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**SOILS AND GEOLOGY STUDY
MONUMENT RIDGE EAST – FILING NO. 1
MONUMENT HILL ROAD AND PALMER DIVIDE ROAD
EL PASO COUNTY, COLORADO**

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Respectfully Submitted,

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1 SUMMARY

Project Location

The project lies in portions of the SW¼ of Section 36, Township 11 South, Range 67 West of the 6th Principal Meridian in El Paso County, Colorado. The site is southeast of the town of Monument, Colorado, located east of the intersection of Struthers Road and Spanish Bit Drive. The location of the site is as shown on the Vicinity Map, Figure 1.

Project Description

Total acreage involved in the project is approximately 63 acres. Filing No. 1 consists of 35 single family lots, tracts, and other associated site improvements. Tracts 1 and 2 will be developed in future filings. The development will be serviced by Woodmoor Water and Sanitation District.

Scope of Report

This report presents the results of our geologic evaluation and treatment of engineering geologic hazard study. The report has been revised to address Colorado Geological Survey review comments and reflect the latest development plans (Reference 2). The response letter is included in Appendix E of this report.

Land Use and Engineering Geology

This site was found to be suitable for the proposed development. Areas were encountered where the geologic conditions will impose minor constraints on development and land use. These include areas of potentially collapsible soils, potentially expansive soils, wetlands, and shallow groundwater areas. Based on the proposed development plan, it appears that these areas will have minor constraints on the development. These conditions and mitigation will be discussed in greater detail in the report.

In general, it is our opinion that the development can be achieved if the observed geologic conditions on site are either avoided or properly mitigated. All recommendations are subject to the limitations discussed in the report.

2 GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The site is in portions of the W½ of Section 2, Township 11 South, Range 67 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located at the southeast corner of Monument Hill Road and Palmer Divide East just north of Monument, Colorado. The location of the site is as shown on the Vicinity Map, Figure 1.

The topography of the site is generally gradually to moderately sloping to the east, west, and north along a drainage through the central portion of the site. Portions of the delineated wetlands indicated on Figure 3 were wet, however, flowing water was not observed. Several minor drainage swales were observed across the site. The drainages onsite flow in a northerly direction. The site is currently mostly undeveloped with an old farm house and barn located in the central portion of the site. Misty Acres Boulevard extends into the site and is partially paved. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have included agricultural grazing and pasture land. The site contains primarily field grasses, weeds, scrub oak, and ponderosa pines. Site photographs, taken February 28, 2023, are included in Appendix A, and approximate locations are indicated on Figure 3.

Total acreage involved in the proposed development is approximately 63 acres. Filing No. 1 consists of 35 single family lots, tracts, and other associated site improvements. Tracts 1 and 2 will be developed in future filings. Preliminary plans indicate significant grading will be performed to develop the site. An existing Woodmoor Water and Sanitation sewer main is located in the central and northern portions of the site. Proposed grading is shown on Figure 3, and the Cut/Fill Exhibit is presented on Figure 4. Significant cuts up to 20 feet or more are proposed across the site with the drainage area in the central portion of the site to be filled. Detention ponds and storm water drainage improvements are proposed across the site.

3 SCOPE OF THE REPORT

The scope of the report includes a general geologic analysis utilizing published geologic data. Detailed site-specific mapping was be conducted to obtain general information in respect to major geographic and geologic features, geologic descriptions and their effects on the development of the property.

4 FIELD INVESTIGATION

Our field investigation consisted of the preparation of a geologic map of any bedrock features and significant surficial deposits. The Natural Resource Conservation Service (NRCS), previously the Soil Conservation Service (SCS) survey was also reviewed to evaluate the site. The position of mappable units within the subject property are shown on the Geologic Map. Our mapping procedures involved both field reconnaissance, measurements and air photo reconnaissance and interpretation. The same mapping procedures have also been utilized to produce the Engineering Geology Map which identified pertinent geologic conditions affecting development. The field mapping was performed by personnel of Entech Engineering, Inc. on February 28, 2023.

Ten (10) test borings were performed on the site to determine general soil and bedrock characteristics. The locations of the test borings are indicated on the Site and Exploration Plan, Figure 3. The Test Boring Logs are presented in Appendix B. Results of this testing will be discussed later in this report.

Four (4) additional test borings were performed and temporary piezometers installed on July 29, 2024. The piezometers, designated P1 through P4 were installed in areas of proposed cuts, and where shallow groundwater conditions were previously encountered. The Test Boring Logs and Summary of Laboratory Testing for the Piezometers are presented in Appendix C, and locations indicated on the Site and Exploration Plan, Figure 3.

Soil and bedrock samples were obtained from the borings utilizing the Standard Penetration Test (ASTM D1586) using a split-barrel California sampler. Results of the Standard Penetration Test (SPT) are included on the boring logs in terms of N-values expressed in blows per foot (bpf). Soil and bedrock samples recovered from the borings were visually classified and recorded on the boring logs. The soil and bedrock classifications were later verified utilizing laboratory testing and grouped by soil type. The soil and bedrock type numbers are included on the boring logs. It should be understood that the soil and bedrock descriptions shown on the boring logs may vary between boring location and sample depths. It should also be noted that the lines of stratigraphic separation shown on the boring logs represent approximate boundaries between soil and bedrock types and the actual stratigraphic transitions may be more gradual or variable with location.

Water content testing (ASTM D2216) was performed on the samples recovered from the borings, and the results are shown on the boring logs. Grain-Size Analysis (ASTM D422) and Atterberg Limits testing (ASTM D4318) were performed on selected samples to assist in classifying the

materials encountered in the borings. Volume change testing was performed on selected samples using Swell/Collapse Testing (ASTM D4546) in order to evaluate potential expansion characteristics of the soil and bedrock. Soluble sulfate testing was performed on select soil samples to evaluate the potential for below-grade degradation of concrete due to sulfate attack. A Summary of Laboratory Test Results is included in Appendix B.

5 SOIL, GEOLOGY, AND ENGINEERING GEOLOGY

5.1 General Geology

Physiographically, the site lies in the western portion of the Great Plains Physiographic Province. Approximately 3 miles to the west is a major structural feature known as the Rampart Range Fault. This fault marks the boundary between the Great Plains Physiographic Province and the Southern Rocky Mountain Province. The site exists within the southeastern edge of a large structural feature known as the Denver Basin. Bedrock in the area tends to be very gently dipping in a northeasterly direction (Reference 3). The rocks in the area of the site are sedimentary in nature and typically Upper Cretaceous in age. The bedrock underlying the site consists of the Pierre Shale Formation. Overlying this formation are unconsolidated deposits of artificial fill deposits, residual soils, sheetwash and alluvial soils of Quaternary Age. The site's stratigraphy will be discussed in more detail in Section 5.3.

5.2 Soil Conservation Survey

The Natural Resource Conservation Service (Reference 4), previously the Soil Conservation Service (Reference 5) has mapped one soil types on the site Figure 4. In general, the soils are classified as sandy loams. The soils are described as follows:

Soil Type	Description
1	Alamosa Loam, 1 to 3% slopes
69	Peyton-Pring Complex, 8 to 15% slopes
92	Tomah-Crowfoot Loamy Sands, 3 to 8% slopes

Complete descriptions of each soil type are presented in Appendix C. The soils have generally been described to have rapid to moderate permeabilities. Possible hazards with soil erosion are present on the site. The erosion potential can be controlled with vegetation. The soils have been described to have moderate erosion hazards.

5.3 Site Stratigraphy

The Greenland and Monument Quadrangles Geology Map showing the site is presented in (Figure 5, References 6 and 7). The Geology/Engineering Geology Map prepared for the site is presented in Figure 6. Three mappable units were identified on this site which are described as follows:

- Qaf Artificial Fill of Holocene Age:** These are man-made fill deposits associated with a minor fill areas observed on the site, and along the existing Woodmoor Water and Sanitation sewer main through the central portion of the site.
- Qau Alluvium Undivided of Holocene and Pleistocene Age:** These are alluvial filled valley heads consisting of sheetwash, and stream-deposited alluvium. Typically consisting of poorly sorted sand and fine gravel.
- Qc/Tkd Colluvium of Quaternary Age overlying Dawson Arkose of Tertiary to Cretaceous Age:** These materials consist of silty to clayey sands, cobbles and boulders deposited by the action of sheetwash and gravity. Some alluvial soils deposited by water and residual soil from in-situ weathering exist in this mapping. These soils are overlying the Dawson Formation. The Dawson Formation typically consists of coarse-grained, arkosic sandstone with interbedded lenses of fine-grained sandstone, siltstone and claystone.

The soils listed above were mapped from site-specific mapping, the *Geologic Maps of the Greenland and Monument Quadrangles* distributed by the Colorado Geological Survey in 2003 (References 6 and 7), the *Geologic Map of the Colorado Springs-Castle Rock Area*, distributed by the US Geological Survey in 1979 (Reference 8), and the *Geologic Map of the Denver 1° x 2° Quadrangle*, distributed by the US Geological Survey in 1981 (Reference 9). The Test Borings were also used in evaluating the site and are included in Appendix B. The Geology Map prepared for the site is presented in Figure 6.

5.4 Soil Conditions

Two soil types and one bedrock types were observed during drilling which consisted of Type 1: native silty to clean to very silty sand (SM, SW), Type 2: native very clayey sand (SC), and Type 3: silty to clayey sandstone (SM, SC). The topsoil was relatively thin on the site. Each soil type was classified in accordance with the Unified Soil Classification System (USCS) using the laboratory testing results and the observations made during drilling.

Soil Type 1 classified as clean to silty to very silty sand (SM, SW). The sand was encountered in 8 of the 10 test borings directly beneath the topsoil extending to depths of 4 feet below ground surface (bgs) to termination of boring at 20 feet below ground surface (bgs). Standard Penetration Testing on the sand resulted in N-values of 11 to 49 bpf, indicating medium dense to very dense states. Sulfate testing resulted in less than 0.01 percent soluble sulfate by weight, indicating a negligible potential for below grade concrete degradation due to sulfate attack.

Soil Type 2 classified as native very clayey sand (SC). The clayey sand was encountered in two of the test borings (Test Boring Nos. 3 and 4) at depths from the ground surface and extending to 7 to 9 feet and again from 13 to depth drilled (20 feet) in Test Boring No. 4. Standard Penetration Testing on the clayey sand resulted in an N-values of 6 to 38 bpf indicating loose to dense states. A Swell/Consolidation test resulted in a volume change of 2.8%, indicating a moderate to high expansion potential. Sulfate testing resulted in less than 0.01 percent soluble sulfate by weight, indicating a negligible potential for below grade concrete degradation due to sulfate attack.

Soil Type 3 classified as a silty to clayey sandstone bedrock. The sandstone was encountered in four of the test borings at depths of 4 to 19 feet and extended to termination of borings at 20 feet. Standard Penetration Testing on the clayey to silty sandstone resulted in N-values of greater than 50 bpf indicating very dense states. The sandstone is anticipated to have low expansion potential. Sulfate Testing resulted in less than 0.01 percent soluble sulfate by weight, indicating a negligible potential for below grade degradation due to sulfate attack.

Additional soil descriptions are presented on the enclosed drill logs. A Summary of Laboratory Test Results and the Test Boring Logs are presented in Appendix B. The soils were classified using the results of the laboratory testing, the Unified Soil Classification System (USCS), and visual classification. The soil types are expected to vary across the site. Also, stratification lines shown on the logs represent the approximate boundary between soil types and the actual transition are expected to be gradual and vary with location.

5.5 Groundwater

Groundwater was encountered in Test Boring Nos. 1 – 4 at depths ranging from 1 to 10 feet which were drilled to depths of 20 feet. Fluctuation in groundwater conditions may occur due to variations in rainfall and other factors not readily apparent at this time. Wetlands, areas of seasonally shallow and potentially seasonal shallow groundwater were observed on the site and further discussed in the following sections.

Four (4) temporary piezometers designated P1 through P4 were installed in areas of proposed cuts, and where shallow groundwater conditions were previously encountered. The piezometers will be measured periodically to obtain seasonal groundwater fluctuations across the site. Groundwater was encountered in the piezometers at depths of 6 to 16.2 feet. The readings taken for the piezometers are shown on the table below, and will continued to be monitored in the coming seasons and during the development process. Where the proposed cut depths approach or are at and/or exceeding current groundwater levels, dewatering in addition to stabilization may be required. Specific stabilization recommendations are discussed in Section 9.

Shallow groundwater conditions were encountered along or near existing drainages or low-lying areas, and the pond in the northern portion of the site. Drainages on the site generally flow in a northerly direction. Areas along and near the drainages and wetlands on the site have been mapped as psw – potential seasonally shallow groundwater, or sw – seasonally shallow groundwater areas and are shown on the Geology/Engineering Geology Map, Figure 7.

Piezometer, and Total Depth (ft.)	Ground-water Level (ft.) 8/2/24	Ground-water Level (ft.) 8/6/24	Ground-water Level (ft.) 9/16/24	Ground-water Level (ft.) 3/10/25	Ground-water Level (ft.) 6/30/25	Ground-water Level (ft.) 2/6/26	Ground-water Level (ft.) 4/20/26	Approx. Cut/Fill
P1, 20'	16.2	14.4	15.5	15.1	13.5	16.2	16.0	10 – 16
P2, 20'	8.7	8.6	9.3	8.3	6.2	9.6	9.2	0 – 3
P3, 15'	6	6	6.3	6.2	5.5	6.2	6.1	6 – 10
P4, 15'	8.2	8.2	8.5	8.1	7.1	7.6	8.1	4 – 8

Note: Any semi-permanent flowing underdrain systems are subject to state well permitting.

It should be noted that in the sandy materials on site, some groundwater conditions might be encountered due to the variability in the soil profile. Isolated sand and gravel layers within the soils, sometimes only a few feet in thickness and width, can carry water in the subsurface. Groundwater may also flow on top of the underlying bedrock. Builders and planners should be cognizant of the potential for the occurrence of such subsurface water features during construction on-site and deal with each individual problem as necessary at the time of construction.

Due to the shallow groundwater levels across the project site and areas where proposed grade exceeds or encroaches the groundwater level an underdrain system will be installed to develop the site as planned. The underdrain system should be designed have a gravity discharge to a daylight outfall, and include individual connections for the individual lot foundation drains. The collected groundwater must be discharged appropriately. Typical utility underdrain details are included in Figure 8.

6 ENGINEERING GEOLOGY – IDENTIFICATION AND MITIGATION OF GEOLOGIC HAZARDS

Detailed mapping has been performed on this site to produce an Engineering Geology Map Figure 7. This map shows the location of various geologic conditions of which the developers should be cognizant during the planning, design and construction stages of the project. Constraints/Hazards include areas of artificial fill, potentially expansive soils, shallow groundwater, seasonally wet, potentially seasonally wet, and potential areas of shallow bedrock. These hazards and the recommended mitigation techniques are as follows:

Artificial Fill – Constraint

Fill was not encountered in the test borings, however, minor areas of fill were observed on the site, and fill associated with the existing sewer main located through the central portion of the site. Additionally, other areas of artificial fill may be encountered in areas other than those mapped. The fill and fill piles are considered uncontrolled for construction purposes.

Mitigation: It is anticipated the minor areas of fill will be removed prior to construction during site grading. Any uncontrolled fill encountered beneath foundations or retaining walls will require removal and recompaction at a minimum of 95% of its maximum Standard Proctor Dry Density, ASTM D-698. Fill placed at depths greater than 10 feet will require 100% of its maximum Standard Proctor Dry Density, ASTM D-698. Any organic material or mulch should be removed prior to placing controlled fill.

Expansive Soils – Constraint

Expansive soils are common in the area, and were encountered in the test borings drilled on site. Swells ranged from low to moderate in the soils tested. The clay and claystone, if encountered beneath foundations, can cause differential movement in the structure foundation. These occurrences should be identified and dealt with on an individual basis or possibly mitigated during site grading.

Mitigation: Should expansive soils be encountered beneath the foundation; mitigation will be necessary. Mitigation of expansive soils will require special foundation design. Overexcavation and replacement with non-expansive soils at a minimum of 95 percent of its maximum Modified Proctor Dry Density, ASTM D-1557 is a suitable mitigation, which is common in the area. Floor slabs on expansive soils should be expected to experience movement. Overexcavation and replacement has been successful in minimizing slab movements. Overexcavation depths of 4 to

6 feet are anticipated for the site. Mitigation may also include moisture conditioning and recompaction of the clay soils.

Drilled piers are another option that is used in areas where highly expansive soils are encountered. Typical minimum pier depths are on the order of 25 feet or more and require penetration into the bedrock material a minimum of 4 to 6 feet, depending upon building loads. Final recommendations should be determined after additional investigation of the lots.

Areas of Erosion – Constraint

Due to the nature of the soils on this site, virtually all the soils are subject to erosion by wind and water. Areas of erosion can occur across the entire site, particularly if the soils are disturbed during construction. Vegetation reduces the potential for erosion. The areas identified where erosion is actually taking place may require check dams, regrading and revegetation using channel lining mats to anchor vegetation. Further recommendations for erosion control are discussed under Section 8.0 "Erosion Control" of this report. Recommendations pertaining to revegetation may require input from a qualified landscape architect and/or the Natural Resource Conservation Service (previously Soil Conservation Service).

Floodplain and Drainage Areas – Constraint

A drainage is located in the central portion of the site which flows in a northerly direction. The site is not mapped within any floodplain zones according to the FEMA Map Nos. 08041CO065G and 08041CO276G, dated December 7, 2018 (Figure 9, Reference 10). Wet areas were observed in the northern and northwestern portions of the site along the drainage in the delineated wetland areas. Additionally, areas of seasonal and potentially seasonal shallow groundwater were observed across the site. In these areas, we would anticipate the potential for periodically high

When will groundwater be determined for construction? Will testing be done prior to construction, early grading, or during construction? If groundwater is encountered within 5 vertical feet of public ROW or drainage facilities, additional reports and testing will be required to address shallow groundwater. (See ECM C.6.1)

have potential. These are low-lying areas along the cross the site. Perched water conditions could be water can flow within permeable sand layers overlying water conditions are encountered, the mitigation ly seasonal shallow groundwater should be followed. paration of 3 feet between the foundation grade and the maximum anticipated groundwater level. If groundwater is within 3 feet additional drainage systems (underslab, interceptor) will be required. These areas are further discussed below.

The seasonally shallow groundwater and potentially seasonal shallow groundwater areas located on the site are shown on the Geology Map, Figure 7. Portions of these areas mapped with these

hazards have been identified in the National Wetland Inventory as Freshwater Emergent Wetland habitats classified as PEM1C (Palustrine – P, Emergent – EM, Persistent – 1, Seasonally Flooded – C), Freshwater Forested/Shrub Wetland habitat classified as PSS1C (Palustrine – P, Scrub-Shrub – SS, Broad-Leaved Deciduous – 1), and Riverine habitat classified as R4SBC (Riverine – R, Intermittent – 4, Streambed – SB, Seasonally Flooded – C), (Figure 10, Reference 11). The jurisdictional and non-jurisdictional wetlands were previously delineated by WBS (Reference 12), and USACE Jurisdictional Determination letter (Reference 13) are included in Appendix E.

The PEM1C and PSS1C wetland areas in the central drainage through the site and the northwestern portion of the site will be regraded with cuts and fill proposed. The delineated jurisdictional wetland areas within Tract A and C in the northern portion of the site will be avoided by the proposed grading. The non-jurisdictional wetland areas to be filled along the future extension of Misty Acres Boulevard and proposed Lots 6 through 23. Cuts in these areas are primarily for the proposed detention pond locations.

sw, psw – Seasonal and Potentially Seasonal shallow groundwater areas: In these areas, we would anticipate the potential for periodically high subsurface moisture conditions, frost heave potential, and highly organic soils. Areas where perched water conditions are encountered should also follow these recommendations. Construction proposed in or adjacent to these areas, should follow these precautions:

w – Areas of ponded water/wetlands: These are areas where water could potentially pool in low-lying areas of the drainages. According to the development plan the mapped wetlands in these areas are within designated as open space. Any areas of ponded water to be filled or regraded should have all soft organic soils removed prior to fill placement.

Mitigation: In these locations, foundations are subject to severe frost heave and should penetrate to a sufficient depth so as to prevent the formation of ice lenses beneath foundations. At this location and elevation, a foundation depth for frost protection of 30-inches is recommended. In areas where high subsurface moisture conditions are anticipated periodically, a subsurface perimeter drain will be necessary to help prevent the seepage of water into areas below grade. A typical perimeter drain detail is presented in Figure 8. Any grading in these areas should be done in a manner that directs surface flow around construction to avoid areas of ponded water. Areas of organic material will require removal prior to any fill placement. Unstable soil conditions should be expected in areas of shallow groundwater. Where foundations approach the groundwater level, stabilization

of the excavations utilizing shot rock may be necessary. Underslab drains or capillary breaks, and interceptor drains may be necessary to prevent intrusion of water into areas below grade. Typical drain details are presented in Figures 11 through 13.

Proposed grading is shown on Figure 3, and the Cut/Fill Exhibit is presented on Figure 4. Significant cuts up to 20 feet or more are proposed in a few areas of the site with the drainage area in the central portion of the site to be filled. Seven detention ponds and storm water drainage improvements are proposed across the site. Additional investigation once grading and utility installation has been completed to evaluate the groundwater levels is recommended. Temporary dewatering during construction will likely be required. All organic matter and soft, wet soils should be completely removed before filling.

Radon – Hazard

Radon is a colorless, tasteless radioactive gas with a United States Environmental Protection Agency (EPA) specified action level of 4.0 picocuries per liter (pCi/L) of air. Radon gas has a very short half-life of 3.8 days. Radon levels for the area have been reported by the Colorado Geologic Survey in the open file, Report No. 91-4 (Reference 13). Average Radon levels for the 80921-zip code is 1.90 pCi/l. The following is a table of radon levels in this area:

Average Radon Levels for the 80921 Zip Code	
0 < 4 pCi/L	100.00%
4 < 10 pCi/L	0.00%
10 < 20 pCi/L	0.00%
> 20 pCi/L	0.00%

Mitigation:

The potential for high radon levels is present for the site. Build-up of radon gas can usually be mitigated by providing increased ventilation of basement and crawlspace and sealing joints.

Specific requirements for mitigation should be based on site specific testing.

Shallow Bedrock – Constraint

Bedrock was encountered five of the ten test borings at depths ranging from 4 to 19 feet. A Summary of the Depth to Bedrock is included in Table 1. Shallow bedrock will be encountered in some areas of this site, particularly those mapped as Qc/Tkd: colluvial soils overlying the Dawson Formation. Where shallow claystone, sandstone, and siltstone are encountered,

excavation/grading may be difficult requiring track-mounted excavators. Bedrock may be encountered cuts for roadways and utility excavations.

6.1 Relevance of Geologic Conditions to Land Use Planning

Total acreage involved in the project is approximately 63 acres. Filing No. 1 consists of 35 single family lots, tracts, and other associated site improvements. It is our opinion that the existing geologic and engineering geologic conditions will impose some constraints on the proposed development and construction. The most significant problems affecting development will be those associated with the artificial fill, potentially expansive soils, shallow groundwater, seasonally wet, potentially seasonally wet, and potential areas of shallow bedrock on-site that can be satisfactorily mitigated through proper engineering design and construction practices. Basement and crawlspace construction is anticipated for the site.

The upper materials are typically at loose to medium states and firm to very stiff consistencies. Expansive soils were encountered in some of the test borings that will require mitigation. Loose soils if encountered at foundation depth will require recompaction. Foundations anticipated for the site are standard spread footings in conjunction with overexcavation in areas of expansive soils or loose soils. Excavation of the sand and clay soils is anticipated to be moderate with rubber-tired equipment. Excavation of claystone and shale may be difficult and require track-mounted equipment. Expansive soils will require special foundation design and/or overexcavation. These soils will not prohibit development.

Areas of fill exist on the site. These are areas associated minor areas of fill observed across the site, and fill associated with the existing sewer line. We would anticipate that the fill piles would be removed during site grading. Any uncontrolled fill encountered beneath foundations will require removal and recompaction at a minimum of 95% of its maximum Standard Proctor Dry Density, ASTM D-698. Fill placed at depths greater than 10 feet will require 100% of its maximum Standard Proctor Dry Density, ASTM D-698 (clay soils), and 98% of its maximum Modified Proctor Dry Density, ASTM D-1557 (granular soils). Any organic material or mulch should be removed prior to placing controlled fill.

A drainage is located in the central portion of the site which flows in a northerly direction. The site is not mapped within any floodplain zones according to the FEMA Map Nos. 08041CO065G and 08041CO276G, dated December 7, 2018 (Figure 9, Reference 10). Wet areas were observed in the northern and northwestern portions of the site along the drainage in the delineated wetland areas. The jurisdictional and non-jurisdictional wetlands were previously delineated by WBS

(Reference 12), and USACE Jurisdictional Determination letter (Reference 13) are included in Appendix E. No construction or grading is proposed in the jurisdictional wetland areas.

Additionally, areas of seasonal and potentially seasonal shallow groundwater were observed across the site. In these areas, we would anticipate the potential for periodically high subsurface moisture conditions and frost heave potential. These are low-lying areas along the drainage and minor drainages across the site. Foundations should maintain a minimum separation of 3 feet between the foundation grade and the maximum anticipated groundwater level.

Proposed grading is shown on Figure 3, and the Cut/Fill Exhibit is presented on Figure 4. Significant cuts up to 20 feet or more are proposed in a few areas the site with the drainage area in the central portion of the site to be filled. Several detention ponds and significant drainage improvements area proposed as part of the development. Retaining walls are proposed in the southern and northern portions of the site varying in height from 0.5 to 16 feet. The retaining walls should be designed for the existing site conditions by a qualified professional engineer and be designed for internal and external global slope stability.

Continued monitoring of the piezometers, and additional investigation once grading and utility installation with underdrains has been completed to evaluate the groundwater levels is recommended.

These above constraints can be mitigated through proper design and construction or through avoidance. Additional subsurface soil investigation is recommended for each building site prior to construction. Observation and testing of overlot fill/grading is recommended.

7 ECONOMIC MINERAL RESOURCES

According to the *El Paso County Aggregate Resource Evaluation Map* (Reference 15), the area is not mapped with any aggregate deposits. According to the *Atlas of Sand, Gravel and Quarry Aggregate Resources, Colorado Front Range Counties* distributed by the Colorado Geological Survey (Reference 16), areas of the site are not mapped with any resources. According to the *Evaluation of Mineral and Mineral Fuel Potential* (Reference 17), the area of the site has been mapped as “Fair” for industrial minerals. However, considering the clayey silty nature of the soils, they would be considered to have little significance as an economic resource.

According to the *Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands* (Reference 17), the site is mapped within the Denver Basin Coal Region. However, the

area of the site has been mapped as “Poor” for coal resources. No active or inactive mines have been mapped in the area of the site. No metallic mineral resources have been mapped on-site (Reference 17).

The site has been mapped as “Fair” for oil and gas resources (Reference 17). No oil or gas fields have been discovered in the area of the site. The sedimentary rocks in the area may lack the geologic structure for trapping oil or gas; therefore, it may not be considered a significant resource. Hydraulic fracturing is a new method that is being used to extract oil and gas from rocks. It utilizes pressurized fluid to extract oil and gas from rocks that would not normally be productive. The area of the site has not been explored to determine if the rocks underlying the site would be commercially viable utilizing hydraulic fracturing. The practice of hydraulic fracturing has come under review due to concerns about environmental impacts, health and safety.

8 EROSION CONTROL

The soil types observed on the site are mildly to highly susceptible to wind erosion, and moderately to highly susceptible to water erosion. A minor wind erosion and dust problem may be created for a short time during and immediately after construction. Should the problem be considered severe enough during this time, watering of the cut areas or the use of chemical palliative may be required to control dust. However, once construction has been completed and vegetation re-established, the potential for wind erosion should be considerably reduced.

With regard to water erosion, loosely compacted soils will be the most susceptible to water erosion, residually weathered soils become increasingly less susceptible to water erosion. For the typical soils observed on-site, allowable velocities on unvegetated and unlined earth channels would be on the order of 3 to 4 feet/second, depending upon the sediment load carried by the water. Permissible velocities may be increased through the use of vegetation to something on the order of 4 to 7 feet/second, depending upon the type of vegetation established. Should the anticipated velocities exceed these values, some form of channel lining material may be required to reduce erosion potential. These might consist of some of the synthetic channel lining materials on the market or conventional riprap. In cases where ditch-lining materials are still insufficient to control erosion, small check dams or sediment traps may be required. The check dams will serve to reduce flow velocities, as well as provide small traps for containing sediment. The determination of the amount, location and placement of ditch linings, check dams and of the special erosion control features should be performed by or in conjunction with the drainage engineer who is more familiar with the flow quantities and velocities.

Cut and fill slope areas will be subjected primarily to sheetwash and rill erosion. Unchecked rill erosion can eventually lead to concentrated flows of water and gully erosion. The best means to combat this type of erosion is, where possible, the adequate re-vegetation of cut and fill slopes. Cut and fill slopes having gradients more than three (3) horizontal to one (1) vertical become increasingly more difficult to revegetate successfully. Therefore, recommendations pertaining to the vegetation of the cut and fill slopes may require input from a qualified landscape architect and/or the Soil Conservation Service.

9 ROADWAY, EMBANKMENT, AND STORMWATER FACILITY CONSTRUCTION RECOMMENDATIONS

In general, the site soils are suitable for the proposed roadways and embankments. Groundwater may be encountered in deeper cuts and along drainages and low areas. If excavations encroach on the groundwater level unstable soil conditions may be encountered. Excavation of saturated soils may be difficult with rubber-tired equipment. Stabilization using shot rock or geogrids may be necessary.

Due to the shallow water conditions across the site, clay liners are recommended for the pond bottoms and side slopes to prevent groundwater from entering the pond facilities. Granular sodium bentonite mixed with native site soils that are properly compacted or the use is recommended. Geosynthetic Clay Liners (GCLs) are a suitable alternate lining option that could be considered.

Swell/Consolidation testing was conducted on the site subgrade soils which exhibited a swell of 2.8 percent. These results indicate that soil mitigation due to expansive soils may be required for the roadways. Overexcavation and cement-stabilization are suitable mitigation methods for the expansive soils in the roadways. Additional investigation for the proposed roadways will be required once site grading has been completed and utilities have been installed.

Any areas to receive fill should have all topsoil, organic material or debris removed. Prior to fill placement Entech should observe the subgrade. Fill must be properly benched and compacted to minimize potentially unstable conditions in slope areas. Fill slopes should be 3:1. The subgrade should be scarified and moisture conditioned to within 2 percent of optimum moisture content and compacted to a minimum of 95 percent of its maximum Modified Proctor Dry Density, ASTM D-1557, prior to placing new fill. Areas receiving fill may require stabilization with rock or fabric if shallow groundwater conditions are encountered.

New fill should be placed in thin lifts not to exceed 6 inches after compaction while maintaining at least 95 percent of its maximum Modified Proctor Dry Density, ASTM D-1557 for sandy soils, and clay soils should be compacted to a minimum of 95 percent of its maximum Standard Proctor Dry Density, ASTM D-698 at 0 to 4 percent of optimum moisture content. **Fill placed at depths greater than 10 feet will require 100% of its maximum Standard Proctor Dry Density, ASTM D-698 (clay soils), and 98% of its maximum Modified Proctor Dry Density, ASTM D-1557 (granular soils).** These materials should be placed at a moisture content conducive to compaction, usually 0 to ± 2 percent of Proctor optimum moisture content. The placement and compaction of fill should be observed and tested by Entech during construction. Entech should approve any import materials prior to placing or hauling them to the site. Additional investigation will be required for pavement designs once roadway grading is completed and utilities are installed.

10 CLOSURE

It is our opinion that the existing geologic engineering and geologic conditions will impose some constraints on development and construction of the site. The majority of these conditions can be mitigated through proper engineering design and construction practices. The proposed development and use are consistent with anticipated geologic and engineering geologic conditions.

It should be noted that because of the nature of data obtained by random sampling of such variable and non-homogeneous materials as soil and rock, it is important that we be informed of any differences observed between surface and subsurface conditions encountered in construction and those assumed in the body of this report. Basement and crawlspace construction can be used on the site. Additional investigations for building sites will be required prior to construction. Construction and design personnel should be made familiar with the contents of this report. Reporting such discrepancies to Entech Engineering, Inc. soon after they are discovered would be greatly appreciated and could possibly help avoid construction and development problems.

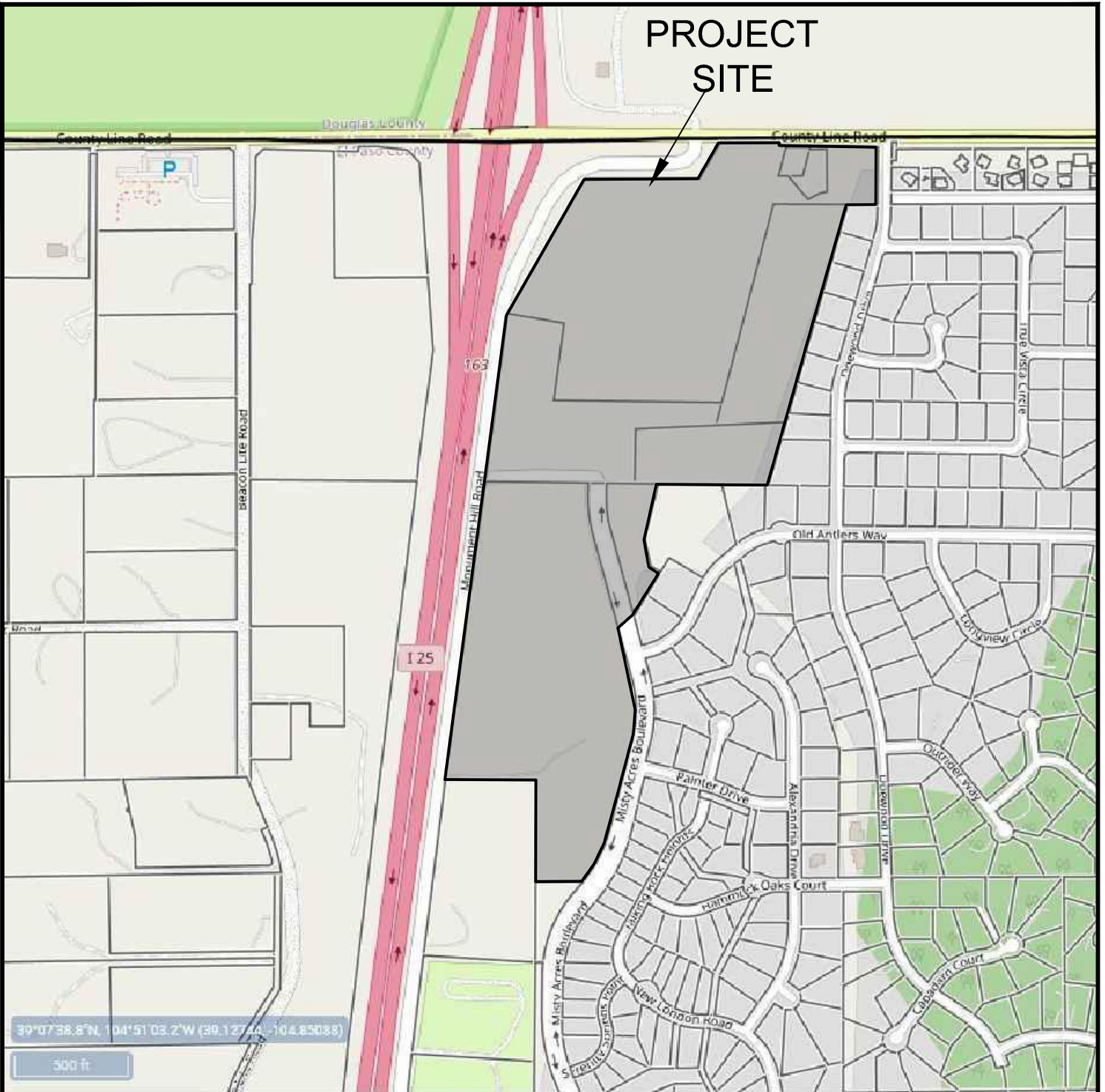
This report has been prepared for Monument Ridge East, LLC for application to the proposed project in accordance with generally accepted geologic, and geotechnical engineering practices. No other warranty expressed or implied is made.

We trust that this report has provided you with all the information that you required. Should you require additional information, please do not hesitate to contact Entech Engineering, Inc.

11 REFERENCES

1. Entech Engineering, Inc. dated January 17, 2022. *Preliminary Subsurface Soil Investigation, Monument Ridge East, Monument Hill Road and Palmer Divide Road, Monument, Colorado*. Entech Job No. 212536.
2. Colorado Geological Survey, dated June 13, 2024. *Monument Ridge East, File No. SP241, CGS Unique No. EP-24-0077*.
3. Bryant, Bruce; McGrew, Laura W, and Wobus, Reinhard A. 1981. *Geologic Structure Map of the Denver 1° x 2° Quadrangle, North-Central Colorado*. Sheet 2. U.S. Geologic Survey. Map I-1163.
4. Natural Resource Conservation Service, September 23, 2016. *Web Soil Survey*. United States Department Agriculture, <http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>.
5. United States Department of Agriculture Soil Conservation Service. June 1981. *Soil Survey of El Paso County Area, Colorado*.
6. Thorson, Jon P., 2003. *Geologic Map of the Greenland Quadrangle, Douglas and El Paso County, Colorado*. Colorado Geological Survey. Open-File Report 03-9.
7. Thorson, Jon P., and Madole, Richard F., 2003. *Geologic Map of the Monument Quadrangle, El Paso County, Colorado*. Colorado Geological Survey. Open-File Report 02-4.
8. Trimble, Donald E. and Machette, Michael N. 1979. *Geologic Map of the Colorado Springs-Castle Rock Area, Front Range Urban Corridor, Colorado*. USGS, Map I-857-F.
9. Bryant, Bruce; McGrew, Laura W. and Wobus, Reinhard A. 1981. *Geologic Map of the Denver 1° x 2° Quadrangle, North-Central Colorado*. U.S. Geologic Survey. Map 1-1163.
10. Federal Emergency Management Agency. December 7, 2018. *Flood Insurance Rate Maps for El Paso County, Colorado and Incorporated Areas*. Map Numbers 08041CO065G and 08041CO276G.
11. U.S. Fish & Wildlife Service, May 1, 2020. *National Wetlands Inventory*. Department of the Interior, fws.gov/wetlands/data/Mapper.html.
12. WSB, dated September 10, 2021, *Level 2 Wetland Delineation Report, Monument Ridge East Development, Woodmoor, El Paso County, Colorado*. WSB Project No. 18697.
13. Department of the Army Corps of Engineers, dated March 22, 2022, *Jurisdictional Determination – Action No. SPA-2005-00679*.
14. Colorado Geological Survey. 1991. *Results of the 1987-88 EPA Supported Radon Study in Colorado*. Open-file Report 91-4.
15. El Paso County Planning Development. December 1995. *El Paso County Aggregate Resource Evaluation Maps*.
16. Schwochow, S.D.; Shroba, R.R. and Wicklein, P.C. 1974. *Atlas of Sand, Gravel, and Quarry Aggregate Resources, Colorado Front Range Counties*. Colorado Geological Survey. Special Publication 5-B.
17. Keller, John W.; TerBest, Harry and Garrison, Rachel E. 2003. *Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands Administered by the Colorado State Land Board*. Colorado Geological Survey. Open-File Report 03-07.

FIGURES



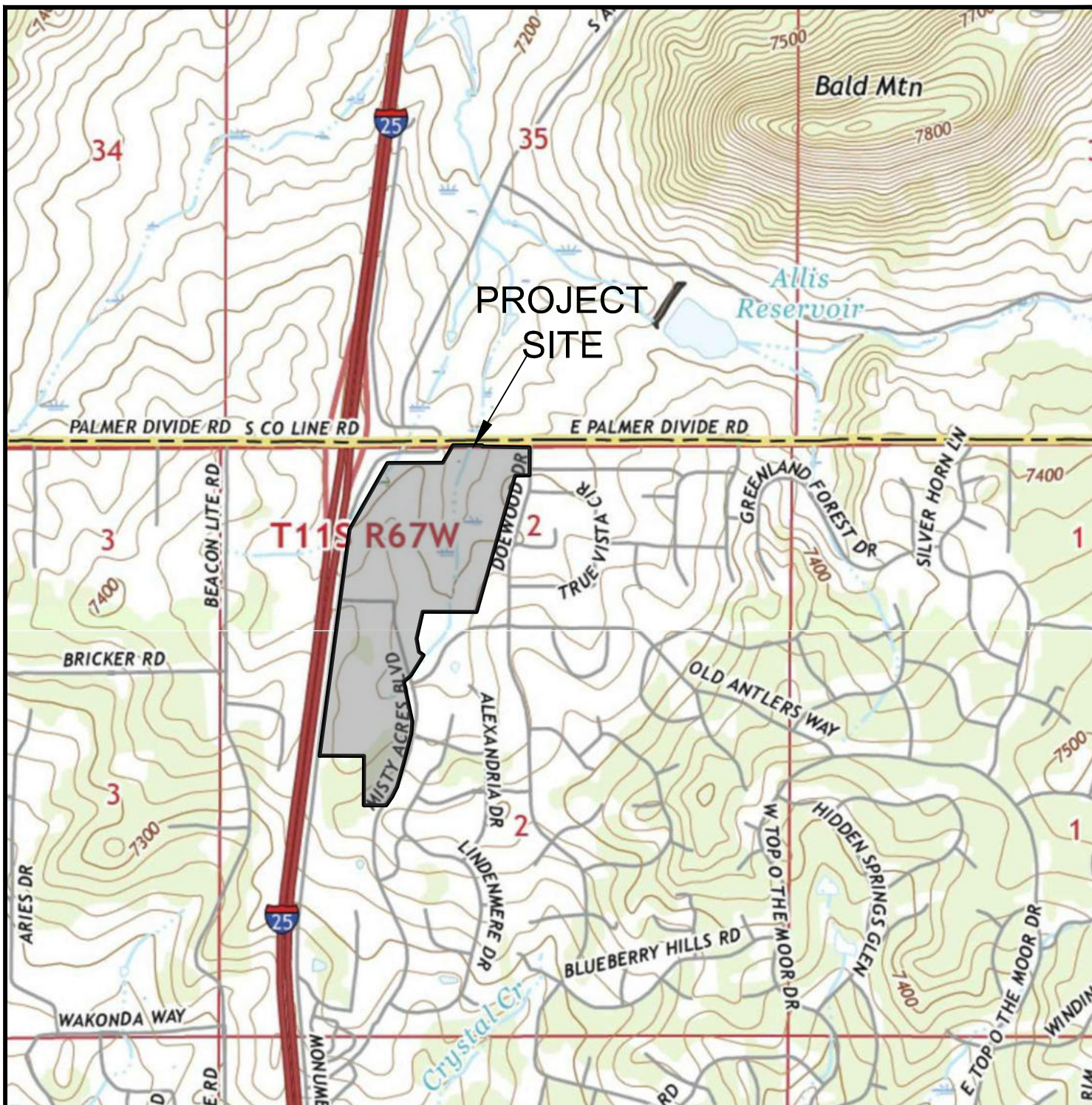
VICINITY MAP

MONUMENT RIDGE EAST
MONUMENT RIDGE EAST, LLC

JOB NO.
230248

FIG. 1





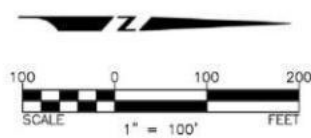
USGS TOPOGRAPHY MAP

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JOB NO.
230248

FIG. 2

NORTH ONE-HALF OF SECTION 2, T 11 S, R 67 W OF THE 6th P.M.
EL PASO COUNTY, COLORADO



- APPROXIMATE PHOTOGRAPH LOCATION AND NUMBER



MONUMENT RIDGE EAST
MONUMENT RIDGE EAST, LLC

FIG. 3

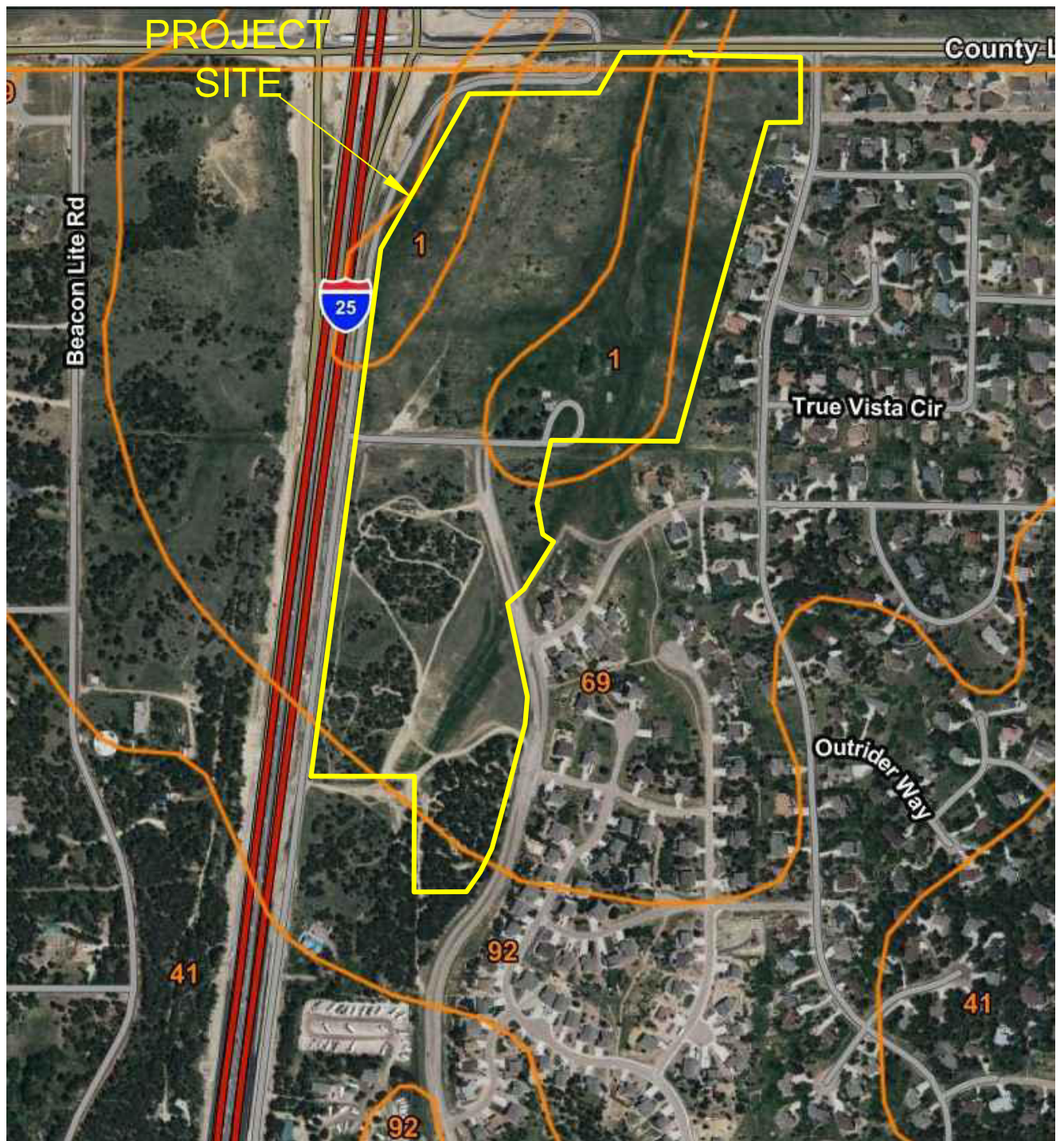


CUT/FILL EXHIBIT

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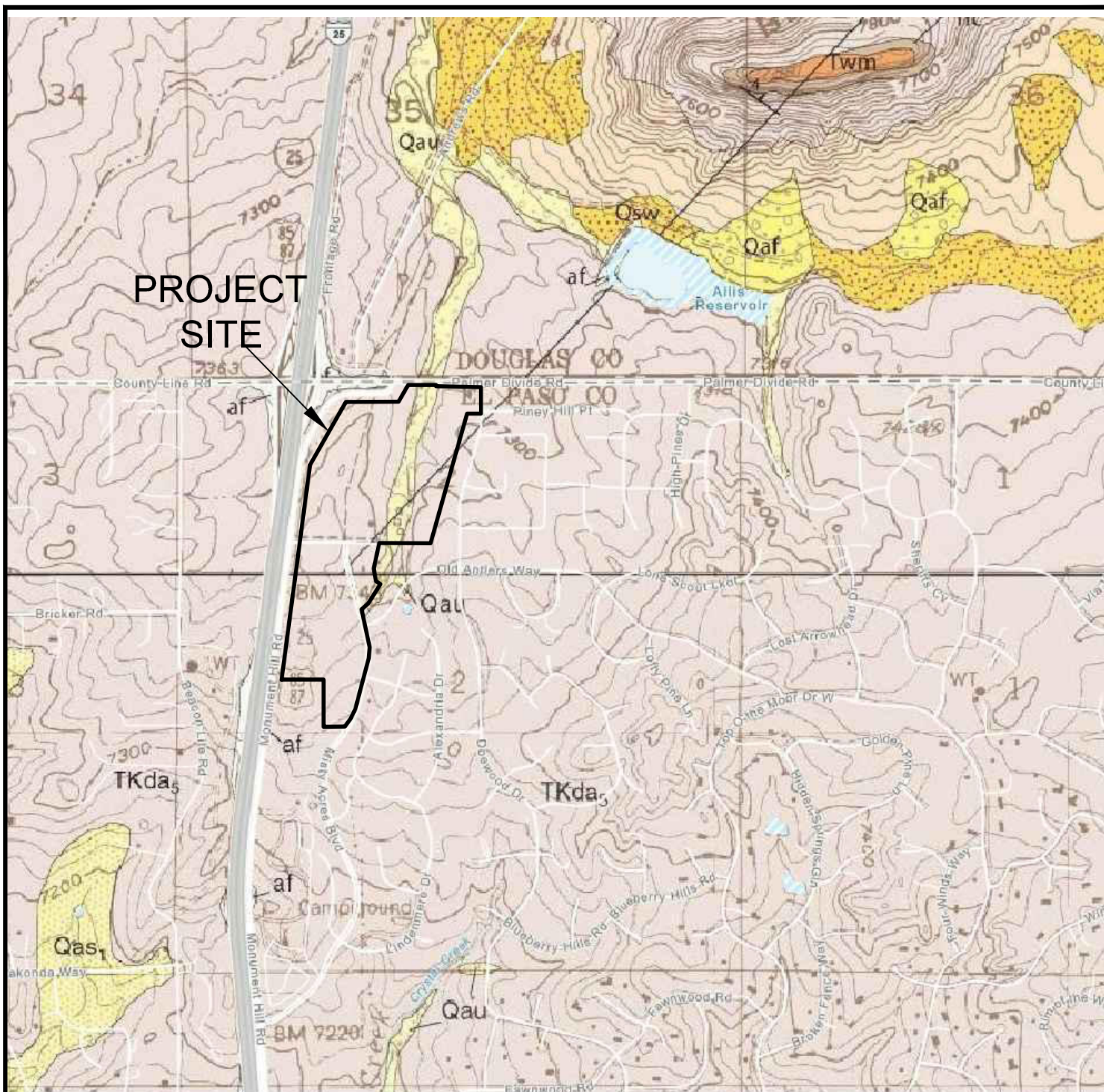
FIG. 4



USDA SOIL MAP
MONUMENT RIDGE EAST
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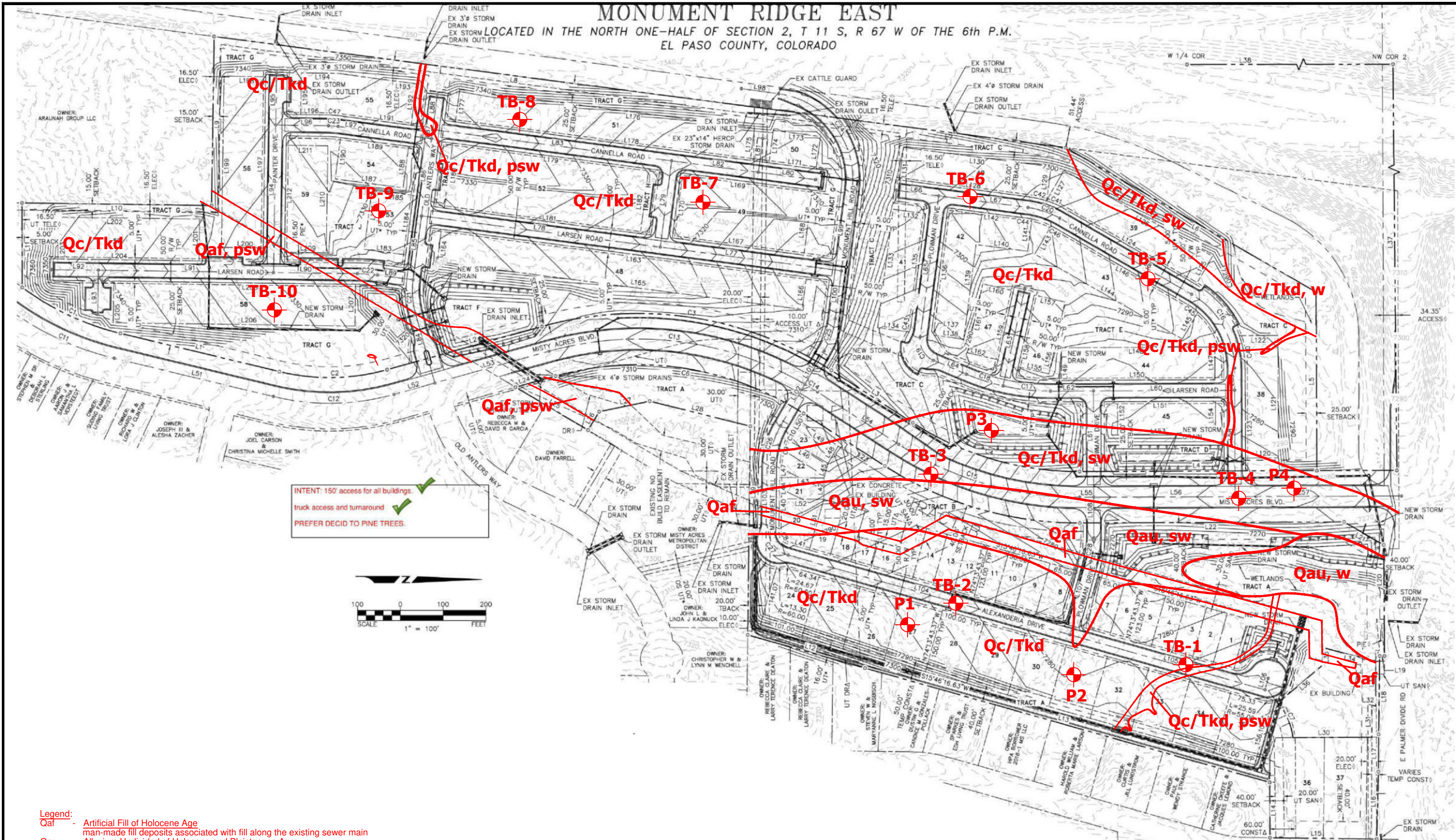
FIG. 5



**GEOLOGIC MAP OF THE
MONUMENT QUADRANGLE**
MONUMENT RIDGE EAST
MONUMENT RIDGE EAST, LLC

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FIG. 6

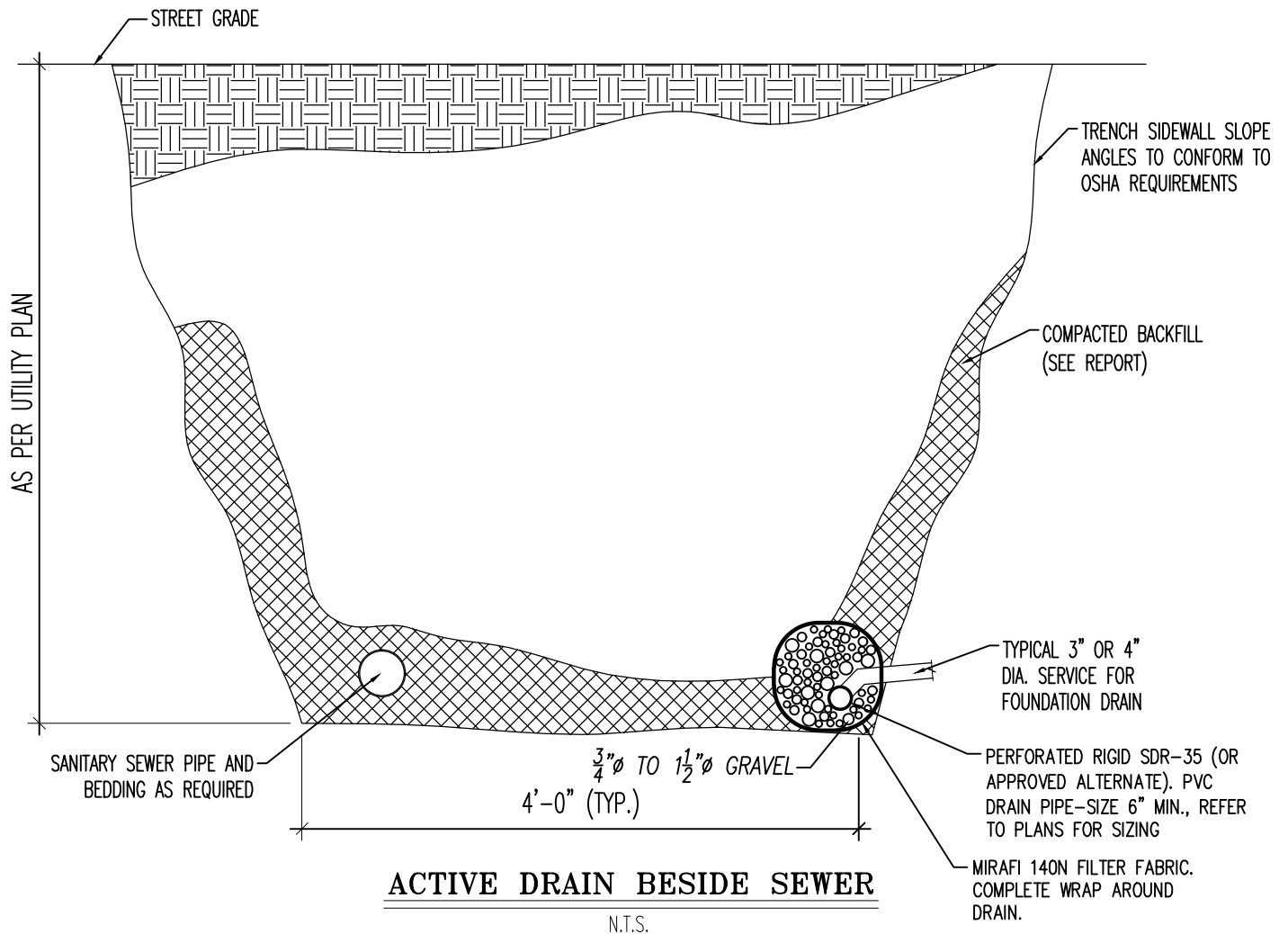


Legend:
 Qaf - Artificial Fill of Holocene Age
 man-made fill deposits associated with fill along the existing sewer main
 Qau - Alluvium Undivided of Holocene and Pleistocene Age:
 sheetwash and channel deposited alluvium along active drainage way
 QcTkd - Colluvium of Quaternary Age overlying Dawson Formation of Tertiary to Cretaceous Age:
 colluvial and residual soils overlying arkosic sandstone with interbedded fine-grained
 sandstone, siltstone and claystone
 psw - potentially shallow groundwater area
 sw - seasonally shallow groundwater area
 w - standing water/wetlands



GEOLOGY / ENGINEERING MAP
 MONUMENT RIDGE EAST
 MONUMENT RIDGE EAST, LLC

JOB NO.
 230248
 FIG. 7

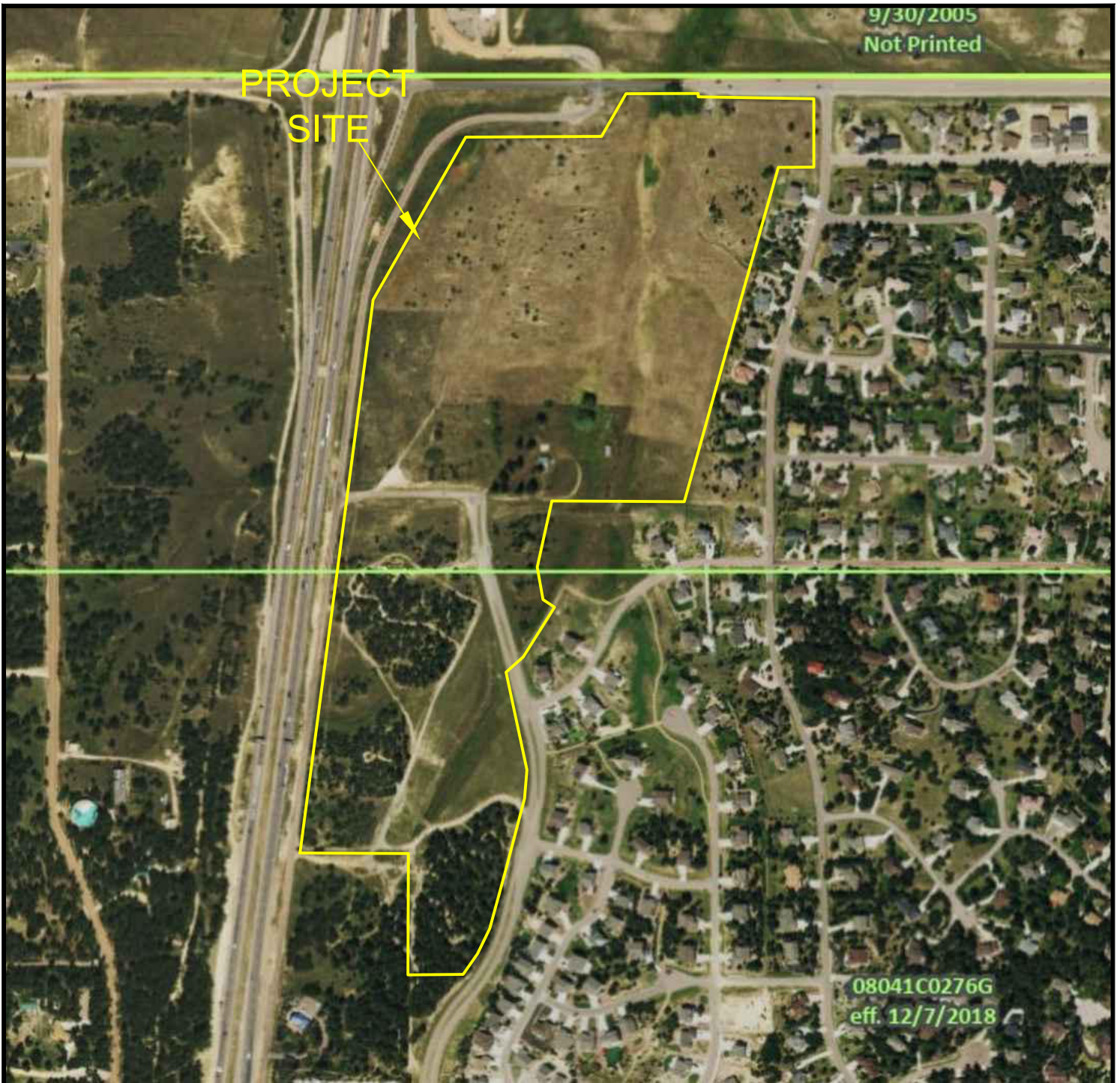


ACTIVE SEWER UNDERDRAIN

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FIG. 8



FEMA FLOODPLAIN MAP

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FIG. 9

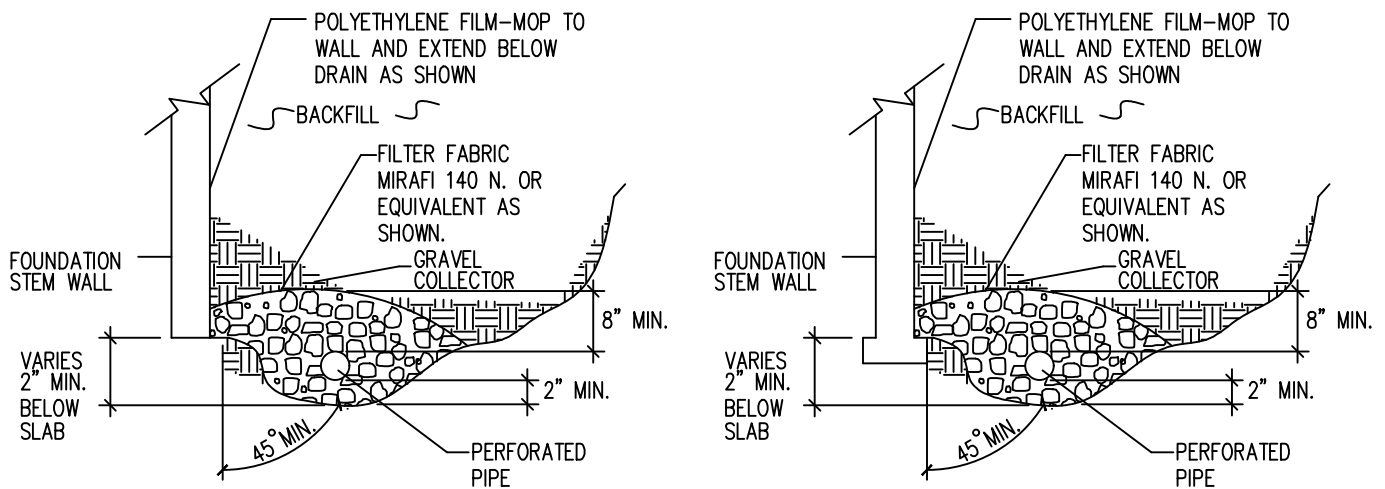


USFWS WETLANDS MAP

MONUMENT RIDGE EAST
MONUMENT RIDGE EAST, LLC

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FIG. 10



NOTES:

—GRAVEL SIZE IS RELATED TO DIAMETER OF PIPE PERFORATIONS—85% GRAVEL GREATER THAN 2x PERFORATION DIAMETER.

—PIPE DIAMETER DEPENDS UPON EXPECTED SEEPAGE. 4-INCH DIAMETER IS MOST OFTEN USED.

—ALL PIPE SHALL BE PERFORATED PLASTIC. THE DISCHARGE PORTION OF THE PIPE SHOULD BE NON-PERFORATED PIPE.

—FLEXIBLE PIPE MAY BE USED UP TO 8 FEET IN DEPTH, IF SUCH PIPE IS DESIGNED TO WITHSTAND THE PRESSURES. RIGID PLASTIC PIPE WOULD OTHERWISE BE REQUIRED.

—MINIMUM GRADE FOR DRAIN PIPE TO BE 1% OR 3 INCHES OF FALL IN 25 FEET.

—DRAIN TO BE PROVIDED WITH A FREE GRAVITY OUTFALL, IF POSSIBLE. A SUMP AND PUMP MAY BE USED IF GRAVITY OUT FALL IS NOT AVAILABLE.

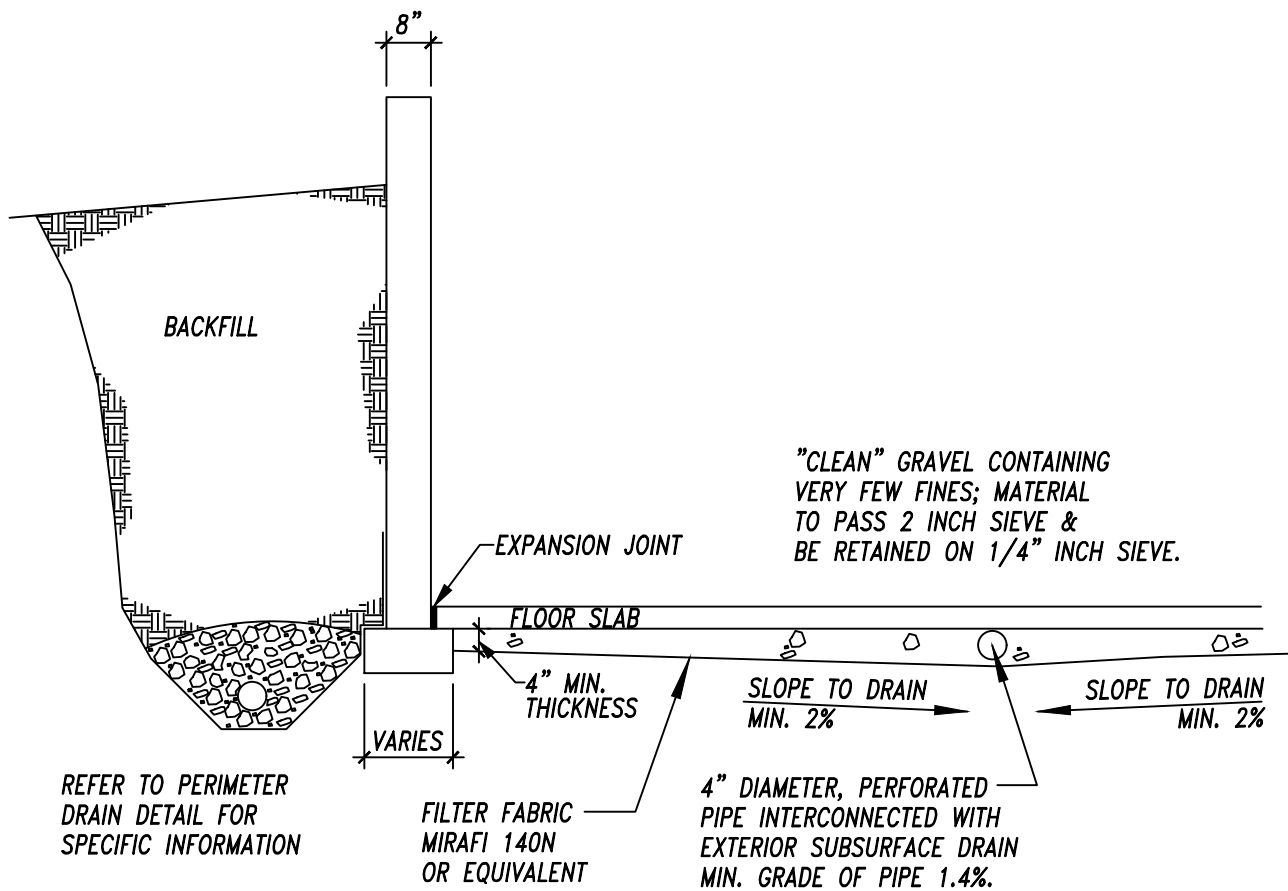


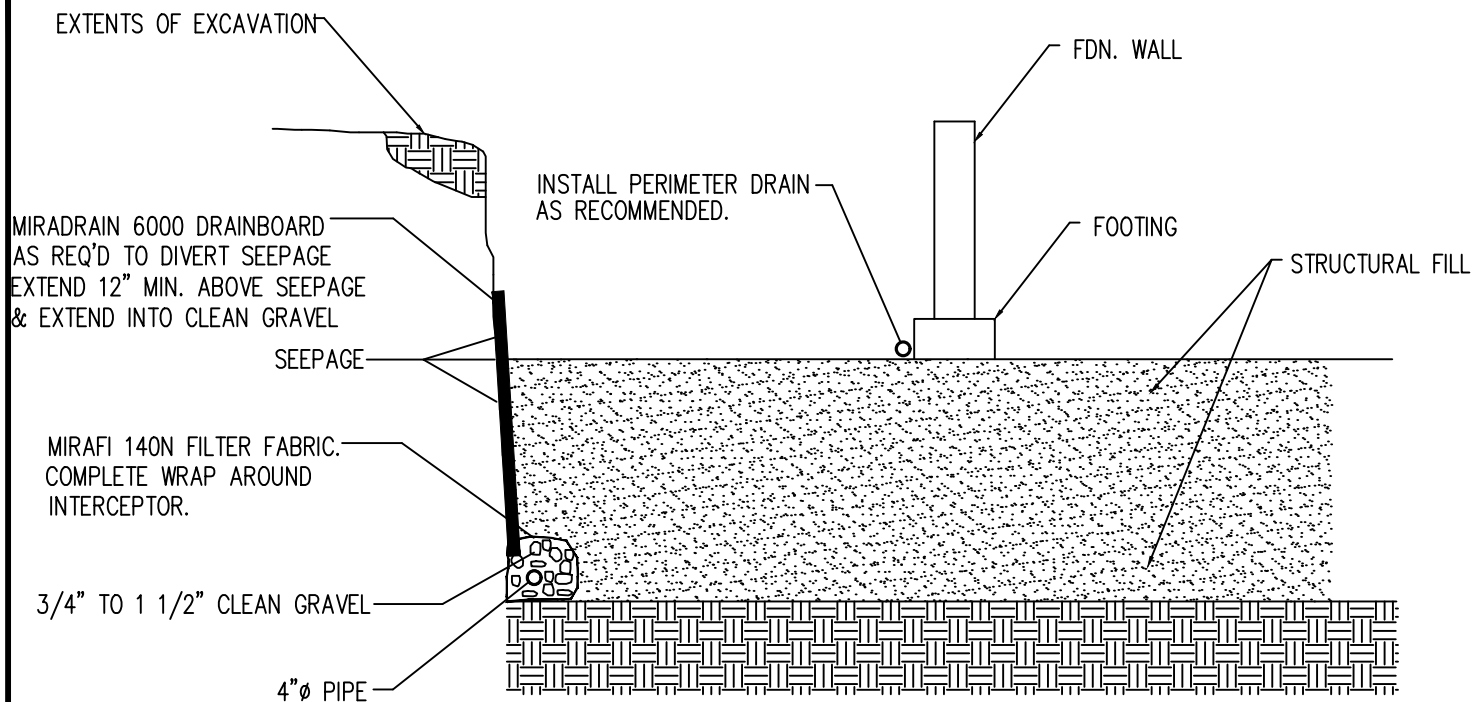
PERIMETER DRAIN DETAIL

MONUMENT RIDGE EAST
MONUMENT RIDGE EAST, LLC

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230248

FIG. 11





NOTE:
EXTEND INTERCEPTOR DRAIN TO UNDERDRAIN OR TO SUMP.
BENCH DRAIN INTO NATIVE SOILS 12 INCHES MINIMUM.

INTERCEPTOR DRAIN DETAIL

N.T.S.



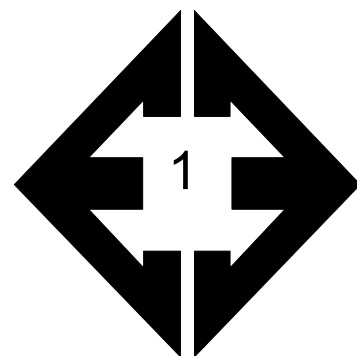
INTERCEPTOR DRAIN DETAIL

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230248

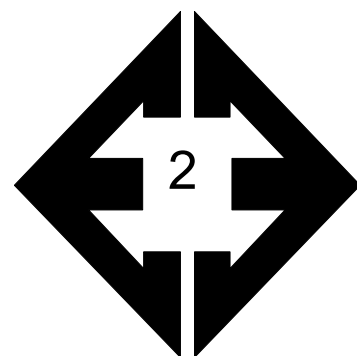
FIG. 13

APPENDIX A: Site Photographs



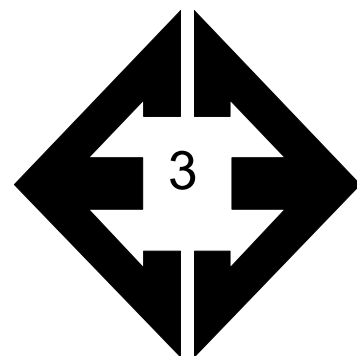
**Looking north from the
southern portion of the
site.**

February 28, 2023



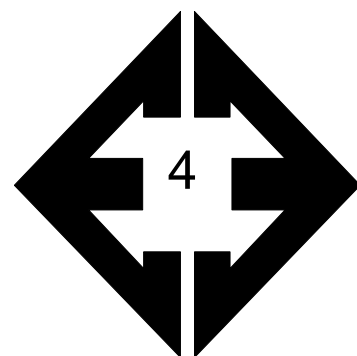
**Looking south from
the southern portion of
the site.**

February 28, 2023



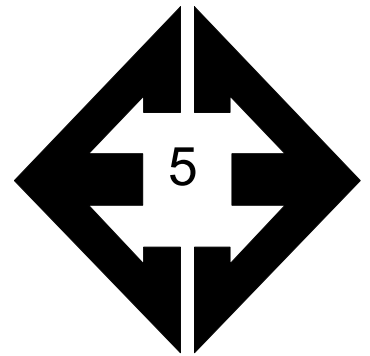
**Looking southwest
along drainage from
Misty Acres Boulevard
in the southern portion
of the site.**

February 28, 2023



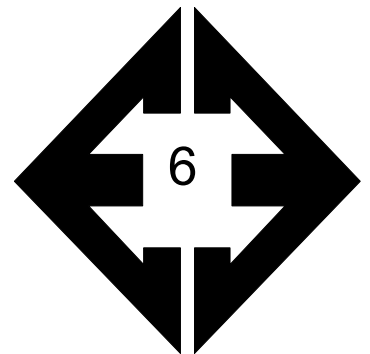
**Looking northwest
from Misty Acres
Boulevard in the
southern portion of the
site.**

February 28, 2023



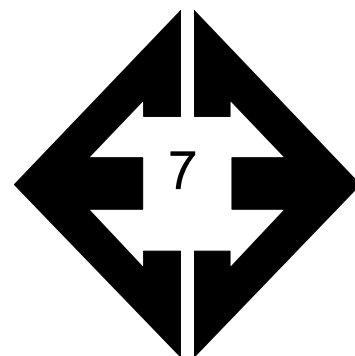
**Looking north from the
western side of the
site.**

February 28, 2023



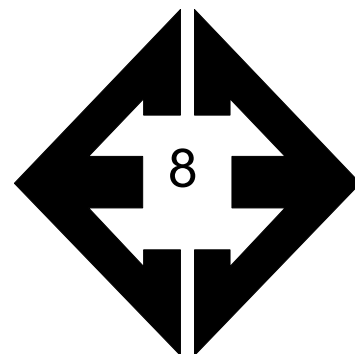
**Looking south from
the western portion of
the site.**

February 28, 2023



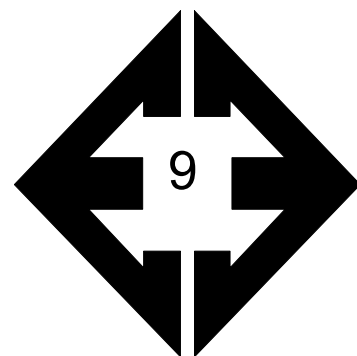
**Looking southeast
from northwestern
portion of the site.**

February 28, 2023



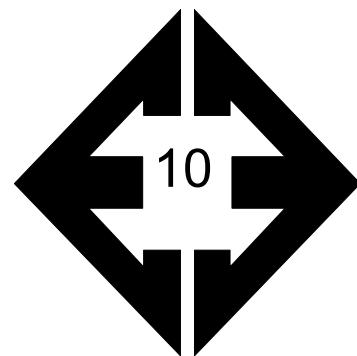
**Looking east from the
northwestern portion
of the site.**

February 28, 2023



**Looking south along
drainage from the
north-central portion
of the site.**

February 28, 2023



**Looking southwest
from northeast portion
of the site.**

February 28, 2023

**APPENDIX B: Test Boring Logs and Laboratory Testing
Summary, Entech Job No. 212536**

Table A-1: Summary Test Boring Results

Test Boring No.	Depth to Bedrock (ft.)	Depth to Groundwater (ft.)
1	>20	9
2	19	9
3	19	1
4	>20	10
5	13	>19
6	4	>18
7	>20	>20
8	10	>20
9	>20	>20
10	>20	>19

TEST BORING NO. 1
 DATE DRILLED 10/1/2021
 Job # 212536

TEST BORING NO. 2
 DATE DRILLED 10/1/2021
 CLIENT MONUMENT RIDGE EAST, LLC
 LOCATION MONUMENT RIDGE EAST

REMARKS

WATER @ 9', 10/11/21

SAND, CLEAN TO SILTY, FINE
 TO COARSE GRAINED, BROWN
 TO TAN, MEDIUM DENSE TO
 DENSE, DRY TO MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			11	2.2	1
5			14	9.4	1
10			37	11.4	1
15			31	13.1	1
20			42	11.6	1



REMARKS

WATER @ 9', 10/11/21

SAND, SILTY, FINE TO COARSE
 GRAINED, BROWN TO TAN,
 MEDIUM DENSE TO DENSE,
 MOIST

SANDSTONE, CLAYEY, FINE TO
 MEDIUM GRAINED, TAN, VERY
 DENSE, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			17	7.4	1
5			12	11.3	1
10			16	11.6	1
15			38	10.8	1
20			50	9.7	3



ENTECH
 ENGINEERING, INC.

505 ELKTON DRIVE
 COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:

DATE:

CHECKED:

SW

DATE:

10-20-21

JOB NO.
 212536

FIG NO.
 A- 1

TEST BORING NO. 3
 DATE DRILLED 10/1/2021
 Job # 212536

TEST BORING NO. 4
 DATE DRILLED 10/1/2021
 CLIENT MONUMENT RIDGE EAST, LLC
 LOCATION MONUMENT RIDGE EAST

REMARKS

WATER @ 1', 10/11/21

SAND, VERY CLAYEY, FINE
 GRAINED, GRAY, LOOSE TO
 MEDIUM DENSE, MOIST TO WET

SAND, SILTY, FINE TO COARSE
 GRAINED, TAN, MEDIUM DENSE
 TO DENSE, MOIST

SANDSTONE, CLAYEY, FINE TO
 MEDIUM GRAINED, TAN, VERY
 DENSE, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			6	16.7	2
5			10	20.5	2
10			13	13.8	1
15			38	10.5	1
20			50 7"	11.6	3

REMARKS

WATER @ 10', 10/11/21

SAND, VERY CLAYEY, FINE
 GRAINED, BROWN, LOOSE TO
 MEDIUM DENSE, MOIST TO WET

SAND, SILTY, FINE GRAINED,
 GRAY, MEDIUM DENSE, MOIST

SAND, VERY CLAYEY, GRAY,
 FINE TO MEDIUM GRAINED,
 LOOSE, VERY MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			26	5.7	2
5			17	10.6	2
10			16	15.7	1
15			6	18.7	2
20			15	18.7	2



ENTECH
ENGINEERING, INC.

505 ELKTON DRIVE
 COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:

DATE:

CHECKED:

DATE:

SW

10-20-21

JOB NO.
 212536

FIG NO.
 A- 2

TEST BORING NO. 5
 DATE DRILLED 10/1/2021
 Job # 212536

TEST BORING NO. 6
 DATE DRILLED 10/4/2021
 CLIENT MONUMENT RIDGE EAST, LLC
 LOCATION MONUMENT RIDGE EAST

REMARKS

DRY TO 19', 10/11/21

SAND, SILTY, FINE TO COARSE
 GRAINED, BROWN TO RED BROWN,
 MEDIUM DENSE TO VERY DENSE,
 MOIST

WEATHERED TO FORMATIONAL
 SANDSTONE, SILTY, FINE TO
 COARSE GRAINED, RED BROWN,
 VERY DENSE TO MEDIUM DENSE,
 MOIST

HIGHLY WEATHERED ZONE

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			24	5.8	1
			24	8.4	1
10			40	9.3	1
15			50 9"	11.3	3
20			25	13.6	3

REMARKS

DRY TO 18', 10/11/21

SAND, SILTY, FINE TO COARSE
 GRAINED, TAN, DENSE, MOIST

SANDSTONE, SILTY, FINE TO
 COARSE GRAINED, BROWN TO
 TAN, VERY DENSE, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			37	5.5	1
			50 6"	8.8	3
10			50 10"	8.8	3
15			50 10"	9.6	3
20			50 9"	10.4	3



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ENGINEERING, INC.

505 ELKTON DRIVE
 COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:

DATE:

CHECKED:

DATE: 10-20-21

JOB NO.:
 212536

FIG NO.:
 A-3

TEST BORING NO. 7
 DATE DRILLED 10/4/2021
 Job # 212536

TEST BORING NO. 8
 DATE DRILLED 10/4/2021
 CLIENT MONUMENT RIDGE EAST, LLC
 LOCATION MONUMENT RIDGE EAST

REMARKS

DRY TO 20', 10/11/21

SAND, VERY SILTY TO SILTY,
 FINE TO MEDIUM GRAINED, TAN
 TO BROWN, MEDIUM DENSE TO
 DENSE, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			20	4.2	1
5			15	8.9	1
10			19	12.4	1
15			31	8.4	1
20			28	8.4	1

REMARKS

DRY TO 20', 10/11/21

SAND, SILTY, FINE TO COARSE
 GRAINED, BROWN TO TAN,
 MEDIUM DENSE TO DENSE,
 MOIST

SANDSTONE, CLAYEY, FINE TO
 MEDIUM GRAINED, RED BROWN,
 VERY DENSE, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			18	3.0	1
5			18	11.3	1
10			44	10.0	1
15			50 7"	17.1	3
20			50 5"	9.1	3



ENTECH
ENGINEERING, INC.

505 ELKTON DRIVE
 COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:

DATE:

CHECKED:

SW

DATE:

10-20-21

JOB NO.:
 212536

FIG NO.:
 A- 4

TEST BORING NO. 9
 DATE DRILLED 10/4/2021
 Job # 212536

TEST BORING NO. 10
 DATE DRILLED 10/4/2021
 CLIENT MONUMENT RIDGE EAST, LLC
 LOCATION MONUMENT RIDGE EAST

REMARKS

DRY TO 20', 10/11/21
 SAND, VERY SILTY TO SILTY,
 FINE TO MEDIUM GRAINED,
 BROWN, MEDIUM DENSE, MOIST

CLAYEY LENS

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			15	11.2	1
			17	6.8	1
10			28	10.3	1
15			17	9.0	1
20			27	12.0	1

REMARKS

DRY TO 19', 10/11/21
 SAND, SILTY, FINE TO COARSE
 GRAINED WITH FINE GRAINED
 INTERBEDS, BROWN TO TAN,
 MEDIUM DENSE TO VERY DENSE,
 MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			22	4.1	1
			36	5.3	1
10			26	8.2	1
15			39	10.3	1
20			49	15.2	1



ENTECH
ENGINEERING, INC.

505 ELKTON DRIVE
 COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:

DATE:

CHECKED:

SW

DATE:

10-20-21

JOB NO.
 212536

FIG NO.
 A- 5

TABLE 1
SUMMARY OF LABORATORY TEST RESULTS

CLIENT MONUMENT RIDGE EAST, LLC
PROJECT MONUMENT RIDGE EAST
JOB NO. 212536

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT (%)	PLASTIC INDEX (%)	SULFATE (WT %)	FHA SWELL (PSF)	SWELL/ CONSOL (%)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION
1	1	2-3			4.5	NV	NP	<0.01			SW	SAND
1	5	5			26.7						SM	SAND, SILTY
1	7	2-3			38.4						SM	SAND, VERY SILTY
1	8	10			33.3						SM	SAND, SILTY
1	9	5			43.5				20		SM	SAND, VERY SILTY
1	10	2-3			20.8						SM	SAND, SILTY
2	3	2-3	17.9	95.1	42.9	34	18	<0.01		2.8	SC	SAND, VERY CLAYEY
2	4	5			38.0						SC	SAND, VERY CLAYEY
3	6	5			28.8						SM	SANDSTONE, SILTY
3	2	20			24.6	32	16	<0.01			SC	SANDSTONE, CLAYEY

APPENDIX C: Temporary Piezometers, Test Boring Logs and Summary of Laboratory Testing Results

TEST BORING (P1) 1
DATE DRILLED 7/29/2024
REMARKS

WATER @ 16.2', 8/2/24

24" TOPSOIL

SAND, CLAYEY, BROWN to OLIVE,
LOOSE to DENSE, MOIST

SANDSTONE, VERY WEAK, OLIVE,
HIGHLY WEATHERED (SAND,
CLAYEY, VERY DENSE, MOIST)

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			9	4.2	1
5			8	11.2	1
10			31	12.2	1
15			47	15.3	1
20			50	11.0	3
			11"		

TEST BORING (P2) 2
DATE DRILLED 7/29/2024
REMARKS

WATER @ 8.7', 8/2/24

2" TOPSOIL

CLAY, SANDY, OLIVE, VERY STIFF,
MOIST

SAND, SILTY, LIGHT BROWN,
MEDIUM DENSE, MOIST

SAND, CLAYEY, LIGHT BROWN to
OLIVE, LOOSE to MEDIUM
DENSE, MOIST

CLAY, SANDY, OLIVE, VERY STIFF,
MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			16	12.4	2
5			18	5.5	1
10			6	19.4	1
15			23	16.7	1
20			29	11.6	2



TEST BORING LOGS

MONUMENT HILL ROAD
MONUMENT RIDGE EAST

JOB NO.
230248

FIG. C-1

TEST BORING (P3) 3
 DATE DRILLED 7/29/2024
 REMARKS

WATER @ 6', 8/2/24

24" TOPSOIL

CLAY, SANDY, BROWN to OLIVE,
 STIFF to VERY STIFF, MOIST



Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			12	10.8	2
5			14	17.4	2
10			10	16.1	2
15			17	11.7	2
20					

TEST BORING (P4) 4
 DATE DRILLED 7/29/2024
 REMARKS

WATER @ 8.2', 8/2/24

24" TOPSOIL

SAND, CLAYEY, BROWN to OLIVE,
 MEDIUM DENSE, MOIST



Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			12	11.4	1
5			21	13.0	1
10			27	9.8	1
15			7	19.7	2
20					

CLAY, SANDY, OLIVE, MEDIUM
 STIFF, MOIST



TEST BORING LOGS

MONUMENT HILL ROAD
 MONUMENT RIDGE EAST

JOB NO.
 230248

FIG. C-2

TABLE C-1
SUMMARY OF LABORATORY TEST RESULTS

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	PASSING NO. 200 SIEVE (%)	USCS	SOIL DESCRIPTION
1	2	10	17.7	SM	SAND, SILTY
1	4	5	24.8	SC	SAND, CLAYEY
2	3	2-3	53.9	CL	CLAY, SANDY
3	1	20	28.1	SC	SANDSTONE (SAND, CLAYEY)

APPENDIX D: USDA Soil Survey Descriptions

El Paso County Area, Colorado

1—Alamosa loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 3670

Elevation: 7,200 to 7,700 feet

Farmland classification: Prime farmland if irrigated and reclaimed of excess salts and sodium

Map Unit Composition

Alamosa and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alamosa

Setting

Landform: Flood plains, fans

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 6 inches: loam

Bt - 6 to 14 inches: clay loam

Btk - 14 to 33 inches: clay loam

Cg1 - 33 to 53 inches: sandy clay loam

Cg2 - 53 to 60 inches: sandy loam

Properties and qualities

Slope: 1 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water

(Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: About 12 to 18 inches

Frequency of flooding: Frequent

Frequency of ponding: None

Calcium carbonate, maximum content: 5 percent

Maximum salinity: Very slightly saline to strongly saline (2.0 to 16.0 mmhos/cm)

Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: D

Ecological site: R048AY241CO - Mountain Meadow

Hydric soil rating: Yes

Minor Components

Other soils

Percent of map unit:

Hydric soil rating: No

Data Source Information

Soil Survey Area: Castle Rock Area, Colorado

Survey Area Data: Version 16, Aug 24, 2023

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 21, Aug 24, 2023

El Paso County Area, Colorado

69—Peyton-Pring complex, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 369g

Elevation: 6,800 to 7,600 feet

Farmland classification: Not prime farmland

Map Unit Composition

Peyton and similar soils: 40 percent

Pring and similar soils: 30 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peyton

Setting

Landform: Hills

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Arkosic alluvium derived from sedimentary rock and/or arkosic residuum weathered from sedimentary rock

Typical profile

A - 0 to 12 inches: sandy loam

Bt - 12 to 25 inches: sandy clay loam

BC - 25 to 35 inches: sandy clay loam

C - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 8 to 9 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water

(Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Ecological site: R049XY216CO - Sandy Divide

Hydric soil rating: No

Description of Pring

Setting

Landform: Hills

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Arkosic alluvium derived from sedimentary rock

Typical profile

A - 0 to 14 inches: coarse sandy loam

C - 14 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): High
(2.00 to 6.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: B

Ecological site: R048AY222CO - Loamy Park

Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:

Hydric soil rating: No

Pleasant

Percent of map unit:

Landform: Depressions

Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Castle Rock Area, Colorado

Survey Area Data: Version 16, Aug 24, 2023

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 21, Aug 24, 2023

El Paso County Area, Colorado

92—Tomah-Crowfoot loamy sands, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 36b9

Elevation: 7,300 to 7,600 feet

Farmland classification: Not prime farmland

Map Unit Composition

Tomah and similar soils: 50 percent

Crowfoot and similar soils: 30 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tomah

Setting

Landform: Hills, alluvial fans

Landform position (three-dimensional): Crest, side slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from arkose and/or residuum weathered from arkose

Typical profile

A - 0 to 10 inches: loamy sand

E - 10 to 22 inches: coarse sand

Bt - 22 to 48 inches: stratified coarse sand to sandy clay loam

C - 48 to 60 inches: coarse sand

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water

(Ksat): Moderately high to high (0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Ecological site: R049XY216CO - Sandy Divide

Hydric soil rating: No

Description of Crowfoot

Setting

Landform: Alluvial fans, hills

Landform position (three-dimensional): Crest, side slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 12 inches: loamy sand

E - 12 to 23 inches: sand

Bt - 23 to 36 inches: sandy clay loam

C - 36 to 60 inches: coarse sand

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water

(Ksat): Moderately high to high (0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Ecological site: R049XY216CO - Sandy Divide

Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:

Hydric soil rating: No

Pleasant

Percent of map unit:

Landform: Depressions

Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Castle Rock Area, Colorado

Survey Area Data: Version 16, Aug 24, 2023

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 21, Aug 24, 2023

**APPENDIX E: Entech Response Letter to CGS Review
dated June 13, 2024**

August 7, 2024

Monument Ridge East, LLC
101 North Cascade Avenue, Suite 10
Colorado Springs, Colorado 80903



ENTECH
ENGINEERING, INC.

505 ELKTON DRIVE
COLORADO SPRINGS, CO 80907
PHONE (719) 531-5599

Attn: Norbie Larsen

Re: Response to Review Comments
Monument Ridge East
Monument Hill Road and Palmer Divide Road
El Paso, Colorado
Entech Job No. 230248

Ref: Entech Engineering, Inc., dated March 7, 2023. *Soils and Geology Study, Monument Ridge East, Monument Hill Road and Palmer Divide Road, El Paso County, Colorado.* Entech Job No. 230248.

Colorado Geological Survey, dated June 13, 2024. *Monument Ridge East, File No. SP241, CGS Unique No. EP-24-0077.*

WSB, dated September 10, 2021, *Level 2 Wetland Delineation Report, Monument Ridge East Development, Woodmoor, El Paso County, Colorado.* WSB Project No. 18697.

Department of the Army Corps of Engineers, dated March 22, 2022, *Jurisdictional Determination – Action No. SPA-2005-00679.*

Dear Mr. Larsen:

Entech Engineering, Inc. (Entech) has reviewed the CGS comments dated June 13, 2024 on the proposed Monument Ridge East development. This letter presents our responses to the CGS comments. It should be noted that additional investigation/design will be required and completed as the project continues through the development process.

The CGS comments, *WSB Level 2 Wetland Delineation Report, and USACE Jurisdictional Determination letter* are attached with this response letter. The responses to their comments are presented below:

ENTECH ENGINEERING, INC. RESPONSES

Entech Response to Comment 1: The Geology/Engineering Geology Map has been updated and is included with the revised report.

Entech Response to Comment 2: The proposed grading indicates significant cuts of up to 20 to 24 feet across the site. Four piezometers were recently installed in areas of proposed cuts, and where shallow water conditions were previously encountered in Test Boring Nos. 1 – 4. Significant drainage improvements and interceptor drains are planned. Additional site investigation will be conducted during the development process and recommendations regarding an underdrain system will be provided. The underdrain system must have a daylight to function properly. At this time, we do not believe that a general “no basement” statement is warranted. This statement should be used for areas where further investigation/analysis determines that basement construction is not feasible.

Entech Response to Comment 3: Foundations should be 3 feet above water for typical construction practices. Areas of shallow water will be further evaluated to determine mitigation measures required for the proposed construction. Mitigation measures may include raising the site grades, interceptor drains, and utility drains. Entech will continue to monitor the temporary piezometers throughout the coming seasons and during the development process. The readings



will be utilized to evaluate the development. Additional piezometers may be recommended following site grading and utility installation.

Entech Response to Comment 4: Figure 7 has been updated, and a geologic hazard note provided for the preliminary plan/plat.

Entech Response to Comment 5: Entech is in agreement that lots should not be located within the delineated jurisdictional wetlands located in the northern and northwestern portions of the site. The jurisdictional wetlands lie within no-build areas and will be avoided by the development.

Entech Response to Comment 6: Entech is in agreement that filling of the natural drainages will not mitigate the shallow groundwater conditions and an undrain system will be needed. Additional site investigation will be conducted during the development process and recommendations regarding an underdrain system will be provided. The underdrain system must have a daylight to function properly.

We trust this has provided you with the information you require. If you have any questions or need additional information, please do not hesitate to contact us.

Respectfully Submitted,

ENTECH ENGINEERING, INC.

A handwritten signature in blue ink, appearing to read "Logan L. Langford", is written over a light blue circular background.

Logan L. Langford, P.G.
Sr. Geologist

Reviewed by:



Digitally signed by Joseph C. Goode Jr.
Date: 08/07/24

Joseph C. Goode, Jr., P.E.
President

LLL:JCG

Encl.

F:\AA Projects\2023\230248-Monument Ridge East-Monument Hill Rd & Palmer Divide Rd-300-SGS\Reports\230248 CGS Response Letter.docx

EP-24-0077 Monument Ridge East
N½ Section 2, T11S, R67W, 6th Meridian
39.1284, -104.8624
File Number: SP241
Preliminary plan to create 342 residential lots on 63 acres.

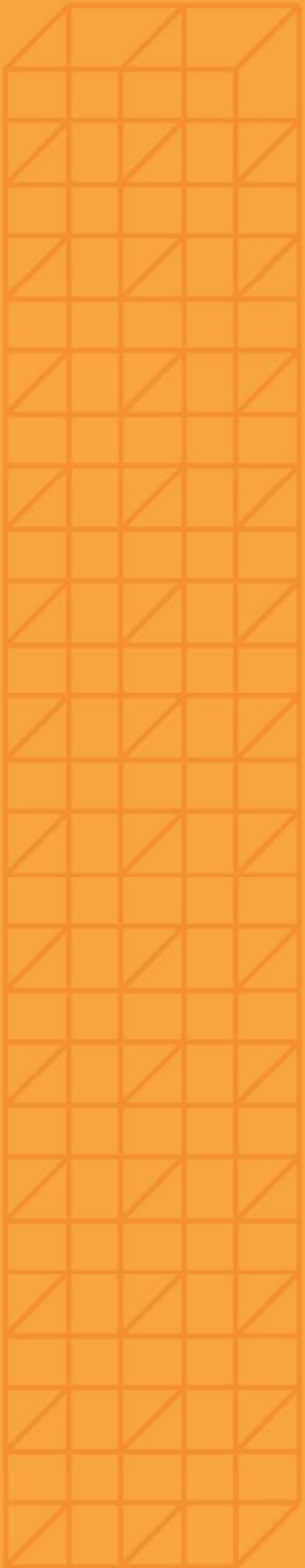
With this referral, we received a request to provide Review Comments (Email dated 6/13/2024); Construction Drawings (Drexel, Barrell & CO., January 3, 2024); Preliminary Drainage Report (PRC Engineering, April 2024); Preliminary Plan Drawings (Bear Creek Surveying, Inc., 4/12/2024); Soil and Geology Study (Entech Engineering, Inc., 3/7/2023), and other documents. We offer the following comments and recommendations.

1. Entech encountered groundwater at depths ranging from 1 to 10 feet during drilling. However, figure 7 of their report fails to depict this shallow groundwater in the relevant areas. Test Boring No. 3, which includes groundwater at 1 foot, is mapped as Colluvium and Dawson Formation without shallow groundwater. It is imperative that Figure 7 is revised to reflect the geologic hazards and constraints.
2. Entech states (page 11), *“Proposed grading plans indicate these areas that have been mapped in lot areas will be filled and raised above the seasonally shallow and potentially seasonally shallow groundwater areas.”* In our cursory review of the preliminary plan with existing and proposed grades, it appears that most of the site will contain significant cuts to achieve the proposed grades, in some areas up to 20 feet. Due to the shallow groundwater conditions at this site and the cuts planned, **no basements should be allowed.**
3. CGS agrees with Entech (page 10), “Foundations should maintain a minimum separation of 3 feet between the foundation grade and the maximum anticipated groundwater level.” The maximum anticipated groundwater level should be determined during the preliminary plat application by performing a groundwater observation/monitoring program. Site grades may require filling to accommodate this recommendation. CGS recommends that a groundwater observations/monitoring program is performed in areas of shallow groundwater and potentially shallow groundwater. To be effective, this monitoring should be performed through Spring/Summer/Fall/Winter 2024.
4. A geologic hazard note is not included in the preliminary plan drawings. CGS recommends updating Figure 7 of Entech’s report and adding a note to the preliminary plan/plat listing the geologic hazards and constraints, along with mitigation measures.
5. Wetlands (Freshwater Emergent/Freshwater Forested/Shrub Wetland) are located within the site. However, these areas do not appear to be portrayed correctly in Figure 7 of Entech’s report. These areas are associated with standing water; lots should not be located within these areas, a setback should be established, and these areas should be designated as “No Build Areas”. Setbacks and no build areas should be noted on the plans.
6. CGS has concerns with lots and future improvements constructed over the existing drainage that runs north and south through the site, even following grading operations, as this natural drainage can be an area where water will continue to migrate. CGS recommends that if lots are planned (or allowed) within/near the existing drainage (after rerouting and site grading occurs), these areas be further evaluated during site-specific geotechnical investigations to determine the impact (i.e., groundwater conditions, differential settlement, etc.) on future development. It would be prudent to install a drain system within the existing drainage prior to grading operations if it is not planned already.

Submitted 6/13/2024 by Amy Crandall, Colorado Geological Survey: acrandall@mines.edu



**WSB, Level 2 Wetlands Delineation Report, dated September
10, 2021, WSB Project No. 18697**



LEVEL 2 WETLAND DELINEATION REPORT

Monument Ridge East Development

Woodmoor | EL PASO COUNTY, COLORADO

SEPTEMBER 10, 2021

Prepared for:
Monument Ridge East, LLC
5505 List Drive
Colorado Springs, CO 80919

WSB PROJECT NO. 18697



LEVEL 2 WETLAND DELINEATION REPORT

Monument Ridge East Development

For:

Monument Ridge East, LLC

September 10, 2021

Prepared by:



CERTIFICATION

The report was prepared by:

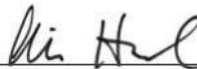


Shawn Williams, CMWP No.1178

Date: September 10, 2021

Title: Senior Environmental Scientist

I hereby certify that this report was reviewed by me and that I am a
Certified Minnesota Wetland Professional (CMWP).



Alison Harwood, CMWP No.1238

Date: September 10, 2021

Title: Director of Natural Resources

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CERTIFICATION
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Appendix A: Figure 1 – Project Location
 Figure 2 – Topography
 Figure 3 – CDPHE Public Waters
 Figure 4 – National Wetlands Inventory
 Figure 5 – County Soil Survey

Appendix B: Figure 6 – Wetland Boundary
 Wetland Determination Data Forms

Appendix C: Wetland Photos

Appendix D: Antecedent Precipitation Data

SECTION I

I. Introduction

A. Project Location

The project is located immediately southeast of the intersection of Interstate 25 and Palmer Divide Road in the City of Monument (Woodmoor), El Paso County, CO. The project area consists of approximately 66 acres (**Figure 1, Appendix A**).

B. Project Purpose

Monument Ridge East, LLC is proposing a residential development at this location. This report is intended to address all jurisdictional Waters of the United States (WOUS) for final design and permitting of this project. This project was authorized by Monument Ridge East, LLC.

C. Project Scope

The scope of this project was to delineate all wetlands within the outlined project area.

D. Summary of Findings

A Level 2 wetland delineation was performed on the site. A total of two (2) wetlands were identified and delineated in the preparation of this report, as summarized in **Table 1**. For a visual representation of the wetland locations and size, please see **Figure 6, Appendix B**. All potential wetland areas (mapped hydric soils, NWI signatures, and low depressional areas) were reviewed on-site and either delineated or determined to be upland.

Table 1: Summary of Delineated Wetlands, Monument Ridge East, El Paso County, Colorado

Wetland ID	Delineation Method	No. Flags/ No. Transects	Circular 39 (Cowardin)	NWI *	CO Stream Segments*	County Soil Survey (Hydric/N on-Hydric)***	Wetland Size (acres)
A	Level 2	1-28/1	Type 1/3 (PEM1A/ PEM1C)	Yes	N/A	1 (Alamosa loam)	0.90
B	Level 2	1-9/1	Type 1 (PEM1A)	Yes	N/A	1 (Alamosa loam)	0.40

SECTION II

II. Delineation Procedure

A. Off-Site Determination: Base Map Review

Topography: The landform consists of sloping hills and two wetlands. The wetlands were located at two mapped low drainageways. Water generally flows north (**Figure 2, Appendix A**).

The Colorado Department of Public Health and Environment – Water Quality Control Division 2020 *Spatial Representation of Stream Segment* data (CDPHE 2020) shows no stream segments in the project area (**Figure 3, Appendix A**).

The *National Wetlands Inventory Map* (US Fish and Wildlife Service) identified three wetland types as part of the National Wetlands Inventory (NWI) (**Figure 4, Appendix A**). The NWI identifies the following wetland types: PEM1C, PSS1C, and R4SBC.

The *Soil Survey of El Paso County, Colorado* (<https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>) identified the following soils (**Table 2**) within the project area (**Figure 5, Appendix A**):

Table 2: Soil Survey

Map Symbol	Soil Unit Name	Percent Hydric	Rating
1	Alamosa loam, 1 to 3 percent slopes	85	Predominantly hydric
69	Peyton-Pring complex, 8 to 15 percent slopes	0	Not hydric
92	Tomah-Crowfoot loamy sands, 3 to 8 percent slopes	0	Not hydric
PrE2	Peyton-Pring-Crowfoot Complex, 8-15 percent slopes	0	Not hydric
Lw	Loamy Wet Alluvial Land	1	Predominantly not hydric

Antecedent Climate Conditions: The *U.S. Drought Monitor* (UNL) was referenced to determine the status of drought conditions within El Paso County, preceding the August 26, 2021 site visit, which fell within the normal precipitation range. The U.S. Drought Monitor is jointly produced by the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration. The map is courtesy of NDMC. The Drought Monitor record for August 26, 2021 can be found in **Appendix D**.

B. On-Site Determination

A Level 2 field investigation was conducted by Shawn Williams (Certified Minnesota Wetland Professional - CMWP No. 1178) of WSB on August 26, 2021 within the project area. No deviation or omissions were undertaken as part of this investigation.

The project area was delineated using the routine methodology described in the *Corps of Engineers Wetlands Delineation Manual* (US Army Corps of Engineers 1987), with additional guidance provided by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)*. Wetlands were classified according to the methodologies set forth in *Wetlands of the United States (Circular 39)*, USFWS Shaw and Fredine 1971 and *Classification of Wetlands and Deepwater Habitats of the United States*, Cowardin 1979. The wetland types in this report are classified by the Circular 39 and Cowardin Classifications.

SECTION II

Soil types were researched prior to the on-site investigation with the assistance of the *Soil Survey of El Paso County* from the National Resources Conservation Service. All soil test pits were excavated to a minimum depth of 24 inches unless otherwise noted. Soil colors were described on-site per the *Munsell Soil Color Charts* (2009 Revised Edition) from the test pits in and adjacent to the wetlands. Hydric soils were identified using the current technical criteria for hydric soils developed by the NRCS in 2017 (Version 8.1). The presence of water was observed after time was allowed for movement of water through the substrate. This time varied depending upon soil characteristics.

The quadrant sampling method was employed for all sample points unless otherwise noted. Vegetation was measured as actual areal cover and may exceed 100 percent of total area due to overlap. Grasses and herbaceous vegetative cover were measured within a circular plot of a 5-foot-radius, all woody shrubs and saplings were measured within a circular plot with a 15-foot-radius, and trees and woody vines were measured in a 30-foot-radius circular plot. Regional plant identification resources were utilized in the identification of plant species, with indicator status taken from the *2018 National Wetland Plant List* (US Army Corps of Engineers 2018). Plant species dominance was estimated based on the absolute percent coverage for herbaceous, shrub-sapling, and tree strata if present. In addition to the use of indicators of hydrology, hydric soils, and the presence of hydrophytic vegetation, other evidence such as topographic breaks and watershed characteristics were used to determine the wetland boundary.

Western Mountains, Valleys, and Coast Regional Supplement Routine Wetland Delineation data forms were used to record vegetation, hydrology, and soil characteristics at sample points in and adjacent to the wetlands (**Appendix B**). Sampling transects were taken along the wetland-upland boundary of the wetland. Transects and delineated wetland boundaries were field surveyed using a sub-meter accuracy hand-held GPS unit. Approximate sampling points and delineated wetland edges are shown on **Figure 6, Appendix B**. Pictures of each wetland can be found in **Appendix C**.

SECTION IV

III. Results and Wetland Information

The wetland delineation data forms (**Appendix B**) and photos (**Appendix C**) are attached. A summary of the delineation is below.

A. Wetland A

Circular 39: 1/3

Cowardin: PEM1A/PEM1C

Soil mapping unit: Alamosa loam (1)

No. Transects: 1 **No. Additional Sample Points:** 0

Wetland Flags: 1-28

Wetland Size (within Project Area): 0.90 acre

Wetland A is positioned in a sloped depression. The wetland is characterized as a seasonally flooded/shallow marsh wetland. The wetland boundary is outlined in **Figure 6, Appendix B**.

Dominant vegetation in the wetland consisted of Canadian thistle (*Cirsium arvense*) and Hybrid cattail (*Typha x glauca*) in the herb stratum. Hydric soil indicators consisted of Redox Dark Surface (F6). Hydrology indicators included Saturation (A3), Hydrogen Sulfide Odor (C1), Drainage Patterns (B10), Geomorphic Conditions (D2), and FAC-Neutral Test (D5).

Dominant vegetation in the upland consisted of Smooth brome (*Bromus inermis*) and Black bent (*Agrostis gigantea*) in the herb stratum. No hydric soil or hydrology indicators were observed.

The wetland boundary was placed along a slight topographic break where wetland hydrology was no longer observed. Wetland A flows from south to north, and conveys water under Palmer Divide Road via a culvert.

B. Wetland B

Circular 39: 1

Cowardin: PEM1A

Soil mapping unit: Alamosa loam (1)

No. Transects: 1 **No. Additional Sample Points:** 0

Wetland Flags: 1-9

Wetland Size (within Project Area): 0.40 acre

Wetland B is positioned in a sloped depression. The wetland is characterized as a seasonally flooded wetland. The wetland boundary is outlined in **Figure 6, Appendix B**.

Dominant vegetation in the wetland consisted of Canadian thistle (*Cirsium arvense*) and Bluejoint (*Calamagrostis canadensis*) in the herb stratum. Hydric soil indicators consisted of Redox Depressions (F8). Hydrology indicators included Oxidized Rhizospheres along Living Roots (C3), Geomorphic Conditions (D2), and FAC-Neutral Test (D5).

Dominant vegetation in the upland consisted of Smooth brome (*Bromus inermis*) and Common yarrow (*Achillea millefolium*) in the herb stratum. No hydric soil or hydrology indicators were observed.

The wetland boundary was placed along a defined topographic break where wetland hydrology was no longer observed. Wetland B flows from southwest to northeast, and conveys water under Palmer Divide Road via a culvert.

SECTION IV

C. Additional Sampled Areas

Two additional sample points were taken (Sample Point 1 Up, Sample Point 2 Up). These two sample points did not meet at least one of the three wetland criteria, and were determined to be upland.

D. Additional Water Resources

No additional water resources were identified within the project area.

IV. Summary and Closing Statements

Two (2) wetlands were delineated within the project area using the Level 2 method. Two (2) additional areas were investigated but determined to be upland.

The wetland delineation report was completed by Shawn Williams of WSB. This delineation report is being submitted as a request for approval of Wetland Type and Boundary of the wetland described herein. This report supports the Approved Jurisdictional Determination (AJD) request prepared by WSB, dated July 28, 2021. This report is associated with US Department of Army (DA) # SPA-2005-0679.

SECTION V

V. References

The following sources of information were reviewed to assist in performing the wetland delineation.

Literature Sources

Colorado Department of Public Health and Environment – Water Quality Control Division. *2020 Spatial Representation of Stream Segment* data (CDPHE 2020). Available online at Center for Health and Environmental Data | Department of Public Health & Environment (colorado.gov). Accessed 8/30/2021.

Cowardin L.M. USFWS. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Government Printing Office, Carver, D.C. 131 pp.

Fredine, C.G. and S.P. Shaw. 1956. Wetlands of the United States (Circular 39). United States Government Printing Office, Carver, D.C.

Kollmorgen Instruments Corp. 2009 Revised Edition. Munsell Soil Color Charts.

National Technical Committee for Hydric Soils. 1991. Hydric Soils of the United States. U.S.D.A. Soil Conservation Service. Carver, D.C. Misc. Publication 1491. Revised December 15, 1995.

National Drought Mitigation Center. University of Nebraska-Lincoln. 2021. Available online at Current Map | U.S. Drought Monitor (unl.edu). Accessed 9/7/2021.

United States Army Corps of Engineers. 2018 National Wetland Plant List, version 3.4. Engineer Research and Development Center. Cold Regions Research and Engineering Laboratory, Hanover, NH. <http://wetland-plants.usace.army.mil/>

United States Army Corps of Engineers. August 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, and C. V. Nobel. ERDC/EL TR-10-03. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

United States Army Corps of Engineers. 1987 2014. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Version 2.0 Waterways Experiment Station.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey, Colorado. Available online at <http://websoilsurvey.nrcs.usda.gov/>. Accessed 8/25/2021.

APPENDIX

APPENDIX A

- Figure 1: Project Location
- Figure 2: Topography
- Figure 3: CDPHE 2020 Stream Segments
- Figure 4: National Wetlands Inventory
- Figure 5: County Soil Survey



Figure 1 - Project Location

Monument Ridge Development
Woodmoor, Colorado



0 4,000
Feet
1 inch = 4,000 Ft





Figure 2 - Topography

Monument Ridge Development
Woodmoor, Colorado



0 500
Feet
1 inch = 500 Ft





Figure 3 - CDPHE Public Waters

Monument Ridge Development
Woodmoor, Colorado



0 1,000
Feet
1 inch = 1,000 Ft





Figure 4 - National Wetlands Inventory

Monument Ridge Development
Woodmoor, Colorado



0 500
Feet
1 inch = 500 Ft



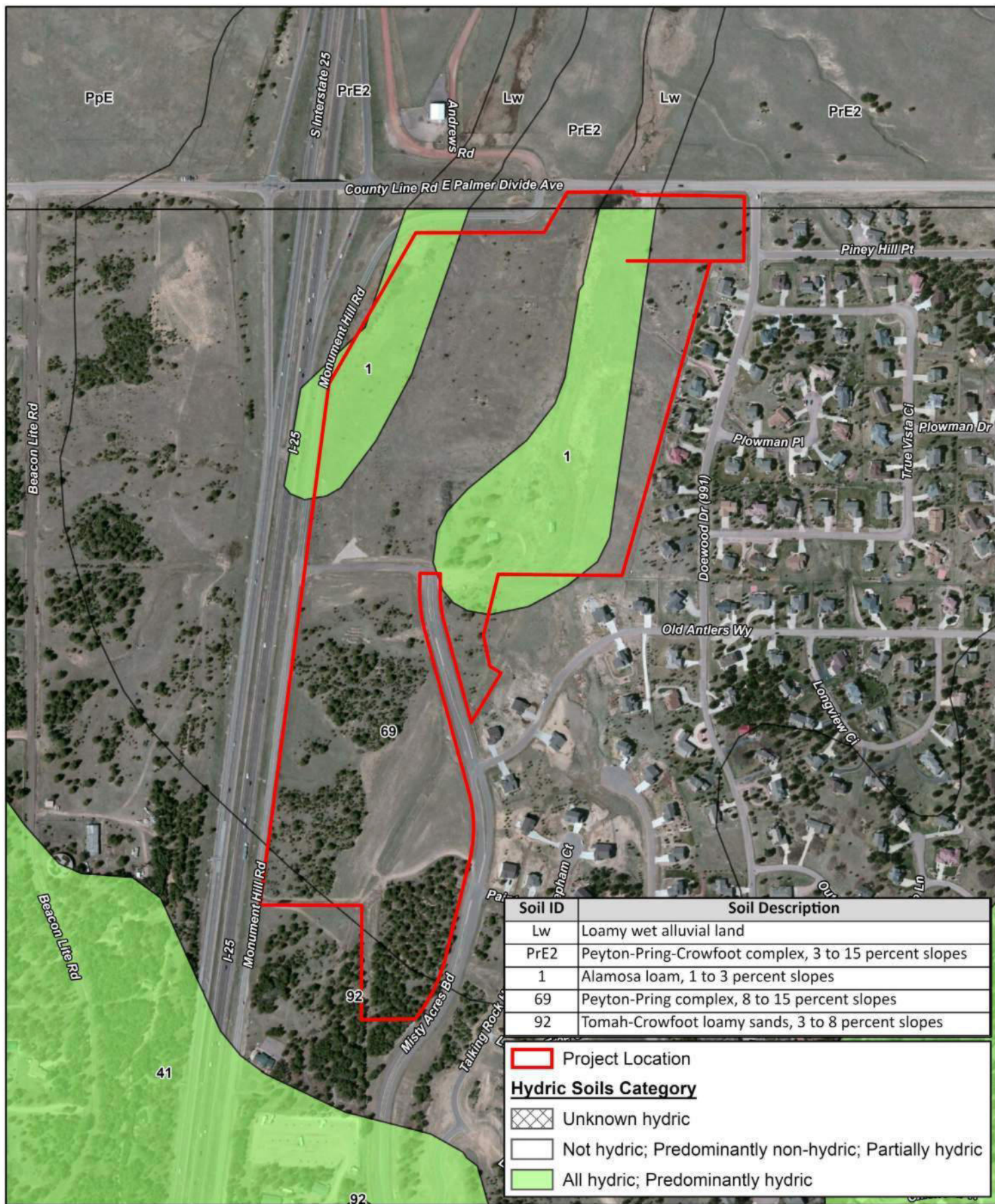


Figure 5 - County Soil Survey

Monument Ridge Development
Woodmoor, Colorado



0 500
Feet
1 inch = 500 Ft



APPENDIX

APPENDIX B

Figure 6: Wetland Boundary
Wetland Determination Data Forms

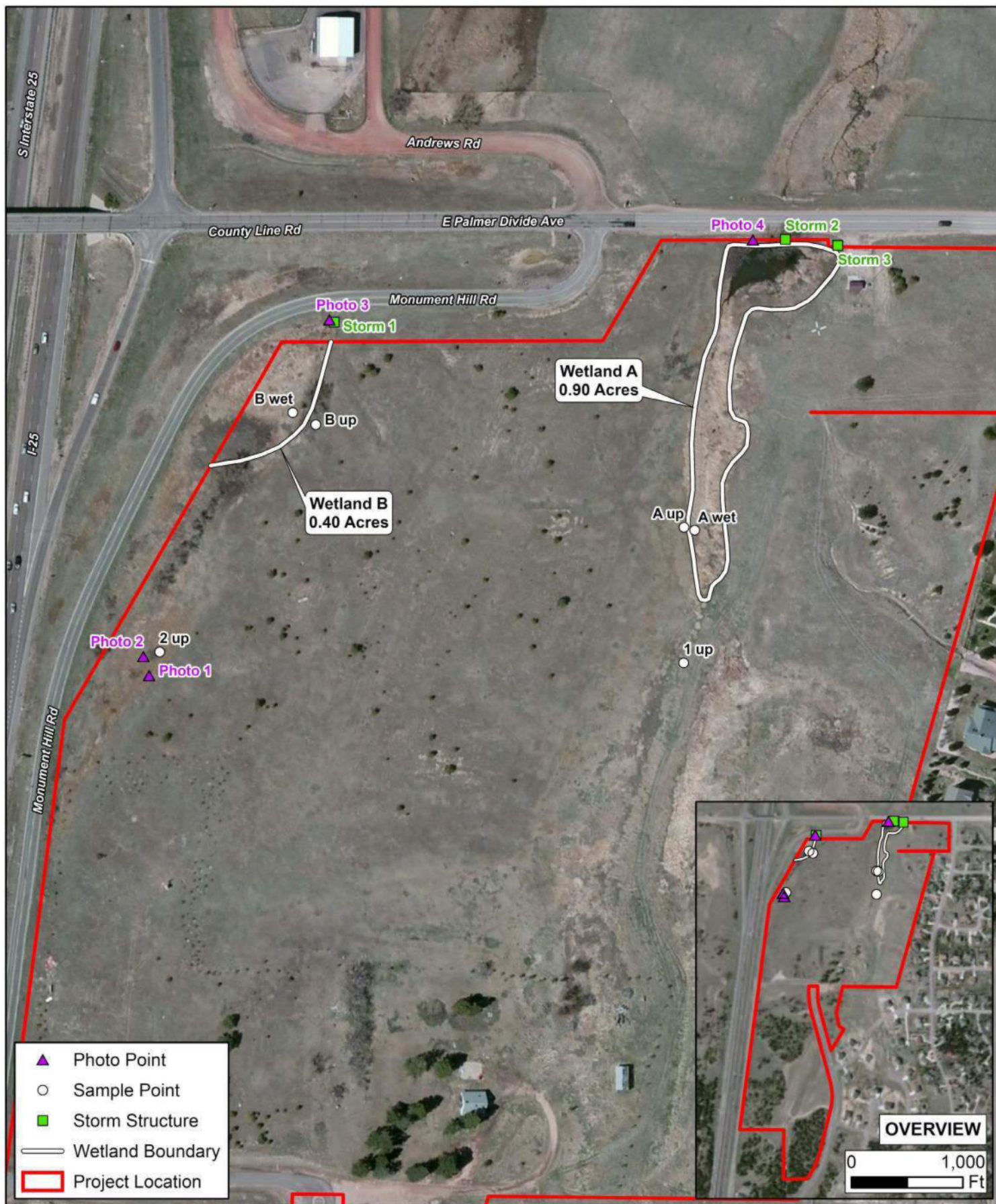


Figure 6 - Wetland Boundary

Monument Ridge Development
Woodmoor, Colorado



0 200
Feet
1 inch = 200 Ft



WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Monument Ridge East Development City/County: Woodmoor/ El Paso Sampling Date: 8/26/2021
Applicant/Owner: Monument Ridge East, LLC State: CO Sampling Point: A Wet
Investigator(s): WSB (Shawn Williams) Section, Township, Range: Sec. 2, T11S, R67W
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 4
Subregion (LRR): E Lat: 39.128710 Long: -104.860271 Datum: WGS 84
Soil Map Unit Name: Alamosa loam, 1 to 3 percent slopes (1) NWI classification: PEM1C, R4SBC

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

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

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

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30' x 30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15' x 15'</u>)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
_____ = Total Cover			
Herb Stratum (Plot size: <u>5' x 5'</u>)			
1. <u>Cirsium arvense</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>
2. <u>Typha x glauca</u>	<u>20</u>	<u>Yes</u>	<u>OBL</u>
3. <u>Juncus tenuis</u>	<u>15</u>	<u>No</u>	<u>FAC</u>
4. <u>Mentha arvensis</u>	<u>10</u>	<u>No</u>	<u>FACW</u>
5. <u>Persicaria amphibia</u>	<u>10</u>	<u>No</u>	<u>OBL</u>
6. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>
7. <u>Geum allepicum</u>	<u>5</u>	<u>No</u>	<u>FACW</u>
8. <u>Verbascum thapsus</u>	<u>5</u>	<u>No</u>	<u>FACU</u>
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
_____ = Total Cover			
Woody Vine Stratum (Plot size: <u>30' x 30'</u>)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
_____ = Total Cover			
% Bare Ground in Herb Stratum <u>0</u>			
Remarks:			

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or 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 ≤3.0¹
____ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
____ 5 - Wetland Non-Vascular Plants¹
____ Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

SOIL

Sampling Point: A Wet

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-14	10YR 4/1	95	7.5YR 3/4	5	C	PL	silt loam	
14-24	10YR 4/1	90	7.5YR 3/4	10	C	M	sand	

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

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

- | | |
|--|--|
| ☐ Histosol (A1) | ☐ Sandy Redox (S5) |
| ☐ Histic Epipedon (A2) | ☐ Stripped Matrix (S6) |
| ☐ Black Histic (A3) | ☐ Loamy Mucky Mineral (F1) (except MLRA 1) |
| ☐ Hydrogen Sulfide (A4) | ☐ Loamy Gleyed Matrix (F2) |
| ☐ Depleted Below Dark Surface (A11) | ☐ Depleted Matrix (F3) |
| ☐ Thick Dark Surface (A12) | ☒ Redox Dark Surface (F6) |
| ☐ Sandy Mucky Mineral (S1) | ☐ Depleted Dark Surface (F7) |
| ☐ Sandy Gleyed Matrix (S4) | ☐ Redox Depressions (F8) |

Indicators for Problematic Hydric Soils³:

- | |
|---|
| ☐ 2 cm Muck (A10) |
| ☐ Red Parent Material (TF2) |
| ☐ Very Shallow Dark Surface (TF12) |
| ☐ Other (Explain in Remarks) |

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

Restrictive Layer (if present):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- | | |
|--|--|
| ☐ Surface Water (A1) | ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) |
| ☐ High Water Table (A2) | ☐ Salt Crust (B11) |
| ☒ Saturation (A3) | ☐ Aquatic Invertebrates (B13) |
| ☐ Water Marks (B1) | ☒ Hydrogen Sulfide Odor (C1) |
| ☐ Sediment Deposits (B2) | ☐ Oxidized Rhizospheres along Living Roots (C3) |
| ☐ Drift Deposits (B3) | ☐ Presence of Reduced Iron (C4) |
| ☐ Algal Mat or Crust (B4) | ☐ Recent Iron Reduction in Tilled Soils (C6) |
| ☐ Iron Deposits (B5) | ☐ Stunted or Stressed Plants (D1) (LRR A) |
| ☐ Surface Soil Cracks (B6) | ☐ Other (Explain in Remarks) |
| ☐ Inundation Visible on Aerial Imagery (B7) | |
| ☐ Sparsely Vegetated Concave Surface (B8) | |

Secondary Indicators (2 or more required)

- | |
|---|
| ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| ☒ Drainage Patterns (B10) |
| ☐ Dry-Season Water Table (C2) |
| ☐ Saturation Visible on Aerial Imagery (C9) |
| ☒ Geomorphic Position (D2) |
| ☐ Shallow Aquitard (D3) |
| ☒ FAC-Neutral Test (D5) |
| ☐ Raised Ant Mounds (D6) (LRR A) |
| ☐ Frost-Heave Hummocks (D7) |

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____
Water Table Present? Yes ☐ No ☒ Depth (inches): _____
Saturation Present? Yes ☒ No ☐ Depth (inches): ⁰ _____
(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Monument Ridge East Development City/County: Woodmoor/ El Paso Sampling Date: 8/26/2021
 Applicant/Owner: Monument Ridge East, LLC State: CO Sampling Point: A Up
 Investigator(s): WSB (Shawn Williams) Section, Township, Range: Sec. 2, T11S, R67W
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 5
 Subregion (LRR): E Lat: 39.128710 Long: -104.860271 Datum: WGS 84
 Soil Map Unit Name: Alamosa loam, 1 to 3 percent slopes (1) NWI classification: _____

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

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

Hydrophytic Vegetation Present? Yes _____ No ☒ Hydric Soil Present? Yes _____ No ☒ Wetland Hydrology Present? Yes _____ No ☒	Is the Sampled Area within a Wetland? Yes _____ No ☒
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30' x 30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species <u>65</u> x 3 = <u>195</u> FACU species <u>5</u> x 4 = <u>20</u> UPL species <u>30</u> x 5 = <u>150</u> Column Totals: <u>100</u> (A) <u>365</u> (B) Prevalence Index = B/A = <u>3.65</u>
Sapling/Shrub Stratum (Plot size: <u>15' x 15'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5' x 5'</u>)				Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ 5 - Wetland Non-Vascular Plants ¹ ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Bromus inermis</u>	<u>30</u>	<u>Yes</u>	<u>UPL</u>	
2. <u>Agrostis gigantea</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Cirsium arvense</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	
4. <u>Geum macrophyllum</u>	<u>15</u>	<u>No</u>	<u>FAC</u>	
5. <u>Juncus tenuis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
6. <u>Achillea millefolium</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: <u>30' x 30'</u>)				Hydrophytic Vegetation Present? Yes _____ No ☒
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				
Remarks:				

SOIL

Sampling Point: A Up

[illegible]

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
☐ 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) ☐ Surface Soil Cracks (B6) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Sparsely Vegetated Concave Surface (B8)	☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) ☐ Salt Crust (B11) ☐ Aquatic Invertebrates (B13) ☐ Hydrogen Sulfide Odor (C1) ☐ Oxidized Rhizospheres along Living Roots (C3) ☐ Presence of Reduced Iron (C4) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Stunted or Stressed Plants (D1) (LRR A) ☐ Other (Explain in Remarks)	☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) ☐ Drainage Patterns (B10) ☐ Dry-Season Water Table (C2) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ FAC-Neutral Test (D5) ☐ Raised Ant Mounds (D6) (LRR A) ☐ Frost-Heave Hummocks (D7)
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? Yes ☐ No ☒ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes ☐ No ☒
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Monument Ridge East Development City/County: Woodmoor/ El Paso Sampling Date: 8/26/2021
Applicant/Owner: Monument Ridge East, LLC State: CO Sampling Point: B Wet
Investigator(s): WSB (Shawn Williams) Section, Township, Range: Sec. 2, T11S, R67W
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 4
Subregion (LRR): E Lat: 39.129093 Long: -104.862403 Datum: WGS 84
Soil Map Unit Name: Alamosa loam, 1 to 3 percent slopes (1) NWI classification: PEM1C, R4SBC

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

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

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

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30' x 30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15' x 15'</u>)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
_____ = Total Cover			
Herb Stratum (Plot size: <u>5' x 5'</u>)			
1. <u>Calamagrostis canadensis</u>	<u>75</u>	<u>Yes</u>	<u>FACW</u>
2. <u>Cirsium arvense</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
_____ = Total Cover			
Woody Vine Stratum (Plot size: <u>30' x 30'</u>)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
_____ = Total Cover			
% Bare Ground in Herb Stratum <u>5</u>			
Remarks:			

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or 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 ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ 5 - Wetland Non-Vascular Plants¹
☐ Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Hydrophytic Vegetation Present? Yes ☒ No ☐

SOIL

Sampling Point: B Wet

[illegible]

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
☐ High Water Table (A2)	☐ Salt Crust (B11)	☐ Drainage Patterns (B10)
☐ Saturation (A3)	☐ Aquatic Invertebrates (B13)	☐ Dry-Season Water Table (C2)
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Saturation Visible on Aerial Imagery (C9)
☐ Sediment Deposits (B2)	☒ Oxidized Rhizospheres along Living Roots (C3)	☐ Geomorphic Position (D2)
☐ Drift Deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Shallow Aquitard (D3)
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☒ FAC-Neutral Test (D5)
☐ Iron Deposits (B5)	☐ Stunted or Stressed Plants (D1) (LRR A)	☐ Raised Ant Mounds (D6) (LRR A)
☐ Surface Soil Cracks (B6)	☐ Other (Explain in Remarks)	☐ Frost-Heave Hummocks (D7)
☐ Inundation Visible on Aerial Imagery (B7)		
☐ Sparsely Vegetated Concave Surface (B8)		
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? Yes ☐ No ☒ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes ☒ No ☐
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Monument Ridge East Development City/County: Woodmoor/ El Paso Sampling Date: 8/26/2021
 Applicant/Owner: Monument Ridge East, LLC State: CO Sampling Point: B Up
 Investigator(s): WSB (Shawn Williams) Section, Township, Range: Sec. 2, T11S, R67W
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 5
 Subregion (LRR): E Lat: 39.129093 Long: -104.862403 Datum: WGS 84
 Soil Map Unit Name: Alamosa loam, 1 to 3 percent slopes (1) NWI classification: _____

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

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

Hydrophytic Vegetation Present?	Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>	
Wetland Hydrology Present?	Yes _____ No <u>X</u>	
Remarks:		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30' x 30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15' x 15'</u>) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ _____ = Total Cover				
Herb Stratum (Plot size: <u>5' x 5'</u>) 1. <u>Bromus inermis</u> 60 Yes UPL 2. <u>Achillea millefolium</u> 20 Yes FACU 3. <u>Symphytotrichum ericoides</u> 5 No FAC 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____ _____ = Total Cover				
Woody Vine Stratum (Plot size: <u>30' x 30'</u>) 1. _____ 2. _____ _____ = Total Cover % Bare Ground in Herb Stratum _____				
Remarks:				

SOIL

Sampling Point: B Up

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-7	10YR 5/3						silt	

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

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

- | | |
|--|--|
| ☐ Histosol (A1) | ☐ Sandy Redox (S5) |
| ☐ Histic Epipedon (A2) | ☐ Stripped Matrix (S6) |
| ☐ Black Histic (A3) | ☐ Loamy Mucky Mineral (F1) (except MLRA 1) |
| ☐ Hydrogen Sulfide (A4) | ☐ Loamy Gleyed Matrix (F2) |
| ☐ Depleted Below Dark Surface (A11) | ☐ Depleted Matrix (F3) |
| ☐ Thick Dark Surface (A12) | ☐ Redox Dark Surface (F6) |
| ☐ Sandy Mucky Mineral (S1) | ☐ Depleted Dark Surface (F7) |
| ☐ Sandy Gleyed Matrix (S4) | ☐ Redox Depressions (F8) |

Indicators for Problematic Hydric Soils³:

- | |
|---|
| ☐ 2 cm Muck (A10) |
| ☐ Red Parent Material (TF2) |
| ☐ Very Shallow Dark Surface (TF12) |
| ☐ Other (Explain in Remarks) |

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

Restrictive Layer (if present):

Type: refusal
Depth (inches): 7

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- | | |
|--|--|
| ☐ Surface Water (A1) | ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) |
| ☐ High Water Table (A2) | ☐ Salt Crust (B11) |
| ☐ Saturation (A3) | ☐ Aquatic Invertebrates (B13) |
| ☐ Water Marks (B1) | ☐ Hydrogen Sulfide Odor (C1) |
| ☐ Sediment Deposits (B2) | ☐ Oxidized Rhizospheres along Living Roots (C3) |
| ☐ Drift Deposits (B3) | ☐ Presence of Reduced Iron (C4) |
| ☐ Algal Mat or Crust (B4) | ☐ Recent Iron Reduction in Tilled Soils (C6) |
| ☐ Iron Deposits (B5) | ☐ Stunted or Stressed Plants (D1) (LRR A) |
| ☐ Surface Soil Cracks (B6) | ☐ Other (Explain in Remarks) |
| ☐ Inundation Visible on Aerial Imagery (B7) | |
| ☐ Sparsely Vegetated Concave Surface (B8) | |

Secondary Indicators (2 or more required)

- | |
|---|
| ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| ☐ Drainage Patterns (B10) |
| ☐ Dry-Season Water Table (C2) |
| ☐ Saturation Visible on Aerial Imagery (C9) |
| ☐ Geomorphic Position (D2) |
| ☐ Shallow Aquitard (D3) |
| ☐ FAC-Neutral Test (D5) |
| ☐ Raised Ant Mounds (D6) (LRR A) |
| ☐ Frost-Heave Hummocks (D7) |

Field Observations:

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

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Monument Ridge East Development City/County: Woodmoor/ El Paso Sampling Date: 8/26/2021
 Applicant/Owner: Monument Ridge East, LLC State: CO Sampling Point: 1 Up
 Investigator(s): WSB (Shawn Williams) Section, Township, Range: Sec. 2, T11S, R67W
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 4
 Subregion (LRR): E Lat: 39.128056 Long: -104.860204 Datum: WGS 84
 Soil Map Unit Name: Alamosa loam, 1 to 3 percent slopes (1) NWI classification: PEM1C/R4SBC

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

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

Hydrophytic Vegetation Present? Yes _____ No <u>X</u> Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30' x 30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species <u>30</u> x 3 = <u>90</u> FACU species _____ x 4 = _____ UPL species <u>70</u> x 5 = <u>350</u> Column Totals: <u>100</u> (A) <u>440</u> (B) Prevalence Index = B/A = <u>4.4</u>
Sapling/Shrub Stratum (Plot size: <u>15' x 15'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5' x 5'</u>)				Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ 5 - Wetland Non-Vascular Plants ¹ ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Bromus inermis</u>	<u>70</u>	<u>Yes</u>	<u>UPL</u>	
2. <u>Cirsium arvense</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: <u>30' x 30'</u>)				Hydrophytic Vegetation Present? Yes _____ No <u>X</u>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				
Remarks:				

SOIL

Sampling Point: 1 Up

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR 3/2	90	10YR 4/6	10	C	M	silt loam	
8-24	10YR 4/2	80	10YR 4/6	20	C	M	sand	

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

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

- | | |
|--|--|
| ☐ Histosol (A1) | ☐ Sandy Redox (S5) |
| ☐ Histic Epipedon (A2) | ☐ Stripped Matrix (S6) |
| ☐ Black Histic (A3) | ☐ Loamy Mucky Mineral (F1) (except MLRA 1) |
| ☐ Hydrogen Sulfide (A4) | ☐ Loamy Gleyed Matrix (F2) |
| ☐ Depleted Below Dark Surface (A11) | ☐ Depleted Matrix (F3) |
| ☐ Thick Dark Surface (A12) | ☒ Redox Dark Surface (F6) |
| ☐ Sandy Mucky Mineral (S1) | ☐ Depleted Dark Surface (F7) |
| ☐ Sandy Gleyed Matrix (S4) | ☐ Redox Depressions (F8) |

Indicators for Problematic Hydric Soils³:

- | |
|---|
| ☐ 2 cm Muck (A10) |
| ☐ Red Parent Material (TF2) |
| ☐ Very Shallow Dark Surface (TF12) |
| ☐ Other (Explain in Remarks) |

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

Restrictive Layer (if present):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- | | |
|--|--|
| ☐ Surface Water (A1) | ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) |
| ☐ High Water Table (A2) | ☐ Salt Crust (B11) |
| ☐ Saturation (A3) | ☐ Aquatic Invertebrates (B13) |
| ☐ Water Marks (B1) | ☐ Hydrogen Sulfide Odor (C1) |
| ☐ Sediment Deposits (B2) | ☐ Oxidized Rhizospheres along Living Roots (C3) |
| ☐ Drift Deposits (B3) | ☐ Presence of Reduced Iron (C4) |
| ☐ Algal Mat or Crust (B4) | ☐ Recent Iron Reduction in Tilled Soils (C6) |
| ☐ Iron Deposits (B5) | ☐ Stunted or Stressed Plants (D1) (LRR A) |
| ☐ Surface Soil Cracks (B6) | ☐ Other (Explain in Remarks) |
| ☐ Inundation Visible on Aerial Imagery (B7) | |
| ☐ Sparsely Vegetated Concave Surface (B8) | |

Secondary Indicators (2 or more required)

- | |
|---|
| ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| ☐ Drainage Patterns (B10) |
| ☐ Dry-Season Water Table (C2) |
| ☐ Saturation Visible on Aerial Imagery (C9) |
| ☒ Geomorphic Position (D2) |
| ☐ Shallow Aquitard (D3) |
| ☐ FAC-Neutral Test (D5) |
| ☐ Raised Ant Mounds (D6) (LRR A) |
| ☐ Frost-Heave Hummocks (D7) |

Field Observations:

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

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Monument Ridge East Development City/County: Woodmoor/ El Paso Sampling Date: 8/26/2021
Applicant/Owner: Monument Ridge East, LLC State: CO Sampling Point: 2 Up
Investigator(s): WSB (Shawn Williams) Section, Township, Range: Sec. 2, T11S, R67W
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 3
Subregion (LRR): E Lat: 39.127965 Long: -104.863266 Datum: WGS 84
Soil Map Unit Name: Alamosa loam, 1 to 3 percent slopes (1) NWI classification: PEM1C/R4SBC

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

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

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

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30' x 30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15' x 15'</u>)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
_____ = Total Cover			
Herb Stratum (Plot size: <u>5' x 5'</u>)			
1. <u>Juncus tenuis</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>
2. <u>Cirsium arvense</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>
3. <u>Salix interior</u>	<u>10</u>	<u>No</u>	<u>FACW</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
_____ = Total Cover			
Woody Vine Stratum (Plot size: <u>30' x 30'</u>)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
_____ = Total Cover			
% Bare Ground in Herb Stratum <u>0</u>			
Remarks:			

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or 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 ≤3.0¹
____ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
____ 5 - Wetland Non-Vascular Plants¹
____ Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Hydrophytic Vegetation Present? Yes ☒ No ☐

SOIL

Sampling Point: 2 Up

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-14	10YR 4/1	100					loamy sand	

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

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

- | | |
|--|--|
| ☐ Histosol (A1) | ☐ Sandy Redox (S5) |
| ☐ Histic Epipedon (A2) | ☐ Stripped Matrix (S6) |
| ☐ Black Histic (A3) | ☐ Loamy Mucky Mineral (F1) (except MLRA 1) |
| ☐ Hydrogen Sulfide (A4) | ☐ Loamy Gleyed Matrix (F2) |
| ☐ Depleted Below Dark Surface (A11) | ☐ Depleted Matrix (F3) |
| ☐ Thick Dark Surface (A12) | ☐ Redox Dark Surface (F6) |
| ☐ Sandy Mucky Mineral (S1) | ☐ Depleted Dark Surface (F7) |
| ☐ Sandy Gleyed Matrix (S4) | ☐ Redox Depressions (F8) |

Indicators for Problematic Hydric Soils³:

- | |
|---|
| ☐ 2 cm Muck (A10) |
| ☐ Red Parent Material (TF2) |
| ☐ Very Shallow Dark Surface (TF12) |
| ☐ Other (Explain in Remarks) |

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

Restrictive Layer (if present):

Type: refusal
Depth (inches): 14

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- | | |
|--|--|
| ☐ Surface Water (A1) | ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) |
| ☐ High Water Table (A2) | ☐ Salt Crust (B11) |
| ☐ Saturation (A3) | ☐ Aquatic Invertebrates (B13) |
| ☐ Water Marks (B1) | ☐ Hydrogen Sulfide Odor (C1) |
| ☐ Sediment Deposits (B2) | ☐ Oxidized Rhizospheres along Living Roots (C3) |
| ☐ Drift Deposits (B3) | ☐ Presence of Reduced Iron (C4) |
| ☐ Algal Mat or Crust (B4) | ☐ Recent Iron Reduction in Tilled Soils (C6) |
| ☐ Iron Deposits (B5) | ☐ Stunted or Stressed Plants (D1) (LRR A) |
| ☐ Surface Soil Cracks (B6) | ☐ Other (Explain in Remarks) |
| ☐ Inundation Visible on Aerial Imagery (B7) | |
| ☐ Sparsely Vegetated Concave Surface (B8) | |

Secondary Indicators (2 or more required)

- | |
|---|
| ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| ☐ Drainage Patterns (B10) |
| ☐ Dry-Season Water Table (C2) |
| ☐ Saturation Visible on Aerial Imagery (C9) |
| ☒ Geomorphic Position (D2) |
| ☐ Shallow Aquitard (D3) |
| ☐ FAC-Neutral Test (D5) |
| ☐ Raised Ant Mounds (D6) (LRR A) |
| ☐ Frost-Heave Hummocks (D7) |

Field Observations:

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

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

APPENDIX

APPENDIX C

Wetland Photos

APPENDIX

	Photo 1 – Sample Point 2 Up Date: 8/26/2021 Direction Photo is Taken: Southwest Photo Location: Near Sample Point 2 Up
	Photo 2 – Sample Point 2 Up Date: 8/26/2021 Direction Photo is Taken: Northeast Photo Location: Near Sample Point 2 Up
	Photo 3 – Wetland B Date: 8/26/2021 Direction Photo is Taken: Southwest Photo Location: Looking at Wetland B, from Storm structure.

APPENDIX

	Photo 4 – Wetland A Date: 8/26/2021 Direction Photo is Taken: South Photo Location: Looking south from East Palmer Divide Road.
---	--

APPENDIX

APPENDIX D

Antecedent Precipitation Data

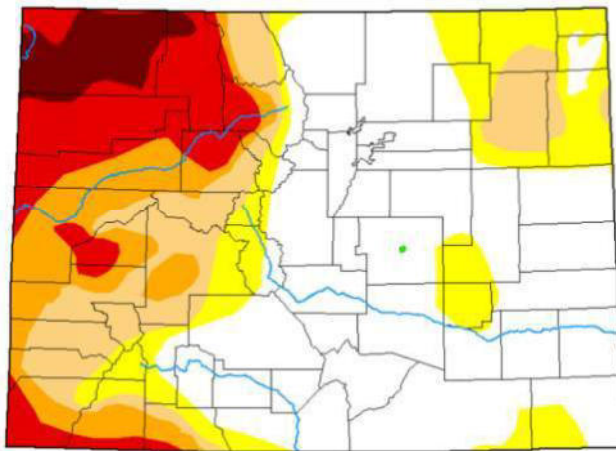
U.S. Drought Monitor

[Current Map](#)[Maps](#)[Data](#)[Summary](#)[About](#)[Conditions & Outlooks](#)[En Español](#)[NADM](#)[Home](#) > [Colorado](#)

Colorado

Map released: Thurs. August 26, 2021

Data valid: August 24, 2021 at 8 a.m. EDT



Intensity

	None
	D0 (Abnormally Dry)
	D1 (Moderate Drought)
	D2 (Severe Drought)
	D3 (Extreme Drought)
	D4 (Exceptional Drought)
	No Data

Authors

United States and Puerto Rico Author(s):
Curtis Riganti, National Drought Mitigation Center

Pacific Islands and Virgin Islands Author(s):
Brad Rippey, U.S. Department of Agriculture

**USACE, Jurisdictional Determination Letter,
Action No. SPA-2005-00679**



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, ALBUQUERQUE DISTRICT
400 ROOD AVENUE, ROOM 224
GRAND JUNCTION, COLORADO 81501-2520

March 22, 2022

Regulatory Division

SUBJECT: Jurisdictional Determination – Action No. SPA-2005-00679

Monument Ridge East, LLC
Attn: Don Cannella
5505 List Drive
Colorado Springs, CO 80919
donald.cannella@gmail.com

Dear Mr. Cannella:

This letter responds to your request for a jurisdictional determination (JD) for the property located on wetlands immediately southeast of the intersection of Interstate 25 and Palmer Divide Road, in the unincorporated community of Woodmoor, at latitude 39.1272, longitude -104.8606, in El Paso County, Colorado. We have assigned Action No. SPA-2005-00679 to your request. Please reference this number in all future correspondence concerning the site.

Based on the information provided, we have determined that the site contains waters of the United States that are subject to regulation under Section 404 of the Clean Water Act. The attached JD form contains a list of aquatic resources that are waters of the United States located within the subject property. If you intend to conduct work that could result in a discharge of dredged or fill material into waters of the United States, please contact this office for a determination of Department of the Army permit requirements and refer to Action No. SPA-2005-00679.

The basis for this approved JD (attached) is that the project site contains wetlands with a clear flow path into Relatively Permanent Waters (RPW), Carpenter, East Plum, and Plum Creek, which then flows into Chatfield Reservoir, a Traditional Navigable Water (TNW). A copy of this JD is also available at <http://www.spa.usace.army.mil/reg/JD>. This approved JD is valid for 5 years unless new information warrants revision of the determination before the expiration date.

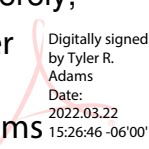
You may accept or appeal this approved JD or provide new information in accordance with the attached Notification of Administration Appeal Options and Process and Request for Appeal (NAAOP-RFA). If you elect to appeal this approved JD, you must complete Section II of the form and return it to the Army Engineer Division, South Pacific, CESPDS-PDS-O, Attn: Tom Cavanaugh, Administrative Appeal Review Officer, P.O. Box 36023, 450 Golden Gate Avenue, San Francisco, CA 94102 within 60 days of the date of this notice. Failure to notify the Corps within 60 days of the date of this

notice means that you accept the approved JD in its entirety and waive all rights to appeal the approved JD.

If you have any questions, please contact me at (970) 243-1199 X 1013 or by email at Tyler.R.Adams@usace.army.mil. At your convenience, please complete a Customer Service Survey online at <https://regulatory.ops.usace.army.mil/customer-service-survey/>.

Sincerely,

Tyler
R.
Adams



Digitally signed
by Tyler R.
Adams
Date:
2022.03.22
15:26:46 -06'00'

Tyler R. Adams
Project Manager NW
Colorado Branch

Enclosures

V5_Soils & Geology Report.pdf Markup Summary

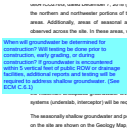
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If groundwater is within 3 feet additional drainage systems (underslab, interceptor) will be required. These areas are further discussed below.

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When will groundwater be determined for construction? Will testing be done prior to construction, early grading, or during construction? If groundwater is encountered within 5 vertical feet of public ROW or drainage facilities, additional reports and testing will be required to address shallow groundwater. (See ECM C.6.1)



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Note: Any semi-permanent flowing underdrain systems are subject to state well permitting.