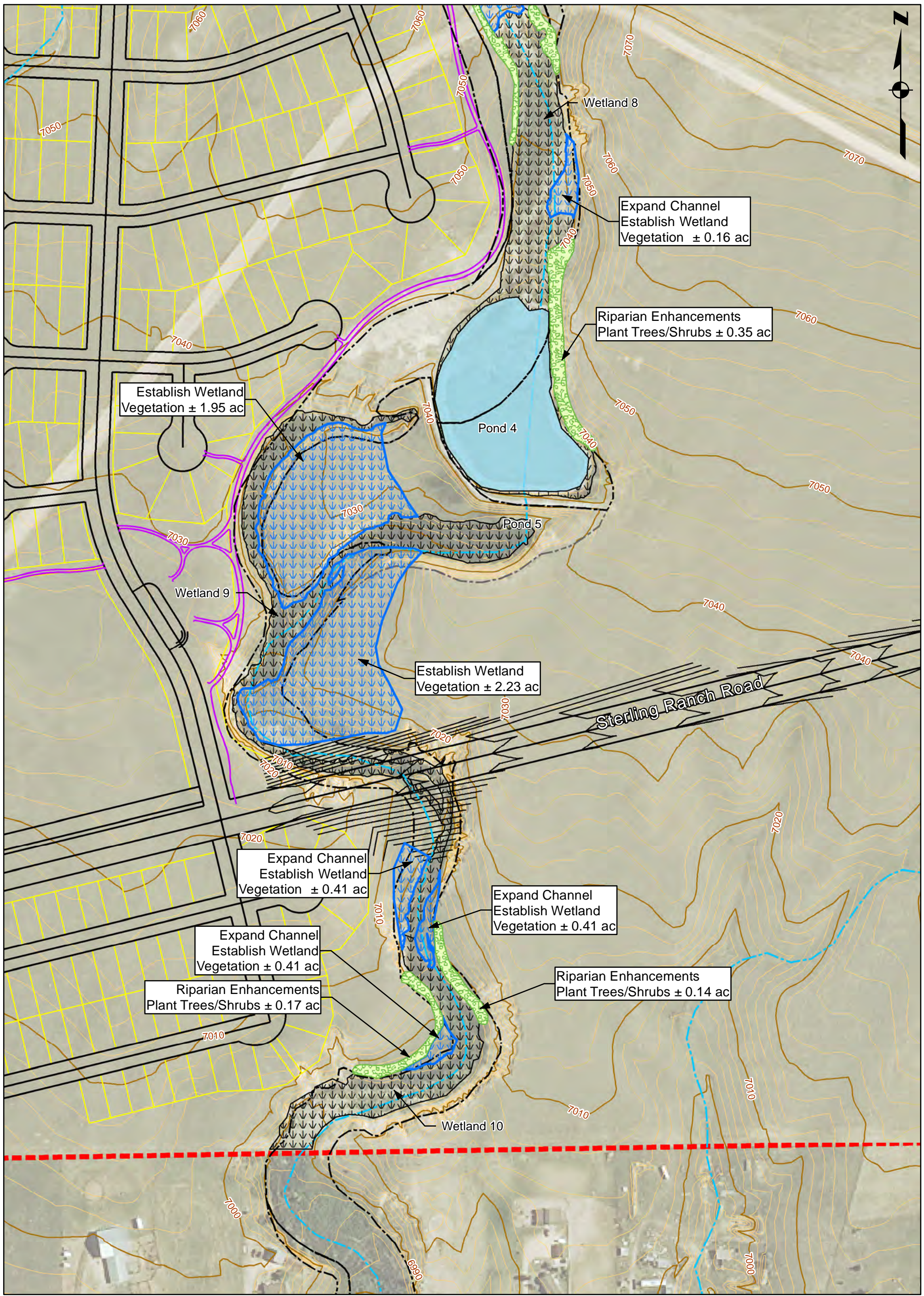
Sterling Ranch

Channel Improvements & Mitigation Plan

Sheet 2

El Paso County, Colorado

Date: 10/13/2015
Project #: 15-001



- Potential Riparian Enhancement
- Potential Wetland Mitigation Area
- Existing Wetland

- Pond
- Dry Wash
- Existing Isolated Wetland

- NHD Watercourse
- 100-year Floodplain
- 500-year Floodplain

- Proposed Road
- Proposed Trail
- Proposed Lot Lines
- Proposed Contour
- Index Contour
- Intermediate Contour
- Parcel Boundary



CIVIL ENGINEERING
DEVELOPMENT CONSULTING
LAND SURVEYING
303.703.4444
1950 W. Littleton Blvd., Ste. 109
Littleton, CO 80120

Sterling Ranch Channel Improvements & Mitigation Plan Sheet 3

El Paso County, Colorado

Date: 10/13/2015
Project #: 15-001



Appendix VIII: *Sterling Ranch Alternatives Analysis*



**ALTERNATIVES ANALYSIS
FOR THE
STERLING RANCH RESIDENTIAL DEVELOPMENT PROJECT
EL PASO COUNTY, COLORADO
PROJECT No. 15-001**

PREPARED FOR:

MORLEY-BENTLEY INVESTMENTS, LLC
20 BOULDER CRESCENT, 2ND FLOOR
COLORADO SPRINGS, COLORADO 80903
CONTACT: VIRGIL SANCHEZ
PHONE: 303-740-9393

PREPARED BY:

CORE CONSULTANTS, INC.
1950 W. LITTLETON BOULEVARD, SUITE 109
LAKEWOOD, CO 80228
PHONE: 719-598-5192
CONTACT: CHRIS HAAS, PROJECT MANAGER
CORE PROJECT NUMBER: 15-001

OCTOBER 15, 2015



TABLE OF CONTENTS

Section	Page
1.0 INTRODUCTION	3
2.0 SITE DESCRIPTION	4
3.0 NEED AND PURPOSE	5
3.1 Project Need	5
3.2 Project Purpose	5
4.0 ALTERNATIVES ANALYSIS	5
4.1 Description of Alternatives	6
4.2 Practicability of Alternatives	10
4.3 Determination of LEDPA	13
5.0 CONCLUSIONS AND RECOMMENDATIONS	17

APPENDICES

APPENDIX I
Site Location Map

APPENDIX II
Aerial Maps



1.0 INTRODUCTION

SR Land, LLC (Applicant) is in the process of permitting a residential development project encompassing approximately 1,444 acres within unincorporated El Paso County immediately adjacent to Colorado Springs, El Paso County, Colorado. The residential development ("Project") is located northeast of the intersection of Vollmer Road and Black Forest Road and is bordered by mostly residential development with the exception of undeveloped agricultural grazing land to the east and north. More specifically, the Project lies within Sections 27, 28, 32, 33, and 34 in Township 12 South, Range 65 West and the northwest portion of Section 4, Township 13 South, Range 65 West. A single drainage system traverses the Project, namely Sand Creek and its two western tributaries.

Project components include the development of multiple single-family residences, associated infrastructure, and channel improvements across the stretch of Sand Creek within the Project area. Proposed infrastructure includes two residential access road crossings and associated culverts (one at Sand Creek, one at its western tributary), three off-line detention ponds, and utility line construction including a water line and sanitary sewer line. Channel improvements would include widening of the channel at multiple locations within the main stem of Sand Creek, resulting in improved hydrology.

Since construction of residential developments invariably increase impervious surface area across the landscape, increased stormwater flows are anticipated within the Sand Creek channel. Sand Creek hydrology is currently considered "poor" within El Paso County (Pikes Peak Regional Stormwater Task Force, 2015). The El Paso County Stormwater Needs Assessment Final Report (CH2MHill, 2013) determined that improved hydrology within Sand Creek is a high priority relative to all other stormwater management priorities within El Paso County (County). Proposed channel improvements would meet these objectives by improving grade control, improving water quality, and reducing erosion and sedimentation downstream of the residential development. Specific improvements include changing grade of banks and broadening of the channel at points of greatest erosion and incision. Because these Project components would result in the unavoidable discharge of fill material into jurisdictional wetlands and/or Waters of the U.S. (WOUS), permit(s) would be required under Section 404 of the Clean Water Act (CWA) of 1972. CORE Consultants, Inc. (CORE) was retained by the Applicant to assist in the Section 404 permitting process, a component of which is the preparation and submittal of an alternatives analysis. CORE prepared this alternatives analysis to inform the U.S. Army Corps of Engineers (USACE) in analyzing practicable and reasonable alternatives to the Project as proposed.

A principal purpose of this alternatives analysis consists of the verification of two key presumptions with regard to Alternatives. The first presumes that alternatives which do not

affect special aquatic sites (defined to include wetlands, riffle pool complexes, and other specific aquatic resources at 40 CFR 204.40-45) are available and satisfy the need of the current Project. The second presumes that practicable alternatives not located in special aquatic sites are preferable because they result in less adverse impact to the aquatic ecosystem. In order for alternatives to be considered less viable than the current proposal, these presumptions must both be rebutted in the analysis. As such, this alternatives analysis will show that alternatives to the proposed Project would not be less impactful, nor are alternatives that do not affect special aquatic sites available. Furthermore, this analysis will demonstrate that all reasonable alternatives have been considered, and that the Project as originally/currently proposed is the Least Environmentally Damaging Practicable Alternative (LEDPA) as required under Section 404 and the National Environmental Policy Act (NEPA).

2.0 SITE DESCRIPTION

The Project consists of 5,407 development units (du), a firehouse, elementary school, associated infrastructure, and channel improvements within 1,444 acres of unincorporated land immediately adjacent to Colorado Springs, El Paso County, Colorado. Specifically, the Project is located northeast of the intersection of Vollmer Road and Black Forest Road and is bordered by mostly residential development with the exception of undeveloped agricultural grazing land to the east and north. A single drainage traverses the Project, namely Sand Creek and its two western tributaries. See **Appendix I: Sterling Ranch Site Location Map**.

The Project is located in central Colorado along the foothills of the Rocky Mountains within the Foothill Grasslands (Level IV Ecoregion) of the Southwestern Tablelands Level III Ecoregion (Western Ecological Division - US EPA, 2006). Topography of the Project area consists of gently sloping terrain with elevations ranging from approximately 6,980 to 7,290 feet above mean sea level (AMSL). The USGS 7.5 Minute Topographic map – Falcon NW Quadrangle indicates the property generally sloping from higher elevation in the northeast portion of the property to lower elevations in the southwest (USGS 1965, revised 1994). Dense herbaceous wetland coverage occurs throughout most of the main stem and its western tributary. Special aquatic sites were documented throughout the main channel of Sand Creek and its western tributaries. Wetlands on site were described as emergent wetlands within a riverine channel with a defined bed and bank and/or isolated emergent wetlands in the vicinity of the main channel or its western tributaries.

Ongoing residential expansion and incorporation of land into the City of Colorado Springs has increased stormwater runoff to Sand Creek, resulting in severe incision and degradation throughout the main channel (CH2MHill, 2013).

3.0 NEED AND PURPOSE

Preparation of an alternatives analysis begins with describing the need for and defining the purpose of a project. Need and purpose are critical to the alternatives analysis because they provide a framework for the project and allow for a critical discussion of specific development alternatives. They are interdependent terms: a project's purpose is formulated to address a specific need.

3.1 Project Need

The project need is simple and twofold: (1) to satisfy market demands for additional housing in Colorado Springs (City), El Paso County, based on recent County and City economic development reports (Southern Colorado Economic Forum, 2012), and (2) to address a County-wide high-priority stormwater management project while simultaneously managing an increase in stormwater runoff to Sand Creek via channel improvements.

3.2 Project Purpose

The purpose of the Project will satisfy need through the development of a medium sized single-family residential development and associated facilities and infrastructure on multiple parcels of land which will be incorporated into the City. Development of the residential units would result in an increase in impermeable surface area and therefore a simultaneous increase in stormwater runoff. Channel improvements and associated detention pond facilities would satisfy the need to capture an increase in stormwater runoff and address the need to improve the hydrology and stormwater capability of Sand Creek. Hydrology would be improved through control of flood water conveyance, establishing improved grade control, and improving water quality within the stream channel. The alternatives described below address possible alternatives that would practicably satisfy Project need and purpose in a less environmentally damaging manner.

4.0 ALTERNATIVES ANALYSIS

Alternatives to the original proposal are considered and discussed in depth in this section. It can be assumed that the alternatives listed below constitute the "universe of alternatives," that is, the entirety of possible alternatives available that may be considered practicable and reasonable, while meeting the stated purpose of the project. Alternatives are categorized as Preferred (i.e. applicant's preferred option), No Action Alternative, On-site, and Off-site, and each is described. Each Alternative is then screened for practicability; any option that is not found to be practicable is eliminated from consideration. Finally, the LEDPA is determined from the list of remaining options, and

presented for consideration by the USACE. A permit may be issued only if the USACE concurs with the determination of the LEDPA presented herein.

4.1 Description of Alternatives

Alternatives to the proposed Sterling Ranch Residential development project that are under consideration are presented below. The applicant's preferred alternative is presented first, which entails the Project as described above. Second, a No Action Alternative (NAA) is included which involves no discharge of material into wetlands or WOUS. The NAA would reduce residential units so that impacts to jurisdictional waters are avoided. Four additional alternatives are presented which would avoid or significantly reduce impacts to special aquatic sites. Two additional on-site alternatives and three off-site alternatives are detailed below. The seven total alternatives represent the universe of alternatives considered that would satisfy the need and purpose of this Project. Aerial maps of the locations of each alternative are provided in **Appendix II: Aerial Maps**.

Alternative 1

Alternative 1 consists of construction of the residential development, associated infrastructure, and stream channel improvements as originally and currently proposed. Coordinates for the Project are latitude 38.962389 N and longitude 104.675084 W. The Project parcels are 5200000364, 5228000030, 5228000031, 5233000008, and 5300000173 which are currently zoned for agricultural grazing with the exception of parcel number 5200000364 which is vacant. The site also includes parcel 5233000009 (zoned agricultural grazing) for the purpose of channel improvements along the east bank of Sand Creek. Jurisdictional wetlands and WOUS are located throughout the stretch of Sand Creek and its tributaries within the Project site and account for 21.42 acres and 11,297 linear feet within this property. Proposed impacts would occur within the main stem of Sand Creek and its southernmost western tributary, as well as a single isolated wetland in the vicinity of the affected western tributary. Refer to the *Sterling Ranch Wetland Delineation Report* in **Appendix V** of the *Sterling Ranch Individual Permit Application* (IP) for wetland locations. The preferred alternative would result in permanent impacts to 4.21 acres and 5,048 linear feet of jurisdictional wetlands and WOUS. Construction of residential units would result in permanent impacts to 2.78 acres and 3,522 linear feet of jurisdictional wetlands and WOUS. Road crossings and culverts would account for 1.43 acres and 1,526 linear feet of impacts. Three off-line detention ponds would not result in permanent impacts to special aquatic sites.

A review of the USFWS Information, Planning and Conservation (IPaC) System provided information regarding federally listed threatened and endangered species (TES) in the region. A total of four species were flagged in the IPaC query: Mexican spotted owl (*Strix occidentalis lucida*), Preble's meadow jumping mouse (*Zapus hudsonius preblei*), greenback cutthroat trout (*Oncorhynchus clarkii stomias*), and Ute ladies'-tresses Orchid



(*Spiranthes diluvialis*). A TES assessment of the Project was conducted in April 2015 which concluded that the Project and immediate vicinity lacked suitable habitat for the species listed above, and impacts were not anticipated. Refer to **Appendix VI** of the *Sterling Ranch Individual Permit Application* for a review of TES resources.

Alternative 2

Alternative 2 is a No Action Alternative, which proposes to construct the residential development to avoid any impacts to special aquatic sites. Jurisdictional wetlands and WOUS account for 21.42 acres and 11,297 linear feet within this property. Project parcels are 5200000364, 5228000030, 5228000031, 5233000008, and 5300000173 which are currently zoned for agricultural grazing with the exception of parcel number 5200000364 which is vacant. The site also includes parcel 5233000009 (zoned agricultural grazing) for the purpose of channel improvements along the east bank of Sand Creek. Coordinates are latitude 38.962389 N and longitude 104.675084 W. The NAA would reduce the number of residential units so that fill of the western tributary would be avoided. Roads would be constructed using clear span bridges to avoid any impacts at crossing points. Refer to the *Sterling Ranch Wetland Delineation Report* in **Appendix V** of the *Sterling Ranch Individual Permit Application* for wetland locations. Detention ponds would be constructed as proposed since off-line ponds do not impact jurisdictional waters. Stormwater runoff would be directed to Sand Creek at historic flow rates. Minimal additional infrastructure needs are anticipated beyond those already planned for the residential development, as stream channel stabilization measures would not be implemented. Improved channel hydrology would not be addressed in the NAA which would result in continued degradation, erosion, and sedimentation of the Sand Creek drainage.

A review of the USFWS IPaC System provided information regarding federally listed threatened and endangered species (TES) in the region. A total of four species were flagged in the IPaC query: Mexican spotted owl (*Strix occidentalis lucida*), Preble's meadow jumping mouse (*Zapus hudsonius preblei*), greenback cutthroat trout (*Oncorhynchus clarkii stomias*), and Ute ladies'-tresses (*Spiranthes diluvialis*). A TES assessment of the Project was conducted in April 2015 which concluded that the Project and immediate vicinity lacked suitable habitat for the species listed above, and impacts were not anticipated.

Alternative 3

Alternative 3 drastically reduces the impacts to special aquatic sites through a major re-platting of housing lots. The Applicant would redesign the lot layout so that all residential units are located on the east side of Sand creek which would avoid fill of the western tributary. Alternative 3 would require a higher density of development units per acre to satisfy the need of the Project. As such, condominium units would replace some single family units to account for this increase in housing density. Wetlands and WOUS are present throughout this reach of Sand Creek. Jurisdictional wetlands and WOUS account for 21.42 acres and 11,297 linear feet within this property. Impacts would be drastically reduced;



however, specific impacts would need to be calculated by the Applicant's engineer design team. Refer to the *Sterling Ranch Wetland Delineation Report* in **Appendix V** of the IP application for wetland locations. This alternative would still require detention ponds for the anticipated increase in stormwater runoff from an increase in impermeable surface area. Coordinates for alternative 3 are latitude 38.963094 N and longitude 104.666144 W. The parcel number is 5233000009 and is owned by the Applicant. Current zoning is agricultural grazing. Minimal additional infrastructure needs are anticipated beyond those already planned for the residential development as detention ponds and roads would be constructed for this alternative. However, redesigning the development to accommodate this alternative will require significant changes in project engineering and planning and impacts to special aquatic sites are still anticipated, though the extent of these impacts cannot be predicted prior to redesign.

A review of the USFWS IPaC System provided information regarding federally listed threatened and endangered species (TES) in the region. A total of four species were flagged in the IPaC query: Mexican spotted owl (*Strix occidentalis lucida*), Preble's meadow jumping mouse (*Zapus hudsonius preblei*), greenback cutthroat trout (*Oncorhynchus clarkii stomias*), and Ute ladies'-tresses (*Spiranthes diluvialis*). A TES assessment of the Project was conducted in April 2015 which concluded that the Project and immediate vicinity lacked suitable habitat for the species listed above, and impacts were not anticipated.

Alternative 4

Alternative 4 would include construction of an underground stormwater detention system. Environmental Protection Agency (EPA) guidance suggests that underground stormwater retention/detention systems can be effective at slowing runoff flows during peak flow events, ensuring that the waters receiving runoff (i.e. Sand Creek) are not adversely impacted during these events (EPA 2001). Design specifications of the underground detention system are not known at this time and would need to be addressed by the Project engineer. Alternative 4 would reduce impacts to jurisdictional waters by negating the need for channel improvements to the main stem of Sand Creek. Jurisdictional wetlands and WOUS are present throughout this reach of Sand Creek and account for 21.42 acres and 11,297 linear feet within this property. Impacts would be drastically reduced; however, specific impacts would need to be calculated by the Applicant's engineering and design team. Refer to the *Sterling Ranch Wetland Delineation Report* in **Appendix V** of the Project's IP application for wetland locations. Coordinates for Alternative 4 are latitude 38.962389 and longitude -104.675084. Alternative 4 would utilize the same parcels 5200000364, 5228000030, 5228000031, 5233000008, and 5300000173 which are currently zoned for agricultural grazing with the exception of parcel number 5200000364 which is vacant. The site also includes parcel 5233000009 (zoned agricultural grazing) for the purpose of channel improvements along the east bank of Sand Creek. Infrastructure needs would include a ditch system that would redirect stormwater to a collection system that would empty into

the underground detention system, and underground access for the purpose of maintenance.

A review of the USFWS IPaC System provided information regarding federally listed threatened and endangered species (TES) in the region. A total of four species were flagged in the IPaC query: Mexican spotted owl (*Strix occidentalis lucida*), Preble's meadow jumping mouse (*Zapus hudsonius preblei*), greenback cutthroat trout (*Oncorhynchus clarkii stomias*), and Ute ladies'-tresses (*Spiranthes diluvialis*). A TES assessment of the Project was conducted in April 2015 which concluded that the Project and immediate vicinity lacked suitable habitat for the species listed above, and impacts were not anticipated.

Alternative 5

The second of three off-site alternatives is the acquisition of parcel number 5200000324 east of the Project site. The parcel is currently owned by Marksheffel Woodmen, LLC. Coordinates for this alternative are: latitude 39.522922 N and longitude 104.980627 W. Current zoning is agricultural grazing. Jurisdictional waters are likely present as tributaries to the east fork of Sand Creek traverse the parcel; however, the NWI does not identify any wetlands within the parcel. Impacts would be determined following design of residential units within the aforementioned alternative parcel. However, required infrastructure would be similar to that required of the preferred alternative. That is, infrastructure to support the residential developments as well as channel improvements would likely be required.

A review of the USFWS IPaC System provided information regarding federally listed threatened and endangered species (TES) in the region. A total of four species were flagged in the IPaC query: Mexican spotted owl (*Strix occidentalis lucida*), Preble's meadow jumping mouse (*Zapus hudsonius preblei*), greenback cutthroat trout (*Oncorhynchus clarkii stomias*), and Ute ladies'-tresses (*Spiranthes diluvialis*). Desktop review of aerial imagery indicates that habitat is not present for Mexican spotted owl or greenback cutthroat trout. An on-site TES assessment of the alternative parcel would be required to determine the presence or absence of habitat characteristics required by Preble's meadow jumping mouse or Ute ladies'-tresses.

Alternative 6

The final off-site option proposes to allow stormwater runoff to flow into Sand Creek and divert approximately 1.7 miles downstream out of the drainage channel and into an adjacent wastewater collection facility associated with the Britton Nursery. The Britton Nursery wastewater collection facility lies within parcel number 5308000101; coordinates of the collection facility are latitude 38.934162 N and 104.687834 W. Zoning for the parcel is special use. Two NWI wetlands (freshwater ponds) are present within the parcel totaling approximately 0.50 acre, as well as a span of Sand Creek approximately 0.12 mile in length. Aerial imagery confirms that no wetlands are present. However, one NWI wetland (freshwater pond) sits within the larger detention facility. Release of stormwater runoff to the



detention facility would not impact the wetland since it has been incorporated into the larger footprint of the detention facility. Additional required infrastructure would include an outlet structure at the redirection point. Infrastructure for this endeavor would require a major design effort that would allow for redirection of anticipated flows from the Sterling Ranch development while still allowing historic flows to continue down the Sand Creek channel, downstream of the redirection point.

A review of the USFWS IPaC System provided information regarding federally listed threatened and endangered species (TES) in the region. A total of four species were flagged in the IPaC query: Mexican spotted owl (*Strix occidentalis lucida*), Preble's meadow jumping mouse (*Zapus hudsonius preblei*), greenback cutthroat trout (*Oncorhynchus clarkii stomias*), and Ute ladies'-tresses (*Spiranthes diluvialis*). Desktop review of aerial imagery indicates that habitat is not present for Mexican spotted owl or greenback cutthroat trout. A TES assessment of the alternative parcel would be required to determine the presence or absence of habitat characteristics required by Preble's meadow jumping mouse or Ute ladies'-tresses.

4.2 Practicability of Alternatives

Alternatives were considered from several perspectives, and each was subjected to a series of practicability screenings. **Table 1** below presents an alternatives comparison matrix for practicability of each option, and was used to eliminate any option that was unable to pass all practicability screens. At the conclusion of practicability screening, four of the six possible alternatives were deemed impracticable, and were eliminated from the pool of alternatives under consideration.

Table 1. Practicability Matrix for Sterling Ranch Residential Development Project

PRACTICABILITY CATEGORY	Project	Available	Logistics				Existing Technology	Cost
FACTOR		Available for Acquisition?	Sufficient Parcel size?	Existing Zoning Appropriate & Potential for Zoning Change?	Availability of Utilities?	Availability for Access?	Topography and Other Site Conditions Feasible for Construction?	Reasonable Acquisition Costs (non-exorbitant)?
Alternative 1 (Applicant's Preferred)	Current project	YES - Applicant owns the parcel	YES-1,444 acres	YES - Agricultural Grazing Zoning; can be converted	YES - Adjacent to site	YES - County ROW northwest of property; applicant owns properties to east of County ROW	YES-excess stormwater would drain to Sand Creek as a result of natural contours and hydrology improved through channel improvements	YES - Applicant owns the parcel
Alternative 2 (No Action Alternative)	Project as designed with no impacts to Sand Creek or western tributary and reduction in units	YES - Applicant owns the parcel	NO- reduction in units would not satisfy Project need	NO-failed feasibility screening	NO-failed feasibility screening	NO-failed feasibility screening	NO-failed feasibility screening	NO-failed feasibility screening
Alternative 3 (On-site)	Redesign that would move lots from west of Sand Creek to east side; avoid filling of western tributary	YES - Applicant owns the parcel	YES - 259.32 acres	NO- violates zoning and terms of PUD; can't build condos where SF homes are platted	NO-failed feasibility screening	NO-failed feasibility screening	NO-failed feasibility screening	NO-failed feasibility screening

PRACTICABILITY CATEGORY	Project	Available	Logistics				Existing Technology	Cost
FACTOR		Available for Acquisition?	Sufficient Parcel size?	Existing Zoning Appropriate & Potential for Zoning Change?	Availability of Utilities?	Availability for Access?	Topography and Other Site Conditions Feasible for Construction?	Reasonable Acquisition Costs (non-exorbitant)?
Alternative 4 (On-site)	Construct EPA recommended underground stormwater detention system	YES - Applicant owns the parcel	YES - 166.77 acres	YES - Agricultural Zoning; can be converted	YES - Adjacent to site	YES - County ROW northwest of property; applicant owns properties to east of County ROW	YES - With use of underground stormwater retention system	YES-cost to build underground detention system comparable to other, similar systems
Alternative 5 (Off-site)	Move to parcel east (outside project boundary not owned by applicant, impacts to tributary of E Fork Sand Creek)	MAYBE- Owned by other investor	YES - 231.08 acres	YES - Agricultural Zoning; can be converted	YES - Adjacent to site	YES - County ROW north of property	YES - pond in place on site within channel of tributary to E fork of Sand Creek	NO-Already platted by different developer
Alternative 6 (stormwater off-site)	Stormwater to flow downstream until Britton Nursery where would be redirected to nursery detention pond	YES - Applicant owns the parcel	NA-residential development does not move	YES - Agricultural Grazing Zoning; can be converted	YES - Adjacent to site	YES - Adjacent to site	NO - stormwater would drain to Sand Creek until redirection point at Britton Nursery; Britton Nursery denied access	NO-failed feasibility screening

Practicability screening determined that alternatives 2, 3, 5, and 6 are not feasible. Alternative 2 (NAA) does not satisfy Project need since a reduction in homes does not satisfy the growing housing economy within the City of Colorado Springs, as indicated by the Southern Colorado Economic Forum (2011). Since a reduction in number of homes would not satisfy the Project need due to a decrease in parcel size, Alternative 2 was eliminated.

Alternative 3 was eliminated since it directly violates zoning and terms of the Planned Unit Development (PUD). Specifically, planning areas east of Sand Creek include multiple development units requiring single family homes. To satisfy the Project need for additional housing in the City of Colorado Springs, the PUD identifies a specific number of single family homes within approximately 850 acres of Project area. Moving planning areas platted for single family units from the west side of Sand Creek to the east side of Sand Creek would require a conversion of multiple single family units to condominium units. Conversion of planning areas from single family designation to condominium unit designation is not allowed within the current PUD and violates zoning for the development.

Alternative 5 proposed reviewing parcel number 52000000324 for potential relocation of the Sterling Ranch residential community. The parcel is owned by Marksheffel Woodmen, LLC. The Applicant inquired of this owner regarding the possibility for acquisition of the parcel. The parcel, however, is currently platted for additional development by its current owner. Alternative 5 was eliminated due to its unavailability for acquisition. Furthermore, this alternative would not satisfy the Project need because it would merely replace one residential development identified as necessary to the growing housing need in the City with another.

Alternative 6 proposed diverting stormwater to the wastewater detention facility associated with Britton Nursery on parcel 5308000101. Britton Nursery denied the request to incorporate stormwater runoff from the Sterling Ranch residential development into their facility. Therefore, Alternative 7 was eliminated since the associated parcel is prohibited from access.

Following elimination of Alternatives 2, 3, 5, and 6, one Alternative (Alternative 4) plus the original Project design remain from which to determine the LEDPA. Although Alternative 4 passed the practicability screening, the following discussion will demonstrate that Alternative 1, the Applicant's original, preferred alternative, remains the LEDPA. Since Sand Creek is a high-priority drainage for channel stabilization and stormwater runoff improvement (CH2MHill, 2013), any alternative that addresses this need would be ecologically preferred during LEDPA determination. Alternative 4 (underground stormwater detention system) would require a redesign that would include additional engineering efforts to construct a system capable of capturing and detaining runoff from a 1,444 acre development area. Further, maintenance and access issues would require additional costs beyond construction of the system, including development of an appropriate outlet

structure and permanent access points underground. Nevertheless, Alternative 1 (preferred) and Alternative 4 passed all practicability screens and were analyzed to determine which would be the least environmentally damaging. A discussion of the criteria used in this determination follows.

4.3 Determination of LEDPA

According to the USACE's guidance on the preparation of an alternatives analysis, a proposed alternative (including the applicant's original option) cannot be approved unless it is found to be the least environmentally damaging of all the practicable options. **Table 2** below presents a comparison of the anticipated impacts from development of each of the alternatives, plus the original project design. Impact comparison examines several environmental factors, including effects to wetlands, WOUS, open water, TES, floodplains, and any secondary impacts not otherwise addressed. A discussion of each alternative in reference to impact categories follows.

Table 2 – Environmental Factor Matrix

Environmental Factors	Alternative 1 – Applicant's Preferred Alternative	Alternative 4 – Underground Stormwater Detention System
Wetland Impacts	4.21 acres	2.61 acres
Impacts to Waters of the U.S.	5,048 linear feet	4,834 linear feet
Open Water Impacts	0.0 acres	2.61 acres
Impacts to Federally Listed TES	No	No
Floodplain Upland Impacts (Acres)	2.27 acres	2.27 acres
Secondary Impacts from electing another Alternative	0.0 acres 0.0 linear feet	High – continued sedimentation, erosion, flash scouring events, degradation, etc. to main channel of Sand Creek
LEDPA	Yes	No

4.3.1 Wetlands and Open Waters

Alternative 1 (Preferred Alternative)

The preferred alternative permanently impacts 4.21 acres of jurisdictional waters and temporarily impacts 0.87 acres for the purpose of widening and improving the channel where stormwater runoff has steeply incised and eroded the banks of the main channel. Additional temporary impacts would result from the installation of the water transmission line and sanitary sewer line. The complete Project would result in 1.410 acres of temporary impacts. The City and County consider stabilization and hydrological improvement of Sand

Creek a high priority in overall stormwater management (CH2MHill, 2013). As residential development increases, main drainages within the County have experienced higher than historic flow rates as volume and energy of stormwater flow increased from the expansion of impermeable surfaces associated with residential development. Alternative 1 improves the hydrology of Sand Creek in a number of ways:

- 1) Widening and broadening of the channel in sections of deep incision decreases energy of stormwater runoff since flow velocity is reduced across a broader channel.
- 2) Widening of the channel will also mitigate for wetland impacts through wetland revegetation in graded areas. In addition, the wider channel will result in a decrease in the loss of soils from channel incision/flooding/scouring, allowing for a net increase in wetland vegetation in the Sand Creek watershed.
- 3) Three off-line stormwater detention ponds would detain stormwater runoff from the Sterling Ranch development. A low-flow trickle channel and outlet structure will release stormwater into the channel at historic flow rates. Developing detention ponds off-line prevents additional temporary and permanent impacts to the channel while still allowing for a controlled release of stormwater runoff. A controlled release of stormwater would maintain historic flows, thereby reducing scouring from unregulated flows and further reducing sedimentation downstream.

Alternative 4

Alternative 4 would result in permanent impacts to 2.61 acres and 4,384.4 linear feet of jurisdictional wetlands and WOUS, respectively. However, it does not address the need for channel improvements to Sand Creek. Similar to the preferred alternative, the underground detention system would release stormwater runoff into Sand Creek at historic flow rates. However, the underground detention system would do nothing to address the Project need for improving hydrology of the Sand Creek drainage. Alternative 4 would capture stormwater runoff produced by the adjacent residential development only. Stormwater runoff from further upstream would continue to destabilize banks, scour vegetation, and deposit sediment further downstream which would, in turn, maintain poor water quality throughout the drainage. Since improved stormwater management of Sand Creek is a high priority within the City and County, any residential development associated with Sand Creek should consider channel improvements as inclusive of the project. Since Alternative 4 does not improve Sand Creek's water quality or aquatic functionality long-term it is a more environmentally damaging option for wetlands and waters than the preferred alternative.

4.3.2 TES

Alternative 1

A review of the USFWS Information, Planning and Conservation (IPaC) System provided information regarding federally listed threatened and endangered species (TES) in the region. A total of four species were flagged in the IPaC query: Mexican spotted owl (*Strix occidentalis lucida*), Preble's meadow jumping mouse (*Zapus hudsonius preblei*), greenback cutthroat trout (*Oncorhynchus clarkia stomias*), and Ute ladies'-tresses (*Spiranthes diluvialis*). A TES assessment of the Project was conducted in April 2015 which concluded that the Project and immediate vicinity lacked suitable habitat for the species listed above, and impacts were not anticipated.

Alternative 4

A review of the USFWS Information, Planning and Conservation (IPaC) System provided information regarding federally listed threatened and endangered species (TES) in the region. A total of four species were flagged in the IPaC query: Mexican spotted owl (*Strix occidentalis lucida*), Preble's meadow jumping mouse (*Zapus hudsonius preblei*), greenback cutthroat trout (*Oncorhynchus clarkia stomias*), and Ute ladies'-tresses (*Spiranthes diluvialis*). A TES assessment of the Project was conducted in April 2015 which concluded that the Project and immediate vicinity lacked suitable habitat for the species listed above, and impacts were not anticipated.

4.3.3 Floodplain Upland Impact

Alternative 1

The main channel of Sand Creek within the Project area is bounded by FEMA Zone A floodplain. The upland area adjacent to the channel is included within the Zone A floodplain. The preferred alternative includes two road crossings and associated culverts (see **Appendix IV** of the *Sterling Valley Individual Permit Application* for preliminary lot layouts and design). The road crossings would impact 2.27 acres of upland floodplain for the purpose of fill deposition to support the road and culvert installation. Although the preferred alternative impacts upland floodplain, channel improvements to Sand Creek would ultimately preserve floodplain through improved water quality, thereby decreasing sedimentation of the floodplain further downstream. Proposed channel improvements would also broaden the channel which would protect against future floodplain loss within the Sand Creek channel. The preferred alternative would allow for bank and channel stabilization within the Project. Since improved stormwater management of Sand Creek is a high priority within the City and County, any residential development associated with Sand Creek should consider channel improvements as inclusive of the project. Therefore, in terms of floodplain impacts, the preferred Alternative is again considered the LEDPA.



Alternative 4

Alternative 4 would not eliminate direct impacts to the floodplain since road crossings and associated culverts would remain in the Project design. Constructing an underground retention system would impact 2.27 acres of upland floodplain for the purpose of developing road crossings and associated culverts across the main channel of Sand Creek. Alternative 4 does eliminate temporary and permanent impacts to jurisdictional waters since the off-line detention ponds and channel improvements would not be completed. However, elimination of channel improvements and off-line detention ponds would ultimately result in higher impacts to the floodplain through continued degradation of the channel and sedimentation downstream. Since Alternative 4 would more negatively impact the aquatic ecosystem of Sand Creek than the preferred alternative, it cannot be considered the LEDPA.

5.0 CONCLUSIONS AND RECOMMENDATIONS

In conclusion, out of the universe of six project alternatives, only two were deemed practicable under the USACE's criteria for practicability screening. From these options, the LEDPA was calculated using a basic summation of total impacts to wetlands/WOUS for each option. In addition, consideration was given to the positive (i.e. ecologically beneficial) impacts resulting from development of an alternative, and to the possible negative (ecologically harmful) impacts to the aquatic ecosystem of Sand Creek, including satisfying the need to improve hydrology and water quality of the Sand Creek watershed. Based upon these analyses, Alternative 1, the applicant's original and preferred proposed alternative, was selected as the LEDPA.

On behalf of the Applicant, CORE Consultants hereby request the USACE's review of the alternatives presented herein. In addition, CORE seeks the USACE's concurrence regarding our analysis of the Least Environmentally Damaging Practicable Alternative. It is the applicant's contention that construction of the residential development without addressing degradation of the Sand Creek channel would result in further degradation and sedimentation downstream. As such, the NAA and Alternative 4 are more environmentally damaging to the Sand Creek watershed than the original preferred alternative.

Should you have any questions regarding this or any other matter, please feel free to contact our office at (303) 703-4444.



Sincerely,

CORE Consultants, Inc.

A handwritten signature in black ink that reads 'Daniel Maynard'.

Daniel Maynard
Senior Ecologist

A handwritten signature in blue ink that reads 'Chris Haas'.

Chris Haas
Project Manager

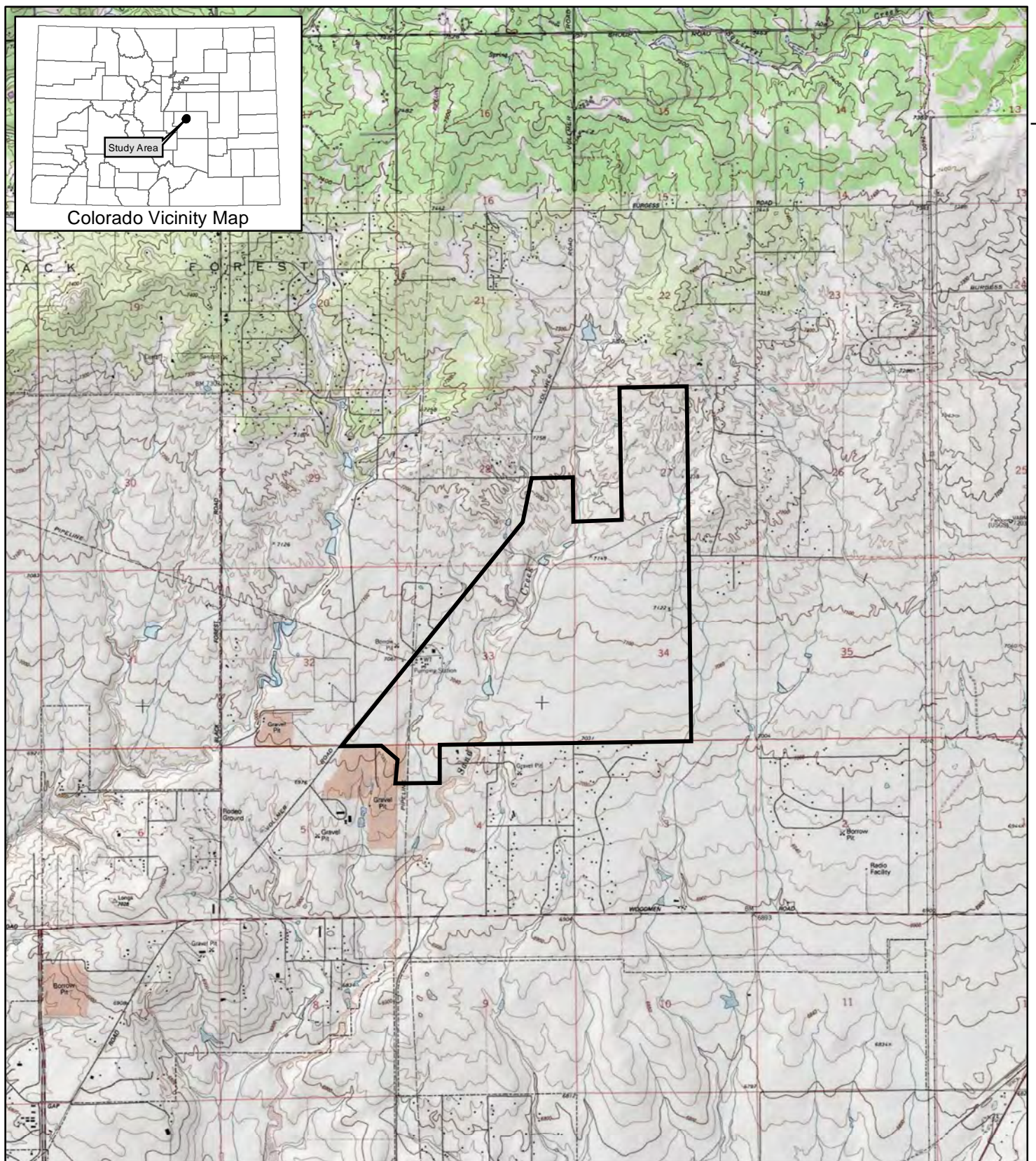
REFERENCES

- Chapman, S.S., Griffith, G.E., Omernik, J.M., Price, A.B., Freeouf, J., and Schrupp, D.L., 2006, Ecoregions of Colorado. Reston, Virginia, U.S. Geological Survey (map scale 1:1,200,000). ftp://ftp.epa.gov/wed/ecoregions/co/co_front.pdf
- CH2MHill. El Paso County Stormwater Needs Assessment (2013). Available Online: http://www.elpasoco.com/Documents/Stormwater%20CH2M%20Hill/CH2M%20Hill%20EPC_Stormwater_Needs_Assessment_Report_FINAL_14-0108.pdf
- Southern Colorado Economic Forum. 2011. Available Online. <https://coloradosprings.gov/sites/default/files/finance/Budget/2012/01-04-economicoverview.pdf>. Accessed October 2015.
- U. S. Environmental Protection Agency (U.S. EPA). 2001. *Storm Water Technology Fact Sheet – Underground Retention/Detention*. Available Online. http://water.epa.gov/scitech/wastetech/upload/2002_06_28_mtb_runoff.pdf. Accessed January 2015.
- U.S. Geological Survey 7.5-Minute Topographic Maps. 1994. Falcon NW Quadrangle – Colorado.
- U.S. Fish and Wildlife Service (USFWS). 2015. Information Planning and Conservation System (IPAC). Available Online: <http://www.fws.gov/ipac/>
- U.S. Fish and Wildlife Service (USFWS). 2015. National Wetland Inventory. Available Online. <http://www.fws.gov/wetlands/>. Accessed October 2015.




APPENDIX I

Site Location Map



Sterling Ranch **Site Location Map** El Paso County, Colorado

 Study Area

0 2,000 4,000
 Feet
 1 inch = 4,000 feet

Date: 5/20/2015
 Project #: 15-001



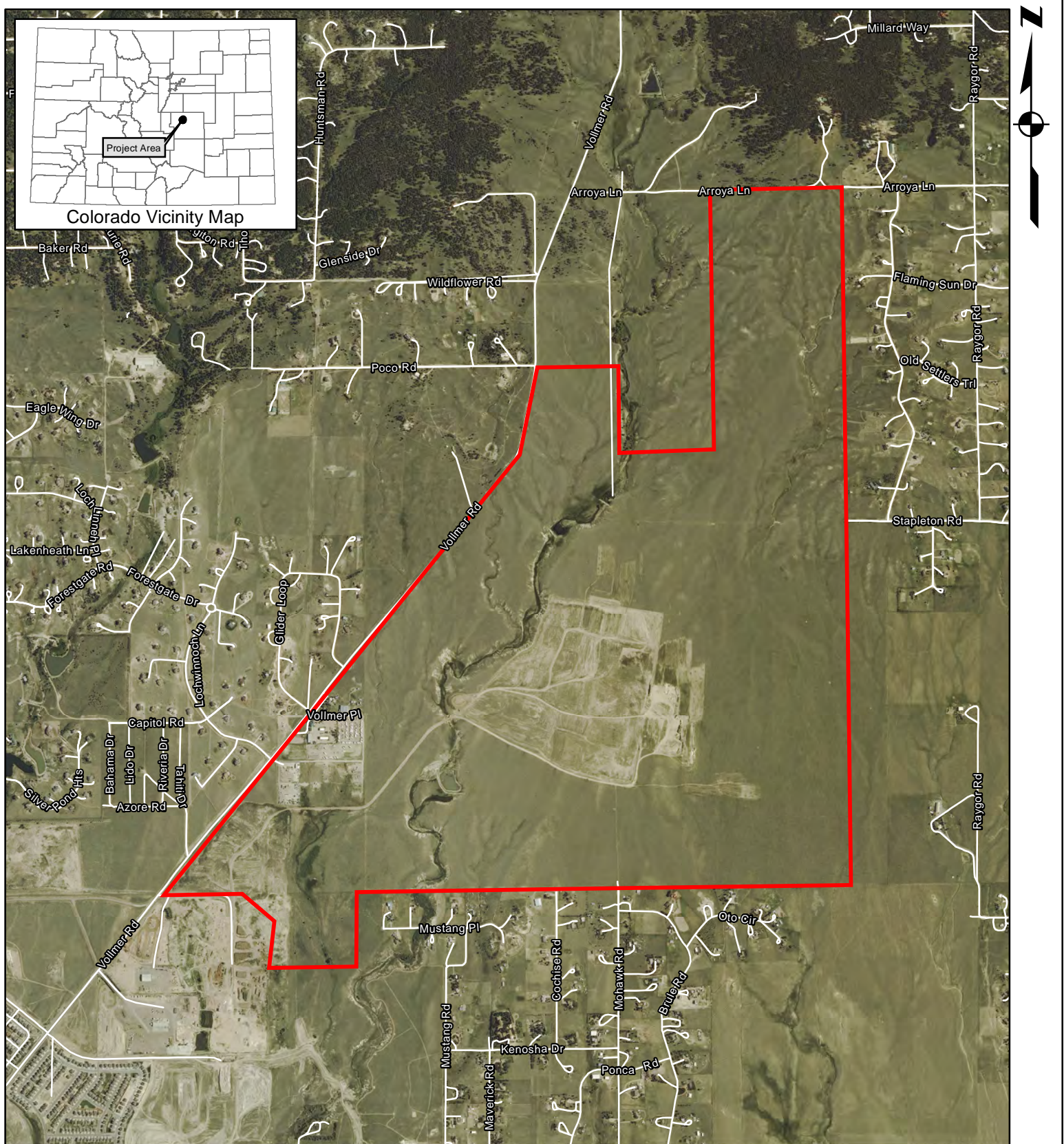
CORE
 CONSULTANTS

CIVIL ENGINEERING
 DEVELOPMENT CONSULTING
 LAND SURVEYING
 303.703.4444
 1950 W. Littleton Blvd., Ste. 109
 Littleton, CO 80120



Alternatives Analysis
Sterling Ranch Residential Development Project
El Paso County, Colorado

APPENDIX II:
Aerial Maps



Sterling Ranch **Alternative Analysis 1-4** El Paso County, Colorado

 Project Area

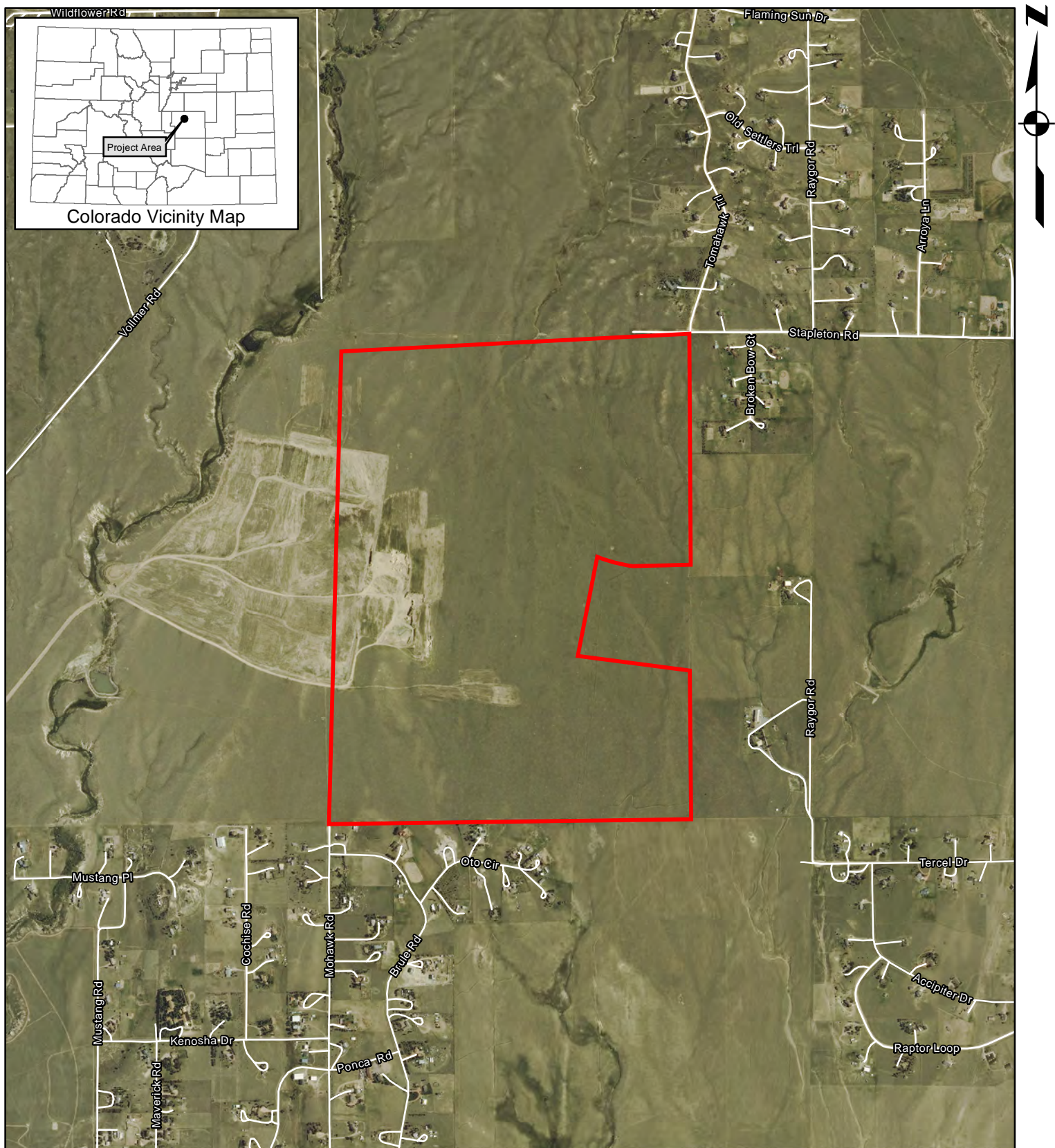
0 1,000 2,000
 Feet
 1 inch = 2,000 feet

Date: 10/15/2015
 Project #: 15-001



CORE
 CONSULTANTS

CIVIL ENGINEERING
 DEVELOPMENT CONSULTING
 LAND SURVEYING
 303.703.4444
 1950 W. Littleton Blvd., Ste. 109
 Littleton, CO 80120



Sterling Ranch **Alternative Analysis 5** El Paso County, Colorado

 Project Area

0 750 1,500

Feet

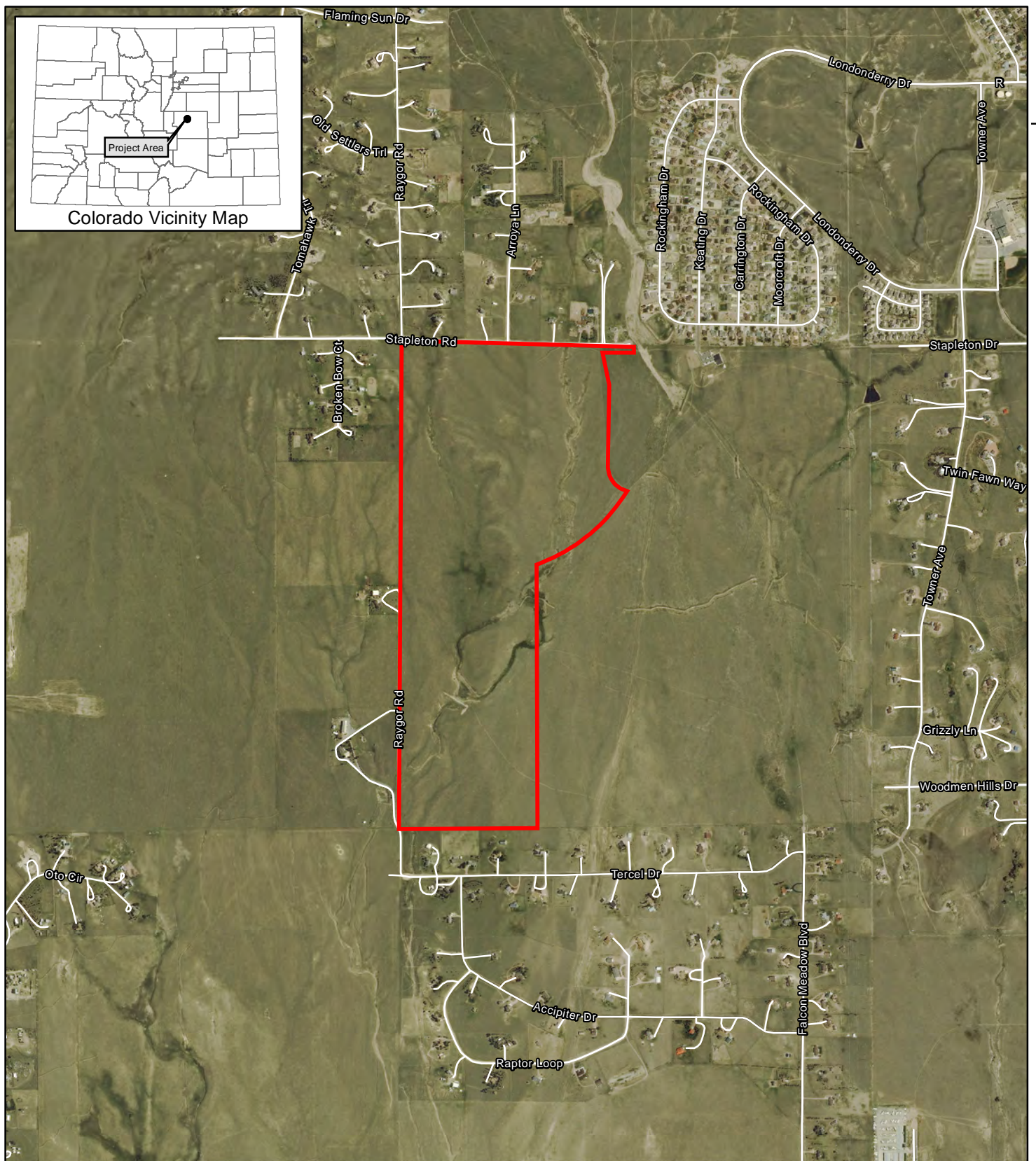
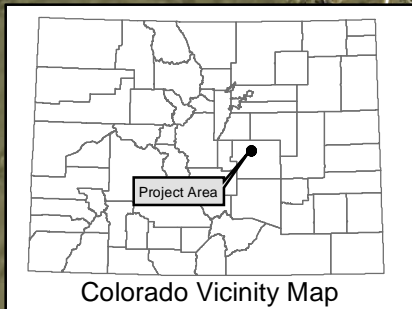
1 inch = 1,500 feet

Date: 10/13/2015
Project #: 15-001



CORE
CONSULTANTS

CIVIL ENGINEERING
DEVELOPMENT CONSULTING
LAND SURVEYING
303.703.4444
1950 W. Littleton Blvd., Ste. 109
Littleton, CO 80120



Sterling Ranch **Alternative Analysis 6** El Paso County, Colorado

 Project Area

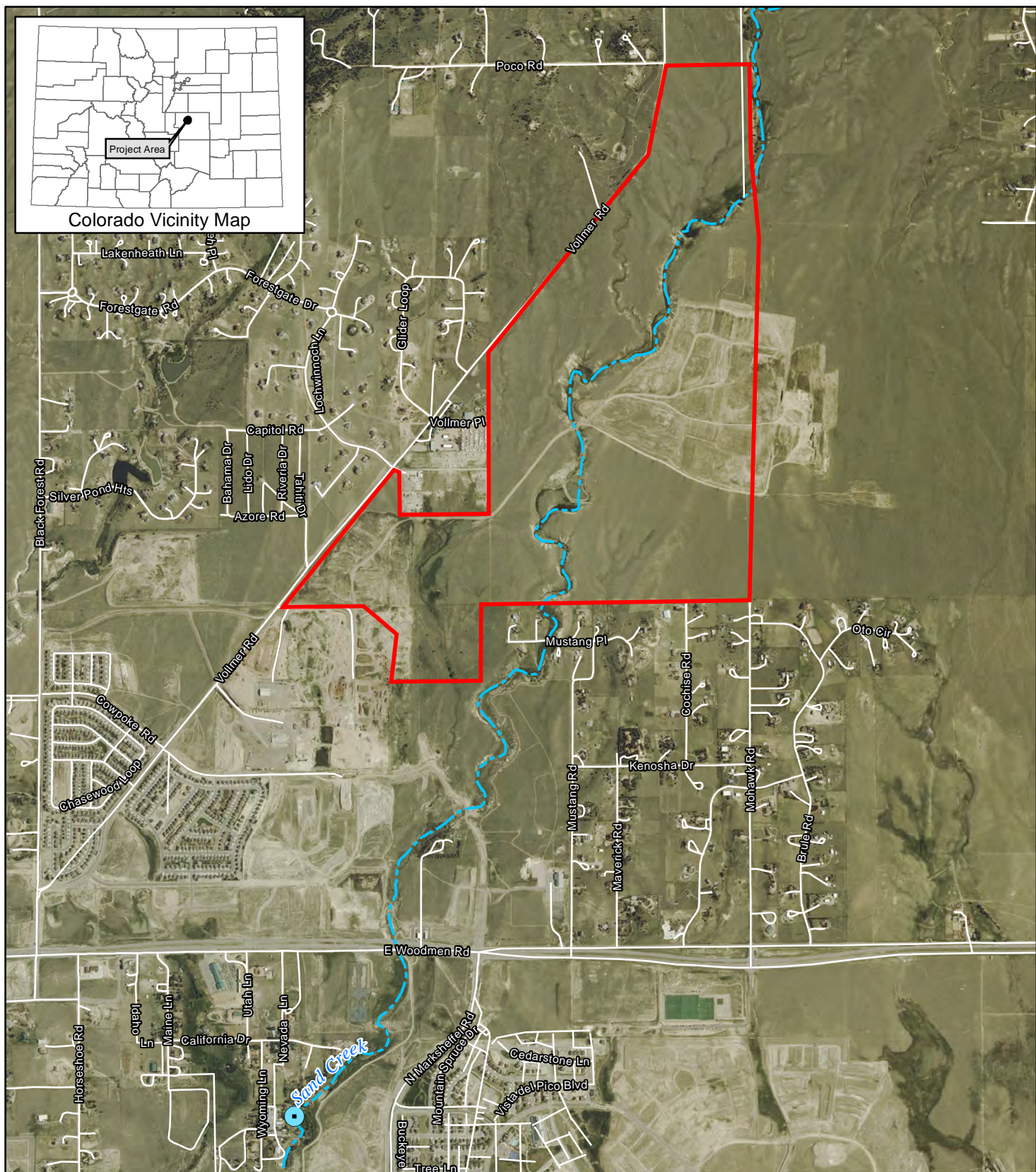
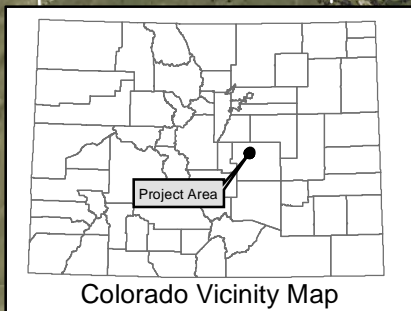
0 750 1,500
 Feet
 1 inch = 1,500 feet

Date: 10/13/2015
 Project #: 15-001



CORE
 CONSULTANTS

CIVIL ENGINEERING
 DEVELOPMENT CONSULTING
 LAND SURVEYING
 303.703.4444
 1950 W. Littleton Blvd., Ste. 109
 Littleton, CO 80120



Sterling Ranch **Alternative Analysis 7** El Paso County, Colorado

- Project Area
- Offsite Detention Pond
- Sand Creek

0 750 1,500
 Feet
 1 inch = 2,000 feet

Date: 10/13/2015
 Project #: 15-001



CORE
 CONSULTANTS

CIVIL ENGINEERING
 DEVELOPMENT CONSULTING
 LAND SURVEYING
 303.703.4444
 1950 W. Littleton Blvd., Ste. 109
 Littleton, CO 80120