

March 13, 2023
Revised July 8, 2026



ENTECH
ENGINEERING, INC.

505 ELKTON DRIVE
COLORADO SPRINGS, CO 80907
PHONE (719) 531-5599
FAX (719) 531-5238

GWH, LLC
6547 North Academy Boulevard, Suite 1009
Colorado Springs, CO 80918

Attn: Rocky Manning

Re: Soil, Geology and Geologic Hazard Evaluation
23218 Highway 94
Tax Schedule Nos. 34120-00-026
El Paso County, Colorado
Entech Job No. 230089
PCD File SF2521

Please add:
PCD File SF2521

Dear Mr. Manning:

GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The site is located in the SW¼ of Section 12, Township 14 South, Range 63 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located approximately 15 miles east of Colorado Springs, Colorado, east of Peyton Highway and Highway 94 in El Paso County, Colorado. The location of the site is as shown on the Vicinity Map, Figure 1.

The topography of the site is generally gradually sloping to the southeast. Three dry drainages were observed on the site, in the southwest corner, the south-central portion and along the east portion of the site. The drainage swales trend in a south to southeasterly direction. Water was not observed in the drainages at the time of this investigation. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have included residential, agricultural grazing and undeveloped land. The site contains primarily field grasses, weeds, and yucca with planted trees around the existing homes and the corral areas in the northwest portion of the site. Site photographs, taken February 1, 2023, are included in Appendix A.

Total acreage involved in the proposed subdivision is 60-acres. A new rural subdivision consisting of 10 lots is planned for the replat. The lots for this site are anticipated to be approximately 5 to 9-acres in size. The lots will be serviced by individual on-site wastewater treatment systems and water wells. The Site Plan is presented in Figure 3.

LAND USE AND ENGINEERING GEOLOGY

This site was found to be suitable for the proposed development, which will consist of rural, residential lots and associated site improvements. Areas were encountered where the geologic conditions will impose some constraints on development and land use. These include areas of floodplains, seasonally shallow groundwater, and potentially seasonal shallow groundwater areas. Based on the proposed development plan, it appears that these areas will have minor impacts on the development. These conditions will be discussed in greater detail in the report.

Please revised based
on current layout.

GWH, LLC
Soil, Geology and Geologic Hazard Evaluation
23218 Highway 94
Tax Schedule Nos. 34120-00-026
El Paso County, Colorado
Entech Job No. 230089

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

SCOPE OF THE REPORT

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

FIELD INVESTIGATION

Our field investigation consisted of the preparation of a geologic map of bedrock features and significant surficial deposits. The Natural Resource Conservation Service (NRCS) (Reference 2), previously the Soil Conservation Service (SCS) survey was also reviewed to evaluate the site (Reference 3). The position of mappable units within the subject site are shown on the Geologic Map Figure, 6. Our mapping procedures involved both field reconnaissance and measurements, and aerial photo reconnaissance and interpretation. The field mapping was performed by personnel of Entech Engineering, Inc. on February 1, 2023.

Six (6) test borings were drilled and five (5) test pits were excavated on the site to determine general suitability of the soil characteristics for residential construction and on-site wastewater treatment systems. The locations of the test borings are indicated on the Site Plan/Test Boring Location Map, Figure 3. The Test Boring Logs are presented in Appendix B, and Laboratory Testing results are included in Appendix C.

SOIL AND GEOLOGIC CONDITIONS

Soil Survey

The Natural Resource Conservation Service (NRCS) (Reference 2, Figure 4), previously the Soil Conservation Service (Reference 3) has mapped two soil types on the site. Complete descriptions of the soils are presented in Appendix D. In general, the soils consist of loamy sand and sandy loam. The soils are described as follows:

Type	Description
19	Columbine Gravelly Sandy Loam, 0 – 3% Slopes
28	Ellicott loamy Coarse Sand, 0 – 5% Slopes

The Columbine Gravelly Sandy Loam has been described to have rapid permeabilities and the Ellicott Loamy Coarse Sand has been described to have very limited permeabilities. The soils are described as well suited for use as home sites. Possible hazards with soils erosion are

GWH, LLC
Soil, Geology and Geologic Hazard Evaluation
23218 Highway 94
Tax Schedule Nos. 34120-00-026
El Paso County, Colorado
Entech Job No. 230089

present on the site. The erosion potential can be controlled with vegetation. The soils have been described to have moderate erosion hazards (Reference 2).

Soils

Two soil types were encountered in the test borings on the site. Soil Type 1: slightly silty to silty sand (SM, SM-SW) and Soil Type 2: sandy silt. Bedrock was not encountered in the test borings which were drilled to 20 feet bgs. Each soil type was classified in accordance with the Unified Soil Classification System (USCS) using the laboratory testing results.

Soil Type 1 classified as slightly silty to silty sand (SM, SM-SW). The sand was encountered in Test Boring Nos. 1 through 4 and 6 at the existing ground surface and at 3 feet below ground surface (bgs) extending to the termination of test borings (20 feet). Standard Penetration Testing on the sand resulted in N-values of 7 to greater than 50 blows per foot (bpf) indicating loose to very dense states. The very high blow counts encountered in the test borings are due to gravel. The majority of the sands were encountered at medium dense to dense states. Water content and grain size testing resulted in approximately 1 to 18 percent water content with 5 to 19 percent of the soil size particles passing the No. 200 sieve. Atterberg limit test was performed on samples of the slightly silty to silty sand resulted in Liquid Limits of No-Value and Plastic Indexes of Non-Plastic. Sulfate testing resulted in less than 0.01 to 0.02 percent soluble sulfate by weight, indicating negligible to low potential for below grade concrete degradation due to sulfate attack.

Soil Type 2 classified as slightly sandy silt (ML). The silt was encountered in Test Boring No. 5 at the existing ground surface and extending to 3 feet bgs. Standard Penetration Testing on the silt resulted in N-values of 17 bpf indicating stiff consistencies. Water content and grain size testing resulted in approximately 8 percent water content with 78 percent of the soil size particles passing the No. 200 sieve. The silt soils are anticipated to be penetrated by the foundation excavation

Groundwater

Groundwater was encountered in Test Boring Nos. 1, 3 and 4 at depths of 10 to 12 feet. It is not anticipated that groundwater will affect construction of shallow crawl space foundations. Basements should be excavated to a maximum depth of 6 feet in areas with water at 10 feet. It should be noted that fluctuation in groundwater levels could change due to seasonal variations, changes in land runoff characteristics and future development of nearby areas. Isolated sand layers within the soil profile can carry water in the subsurface. Contractors should be cognizant of the potential for the occurrence of subsurface water during construction.

Geology

Approximately 25½ miles west of the site is the southern extent of 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 a large structural feature known as the Denver Basin. Bedrock in the area is typically gently

GWH, LLC
Soil, Geology and Geologic Hazard Evaluation
23218 Highway 94
Tax Schedule Nos. 34120-00-026
El Paso County, Colorado
Entech Job No. 230089

dipping in a northerly direction (Reference 4). Overlying the Dawson Formation are alluvial deposited sands and clays.

The geology of the site was evaluated using the *Geologic Map of Pueblo 1-degree x 2degrees' quadrangle, South-Central Colorado*, by Scott, G.R., et.al. in 1976, (Reference 4, Figure 5). The Geology Map for the site is presented in Figure 6. One mappable unit was identified on this site which is described as follows:

QI Louviers Alluvium of Pleistocene Age: These deposits are light brown silty sands which contain an abundance of gravels. They commonly occur as stream terrace deposits above the valley floors.

The soils listed above were mapped from site-specific mapping, the *Geologic map of the Pueblo 1-degree x 2-degrees' quadrangle, south-central Colorado* published by the U.S. Geologic Survey in 1976 (Reference 4). The test borings and test pits were used in evaluating the site and are included in Appendix B. The Geology Map prepared for the site is presented in Figure 6.

ENGINEERING GEOLOGIC HAZARDS

Mapping has been performed on this site to identify areas where various geologic conditions exist of which developers should be cognizant during the planning, design and construction stages should new construction be proposed. The engineering geologic hazards identified on this site include potentially seasonally wet areas, seasonally wet areas, and shallow groundwater areas. These hazards and recommended mitigation techniques are discussed as follows:

Loose or Collapsible Soils – Constraint

Loose or collapsible soils were encountered in the upper portions of two of the six borings drilled on the site.

Mitigation: The potential for settlement movement is directly related to saturation of the soils below the foundation areas. Therefore, good surface and subsurface drainage is extremely critical in these areas in order to minimize the potential for saturation of these soils. The ground surface around all permanent structures should be positively sloped away from the structure to all points, and water must not be allowed to stand or pond anywhere on the site. We recommend that the ground surface within 10 feet of the structures be sloped away with a minimum gradient of five percent. If this is not possible on the upslope side of the structures, then a well-defined swale should be created to intercept the surface water and carry it quickly and safely around and away from the structures. Roof drains should be made to discharge well away from the structures and into areas of positive drainage. Where several structures are involved, the overall drainage design should be such that water directed away from one structure is not directed against an adjacent building. Planting and watering in the immediate vicinity of the structures, as well as general lawn irrigation, should be minimized. Should loose

GWH, LLC
Soil, Geology and Geologic Hazard Evaluation
23218 Highway 94
Tax Schedule Nos. 34120-00-026
El Paso County, Colorado
Entech Job No. 230089

or collapsible soils be encountered beneath foundations, removal and recompaction of the upper 2 to 3 feet with thorough moisture conditioning and recompaction at 95% of Modified Proctor Dry Density, ASTM D-1557 will be necessary. **Specific recommendations should be made after additional investigation of each building site.**

Floodplain (fp) – Hazard:

Portions of the site lie within a floodplain zone according to the FEMA Map Nos. 08041CO807G and 08041CO809G, dated December 7, 2018 (Figure 7, Reference 6). The approximate FEMA floodplain boundaries are also indicated on the Engineering Geology Map, Figure 5. The exact location of the floodplain will be required prior to development. **Exact locations of floodplain and specific drainage studies are beyond the scope of this report.** Those areas that currently lie within the FEMA floodplain area will require approval of the Drainage Basin Report prior to construction. Structures should not block drainages. Significant grading and dewatering will be necessary should construction be considered in this area. Channelization of the floodplain and raising the building areas will be necessary. Finished floor levels must be located a minimum of one foot above floodplain levels. Two other areas in the southern portion of the lot are mapped as potentially seasonally wet these areas should be avoided or will require to be regrade if construction is mandatory.

Seasonally Wet Areas (sw) - Constraint:

In these areas, high subsurface moisture condition, frost heave potential and highly organic soils may exist, particularly on a seasonal basis.

Mitigation: These areas lie within drainages which will likely be avoided by construction. If development is desired, in these areas grading can mitigate the drainages. All organic material, soft or wet soils should be removed prior to any filling. The same mitigation recommendations for potentially high groundwater areas as discussed previously should be followed in these areas of seasonally high groundwater. In some areas, it may be necessary to dewater the excavation. Underslab drains or interceptor drains may be used in addition to perimeter drains to prevent the intrusion of water into areas below grade. Typical Drain Details are presented in Figures 8 through 9. It may be desirable to build up the building areas to raise the foundation further above the groundwater level. Any grading should be done in a manner that directs surface flow around construction to avoid areas of ponded water. Structures should not block drainages, but swales should be created to intercept surface runoff and carry it safely around and away from structures. Additional investigation will be necessary to determine the water depth and its effect on development once plans are available. Other areas than those mapped could encounter groundwater that could affect shallow foundations on-site.

Potentially Seasonally Wet Areas (psw) – Constraint:

In these areas, we would anticipate the potential for periodic high subsurface moisture conditions and frost heave potential. These areas did not indicate the yearly presence of shallow groundwater as the seasonal high groundwater areas did, however, based on topography and site conditions, the potential exists for high groundwater during high moisture

GWH, LLC
Soil, Geology and Geologic Hazard Evaluation
23218 Highway 94
Tax Schedule Nos. 34120-00-026
El Paso County, Colorado
Entech Job No. 230089

periods or years. The same mitigation recommendations for Seasonal High Groundwater areas apply to these Potentially Seasonal High Groundwater areas. Further investigation of each building site may be necessary to delineate the depth to groundwater. Groundwater may be at sufficient depth to not affect shallow foundations in these areas.

RELEVANCE OF GEOLOGIC CONDITIONS TO LAND USE PLANNING

The proposed development will consist of subdividing the parcel for rural residential lots, and associated site improvements. The existing geologic and engineering geologic conditions will impose some minor constraints on development and construction. The geologic conditions on the site include loose or collapsible soils, and seasonal shallow groundwater areas which can be satisfactorily mitigated through proper engineering design and construction practices, or avoidance.

The upper granular soils in the borings drilled on the site were encountered at loose to very dense states. Loose or collapsible soils, if encountered beneath foundation or floor slabs, will require recompaction. Expansive layers may also be encountered on this site. Expansive soils, if encountered, will require mitigation/special foundation design. These soils will not prohibit development. Overexcavation and replacement with non-expansive soils at a minimum of 95% 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.

An active floodplain is mapped in the southwest corner of this site. No construction should take place without further investigation within the floodplain. (Drainage channels associated with the windblown sands are located in some areas across the site and that have been mapped as potentially seasonally wet areas and are discussed in the following section.) These low-lying areas are indicated in the Geology/Engineering Geology Map (Figure 6). Due to the lot sizes these areas can be avoided. In these areas, we would anticipate the potential for periodically high subsurface moisture conditions, frost heave potential and highly organic soils.

In summary, the granular soils will likely provide suitable support for shallow foundations. The geologic conditions encountered on site can be mitigated with avoidance or proper engineering and construction practices. **Individual investigations for new building sites and septic systems will be required prior to construction.**

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.

GWH, LLC
Soil, Geology and Geologic Hazard Evaluation
23218 Highway 94
Tax Schedule Nos. 34120-00-026
El Paso County, Colorado
Entech Job No. 230089

With regard to water erosion, loosely compacted soils will be the most susceptible to water erosion, residually weathered soils and weathered bedrock materials become increasingly less susceptible to water erosion. For the typical soils observed on site, allowable velocities or 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.

ROADWAY AND EMBANKMENT CONSTRUCTION RECOMMENDATIONS

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

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% of optimum moisture content and compacted to a minimum of 95% 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% of its maximum Modified Proctor Dry Density, ASTM D-1557. These materials should be placed at a moisture content conducive to compaction, usually 0 to $\pm 2\%$ of Proctor optimum moisture content. The placement and compaction of fill should be observed and

GWH, LLC
Soil, Geology and Geologic Hazard Evaluation
23218 Highway 94
Tax Schedule Nos. 34120-00-026
El Paso County, Colorado
Entech Job No. 230089

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.

ECONOMIC MINERAL RESOURCES

Some of the sandy materials on-site could be considered a low-grade sand resource. According to the *El Paso County Aggregate Resource Evaluation Map* (Reference 6), the area is mapped as upland deposits. According to the *Atlas of Sand, Gravel and Quarry Aggregate Resources, Colorado Front Range Counties* distributed by the Colorado Geological Survey (Reference 6), surrounding areas to the site are mapped as U3 – Upland Deposits: sand resource. According to the *Evaluation of Mineral and Mineral Fuel Potential* (Reference 7), the area of the site has been mapped as “Good” for industrial minerals. Generally, the Dawson formation does not contain significant industrial mineral resources. The sands associated with the eolian and alluvial deposits may be considered a sand resource. Considering the silty to clayey nature of much of these materials and abundance of similar materials through the region, 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 7), 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 the site (Reference 7).

Areas neighboring the site have been mapped as “Fair” for oil and gas resources (Reference 7). No oil or gas fields have been discovered in the area of the site. Two wells were previously drilled in the area to 537 feet in 1924 to an unknown formation, and to 6,514 feet deep to the Jurassic Morrison Formation in 1972. No oil or gas was reported and both wells were plugged. The sedimentary rocks in the area may lack the geologic structure for trapping oil or gas; therefore, it would not be considered a significant resource.

GWH, LLC
Soil, Geology and Geologic Hazard Evaluation
23218 Highway 94
Tax Schedule Nos. 34120-00-026
El Paso County, Colorado
Entech Job No. 230089

CLOSURE

It should be pointed out that because of the nature of data obtained by random sampling of such variable nonhomogeneous 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. Any new construction considered on this site will require additional investigation. Construction and design personnel should be made familiar with the contents of this report. Specific construction and foundation recommendations will be provided when investigations are completed at each building site prior to new construction.

This report has been prepared for GWH, LLC for application to the proposed development in accordance with generally accepted geologic, soil and engineering practices. No other warranty expresses or implied is made.

We trust that this report has provided you with all the information that you required. Should you have any questions or require additional information, please do not hesitate to contact us.

Respectfully Submitted,

ENTECH ENGINEERING, INC.



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

Reviewed by:



Digitally signed by Joseph C Goode Jr.
Date: 07/08/26

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

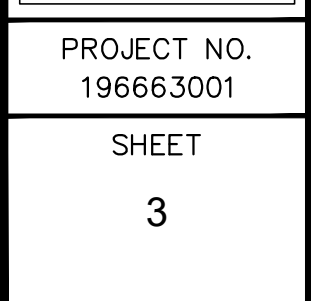
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El Paso County, Colorado
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7. Keller, John W.; TerBest, Harry and Garrison, Rachel E. 2003. *Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands Administered by the Colorado State Land Board*. Colorado Geological Survey. Open-File Report 03-07.



TABLE

CLIENT GWH
 PROJECT 23218 HIGHWAY 94
 JOB NO. 230089

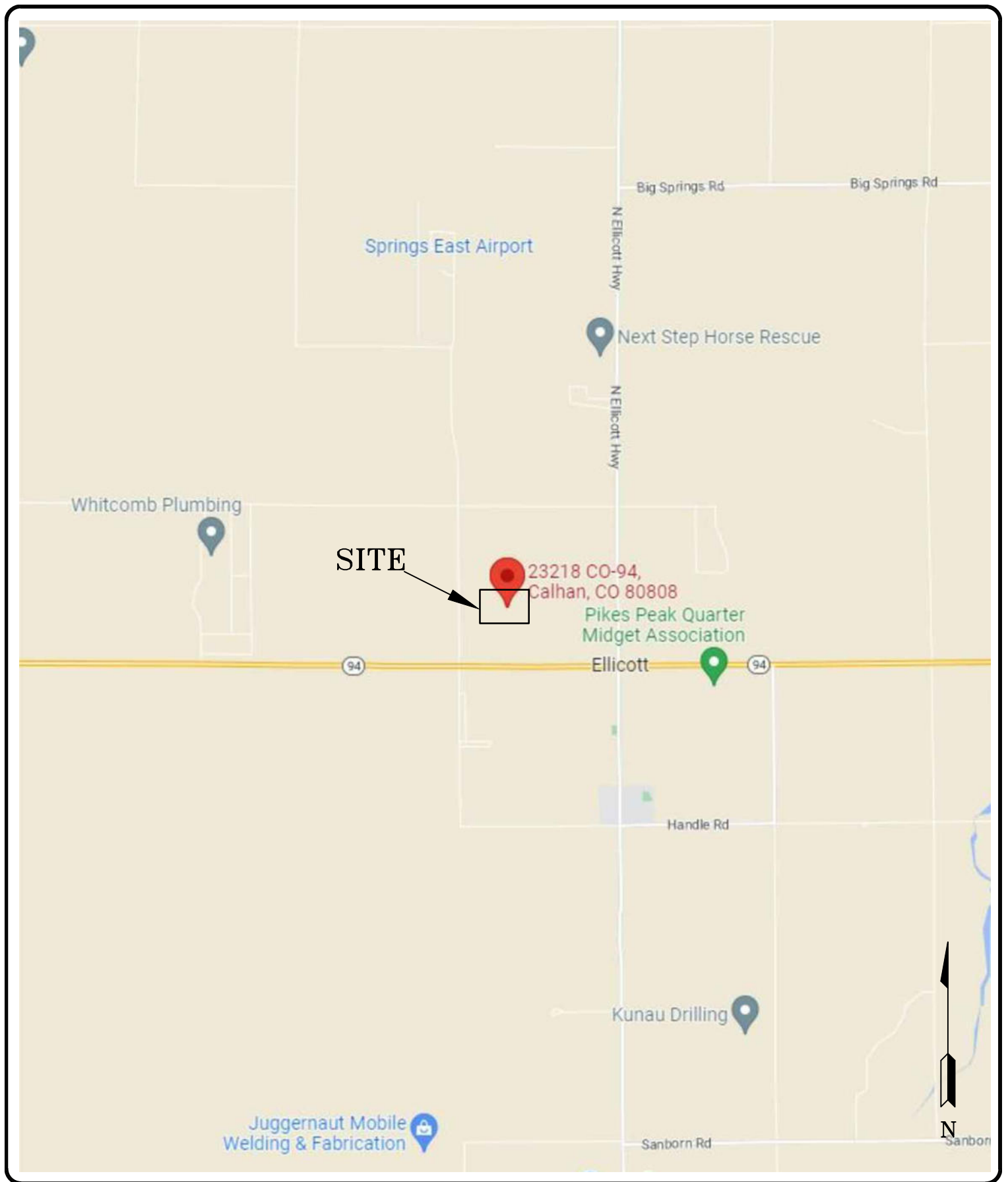
TABLE 1
SUMMARY OF LABORATORY TEST RESULTS

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			5.0	NV	NP	<0.01			SM-SW	SAND, SLIGHTLY SILTY
1	2	15			18.5						SM	SAND, SILTY
1	3	10			13.8	NV	NP	0.02			SM	SAND, SILTY
1	4	5			7.2						SM-SW	SAND, SLIGHTLY SILTY
1	6	10			11.0						SM-SW	SAND, SLIGHTLY SILTY
2	5	2-3			78.0						ML	SILT, SANDY

Table 2: Summary of Groundwater and Bedrock Depths

Test Boring No.	Depth to Bedrock (ft.)	Depth to Groundwater (ft.)
1	N/A	12
2	N/A	N/A
3	N/A	10
4	N/A	10
5	N/A	10
6	N/A	N/A

FIGURES



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VICINITY MAP
23218 HIGHWAY 94
EL PASO COUNTY, CO.
FOR: GWH

DRAWN:
JHR

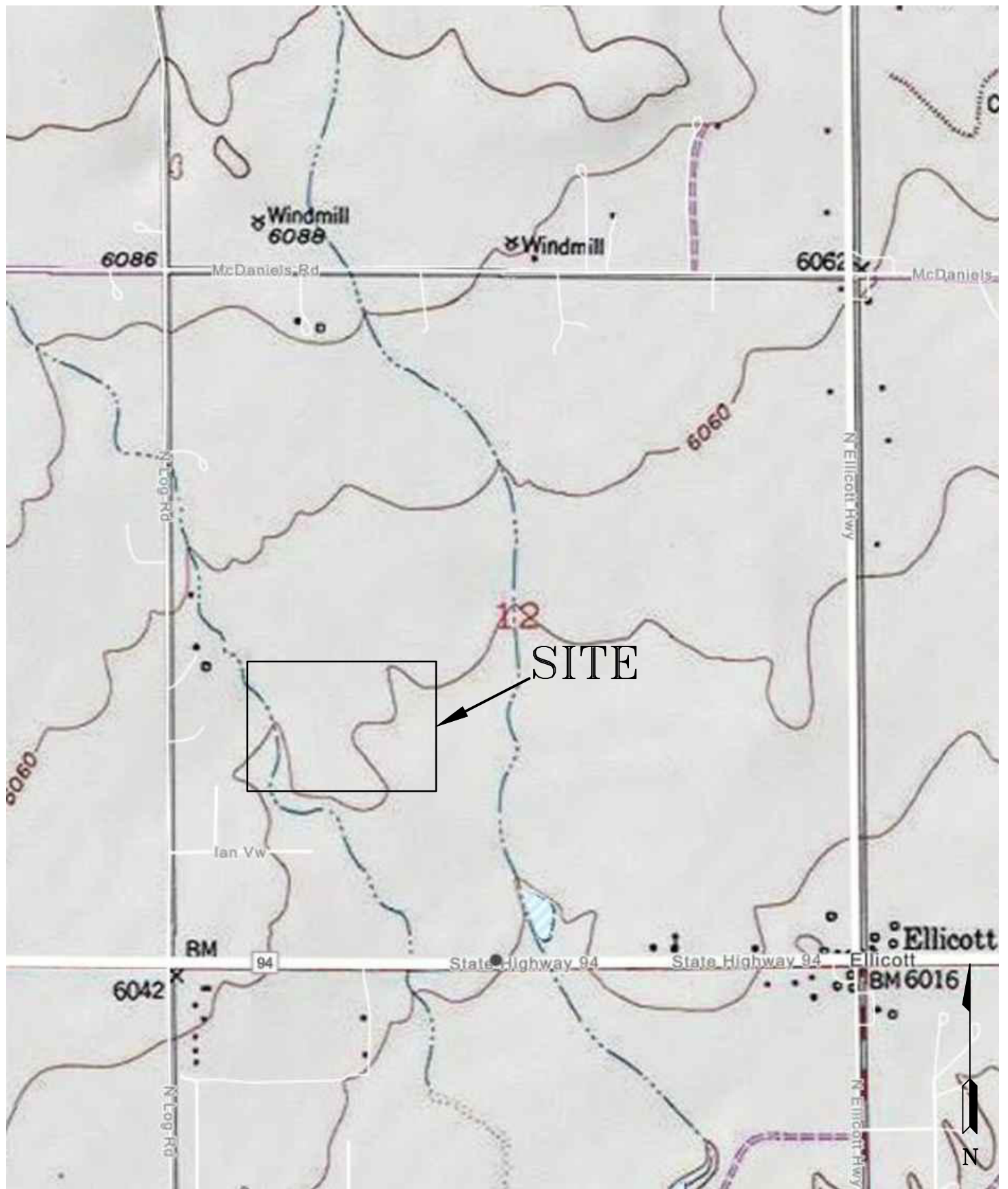
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230089

FIG NO.:
1



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USGS MAP TOPOGRAPHY MAP
23218 HIGHWAY 94
EL PASO COUNTY, CO.
FOR: GWH

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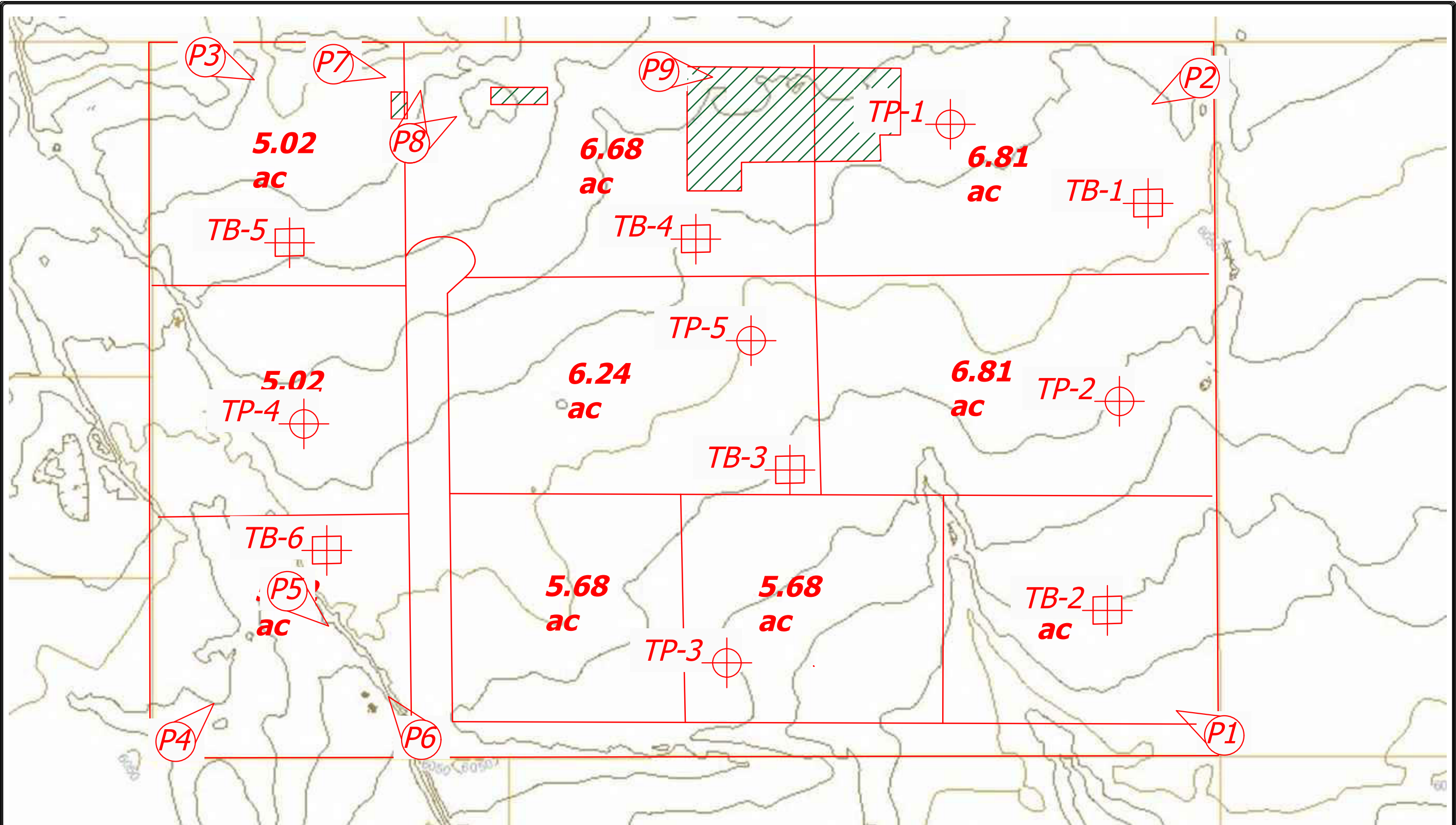
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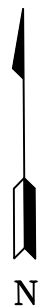
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FIG NO.:
2



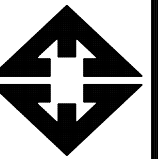
LEGEND:

-  - APPROXIMATE TEST PIT LOCATION
-  - APPROXIMATE TEST BORING LOCATION
-  - APPROXIMATE PHOTOGRAPH LOCATION AND DIRECTION
-  - Man Made- Structure



REVISION	BY

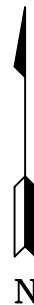
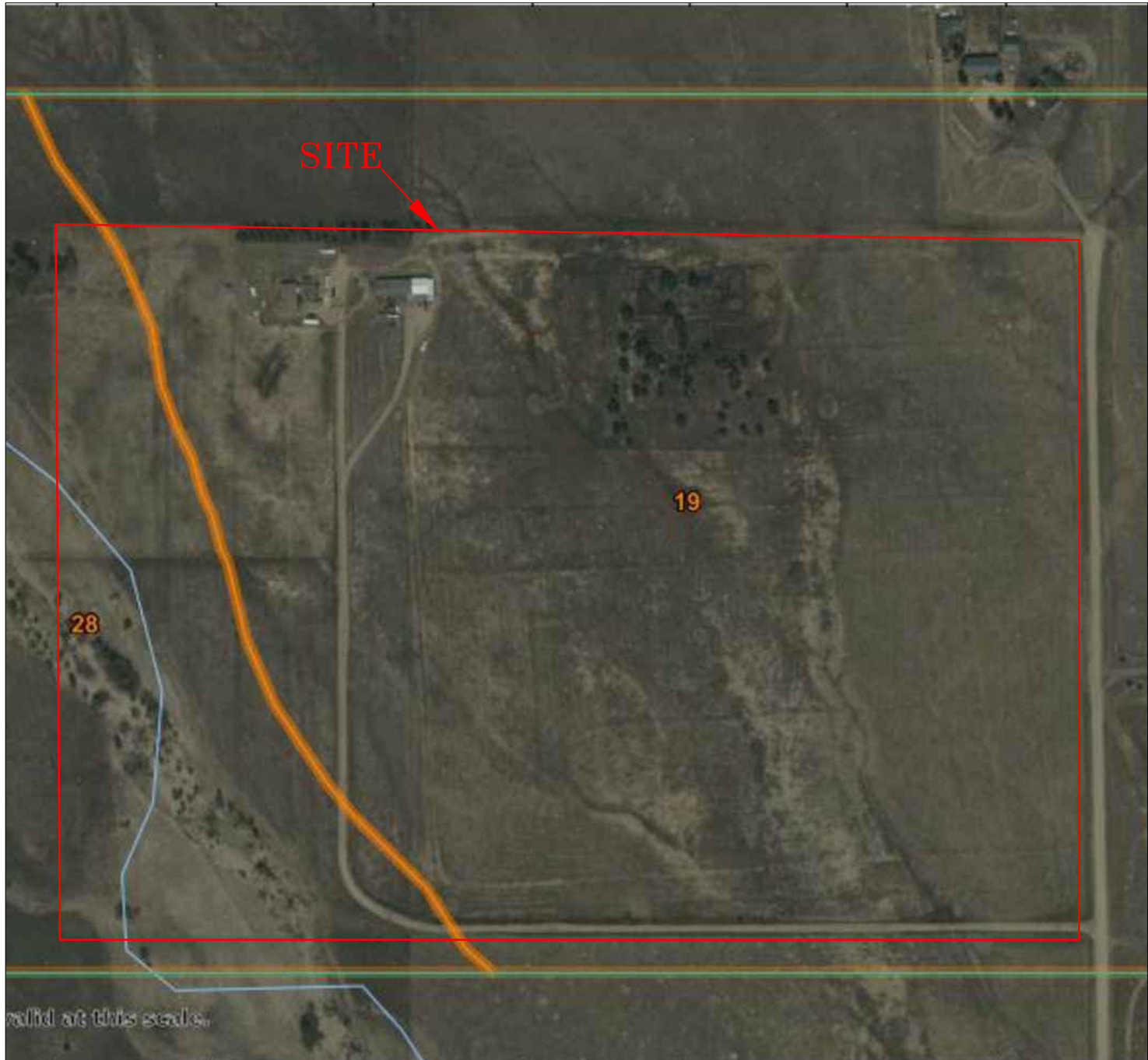
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OWTS SUITABILITY MAP
23218 HIGHWAY 94
EL PASO COUNTY, CO.
FOR: GWH

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FIGURE No.

3



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SOIL SURVEY MAP
23218 HIGHWAY 94
EL PASO COUNTY, CO.
FOR: GWH

DRAWN:
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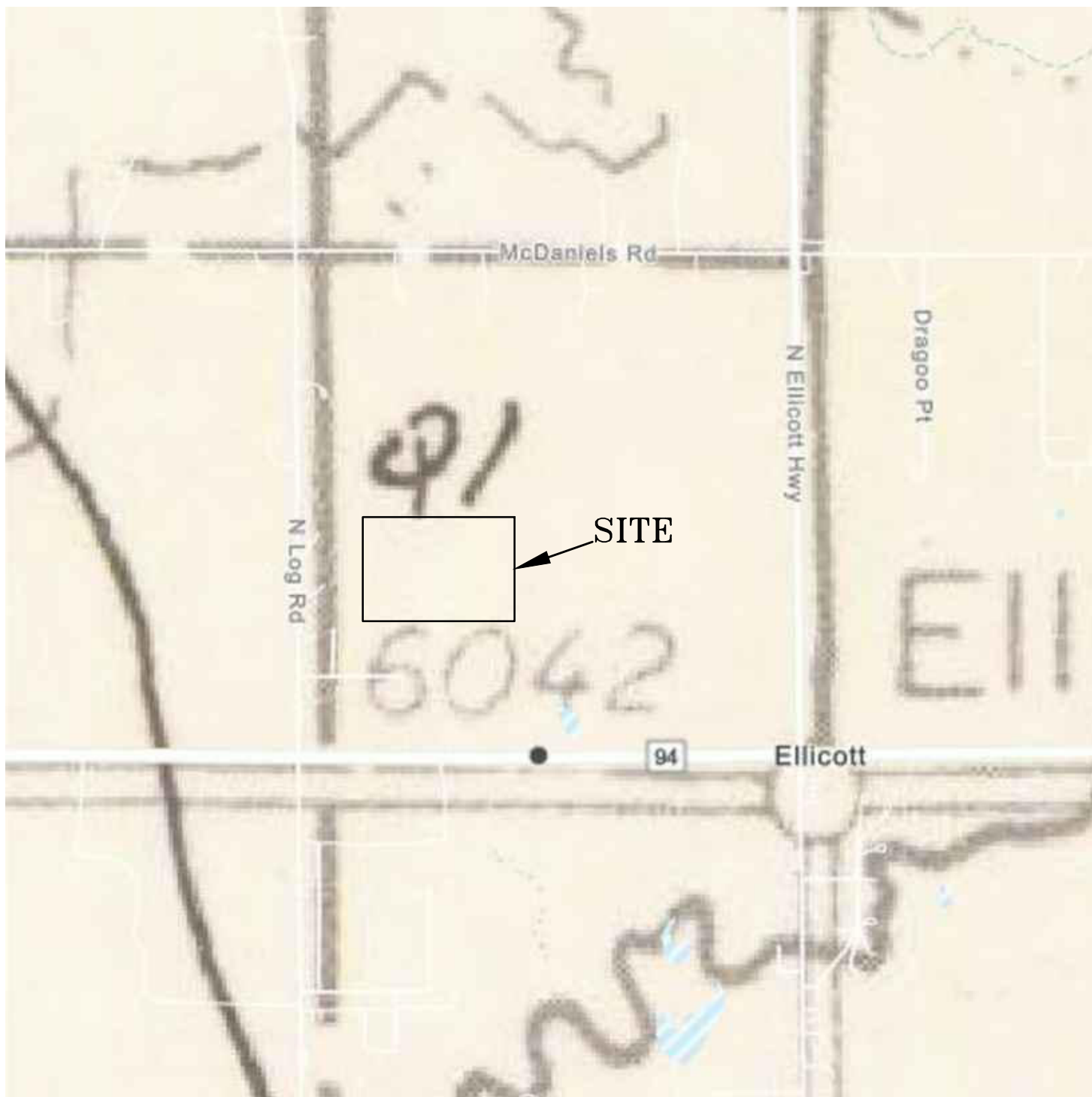
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FIG NO.:
4



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GEOLOGIC MAP OF THE PUEBLO 1° X 2° QUADRANGLE
23218 HIGHWAY 94
EL PASO COUNTY, CO.
FOR: GWH

DRAWN:
JHR

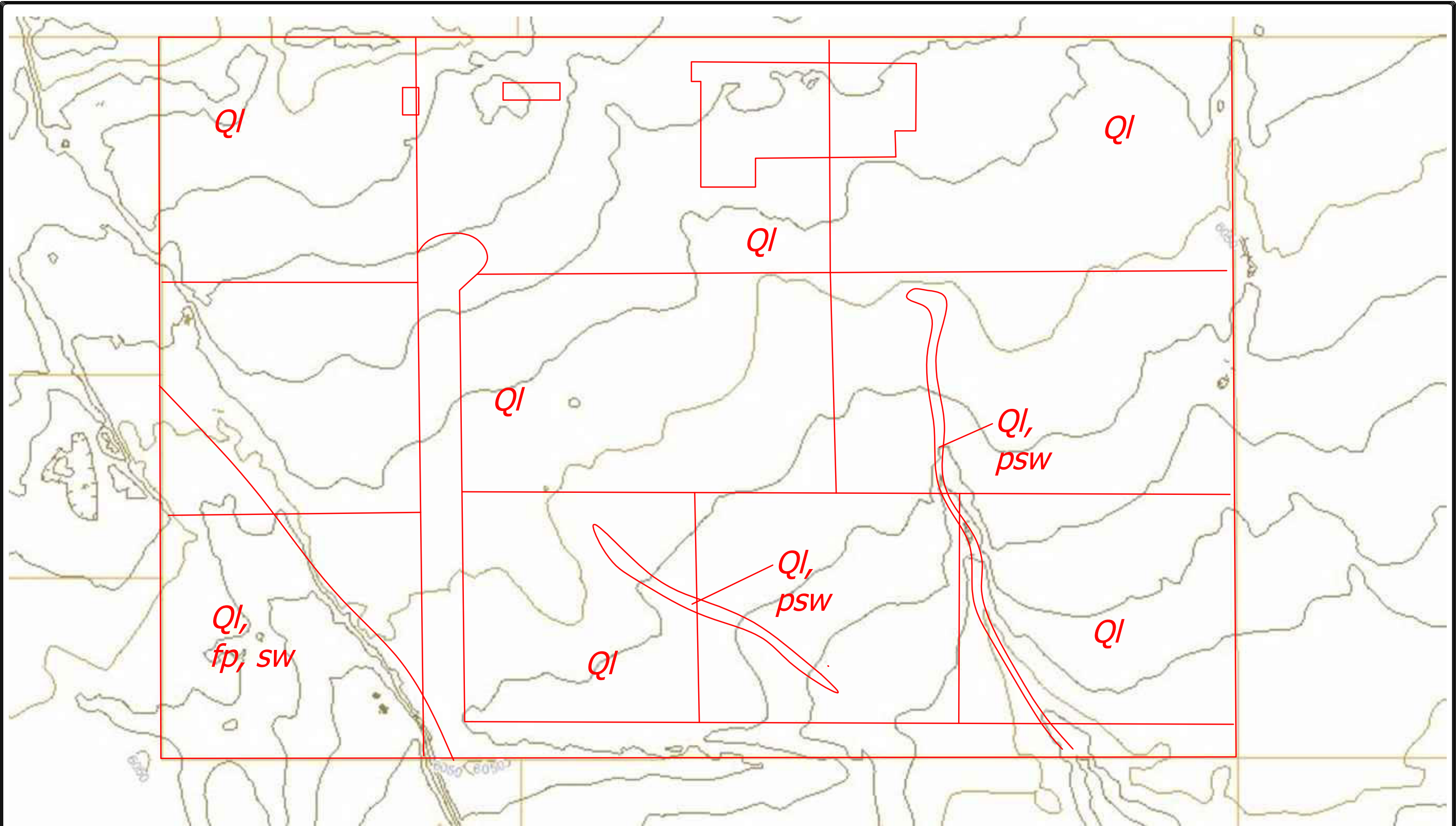
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JOB NO.:
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FIG NO.:
5



- Legend:
- QI - Louviers Alluvium of Pleistocene Age:
silty sand terrace deposits with abundance of gravels
 - psw - potentially seasonally wet area
 - fp - floodplain
 - sw - seasonally wet area

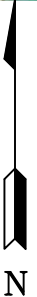


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OWTS SUTABILITY MAP
23218 HIGHWAY 94
EL PASO COUNTY, CO.
FOR: GWH

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DATE 2/9/23
SCALE N.T.S.
JOB NO. 230089
FIGURE No. 6



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COLORADO SPRINGS, CO. 80907 (719) 531-5599

FEMA FLOODPLAIN MAP
23218 HIGHWAY 94
EL PASO COUNTY, CO.
FOR: GWH

DRAWN:
JHR

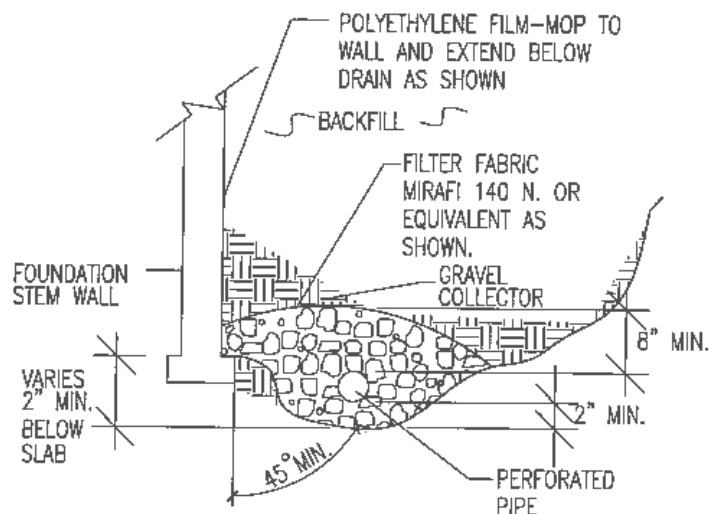
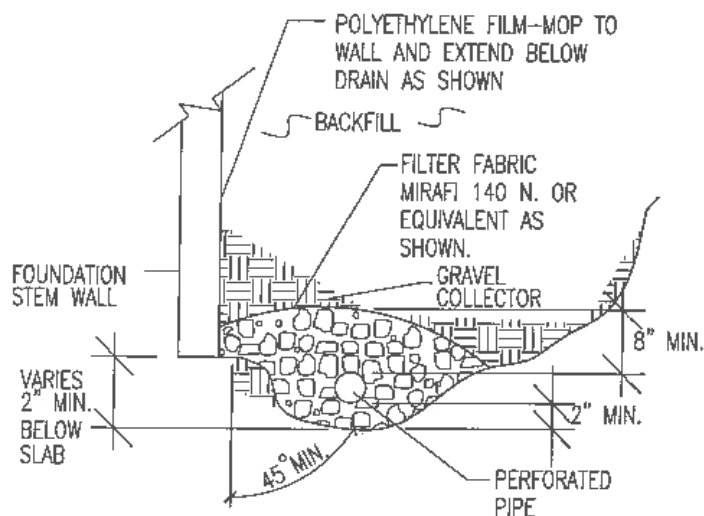
DATE:
2/9/23

CHECKED:

DATE:

JOB NO.:
230089

FIG NO.:
7



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 OUTFALL IS NOT AVAILABLE.



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PERIMETER DRAIN DETAIL

DRAWN:

DATE:

DESIGNED:

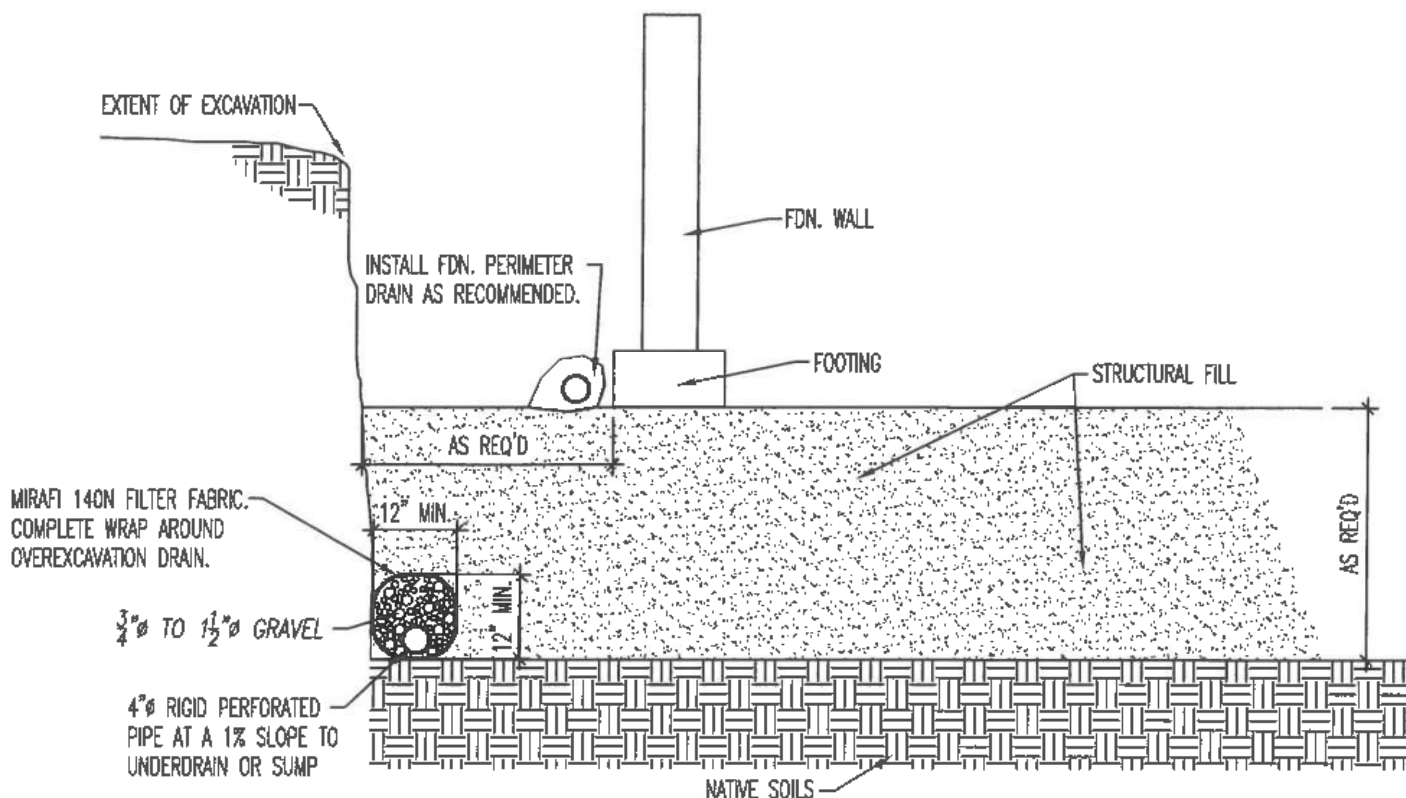
CHECKED:

JOB NO.:

230089

FIG NO.:

8



OVEREXCAVATION DRAIN DETAIL

N.T.S.

NOTE:

EXTEND DRAIN TO SUMP AS REQ'D.



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OVEREXCAVATION DRAIN DETAIL

DRAWN:

DATE:

DESIGNED BY:

CHECKED:

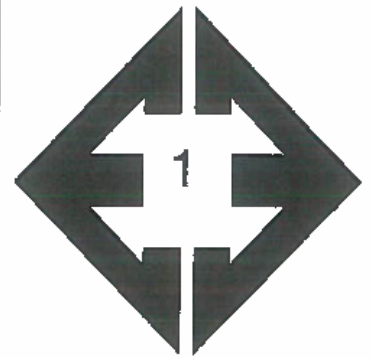
JOB NO.:

230089

FIG. NO.:

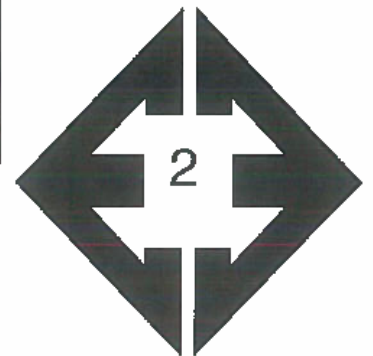
4

APPENDIX A: Site Photographs



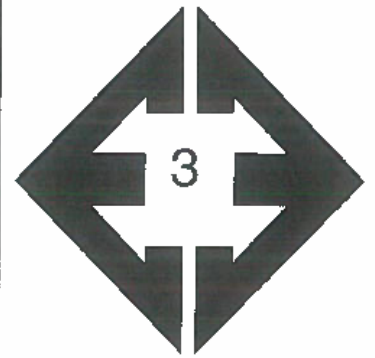
**Looking northwest
from the southeast
corner of the site.**

February 1, 2023



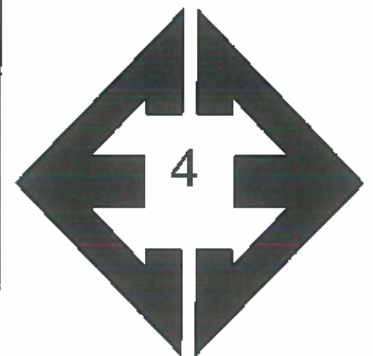
**Looking southwest
from the northeast
corner of the site.**

February 1, 2023



**Looking southeast
from the northwest
corner of the site.**

February 1, 2023



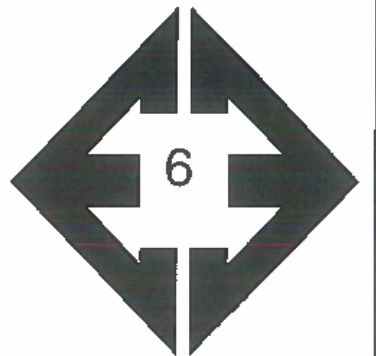
**Looking northeast
from the southeast
corner of the site.**

February 1, 2023



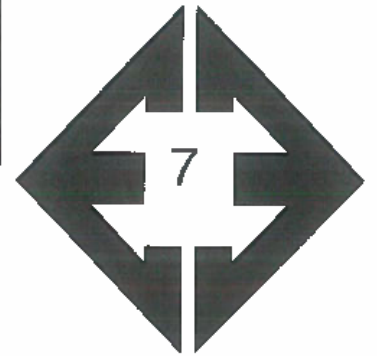
**Looking southeast
along dry drainage in
the southwest corner
of the site.**

February 1, 2023



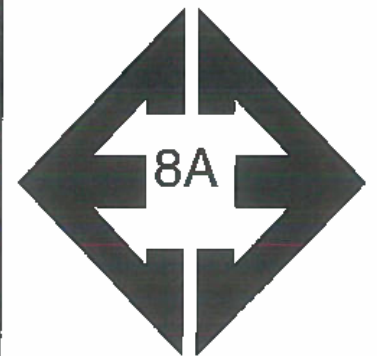
**Looking northwest
along dry drainage in
the southwest corner
of the site.**

February 1, 2023



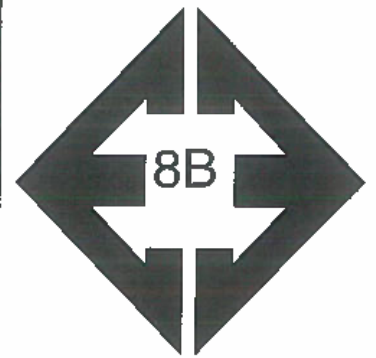
Looking west-southwest from the northwest portion of the site.

February 1, 2023



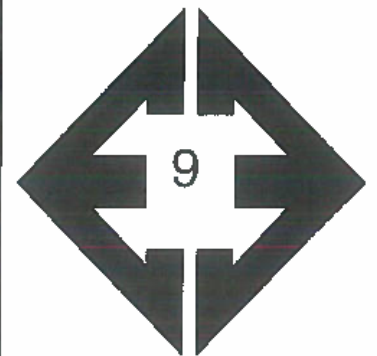
Looking northeast at existing home.

February 1, 2023



**Looking northwest at
existing home.**

February 1, 2023



**Looking southeast at
corrals from the
central point of the
north property line.**

February 1, 2023

APPENDIX B: Test Boring Logs

TEST BORING NO. 1
 DATE DRILLED 1/31/2023
 Job # 230089

TEST BORING NO. 2
 DATE DRILLED 1/31/2023
 CLIENT GWH
 LOCATION 23218 HIGHWAY 94

REMARKS

WATER @ 12', 2/1/23

SAND, SLIGHTLY SILTY TO SILTY,
 FINE TO COARSE GRAINED, TAN,
 LOOSE TO VERY DENSE, DRY
 TO WET

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			9	1.5	1
7			7	1.5	1
10			40	3.9	1
15			50 11"	9.7	1
20			50 11"	7.5	1



REMARKS

DRY TO 20', 2/1/23

SAND, SLIGHTLY SILTY TO SILTY,
 FINE TO COARSE GRAINED, TAN,
 LOOSE TO VERY DENSE, DRY TO
 MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			10	0.7	1
8			8	1.3	1
10			36	4.7	1
15			50	9.2	1
20			12	18.4	1



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TEST BORING LOG

DRAWN:

DATE:

CHECKED:

DATE:

JHR

2/24/23

JOB NO.:
 230089

FIG NO.:
 B-11

TEST BORING NO. 3
 DATE DRILLED 1/31/2023
 Job # 230089

TEST BORING NO. 4
 DATE DRILLED 1/31/2023
 CLIENT GWH
 LOCATION 23218 HIGHWAY 94

REMARKS

WATER @ 10', 2/1/23

SAND, SLIGHTLY SILTY TO SILTY,
 FINE TO COARSE GRAINED, TAN,
 MEDIUM DENSE TO VERY DENSE,
 MOIST TO WET

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			14	3.0	1
			35	4.5	1
10			50	7.7	1
			11"		
15			40	15.3	1
20			36	6.7	1



REMARKS

WATER @ 10', 2/1/23

SAND, SLIGHTLY SILTY TO SILTY,
 FINE TO COARSE GRAINED, TAN,
 MEDIUM DENSE TO DENSE,
 DRY TO WET

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			23	4.2	1
			25	1.7	1
10			39	8.3	1
15			26	8.8	1
20			16	6.7	1



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TEST BORING LOG

DRAWN:

DATE:

CHECKED:

DATE:

SHR

2/22/23

JOB NO.:
 230089

FIG NO.: -

B-2

TEST BORING NO. 5
 DATE DRILLED 1/31/2023
 Job # 230089

TEST BORING NO. 6
 DATE DRILLED 1/31/2023
 CLIENT GWH
 LOCATION 23218 HIGHWAY 94

REMARKS

DRY TO 20', 1/31/23

SILT, SANDY, BROWN, STIFF, MOIST

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

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			17	7.8	2
5			22	1.8	1
10			33	10.6	1
15			25	9.0	1
20			29	8.8	1



REMARKS

DRY TO 20', 1/31/23

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

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			14	1.8	1
5			19	1.6	1
10			20	8.6	1
15			41	4.2	1
20			15	9.7	1



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 COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:

DATE:

CHECKED:

DATE:

JHR

2/22/23

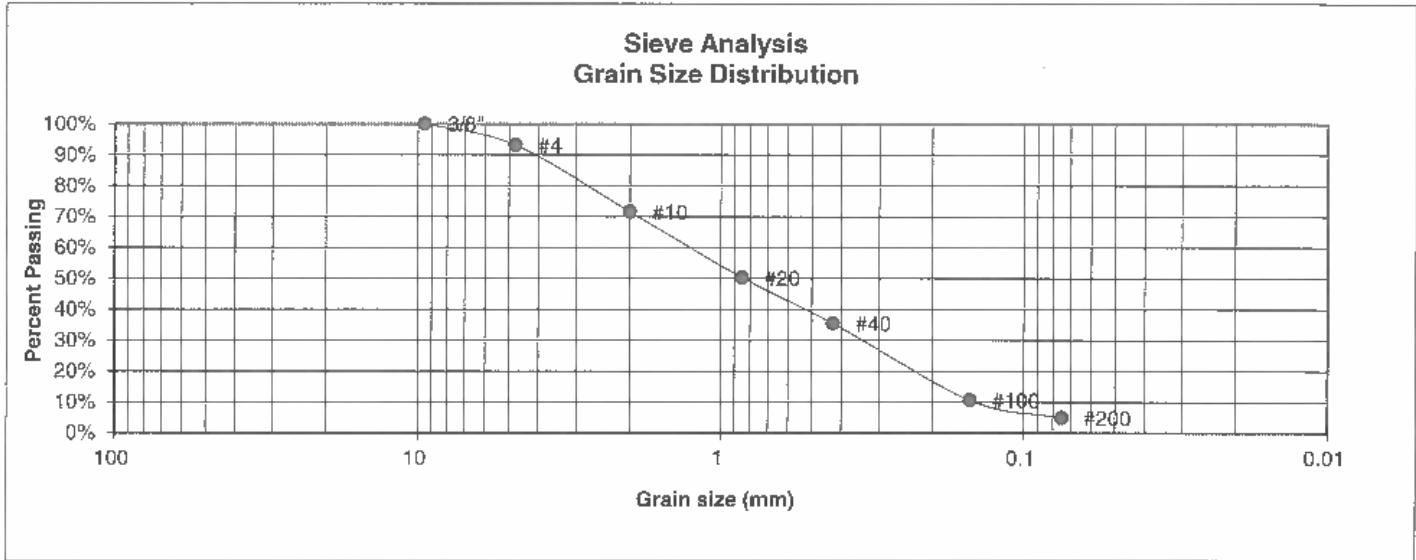
JOB NO.:
 230089

FIG NO.:

B-3

APPENDIX C: Laboratory Testing Results

UNIFIED CLASSIFICATION	SM-SW	CLIENT	GWH
SOIL TYPE #	1	PROJECT	23218 HIGHWAY 94
TEST BORING #	1	JOB NO.	230089
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	93.1%
10	71.6%
20	50.3%
40	35.4%
100	10.7%
200	5.0%

<u>Atterberg Limits</u>	
Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

<u>Swell</u>	
Moisture at start	
Moisture at finish	
Moisture increase	
Initial dry density (pcf)	
Swell (psf)	



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COLORADO SPRINGS, COLORADO 80907

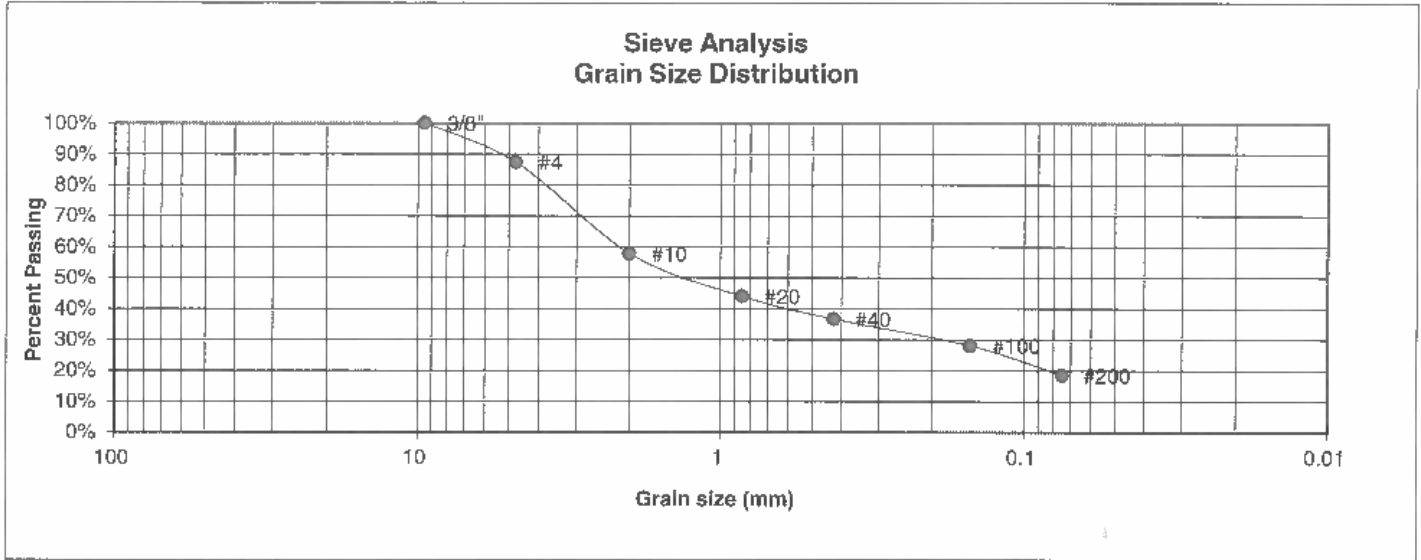
**LABORATORY TEST
RESULTS**

DRAWN:	DATE:	CHECKED:	DATE:
		JHR	2/22/23

JOB NO.:
230089

FIG NO.:
C-1

UNIFIED CLASSIFICATION	SM	CLIENT	GWH
SOIL TYPE #	1	PROJECT	23218 HIGHWAY 94
TEST BORING #	2	JOB NO.	230089
DEPTH (FT)	15	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	87.4%
10	57.8%
20	44.0%
40	36.7%
100	28.1%
200	18.5%

Atterberg
Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)



**ENTECH
ENGINEERING, INC.**
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

**LABORATORY TEST
RESULTS**

DRAWN:	DATE:	CHECKED: JHR	DATE: 2/22/23
--------	-------	-----------------	------------------

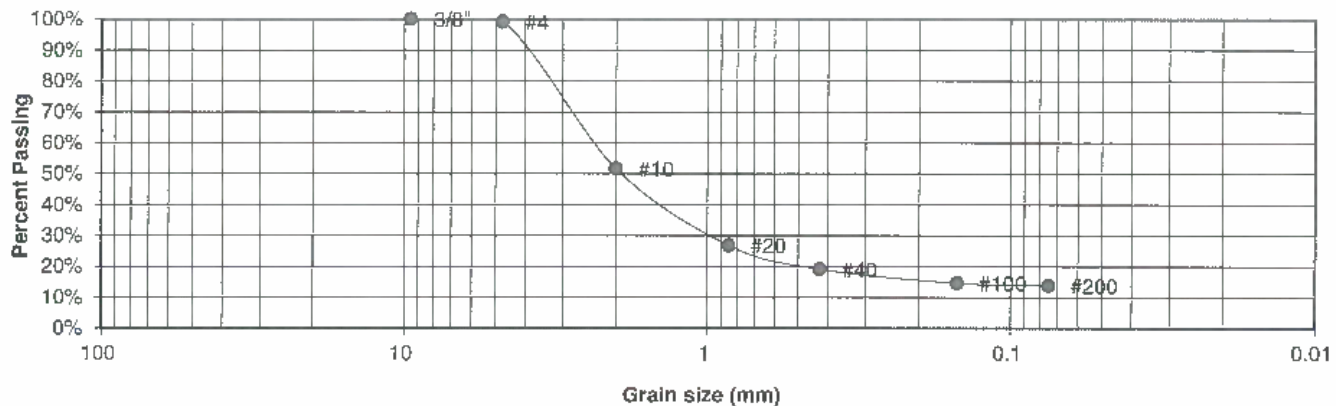
JOB NO.:
230089

FIG NO.:
C-2

UNIFIED CLASSIFICATION	SM
SOIL TYPE #	1
TEST BORING #	3
DEPTH (FT)	10

CLIENT	GWH
PROJECT	23218 HIGHWAY 94
JOB NO.	230089
TEST BY	BL

Sieve Analysis Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.1%
10	51.6%
20	26.8%
40	19.1%
100	14.6%
200	13.8%

Atterberg
Limits

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

Swell

Moisture at start

Moisture at finish

Moisture increase

Initial dry density (pcf)

Swell (psf)



**ENTECH
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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

LABORATORY TEST RESULTS

DRAWN:

DATE:

CHECKED:

DATE:

JHR

2/22/23

JOB NO.:
230089

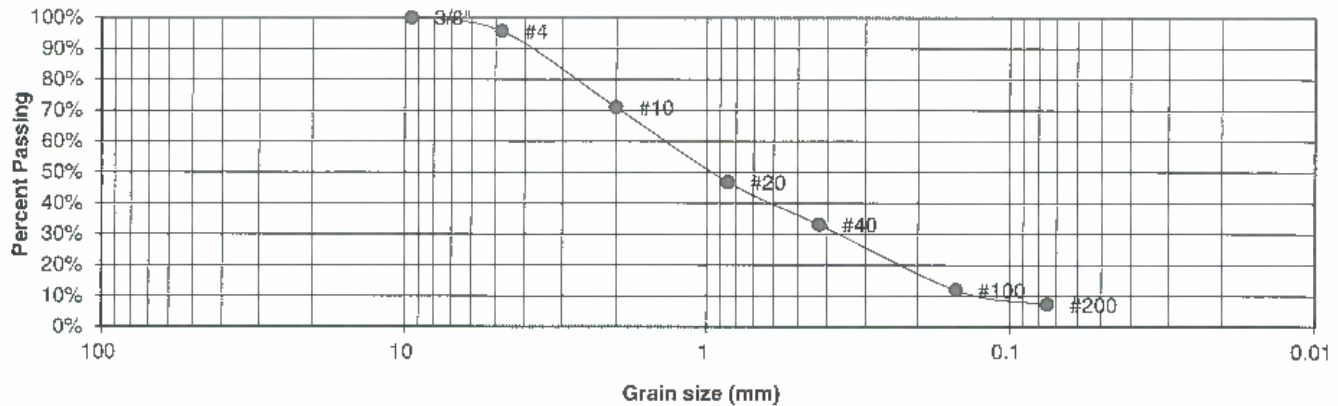
FIG NO.:

63

UNIFIED CLASSIFICATION	SM-SW
SOIL TYPE #	1
TEST BORING #	4
DEPTH (FT)	5

CLIENT	GWH
PROJECT	23218 HIGHWAY 94
JOB NO.	230089
TEST BY	BL

Sieve Analysis Grain Size Distribution



U.S.
Sieve #

3"
1 1/2"
3/4"
1/2"
3/8"
4
10
20
40
100
200

Percent
Finer

100.0%
95.6%
70.9%
46.8%
33.1%
11.9%
7.2%

Atterberg
Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)



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ENGINEERING, INC.**

505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

LABORATORY TEST RESULTS

DRAWN:

DATE:

CHECKED:

DATE:

JHR

2/22/23

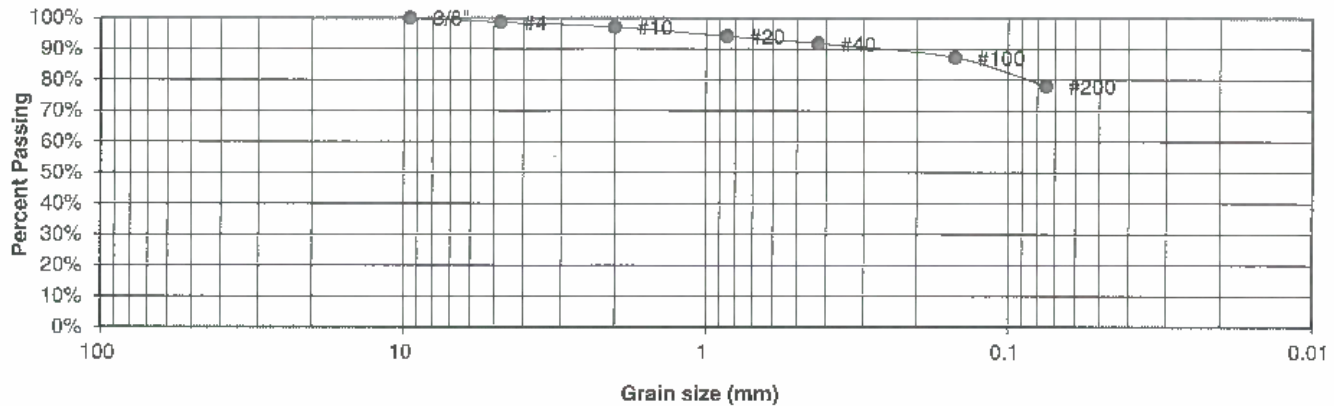
JOB NO.:
230089

FIG NO.:

C4

UNIFIED CLASSIFICATION	ML	CLIENT	GWH
SOIL TYPE #	2	PROJECT	23218 HIGHWAY 94
TEST BORING #	5	JOB NO.	230089
DEPTH (FT)	2-3	TEST BY	BL

Sieve Analysis Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	98.6%
10	97.1%
20	94.1%
40	91.7%
100	87.3%
200	78.0%

Atterberg
Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)



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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

LABORATORY TEST RESULTS

DRAWN:

DATE:

CHECKED:
JHR

DATE:
2/22/23

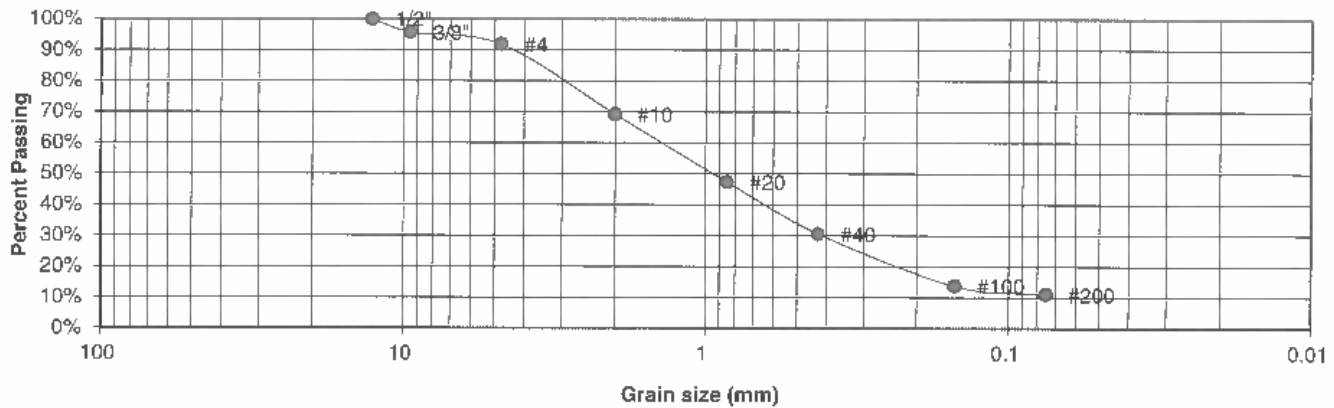
JOB NO.:
230089

FIG NO.:
C-5

UNIFIED CLASSIFICATION	SM-SW
SOIL TYPE #	1
TEST BORING #	6
DEPTH (FT)	10

CLIENT	GWH
PROJECT	23218 HIGHWAY 94
JOB NO.	230089
TEST BY	BL

Sieve Analysis Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	95.7%
4	91.8%
10	69.2%
20	47.3%
40	30.5%
100	13.8%
200	11.0%

Atterberg
Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)



**ENTECH
ENGINEERING, INC.**

505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

LABORATORY TEST RESULTS

DRAWN:

DATE:

CHECKED: JLR

DATE: 2/22/23

JOB NO.:
230089

FIG NO.:
C-6

APPENDIX D: Soil Survey Descriptions

El Paso County Area, Colorado

19—Columbine gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 367p
Elevation: 6,500 to 7,300 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Columbine and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Columbine

Setting

Landform: Fans, fan terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 14 inches: gravelly sandy loam
C - 14 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 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: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R049XY214CO - Gravelly Foothill
Hydric soil rating: No

Minor Components

Fluvaquentic haplaquolls

Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

Other soils

Percent of map unit: 1 percent

Hydric soil rating: No

Pleasant

Percent of map unit: 1 percent

Landform: Depressions

Hydric soil rating: Yes

28—Ellicott loamy coarse sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 3680

Elevation: 5,500 to 6,500 feet

Mean annual precipitation: 13 to 15 inches

Mean annual air temperature: 47 to 50 degrees F

Frost-free period: 125 to 145 days

Farmland classification: Not prime farmland

Map Unit Composition

Ellicott and similar soils: 97 percent

Minor components: 3 percent

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

Description of Ellicott

Setting

Landform: Stream terraces, flood plains

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy alluvium

Typical profile

A - 0 to 4 inches: loamy coarse sand

C - 4 to 60 inches: stratified coarse sand to sandy loam

Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: NoneFrequent

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Custom Soil Resource Report

Land capability classification (nonirrigated): 7w

Hydrologic Soil Group: A

Ecological site: R069XY031CO - Sandy Bottomland

Other vegetative classification: SANDY BOTTOMLAND (069AY031CO)

Hydric soil rating: No

Minor Components

Fluvaquentic haplaquoll

Percent of map unit: 1 percent

Landform: Swales

Hydric soil rating: Yes

Other soils

Percent of map unit: 1 percent

Hydric soil rating: No

Pleasant

Percent of map unit: 1 percent

Landform: Depressions

Hydric soil rating: Yes

APPENDIX E: Existing Septic Records

EL PASO COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT
INDIVIDUAL SEWAGE DISPOSAL SYSTEM INSPECTION FORM

Permit # 3349
Date 10/31/01

#3412000026

APPROVED: YES ☒ NO ☐

ENVIRONMENTALIST Kurt Dahl

Address 23218 Hwy 94

Owner Manuel Saenz

Legal Description NE 1/4 of the SW 1/4 and E 1/2 of the NW of the SW 1/4 of Tract 2
Residence ☒ # of bedrooms 3; Commercial ☐; System Installer Self

SEPTIC TANK:

Commercial ☒; Noncommercial ☐; L ☐; W ☐; WD ☐
Construction Material Precast Concrete, capacity 1,500 gallons.

DISPOSAL FIELD:

Rock Systems:

Trench: depth ☐, width ☐, total length ☐, sq. feet ☐
Bed: depth ☐, length ☐, width ☐, sq. feet ☐
Rock type ☐, depth ☐, under PVC ☐, over PVC ☐
Seepage Pits: # of pits ☐, total # of rings ☐, working depth(s) ☐
size of pit(s) L X W ☐, lining material ☐, total sq. feet ☐

Rockless Systems:

Chamber: Type bio. filter, number of chambers 25, bed ☐, trench ☒
sq. ft./section 24, reduction allowed ☐, sq. ft. required 463
total sq. ft. installed 600, depth of installation 30"

Engineer Design Y or ☒ N, Designing Engineer ☐

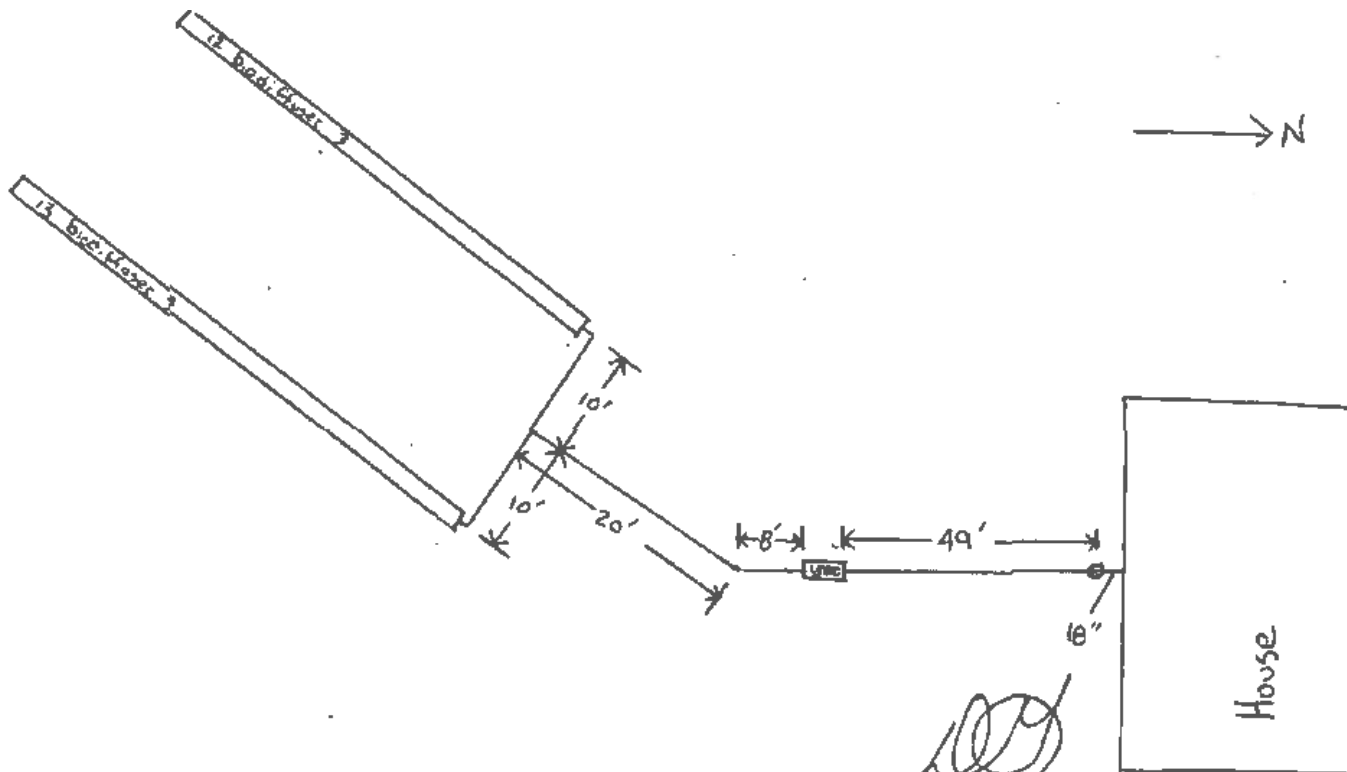
Approval letter provided? Y or ☒ N

Well 50 feet from tank ☒ or N 100 feet from leach field ☒ or N

Well installed at time of septic system inspection ☒ or N Public Water ☐

*Approval will be revoked if in the future the well is found to be within 50 feet of the septic tank and/or 100 feet of the disposal field.

NOTES: All pipes are SDR 35



INDIVIDUAL SEWAGE DISPOSAL SYSTEM PERMIT

OWNER NAME: MANUEL SAENZ
ADDRESS: 23222 HWY 94
CITY, STATE, ZIP: ELLICOTT CO 80808
INSTALLED BY:

PERMIT NUMBER: ON0003349
DATE PERMITTED: 10/23/01
PHONE NUMBER: 3038415030

This permit is issued in accordance with 25-10-107 Colorado Revised Statutes. PERMIT EXPIRES upon completion-installation of sewage-disposal system or at the end of twelve (12) months from date of issue- whichever occurs first-(unless work is in progress). If both a building and an ISDS permit are issued for the same property and construction has not commenced prior to the expiration date of the building permit, the ISDS permit shall expire at the same time as the building permit. This permit is revokable if all stated requirements are not met.
Sewage disposal system to be installed by an El Paso County Licensed System Contractor or the property owner.

THIS PERMIT DOES NOT DENOTE APPROVAL OF ZONING AND ACREAGE REQUIREMENTS.

John Lawrence

DIRECTOR, EL PASO COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT

PERMIT EXPIRATION DATE :
Expires twelve months from date of issue

Yvett Dahl (719) 578-3289
ENVIRONMENTALIST / PHONE NUMBER

NOTE: 48 HOUR ADVANCE NOTICE REQUIRED
LEAVE THE ENTIRE SEWAGE DISPOSAL SYSTEM UNCOVERED FOR FINAL INSPECTION.

WATER SOURCE: WELL

MINIMUM SEPTIC TANK SIZE : 1,250 GALLONS MINIMUM ABSORPTION AREA REQUIRED 463 SQ FT

PLANNING DEPARTMENT ☒ ENUMERATION ☒ FLOOD PLAIN ☒ WASTEWATER ☒

COMMENTS:

MUST MEET MINIMUM SETBACK REQUIREMENTS OF THE CURRENT EL PASO COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT ISDS REGULATIONS. INSTALL SEPTIC SYSTEM AT SITE B PERCOLATION TEST, AT A DEPTH OF NO MORE THAN 48 INCHES. IF GROUND WATER IS ENCOUNTERED WHILE INSTALLING THE SYSTEM, CALL THE EL PASO COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT. ~~UPON COMPLETION OF THE SYSTEM, THE ENGINEER MUST PROVIDE AN APPROVAL LETTER.~~ KHD

The Health Office shall assume no responsibility in case of failure or inadequacy of a sewage-disposal system, beyond consulting in good faith with the property owner or representative. Free access to the property shall be authorized at reasonable time for the purpose of making such inspections as are necessary to determine compliance with requirements of this law.

FOR ADMINISTRATIVE USE ONLY

Permit Ready: 10-24-01 Called DM Mailed

Final Inspection Requested: BY: Ed Date Called In: 10/25/01

Phone # _____ Septic Site will be ready: 10/24/01

EL PASO COUNTY ENVIRONMENTAL HEALTH SERVICES

301 South Union Boulevard • Colorado Springs, CO • 80910-3123 • (719) 578-3126

APPLICATION FOR AN ON-SITE TREATMENT SYSTEM:

☒ NEW ☐ REPAIR TANK ☐ REPAIR/ADD LEACH FIELD ☐ P.E. DESIGN

Owner Manuel L. Saenz Daytime Phone 303-841-5030
 Address of Property 23235 Highway 94 Ellicott City & Zip Ellicott Co.
 Legal Description N.E. 1/4 of the S.W. 1/4 and E 1/2 of the N.W. 1/4
 Owner's MAILING Address 9644 Summit Ridge Pl. City, State & Zip Parker Co 80138
 Lot Size 60 acres Tax Schedule # 34120-00-025 Septic Contractor Hudson Septic
 Type of Building: ☐ Frame ☐ Modular ☐ Mobile ☐ Commercial ☒ Manufactured ☐ Other
 Water Supply: ☒ Well or Spring ☐ Cistern ☐ Public Inside City Limits: ☐ No ☐ Yes-City
☐ MAIL PERMIT OR ☒ PICK UP PERMIT ☐ THERE IS AN ADDITIONAL RESIDENCE ON THIS PROPERTY

MAXIMUM POTENTIAL BEDROOMS 8^{KHP} 3

Percolation Test Attached (Y) N Garbage Disposal Y (N) Basement Y (N) Clothes Washer (Y) N

I have supplied a plot plan as described on the back of this form. I acknowledge the completeness of the application is conditional upon such further mandatory and additional tests and reports as may be required by the Department to be made and furnished by an applicant for purposes of evaluating the application, and issuance of the permit is subject to such terms and conditions as deemed necessary to ensure compliance with rules and regulations adopted pursuant to C.R.S. 25-10-107 et. seq. I hereby certify all represented to be true and correct to the best of my knowledge and belief, and are designed to be relied on by the El Paso County Department of Health and Environment in evaluating the same for purposes of issuing the permit applied for herein. I further understand any falsification or misrepresentation may result in the denial of the application or revocation of any permit granted based upon said application and in legal action for perjury as provided by law.

OWNER'S SIGNATURE Manuel L. Saenz Date 7/16/01

DEPARTMENT OF HEALTH USE ONLY

Eng Design 463 sq ft Eng Design 1,250 gal 8/21/01
 Minimum Absorption Area Minimum Tank Capacity Date of Site Inspection

REMARKS OK
Install per engineer design corrected aug. dated July 12, 2001
Note that first septic tank is a 2250 gallon single compartment tank
Must meet minimum setback requirements of the current El Paso County department of Health and Environment ISDS regulations. Install septic system at site B percolation test, at a depth of no more than 48". If groundwater is found encountered while installing the system, call the El Paso County Dept of Health and Environment. Upon completion of the system, the engineer must provide an approval letter

EHS INSPECTOR Kurt Dahl DATE 9/5/01 APPROVED DENIED

FEE AS OF 8/1/00: NEW \$315 -
 REPAIR TO LEACH FIELD \$150 -
 REPAIR TO TANK OR LINE \$75 -

Resubmit
 DATE TO PLANNING / WASTEWATER 7/17/01
8-31-01
10-17-01

- 1) We require an original of your **PERCOLATION (PERC) TEST** with an original professional engineer's (PE) stamp and signature as well as a plot of the percolation test holes.
- 2) **PROPERTY ADDRESS OR LOT NUMBER MUST BE POSTED AND CLEARLY VISIBLE FROM ROAD. PERC HOLES MUST BE CLEARLY MARKED.**
- 3) A **PLOT PLAN** must be drawn (not to scale) on an 8 1/2 x 11 sheet of paper. The plot plan must include:

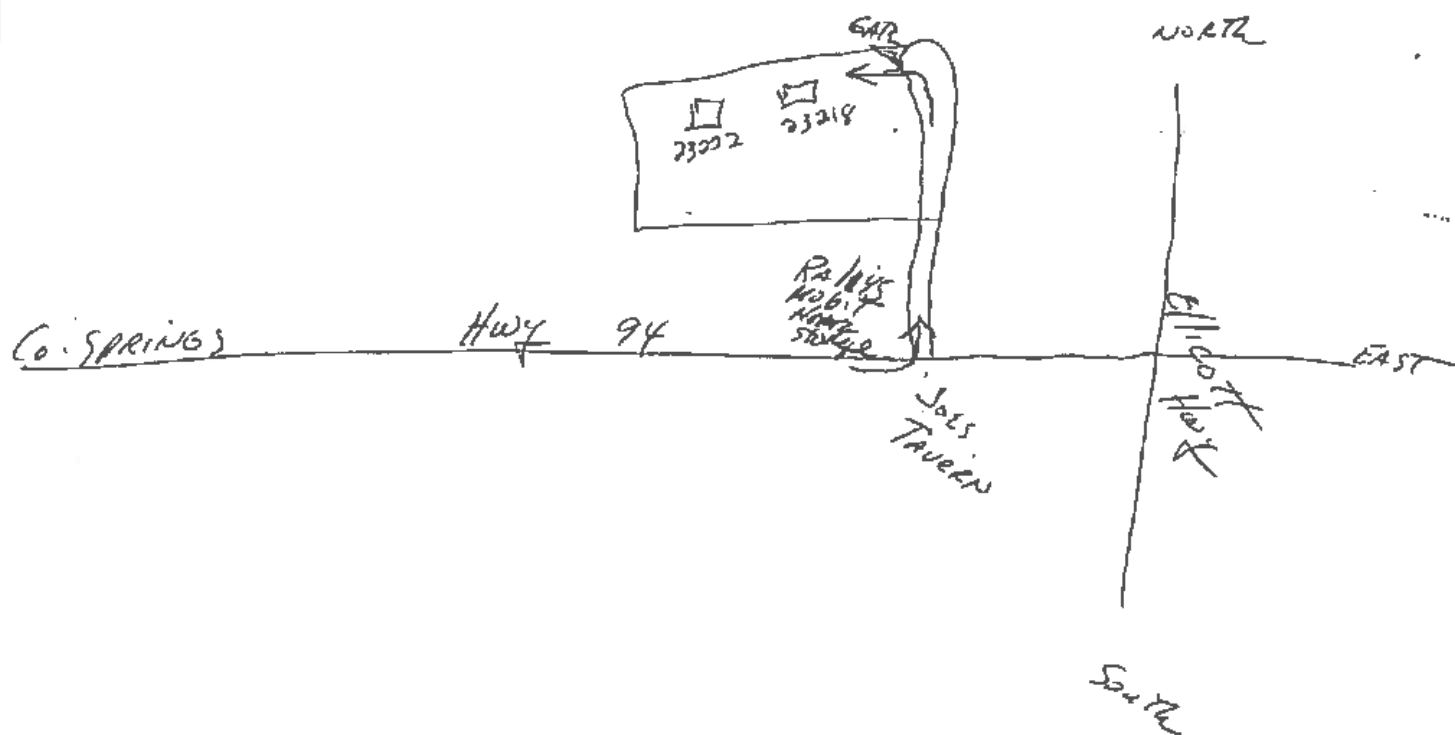
1) a north bearing	4) all buildings (proposed or existing)	7) driveway (proposed or existing and name of adjoining street)
2) property lines	5) proposed septic system site	
3) property dimensions	6) alternate septic system site	
- 4) Initial any of the following features that apply to your property and **INCLUDE** them on your **PLOT PLAN**.

☒ Well(s)	☐ Adjacent property well(s)	☐ Subsoil drain
☐ Cistern	☐ Water line	
- 5) Initial any of the following that are within 100 feet of your proposed septic system and **INCLUDE** on your **PLOT PLAN**.

☐ Spring(s)	☐ Lake(s)
☐ Pond(s)	☐ Stream(s)
☐ Dry Gulch(es)	☐ Natural drainage course(s)

6) GIVE COMPLETE DIRECTIONS TO THE PROPERTY FROM A MAIN HIGHWAY

Hwy 94 E To Elliott LEFT on DIRT RD (PRIVATE RD) north 1/2 mile To GATE (west side)



JoeLetke (3)

Please add:
PCD File SF2521

5 to 9-acres in size

Please revised based on current layout.