WETLAND DELINEATION
FOR THE
STERLING RANCH DEVELOPMENT PROJECT

EL PASO COUNTY, CO
PROJECT NO. 15-001

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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 (*Bouteoloa 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, artic 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 be 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.

The proposed preliminary plan layout indicates far more disturbance than linear transportation crossings and appears to cut off the wetland to the south (as does the proposed Marksheffel Road through the City parcel). Verify USACE requirements.

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

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 steam 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.

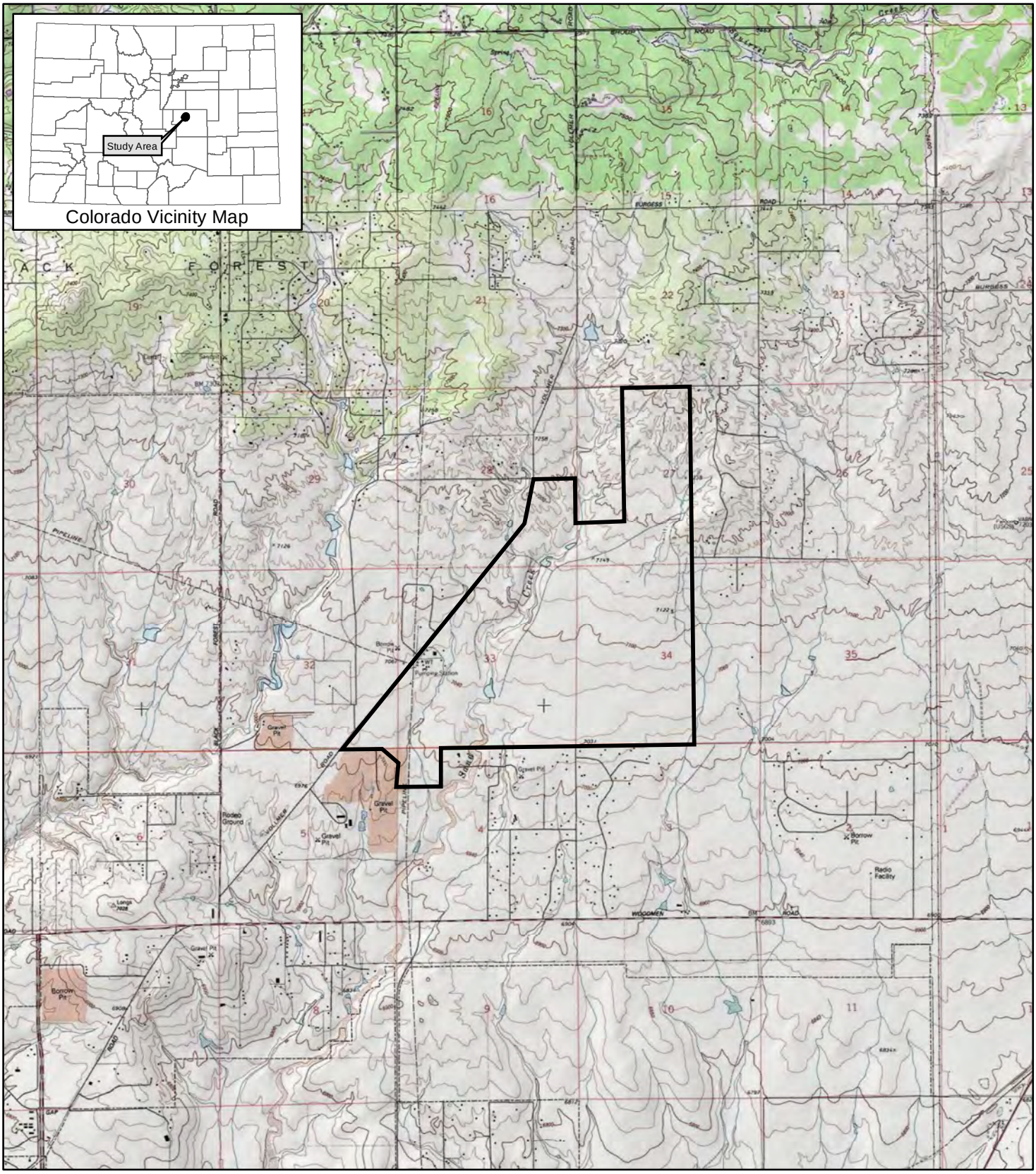
Wetland: "...land characterized by the presence of water at a frequency and duration sufficient to support and that under normal circumstances does support wetland vegetation or aquatic life and is commonly referred to as a bog, swamp, or marsh..." as defined by Part 303, Wetlands Protection, of the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

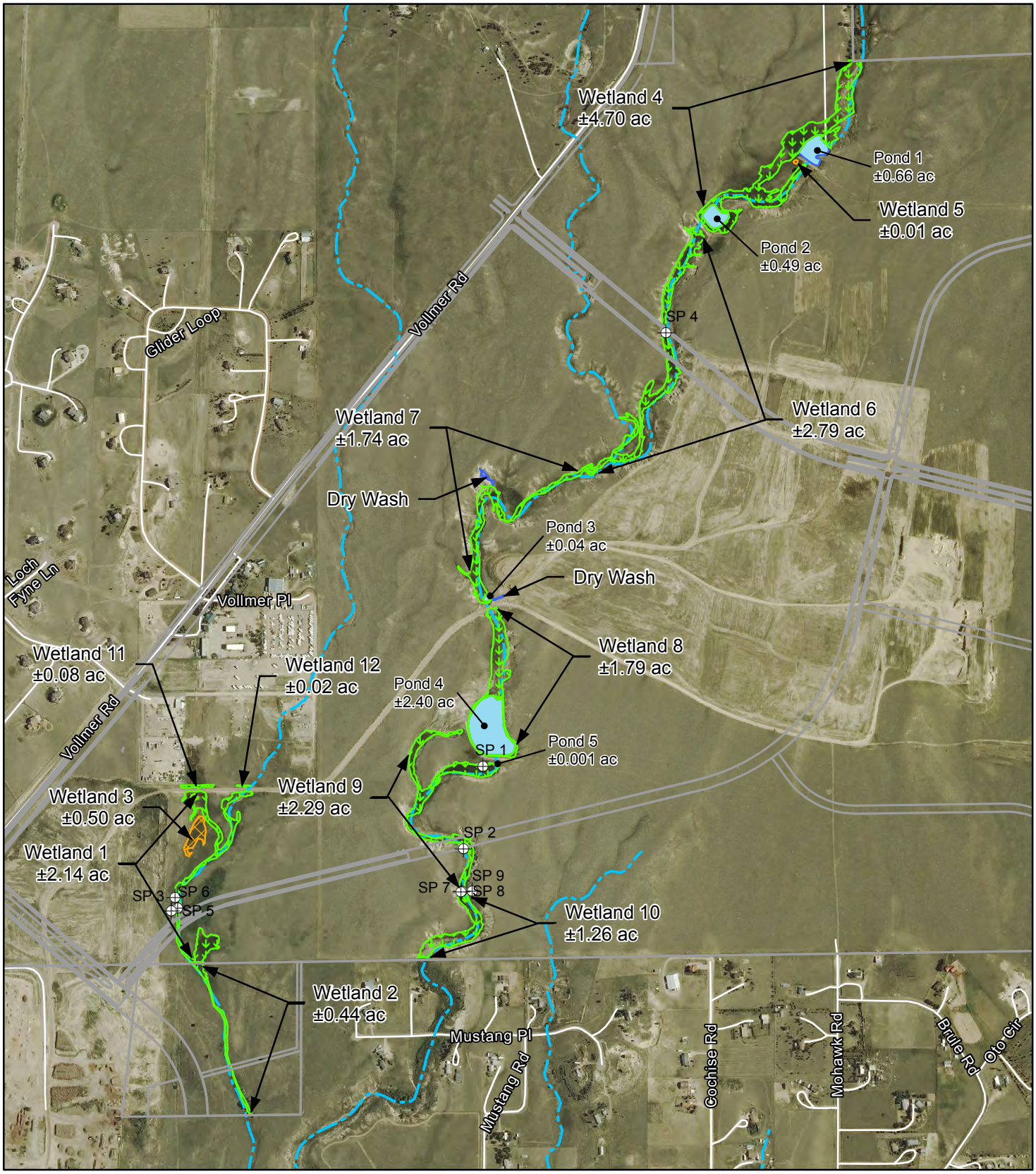
0 2,000 4,000

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

Wetland Delineation Map

El Paso County, Colorado

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

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

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

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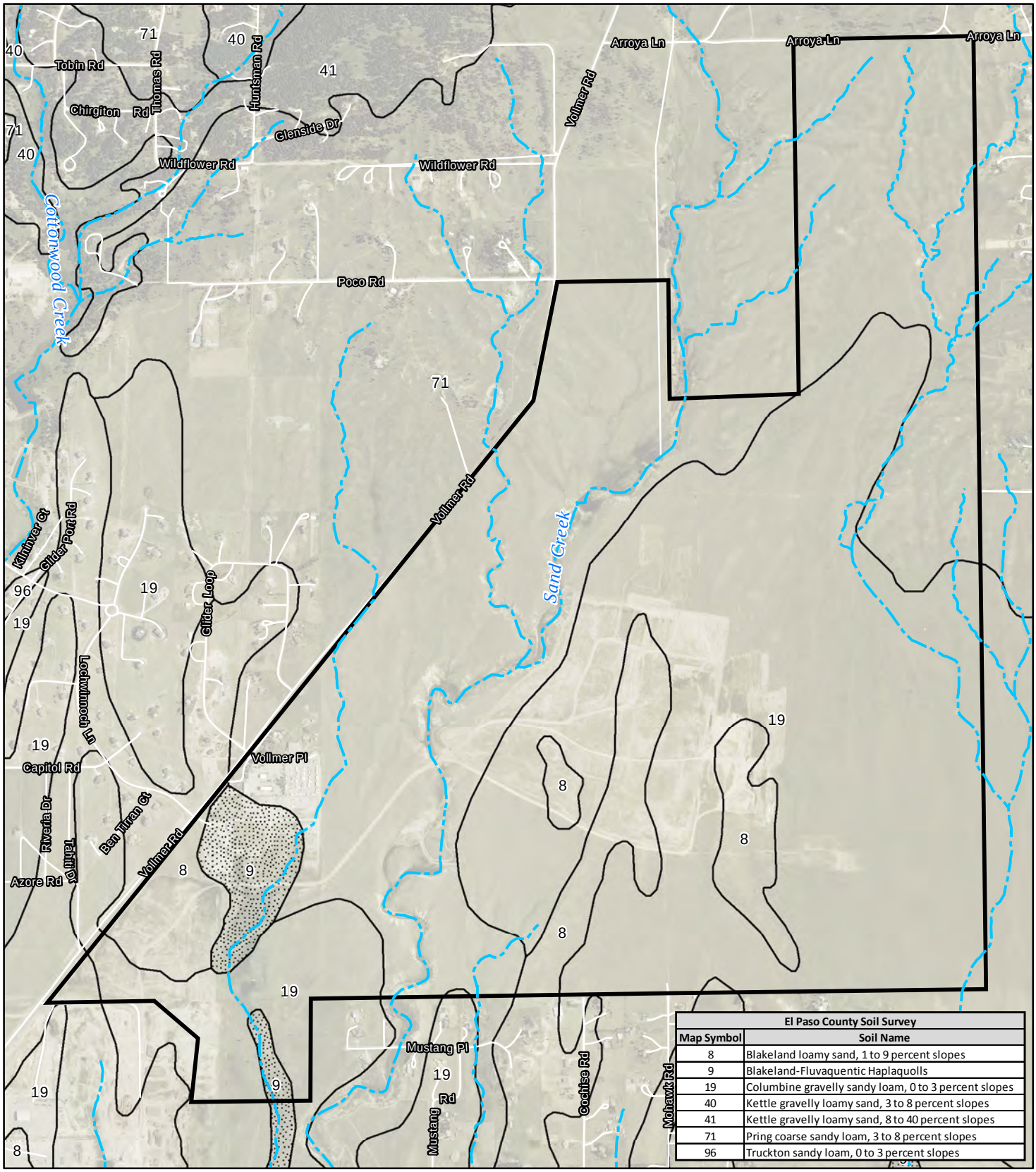
DEVELOPMENT CONSULTING
LAND SURVEYING
303.703.4444
1950 W. Littleton Blvd., Ste. 109
Littleton, CO 80120



El Paso County Soil Survey	
Map Symbol	Soil Name
8	Blakeland loamy sand, 1 to 9 percent slopes
9	Blakeland-Fluvaquentic Haplaquolls
19	Columbine gravelly sandy loam, 0 to 3 percent slopes
40	Kettle gravelly loamy sand, 3 to 8 percent slopes
41	Kettle gravelly loamy sand, 8 to 40 percent slopes
71	Pring coarse sandy loam, 3 to 8 percent slopes
96	Truckton sandy loam, 0 to 3 percent slopes

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

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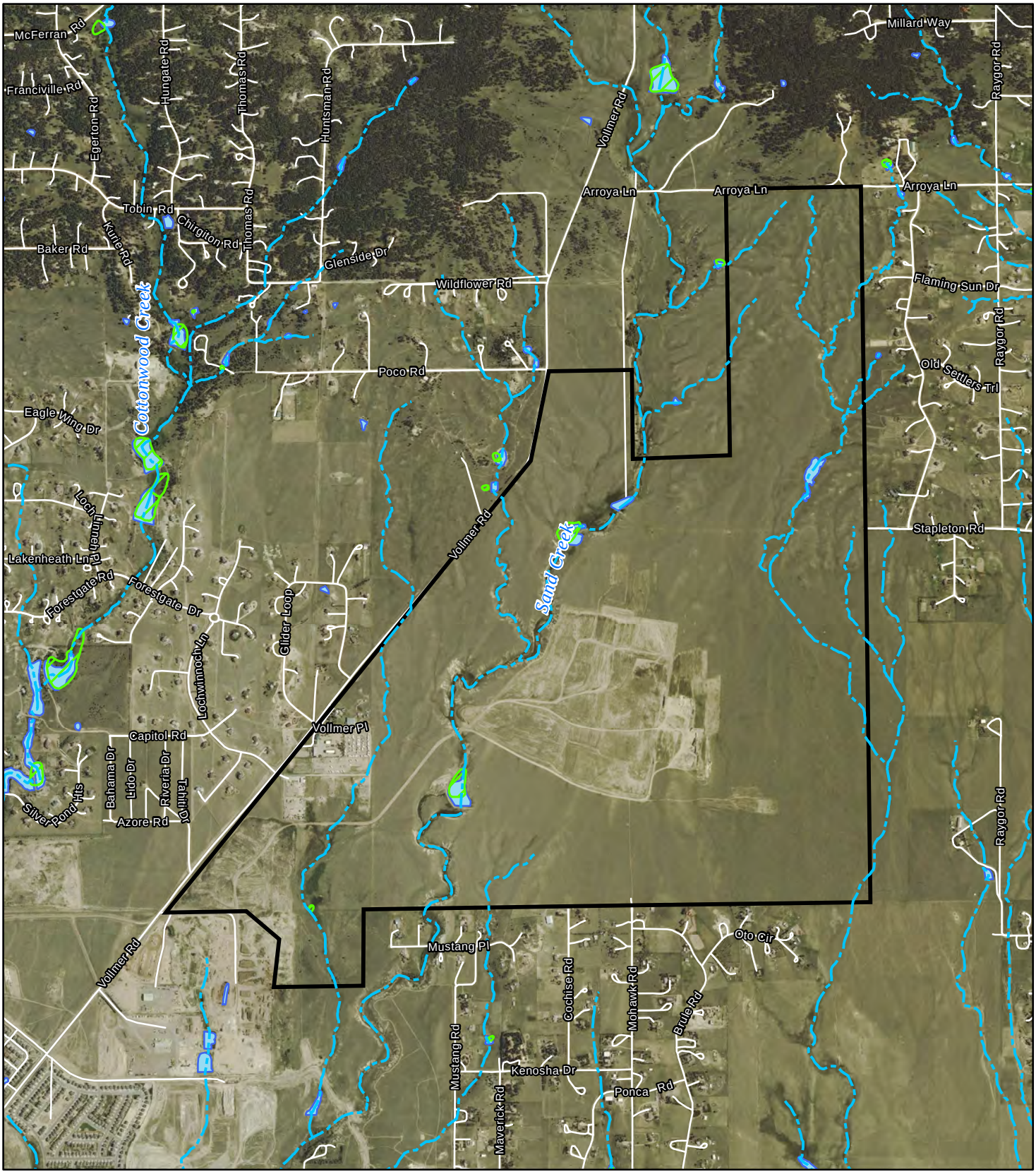

Sterling Ranch

National Wetland Inventory Map

El Paso County, Colorado

Study Area
NWI Wetland
NHD Watercourse
NHD Waterbody

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

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

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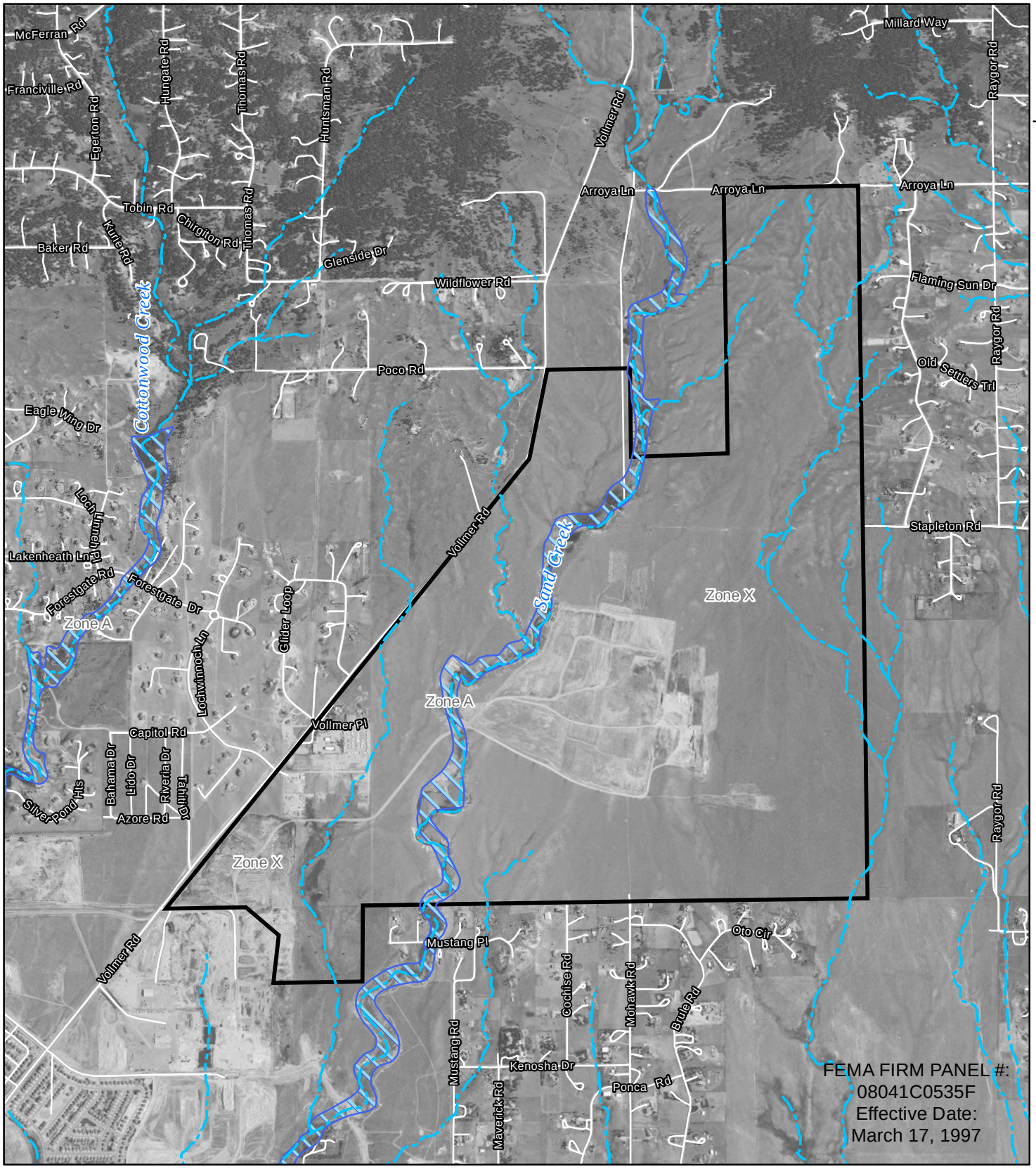

Sterling Ranch

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

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APPENDIX II

Photo Log

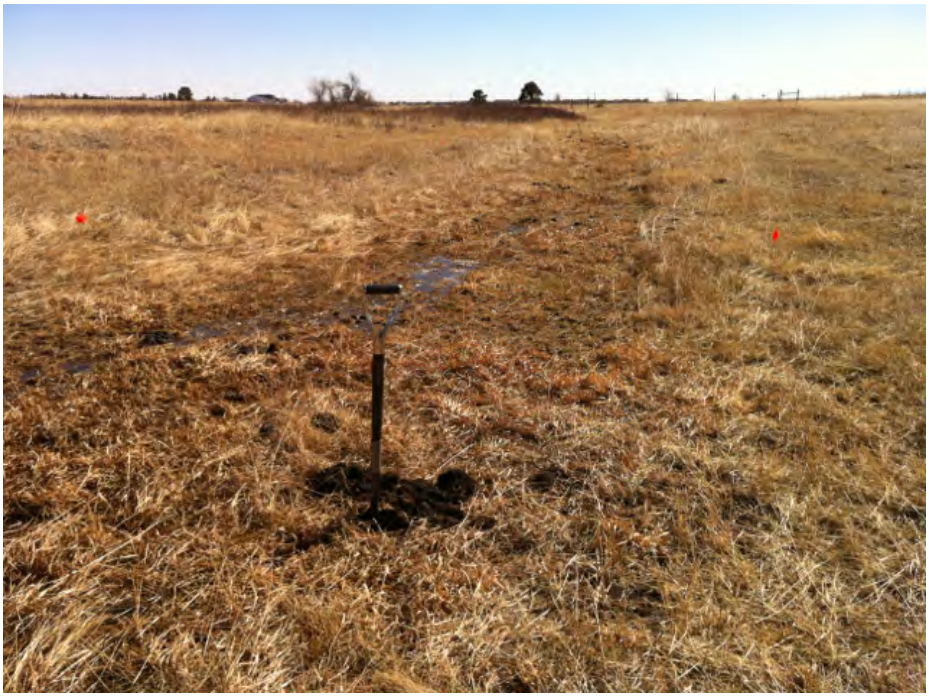
Sampling Point 1 (SP 1) Vicinity – Looking south down Sand Creek from just south of Pond 4. Typical Sand Creek stream channel characteristics and vegetation. 2/5/15

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

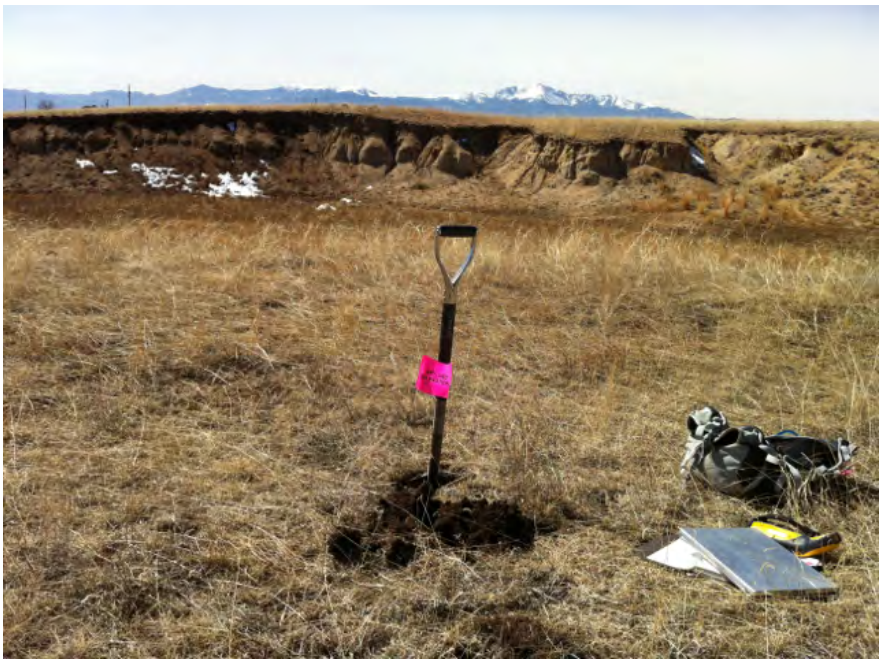
Sampling Point 5 – Upland near Western Tributary, facing southeast towards Western Tributary. 3/10/15



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. 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: WGS 84

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 ✓ No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks: Vegetation is disturbed by heavy cattle grazing

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 5'x5')			
1. Juncus arcticus	75	✓	FACW
2. Carex utriculata	8		OBL
3. Rosa woodsii	10		FACU
4. Poa trivialis	15		FACW
5. Cirsium arvense	2		FACU
6.			
7.			
8.			
9.			
10.			
	110 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: 1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4"	10YR 3/3	100					Coarse SL	A Horizon
4-12+"	10YR 3/2	60	7.5YR 4/6	20	C	PL	Coarse SL	A Horizon (Prominent)
4-12+"	10YR 6/1	20					Loamy Sand	"

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 10"

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 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 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 ✓ No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 5' x 5')			
1. Festuca ~~arizonica~~ pratensis	20	✓	FACU
2. Schizachyrium scoparium	15		FACU
3. Carex ~~atricula~~ ta	25	✓	OBL
4. Juncus articus	~~30~~ 30	✓	FACW
5. Koeleria macrantha	5		NI
6. Mullein (Verbascum thapsis)	2		UPL
7. Pasc. smithii	<1		FACU
8.			
9.			
10.			
	98 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 66% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	25	x 1 =	25
FACW species	30	x 2 =	60
FAC species	—	x 3 =	—
FACU species	36	x 4 =	144
UPL species	2	x 5 =	10
Column Totals:	93 (A)		239 (B)

Prevalence Index = B/A = 2.57

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

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

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:
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 Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
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+"	Gley 1 6/N	85	5YR 4/6	15	C	PL	Loamy Sand (Fine)	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 8"

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: WGS 84

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 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 ✓ No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks: Cattle grazing has disturbed vegetation

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 5' x 5')			
1. Carex nebrascensis	25	✓	OBL
2. Carex utriculata	20		OBL
3. Juncus arcticus	35	✓	FACW
4. Agrostis gigantea	20		FACW
5. Cirsium arvense	5		FACU
6. Aster (Symphyotrichum sp.)	5		?
7.			
8.			
9.			
10.			
	110 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 15

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: 3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9"	10YR 2/1	100					SC (Fine)	
9-18+"	10YR 7/2	85	7.5YR 4/6	15	C	M	Loamy sand (coarse)	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ✓ No ____ Depth (inches): 2"

Water Table Present? Yes ____ No ✓ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): 9"

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: WGS 84

Soil Map Unit Name: Pring CAridic 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 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 ✓ No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15'x15')			
1. Salix irrorata	30	✓	FACW
2.			
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size: 5'x5')			
1. Bulrush (Scirpus microcarpus)	10		OBL
2. Carex nebrascensis	30	✓	OBL
3. Juncus arcticus	30	✓	FACW
4. Aster (Symphyotrichum sp.)	5		?
5. Juncus mertensianus	10		OBL
6.			
7.			
8.			
9.			
10.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 3 (B)

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

+ 1 - Rapid Test for Hydrophytic Vegetation

+ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: 4

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4"	2.5Y 3/1	100					SCL (Med.)	
4-10"	2.5Y 7/2	100					SCL (Med)	
10+"	2.5Y 7/2	100					Loamy Sand (Coarse)	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: N/A

Depth (inches): —

Hydric Soil Present? Yes ✓ No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ✓ No ____ Depth (inches): 1"

Water Table Present? Yes ✓ No ____ Depth (inches): 4"

Saturation Present? (includes capillary fringe) 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 X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

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: 30 Ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 Ft radius)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 Ft radius)			
1. Bouteloua gracilis	73	Y	UPL
2. Artemisia frigida	10	N	UPL
3. Aster sp.	5	N	
4. Juncus articus (balticus)	1	N	FACW
5. Aristida purpurea	1	N	UPL
6.			
7.			
8.			
9.			
10.			
	90	= Total Cover	
Woody Vine Stratum (Plot size: 15 Ft radius)			
1.			
2.			
		= Total Cover	
% Bare Ground in Herb Stratum 10	90	= Total Veg Cover	

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = 0
FACW species ____	x 2 = 0
FAC species ____	x 3 = 0
FACU species ____	x 4 = 0
UPL species ____	x 5 = 0
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A = NaN

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
All dominants are FACW and/or OBL.
___ 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 X

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

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 2/1	100					sandy loam	10% fine (1-2 mm) to medium (2-5mm) gravel

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ **No** X

Remarks:

Soil is very dark and uniform. Not reduced.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

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

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 X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:
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.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 Ft radius)			
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Ft radius)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 Ft radius)			
1. Carex nebrascensis	45	Y	OBL
2. Juncus articus (balticus)	25	Y	FACW
3. Carex utriculata	20	Y	OBL
4. Elymus trachycaulus	5	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 15 Ft radius)			
1.			
2.			
	= Total Cover		
% Bare Ground in Herb Stratum ____	95 = Total Veg Cover		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 1 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	65	x 1 =	65
FACW species	25	x 2 =	50
FAC species		x 3 =	0
FACU species	5	x 4 =	20
UPL species		x 5 =	0
Column Totals:	95 (A)		135 (B)

Prevalence Index = B/A = 1.4210526315789473

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation (All dominants are FACW and/or OBL.)

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks:
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.

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

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X 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)

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes X No ___ Depth (inches): 15

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): surface

Wetland Hydrology Present? Yes X 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 X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:
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.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 Ft radius)			
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Ft radius)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 Ft radius)			
1. Carex nebrascensis	25	Y	OBL
2. Carex utriculata	25	Y	OBL
3. Juncus saximontanus (J. ensifolius in Culver and Lemly)	20	Y	FACW
4. Juncus articus (balticus)	20	Y	FACW
5. Juncus dudleyi (tenuis)	5	N	FACW
6.			
7.			
8.			
9.			
10.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 15 Ft radius)			
1.			
2.			
	= Total Cover		
% Bare Ground in Herb Stratum 5	95 = Total Veg Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 1 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	45	x 2 =	90
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	95 (A)		140 (B)

Prevalence Index = B/A = 1.4736842105263157

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation (All dominants are FACW and/or OBL.)

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks: 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.

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

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes X No ___ Depth (inches): 6

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): surface

Wetland Hydrology Present? Yes X 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 X No ____

Hydric Soil Present? Yes X No ____

Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? Yes X 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 Juncus balticus, Agrostis gigantea, and Elymus trachycaulus; a common species assemblage along the wetland edge.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 Ft radius)			
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Ft radius)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 Ft radius)			
1. Juncus saximontanus (ensifolius in Culver and Lemly)	50	Y	FACW
2. Agrostis gigantea	20	Y	FACW
3. Schizachyrium scoparium	10	N	FACU
4. Elymus trachycaulus	10	N	FACU
5. Juncus articus (balticus)	10	N	FACW
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 15 Ft radius)			
1.			
2.			
	= Total Cover		
% Bare Ground in Herb Stratum 0	100 = Total Veg Cover		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 1 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	70	x 2 =	140
FAC species		x 3 =	0
FACU species	30	x 4 =	120
UPL species		x 5 =	0
Column Totals:	100 (A)		260 (B)

Prevalence Index = B/A = 2.6

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation (All dominants are FACW and/or OBL.)

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

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.

Sampling point vegetation is characteristic of the transitional wetland areas along Sand Creek where vegetation is typically dominated by Juncus spp. and Agrostis gigantea 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 Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
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

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

Much sandier than SP 7.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes X No ___ Depth (inches): 16

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 2

Wetland Hydrology Present? Yes X 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 X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

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: 30 Ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Ft radius)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 Ft radius)			
1. Bouteloua gracilis	79	Y	UPL
2. Artemisia frigida	10	N	UPL
3. Coryphantha vivipara (cactus)	1	N	UPL
4. Hesperostipa comata	10	N	UPL
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 15 Ft radius)			
1.			
2.			
	= Total Cover		
% Bare Ground in Herb Stratum 0	100 = Total Veg Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = 0
FACW species ____	x 2 = 0
FAC species ____	x 3 = 0
FACU species ____	x 4 = 0
UPL species ____	x 5 = 0
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A = NaN

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation (All dominants are FACW and/or OBL.)

___ 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 X

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

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	7.5 YR 3/1	100					sandy loam	10% fine (1-2mm) to medium (2-5mm) gravel
4-15	7.5 YR 2.5/1	100					sandy loam	black, 10% fine to medium gravel

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Very dark, loose, moist soil. Not reduced.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

No wetland hydrology indicators.

Markup Summary

3/5/2019 3:37:50 PM (1)

Subject: Highlight
Page Label: 10
Author: dsdrice
Date: 3/5/2019 3:37:50 PM
Color:

3/5/2019 3:38:17 PM (1)

Subject: Highlight
Page Label: 15
Author: dsdrice
Date: 3/5/2019 3:38:17 PM
Color:

3/5/2019 3:38:54 PM (1)

Subject: Highlight
Page Label: 15
Author: dsdrice
Date: 3/5/2019 3:38:54 PM
Color:

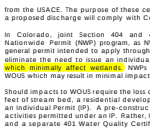
Impacts to WOUS should
be avoided and minimized to the extent possible.

3/5/2019 3:39:40 PM (1)

Subject: Highlight
Page Label: 16
Author: dsdrice
Date: 3/5/2019 3:39:40 PM
Color:

In Colorado, joint Section 404 and 401 permitting
is utilized through the
Nationwide Permit (NWP) program, as NWPs are
certified by statute.

3/5/2019 3:39:53 PM (1)



Subject: Highlight
Page Label: 16
Author: dsdrice
Date: 3/5/2019 3:39:53 PM
Color:

which minimally affect wetlands.

3/5/2019 3:40:17 PM (1)

Subject: Highlight
Page Label: 16
Author: dsdrice
Date: 3/5/2019 3:40:17 PM
Color:

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).

3/5/2019 3:40:43 PM (1)

Subject: Highlight
Page Label: 16
Author: dsdrice
Date: 3/5/2019 3:40:43 PM
Color:

Linear Transportation
Crossings.

3/5/2019 3:46:58 PM (1)

Subject: Callout
Page Label: 16
Author: dsdrice
Date: 3/5/2019 3:46:58 PM
Color:

The proposed preliminary plan layout indicates far more disturbance than linear transportation crossings and appears to cut off the wetland to the south (as does the proposed Marksheffel Road through the City parcel). Verify USACE requirements.