

Architectural
Structural
Geotechnical



Materials Testing
Forensic
Civil/Planning

SOIL AND GEOLOGY STUDY

**New Breed Ranch
Lots 1-7, Filing No. 3
Colorado Springs
El Paso County, Colorado**

PREPARED FOR:

**Viewpoint Development
12750 Oak Cliff Way
Colorado Springs, CO 80908**

JOB NO. 192449

May 23, 2023

Respectfully Submitted,
RMG – Rocky Mountain Group

Reviewed by,
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1.0 GENERAL SITE AND PROJECT DESCRIPTION

1.1 Project Location

The site is located in the southern half of Section 10, Township 12 South, Range 66 West of the 6th principal meridian in northern El Paso County, Colorado. More specifically, the site is located north of Meadow Run Circle, northwest of the intersection of Highway 83 and Shoup Road. The approximate location of the site is shown on the Site Vicinity Map, Figure 1.

1.2 Existing Land Use

The area within the proposed Filing No. 3 is currently undeveloped land within a larger parcel identified as:

- A portion of EPC Schedule No. 6210000002: addressed as 3250 Shoup Rd, which consists of 279.07 acres and is zoned PUD RR-5.

1.3 Project Description

The total acreage for the proposed subdivision is approximately 40 acres. The site is to be subdivided into 7 lots, each approximately 5.0 acres. The Lot Layout Plan is presented in Figure 2.

Each lot is to be serviced by an on-site wastewater treatment system (OWTS) and an individual water supply well. It is our understanding site grading activities are to be limited to the extent necessary to facilitate construction of individual homes, drainage, and utilities. The site is to be accessed from a new cul-de-sac street extending north of the existing paved Meadow Run Circle.

1.4 Previous Studies and Field Investigation

Reports of previous geotechnical engineering/geologic investigations for this site were available for our review and are listed below:

1. *Wastewater Study, Lots 1-7, New Breed Ranch, Filing No. 3, El Paso County, Colorado*, prepared by RMG – Rocky Mountain Group, Job No. 192449, dated May 23, 2023.
2. *Onsite Wastewater Report, New Breed Ranch, Filing No. 2, Meadow Run Circle, El Paso County, Colorado*, prepared by RMG Engineers Group, Job No. 118479, dated August 26, 2008.
3. *Soil and Geology Report, New Breed Ranch, Filing No. 2, Meadow Run Circle, El Paso County, Colorado*, prepared by RMG Engineers Group, Job No. 118479, dated August 30, 2008.
4. *Geologic Hazard Investigation, New Breed Ranch, Should Road Near Black Forest, Colorado*, prepared by RMG Engineers Group, Job No. 41765, dated February 11, 1999.

The findings, conclusions and recommendations contained in this reports were considered during the preparation of this report.

2.0 QUALIFICATIONS OF PREPARERS

This Soil and Geology Study was prepared by a professional geologist as defined by Colorado Revised Statutes section 34-1-201(3) and by a qualified geotechnical engineer as defined by policy statement 15, "Engineering in Designated Natural Hazards Areas" of the Colorado State Board of Registration for Professional Engineers and Professional Land Surveyors. (Ord. 96-74; Ord. 01-42)

The principle investigators for this study are Kelli Zigler P.G., and Tony Munger, P.E. Ms. Zigler is a Professional Geologist as defined by State Statute (C.R.S 34-1-201) with over 22 years of experience in the geological and geotechnical engineering field. Ms. Kelli Zigler holds a B.S. in Geology from the University of Tulsa. Ms. Zigler has supervised and performed numerous geological and geotechnical field investigations throughout Colorado.

Tony Munger, P.E. is a licensed professional engineer with over 22 years of experience in the construction engineering (residential) field. Mr. Munger holds a B.S. in Architectural Engineering from the University of Wyoming.

3.0 STUDY OVERVIEW

The purpose of this investigation is to characterize the general geotechnical, geologic site conditions, and onsite wastewater treatment system (OWTS) feasibility and present our opinions of the potential effect of these conditions on the proposed residential development within El Paso County, Colorado. As such, our services exclude evaluation of the environmental and/or human, health related work products or recommendations previously prepared, by others, for this project.

Revisions to the conclusions presented in this report may be issued based upon submission of the Development Plan. This study has been prepared in accordance with the requirements outlined in the El Paso County Land Development Code (LDC) specifically Chapter 8, last updated August 27, 2019. Applicable sections include 8.4.8 and 8.4.9, and the El Paso County Engineering Criteria Manual (ECM), specifically Appendix C last updated July 9, 2019.

3.1 Scope and Objective

The scope of this study is to include a physical reconnaissance of the site and a review of pertinent, publically available documents including, but not limited to, previous geologic and geotechnical reports, overhead and remote sensing imagery, published geology and/or hazard maps, design documents, etc.

The objectives of our study are to:

- Identify geologic conditions present on the site
- Analyze potential negative impacts of these conditions on the proposed site development
- Analyze potential negative impacts to surrounding properties and/or public services resulting from the proposed site development as it relates to existing geologic conditions

- Provide our opinion of suitable techniques that may be utilized to mitigate any potential negative impacts identified herein

This report presents the findings of the study performed by RMG relating to the geologic conditions of the above-referenced site. Revisions and modifications to this report may be issued subsequently by RMG, based upon:

- Additional observations made during grading and construction which may indicate conditions that require re-evaluation of some of the criteria presented in this report
- Review of pertinent documents (development plans, plat maps, drainage reports/plans, etc.) not available at the time of this study
- Comments received from the governing jurisdiction and/or their consultants subsequent to submission of this document.

3.2 Site Evaluation Techniques

The information included in this report has been compiled from several sources, including:

- Field reconnaissance
- Geologic and topographic maps
- Review of selected publicly available, pertinent engineering reports
- Available aerial photographs
- Subsurface exploration
- Laboratory testing of representative site soil and rock samples
- Geologic research and analysis

Geophysical investigations were not considered necessary for characterization of the site geology. Monitoring programs, which typically include instrumentation and/or observations for changes in groundwater, surface water flows, slope stability, subsidence, and similar conditions, are not known to exist and were not considered applicable for the scope of this report.

3.3 Previous Studies and Field Investigation

Reports of previous geotechnical engineering/geologic investigations for this site or nearby sites were not available for our review.

3.4 Additional Documents

Additional documents reviewed during the performance of this study are included in Appendix A.

4.0 SITE CONDITIONS

4.1 Existing Site Conditions

The site is currently undeveloped land. A dry drainageway traverses the site from the north to the south, near the eastern property boundary. Three man-made ponds exist within the drainageway. At this time, it is unknown if the ponds are to remain.

4.2 Topography

Based on our site reconnaissance on April 11, 2023 and USGS 2013 topographic map of the Monument Quadrangle, the site generally slopes down from the northwest to the southeast with an elevation difference of approximately 112 to 115 feet across the entire site. The ridge located in the northwest portion of the site accounts for 30 to 35 feet of the elevation difference. Overall, slopes across the site do not exceed 20 percent.

4.3 Vegetation

Site vegetation primarily consists of native grasses and other alpine-type vegetation. Coniferous trees are spread sparsely across the site, but are denser around the base of the ridge.

4.4 Aerial photographs and remote-sensing imagery

Personnel of RMG reviewed aerial photos available through Google Earth Pro dating back to 1985, CGS surficial geologic mapping, and historical photos by historicaerials.com dating back to 1947. Historically, the site has remained vacant land. The first home in the area, north of the site, was constructed prior to 1960. The driveway to the residence traverses the site from the south to the north. The surrounding area, Filing No. 1 and 2 of the Meadow Run subdivision, began development prior to 2005.

5.0 FIELD INVESTIGATION AND LABORATORY TESTING

The subsurface conditions within the property were explored by drilling two (2) exploratory test borings to depths of 20-feet below the existing ground surface on March 22, 2023 and observing two 5-foot deep test pits on April 11, 2023. The test pits were excavated to evaluate the site for on-site wastewater treatment systems (OWTS). The total number of borings generally meets the minimum criteria as stipulated in the ECM, Section C.3.3.

The test borings were drilled with a power-driven, continuous-flight auger drill rig. Samples were obtained during drilling of the test borings in general accordance with ASTM D-1586, utilizing a 2-inch O.D. Split Barrel Sampler. The test pits were excavated with a Case mini-excavator. Results of penetration tests are shown on the drilling logs. The test boring and test pit locations are presented in the Test Boring/Test Pit Location Map, Figure 3. An Explanation of Test Boring/Test Pit Logs is presented in Figure 4, the Test Boring Logs and Test Pit Logs are presented in Figures 5 and 6.

5.1 Laboratory Testing

Soil laboratory testing was performed as part of this investigation. Laboratory testing included moisture content, grain-size analysis and Atterberg Limits. A Summary of Laboratory Test Results is presented in Figure 7. Soil Classification Data is presented in Figure 8.

5.2 Groundwater

Groundwater was not encountered in the test borings or test pits during the field exploration for this investigation. Indications of groundwater fluctuations (redoximorphic features) was not observed in the test pits.

Fluctuations in groundwater and subsurface moisture conditions may occur due to variations in precipitation, landscape irrigation, and modifications in land use in the area. Development of adjacent properties may also affect groundwater levels.

6.0 SOIL, GEOLOGY, AND ENGINEERING GEOLOGY

The site is located within the western portion of the Great Plains Physiographic Province. A major structural feature known as the Rampart Range Fault is located more than 15 miles west of the site. Rampart Range Fault marks the boundary between the Great Plains Physiographic Province and the Southern Rocky Mountain Province. The site exists within the southern edge of a large structural feature known as the Denver Basin. In general, the geology at the site consists of alluvium overlying the bedrock of the Upper part of the Dawson Formation. The alluvium generally consists of gravelly loamy sands to extremely gravelly loamy sands. The upper part of the Dawson Formation is generally comprised of the arkosic sandstone, claystone, mudstone, conglomerate, and localized coal beds.

6.1 Subsurface Soil Conditions

The subsurface materials encountered in the test borings were classified within the laboratory using the Unified Soil Classification System (USCS). The sandstone materials encountered classify primarily as clayey sand (SC). Alluvial material was not encountered above the sandstone in the test borings or test pits.

Additional descriptions and the interpreted distribution (approximate depths) of the subsurface materials are presented on the Test Boring Logs. The classifications shown on the log are based upon visual description of the samples at the depths indicated. Stratification lines shown on the logs represent the approximate boundaries between material types and the actual transitions may be gradual and vary with location.

6.2 Bedrock Conditions

Bedrock was encountered in both the test borings and the test pits performed for this study. In general, the bedrock (as mapped by Colorado Geologic Survey - CGS) is considered part of the Dawson formation and consists of silty to clayey sandstone with interbedded layers of claystone.

The claystone was not observed in the samples obtained from the test borings but is anticipated to be thinly interbedded within the sandstone. The Dawson formation is thick-bedded to massive, generally light colored arkose, pebbly, and pebble conglomerate. The sandstone is generally poorly sorted with various amounts of clay content. The sandstone is generally permeable, well drained, and has good foundation characteristics. The claystone is generally well sorted with high sand content. The claystone (if encountered) is less permeable than the sandstone and is generally not suitable for direct bearing of shallow foundations. Bedrock is anticipated in the excavations and utility trenches for the proposed development.

6.3 U.S. Soil Conservation Service

The U.S. Soil Conservation Service along with United States Department of Agriculture (USDA) identifies the site soils as:

- 41 – Kettle gravelly loamy sand, 8 to 40 percent slopes. The Kettle gravelly loamy sand was mapped by the USDA to be located along the southern portion of the property. Properties of the Kettle gravelly loamy sand include, somewhat excessively drained soil, depth of the water table is anticipated to be greater than 6.5 feet, runoff is anticipated to be medium, frequency of flooding and ponding is none, and landforms are depressions.
- 69 – Peyton-Pring complex, 8 to 15 percent slopes. Properties of the Peyton-Pring complex include, well-drained soils, depth of the water table is anticipated to be more than 80 inches, runoff is anticipated to be medium, frequency of flooding and ponding is none, and landforms include hills. The hydrologic soil group of the unit is B.
- 93 – Tomah-Crowfoot complex, 8 to 15 percent slopes. Properties of the Tomah-Crowfoot complex include, well-drained soils, depth of the water table is anticipated to be more than 80 inches, runoff is anticipated to be medium, frequency of flooding and ponding is none, and landforms include alluvial fans and hills. The hydrologic soil group of the unit is B. The Tomah-Crowfoot complex is anticipated in the area of the subject property where the proposed new residence and treatment area are to be built on the newly subdivided lot.

The USDA Soil Survey Map is presented in Figure 9.

6.4 General Geologic Conditions

Based on our field observations and review of relevant geologic maps, a geologic map was prepared which identifies the geologic conditions affecting the development. The identified geologic conditions affecting the development are presented in the Engineering and Geology Map, Figure 11.

The site generally consists of alluvial/slope wash material overlying sandstone bedrock. The geologic units mapped at the site are:

- *TKda₃* – Dawson formation, facies unit three – white to light tan, thin to medium bedded, fine to medium-grained feldspathic sandstone or pebbly conglomerate. The Dawson is known to contain occasional interbedded sandy claystone. Estimated thickness is around 500 to 600 feet. The Dawson sandstone was encountered in the test borings near the surface

and extended to the 20-foot termination depths of the borings. The sandstone bedrock is anticipated to be encountered at various depths across the site.

- *TKda₄* – Dawson formation, facies unit four – white to light tan, thin to medium bedded, fine to medium-grained feldspathic sandstone or pebbly conglomerate. The Dawson is known to contain occasional interbedded sandy claystone. Unit contains massive structureless mudflow beds that occasionally have dark-colored swamp soil zone tops. Estimated thickness is around 500 feet. The Dawson sandstone was encountered in the test borings near the surface and extended to the 20-foot termination depths of the borings. The sandstone bedrock is anticipated to be encountered at various depths across the site.
- *Qas₁* – Younger alluvial-slope deposits (Holocene and late Pleistocene) – poorly exposed, includes deposits of both sheet flow and fluvial origin. Estimated thickness is 5 to 15 feet.
- *Qas₂* – Middle alluvial-slope deposits (middle Pleistocene) – unit consists of poorly sorted sand and sandy fine pebble gravel. Alluvium in this unit originates from sheet wash and stream-deposited alluvium that span a broad range of time and include deposits of more than one age. Estimated thickness 5 to 40 feet.
- *Qt₁* – Terrace alluvium one (Holocene and late Pleistocene) – unit is comprised of poorly sorted sand and gravel with occasional large cobbles and small boulders. Unit is derived from the Dawson Formation and corresponds with Kettle Creek Alluvium. Estimated thickness is approximately 50 to 40 feet.
- *Qsw* – Sheetwash (Holocene and upper Pleistocene) – poorly sorted silty and clayey sand with occasional gravel. Unit consists primarily of material transported from the upper parts of valley-side slopes by sheet flow, majority of deposits exist along valley sides and footslopes. Approximate unit thickness is 3 to 15 feet.
- *psw* – potential seasonally wet - areas that may collect surface water during high moisture events.

6.5 Engineering Geology

Charles Robinson and Associates (1977) have mapped one environmental engineering unit across the entire site as:

- *IA* – Stable alluvium, colluvium and bedrock on flat to gentle slopes (0-5%).

6.6 Structural Features

Structural features such as schistosity, folds, zones of contortion or crushing, joints, shear zones or faults were not observed on the site, in the surrounding area, or in the soil samples collected for laboratory testing.

6.7 Surficial (Unconsolidated) Deposits

Lake and pond sediments, swamp accumulations, sand dunes, marine terrace deposits, talus accumulations, creep, or slope wash were not observed on the site. Slump and slide debris were also not observed on the site.

6.8 Features of Special Significance

Features of special significance such as accelerated erosion, (advancing gully head, badlands, or cliff reentrants) were not observed on the property. Features indicating settlement or subsidence such as fissures, scarplets, and offset reference features were not observed on the study site or surrounding areas. Features indicating creep, slump, or slide masses in bedrock and surficial deposits were not observed on the property.

6.9 Drainage of Surface Water and Groundwater

The overall topography of the site slopes down from the northwest to the southeast. It is anticipated the direction of surface water and groundwater is to flow in the same direction. Groundwater was not encountered in the test boring performed for this study.

6.10 Floodplain

Based on our review of the Federal Emergency Management Agency (FEMA) Community Panel No. 08041C0295G and the online ArcGIS El Paso County Risk Map, the entire site lies outside the 100- and 500-year floodplains of both Black Squirrel Creek and Sand Creek. The site currently lies in the Zone X. Zone X is defined by FEMA as an area of minimal flood hazard that is determined to be outside the Special Flood Hazard Area and higher than the elevation of the 0.2-percent-annual-chance (or 500-year) flood. The FEMA Flood Map is presented in Figure 10.

A natural drainage feature was observed near the eastern portion of the site. It's anticipated that the area serves as a conduit for surface runoff water during periods of rain and snowmelt. As such, this area is mapped on Figure 11 as potentially seasonally wet.

7.0 ECONOMIC MINERAL RESOURCES

Under the provision of House Bill 1529, it was made a policy by the State of Colorado to preserve for extraction commercial mineral resources located in a populous county. Review of the *El Paso Aggregate Resource Evaluation Map, Master Plan for Mineral Extraction, Map 2* indicates the site is identified as Upland Deposits. The overburden upland deposits consist of sand and gravel with silt and clay deposited by older stream deposits on topographic highs or beach like features. Extraction of the sand and gravel more than likely would not be considered to be economical compared to materials available elsewhere within the county.

According to the *Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands*, the site is mapped within the southern part of the Denver Basin Coal Region. However, the area of the site has been mapped "Somewhat 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 the site. No oil and gas wells are drilled on this tract, or within two miles of it. There

are no historic coal mines in the vicinity. In this part of the Denver coal region, coal resources are locally present within the lower part of the Laramie Formation of Upper Cretaceous age.

The alluvium on this tract may contain sand or gravel. Due to the high clay content in the sandstone of the upper Dawson Formation and the interbedded claystone, the sand and gravel are often unusable.

8.0 IDENTIFICATION AND MITIGATION OF POTENTIAL GEOLOGIC CONDITIONS

The El Paso County Engineering Criteria Manual recognizes and delineates the difference between geologic hazards and constraints. A *geologic hazard* is one of several types of adverse geologic conditions capable of causing significant damage or loss of property and life. Geologic hazards are defined in Section C.2.2 Sub-section E.1 of the ECM. A *geologic constraint* is one of several types of adverse geologic conditions capable of limiting or restricting construction on a particular site. Geologic constraints are defined in Section C.2.2 Sub-section E.2 of the ECM (1.15 Definitions of Specific Terms and Phrases). The following geologic constraints were considered in the preparation of this report and are not anticipated to pose a significant risk to the proposed development:

- Avalanches
- Compressible Soils
- Debris Flow-Fans/Mudslides
- Downhill/Downslope Creep
- Floodplains
- Ground Subsidence
- Landslides
- Rockfall
- Ponding water
- Steeply Dipping Bedrock
- Unstable or Potentially Unstable Slopes
- Scour, Erosion, accelerated erosion along creek banks and drainage ways
- Corrosive Minerals
- Undocumented Fill or History of Landfill

The following sections present geologic constraints that have been identified on the property:

8.1 Expansive Soils and Bedrock

Based on our experience with the soils and bedrock in the vicinity, sandy clay and claystone (if encountered) generally possess low to high swell potential. It is anticipated if expansive clay soils or claystone bedrock are encountered at the time of the site-specific subsurface soil investigation and/or excavation observation, additional mitigations will be required. These materials are readily mitigated with typical construction practices common to this region of El Paso County, Colorado.

Mitigation

Sporadic areas of expansive soils and bedrock are anticipated. If expansive soils or bedrock are encountered beneath the foundations, mitigation will be required. “Mass” subexcavation during land development is currently not proposed. Lot-specific overexcavation and replacement with non-expansive soils is a suitable mitigation. Floor slabs bearing directly on expansive material should be expected to experience movement. Overexcavation and replacement has also been successful in reducing slab movement. Overexcavation is not anticipated for the majority of the lots. However, if clay or claystone seams are encountered, overexcavation depths of 3 to 4 feet are anticipated.

The final determination of mitigation alternatives and foundation design criteria is to be made in site-specific subsurface soil investigations for each lot. Provided that appropriate mitigations and/or foundation design adjustments are implemented, the presence of expansive soils or bedrock is not considered to pose a risk to the proposed structures.

8.2 Seasonal Surface and Subsurface Water

Based on our site observations and review of the Monument Quadrangle and Google Earth images dating back to September 1999, springs do not appear to originate on the subject site. Groundwater was not encountered at the time of drilling for this investigation. Shallow groundwater is not anticipated to impact the proposed development. However, the site conditions indicate the potential for concentrated flows of surface runoff water in the drainageway in times of heavy rainfall or snowmelt. The proposed development should consider the potential impacts of surface runoff water (particularly within the drainageway) when selecting locations for the proposed structures and wastewater treatment areas.

Due to the potential for seasonal fluctuations in groundwater, subsurface moisture conditions may occur due to variations in rainfall and other factors not readily apparent at this time. Development of the property and adjacent properties may also affect groundwater levels. Groundwater information obtained for the current investigation performed prior to the land development phase may or may not be representative of the conditions present at the time of construction. Furthermore, the development processes (reshaping of the ground surface, installation of buried utilities, installation of an underdrain below the roadways, etc.) can significantly alter the depth and flow paths of the subsurface water. The construction of surrounding lots can also alter the amount and depth of subsurface groundwater below a given lot. The potential exists for elevated groundwater levels during high moisture periods and if structures encroach on these areas, the following mitigations should be followed.

Mitigation:

Foundations must have a minimum 30-inch depth for frost protection. Perimeter drains are recommended around portions of the structures which will have habitable or storage space located below the finished ground surface. This includes crawlspace areas but not the walkout trenches, if applicable. Perimeter drains are recommended for portions of the structures which will have below-grade spaces to help reduce the intrusion of water into areas below grade. A typical perimeter drain detail is presented in Figure 12.

If groundwater is encountered at the time of the site-specific subsurface soil investigations within 4 to 6 feet of the proposed basement slab elevation, an underslab drain would be considered in conjunction with the perimeter drain. It must be understood that subsurface drains are designed to intercept some types of subsurface moisture and not others. Therefore, the drain(s) could operate properly and not mitigate all moisture problems relating to foundation performance or moisture intrusion into the basement areas.

8.3 Faults and Seismicity

Based on review of the Earthquake and Late Cenozoic Fault and Fold Map Server provided by CGS located at <http://dnrwebmapgdev.state.co.us/CGSOnline/> and the recorded information dating back to November of 1900, Colorado Springs has not experienced a recorded earthquake with a magnitude greater than 1.6 during that period. The nearest recorded earthquakes over 1.6 occurred in December of 1995 in Manitou Springs, which experienced magnitudes ranging between 2.8 to 3.5. Additional earthquakes over 1.6 occurred between 1926 and 2001 in Woodland Park, which experienced magnitudes ranging from 2.7 to 3.3. Both of these locations are located near the Ute Pass Fault, which is greater than 10 miles from the subject site.

Earthquakes felt at this site will most likely result from minor shifting of the granite mass within the Pikes Peak Batholith, which includes pull from minor movements along faults found in the Denver basin. It is our opinion that ground motions resulting from minor earthquakes may affect structures (and the surrounding area) at this site if minor shifting were to occur.

Mitigation

The Pikes Peak Regional Building Code, 2017 Edition, indicates maximum considered earthquake spectral response accelerations of 0.185g for a short period (S_s) and 0.059g for a 1-second period (S_1). Based on the results of our experience with similar subsurface conditions, we recommend the site be classified as Site Class B, with average shear wave velocities ranging from 2,500 to 5,000 feet per second for the materials in the upper 100 feet.

8.4 Radon

"Radon Act 51 passed by Congress set the natural outdoor level of radon gas (0.4 pCi/L) as the target radon level for indoor radon levels".

Northern El Paso County and the 80908 zip code in which the site is located, has an EPA assigned Radon Zone of 1. A radon Zone of 1 predicts an average indoor radon screening level greater than 0.4 pCi/L (picocuries per liter), which is above the recommended levels assigned by the EPA. *The EPA recommends corrective measures to reduce exposure to radon gas.*

All of the State of Colorado is considered EPA Zone 1 based on the information provided at https://county-radon.info/CO/El_Paso.html. Elevated hazardous levels of radon from naturally occurring sources are not anticipated at this site.

Mitigation

Radon hazards are best mitigated at the building design and construction phases. Providing increased ventilation of basements, crawlspaces, creating slightly positive pressures within structures, and sealing of joints and cracks in the foundations and below-grade walls can help mitigate radon hazards. Passive radon mitigation systems are also available.

Passive and active mitigation procedures are commonly employed in this region to effectively reduce the buildup of radon gas. Measures that can be taken after the residence is enclosed during construction include installing a blower connected to the foundation drain and sealing the joints and cracks in concrete floors and foundation walls. If the occurrence of radon is a concern, it is recommended that the residence be tested after they are enclosed and commonly utilized techniques are in place to minimize the risk.

8.5 Proposed Grading, Erosion Control, Cuts and Masses of Fill

A preliminary grading plan was not available for this site. It is our understanding that site grading is to be limited to the building and OWTS locations and will alter the existing topography only to the extent necessary to accommodate the proposed development. Based on the test boring for this investigation, excavations are anticipated to encounter clayey sandstone with the potential for thinly interbedded sandy claystone seams.

Mitigation

The on-site soils can be used as site grading fill, though the claystone should be avoided in areas where the proposed foundations are not anticipated to penetrate through the grading fill.

The on-site soils are mildly susceptible to wind and water erosion. Minor wind erosion and dust may be an issue for a short time during and immediately after construction. Should the problem be considered severe during construction, watering of the cut areas may be required. Once construction is complete, vegetation should be re-established.

Prior to placement of overlot fill or removal and recompaction of the existing materials, topsoil, low-density native soil, all uncontrolled or undocumented fill, and organic matter should be removed from the proposed fill area. The subgrade should be scarified, moisture conditioned to facilitate compaction (usually within 2% of the optimum moisture content), and recompacted to the same degree as the overlying fill to be placed. The placement and compaction of fill should be periodically observed and tested by a representative of RMG during construction.

9.0 ON-SITE WASTEWATER TREATMENT SYSTEMS

It is our understanding that On-site Wastewater Treatment Systems (OWTS) are proposed for the site. The site was evaluated in general accordance with the El Paso Land Development Code, specifically sections 8.4.8. Two test pits to depths of 5 feet were performed across the site to obtain a general understanding of the soil and bedrock conditions. The Test Pit Logs are presented in Figure 6.

The United States Department of Agriculture (USDA) classified soil types, as discussed in section 6.3, consisted of loamy sand. Limiting layers were encountered in both the test pits at a depth of 5 feet. The estimated long term acceptance rates (LTAR) associated with the soils observed in the test pits range from 0.2 to 1.0 gallons per day per square foot. Signs of seasonal groundwater were not observed in the test pits.

Contamination of surface and subsurface water resources should not occur provided the OWTS sites are evaluated and installed according to the El Paso County Board of Health Guidelines and property maintained.

Treatment areas at a minimum, must achieve the following:

- Treatment areas must be 4 feet above groundwater or bedrock as defined by the Definitions 8.3.4 of the Regulations of the El Paso County Board of Health, Chapter 8 OWTS Regulations, most recently amended May 23, 2018;
- Each lot (after purchase but prior to construction of an OWTS) will require an OWTS site evaluation report prepared per *the Regulations of the El Paso County Board of Health, Chapter 8 OWTS Regulations*. During the site reconnaissance, a minimum of two 8-foot deep test pits will need to be excavated in the vicinity of the proposed treatment area;
- Comply with any physical setback requirements of Table 7-1 of the El Paso County Department of Health and Environment (EPCDHE);
- Treatment areas are to be located a minimum 100 feet from any well (existing or proposed), including those located on adjacent properties per Table 7-2 per the EPCDHE;
- Each lot shall be designed to insure that a minimum of 2 sites are appropriate for a OWTS and do not fall within the restricted areas identified on the Engineering and Geology Map, Figure 10, (e.g. existing ponds, existing septic fields that may remain).

It is our opinion that if the EPCDHE physical setback requirements are met for each lot, there are no restrictions on the placement of the individual On-site Wastewater Treatment Systems.

Soil and groundwater conditions at the site are suitable for individual treatment systems. It should be noted, if LTAR values of less than 0.35 (or soil types 3A to 5) or greater than 0.80 (soil type 0) are encountered at the time of the site specific OWTS evaluation, an "engineered system" will be required.

Additionally, based on the depth of the limiting layer encountered at approximately 5 feet below the existing ground surface, the maximum depth of the OWTS components may be limited to 1 foot below the existing ground surface or mounded systems (above the existing ground surface) may be required. The Wastewater Study is included in Appendix C.

10.0 BEARING OF GEOLOGIC CONDITIONS UPON PROPOSED DEVELOPMENT

Geologic hazards (as described in Section 8 of this report) found to be present at this site include seismicity and radon. The most significant geologic constraints to development recognized at this site are potentially expansive soils and the potential for seasonal groundwater. The geologic

conditions encountered at this site are relatively common to the immediate area and mitigation can be accomplished by implementing common engineering and construction practices. None of these conditions are anticipated to preclude the proposed development.

11.0 ADDITIONAL STUDIES

The findings, conclusions and recommendations presented in this report were provided to evaluate the suitability of the site for future development. Unless indicated otherwise, the test borings, laboratory test results, conclusions and recommendations presented in this report are not intended for use for design and construction of individual OWTS or foundations. ***A site-specific subsurface soil investigation will be required for all proposed structures including (but not limited to) residences and retaining walls (if needed).***

To develop recommendations for construction of the proposed roadways, a pavement design investigation should be performed. This investigation should consist of additional test borings, soil laboratory testing and specific recommendations for the design and construction of roadway pavement sections.

12.0 CONCLUSIONS

Based upon our evaluation of the geologic conditions, it is our opinion that the proposed development is feasible. The geologic conditions identified are considered typical for the Front Range region of Colorado. Mitigation of geologic conditions is most effectively accomplished by avoidance. However, where avoidance is not a practical or acceptable alternative, geologic conditions should be mitigated by implementing appropriate planning, engineering, and suitable construction practices.

In addition to the previously identified mitigation alternatives, surface and subsurface drainage systems should be considered. Exterior, perimeter foundation drains should be installed around below-grade habitable or storage spaces. Surface water should be efficiently removed from the building area to prevent ponding and infiltration into the subsurface soil.

The foundation and floor slabs of the structures should be designed using the recommendations provided in the site-specific Subsurface Soil Investigation performed for each lot. In addition, appropriate surface drainage should be established during construction and maintained by the homeowner.

The recommendations in this and the referenced report are intended to address normal surface drainage conditions, assuming the presence of groundcover (established vegetation, paved surfaces, and/or structures) throughout the regions upslope from this structure. However, groundcover may not be present due to a variety of factors (ongoing construction/development, wildfires, etc.). During periods when groundcover is not present in the "upslope" regions, higher than normal surface drainage conditions may occur, resulting in perched water tables, excess runoff, flash floods, etc. In these cases, the surface drainage recommendations presented herein

(even if properly maintained) may not mitigate all groundwater problems or moisture intrusion into the structure.

Revisions and modifications to the conclusions and recommendations presented in this report may be issued subsequently by RMG based upon additional observations made during grading and construction, which may indicate conditions that require re-evaluation of some of the criteria presented in this report.

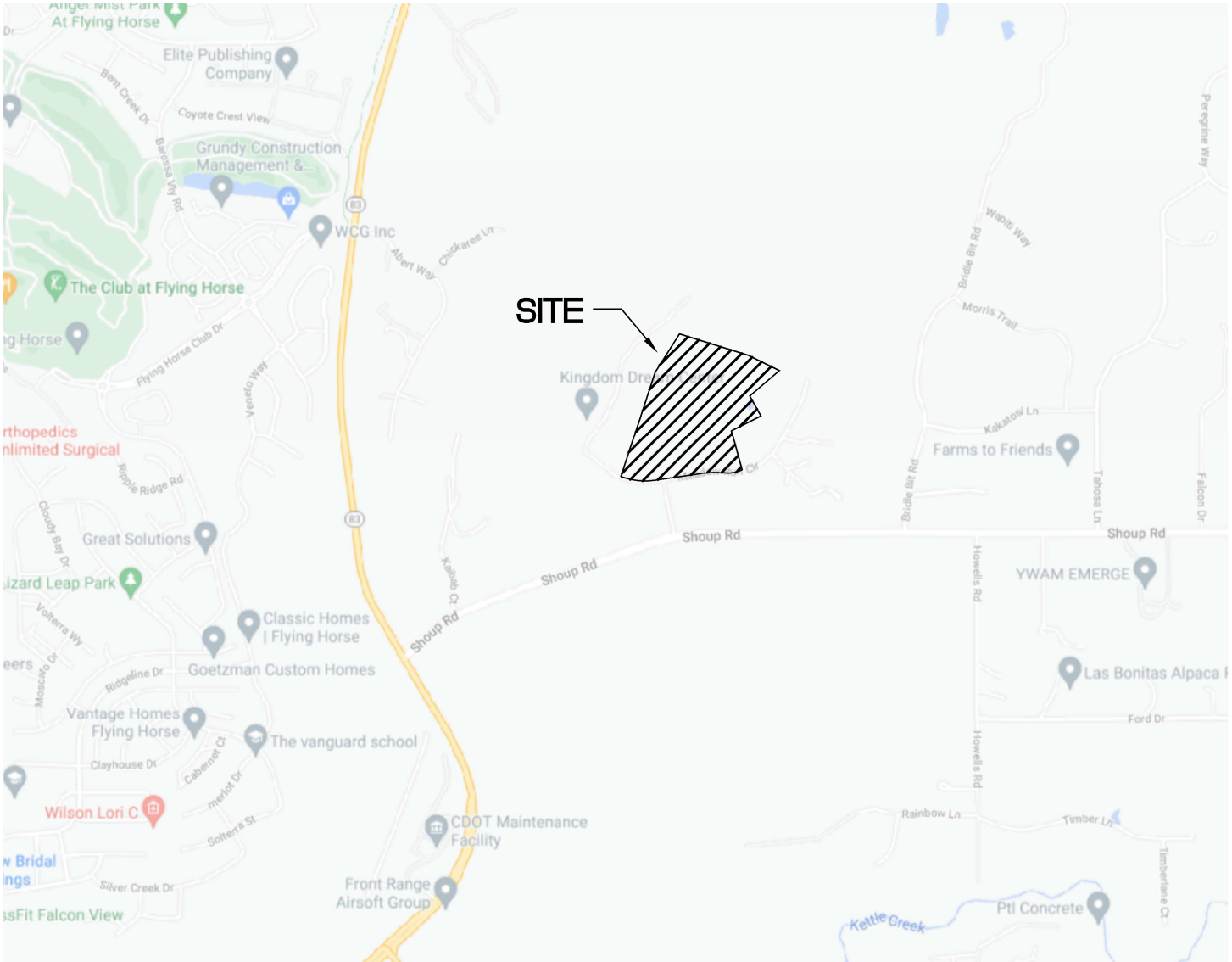
13.0 CLOSING

This report is for the exclusive purpose of providing geologic hazards information and preliminary geotechnical engineering recommendations. The scope of services did not include, either specifically or by implication, evaluation of wild fire hazards, environmental assessment of the site, or identification of contaminated or hazardous materials or conditions. Development of recommendations for the mitigation of environmentally related conditions, including but not limited to, biological or toxicological issues, are beyond the scope of this report. If the owner is concerned about the potential for such contamination or conditions, other studies should be undertaken.

This report has been prepared for **Viewpoint Development** in accordance with generally accepted geotechnical engineering and engineering geology practices. The conclusions and recommendations in this report are based in part upon data obtained from review of available topographic and geologic maps, review of available reports of previous studies conducted in the site vicinity, a site reconnaissance, and research of available published information, soil test borings, soil laboratory testing, and engineering analyses. The nature and extent of variations may not become evident until construction activities begin. If variations then become evident, RMG should be retained to re-evaluate the recommendations of this report, if necessary.

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by geotechnical engineers and engineering geologists practicing in this or similar localities. RMG does not warrant the work of regulatory agencies or other third parties supplying information which may have been used during the preparation of this report. No warranty, express or implied, is made by the preparation of this report. Third parties reviewing this report should draw their own conclusions regarding site conditions and specific construction techniques to be used on this project.

FIGURES



SITE



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Structural
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Materials Testing
Forensics
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SITE VICINITY MAP

LOTS 1-7
NEW BREED RANCH, FILING NO. 3
EL PASO COUNTY, COLORADO
VIEWPOINT DEVELOPMENT

JOB No. 192449

FIG No. 1

DATE 5-23-2023



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LOT LAYOUT PLAN

LOTS 1-7




NEW BREED RANCH, FILING NO. 3
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FIG No. 2

DATE 5-23-2023



-  DENOTES APPROXIMATE LOCATION OF TEST BORINGS
-  DENOTES APPROXIMATE LOCATION OF TEST PITS
-  DENOTES APPROXIMATE LOCATION OF TEST BORINGS FROM PREVIOUS RMG INVESTIGATION 118479, LAST DATED AUGUST 26, 2008


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LOTS 1-7
 NEW BREED RANCH, FILING NO. 3
 EL PASO COUNTY, COLORADO
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ENGINEER:	TM
DRAWN BY:	NM
CHECKED BY:	TM
ISSUED:	5-23-2023

TEST BORING/TEST PIT
LOCATION PLAN

SHEET No.

FIG-3

SOILS DESCRIPTION



SANDSTONE

UNLESS NOTED OTHERWISE, ALL LABORATORY TESTS PRESENTED HEREIN WERE PERFORMED BY:
RMG - ROCKY MOUNTAIN GROUP
2910 AUSTIN BLUFFS PARKWAY
COLORADO SPRINGS, COLORADO

SYMBOLS AND NOTES



XX

STANDARD PENETRATION TEST - MADE BY DRIVING A SPLIT-BARREL SAMPLER INTO THE SOIL BY DROPPING A 140 LB. HAMMER 30", IN GENERAL ACCORDANCE WITH ASTM D-1586. NUMBER INDICATES NUMBER OF HAMMER BLOWS PER FOOT (UNLESS OTHERWISE INDICATED).



XX

UNDISTURBED CALIFORNIA SAMPLE - MADE BY DRIVING A RING-LINED SAMPLER INTO THE SOIL BY DROPPING A 140 LB. HAMMER 30", IN GENERAL ACCORDANCE WITH ASTM D-3550. NUMBER INDICATES NUMBER OF HAMMER BLOWS PER FOOT (UNLESS OTHERWISE INDICATED).



FREE WATER TABLE



DEPTH AT WHICH BORING CAVED



BULK DISTURBED BULK SAMPLE



AUG AUGER "CUTTINGS"

4.5

WATER CONTENT (%)

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EXPLANATION OF TEST BORING LOGS

JOB No. 192449

FIGURE No. 4

DATE May/23/2023

TEST BORING: 1 DATE DRILLED: 3/22/23 NO GROUNDWATER ON 3/22/23	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: 2 DATE DRILLED: 3/22/23 NO GROUNDWATER ON 3/22/23	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
SANDSTONE, CLAYEY, with gravel, brown to gray, very hard, moist	5	[Dotted pattern]	[Solid black]	50/5"	9.0	SANDSTONE, CLAYEY, with gravel, brown to gray, medium hard to very hard, moist	5	[Dotted pattern]	[Solid black]	37	5.0
	10	[Dotted pattern]	[Solid black]	10/0"	8.8		10	[Dotted pattern]	[Solid black]	10/0"	5.8
	15	[Dotted pattern]	[Solid black]	50/6"	9.4		15	[Dotted pattern]	[Solid black]	50/5"	6.9
	20	[Dotted pattern]	[Solid black]	50/5"	8.3		20	[Dotted pattern]	[Solid black]	41	11.0

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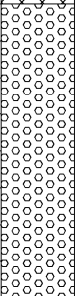
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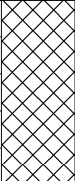
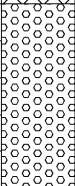
TEST BORING / TEST PIT LOGS

JOB No. 192449

FIGURE No. 5

DATE May/23/2023

TEST PIT TP-1			
DATE OBSERVED: 4/11/23			
SOIL DESCRIPTION	DEPTH (FT)	SYMBOL	SOIL TYPE
0 - 1.0 FT SANDY, CLAY (BLOCKY, MODERATE)	0 - 1ft		4
1.0 - 5.0 FT SANDY, CLAY LOAM (BLOCKY, MODERATE)	1ft - 5ft		3
NO GROUNDWATER LIMITING LAYER (BEDROCK) AT 5 FEET	6ft - 8ft		

TEST PIT TP-2			
DATE OBSERVED: 4/11/23			
SOIL DESCRIPTION	DEPTH (FT)	SYMBOL	SOIL TYPE
0 - 2.5 FT SANDY CLAY (BLOCKY, MODERATE)	0 - 2ft		4
2.5 - 5.0 FT SANDY CLAY LOAM (BLOCKY, MODERATE)	2ft - 5ft		3
NO GROUNDWATER LIMITING LAYER (BEDROCK) AT 5 FEET	6ft - 8ft		

SOIL DESCRIPTIONS



SANDY CLAY



SANDY CLAY LOAM

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TEST PIT LOGS

NEW BREED RANCH
LOTS 1-7, FILING NO. 3

EL PASO COUNTY, COLORADO
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JOB No. 192449

FIG No. 6

DATE 5-23-2023

Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	Load at Saturation (psf)	% Swell/ Collapse	USCS Classification
1	4.0	9.0		32	16	2.1	25.0			SC
1	9.0	8.8								
1	14.0	9.4								
1	19.0	8.3								
2	2.0	5.0								
2	7.0	5.8		24	13	0.6	36.8			SC
2	14.0	6.9								
2	19.0	11.0								

ROCKY MOUNTAIN GROUP

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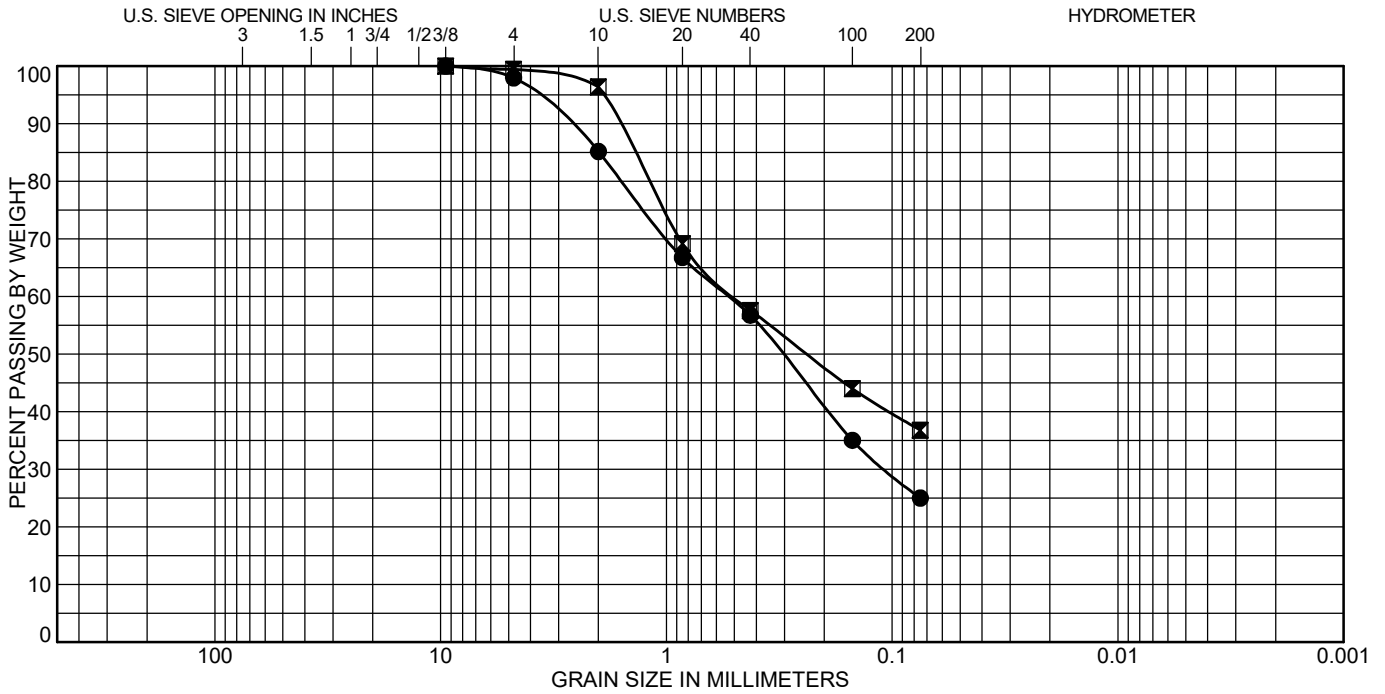
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SUMMARY OF LABORATORY TEST RESULTS

JOB No. 192449
 FIGURE No. 7
 PAGE 1 OF 1
 DATE May/23/2023



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification	LL	PL	PI
● 1	4.0	CLAYEY SAND(SC)	32	16	16
☒ 2	7.0	CLAYEY SAND(SC)	24	11	13

Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
● 1	4.0	2.1	72.9	25.0	
☒ 2	7.0	0.6	62.6	36.8	

ROCKY MOUNTAIN GROUP



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SOIL CLASSIFICATION DATA

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FIGURE No. 8

DATE May/23/2023



41 - Kettle gravelly loamy sand,
8 to 40 percent slopes

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

93 - Tomah-Crowfoot complex,
8 to 15 percent slopes



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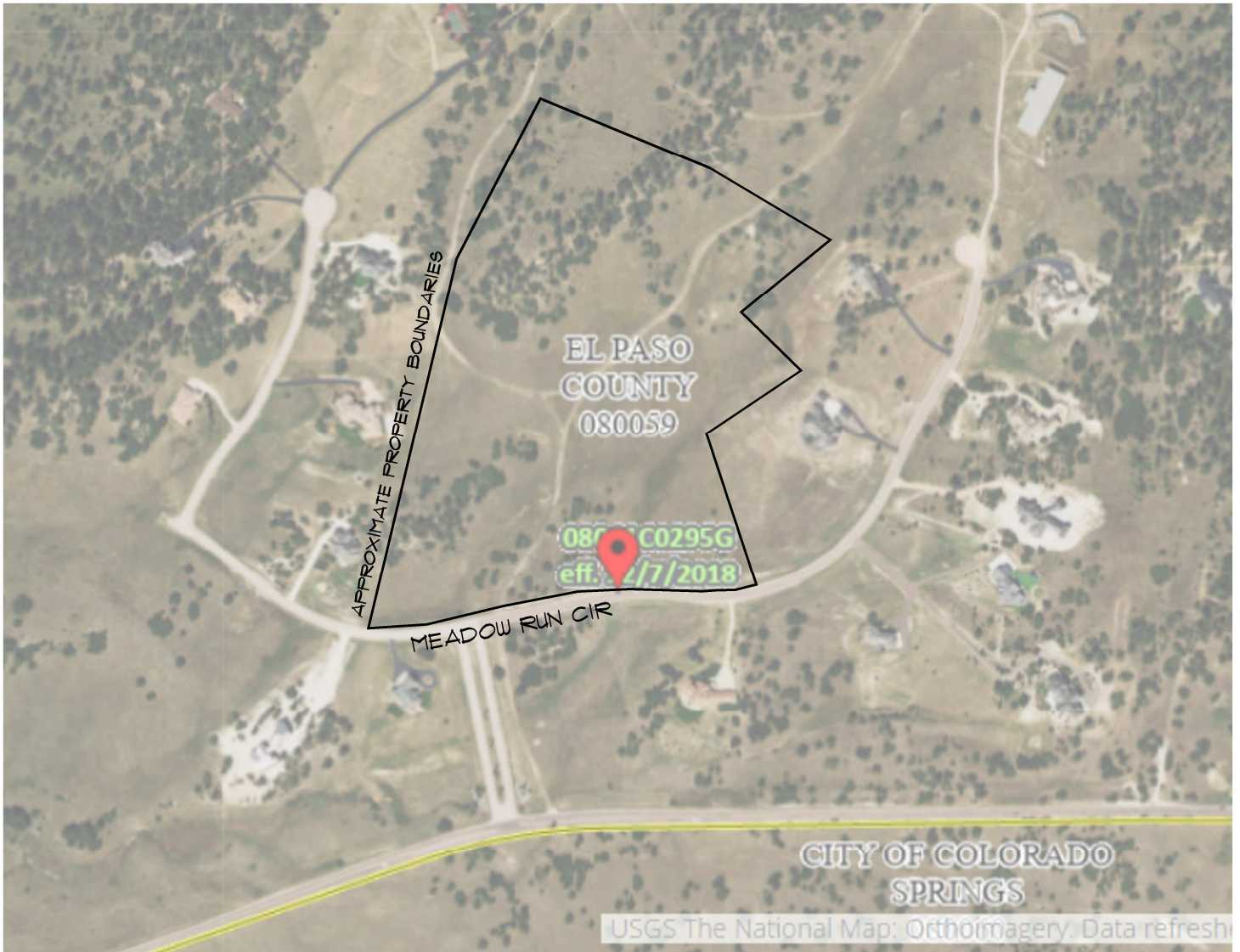
LOTS 1-7
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USDA SOIL
SURVEY MAP

SHEET No.

FIG-9



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FEMA FLOOD MAP

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JOB No. 192449

FIG No. 10

DATE 5-23-2023



GEOLOGIC CONDITIONS

TKda₃ - Dawson Formation - facies unit three (Paleocene) Thick bedded, massive or cross bedded sandstone with thin to thick bedded sandy claystone. Unit thickness between 500 to 600 feet.

TKda₄ - Dawson Formation - facies unit four (Paleocene) Mainly consists of conglomerates, and clayey sandstone. This unit contains very thin beds of claystone and massive structureless mudflow beds. Unit thickness is approximately 500 feet.

Qas₁ - Alluvial slope deposits (Holocene and Late Pleistocene) Contains alluvium from sheet flow and fluvial origin. Unit thickness is between 5 to 15 feet.

Qas₂ - Alluvial slope deposits (Middle Pleistocene) Unit consists of poorly sorted sand and sandy fine pebble gravel. Alluvium in this unit originates from sheet wash and stream-deposited materials. Unit thickness is approximately 5 to 40 feet.

Qt₁ - Terrace alluvium two (late-middle Pleistocene) Unit is comprised of poorly sorted sand and gravel with occasional large cobbles and small boulders. Unit is derived from the Dawson Formation. Unit thickness is approximately 50 to 40 feet.

Qsw - Sheetwash (Holocene and upper Pleistocene) Poorly sorted silty and clayey sand with occasional gravel. Approximate unit thickness is 3 to 15 feet.

psw - areas that may collect surface water during high moisture events

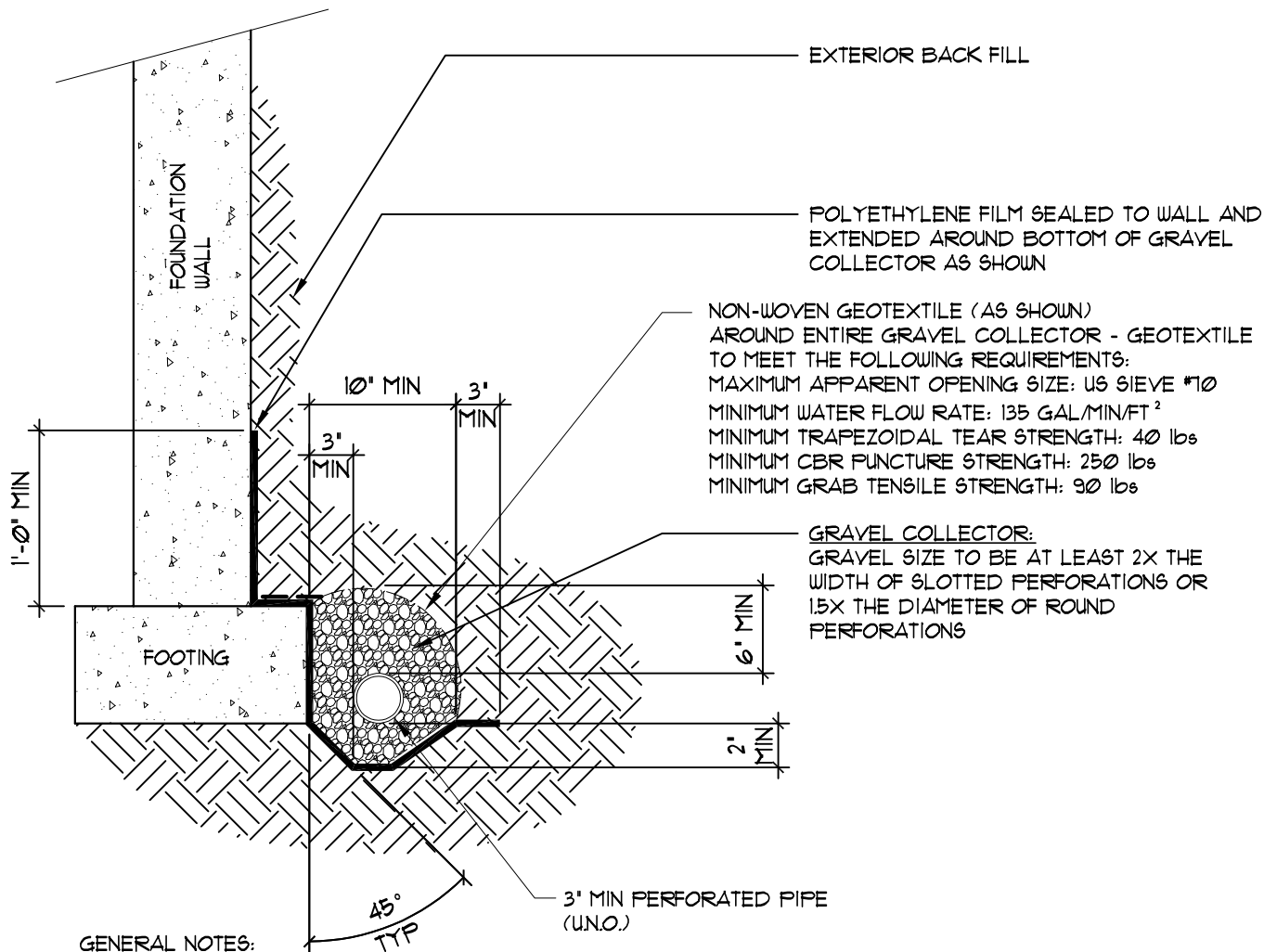
LOTS 1-7
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EL PASO COUNTY, COLORADO
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ENGINEERING AND
GEOLOGY MAP

SHEET No.
FIG-11





1. BOTTOM OF DRAIN PIPE SHALL BE AT OR BELOW BOTTOM OF FOOTING AT ALL LOCATIONS
2. ALL DRAIN PIPE SHALL BE PERFORATED PLASTIC, WITH THE EXCEPTION OF THE DISCHARGE PORTION WHICH SHALL BE SOLID, NON-PERFORATED PIPE.
3. DRAIN PIPE SHALL HAVE POSITIVE FALL THROUGHOUT.
4. DRAIN PIPE SHALL BE PROVIDED WITH A FREE GRAVITY OUTFALL, IF POSSIBLE. IF A GRAVITY OUTFALL CANNOT BE ACHIEVED, THEN A SUMP PIT AND PUMP SHALL BE USED. THE OUTFALL SHOULD EXTEND PAST BACKFILL ZONES AND DISCHARGE TO A LOCATION THAT IS GRADED TO DIRECT WATER OFF-SITE.
5. ALL DRAIN COMPONENTS SHALL BE RATED/APPROVED BY THE MANUFACTURER FOR THE INSTALLED DEPTH AND APPLICATION
6. DRAIN SYSTEM, INCLUDING THE OUTFALL OF THE DRAIN, SHALL BE OBSERVED BY QUALIFIED PERSONNEL PRIOR TO BACKFILLING TO VERIFY INSTALLATION.
7. A VERTICAL SEGMENT OF PERFORATED DRAIN PIPE, CAPPED AT THE TOP, SHALL EXTEND TO FINISH GRADE WITHIN ALL WINDOW WELLS.

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PERIMETER DRAIN

FIG No. 12

APPENDIX A

Additional Reference Documents

1. *Site Survey – Graupner Subdivision* – prepared by Eagle Land Surveying, Inc., dated December 26, 2022, Job Number 22140-02.
2. *Flood Insurance Rate Map, El Paso County, Colorado and Unincorporated Areas, Community Panel No. 081041C0512G*, Federal Emergency Management Agency (FEMA), effective December 7, 2018. *FEMA Flood Map Service Center*: <https://msc.fema.gov/portal/home>.
3. *Environmental and Engineering Geologic Map for Land Use*, compiled by Dale M. Cochran, Charles S. Robinson & Associates, Inc., Golden, Colorado, 1977.
4. *Map of Potential Geologic Hazards and Surficial Deposits*, compiled by Dale M. Cochran, Charles S. Robinson & Associates, Inc., Golden, Colorado, 1977.
5. *El Paso County, Master Plan for Mineral Extraction*, dated February 8, 1996.
6. *Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands Administered by the Colorado State Land Board*, prepared by Colorado Geological Survey, dated February 19, 2003, Open-file Report OF-03-07.
7. *USDA – Natural Resources Conservation Service, Web Soil Survey* <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>
8. *Colorado Geological Survey, USGS Geologic Map Viewer*: <http://coloradogeologicalsurvey.org/geologic-mapping/6347-2/>.
9. *Pikes Peak Regional Building Department*: <https://www.pprbd.org/>.
10. El Paso County Assessor Website <https://property.spatalest.com/co/el Paso/#!/property/4132000010> Schedule No. 4132000010
11. *Colorado Geological Survey, USGS Geologic Map Viewer*: <http://coloradogeologicalsurvey.org/geologic-mapping/6347-2/>.
12. *Historical Aerials*: <https://www.historicaerials.com/viewer>, Images dated 1952, 1955, 1983, 1984, 1999, 2005, 2009, 2011, 2013, 2015, and 2017.
13. *USGS Historical Topographic Map Explorer*: <http://historicalmaps.arcgis.com/usgs/> El Paso County, Images dated 1894, 1913, 1940, 1944, 1960, 1975, and 1983.
14. *Google Earth Pro*, Imagery dated 1999, 2004, 2005, 2006, 2011, 2013, 2015, 2017, 2019, 2020, and 2022.

APPENDIX B

Site Photos

Site Photos – April 11, 2023



Test Pit near southwest corner of property



Looking west across grasslands and rolling hills



Looking north



Near center of property





Northern boundary



Looking southwest near center of property



APPENDIX C

Wastewater Study

Job No. 192449

May 23, 2023

Viewpoint Development
12750 Oak Cliff Way
Colorado Springs, CO 80908

Re: Wastewater Study
Lots 1-7, New Breed Ranch, Filing No. 3
El Paso County, Colorado

Ref: *Development Plan/Preliminary Plan, dated May 24, 2000*

Dear Mr. Scott:

As requested, personnel of RMG – Rocky Mountain Group has performed a preliminary investigation and site reconnaissance at the above referenced address.

The area within the proposed Filing No. 3 is currently undeveloped land within a larger parcel identified as:

- A portion of EPC Schedule No. 6210000002: addressed as 3250 Shoup Rd, which consists of 279.07 acres and is zoned PUD RR-5.

It is our the southern portion of the parcel is to be subdivided into 7 new lots, each approximately 5 acres. The approximate location of the site is shown on the Site Vicinity Map, Figure 1.

This letter is to provide information for the on-site wastewater report per the On-Site Wastewater Treatment Systems (OWTS) Regulations of the El Paso County Board of Health pursuant to Chapter 8.

The following are also excluded from the scope of this report including (but not limited to) foundation recommendations, site grading/surface drainage recommendations, subsurface drainage recommendations, geologic, natural and environmental hazards such as landslides, unstable slopes, seismicity, snow avalanches, water flooding, corrosive soils, erosion, radon, wild fire protection, hazardous waste and natural resources.

Previous Studies and Field Investigation

Reports of previous geotechnical engineering/geologic investigations for this site were available for our review and are listed below:

1. Soil and Geology Study, Lots 1-7, New Breed Ranch, Filing No. 3, El Paso County, Colorado, prepared by RMG – Rocky Mountain Group, Job No. 192449, dated May 23, 2023.
2. *Onsite Wastewater Report, New Breed Ranch, Filing No. 2, Meadow Run Circle, El Paso County, Colorado*, prepared by RMG Engineers Group, Job No. 118479, dated August 26, 2008.
3. *Soil and Geology Report, New Breed Ranch, Filing No. 2, Meadow Run Circle, El Paso County, Colorado, prepared by RMG Engineers Group*, Job No. 118479, dated August 30, 2008.
4. *Geologic Hazard Investigation, New Breed Ranch, Should Road Near Black Forest, Colorado, prepared by RMG Engineers Group*, Job No. 41765, dated February 11, 1999.

The findings, conclusions and recommendations contained in these reports were considered during the preparation of this report.

SITE CONDITIONS

Personnel of RMG performed a reconnaissance visit on April 11, 2023. The purpose of the reconnaissance visit was to evaluate the site surface characteristics including landscape position, topography, vegetation, natural and cultural features, and current and historic land uses. Two 5-foot deep test pits were performed within the boundaries of the proposed Filing No. 3, during our reconnaissance visit. A Test Pit Layout Plan is presented in Figure 2.

The site surface characteristics were observed to consist of low lying grasses and weeds across the entire site. Deciduous trees are scattered across the property.

The following conditions were observed with regard to Filing No. 3:

- A well currently **does not** exist within the proposed Filing No. 3 boundaries;
- No runoff or irrigation features anticipated to cause deleterious effects to treatment systems on the site were observed;
- A drainageway exists on the eastern portion of the property. The entire site lies outside the designated floodway or floodplain;
- Slopes greater than 20 percent **do not** exist on the site; and
- Significant man-made cuts **do not** exist on the site.

Treatment Areas

Treatment areas at a minimum must achieve the following:

- The treatment areas must be 4 feet above groundwater or bedrock as defined by the Definitions 8.3.4 of the Regulations of the El Paso County Board of Health, Chapter 8, *OWTS Regulations*, effective July 7, 2018;
- Prior to construction of an OWTS, an OWTS design prepared per *the Regulations of the El Paso County Board of Health, Chapter 8, OWTS Regulations* will need to be completed. A scaled site plan and engineered design will also be required prior to obtaining a building permit;

- Comply with any physical setback requirements of Table 7-1 of the El Paso County Department of Health and Environment (EPCDHE);
- Treatment areas are to be located a minimum 100 feet from any well (existing or proposed), including those located on adjacent properties per Table 7-2 per the EPCDHE;
- Treatment areas must also be located a minimum 50 feet from any spring, lake, water course, irrigation ditch, stream or wetland, and 25 feet from dry gulches;
- Other setbacks include the treatment area to be located a minimum 10 feet from property lines, cut banks and fill areas (from the crest);
- The new lots shall be laid out to ensure that the proposed OWTS does not fall within any restricted areas, (e.g. utility easements, right of ways). Based on the test pit observations, the parcel has a minimum of two locations for the OWTS.

Contamination of surface and subsurface water resources should not occur if the treatment areas are evaluated and installed according to El Paso County Health Department and State Guidelines in conjunction with proper maintenance.

DOCUMENT REVIEW

RMG has reviewed the above referenced development plan. We have identified the soil conditions anticipated to be encountered during construction of the proposed OWTS for the lots included in the proposed Filing No. 3. Our review included a review of documented Natural Resource Conservation Service - NRCS data provided by websoilsurvey.nrcs.usda.gov. The Soil Survey Descriptions are presented below. A review of FEMA Map No. 08041C0295G, effective December 7, 2018, indicates that the proposed treatment areas are not located within an identified floodplain.

SOIL EVALUATION

Personnel of RMG performed a soil evaluation to include two 5-foot deep test pits, on April 11, 2023 (Test Pit TP-1 and TP-2), utilizing the visual and tactile method for the evaluation of the site soils. The test pits were terminated at 5 feet due to the limiting layer (bedrock) encountered. The test pits were excavated in areas that appeared most likely to be used for residential construction. The Test Pit Logs are presented in Figure 3. A Septic Suitability Map is presented in Figure 4.

The soil conditions as indicated by the NRCS data are anticipated to consist of:

- 41 – Kettle gravelly loamy sand, 8 to 40 percent slopes. The Kettle gravelly loamy sand was mapped by the USDA to be located along the southern portion of the property. Properties of the Kettle gravelly loamy sand include, somewhat excessively drained soil, depth of the water table is anticipated to be greater than 6.5 feet, runoff is anticipated to be medium, frequency of flooding and ponding is none, and landforms are depressions.
- 69 – Peyton-Pring complex, 8 to 15 percent slopes. Properties of the Peyton-Pring complex include, well-drained soils, depth of the water table is anticipated to be more than 80 inches, runoff is anticipated to be medium, frequency of flooding and ponding is none, and landforms include hills. The hydrologic soil group of the unit is B.
- 93 – Tomah-Crowfoot complex, 8 to 15 percent slopes. Properties of the Tomah-Crowfoot complex include, well-drained soils, depth of the water table is anticipated to be more than

80 inches, runoff is anticipated to be medium, frequency of flooding and ponding is none, and landforms include alluvial fans and hills. The hydrologic soil group of the unit is B.

Groundwater was not encountered in the test pits. However, bedrock was encountered at approximately 5 feet in both the test pits performed by RMG.

An OWTS is proposed for each lot and should conform to the recommendations of a future OWTS site evaluation, performed in accordance with the applicable health department codes prior to construction. This report may require additional test pits in the vicinity of the proposed treatment field. A minimum separation of 4 feet shall be maintained from groundwater and bedrock to the infiltrative surface.

Redoximorphic features indicating the fluctuation of groundwater or higher ground water levels were not observed in the test pits.

CONCLUSIONS

In summary, it is our opinion the site is suitable for individual on-site wastewater treatment systems within the cited limitations. There are no foreseeable or stated construction related issues or land use changes proposed at this time.

Soil and groundwater conditions at the site are suitable for individual treatment systems. It should be noted that the LTAR values stated above are for the test pit locations performed for this report only. The LTAR values may change throughout the site. If an LTAR value of less than 0.35 (or soil types 3A to 5) or greater than 0.80 (soil type 0) is encountered at the time of the site specific OWTS evaluation, an "engineered system" will be required.

Additionally, based on the depth of the limiting layer (bedrock) encountered at a depth of 5 feet below the existing ground surface, the maximum depth of the OWTS components may be limited to 1 foot below the existing ground surface or mound systems (above the ground surface) may be required.

LIMITATIONS

The information provided in this report is based upon the subsurface conditions observed in the profile pit excavations and accepted engineering procedures. The subsurface conditions encountered in the excavation for the treatment area may vary from those encountered in the test pit excavations. Therefore, depth to limiting or restrictive conditions, bedrock, and groundwater may be different from the results reported in this letter.

An OWTS site evaluation will need to be performed in accordance with the applicable health department codes prior to construction.

I hope this provides the information you have requested. Should you have questions, please feel free to contact our office.

Cordially,

Reviewed by,

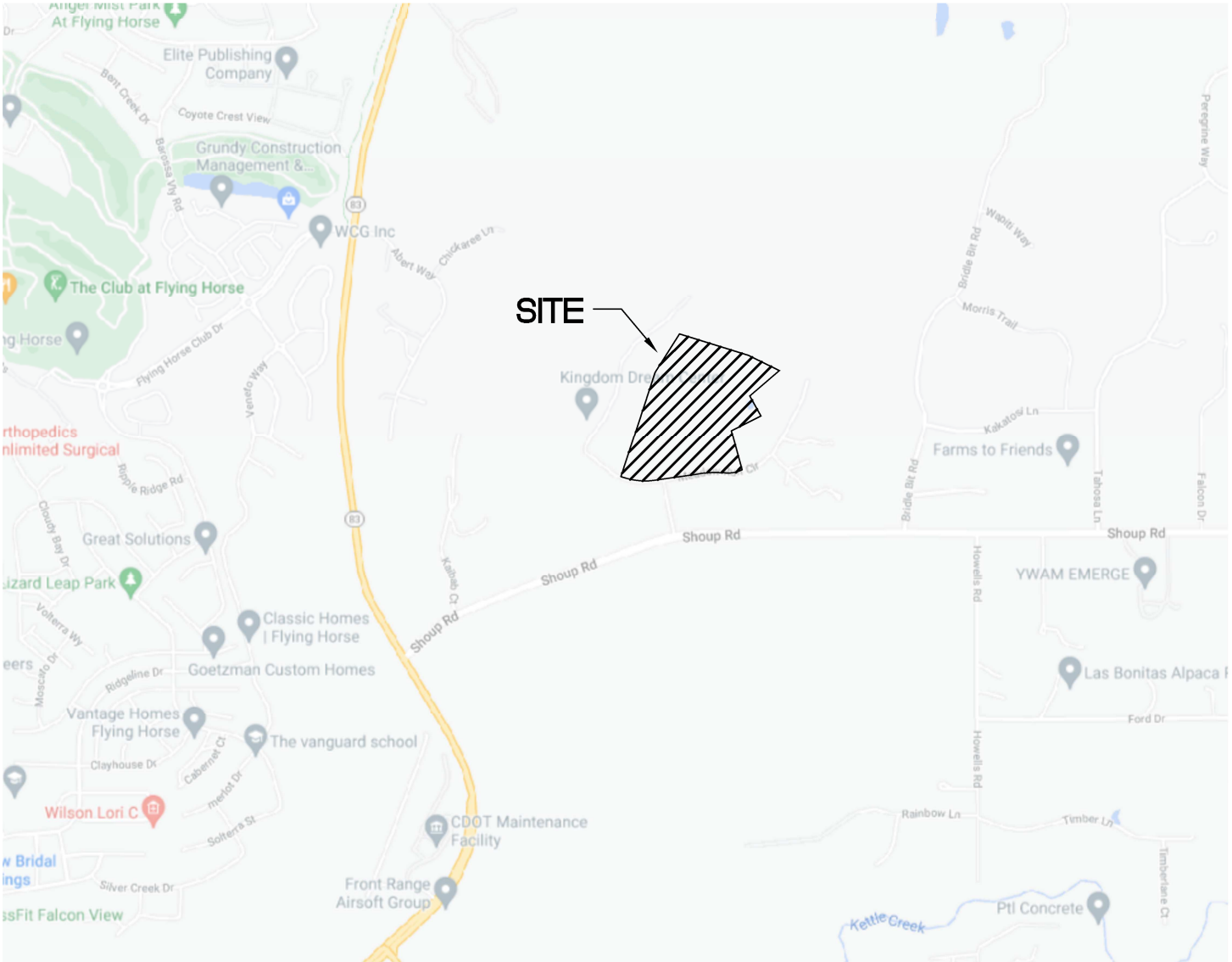
RMG – Rocky Mountain Group

RMG – Rocky Mountain Group



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Project Geologist

Tony Munger, P.E.
Sr. Geotechnical Project Manager



SITE



NOT TO SCALE

Architecture
Structural
Geotechnical



Engineers / Architects

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SOUTHERN COLORADO, DENVER METRO, NORTHERN COLORADO

Materials Testing
Forensics
Civil / Planning

SITE VICINITY MAP

LOTS 1-7
NEW BREED RANCH, FILING NO. 3
EL PASO COUNTY, COLORADO
VIEWPOINT DEVELOPMENT

JOB No. 192449

FIG No. 1

DATE 5-23-2023




 NOT TO SCALE

 DENOTES APPROXIMATE LOCATION OF TEST PITS

JOB No. 192449

Materials Testing
Forensics
Civil / Planning



Architecture
Structural
Geotechnical

Engineers / Architects

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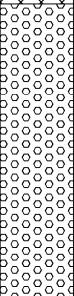
LOTS 1-7
 NEW BREED RANCH, FILING NO. 3
 EL PASO COUNTY, COLORADO
 VIEWPOINT DEVELOPMENT

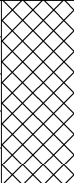
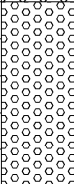
ENGINEER:	TM
DRAWN BY:	NM
CHECKED BY:	TM
ISSUED:	4-25-2023

TEST PIT LAYOUT PLAN

SHEET No.

FIG-2

TEST PIT TP-1			
DATE OBSERVED: 4/11/23			
SOIL DESCRIPTION	DEPTH (FT)	SYMBOL	SOIL TYPE
0 - 1.0 FT SANDY, CLAY (BLOCKY, MODERATE)	0 - 1ft		4
1.0 - 5.0 FT SANDY, CLAY LOAM (BLOCKY, MODERATE)	1ft - 5ft		3
NO GROUNDWATER LIMITING LAYER (BEDROCK) AT 5 FEET	6ft - 8ft		

TEST PIT TP-2			
DATE OBSERVED: 4/11/23			
SOIL DESCRIPTION	DEPTH (FT)	SYMBOL	SOIL TYPE
0 - 2.5 FT SANDY CLAY (BLOCKY, MODERATE)	0 - 2ft		4
2.5 - 5.0 FT SANDY CLAY LOAM (BLOCKY, MODERATE)	2ft - 5ft		3
NO GROUNDWATER LIMITING LAYER (BEDROCK) AT 5 FEET	6ft - 8ft		

SOIL DESCRIPTIONS



SANDY CLAY



SANDY CLAY LOAM

Architecture
Structural
Geotechnical



Engineers / Architects

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Materials Testing
Forensics
Civil / Planning

TEST PIT LOGS

NEW BREED RANCH
LOTS 1-7, FILING NO. 3

EL PASO COUNTY, COLORADO
VIEWPOINT DEVELOPMENT

JOB No. 192449

FIG No. 3

DATE 5-23-2023

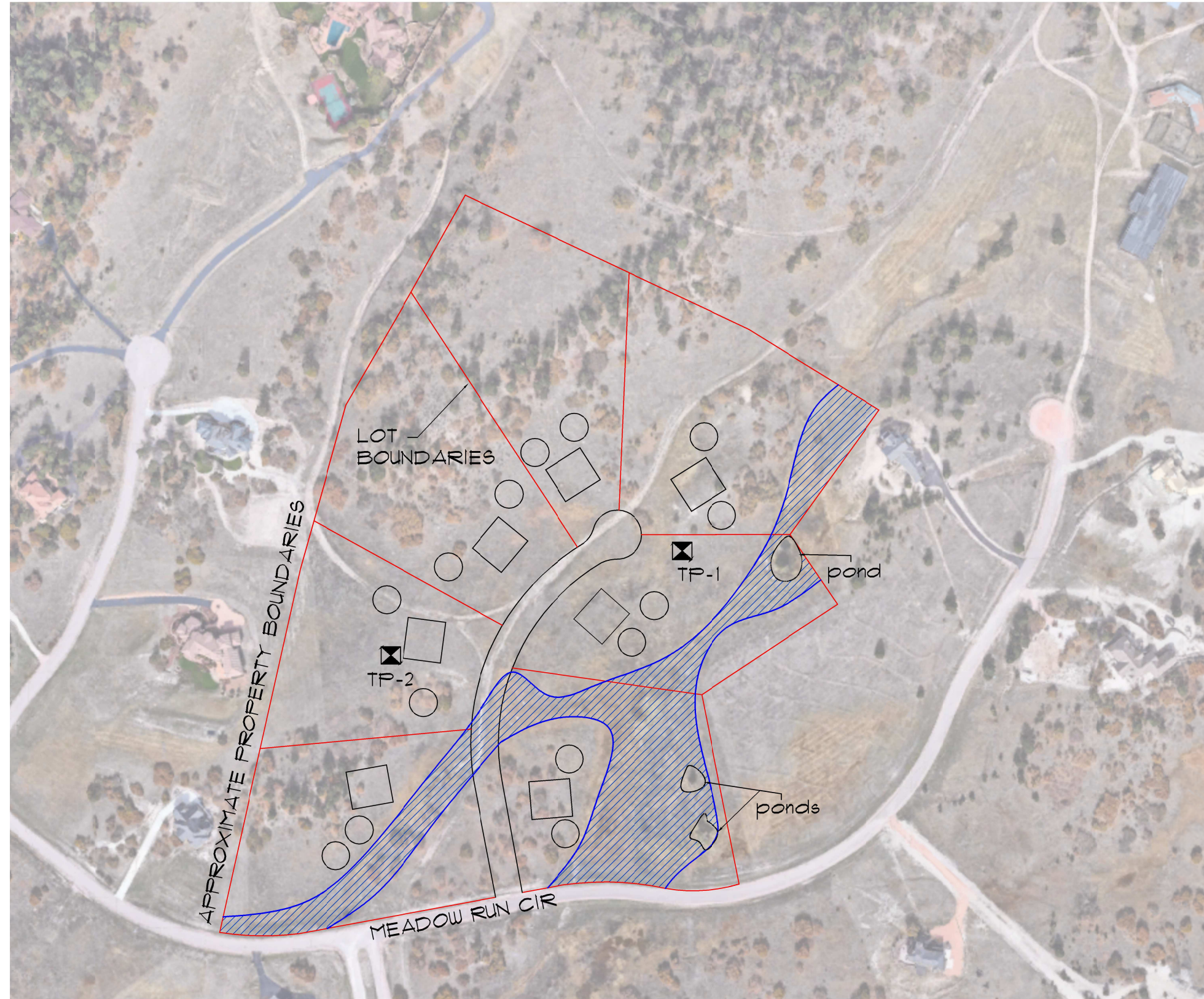
LOTS 1-7

NEW BREED RANCH, FILING NO. 3
EL PASO COUNTY, COLORADO
VIEWPOINT DEVELOPMENT

ENGINEER:	TM
DRAWN BY:	NM
CHECKED BY:	TM
ISSUED:	5-23-2023

SEPTIC
SUITABILITY MAP

SHEET No.
FIG-4



○ DENOTES APPROXIMATE LOCATION OF OWTS

□ DENOTES APPROXIMATE LOCATION OF RESIDENCE

▨ DENOTES APPROXIMATE LOCATION OF SEASONALLY WET AREAS THAT SHOULD BE AVOIDED IN PLACEMENT OF OWTS

⊠ DENOTES APPROXIMATE LOCATION OF TEST PITS



NOT TO SCALE