Daniel Abeyta

WATER RESOURCES REPORT
For
Sedona Sun Acres Subdivision
(Property Record Card 5200000303)

October 2020

Prepared By:

Engineer of Record: Douglas E. Schwenke, P.E.

Signature: _____

Date: 11/18/2020

JDS-HYDRO
CONSULTANTS, INC.

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Executive Summary:
Water Resources and Wastewater Report—Sedona Sun Acres Subdivision

A proposed development on property owned by Daniel Abeyta (Property Record Card 5200000303) consists of approximately 37.7 acres and is located at 13235 Vollmer Road in Colorado Springs, CO 80908. The development is located in Section 10, Township 12 South, Range 65 West. The proposed development is planned to consist of 3 residential properties which will be provided water services through individual residential wells drilled into the not-nontributary Dawson Aquifer and wastewater served through individual on-site wastewater treatment systems (OWTS).

It is expected that each rural residential home in the proposed subdivision will require an average of 1.0 annual acre-feet of water (which uses represent annual allocations for domestic use, irrigation, commercial, replacement, and stock water). This anticipated water demand is consistent with historic needs for nearby developments in the Black Forest area. Overall annual demand is anticipated to consist of an annual average of 3.0 AF/year between the 3 proposed lots.

The estimated annual depletion to the designated basins by the end of the 300-year period is modeled as 0.077 AF/year or 2.57% of overall annual pumping within the development at full buildout. All depletions are expected to occur within the Upper Black Squirrel designated basin. At full buildout, return flows from the septic fields are projected to return 0.90 AF/year between the 3 proposed lots at 90% of the domestic flows. This projected amount is more than enough to cover estimated depletions out of the designated basin alluvium by year 300 of pumping.

TABLE OF CONTENTS

SECTION 1 INTRODUCTION

The purpose of this study is to provide a preliminary outline of the water resources, wastewater needs, and replacement requirements that would be necessary to support residential uses within the proposed 3-lot development of the Sedona Sun Acres Subdivision.

1.1 New Development Description:

Development at the proposed Sedona Sun Acres Subdivision is estimated to consist of 37.7 acres subdivided into four lots with approximate acreage of 9.5, 9.0, and 19.2 acres. The proposed subdivision is to be located near the intersection of Swan Road and Vollmer Road near the address of 13251 Vollmer Road in Colorado Springs, CO. The development is located in Section 10, Township 12 South, Range 65 West. The proposed lots are to be provided water through on-site individual wells drilled into the Dawson Aquifer. Wastewater service is to be provided via on-site septic systems designed to be non-evaporative. **Appendix A** contains a preliminary layout for the proposed Sedona Sun Acres Subdivision.

SECTION 2 PROJECTION OF WATER NEEDS

2.1 *Analysis of Water Demands:*

Expected water demands and return flows are calculated in **Appendix B.** Table 2-1 below estimates the projected water demands for development at the Abeyta Subdivision. Each well is proposed to divert 1.0 acre-feet of water annually for each one single family residence (0.25 acre-foot per residence for domestic indoor use; 0.50 acre-feet per residence would be dedicated to irrigation while 0.25 acre-feet per residence would be allocated for stock watering approximately 8 heads of cattle). Of note, the 0.25 AF/year/residence was selected as this demand constant is typically what the Colorado's State Engineer's Office and Groundwater Commission employ. In addition, the 0.25 AF/year/residence is used in the approved replacement plan (Determination No.: 1068-BD) for residential use and calculated replacement supplies.

Table 2-1 -Projected Water Demands for Sedona Sun Acres Subdivision

# of Units	*Land Use*	*Water Use Per Unit (AF/Unit)*	*Annual Demand (AF)*	*Average Daily Flow (ADF) (GPD)*	*Maximum Daily Flow (MDF) (@ 2.5 x ADF) (GPD)*	*Peak Hour Flow (@ 1.5 x MDF) (GPM)*
3	**Residential (Rural, Well, OWTS)**	**1.0**	**3.0**	**2,678**	**6,695**	**6.97**

SECTION 3 PROPOSED WATER RIGHTS AND SYSTEM FACILITIES

3.1 Water Rights:

Water rights adjudications have been decreed by the State of Colorado Ground Water Commission Findings in Water Right Nos.1065-BD, 1066-BD, 1067-BD, and 1068-BD and are summarized in **Appendix C**. The Denver Basin water supply is available for use at the Sedona Sun Acres Subdivision as summarized in **Table 3-1**.

Table 3-1
Summary of Available Legal Water Supply
for Sedona Sun Acres Subdivision

Water	Annual 100-year Supply (Acre-Feet)	Annual 300-year Supply (Acre-Feet)
Dawson (NNT)	28.41	9.47
Denver (NT)	23.71	7.90
Arapahoe (NT)	16.66	5.55
Laramie-Fox Hills (NT)	10.74	3.58

The intent of the developer is to use the remaining water in the Dawson not-nontributary aquifer to supply all residential uses described in Section 2 above. The estimated 9.47 AF/year available for 300-year supply in the Dawson aquifer is enough to serve the 3.0 AF/year estimated for the 3 proposed residential lots. Projected depletions to the alluvium from the proposed 300-year pumping period out of the Dawson Aquifer are presented in Section 5 of this report.

Proposed beneficial use of the water from the decrees includes domestic, irrigation, stock watering, commercial, and replacement purposes.

3.2 Source of Supply:

Domestic water demand will be met using individual wells drilled into the Dawson formation.

3.3 Water Quality and Treatment:

The water quality in the Dawson Aquifer in this area has typically been suitable for residential potable use. Water samples were obtained from an existing Dawson well located on one of the proposed lots in the subdivision (13251 Vollmer, Colorado Springs, CO), located on the north-east property of the proposed Sedona Sun Acres Subdivision. This well structure is a representative sample source for the individual residential wells within this subdivision. Water samples were obtained from the Daniel Abeyta's Well on December 11, 2019 with water quality testing performed by Colorado Analytical Laboratories per the El Paso County

Land Development Code section 8.4.7(B). Final results from this water quality testing were received on January 6, 2020 and February 24, 2020 and can be found in **Appendix G**. The only results of concern were for low pH.

The Colorado Department of Public Health Environment recommends a drinking water pH of 6.5 – 8.5. Results from water sampling show the pH of the raw water from the Abeyta well to be 6.42. A low pH represents corrosive water. House distribution line material should be chosen based on low pH water. recommendations are PVC or PEX piping.

3.4 Water Storage:

Each single-family home will have its own individual pressure tank. The size and pressure of the tank will be determined by each property owner.

3.5 Impact to Existing Wells:

The largest lot in the subdivision, 19.18 acres, contains the Abeyta well from which water samples were taken. The additional three lots will be south of this property and will not impact any wells in the area as the Abeyta well is the closest in proximity. Even if lots 1, 2, and 3 drilled wells as close as possible to the western lot boundary, any and all new wells would be over 500 feet from the residential wells on the west side of Vollmer.

SECTION 4 WASTEWATER PRODUCTION

4.1 Wastewater Loads

Wastewater projections are based on similar residential historical use in the rural locations of the Pikes Peak region. There are 4 proposed residential units expected in the proposed development, all of which will all have on-site septic systems. The proposed source of replacement water will be from septic leaching field return flows released through the domestic use of Dawson ground water. Return flows from each lot will consist of an estimated 90% of the water used for in-house purposes. Therefore, assuming each residential lot uses a total annual amount for in-house use of 0.25 acre-feet, the return flow per lot would be 0.225 acre-feet annually (or 0.675 AF/year from all three (3) proposed lots). Please see Table 4-1 below for a more detailed representation of the estimated annual return flows to the Upper Black Squirrel Designated Basins. Of note, the proposed septic systems will be individually engineered according to specific individual soils evaluations obtained from each individual lot and be designed to promote non-evaporative conditions from the septic fields. A preliminary soils report for the development is provided in **Appendix E**. Overall, the soils report generated by Entech Engineering suggests that the site is suitable for individual on-site wastewater treatment systems (OWTS) provided that individual soil testing be conducted on each lot prior to construction.

Table 4-1 - Projected Return Flows to the Upper Black Squirrel Alluvial Aquifer

Wastewater Loads				
# of Units	***Type***	***Average Daily Flow (ADF) (GPD)***	***Maximum Daily Flow (GPD)***	***Return Flow (AF/Year)***
3	**Residential**	**602**	**735**	**0.675**

SECTION 5 PROJECTED DEPLETIONS AND ASSOCIATED REPLACEMENT PLAN

5.1 Depletions vs. Replacement

The AUG3 program developed by the Colorado Department of Water Resources was utilized to estimate the annual depletion to the alluvial aquifer system of the Upper Black Squirrel Creek Designated Ground Water Basin over a 300-year period. Specifically, the DA02 model for the Upper Dawson aquifer was used to estimate the post-pumping depletion quantities for 3 wells located in Section 10, Township 12 South, Range 65 West. Annual pumping from the proposed development was assumed to be 4.00 AF/year over a 300-year pumping period as estimated in Table 2-1 above. The 2019 version of AUG_3's Designated Basin 5-year Timestep was utilized for this evaluation.

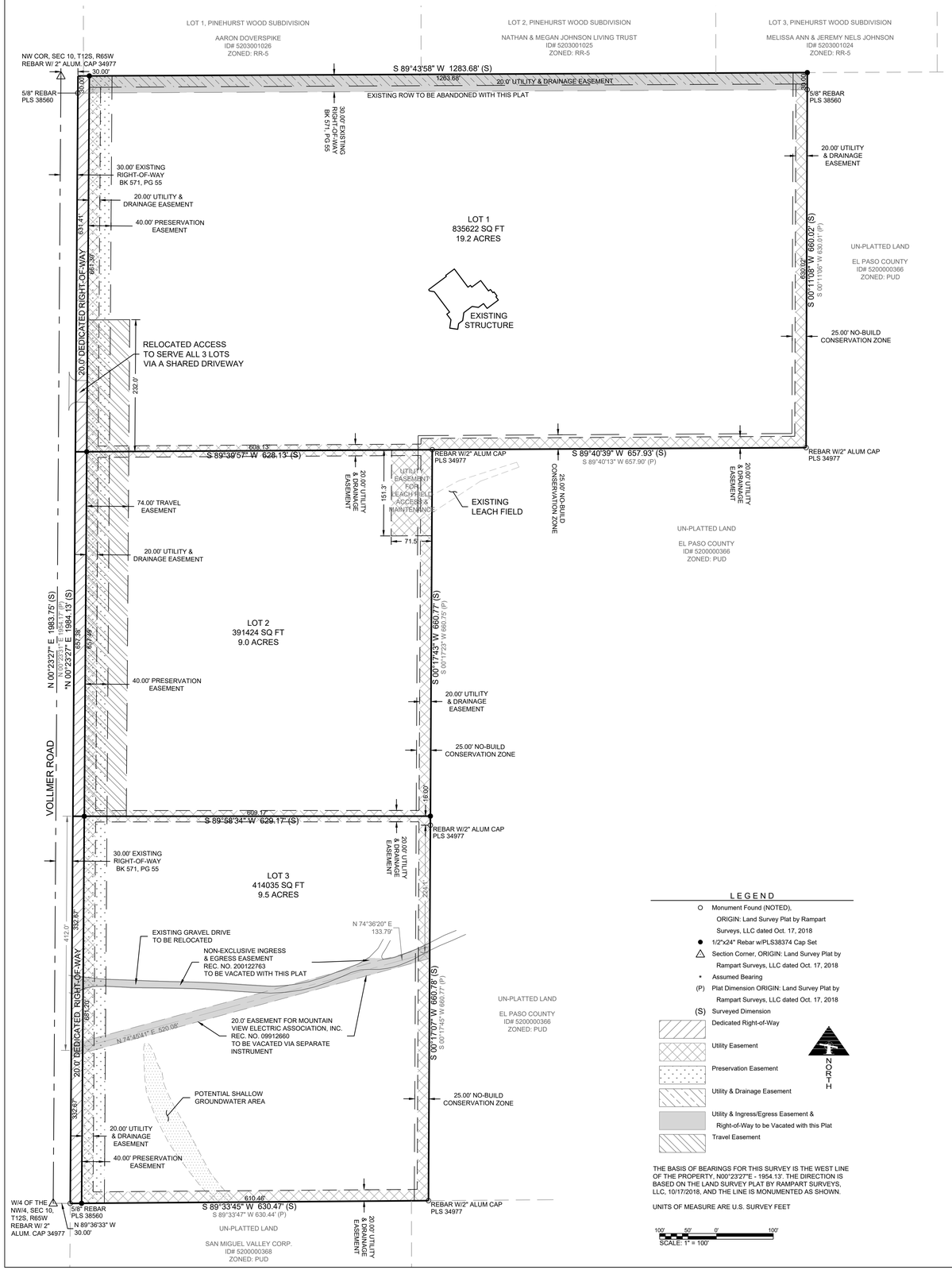
Based on the results from this model, the maximum designated basin depletion is 0.077 AF/Year (2.57% of annual pumping at full build-out) which would occur in year 300. The proposed replacement plan would utilize return flows from each on-site individual septic leach filed on the order of 0.225 AF/Year/SFE (residential) which is estimated to provide approximately 0.90 AF/year of return flows. Overall, these proposed return flows would be more than sufficient to augment the above estimated annual post-pumping depletions within the development. Replacement volumes generated from septic return flows Tables outlining the designated basin depletions and the overall 300-year stream depletion summaries can be found in **Appendix B.** The applicant's water attorney has submitted a replacement plan to the Division, with publication of the replacement plan approved on February18th, 2020. Of note, the proposed three lot subdivision was revised per final plat on November 18, 2020 following preliminary submittal on August 2020. It is likely that the replacement plan will need to be amended per the revised 3 lot subdivision demands and return flows. Because the demands will be less than the previously submitted 4 lot subdivision this should not be a problem.

Appendix A

SEDONA SUN ACRES FILING NO. 1

IN THE NORTHWEST QUARTER OF SECTION 10, T12S, R65W, 6TH P.M.

EL PASO COUNTY, COLORADO



TITLE NOTES:

RESEARCH FOR RECORDED RIGHTS OF WAY AND EASEMENTS WAS DONE BY WFG NATIONAL TITLE INSURANCE COMPANY, FILE NO. 20-206795, EFFECTIVE DATE JUNE 5, 2020.

THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY SMH CONSULTANTS OR TIM SLOAN.

EXCEPTIONS:
1. THROUGH 7.; NOT EXAMINED AS PART OF THIS SURVEY.
8. ANY INTEREST WHICH MAY HAVE BEEN ACQUIRED BY THE PUBLIC BY REASON OF THE RESOLUTION OF THE BOARD OF COUNTY COMMISSIONERS DATED JUNE 20, 1917 AND RECORDED THE SAME DAY IN BOOK 571 AT PAGE 55, PROVIDING THAT ALL SECTION LINES, TOWNSHIP LINES, AND RANGE LINES ON THE PUBLIC DOMAIN IN EL PASO COUNTY ARE DECLARED PUBLIC HIGHWAYS OF THE WIDTH OF 60 FEET, BEING 30 FEET ON EACH SIDE OF SAID SECTION LINES, TOWNSHIP LINES, AND RANGE LINES, PROVIDED HOWEVER THAT THE BOARD MAY, FROM TIME TO TIME AS THE OCCASION ARISES, BY RESOLUTION DECLARE IT NECESSARY TO DEVELOP AND IMPROVE SAID HIGHWAYS WHEN IN THEIR JUDGMENT IT SHALL BE NECESSARY AND EXPEDIENT.
9. THE RIGHT OR PROPRIETOR OR A VEIN OR LODE TO EXTRACT OR REMOVE HIS ORE SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT THE PREMISES THEREBY GRANTED AS RESERVED IN UNITED STATES PATENT RECORDED APRIL 17, 1909 IN BOOK 25 AT PAGE 412 AND AUGUST 3, 1891 IN BOOK 36 AT PAGE 170, AND ANY AND ALL ASSIGNMENTS THEREOF OR INTEREST THEREIN.
10. RIGHT OF WAY FOR DITCHES AND CANALS CONSTRUCTED BY THE AUTHORITY OF THE UNITED STATES AS RESERVED IN PATENT RECORDED APRIL 17, 1909 IN BOOK 25 AT PAGE 412.
11. AN EASEMENT FOR TELEPHONE AND TELEGRAPH LINES AND INCIDENTAL PURPOSES GRANTED TO MOUNTAIN STATES TELEPHONE AND TELEGRAPH COMPANY BY THE INSTRUMENT RECORDED MAY 20, 1927 IN BOOK 193 AT PAGE 363 AND DECEMBER 11, 1937 IN BOOK 122 AT PAGE 573.
12. AN UNDIVIDED ONE-HALF INTEREST IN ALL OIL, GAS AND OTHER MINERALS AS RESERVED BY FRANK W. HARRINGTON IN INSTRUMENT RECORDED MARCH 4, 1953 IN BOOK 147 AT PAGE 14, AND ANY AND ALL ASSIGNMENTS THEREOF OR INTERESTS THEREIN.
13. RIGHT OF WAY ACROSS SUBJECT PROPERTY AS RESERVED IN DEED RECORDED JANUARY 14, 1966 IN BOOK 2113 AT PAGE 745.
14. RIGHTS TO ENTER UPON SUBJECT PROPERTY FOR THE REPAIR AND MAINTENANCE OF DITCHES AND HEADGATES AS RESERVED IN INSTRUMENT RECORDED JANUARY 24, 1968 IN BOOK 199 AT PAGE 178.
15. COVENANTS, CONDITIONS, RESTRICTIONS AND EASEMENTS CONTAINED IN INSTRUMENT RECORDED AUGUST 15, 1973 AT BOOK 2613 AT PAGE 749.
NOTE: VARIANE UNDER PROTECTIVE COVENANTS RECORDED JANUARY 14, 1977 IN BOOK 2889 AT PAGE 43.
16. THE EFFECT, IF ANY OF THE INCLUSION OF THE SUBJECT PROPERTY WITHIN THE BLACK FOREST VOLUNTEER FIRE PROTECTION DISTRICT AS DISCLOSED BY DECREE RECORDED AUGUST 21, 1975 IN BOOK 2772 AT PAGE 121.
17. TERMS, CONDITIONS AND PROVISIONS OF THAT CERTAIN NOTICE PURSUANT TO COLORADO STATUTES CONCERNING UNDERGROUND FACILITIES FOR MOUNTAIN VIEW ELECTRIC ASSOCIATION INC. RECORDED MAY 9, 1985 IN BOOK 5078 AT PAGE 812.
18. COVENANTS, CONDITIONS AND RESTRICTIONS, WHICH DO NOT INCLUDE A FORFEITURE OR REVERTER CLAUSE, SET FORTH IN THE INSTRUMENT RECORDED NOVEMBER 14, 1985 IN BOOK 5089 AT PAGE 132. PROVISIONS REGARDING RACE, COLOR, CREED, AND NATIONAL ORIGIN, IF ANY, ARE DELETED.
19. AN EASEMENT FOR ELECTRICAL, TELEPHONE AND/OR TELEGRAPH LINES AND INCIDENTAL PURPOSES GRANTED TO MOUNTAIN VIEW ELECTRIC ASSOCIATION, INC. BY THE INSTRUMENT RECORDED AUGUST 6, 1999 AT RECEPTION NO. 9912660.
20. PERMANENT, NON-EXCLUSIVE EASEMENT FOR INGRESS AND EGRESS OVER THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER OF THE NORTHWEST QUARTER AS RESERVED BY ARKANSAS-PLATTE AND GULF PARTNERSHIP IN DEED RECORDED OCTOBER 10, 2000 AT RECEPTION NO. 200122763.
21. TERMS, CONDITIONS AND PROVISIONS OF THAT CERTAIN COLORADO GROUND WATER COMMISSION FINDS AND ORDER IN THE UPPER BLACK SQUIRREL CREEK RECORDED MARCH 8, 2007 AS RECEPTION NO. 208032050 AND AT RECEPTION NO, 208032051 AND AT RECEPTION NO. 208032052 AND AT RECEPTION NO. 208032053 AND RECORDED APRIL 13, 2020 AT RECEPTION NO. 220049996.
22. TERMS, CONDITIONS AND RESTRICTIONS CONTAINED IN ACCESS AND MAINTENANCE AGREEMENT TO BE RECORDED.

NOTICE:

ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF CERTIFICATION SHOWN HEREON.

NOTES:

1. NO GAPS OR OVERLAPS EXIST.

2. THERE ARE NO LINES OF POSSESSION THAT AFFECT THIS SURVEY.

3. PARENT TRACT IS RECORDED IN INSTRUMENT # 218127460-7461, REGISTER OF DEEDS OFFICE, EL PASO COUNTY, COLORADO.

4. CHAPTER 5 TABLE 5-4, IN THE EVENT THAT THE LAND TO BE PARTITIONED, PLATTED, SOLD, OR ZONED ABUTS A SECTION LINE COUNTY ROAD, THE MINIMUM LOT AREA FOR THE LOTS ABUTTING THE ROAD SHALL BE 4.75 ACRES AND MINIMUM LOT WIDTH SHALL BE 165 FT.

5. THE OWNER, ITS SUCCESSORS AND ASSIGNS SHALL ADVISE THE FUTURE OWNERS OF THESE LOTS OF ALL APPLICABLE REQUIREMENTS OF THE DETERMINATION OF WATER RIGHT 1068-BD RECORDED AT RECEPTION NO. 220049996.

6. SEWAGE TREATMENT IS THE RESPONSIBILITY OF EACH INDIVIDUAL PROPERTY OWNER. THE EL PASO COUNTY PUBLIC HEALTH DEPARTMENT MUST APPROVE EACH SYSTEM AND, IN SOME CASES THE DEPARTMENT MAY REQUIRE AN ENGINEER DESIGNED SYSTEM PRIOR TO PERMIT APPROVAL.

7. INDIVIDUAL WELLS ARE THE RESPONSIBILITY OF EACH PROPERTY OWNER. PERMITS FOR INDIVIDUAL WELLS MUST BE OBTAINED FROM THE STATE ENGINEER WHO BY LAW HAS THE AUTHORITY TO SET CONDITIONS FOR THE ISSUANCE OF THESE PERMITS.

8. THE ADDRESSES EXHIBITED ON THIS PLAT ARE FOR INFORMATIONAL PURPOSES ONLY. THEY ARE NOT THE LEGAL DESCRIPTION AND ARE SUBJECT TO CHANGE.

9. WATER IN THE DAWSON AQUIFER IS ALLOCATED BASED ON A 100-YEAR AQUIFER LIFE; HOWEVER, FOR EL PASO COUNTY PLANNING PURPOSES, WATER IN THE DAWSON AQUIFER IS EVALUATED BASED ON A 300-YEAR AQUIFER LIFE. APPLICANTS, THE HOME OWNERS ASSOCIATION, AND ALL FUTURE OWNERS IN THE SUBDIVISION SHOULD BE AWARE THAT THE ECONOMIC LIFE OF A WATER SUPPLY BASED ON WELLS IN A GIVEN DAWSON BASIN AQUIFER MAY BE LESS THAN EITHER THE 100 YEARS OR 300 YEARS INDICATED DUE TO ANTICIPATED WATER LEVEL DECLINES. FURTHERMORE, THE WATER SUPPLY PLAN SHOULD NOT RELY SOLELY UPON NON-RENEWABLE AQUIFERS AND ALTERNATIVE RENEWABLE WATER RESOURCES SHOULD BE ACQUIRED AND INCORPORATED IN A PERMANENT WATER SUPPLY PLAN THAT PROVIDES FUTURE GENERATIONS WITH A WATER SUPPLY.

10. NO DRIVEWAY SHALL BE ESTABLISHED UNLESS AN ACCESS PERMIT HAS BEEN GRANTED BY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT. INDIVIDUAL LOT PURCHASERS ARE RESPONSIBLE FOR CONSTRUCTING DRIVEWAYS, INCLUDING NECESSARY DRAINAGE CULVERTS FROM VOLLMER ROAD PER LAND DEVELOPMENT CODE SECTION 6.3.3.C.2 AND 6.3.3.C.3. DUE TO THEIR LENGTH, SOME OF THE DRIVEWAYS WILL NEED TO BE SPECIFICALLY APPROVED BY THE BLACK FOREST FIRE PROTECTION DISTRICT.

11. ALL PROPERTY OWNERS ARE RESPONSIBLE FOR MAINTAINING PROPER STORM DRAINAGE IN AND THROUGH THEIR PROPERTY. PUBLIC DRAINAGE EASEMENTS AS SPECIFICALLY NOTED ON THE PLAT SHALL BE MAINTAINED BY THE INDIVIDUAL LOT OWNERS UNLESS OTHERWISE INDICATED. STRUCTURES, FENCES, MATERIALS OR LANDSCAPING THAT COULD IMPEDE THE FLOW OF RUNOFF SHALL NOT BE PLACED IN DRAINAGE EASEMENTS.

12. MAILBOXES SHALL BE INSTALLED IN ACCORDANCE WITH ALL EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS AND UNITED STATES POSTAL SERVICE REGULATIONS.

13. THE FOLLOWING REPORTS HAVE BEEN SUBMITTED IN ASSOCIATION WITH THE FINAL PLAT FOR THIS SUBDIVISION AND ARE ON FILE AT THE COUNTY DEVELOPMENT SERVICES DEPARTMENT: DRAINAGE REPORT, WATER RESOURCES REPORT, WASTEWATER DISPOSAL REPORT, GEOLOGY AND SOILS REPORT, AND FIRE PROTECTION REPORT.

14. STRUCTURAL FOUNDATIONS ON THE LOTS IN THIS SUBDIVISION SHALL BE DESIGNED BY A COLORADO REGISTERED PROFESSIONAL ENGINEER.

15. DRAINAGE EASEMENTS: NO PERMANENT DWELLING UNIT, TEMPORARY STRUCTURES, INCLUDING SHEDS AND OUT BUILDINGS, WATER WELL OR WASTEWATER TREATMENT SYSTEM MAY BE CONSTRUCTED IN THE DRAINAGE EASEMENTS SHOWN ON THIS PLAT. DRAINAGE CULVERTS AND FENCES THAT DO NOT BLOCK OR IMPEDE STORM WATER RUNOFF ARE ALLOWED IN AND ACROSS DRAINAGE EASEMENTS

16. PROPERTY WITHIN THIS SUBDIVISION IS SUBJECT TO THE TERMS AND PROVISIONS OF THE EL PASO COUNTY ROAD IMPACT FEE. FEES FOR EACH LOT WITHIN THIS SUBDIVISION SHALL BE PAID IN FULL AT THE TIME OF BUILDING PERMIT ISSUANCE.

17. THIS PROPERTY IS LOCATED WITHIN AND SERVICED BY THE MOUNTAIN VIEW ELECTRIC ASSOCIATION SERVICE DISTRICT, THE BLACK FOREST FIRE PROTECTION DISTRICT, EL PASO COUNTY SCHOOL DISTRICT NO. 20 AND THE BLACK HILLS ENERGY CORPORATION SERVICE DISTRICT.

18. SOILS, GEOLOGY, GEOLOGIC HAZARD, AND WASTEWATER STUDY FOR THIS SUBDIVISION DATED MARCH 4, 2020, PREPARED BY ENTECH ENGINEERING, INC.

19. THE FOLLOWING LOTS HAVE BEEN FOUND TO BE IMPACTED BY GEOLOGIC HAZARDS. MITIGATION MEASURES AND A MAP OF THE HAZARD AREA CAN BE FOUND IN THE GEOLOGIC HAZARD REPORT BY ENTECH ENGINEERING, INC. DATED MARCH 4, 2020, IN FILE #200160 AVAILABLE AT THE EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT:
- POTENTIALLY SEASONALLY HIGH GROUNDWATER: LOT 3
IN AREA OF HIGH GROUNDWATER:
DUE TO HIGH GROUNDWATER IN THE AREA, ALL FOUNDATIONS SHALL INCORPORATE AN UNDERGROUND DRAINAGE SYSTEM.

FLOODPLAIN NOTE:

FLOOD INSURANCE RATE MAP, MAP NUMBER 08041C0320G EFFECTIVE DATE DECEMBER 7, 2018, INDICATES THAT THE AREA WITHIN THE SURVEYED PROPERTY TO BE LOCATED IN ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 500-YEAR FLOOD PLAIN).

EASEMENTS:

UNLESS OTHERWISE INDICATED, ALL SIDE, FRONT, AND REAR LOT LINES ARE HEREBY PLATTED ON EITHER SIDE WITH A 10 FOOT (USE 5 FEET FOR LOTS SMALLER THAN 2.5 ACRES) PUBLIC UTILITY AND DRAINAGE EASEMENT UNLESS OTHERWISE INDICATED. ALL EXTERIOR SUBDIVISION BOUNDARIES ARE HEREBY PLATTED WITH A 20 FOOT (USE 7 FEET FOR LOTS SMALLER THAN 2.5 ACRES) PUBLIC UTILITY AND DRAINAGE EASEMENT. THE SOLE RESPONSIBILITY FOR MAINTENANCE OF THESE EASEMENT IS HEREBY VESTED WITH THE INDIVIDUAL PROPERTY OWNERS.

UTILITY NOTES:

ANY UTILITY COMPANY THAT LOCATES FACILITIES IN ANY EASEMENT SHALL HAVE THE RIGHT TO PRUNE, REMOVE, ERADICATE, CUT AND CLEAR AWAY ANY TREES, LIMBS, VINES AND BRUSH ON THE UTILITY EASEMENT NOW OR AT ANY FUTURE TIME AND PRUNE AND CLEAR AWAY ANY TREE LIMBS, VINES, AND BRUSH ON LANDS ADJACENT TO THE UTILITY EASEMENT WHENEVER, IN THE UTILITY COMPANIES JUDGMENT, SUCH MAY INTERFERE WITH OR ENDANGER THE CONSTRUCTION, OPERATION, OR MAINTENANCE OF ITS FACILITIES, TOGETHER WITH THE RIGHT OF INGRESS TO AND EGRESS FROM THE UTILITY EASEMENT AND CONTIGUOUS LAND SUBJECT TO THIS PLAT FOR THE PURPOSE OF SURVEYING, ERECTING, CONSTRUCTING, MAINTAINING, INSPECTING, REBUILDING, REPLACING, AND WITH OR ENDANGERING THE CONSTRUCTION, OPERATION OR MAINTENANCE OF SAID FACILITIES.

ENVIRONMENTAL:

DEVELOPER SHALL COMPLY WITH FEDERAL AND STATE LAWS, REGULATIONS, ORDINANCE, REVIEW AND PERMIT REQUIREMENTS, AND OTHER AGENCY REQUIREMENTS, IF ANY, OF APPLICABLE AGENCIES INCLUDING, BUT NOT LIMITED TO , THE COLORADO DIVISION OF WILDLIFE, COLORADO DEPARTMENT OF TRANSPORTATION, U.S. ARMY CORPS OF ENGINEERS AND THE U.S. FISH AND WILDLIFE SERVICE REGARDING THE ENDANGERED SPECIES ACT, PARTICULARLY AS IT RELATES TO THE LISTED SPECIES (E.G. PREBLE'S MEADOW JUMPING MOUSE).

LEGEND

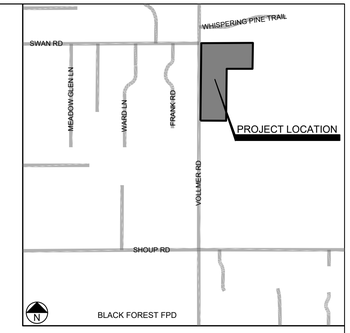
- O — Monument Found (NOTED), ORIGIN: Land Survey Plat by Rampart Surveys, LLC dated Oct. 17, 2018
- ● — 1/2"x24" Rebar w/PLS38374 Cap Set
- △ — Section Corner, ORIGIN: Land Survey Plat by Rampart Surveys, LLC dated Oct. 17, 2018
- * — Assumed Bearing
- (P) — Plat Dimension ORIGIN: Land Survey Plat by Rampart Surveys, LLC dated Oct. 17, 2018
- (S) — Surveyed Dimension
- Dedicated Right-of-Way
- Utility Easement
- Preservation Easement
- Utility & Drainage Easement
- Utility & Ingress/Egress Easement & Right-of-Way to be Vacated with this Plat
- Travel Easement

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE WEST LINE OF THE PROPERTY, N00°23'27"E - 1954.13'. THE DIRECTION IS BASED ON THE LAND SURVEY PLAT BY RAMPART SURVEYS, LLC, 10/17/2018, AND THE LINE IS MONUMENTED AS SHOWN.

UNITS OF MEASURE ARE U.S. SURVEY FEET

100' 50' 0' 100'
SCALE: 1" = 100'

NORTH



VICINITY MAP
(NOT TO SCALE)

DENSITY AND DIMENSIONAL STANDARDS FOR RESIDENTIAL DISTRICT RR-5

ZONING DISTRICT	AREA	WIDTH (AT FRONT SETBACK LINE)	FRONT	REAR	SIDE	MAXIMUM LOT COVERAGE	MAXIMUM HEIGHT
RR-5	5 ACRES (1,2)	200 Ft	25 Ft	25 Ft	25 Ft	25%	30Ft

TOTAL ACREAGE:

LOT 1	=	19.2 ACRES
LOT 2	=	9.0 ACRES
LOT 3	=	9.5 ACRES
DEDICATION	=	0.9 ACRES
TOTAL	=	38.6 ACRES

FEES:

PARK FEE: $1,868.00
SCHOOL FEE: $918.00
BRIDGE FEE:
DRAINAGE FEE:

SERVICE PROVIDERS:

BLACK FOREST FIRE PROTECTION DISTRICT
MOUNTAIN VIEW ELECTRIC ASSOC.
BLACK HILLS ENERGY
EL PASO CO. TELEPHONE
INDIVIDUAL SEWAGE DISPOSAL SYSTEMS
DOMESTIC WELLS

OWNER:

DANIEL S. ABEYTA AND JENNIFER A. ABEYTA
13251 VOLLMER ROAD
COLORADO SPRINGS, CO 80908
719-531-5000

FIRSTBANK - LOAN OPERATIONS
12345 WEST COLFAX AVENUE
LAKEWOOD, CO 80215
303-232-3000

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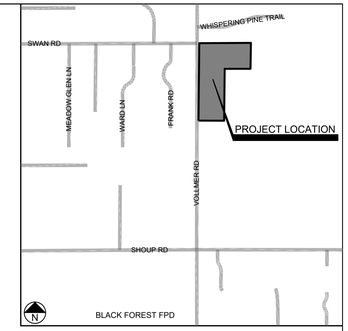
Overland Park, KS P: (913) 444-9615 • **Colorado Springs, CO** P: (719) 465-2145

Drawn By:ASJ Project #1908CS4030 DD #TDS78 PCD FILE # MS203

NOVEMBER 2020

SEDONA SUN ACRES FILING NO. 1

IN THE NORTHWEST QUARTER OF SECTION 10, T12S, R65W, 6TH P.M.
EL PASO COUNTY, COLORADO



VICINITY MAP
(NOT TO SCALE)

BE IT KNOWN BY THESE PRESENTS:

DANIEL S. ABEYTA AND JENNIFER A. ABEYTA AND _____, AS _____ OF FIRSTBANK ARE THE OWNERS OF THE FOLLOWING DESCRIBED TRACT OF LAND, TO WIT:

THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER OF THE NORTHWEST QUARTER, TOGETHER WITH THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER EXCEPT THE SOUTHEAST QUARTER OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER, ALL IN SECTION 10, TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE 6TH P.M., COUNTY OF EL PASO, STATE OF COLORADO, EXCEPT THE NORTHERLY AND WESTERLY 30 FEET FOR PUBLIC ROAD RIGHT-OF-WAY AS RECORDED JUNE 20, 1917 AT BOOK 571 AT PAGE 55 OF THE RECORDS OF EL PASO COUNTY, STATE OF COLORADO.

CONTAINING 37.70 ACRES, MORE OR LESS.

DEDICATION:

THE UNDERSIGNED, BEING ALL THE OWNERS, MORTGAGES, BENEFICIARIES OF DEEDS OF TRUST AND HOLDERS OF OTHER INTERESTS IN THE LAND DESCRIBED HEREIN, HAVE LAID OUT, SUBDIVIDED, AND PLATTED SAID LANDS INTO LOTS AND EASEMENTS AS SHOWN HEREON UNDER THE NAME AND SUBDIVISION OF "SEDONA SUN ACRES FILING NO. 1". ALL PUBLIC IMPROVEMENTS SO PLATTED ARE HEREBY DEDICATED TO PUBLIC USE AND SAID OWNER DOES HEREBY COVENANT AND AGREE THAT THE PUBLIC IMPROVEMENTS WILL BE CONSTRUCTED TO EL PASO COUNTY STANDARDS AND THAT PROPER DRAINAGE AND EROSION CONTROL FOR SAME WILL BE PROVIDED AT SAID OWNER'S EXPENSE, ALL TO THE SATISFACTION OF THE BOARD OF COUNTY COMMISSIONERS OF EL PASO COUNTY, COLORADO. UPON ACCEPTANCE BY RESOLUTION, ALL PUBLIC IMPROVEMENTS SO DEDICATED WILL BECOME MATTERS OF MAINTENANCE BY EL PASO COUNTY, COLORADO. THE UTILITY EASEMENTS SHOWN HEREON ARE HEREBY DEDICATED FOR PUBLIC UTILITIES AND COMMUNICATION SYSTEMS AND OTHER PURPOSES AS SHOWN HEREON. THE ENTITIES RESPONSIBLE FOR PROVIDING THE SERVICES FOR WHICH THE EASEMENTS ARE ESTABLISHED ARE HEREBY GRANTED THE PERPETUAL RIGHT OF INGRESS AND EGRESS FROM AND TO ADJACENT PROPERTIES FOR INSTALLATION, MAINTENANCE, AND REPLACEMENT OF UTILITY LINES AND RELATED FACILITIES.

IN WITNESS WHEREOF:

THE AFOREMENTIONED _____, AS _____ OF FIRST BANK, HAS EXECUTED THIS INSTRUMENT THIS _____ DAY OF _____, 20___ A.D.

_____
FIRST BANK

NOTARIAL:

STATE OF COLORADO)
COUNTY OF EL PASO) SS

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS _____ DAY OF _____, 20___ A.D. BY _____, AS _____ OF FIRSTBANK

WITNESS MY HAND AND SEAL _____

MY COMMISSION EXPIRES _____

BOARD OF COUNTY COMMISSIONERS CERTIFICATE:

THIS PLAT FOR SEDONA SUN ACRES FILING NO. 1 WAS APPROVED FOR FILING BY THE EL PASO COUNTY, COLORADO BOARD OF COUNTY COMMISSIONERS ON THE _____ DAY OF _____, 20___, SUBJECT TO ANY NOTES SPECIFIED HEREON AND ANY CONDITIONS INCLUDED IN THE RESOLUTION OF APPROVAL. THE DEDICATIONS OF LAND TO THE PUBLIC, TRACTS, AND EASEMENTS ARE ACCEPTED, BUT PUBLIC IMPROVEMENTS THEREON WILL NOT BECOME THE MAINTENANCE RESPONSIBILITY OF EL PASO COUNTY UNTIL PRELIMINARY ACCEPTANCE OF THE PUBLIC IMPROVEMENTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE LAND DEVELOPMENT CODE AND ENGINEERING CRITERIA MANUAL, AND THE SUBDIVISION IMPROVEMENTS AGREEMENT.

_____
CHAIR, BOARD OF COUNTY COMMISSIONERS DATE

PLANNING AND COMMUNITY DEVELOPMENT DIRECTOR CERTIFICATION:

THIS PLAT FOR "SEDONA SUN ACRES FILING NO. 1" WAS APPROVED FOR FILING BY THE EL PASO COUNTY, COLORADO PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT DIRECTOR ON THE_____ DAY OF _____, 20___, SUBJECT TO ANY NOTES OR CONDITIONS SPECIFIED HEREON.

_____
PLANNING AND COMMUNITY DEVELOPMENT DIRECTOR DATE

RECORDINGS:

STATE OF COLORADO)
COUNTY OF EL PASO) SS

I HEREBY CERTIFY THAT THIS INSTRUMENT WAS FILED FOR RECORD IN MY OFFICE AT _____O'CLOCK ____.M. THIS _____ DAY OF _____, 20___ A.D., AND IS DULY RECORDED AT RECEPTION NO. _____ OF THE RECORDS OF EL PASO COUNTY, COLORADO.

CHUCK BROERMAN

FEE:_____

BY: _____
COUNTY CLERK AND RECORDER

SURCHARGE:_____

DEDICATION:

THE UNDERSIGNED, BEING ALL THE OWNERS, MORTGAGES, BENEFICIARIES OF DEEDS OF TRUST AND HOLDERS OF OTHER INTERESTS IN THE LAND DESCRIBED HEREIN, HAVE LAID OUT, SUBDIVIDED, AND PLATTED SAID LANDS INTO LOTS AND EASEMENTS AS SHOWN HEREON UNDER THE NAME AND SUBDIVISION OF "SEDONA SUN ACRES FILING NO. 1". ALL PUBLIC IMPROVEMENTS SO PLATTED ARE HEREBY DEDICATED TO PUBLIC USE AND SAID OWNER DOES HEREBY COVENANT AND AGREE THAT THE PUBLIC IMPROVEMENTS WILL BE CONSTRUCTED TO EL PASO COUNTY STANDARDS AND THAT PROPER DRAINAGE AND EROSION CONTROL FOR SAME WILL BE PROVIDED AT SAID OWNER'S EXPENSE, ALL TO THE SATISFACTION OF THE BOARD OF COUNTY COMMISSIONERS OF EL PASO COUNTY, COLORADO. UPON ACCEPTANCE BY RESOLUTION, ALL PUBLIC IMPROVEMENTS SO DEDICATED WILL BECOME MATTERS OF MAINTENANCE BY EL PASO COUNTY, COLORADO. THE UTILITY EASEMENTS SHOWN HEREON ARE HEREBY DEDICATED FOR PUBLIC UTILITIES AND COMMUNICATION SYSTEMS AND OTHER PURPOSES AS SHOWN HEREON. THE ENTITIES RESPONSIBLE FOR PROVIDING THE SERVICES FOR WHICH THE EASEMENTS ARE ESTABLISHED ARE HEREBY GRANTED THE PERPETUAL RIGHT OF INGRESS AND EGRESS FROM AND TO ADJACENT PROPERTIES FOR INSTALLATION, MAINTENANCE, AND REPLACEMENT OF UTILITY LINES AND RELATED FACILITIES.

IN WITNESS WHEREOF:

THE AFOREMENTIONED DANIEL S. ABEYTA AND JENNIFER A. ABEYTA, HAS EXECUTED THIS INSTRUMENT THIS _____ DAY OF _____, 20___ A.D.

_____ _____
DANIEL S. ABEYTA JENNIFER A. ABEYTA

NOTARIAL:

STATE OF COLORADO)
COUNTY OF EL PASO) SS

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS _____ DAY OF _____, 20___ A.D. BY DANIEL S. ABEYTA AND JENNIFER A. ABEYTA

WITNESS MY HAND AND SEAL _____

MY COMMISSION EXPIRES _____

SURVEYOR'S CERTIFICATION:

I, TIM SLOAN, A DULY REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF COLORADO, DO HEREBY CERTIFY THAT THIS PLAT TRULY AND CORRECTLY REPRESENTS THE RESULTS OF A SURVEY MADE ON THE 11TH DAY OF DECEMBER, 2019, BY ME OR UNDER MY DIRECT SUPERVISION AND THAT ALL MONUMENTS EXIST AS SHOWN HEREON; THAT MATHEMATICAL CLOSURE ERRORS ARE LESS THAN 1:10,000; AND THAT SAID PLAT HAS BEEN PREPARED IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS OF THE STATE OF COLORADO DEALING WITH MONUMENTS, SUBDIVISION, OR SURVEYING OF LAND AND ALL APPLICABLE PROVISIONS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE.

I ATTEST THE ABOVE ON THIS_____DAY OF_____,20___.

_____
TIM SLOAN
COLORADO REGISTERED PLS #38374
FOR AND ON BEHALF OF SMH CONSULTANTS, PA.

COLORADO LICENSED
TIM SLOAN
38374
PROFESSIONAL LAND SURVEYOR

SMH CONSULTANTS
Civil Engineering • Land Surveying • Landscape Architecture
www.smhconsultants.com
Manhattan, KS - HQ P: (785) 776-0541 • **Dodge City, KS** P: (620) 255-1952
Overland Park, KS P: (913) 444-9615 • **Colorado Springs, CO** P: (719) 465-2145

Drawn By:ASJ Project #1908CS4030 DD #TDS78 PCD FILE # MS203

NOVEMBER 2020

Appendix B

Appendix B
Dan Abeyta - Sedona Sun Acres Subdivision
Water Demands and Wastewater Loads Estimate (3-Lot Development)

Residential Constants		
Water (Rural)	***1.00***	***AF/Year-SFE***
Wastewater (Base Flow)	***201***	***GPD/SFE***
Wastewater (MDF)	***245***	***GPD/SFE***
Estimated Wastewater Flow	***0.225***	***AF/Year-SFE***

Land Use	Density	Water Demands						Wastewater Loads			
		SFE	Unit Use	Acre-Feet	ADF (GPD)	Max Daily Use (GPD)	Peak Hour (GPM)	Return Flow AF/Year	SFE	Average Daily Flow	Max Day Daily Flow
Residential		3	1.00	3	2,678	6,695	6.97	0.675	3	602	735

Alluvial Depletion Information

AUG-3 Denver Basin Depletion Model - Maximum Depletions - Section 10, Township 12S, Range 65 W
Desginated Basin_V2019 for use inside Upper Black Squirrel Designated Basin

Dawson Aquifer - Not-Nontributary - Upper Black Squirrel - 1325 Vollmer Road, Colorado Springs, CO 80908

		Designated Basin - MaximumTotal Depletions		
Pumping Interval	Formation	Total Depl. (AF/yr)	Total Depl. (% of Pumping)	Year of Max. Depletion
300-year pumping period				
Pumping Period	Dawson (NNT)	0.077	2.57%	300

Appendix C

Appendix C
Dan Abeyta - Sedona Sun Acres Subdivision
Water Demands and Wastewater Loads Estimate (3-Lot Development)

Land Formation/Aquifer	Finding/ Decree	Tributary Status	Volume	Annual Allocation 100 Year	Annual Allocation 300 Year	Notes	Saturated Sand Thickness	Saturated Specific Yield	Owner
			Acre-Feet	A-F/Year	A-F/Year				
Dawson	**1068-BD**	NNT	2,941	28.41	9.47	Located within UBS Basin and Management District. Wells must be located in excess of 600 feet from other wells drilled into the Dawson	390	20%	Transferred from Peter R. Spahn Investment Trust to Dan Abeyta
Denver	**1067-BD**	NT	2,371	23.71	7.90	Located within UBS Basin and Management District. Wells must be located in excess of 600 feet from other wells drilled into the Denver	370	17%	Transferred from Peter R. Spahn Investment Trust to Dan Abeyta
Arapahoe	**1066-BD**	NT	1,666	16.66	5.55	Located within UBS Basin and Management District. Wells must be located in excess of 600 feet from other wells drilled into the Arapahoe	260	17%	Transferred from Peter R. Spahn Investment Trust to Dan Abeyta
Laramie-Fox Hills	**1065-BD**	NT	1,074	10.74	3.58	Located within UBS Basin and Management District. Wells must be located in excess of 600 feet from other wells drilled into the LFH	190	15%	Transferred from Peter R. Spahn Investment Trust to Dan Abeyta
Total Legal Supply			**8,052**	**80**	**27**				
Total Available for Use at Abeyta Subdivision			**8,941**		**69**				

Beneficial Uses *Domestic*
Industrial
Commercial
Irrigation
Augmentation
Stock watering
Recreational water feature ponds
Piscatorial
Wildlife
Replacement

Appendix D

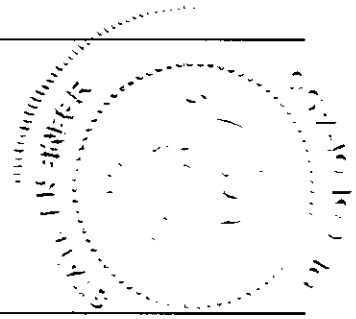
COLORADO GROUND WATER COMMISSION
FINDINGS AND ORDER

IN THE MATTER OF AN APPLICATION FOR DETERMINATION OF WATER RIGHT TO ALLOW THE WITHDRAWAL OF GROUND WATER IN THE UPPER BLACK SQUIRREL CREEK DESIGNATED GROUND WATER BASIN

APPLICANT: PETER R. SPAHN INVESTMENT TRUST

AQUIFER: LARAMIE-FOX HILLS

DETERMINATION NO.: **1065-BD**



In compliance with Section 37-90-107(7), C.R.S., and the Designated Basin Rules, 2 CCR 410-1, Peter R. Spahn Investment Trust (hereinafter "applicant") submitted an application for determination of water right to allow the withdrawal of designated ground water from the Laramie-Fox Hills Aquifer.

FINDINGS

1. The application was received complete by the Colorado Ground Water Commission on September 22, 2006.

2. The applicant requests a determination of rights to designated ground water in the Laramie-Fox Hills Aquifer (hereinafter "aquifer") underlying 37.7 acres, generally described as the W½ of the NW¼ of the NW¼, the NE¼ of the NW¼ of the NW¼, and the NW¼ of the SW¼ of the NW¼ of Section 10, Township 12 South, Range 65 West of the 6th Principal Meridian, in El Paso County. According to a signed statement dated September 19, 2006, the applicant owns the 37.7 acres of land, as further described in said affidavit which is attached hereto as Exhibit A, and claims control of the ground water in the aquifer underlying this land area.

3. The proposed annual amount of ground water to be allocated and withdrawn from the aquifer for intended beneficial uses is the maximum allowable amount.

4. The above described land area overlying the ground water claimed by the applicant is located within the boundaries of the Upper Black Squirrel Creek Designated Ground Water Basin and within the Upper Black Squirrel Creek Ground Water Management District. The Colorado Ground Water Commission (hereinafter "Commission") has jurisdiction.

5. The applicant intends to apply the allocated ground water to the following beneficial uses: indoor residential and commercial (home-based business), stock watering, irrigation, hot tub/swimming pool, and augmentation. The applicant's proposed place of use of the allocated ground water is the above described 37.7 acre land area.

6. The quantity of water in the aquifer underlying the 37.7 acres of land claimed by the applicant is 1,074 acre-feet. This determination was based on the following as specified in the Designated Basin Rules:

   a. The average specific yield of the saturated permeable material of the aquifer underlying the land under consideration that could yield a sufficient quantity of water that may be extracted and applied to beneficial use is 15 percent.

b. The average thickness of the saturated permeable material of the aquifer underlying the land under consideration that could yield a sufficient quantity of water that may be extracted and applied to beneficial use is 190 feet.

7. At this time, there is no substantial artificial recharge that would affect the aquifer within a one hundred year period.

8. Pursuant to Section 37-90-107(7), C.R.S., and in accordance with the Designated Basin Rules, the Commission shall allocate ground water in the aquifer based on ownership of the overlying land and an aquifer life of one hundred years. Therefore, the maximum allowed average annual amount of ground water in the aquifer that may be allocated for withdrawal pursuant to the data in the paragraphs above for the 37.7 acres of overlying land claimed by the applicant is 10.7 acre-feet.

9. A review of the records in the Office of the State Engineer has disclosed that none of the water in the aquifer underlying the land claimed by the applicant has been previously allocated or permitted for withdrawal.

10. Pursuant to Section 37-90-107(7)(c)(III), C.R.S., an approved determination of water right shall be considered a final determination of the amount of ground water so determined; except that the Commission shall retain jurisdiction for subsequent adjustment of such amount to conform to the actual local aquifer characteristics from adequate information obtained from well drilling or test holes.

11. The ability of wells permitted to withdraw the authorized amount of water from this non-renewable aquifer may be less than the one hundred years upon which the amount of water in the aquifer is allocated, due to anticipated water level declines.

12. In accordance with Rule 5.3.6 of the Designated Basin Rules, it has been determined that withdrawal of ground water from the aquifer underlying the land claimed by the applicant will not, within one hundred years, deplete the flow of a natural steam or its alluvial aquifer at an annual rate greater than one-tenth of one percent of the annual rate of withdrawal and, therefore, the ground water is nontributary ground water as defined in Rule 4.2.19 of the Designated Basin Rules. No more than 98% of the amount of ground water withdrawn annually shall be consumed, as required by the Designated Basin Rules.

13. In accordance with Section 37-90-107(7), C.R.S., upon Commission approval of a determination of water right, well permits for wells to withdraw the authorized amount of water from the aquifer shall be available upon application, subject to the conditions of this determination and the Designated Basin Rules and subject to approval by the Commission.

14. On October 5, 2006, in accordance with Rule 9.1 of the Designated Basin Rules, a letter was sent to the Upper Black Squirrel Creek Ground Water Management District requesting written recommendations concerning this application. No written recommendations from the district were received.

15. The Commission Staff has evaluated the application relying on the claims to control of the ground water in the aquifer made by the applicant.

16. In accordance with Sections 37-90-107(7) and 37-90-112, C.R.S., the application was published in the Ranchland News newspaper on October 12 and 19, 2006.

17. No objections to the determination of water right and proposed allocation of ground water were received within the time limit set by statute.

18. In order to prevent unreasonable impairment to the existing water rights of others within the Upper Black Squirrel Creek Designated Ground Water Basin it is necessary to impose conditions on the determination of water right and proposed allocation of ground water. Under conditions as stated in the following Order, no unreasonable impairment of existing water rights will occur from approval of this determination of water right or from the issuance of well permits for wells to withdraw the authorized amount of allocated ground water from the aquifer.

ORDER

In accordance with Section 37-90-107(7), C.R.S., and the Designated Basin Rules, the Colorado Ground Water Commission orders that the application for determination of rights to designated ground water in the Laramie-Fox Hills Aquifer underlying 37.7 acres of land, generally described as the W½ of the NW¼ of the NW¼, the NE¼ of the NW¼ of the NW¼, and the NW¼ of the SW¼ of the NW¼ of Section 10, Township 12 South, Range 65 West of the 6th Principal Meridian, is approved subject to the following conditions:

19. The allowed average annual amount of withdrawal of ground water from the aquifer shall not exceed 10.7 acre-feet. The allowed maximum annual amount of withdrawal may exceed the allowed average annual amount of withdrawal as long as the total volume of water withdrawn does not exceed the product of the number of years since the date of approval of this determination times the allowed average annual amount of withdrawal.

20. To conform to actual aquifer characteristics, the Commission may adjust the allowed average annual amount of ground water to be withdrawn from the aquifer based on analysis of geophysical logs or other site-specific data if such analysis indicates that the initial estimate of the volume of water in the aquifer was incorrect.

21. The applicant may pump the allowed average annual amount of withdrawal and the allowed maximum annual amount of withdrawal from one or more wells of a well field in any combination, so long as the total combined withdrawal of the wells does not exceed the amounts described in this Order.

22. No more than 98% of the ground water withdrawn annually shall be consumed. The Commission may require well owners to demonstrate periodically that no more than 98% of the water withdrawn is being consumed.

23. The use of ground water from this allocation shall be limited to the following beneficial uses: indoor residential and commercial (home-based business), stock watering, irrigation, hot tub/swimming pool, and augmentation. The place of use shall be limited to the above described 37.7 acre land area.

24. The applicant, or subsequent persons controlling this water right, shall record in the public records of the county - in which the claimed overlying land is located - notice of transfer of any portion of this water right to another within sixty days after the transfer, so that a title examination of the above described 37.7 acre land area, or any part thereof, shall reveal the changes affecting this water right. Such notice shall consist of a signed and dated deed which indicates the determination number, the aquifer, a description of the above described land area, the annual amount of ground water (acre-feet) transferred, name of the recipient, and the date of transfer.

25. Subject to the above conditions, well permits for wells to withdraw the allocated annual amount of water from the aquifer shall be available upon application subject to approval by the Commission and the following conditions:

    a. The wells shall be located on the above described 37.7 acre overlying land area.

    b. The wells must be constructed to withdraw water from only the Laramie-Fox Hills Aquifer. Upon application for a well permit to construct such a well, the estimated top and base of the aquifer at the proposed well location will be determined by the Commission and indicated on the approved well permit. Plain non-perforated casing must be installed, grouted and sealed to prevent diversion of ground water from other aquifers and the movement of ground water between aquifers.

    c. The entire depth of each well must be geophysically logged prior to installing the casing as set forth in Rule 9 of the Statewide Nontributary Ground Water Rules, 2 CCR 402-7.

    d. Each well shall be constructed within 200 feet of the location specified on the approved well permit, but must be more than 600 feet from any existing large-capacity well completed in the same aquifer.

    e. A totalizing flow meter or other Commission approved measuring device shall be installed on each well and maintained in good working order by the well owner. Annual diversion records shall be collected and maintained by the well owner and submitted to the Commission or the Upper Black Squirrel Ground Water Management District upon their request.

    f. The well owner shall mark the well in a conspicuous place with the permit number and the name of the aquifer. The well owner shall take necessary means and precautions to preserve these markings.

26. A copy of this Findings and Order shall be recorded by the applicant in the public records of the county in which the claimed overlying land is located so that a title examination of the above described 37.7 acre overlying land area, or any part thereof, shall reveal the existence of this determination.

Dated this 29th day of November, 2006.

Hal D. Simpson
Executive Director
Colorado Ground Water Commission

By: Keith Vander Horst
Keith Vander Horst, P.E.
Supervisor, Designated Basins

Prepared by: SKR

EXHIBIT A

GWS 1
06/09/00

1065-BD

RECEIVED

SEP 22 2006

WATER RESOURCES
STATE ENGINEER
COLO.

STATE OF COLORADO
OFFICE OF THE STATE ENGINEER
DIVISION OF WATER RESOURCES
1313 Sherman St. Room 821
Denver, CO 80203
(303) 866-3581 Fax (303) 866-3589

NONTRIBUTARY GROUND WATER LANDOWNERSHIP STATEMENT

I (We) Peter R. Spahn Investment Trust
(Name(s))

Claim and say that I (we) am (are) the owner(s) of the following described property consisting of 37.7 acres in the County of El Paso, State of Colorado:

(Insert the property legal description)
W ½ NW ¼ NW ¼;
NE ¼ NW ¼ NW ¼;
NW ¼ SW ¼ NW ¼;
Sec. 10, T. 12S., R. 65W., 6th PM

and, that the ground water sought to be withdrawn from the Laramie-Fox Hill aquifer underlying the above-described and has not been conveyed to reserved to another, nor has consent been given to its withdrawal by another.

Further, I (we) claim and say that I (we) have read the statements and made herein; know the contents hereof; and that the same are true to my (our) knowledge.

Park State Bank & Trust, Trustee
Joseph E. Walnofer, Vice President

Joseph Walnofer VP 9/19/2006
Signature Date

Signature Date

INSTRUCTIONS:
Please type or print neatly in black ink. This form may be reproduced by photocopy or word processing means.

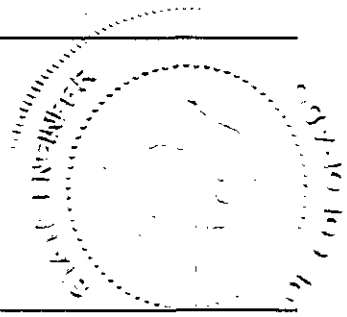
COLORADO GROUND WATER COMMISSION
FINDINGS AND ORDER

IN THE MATTER OF AN APPLICATION FOR DETERMINATION OF WATER RIGHT TO ALLOW THE WITHDRAWAL OF GROUND WATER IN THE UPPER BLACK SQUIRREL CREEK DESIGNATED GROUND WATER BASIN

APPLICANT: PETER R. SPAHN INVESTMENT TRUST

AQUIFER: ARAPAHOE

DETERMINATION NO.: **1066-BD**



In compliance with Section 37-90-107(7), C.R.S., and the Designated Basin Rules, 2 CCR 410-1, Peter R. Spahn Investment Trust (hereinafter "applicant") submitted an application for determination of water right to allow the withdrawal of designated ground water from the Arapahoe Aquifer.

FINDINGS

1. The application was received complete by the Colorado Ground Water Commission on September 22, 2006.

2. The applicant requests a determination of rights to designated ground water in the Arapahoe Aquifer (hereinafter "aquifer") underlying 37.7 acres, generally described as the W½ of the NW¼ of the NW¼, the NE¼ of the NW¼ of the NW¼, and the NW¼ of the SW¼ of the NW¼ of Section 10, Township 12 South, Range 65 West of the 6th Principal Meridian, in El Paso County. According to a signed statement dated September 19, 2006, the applicant owns the 37.7 acres of land, as further described in said affidavit which is attached hereto as Exhibit A, and claims control of the ground water in the aquifer underlying this land area.

3. The proposed annual amount of ground water to be allocated and withdrawn from the aquifer for intended beneficial uses is the maximum allowable amount.

4. The above described land area overlying the ground water claimed by the applicant is located within the boundaries of the Upper Black Squirrel Creek Designated Ground Water Basin and within the Upper Black Squirrel Creek Ground Water Management District. The Colorado Ground Water Commission (hereinafter "Commission") has jurisdiction.

5. The applicant intends to apply the allocated ground water to the following beneficial uses: indoor residential and commercial (home-based business), stock watering, irrigation, hot tub/swimming pool, and augmentation. The applicant's proposed place of use of the allocated ground water is the above described 37.7 acre land area.

6. The quantity of water in the aquifer underlying the 37.7 acres of land claimed by the applicant is 1,666 acre-feet. This determination was based on the following as specified in the Designated Basin Rules:

   a. The average specific yield of the saturated permeable material of the aquifer underlying the land under consideration that could yield a sufficient quantity of water that may be extracted and applied to beneficial use is 17 percent.

b. The average thickness of the saturated permeable material of the aquifer underlying the land under consideration that could yield a sufficient quantity of water that may be extracted and applied to beneficial use is 260 feet.

7. At this time, there is no substantial artificial recharge that would affect the aquifer within a one hundred year period.

8. Pursuant to Section 37-90-107(7), C.R.S., and in accordance with the Designated Basin Rules, the Commission shall allocate ground water in the aquifer based on ownership of the overlying land and an aquifer life of one hundred years. Therefore, the maximum allowed average annual amount of ground water in the aquifer that may be allocated for withdrawal pursuant to the data in the paragraphs above for the 37.7 acres of overlying land claimed by the applicant is 16.7 acre-feet.

9. A review of the records in the Office of the State Engineer has disclosed that none of the water in the aquifer underlying the land claimed by the applicant has been previously allocated or permitted for withdrawal.

10. Pursuant to Section 37-90-107(7)(c)(III), C.R.S., an approved determination of water right shall be considered a final determination of the amount of ground water so determined; except that the Commission shall retain jurisdiction for subsequent adjustment of such amount to conform to the actual local aquifer characteristics from adequate information obtained from well drilling or test holes.

11. The ability of wells permitted to withdraw the authorized amount of water from this non-renewable aquifer may be less than the one hundred years upon which the amount of water in the aquifer is allocated, due to anticipated water level declines.

12. In accordance with Rule 5.3.6 of the Designated Basin Rules, it has been determined that withdrawal of ground water from the aquifer underlying the land claimed by the applicant will not, within one hundred years, deplete the flow of a natural steam or its alluvial aquifer at an annual rate greater than one-tenth of one percent of the annual rate of withdrawal and, therefore, the ground water is nontributary ground water as defined in Rule 4.2.19 of the Designated Basin Rules. No more than 98% of the amount of ground water withdrawn annually shall be consumed, as required by the Designated Basin Rules.

13. In accordance with Section 37-90-107(7), C.R.S., upon Commission approval of a determination of water right, well permits for wells to withdraw the authorized amount of water from the aquifer shall be available upon application, subject to the conditions of this determination and the Designated Basin Rules and subject to approval by the Commission.

14. On October 5, 2006, in accordance with Rule 9.1 of the Designated Basin Rules, a letter was sent to the Upper Black Squirrel Creek Ground Water Management District requesting written recommendations concerning this application. No written recommendations from the district were received.

15. The Commission Staff has evaluated the application relying on the claims to control of the ground water in the aquifer made by the applicant.

16. In accordance with Sections 37-90-107(7) and 37-90-112, C.R.S., the application was published in the Ranchland News newspaper on October 12 and 19, 2006.

17. No objections to the determination of water right and proposed allocation of ground water were received within the time limit set by statute.

18. In order to prevent unreasonable impairment to the existing water rights of others within the Upper Black Squirrel Creek Designated Ground Water Basin it is necessary to impose conditions on the determination of water right and proposed allocation of ground water. Under conditions as stated in the following Order, no unreasonable impairment of existing water rights will occur from approval of this determination of water right or from the issuance of well permits for wells to withdraw the authorized amount of allocated ground water from the aquifer.

ORDER

In accordance with Section 37-90-107(7), C.R.S., and the Designated Basin Rules, the Colorado Ground Water Commission orders that the application for determination of rights to designated ground water in the Arapahoe Aquifer underlying 37.7 acres of land, generally described as the W½ of the NW¼ of the NW¼, the NE¼ of the NW¼ of the NW¼, and the NW¼ of the SW¼ of the NW¼ of Section 10, Township 12 South, Range 65 West of the 6th Principal Meridian, is approved subject to the following conditions:

19. The allowed average annual amount of withdrawal of ground water from the aquifer shall not exceed 16.7 acre-feet. The allowed maximum annual amount of withdrawal may exceed the allowed average annual amount of withdrawal as long as the total volume of water withdrawn does not exceed the product of the number of years since the date of approval of this determination times the allowed average annual amount of withdrawal.

20. To conform to actual aquifer characteristics, the Commission may adjust the allowed average annual amount of ground water to be withdrawn from the aquifer based on analysis of geophysical logs or other site-specific data if such analysis indicates that the initial estimate of the volume of water in the aquifer was incorrect.

21. The applicant may pump the allowed average annual amount of withdrawal and the allowed maximum annual amount of withdrawal from one or more wells of a well field in any combination, so long as the total combined withdrawal of the wells does not exceed the amounts described in this Order.

22. No more than 98% of the ground water withdrawn annually shall be consumed. The Commission may require well owners to demonstrate periodically that no more than 98% of the water withdrawn is being consumed.

23. The use of ground water from this allocation shall be limited to the following beneficial uses: indoor residential and commercial (home-based business), stock watering, irrigation, hot tub/swimming pool, and augmentation. The place of use shall be limited to the above described 37.7 acre land area.

24. The applicant, or subsequent persons controlling this water right, shall record in the public records of the county - in which the claimed overlying land is located - notice of transfer of any portion of this water right to another within sixty days after the transfer, so that a title examination of the above described 37.7 acre land area, or any part thereof, shall reveal the changes affecting this water right. Such notice shall consist of a signed and dated deed which indicates the determination number, the aquifer, a description of the above described land area, the annual amount of ground water (acre-feet) transferred, name of the recipient, and the date of transfer.

25. Subject to the above conditions, well permits for wells to withdraw the allocated annual amount of water from the aquifer shall be available upon application subject to approval by the Commission and the following conditions:

    a. The wells shall be located on the above described 37.7 acre overlying land area.

    b. The wells must be constructed to withdraw water from only the Arapahoe Aquifer. Upon application for a well permit to construct such a well, the estimated top and base of the aquifer at the proposed well location will be determined by the Commission and indicated on the approved well permit. Plain non-perforated casing must be installed, grouted and sealed to prevent diversion of ground water from other aquifers and the movement of ground water between aquifers.

    c. The entire depth of each well must be geophysically logged prior to installing the casing as set forth in Rule 9 of the Statewide Nontributary Ground Water Rules, 2 CCR 402-7.

    d. Each well shall be constructed within 200 feet of the location specified on the approved well permit, but must be more than 600 feet from any existing large-capacity well completed in the same aquifer.

    e. A totalizing flow meter or other Commission approved measuring device shall be installed on each well and maintained in good working order by the well owner. Annual diversion records shall be collected and maintained by the well owner and submitted to the Commission or the Upper Black Squirrel Ground Water Management District upon their request.

    f. The well owner shall mark the well in a conspicuous place with the permit number and the name of the aquifer. The well owner shall take necessary means and precautions to preserve these markings.

26. A copy of this Findings and Order shall be recorded by the applicant in the public records of the county in which the claimed overlying land is located so that a title examination of the above described 37.7 acre overlying land area, or any part thereof, shall reveal the existence of this determination.

Dated this 29th day of November, 2006.

Hal D. Simpson
Executive Director
Colorado Ground Water Commission

By: Keith VanderHorst
Keith Vander Horst, P.E.
Supervisor, Designated Basins

Prepared by: SKR

EXHIBIT A

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1066-BD

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WATER RESOURCES
STATE ENGINEER
COLO.

STATE OF COLORADO
OFFICE OF THE STATE ENGINEER
DIVISION OF WATER RESOURCES
1313 Sherman St. Room 821
Denver, CO 80203
(303) 866-3581 Fax (303) 866-3589

NONTRIBUTARY GROUND WATER LANDOWNERSHIP STATEMENT

I (We) Peter R. Spahn Investment Trust
(Name(s))

Claim and say that I (we) am (are) the owner(s) of the following described property consisting of 37.7 acres in the County of El Paso, State of Colorado:

(Insert the property legal description)
W ½ NW ¼ NW ¼;
NE ¼ NW ¼ NW ¼;
NW ¼ SW ¼ NW ¼;
Sec. 10, T. 12S., R. 65W., 6th PM

and, that the ground water sought to be withdrawn from the Arapahoe aquifer underlying the above-described and has not been conveyed to reserved to another, nor has consent been given to its withdrawal by another.

Further, I (we) claim and say that I (we) have read the statements and made herein; know the contents hereof; and that the same are true to my (our) knowledge.

Park State Bank & Trust, Trustee
Joseph E. Walnofer, Vice President

Signature VP Date 9/19/2006

Signature Date

INSTRUCTIONS:
Please type or print neatly in black ink. This form may be reproduced by photocopy or word processing means.

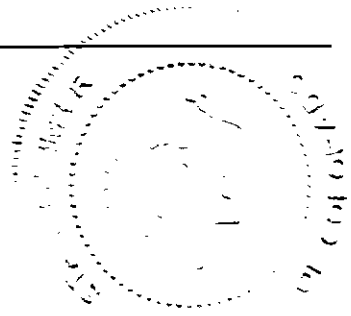
COLORADO GROUND WATER COMMISSION
FINDINGS AND ORDER

IN THE MATTER OF AN APPLICATION FOR DETERMINATION OF WATER RIGHT TO ALLOW THE WITHDRAWAL OF GROUND WATER IN THE UPPER BLACK SQUIRREL CREEK DESIGNATED GROUND WATER BASIN

APPLICANT: PETER R. SPAHN INVESTMENT TRUST

AQUIFER: DENVER

DETERMINATION NO.: **1067-BD**



In compliance with Section 37-90-107(7), C.R.S., and the Designated Basin Rules, 2 CCR 410-1, Peter R. Spahn Investment Trust (hereinafter "applicant") submitted an application for determination of water right to allow the withdrawal of designated ground water from the Denver Aquifer.

FINDINGS

1. The application was received complete by the Colorado Ground Water Commission on September 22, 2006.

2. The applicant requests a determination of rights to designated ground water in the Denver Aquifer (hereinafter "aquifer") underlying 37.7 acres, generally described as the W½ of the NW¼ of the NW¼, the NE¼ of the NW¼ of the NW¼, and the NW¼ of the SW¼ of the NW¼ of Section 10, Township 12 South, Range 65 West of the 6th Principal Meridian, in El Paso County. According to a signed statement dated September 19, 2006, the applicant owns the 37.7 acres of land, as further described in said affidavit which is attached hereto as Exhibit A, and claims control of the ground water in the aquifer underlying this land area.

3. The proposed annual amount of ground water to be allocated and withdrawn from the aquifer for intended beneficial uses is the maximum allowable amount.

4. The above described land area overlying the ground water claimed by the applicant is located within the boundaries of the Upper Black Squirrel Creek Designated Ground Water Basin and within the Upper Black Squirrel Creek Ground Water Management District. The Colorado Ground Water Commission (hereinafter "Commission") has jurisdiction.

5. The applicant intends to apply the allocated ground water to the following beneficial uses: indoor residential and commercial (home-based business), stock watering, irrigation, hot tub/swimming pool, and augmentation. The applicant's proposed place of use of the allocated ground water is the above described 37.7 acre land area.

6. The quantity of water in the aquifer underlying the 37.7 acres of land claimed by the applicant is 2,371 acre-feet. This determination was based on the following as specified in the Designated Basin Rules:

   a. The average specific yield of the saturated permeable material of the aquifer underlying the land under consideration that could yield a sufficient quantity of water that may be extracted and applied to beneficial use is 17 percent.

b. The average thickness of the saturated permeable material of the aquifer underlying the land under consideration that could yield a sufficient quantity of water that may be extracted and applied to beneficial use is 370 feet.

7. At this time, there is no substantial artificial recharge that would affect the aquifer within a one hundred year period.

8. Pursuant to Section 37-90-107(7), C.R.S., and in accordance with the Designated Basin Rules, the Commission shall allocate ground water in the aquifer based on ownership of the overlying land and an aquifer life of one hundred years. Therefore, the maximum allowed average annual amount of ground water in the aquifer that may be allocated for withdrawal pursuant to the data in the paragraphs above for the 37.7 acres of overlying land claimed by the applicant is 23.7 acre-feet.

9. A review of the records in the Office of the State Engineer has disclosed that none of the water in the aquifer underlying the land claimed by the applicant has been previously allocated or permitted for withdrawal.

10. Pursuant to Section 37-90-107(7)(c)(III), C.R.S., an approved determination of water right shall be considered a final determination of the amount of ground water so determined; except that the Commission shall retain jurisdiction for subsequent adjustment of such amount to conform to the actual local aquifer characteristics from adequate information obtained from well drilling or test holes.

11. The ability of wells permitted to withdraw the authorized amount of water from this non-renewable aquifer may be less than the one hundred years upon which the amount of water in the aquifer is allocated, due to anticipated water level declines.

12. In accordance with Rule 5.3.6 of the Designated Basin Rules, it has been determined that withdrawal of ground water from the aquifer underlying the land claimed by the applicant will not, within one hundred years, deplete the flow of a natural steam or its alluvial aquifer at an annual rate greater than one-tenth of one percent of the annual rate of withdrawal and, therefore, the ground water is nontributary ground water as defined in Rule 4.2.19 of the Designated Basin Rules. No more than 98% of the amount of ground water withdrawn annually shall be consumed, as required by the Designated Basin Rules.

13. In accordance with Section 37-90-107(7), C.R.S., upon Commission approval of a determination of water right, well permits for wells to withdraw the authorized amount of water from the aquifer shall be available upon application, subject to the conditions of this determination and the Designated Basin Rules and subject to approval by the Commission.

14. On October 5, 2006, in accordance with Rule 9.1 of the Designated Basin Rules, a letter was sent to the Upper Black Squirrel Creek Ground Water Management District requesting written recommendations concerning this application. No written recommendations from the district were received.

15. The Commission Staff has evaluated the application relying on the claims to control of the ground water in the aquifer made by the applicant.

16. In accordance with Sections 37-90-107(7) and 37-90-112, C.R.S., the application was published in the Ranchland News newspaper on October 12 and 19, 2006.

17. No objections to the determination of water right and proposed allocation of ground water were received within the time limit set by statute.

18. In order to prevent unreasonable impairment to the existing water rights of others within the Upper Black Squirrel Creek Designated Ground Water Basin it is necessary to impose conditions on the determination of water right and proposed allocation of ground water. Under conditions as stated in the following Order, no unreasonable impairment of existing water rights will occur from approval of this determination of water right or from the issuance of well permits for wells to withdraw the authorized amount of allocated ground water from the aquifer.

ORDER

In accordance with Section 37-90-107(7), C.R.S., and the Designated Basin Rules, the Colorado Ground Water Commission orders that the application for determination of rights to designated ground water in the Denver Aquifer underlying 37.7 acres of land, generally described as the W½ of the NW¼ of the NW¼, the NE¼ of the NW¼ of the NW¼, and the NW¼ of the SW¼ of the NW¼ of Section 10, Township 12 South, Range 65 West of the 6th Principal Meridian, is approved subject to the following conditions:

19. The allowed average annual amount of withdrawal of ground water from the aquifer shall not exceed 23.7 acre-feet. The allowed maximum annual amount of withdrawal may exceed the allowed average annual amount of withdrawal as long as the total volume of water withdrawn does not exceed the product of the number of years since the date of approval of this determination times the allowed average annual amount of withdrawal.

20. To conform to actual aquifer characteristics, the Commission may adjust the allowed average annual amount of ground water to be withdrawn from the aquifer based on analysis of geophysical logs or other site-specific data if such analysis indicates that the initial estimate of the volume of water in the aquifer was incorrect.

21. The applicant may pump the allowed average annual amount of withdrawal and the allowed maximum annual amount of withdrawal from one or more wells of a well field in any combination, so long as the total combined withdrawal of the wells does not exceed the amounts described in this Order.

22. No more than 98% of the ground water withdrawn annually shall be consumed. The Commission may require well owners to demonstrate periodically that no more than 98% of the water withdrawn is being consumed.

23. The use of ground water from this allocation shall be limited to the following beneficial uses: indoor residential and commercial (home-based business), stock watering, irrigation, hot tub/swimming pool, and augmentation. The place of use shall be limited to the above described 37.7 acre land area.

24. The applicant, or subsequent persons controlling this water right, shall record in the public records of the county - in which the claimed overlying land is located - notice of transfer of any portion of this water right to another within sixty days after the transfer, so that a title examination of the above described 37.7 acre land area, or any part thereof, shall reveal the changes affecting this water right. Such notice shall consist of a signed and dated deed which indicates the determination number, the aquifer, a description of the above described land area, the annual amount of ground water (acre-feet) transferred, name of the recipient, and the date of transfer.

25. Subject to the above conditions, well permits for wells to withdraw the allocated annual amount of water from the aquifer shall be available upon application subject to approval by the Commission and the following conditions:

    a. The wells shall be located on the above described 37.7 acre overlying land area.

    b. The wells must be constructed to withdraw water from only the Denver Aquifer. Upon application for a well permit to construct such a well, the estimated top and base of the aquifer at the proposed well location will be determined by the Commission and indicated on the approved well permit. Plain non-perforated casing must be installed, grouted and sealed to prevent diversion of ground water from other aquifers and the movement of ground water between aquifers.

    c. The entire depth of each well must be geophysically logged prior to installing the casing as set forth in Rule 9 of the Statewide Nontributary Ground Water Rules, 2 CCR 402-7.

    d. Each well shall be constructed within 200 feet of the location specified on the approved well permit, but must be more than 600 feet from any existing large-capacity well completed in the same aquifer.

    e. A totalizing flow meter or other Commission approved measuring device shall be installed on each well and maintained in good working order by the well owner. Annual diversion records shall be collected and maintained by the well owner and submitted to the Commission or the Upper Black Squirrel Ground Water Management District upon their request.

    f. The well owner shall mark the well in a conspicuous place with the permit number and the name of the aquifer. The well owner shall take necessary means and precautions to preserve these markings.

26. A copy of this Findings and Order shall be recorded by the applicant in the public records of the county in which the claimed overlying land is located so that a title examination of the above described 37.7 acre overlying land area, or any part thereof, shall reveal the existence of this determination.

Dated this 29th day of November, 2006.

Hal D. Simpson
Executive Director
Colorado Ground Water Commission

By: Keith L. Vander Horst
Keith Vander Horst, P.E.
Supervisor, Designated Basins

Prepared by: SKR

EXHIBIT A

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06/09/00

1067-BD

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WATER RESOURCES
STATE ENGINEER
COLO.

STATE OF COLORADO
OFFICE OF THE STATE ENGINEER
DIVISION OF WATER RESOURCES
1313 Sherman St. Room 821
Denver, CO 80203
(303) 866-3581 Fax (303) 866-3589

NONTRIBUTARY GROUND WATER LANDOWNERSHIP STATEMENT

I (We) Peter R. Spahn Investment Trust
(Name(s))

Claim and say that I (we) am (are) the owner(s) of the following described property consisting of 37.7 acres in the County of El Paso, State of Colorado:

(Insert the property legal description)
W ½ NW ¼ NW ¼;
NE ¼ NW ¼ NW ¼;
NW ¼ SW ¼ NW ¼;
Sec. 10, T. 12S., R. 65W., 6th PM

and, that the ground water sought to be withdrawn from the Denver aquifer underlying the above-described and has not been conveyed to reserved to another, nor has consent been given to its withdrawal by another.

Further, I (we) claim and say that I (we) have read the statements and made herein; know the contents hereof; and that the same are true to my (our) knowledge.

Park State Bank & Trust, Trustee
Joseph E. Walnofer, Vice President

Joseph E. Walnofer VP 9/19/2006
Signature Date

Signature Date

INSTRUCTIONS:
Please type or print neatly in black ink. This form may be reproduced by photocopy or word processing means.

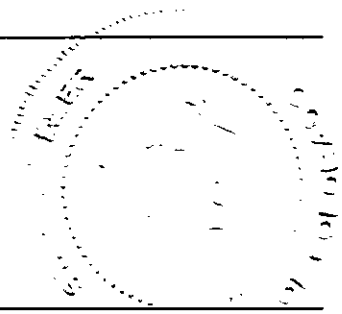
COLORADO GROUND WATER COMMISSION
FINDINGS AND ORDER

IN THE MATTER OF AN APPLICATION FOR DETERMINATION OF WATER RIGHT TO ALLOW THE WITHDRAWAL OF GROUND WATER IN THE UPPER BLACK SQUIRREL CREEK DESIGNATED GROUND WATER BASIN

APPLICANT: PETER R. SPAHN INVESTMENT TRUST

AQUIFER: DAWSON

DETERMINATION NO.: **1068-BD**



In compliance with Section 37-90-107(7), C.R.S., and the Designated Basin Rules, 2 CCR 410-1, Peter R. Spahn Investment Trust (hereinafter "applicant") submitted an application for determination of water right to allow the withdrawal of designated ground water from the Dawson Aquifer.

FINDINGS

1. The application was received complete by the Colorado Ground Water Commission on September 22, 2006.

2. The applicant requests a determination of rights to designated ground water in the Dawson Aquifer (hereinafter "aquifer") underlying 37.7 acres, generally described as the W½ of the NW¼ of the NW¼, the NE¼ of the NW¼ of the NW¼, and the NW¼ of the SW¼ of the NW¼ of Section 10, Township 12 South, Range 65 West of the 6th Principal Meridian, in El Paso County. According to a signed statement dated September 19, 2006, the applicant owns the 37.7 acres of land, as further described in said affidavit which is attached hereto as Exhibit A, and claims control of the ground water in the aquifer underlying this land area.

3. The proposed annual amount of ground water to be allocated and withdrawn from the aquifer for intended beneficial uses is the maximum allowable amount.

4. The above described land area overlying the ground water claimed by the applicant is located within the boundaries of the Upper Black Squirrel Creek Designated Ground Water Basin and within the Upper Black Squirrel Creek Ground Water Management District. The Colorado Ground Water Commission (hereinafter "Commission") has jurisdiction.

5. The applicant intends to apply the allocated ground water to the following beneficial uses: indoor residential and commercial (home-based business), stock watering, irrigation, hot tub/swimming pool, and augmentation. The applicant's proposed place of use of the allocated ground water is the above described 37.7 acre land area.

6. The quantity of water in the aquifer underlying the 37.7 acres of land claimed by the applicant is 2,941 acre-feet. This determination was based on the following as specified in the Designated Basin Rules:

   a. The average specific yield of the saturated permeable material of the aquifer underlying the land under consideration that could yield a sufficient quantity of water that may be extracted and applied to beneficial use is 20 percent.

b. The average thickness of the saturated permeable material of the aquifer underlying the land under consideration that could yield a sufficient quantity of water that may be extracted and applied to beneficial use is 390 feet based on evaluation of the geologic log of an existing well, Permit No. 214120, located on the property. Use of this geologic log constitutes site specific data as provided for by Rule 5.3.4.2 of the Designated Basin Rules.

7. At this time, there is no substantial artificial recharge that would affect the aquifer within a one hundred year period.

8. Pursuant to Section 37-90-107(7), C.R.S., and in accordance with the Designated Basin Rules, the Commission shall allocate ground water in the aquifer based on ownership of the overlying land and an aquifer life of one hundred years. Therefore, the maximum allowed average annual amount of ground water in the aquifer that may be allocated for withdrawal pursuant to the data in the paragraphs above for the 37.7 acres of overlying land claimed by the applicant is 29.4 acre-feet.

9. In accordance with Rule 5.3.2.4 of the Designated Basin Rules, the maximum average annual amount of ground water available for allocation from the aquifer underlying the 37.7 acres of land claimed by the applicant is reduced to 28.4 acre-feet to allow for the annual withdrawal of a small capacity well which is completed in the aquifer, Permit No. 214120. Except for this well, review of the records in the Office of the State Engineer has disclosed that none of the water in the aquifer underlying the land claimed by the applicant has been previously allocated or permitted for withdrawal.

10. Pursuant to Section 37-90-107(7)(c)(III), C.R.S., an approved determination of water right shall be considered a final determination of the amount of ground water so determined; except that the Commission shall retain jurisdiction for subsequent adjustment of such amount to conform to the actual local aquifer characteristics from adequate information obtained from well drilling or test holes.

11. The ability of wells permitted to withdraw the authorized amount of water from this non-renewable aquifer may be less than the one hundred years upon which the amount of water in the aquifer is allocated, due to anticipated water level declines.

12. In accordance with Rule 5.3.6 of the Designated Basin Rules, it has been determined that withdrawal of ground water from the aquifer underlying the land claimed by the applicant will, within one hundred years, deplete the flow of a natural steam or its alluvial aquifer at an annual rate greater than one-tenth of one percent of the annual rate of withdrawal and, therefore, the ground water is considered to be not-nontributary ground water. Withdrawal of water from the aquifer underlying the claimed land area would impact the alluvial aquifer of Upper Black Squirrel Creek or its tributaries, which has been determined to be over-appropriated. Commission approval of a replacement plan - pursuant to Section 37-90-107.5, C.R.S., and Rule 5.6 of the Designated Basin Rules - providing for the actual depletion of the alluvial aquifer and adequate to prevent any material injury to existing water rights, would be required prior to approval of well permits for wells to be located on this land area to withdraw the allocated ground water from the aquifer.

13. In accordance with Section 37-90-107(7), C.R.S., upon Commission approval of a determination of water right, well permits for wells to withdraw the authorized amount of water from the aquifer shall be available upon application, subject to the conditions of this determination and the Designated Basin Rules and subject to approval by the Commission.

14. On October 5, 2006, in accordance with Rule 9.1 of the Designated Basin Rules, a letter was sent to the Upper Black Squirrel Creek Ground Water Management District requesting written recommendations concerning this application. No written recommendations from the district were received.

15. The Commission Staff has evaluated the application relying on the claims to control of the ground water in the aquifer made by the applicant.

16. In accordance with Sections 37-90-107(7) and 37-90-112, C.R.S., the application was published in the Ranchland News newspaper on October 12 and 19, 2006.

17. No objections to the determination of water right and proposed allocation of ground water were received within the time limit set by statute.

18. In order to prevent unreasonable impairment to the existing water rights of others within the Upper Black Squirrel Creek Designated Ground Water Basin it is necessary to impose conditions on the determination of water right and proposed allocation of ground water. Under conditions as stated in the following Order, no unreasonable impairment of existing water rights will occur from approval of this determination of water right or from the issuance of well permits for wells to withdraw the authorized amount of allocated ground water from the aquifer.

ORDER

In accordance with Section 37-90-107(7), C.R.S., and the Designated Basin Rules, the Colorado Ground Water Commission orders that the application for determination of rights to designated ground water in the Dawson Aquifer underlying 37.7 acres of land, generally described as the W½ of the NW¼ of the NW¼, the NE¼ of the NW¼ of the NW¼, and the NW¼ of the SW¼ of the NW¼ of Section 10, Township 12 South, Range 65 West of the 6th Principal Meridian, is approved subject to the following conditions:

19. The allowed average annual amount of withdrawal of ground water from the aquifer shall not exceed 28.4 acre-feet. The allowed maximum annual amount of withdrawal may exceed the allowed average annual amount of withdrawal as long as the total volume of water withdrawn does not exceed the product of the number of years since the date of approval of this determination times the allowed average annual amount of withdrawal.

20. To conform to actual aquifer characteristics, the Commission may adjust the allowed average annual amount of ground water to be withdrawn from the aquifer based on analysis of geophysical logs or other site-specific data if such analysis indicates that the initial estimate of the volume of water in the aquifer was incorrect.

21. The applicant may pump the allowed average annual amount of withdrawal and the allowed maximum annual amount of withdrawal from one or more wells of a well field in any combination, so long as the total combined withdrawal of the wells does not exceed the amounts described in this Order.

22. Commission approval of a replacement plan, providing for actual depletion of affected alluvial aquifers and adequate to prevent any material injury to existing water rights in such alluvial aquifers is required prior to approval of well permits for wells to be located on the overlying land area to withdraw ground water from the aquifer.

23. The use of ground water from this allocation shall be limited to the following beneficial uses: indoor residential and commercial (home-based business), stock watering, irrigation, hot tub/swimming pool, and augmentation. The place of use shall be limited to the above described 37.7 acre land area.

24. The applicant, or subsequent persons controlling this water right, shall record in the public records of the county - in which the claimed overlying land is located - notice of transfer of any portion of this water right to another within sixty days after the transfer, so that a title examination of the above described 37.7 acre land area, or any part thereof, shall reveal the changes affecting this water right. Such notice shall consist of a signed and dated deed which indicates the determination number, the aquifer, a description of the above described land area, the annual amount of ground water (acre-feet) transferred, name of the recipient, and the date of transfer.

25. Subject to the above conditions, well permits for wells to withdraw the allocated annual amount of water from the aquifer shall be available upon application subject to approval by the Commission and the following conditions:

    a. The wells shall be located on the above described 37.7 acre overlying land area.

    b. The wells must be constructed to withdraw water from only the Dawson Aquifer. Upon application for a well permit to construct such a well, the estimated top and base of the aquifer at the proposed well location will be determined by the Commission and indicated on the approved well permit. Plain non-perforated casing must be installed, grouted and sealed to prevent diversion of ground water from other aquifers and the movement of ground water between aquifers.

    c. The entire depth of each well must be geophysically logged prior to installing the casing as set forth in Rule 9 of the Statewide Nontributary Ground Water Rules, 2 CCR 402-7.

    d. Each well shall be constructed within 200 feet of the location specified on the approved well permit, but must be more than 600 feet from any existing large-capacity well completed in the same aquifer.

e. A totalizing flow meter or other Commission approved measuring device shall be installed on each well and maintained in good working order by the well owner. Annual diversion records shall be collected and maintained by the well owner and submitted to the Commission or the Upper Black Squirrel Ground Water Management District upon their request.

f. The well owner shall mark the well in a conspicuous place with the permit number and the name of the aquifer. The well owner shall take necessary means and precautions to preserve these markings.

26. A copy of this Findings and Order shall be recorded by the applicant in the public records of the county in which the claimed overlying land is located so that a title examination of the above described 37.7 acre overlying land area, or any part thereof, shall reveal the existence of this determination.

Dated this 29th day of November, 2006.

Hal D. Simpson
Executive Director
Colorado Ground Water Commission

By: Keith L. Vander Horst
Keith Vander Horst, P.E.
Supervisor, Designated Basins

Prepared by: SKR

EXHIBIT A

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06/09/00

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SEP 22 2006

WATER RESOURCES
STATE ENGINEER
COLO.

STATE OF COLORADO
OFFICE OF THE STATE ENGINEER
DIVISION OF WATER RESOURCES
1313 Sherman St. Room 821
Denver, CO 80203
(303) 866-3581 Fax (303) 866-3589

NONTRIBUTARY GROUND WATER LANDOWNERSHIP STATEMENT

I (We) Peter R. Spahn Investment Trust
(Name(s))

Claim and say that I (we) am (are) the owner(s) of the following described property consisting of 37.7 acres in the County of El Paso, State of Colorado:

(Insert the property legal description)
W ½ NW ¼ NW ¼;
NE ¼ NW ¼ NW ¼;
NW ¼ SW ¼ NW ¼;
Sec. 10, T. 12S., R. 65W., 6th PM

and, that the ground water sought to be withdrawn from the Dawson aquifer underlying the above-described and has not been conveyed to reserved to another, nor has consent been given to its withdrawal by another.

Further, I (we) claim and say that I (we) have read the statements and made herein; know the contents hereof; and that the same are true to my (our) knowledge.

Park State Bank & Trust, Trustee
Joseph E. Walnofer, Vice President

VP 9/19/2006
Signature Date

Signature Date

INSTRUCTIONS:
Please type or print neatly in black ink. This form may be reproduced by photocopy or word processing means.

Appendix E

March 4, 2020

ENTECH
ENGINEERING, INC.

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

SMH Consultants
411 S. Tejon Street, Suite 1
Colorado Springs, CO 80903

Attn: Brett Louk

Re: Soil, Geology, and Geologic Hazard Study
Aztec Residential Subdivision
13235 Vollmer Road
Parcel No. 52000-00-303
El Paso County, Colorado

Dear Mr. Louk:

GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The site is located in a portion of the NW¼ of Section 10, Township 12 South, Range 65 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located approximately 5 miles northeast of Colorado Springs city limits, southeast of Swan Road and Vollmer Road 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 gradually to moderately sloping to the south to south-southeast, and to the north. The Palmer Divide bisects the central portion of the site. The head of a minor drainage is located in the southern portion of the property. Water was not observed in the drainage at the time of this investigation. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have included undeveloped and a rural residential. The southern portion of the site is located in the northeastern extent of the Black Forest burn scar. The site contains field grasses, weeds, kinnikinick, and ponderosa pines in the western portion of the site and around the existing house located on Lot 4. Site photographs, taken January 24, 2020, are included in Appendix A.

Total acreage involved in the proposed subdivision is 37.7-acres. Four rural residential lots are proposed as part of the replat. The proposed lot sizes range from 4.79-acres to 18.60-acres. An existing house is located on Lot 4 which will remain. The new lots will be serviced by individual wells and on-site wastewater treatment systems. The Site Plan with the proposed replat is presented in Figure 3.

LAND USE AND ENGINEERING GEOLOGY

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

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

SCOPE OF THE REPORT

The scope of the report will include the following:

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

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), previously the Soil Conservation Service (SCS) survey was also reviewed to evaluate the site. The position of mappable units within the subject property are shown on the Geologic Map. Our mapping procedures involved both field reconnaissance and measurements, and aerial photo reconnaissance and interpretation. The same mapping procedures have also been utilized to produce the Geology/Engineering Geology Map which identified pertinent geologic conditions affecting development. The field mapping was performed by personnel of Entech Engineering, Inc. on January 24, 2020.

Two test borings and two test pits were excavated on the site to determine general suitability for the use of on-site wastewater treatment systems and general soil characteristics for residential construction. The locations of the test pits are indicated on the Site Plan/Test Pit Location Map, Figure 3. The Test Pit Logs are presented in Appendix B. Results of this testing will be discussed later in this report.

Laboratory testing was also performed on some of the soils to classify and determine the soils engineering characteristics. Laboratory tests included grain-size analysis, ASTM D-422, and Atterberg Limits, ASTM D-4318. Results of the laboratory testing are included in Appendix C. A Summary of Laboratory Test Results is presented in Table 1.

SOIL AND GEOLOGIC CONDITIONS

Soil Survey

The Natural Resource Conservation Service (NRCS) (Reference 1, Figure 4), previously the Soil Conservation Service (Reference 2) has mapped three soil types on the site. Complete descriptions of the soil types are presented in Appendix D. In general, the soils consist of sandy loam to gravelly loamy sand and sandy clay loam. The soils are described as follows:

Type	Description
26	Elbeth Sandy Loam, 8 – 15% Slopes
40	Kettle Gravelly Loamy Sand, 3 – 8% Slopes
68	Peyton-Pring Complex, 3 – 8% Slopes

The soils have been described to have moderate to rapid permeabilities. The soils are described as well suited for use as homesites. Possible hazards with soils erosion are 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

The soils encountered in the test borings and test pits consisted of silty to slightly silty sand and sandy clay loam overlying weathered to formational clayey to silty sandstone. Bedrock was encountered at depths ranging from 3 to 7 feet. The upper sands were encountered at medium dense states and moderate moisture conditions, and the sandstone was encountered at very dense states and moderate moisture conditions. The samples of sand tested had approximately 8 to 25 percent of the soil size particles passing the No. 200 sieve. Atterberg Limits Testing resulted in the sand being non-plastic. The samples of sandstone tested had 17 to 23 percent of the soil size particles passing the No. 200 sieve. Atterberg Limits Testing on a sample of clayey sandstone resulted in a liquid limit of 41 and a plastic index of 20. FHA Swell Testing on a sample of the clayey sandstone resulted in an expansion pressure of 360 psf, which indicates a low expansion potential. Highly expansive claystone and siltstone lenses are commonly interbedded in the Dawson Formation.

Groundwater

Groundwater or signs of seasonally occurring water were not encountered in the test pits, which were excavated to 8 feet. Groundwater was not encountered in the test borings, which were drilled to 20 feet. It is anticipated groundwater will not affect shallow foundations on the majority of the site. Areas of potentially seasonal shallow groundwater have been mapped in the head of a minor drainage in the southern portion of the site that are discussed in the following sections. Fluctuations in groundwater conditions may occur due to variations in rainfall or other factors not readily apparent at this time. 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 features during construction.

Geology

Approximately 13 miles west of the site is a major structural feature known as the Rampart Range Fault. This fault marks the boundary between the Great Plains Physiographic Province and the Southern Rocky Mountain Province. The site exists within a large structural feature known as the Denver Basin. Bedrock in the area is typically gently dipping in a northerly direction (Reference 3). The bedrock underlying the site consists of the Dawson Formation of Cretaceous Age. The Dawson Formation typically consists of coarse-grained arkosic sandstone with interbedded layers claystone or siltstone.

The geology of the site was evaluated using the *Geologic Map of the Black Forest,* by Thorson in 2003, (Reference 4, Figure 5). The Geology Map for the site is presented in Figure 6. Three mappable units were identified on this site which is described as follows:

Qau **Alluvium, Undivided of Holocene and Pleistocene Age:** These are sheetwash and stream deposited alluvium that exists in the western portion of the site associated with alluvial-filled valley heads. These materials typically consist of silty to clayey sands and gravel.

QTa **Alluvium of Palmer Divide of Early Pleistocene or Pliocene Age:** These materials consist of water-deposited stream terrace deposits located along the Palmer Divide. They typically consist of silty to clayey sands with gravelly lenses and may contain areas of pebble and cobble lenses.

Qc/Tkd **Colluvium of Quaternary Age overlying Dawson Formation of Tertiary to Cretaceous Age:** The materials consist of colluvial or residual soils overlying the bedrock materials on-site. The colluvial soils were deposited by the action of sheetwash and gravity. The residual soils were derived from the in-situ weathering of the bedrock on site. These materials typically consist of silty to clayey sand with potential areas of sandy clays. The bedrock consists of the Dawson Formation. The Dawson Formation typically consists of coarse-grained, arkosic sandstone with interbedded lenses of fine-grained sandstone, siltstone and claystone.

The soils listed above were mapped from site-specific mapping, the *Geologic Map of the Black Forest Quadrangle* distributed by the Colorado Geologic Survey in 2003 (Reference 4, Figure 5), The *Geologic Map of the Colorado Springs-Castle Rock Area,* distributed by the US Geological Survey in 1979 (Reference 5), and the *Geologic Map of the Pueblo 1° x 2° Quadrangle,* distributed by the US Geological Survey in 1978 (Reference 6). The test borings and test pits were used in evaluating the site and is 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 where new construction is proposed. The engineering geologic hazards identified on this site include potentially seasonal shallow groundwater areas. These hazards and recommended mitigation techniques are discussed as follows:

Expansive Soils

Expansive soils were not encountered on the site. Highly expansive claystone and siltstone are commonly interbedded in the sandstone of the Dawson Formation. Expansive clays, if encountered beneath foundations, can cause differential movement in the structure foundation.

Mitigation: Should expansive soils be encountered beneath the foundation; mitigation will be necessary. Mitigation of expansive soils will require special foundation design. Overexcavation and replacement with non-expansive soils at a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557 is a suitable mitigation, which is common in the area. Floor

slabs on expansive soils should be expected to experience movement. Overexcavation and replacement has been successful in minimizing slab movements.

Potentially Seasonal Shallow Groundwater Area

The site is not mapped within any floodplains according to the FEMA Map No. 08041CO320G, dated December 7, 2018 (Figure 7, Reference 7). Minor areas of potentially seasonal shallow groundwater were observed on the site (Figure 6). In these areas, we would anticipate the potential for periodically high subsurface moisture conditions and frost heave potential. These areas lie within low-lying areas and along the head of a minor drainage in the southern portion of the site located on Lot 1. Water was not observed in any of the drainages at the time of our site investigation. These areas can likely be avoided or properly mitigated by development. The potential exists for high groundwater levels during high moisture periods and should structures encroach on these areas the following precautions should be followed.

Mitigation: Foundations must have a minimum 30-inch depth for frost protection. In areas where high subsurface moisture conditions are anticipated periodically, subsurface perimeter drains are recommended to help prevent the intrusion of water into areas below grade. Typical drain details are presented in Figure 8. Any grading in these areas should be done to direct surface flow around construction to avoid areas of ponded water. All organic material would be completely removed prior to any fill placement. **Specific drainage studies are beyond the scope of this report.**

RELEVANCE OF GEOLOGIC CONDITIONS TO LAND USE PLANNING

The proposed development will be rural-residential utilizing individual on-site wastewater treatment systems and water wells. Total acreage involved in the proposed subdivision is 37.7-acres. Four rural residential lots are proposed as part of the replat. The proposed lot sizes range from 4.79-acres to 18.6-acres. An existing house is located on Lot 4 with an existing water well and on-site wastewater treatment system which will remain. The new lots will be serviced by individual wells and on-site wastewater treatment systems. The existing geologic and engineering geologic conditions will impose minor constraints on development and construction. The geologic conditions on the site include potentially seasonal shallow and shallow groundwater areas, which can be satisfactorily mitigated through avoidance or proper engineering design and construction practices.

The upper granular soils encountered in the test borings and test pits on the site were encountered at loose to dense states, and the sandstone was encountered at very dense states. Highly expansive claystone and siltstone are commonly interbedded in the sandstone of the Dawson Formation. Mitigation of expansive soils if encountered will be required. 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. Overexcavation and replacement has been successful in minimizing slab movements. These soils will not prohibit development.

A minor area of potentially seasonal shallow groundwater was observed on the site (Figure 6). In these areas, we would anticipate the potential for periodically high subsurface moisture conditions and frost heave potential. These areas lie within low-lying area and along the head of a minor drainage in the southern portion of the site on Lot 1. These areas can likely be avoided or properly mitigated by development. The potential exists for high groundwater levels during high moisture periods and should structures encroach on these areas. A subsurface perimeter drain is recommended should structures encroach on this area. Typical drain details are presented in Figure 8. Septic systems are not recommended in in these areas due to the potential for shallow groundwater. Any grading in theses areas should be done to direct surface flow around construction to avoid areas of ponded water. All organic material should be completely removed prior to any fill placement. Specific drainage studies are beyond the scope of this report. The site is not mapped within any floodplains according to the FEMA Map No. 80841C0320G (Figure 7, Reference 7).

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.

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 8), of the area of the site is not mapped with any potential aggregate resources. According to the *Atlas of Sand, Gravel and Quarry Aggregate Resources, Colorado Front Range Counties* distributed by the Colorado Geological Survey (Reference 9), the site is not mapped with any resources. According to the *Evaluation of Mineral and Mineral Fuel Potential* (Reference 10), the area of the site has been mapped as "little or no potential" for industrial minerals.

According to *the Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands* (Reference 10), 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 10).

The site has been mapped as "Fair" for oil and gas resources (Reference 10). No oil or gas fields have been discovered in the area of the site. The sedimentary rocks in the area may lack the geologic structure for trapping oil or gas; therefore, it may not be considered a significant resource. Hydraulic fracturing is a new method that is being used to extract oil and gas from rocks. It utilizes pressurized fluid to extract oil and gas from rocks that would not normally be productive. The area of the site has not been explored to determine if the rocks underlying the site would be commercially viable utilizing hydraulic fracturing. The practice of hydraulic fracturing has come under review due to concerns about environmental impacts, health and safety.

EROSION CONTROL

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

With regard to water erosion, loosely compacted soils will be the most susceptible to water erosion, residually weathered soils 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.

CLOSURE

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

It should be pointed out that because of the nature of data obtained by random sampling of such variable and non-homogeneous materials as soil and rock, it is important that we be informed of any differences observed between surface and subsurface conditions encountered in construction and those assumed in the body of this report. Individual investigations for new building sites and septic systems will be required prior to construction. Construction and design

personnel should be made familiar with the contents of this report. Reporting such discrepancies to Entech Engineering, Inc. soon after they are discovered would be greatly appreciated and could possibly help avoid construction and development problems.

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

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

Respectfully Submitted,

ENTECH ENGINEERING, INC.

Logan L. Langford, P.G.
Geologist

Reviewed by:

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

LLL/lll

Encl.

Entech Job No. 200160
AAprojects/2020/200160 sg&ghs

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TABLES

TABLE 1

SUMMARY OF LABORATORY TEST RESULTS

CLIENT SMH CONSULTANTS
PROJECT 13235 VOLLMER ROAD
JOB NO. 200160

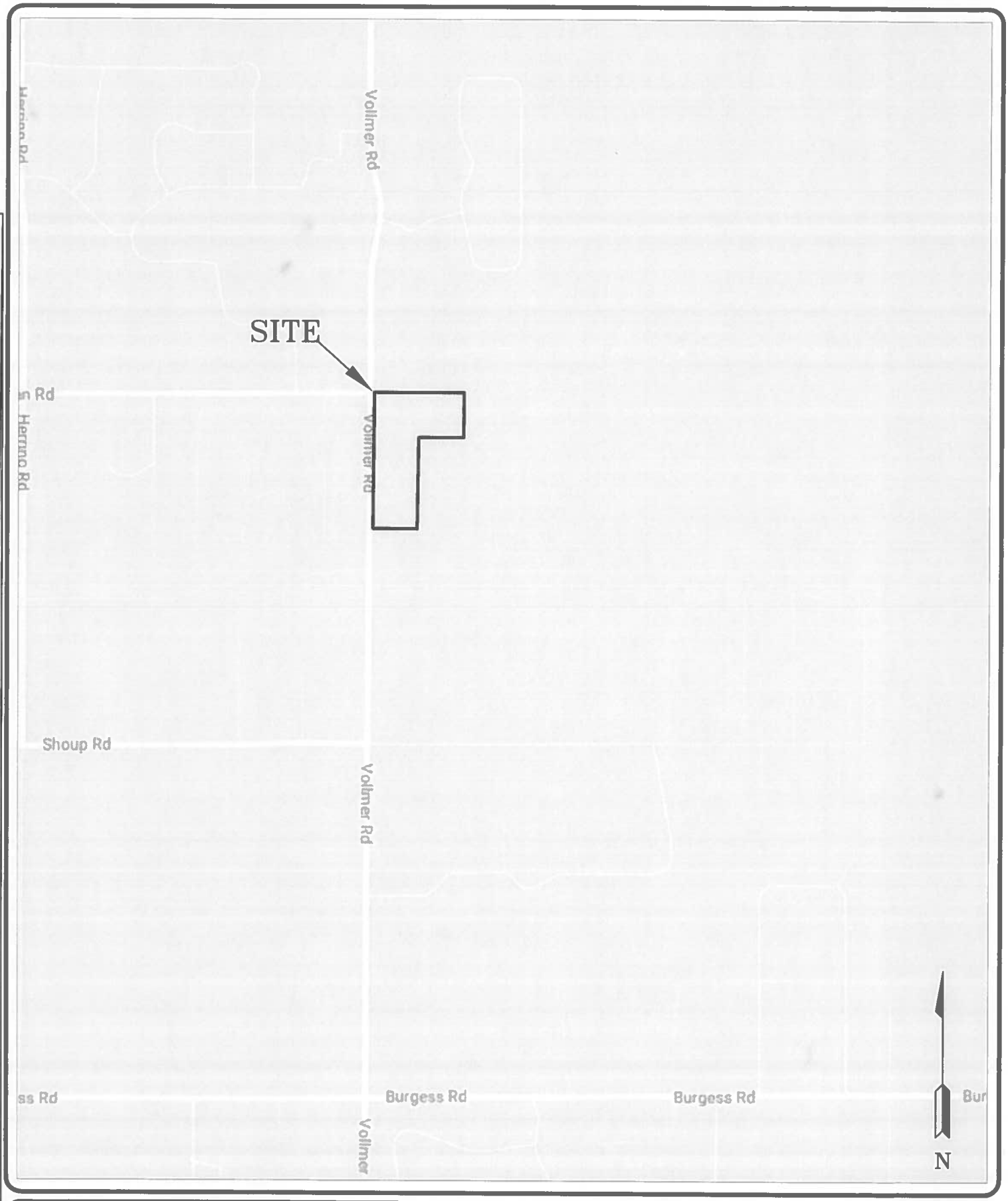
SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT (%)	PLASTIC INDEX (%)	SULFATE (WT %)	FHA SWELL (PSF)	SWELL/ CONSOL (%)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION
1	1	2-3			25.1						SM	SAND, SILTY
1	2	5			17.8	NV	NP				SM	SAND, SILTY
1	TP-2	5-6			8.0						SM-SW	SAND, SLIGHTLY SILTY
2	TP-1	6-7			16.5				360		SC	SANDSTONE, CLAYEY
2	1	15			23.0	41	20				SC	SANDSTONE, CLAYEY

Table 2: Summary Tactile Test Pit Results

Test Pit No.	USDA Soil Type	LTAR Value	Depth to Bedrock (ft.)	Depth to Seasonally Occurring Groundwater (ft.)
1	4A*	0.20*	3*	N/A
2	3A*	0.30*	N/A	N/A

*- Conditions that will require an engineered OWTS

FIGURES



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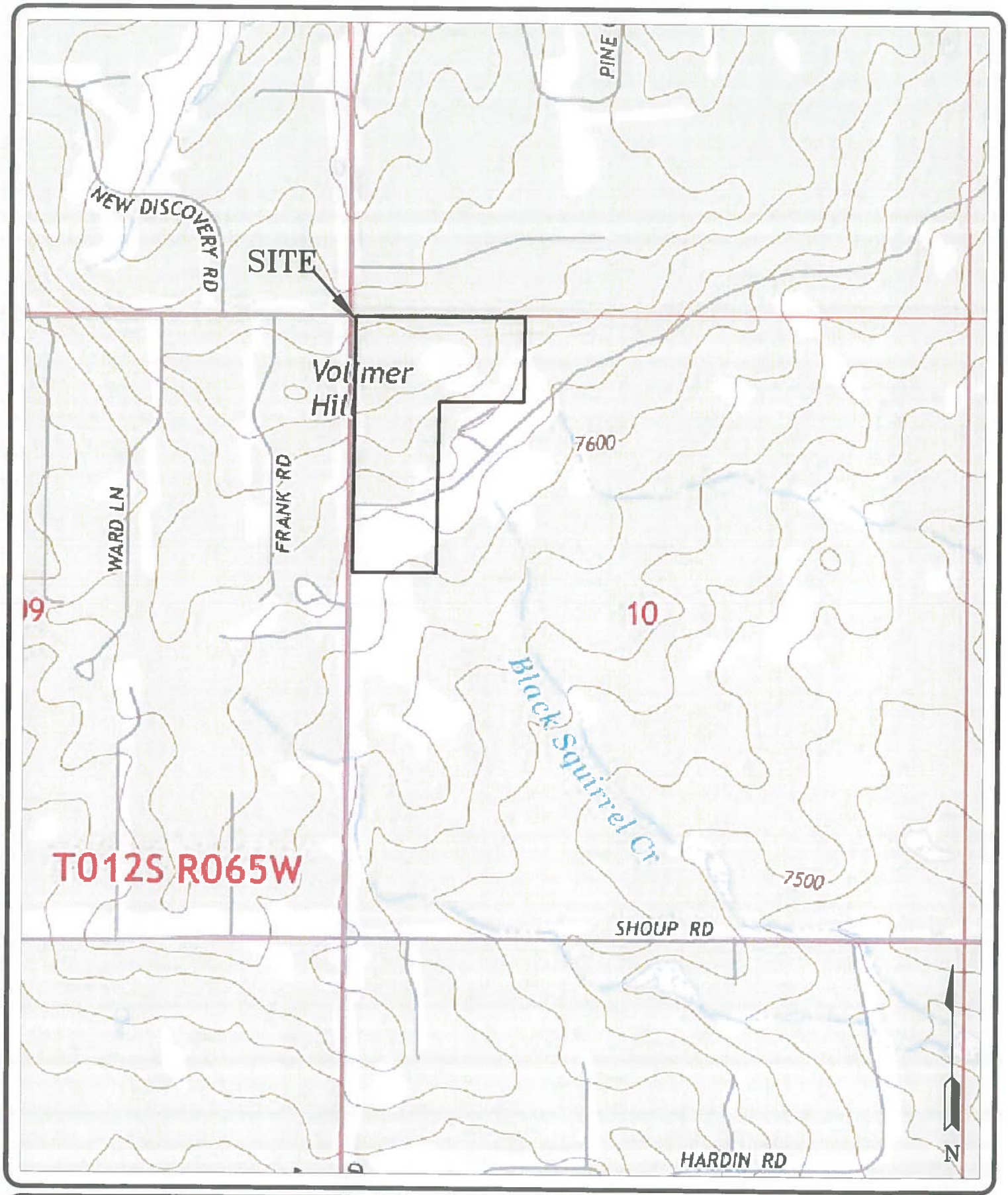
VICINITY MAP
AZTEC RESIDENTIAL SUBDIVISION
13235 VOLLMER ROAD
EL PASO COUNTY, CO.
FOR: SMH CONSULTANTS

DRAWN:	DATE:	CHECKED:	DATE:
LLL	3/4/20		

JOB NO.: 200160

FIG NO.: 1



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USGS MAP
AZTEC RESIDENTIAL SUBDIVISION
13235 VOLLMER ROAD
EL PASO COUNTY, CO.
FOR: SMH CONSULTANTS

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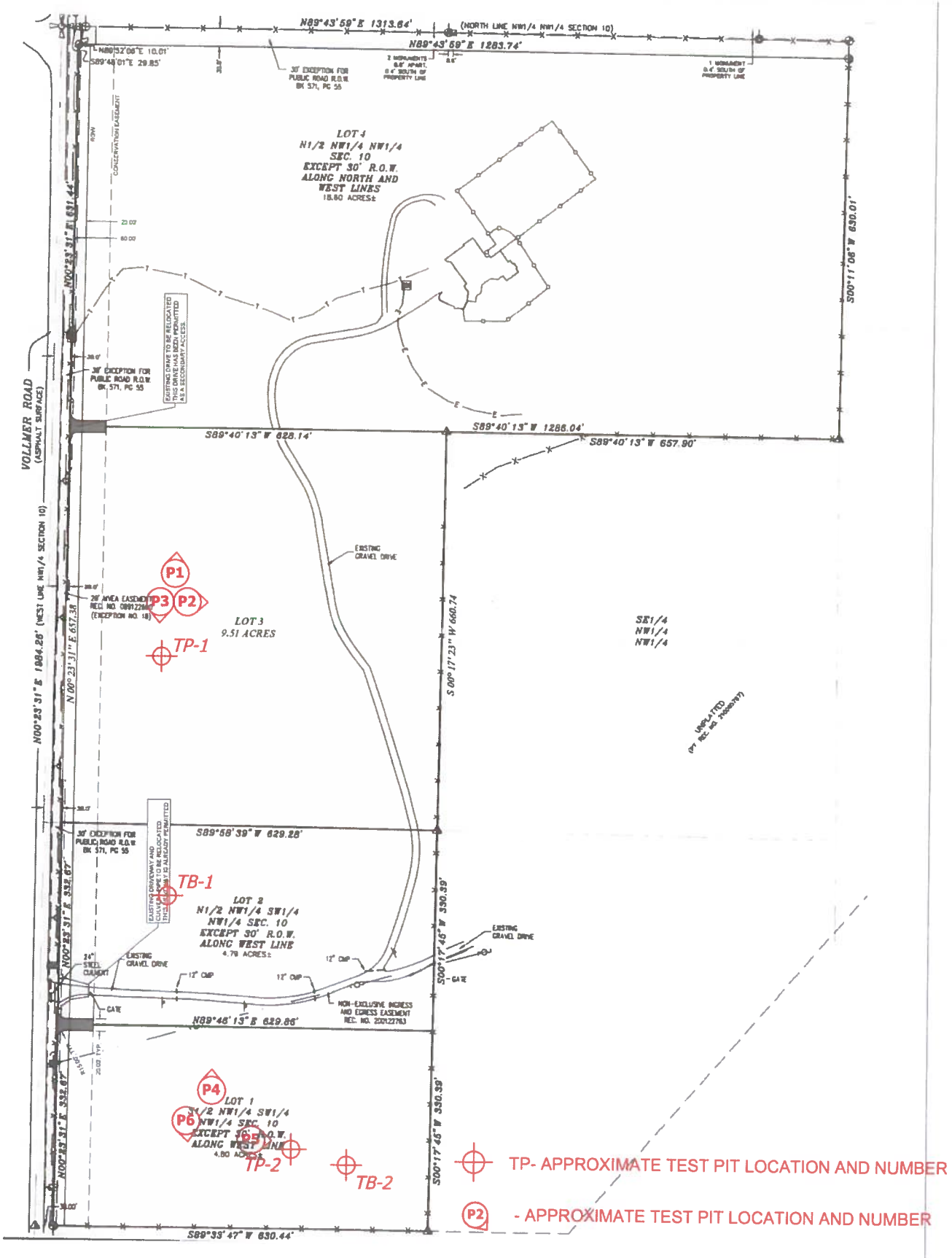
LLL	3/4/20		

JOB NO.: 200160

FIG NO.: 2



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SITE PLAN/TESTING LOCATION MAP
AZTEC RESIDENTIAL SUBDIVISION
13235 VOLLMER ROAD
EL PASO COUNTY, CO.
FOR: SMH CONSULTANTS

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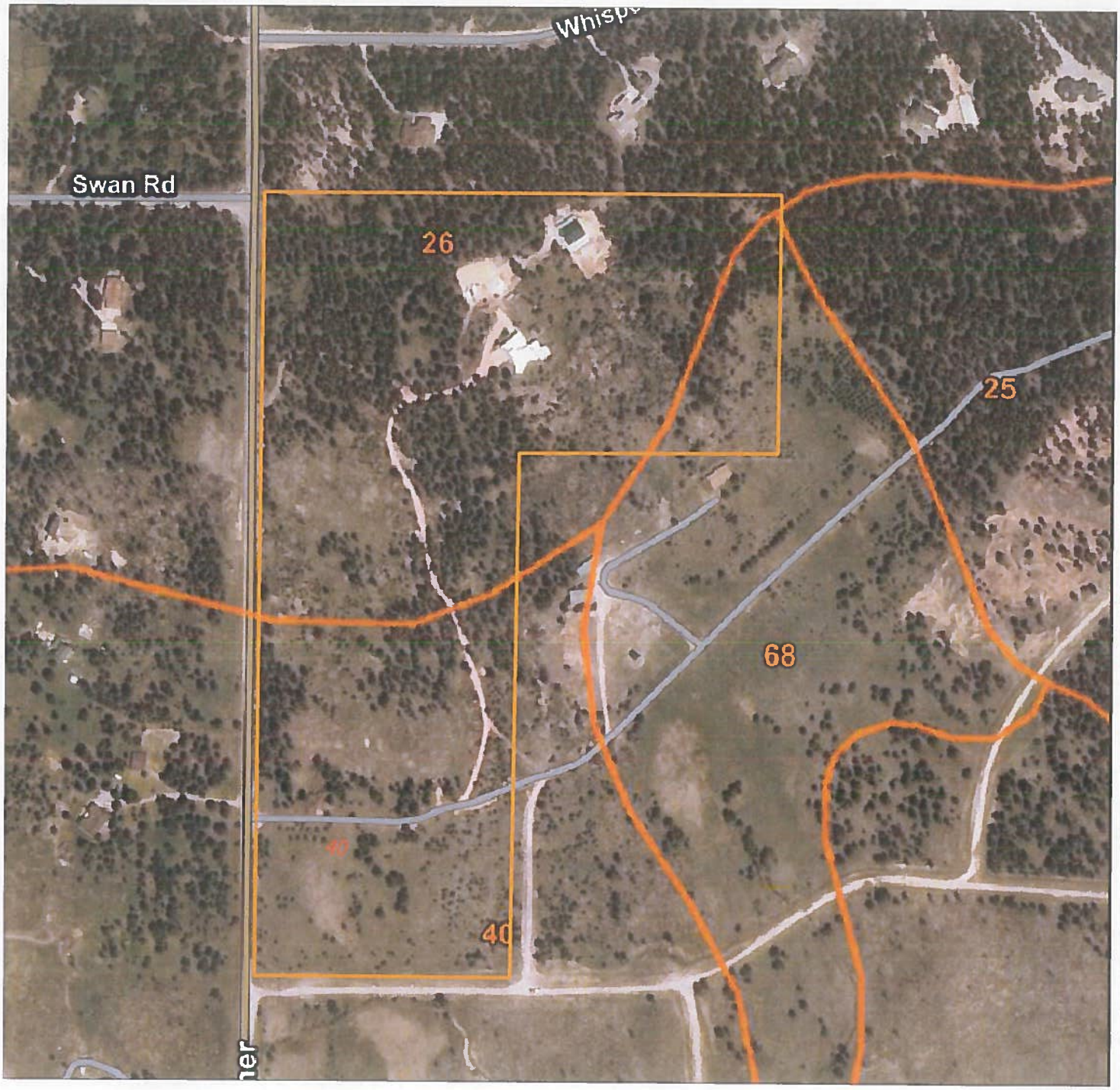
LLL	3/4/20		

JOB NO.: 200160

FIG NO.: 3



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SOIL SURVEY MAP
AZTEC RESIDENTIAL SUBDIVISION
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EL PASO COUNTY, CO.
SMH CONSULTANTS

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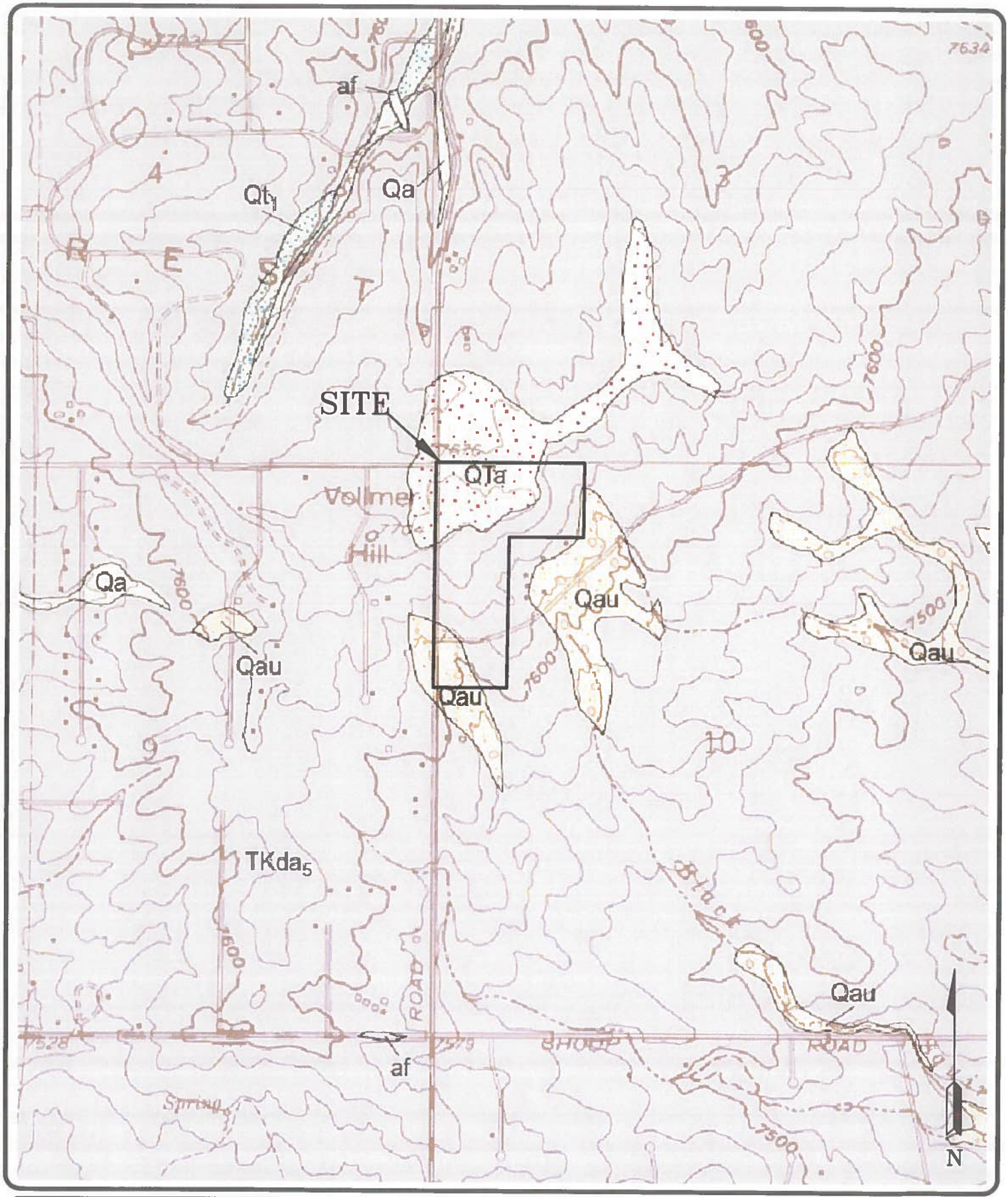
JOB NO.: 200160

FIG NO.: 4



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BLACK FOREST QUADRANGLE GEOLOGIC MAP
AZTEC RESIDENTIAL SUBDIVISION
13235 VOLLMER ROAD
EL PASO COUNTY, CO.
SMH CONSULTANTS

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LLL	3/4/20		

JOB NO.: 200160

FIG NO.: 5

Legend:

Qau - Alluvium Undivided of Holocene and Pleistocene Age:
sheetwash and stream deposited alluvium associated with alluvial-filled valley heads

QTa - Alluvium of Palmer Divide of Early Pleistocene or Pliocene Age:
stream terrace deposits located along the Palmer Divide

QcTKd - Colluvium of Quaternary Age overlying Dawson Formation of Tertiary to Cretaceous Age:
colluvial and residual soils overlying arkosic sandstone with interbedded fine-grained sandstone, siltstone and claystone

psw - potentially shallow groundwater area

N

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ENGINEERING GEOLOGY MAP
AZTEC RESIDENTIAL SUBDIVISION
13235 VOLLMER ROAD
EL PASO COUNTY, CO.
SMH CONSULTANTS

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LLL	3/4/20		

JOB NO.: 200160

FIG NO.: 6

N

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FEMA FLOODPLAIN MAP
AZTEC RESIDENTIAL SUBDIVISION
13235 VOLLMER ROAD
EL PASO COUNTY, CO.
SMH CONSULTANTS

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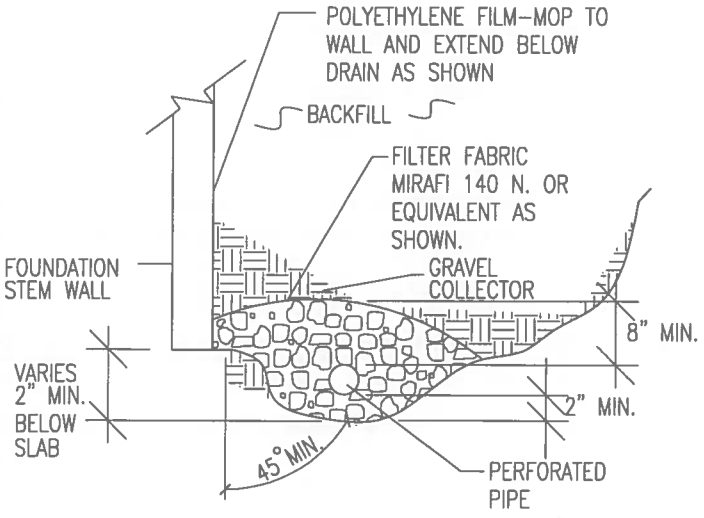
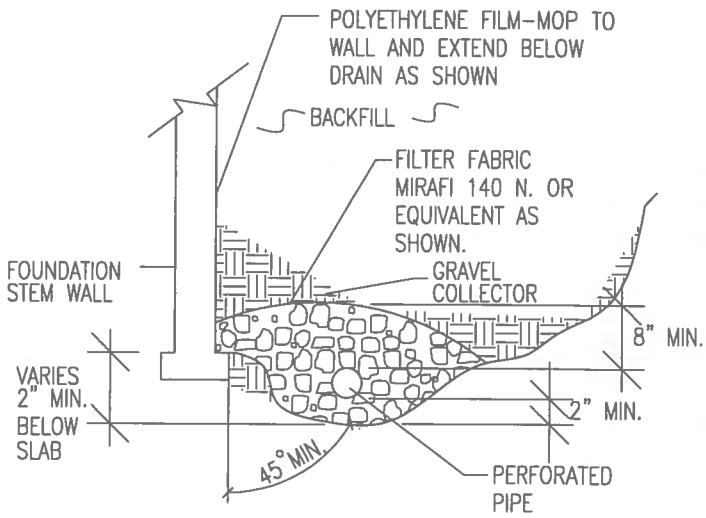
JOB NO.: 200160

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 OUT FALL IS NOT AVAILABLE.

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

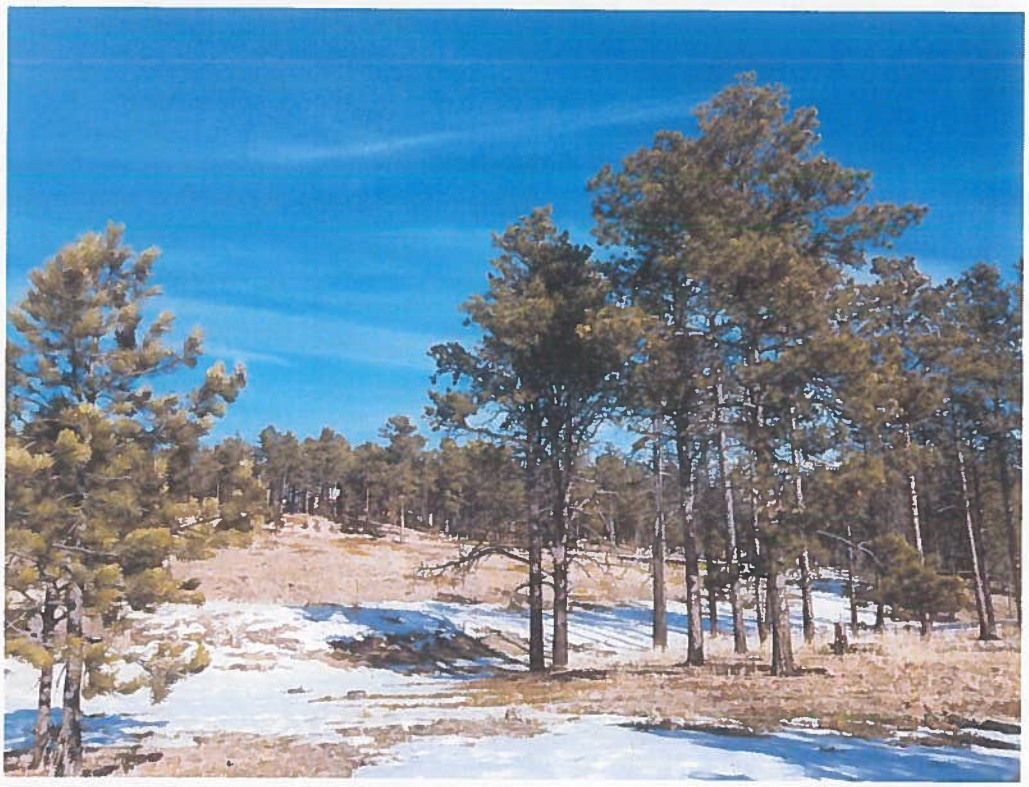
PERIMETER DRAIN DETAIL

DRAWN:	DATE:	DESIGNED:	CHECKED:
		DS	LLL

JOB NO.: R00160

FIG NO.: 8

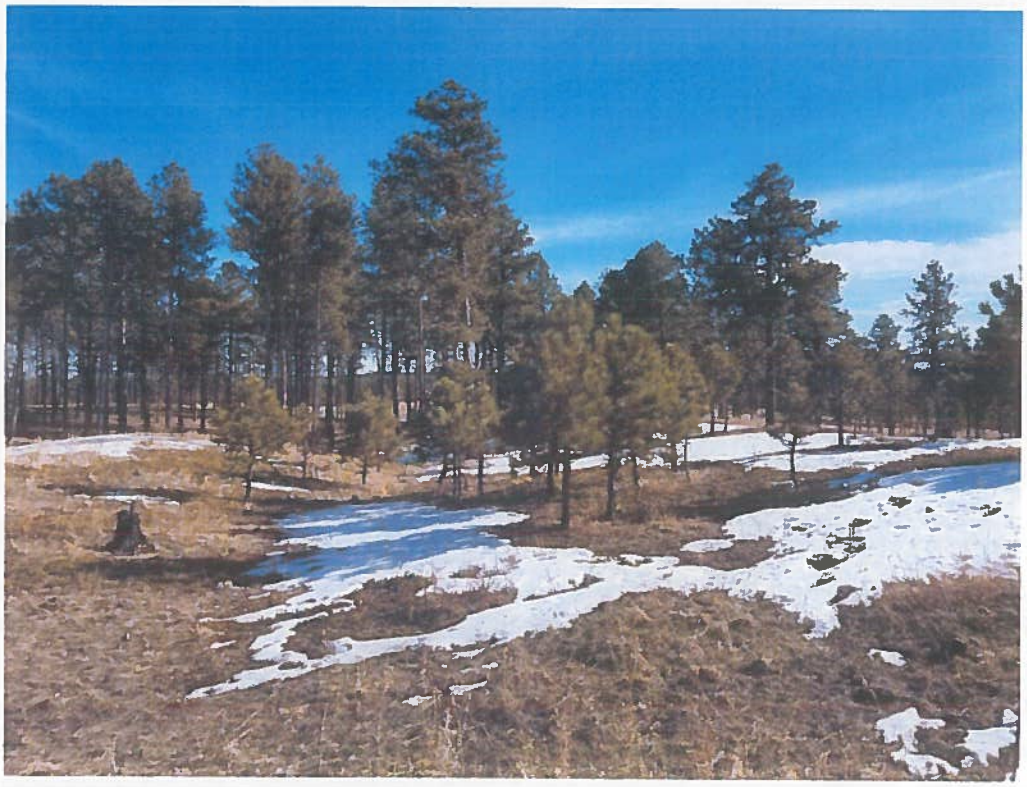
APPENDIX A: Photographs



1

Looking north towards Lot 1 in the eastern portion of the site.

January 24, 2020



2

Looking east from the central portion of the site.

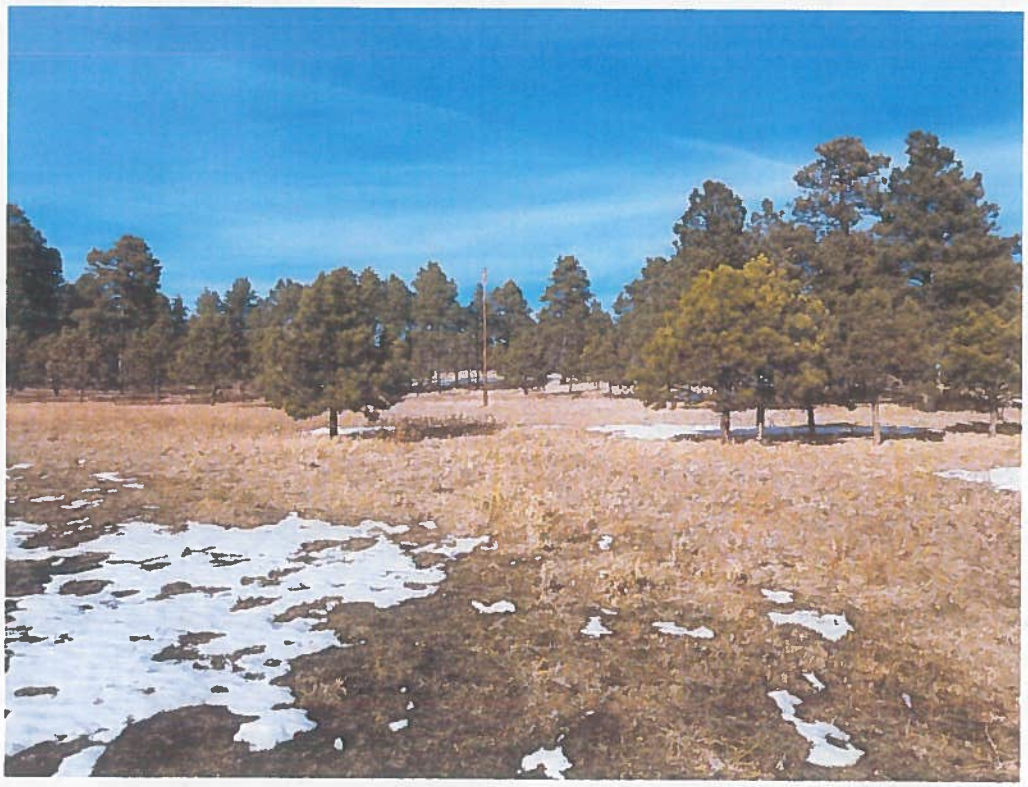
January 24, 2020

Job No. 200160

3

Looking south from the central portion of the site.

January 24, 2020



4

Looking north from the southern portion of the site.

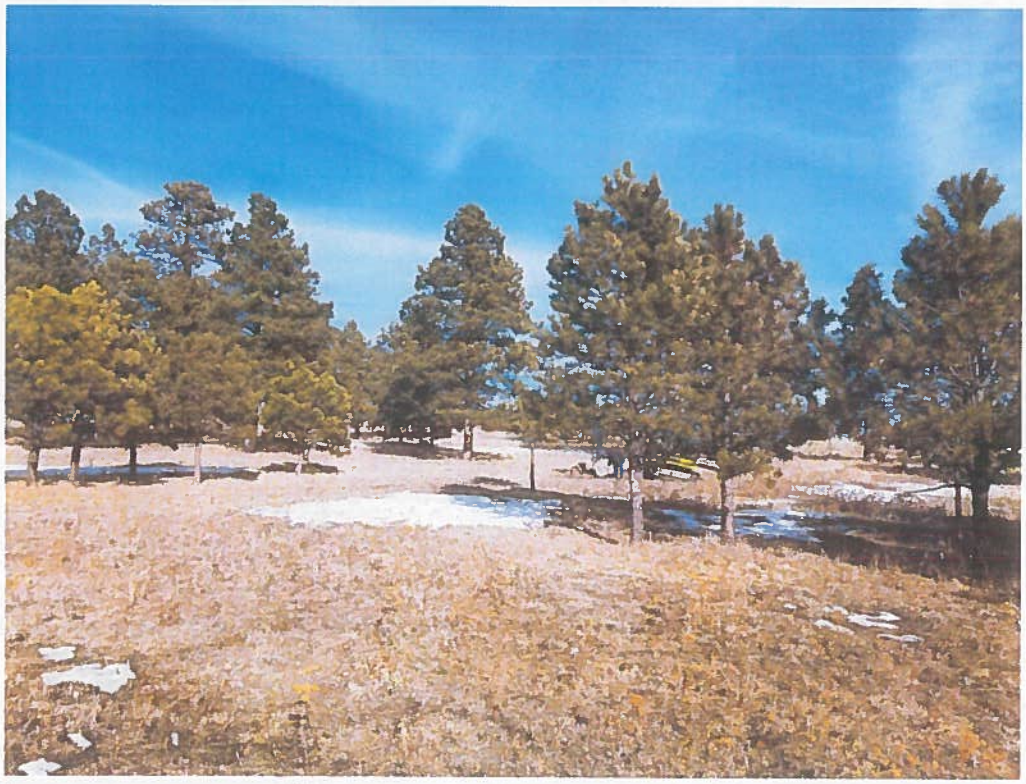
January 24, 2020

Job No. 200160

5

Looking south along head of minor drainage in the southern portion of the site.

January 24, 2020



6

Looking east from the southern portion of site.

January 24, 2020

Job No. 200160

APPENDIX B: Test Boring and Test Pit Logs

TEST BORING NO. 1
DATE DRILLED 2/4/2020
Job # 200160

REMARKS

DRY TO 20', 2/4/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
	SAND, SILTY, FINE TO COARSE GRAINED, TAN, LOOSE TO MEDIUM DENSE, MOIST		9	5.6	1
5			13	6.0	1
	SANDSTONE, CLAYEY, FINE TO COARSE GRAINED, VERY DENSE, MOIST		50/5"	9.7	2
10					
			50/6"	11.1	2
15					
			50/6"	10.2	2
20					

TEST BORING NO. 2
DATE DRILLED 2/4/2020
CLIENT SMH CONSULTANTS
LOCATION 13235 VOLLMER ROAD

REMARKS

DRY TO 20', 2/4/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
	SAND, SILTY, FINE TO COARSE GRAINED, TAN, LOOSE TO DENSE, MOIST		6	5.3	1
5			30	8.3	1
	SANDSTONE, SILTY, FINE TO COARSE GRAINED, BROWN, VERY DENSE, MOIST		50/5"	6.1	2
10					
			50/4"	6.1	2
15					
			50/6"	6.5	2
20					

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE: 2/10/20

JOB NO. 200160
FIG NO. B-1

LOT NO. 3
TEST PIT NO. 1
DATE EXCAVATED 1/24/2020
Job # 200160

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
topsoil sandy loam, brown						
weathered to formational silty sandstone, fine to coarse grained, tan	1			ma		3A
	2					
	3					
weathered to formational clayey sandstone, fine to coarse grained, tan	4			ma		4A
	5					
	6					
	7					
	8					
	9					
	10					

LOT NO. 1
TEST PIT NO. 2
DATE EXCAVATED 1/24/2020
CLIENT SMH CONSULTANTS
LOCATION 13235 VOLLMER RD

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
topsoil sandy loam, brown						
sand clay loam, fine to coarse grained, light brown	1			ma		3A
	2					
	3					
	4					
sandy loam, fine to coarse grained, tan	5			gr	w	2A
	6					
	7					
	8					
	9					
	10					

Soil Structure Shape
granular - gr
platy - pl
blocky - bl
prismatic - pr
single grain - sg
massive - ma

Soil Structure Grade
weak - w
moderate - m
strong - s
loose - l

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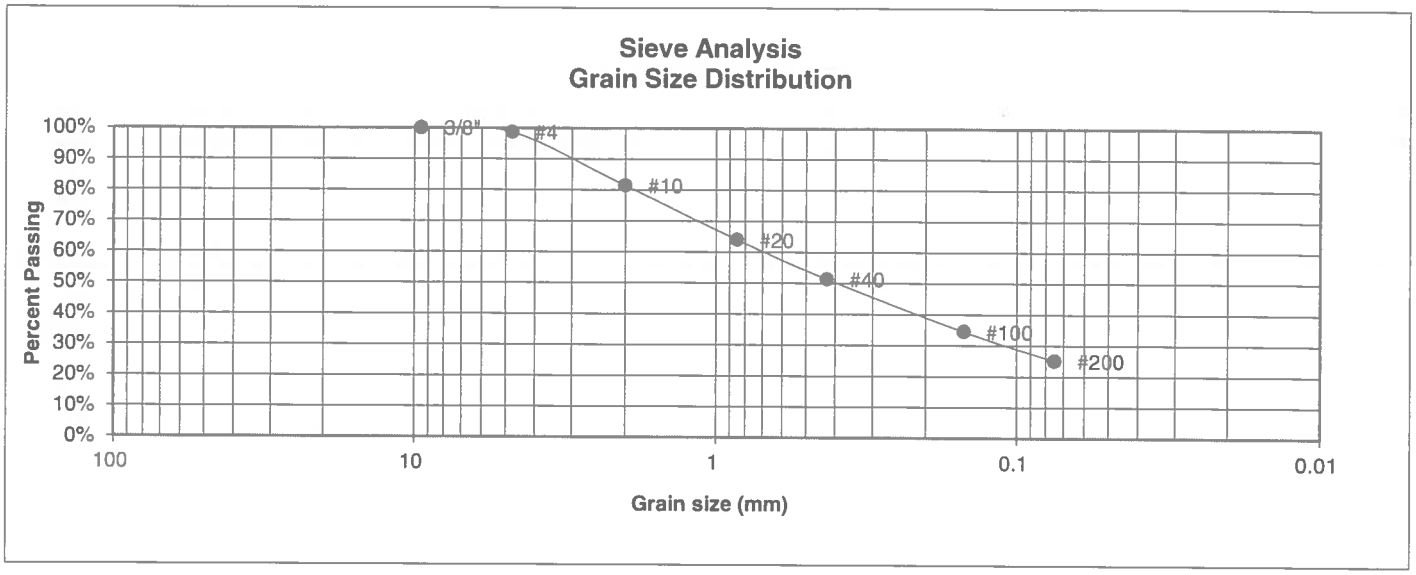
TEST PIT LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/10/20

JOB NO.: 200160
FIG NO.: B-2

APPENDIX C: Laboratory Test Results

UNIFIED CLASSIFICATION	SM	CLIENT	SMH CONSULTANTS
SOIL TYPE #	1	PROJECT	13235 VOLLMER ROAD
TEST BORING #	1	JOB NO.	200160
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	98.6%
10	81.4%
20	64.0%
40	51.3%
100	34.5%
200	25.1%

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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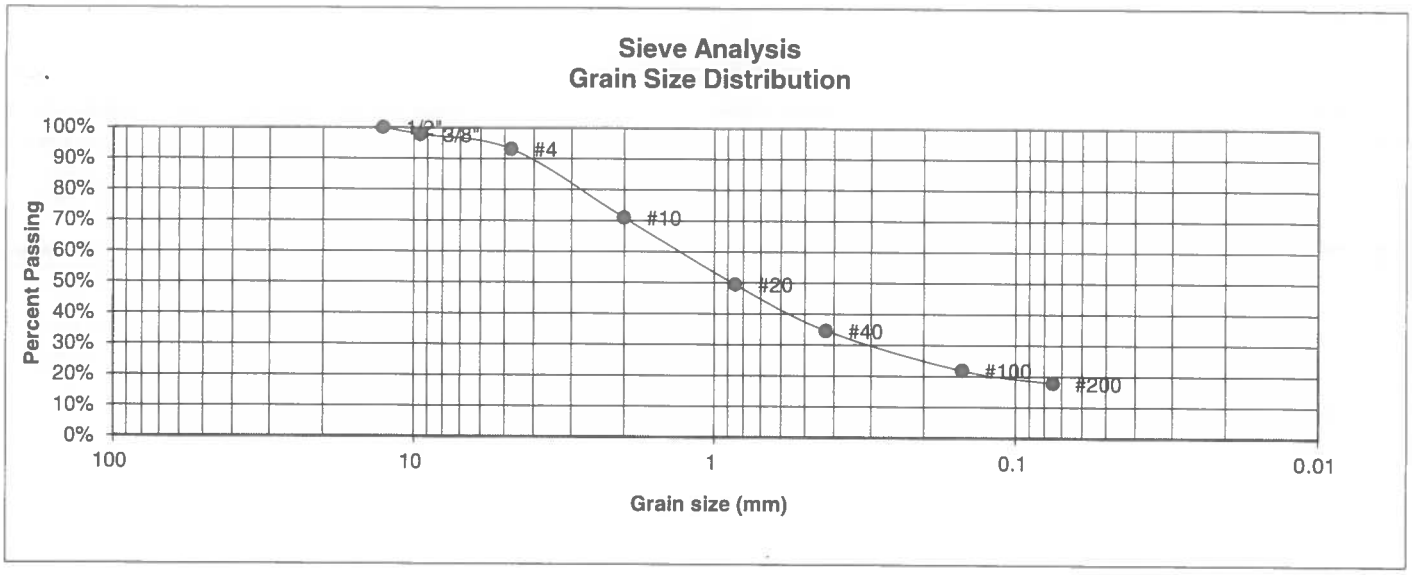
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE: 2/10/20

JOB NO.: 200160

FIG NO.: C-1

UNIFIED CLASSIFICATION	SM	CLIENT	SMH CONSULTANTS
SOIL TYPE #	1	PROJECT	13235 VOLLMER ROAD
TEST BORING #	2	JOB NO.	200160
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	97.7%
4	93.1%
10	70.9%
20	49.5%
40	34.6%
100	21.9%
200	17.8%

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)

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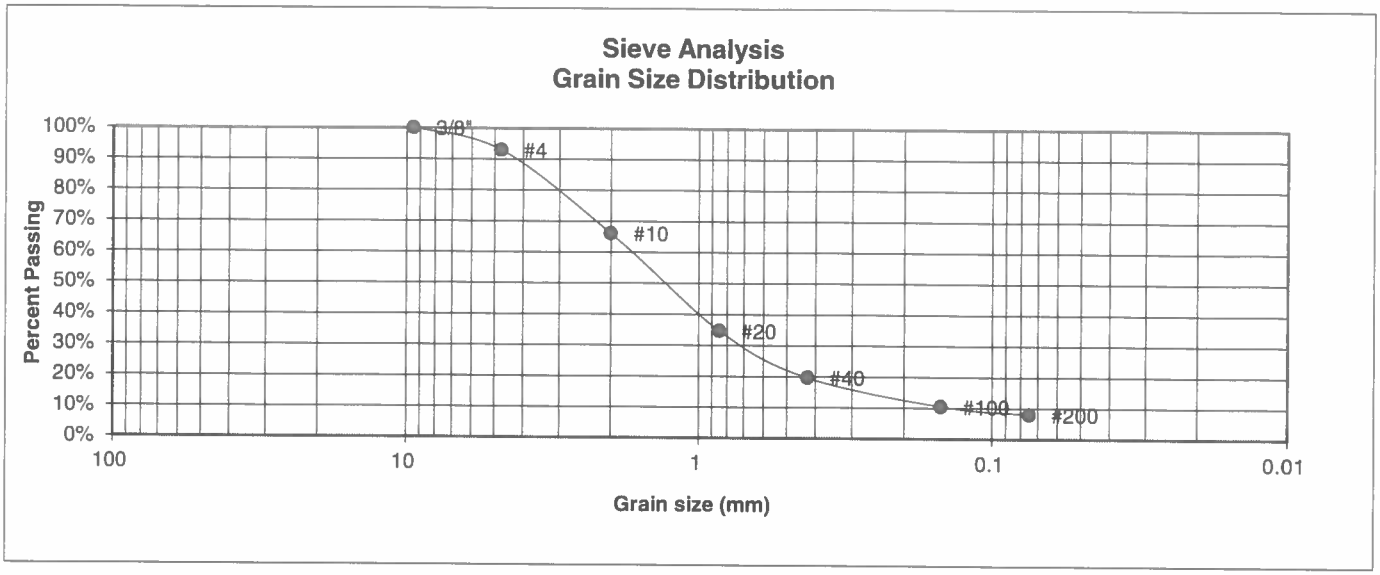
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE: 2/10/20

JOB NO.: 200160

FIG NO.: C-2

BORING NO.	TP-2	UNIFIED CLASSIFICATION	SM-SW	TEST BY	BL
DEPTH(ft)	5-6	AASHTO CLASSIFICATION		JOB NO.	200160
CLIENT	SMH CONSULTANTS				
PROJECT	13235 VOLLMER ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	93.0%
10	66.1%
20	34.7%
40	19.7%
100	10.5%
200	8.0%

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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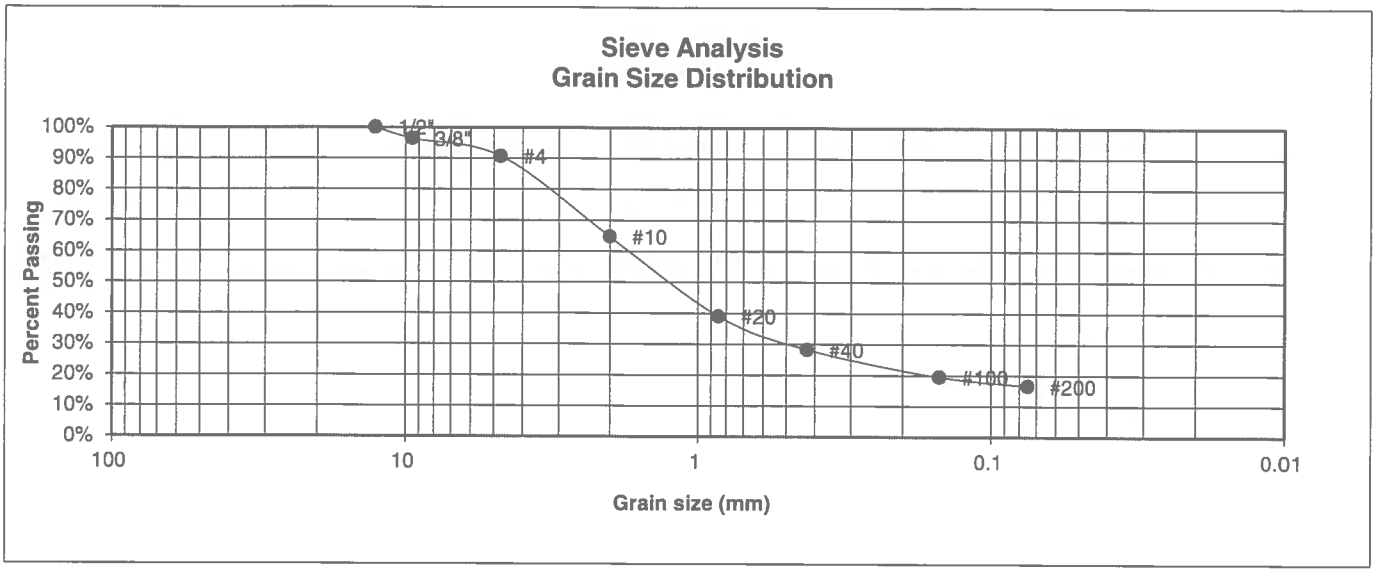
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/20/20

JOB NO.: 200160

FIG NO.: C-3

BORING NO.	TP-1	UNIFIED CLASSIFICATION	SC	TEST BY	BL
DEPTH(ft)	6-7	AASHTO CLASSIFICATION		JOB NO.	200160
CLIENT	SMH CONSULTANTS				
PROJECT	13235 VOLLMER ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	96.3%
4	90.7%
10	64.7%
20	39.0%
40	28.2%
100	19.5%
200	16.5%

Atterberg Limits

Plastic Limit	
Liquid Limit	
Plastic Index	

Swell

Moisture at start	12.3%
Moisture at finish	20.5%
Moisture increase	8.2%
Initial dry density (pcf)	99
Swell (psf)	360

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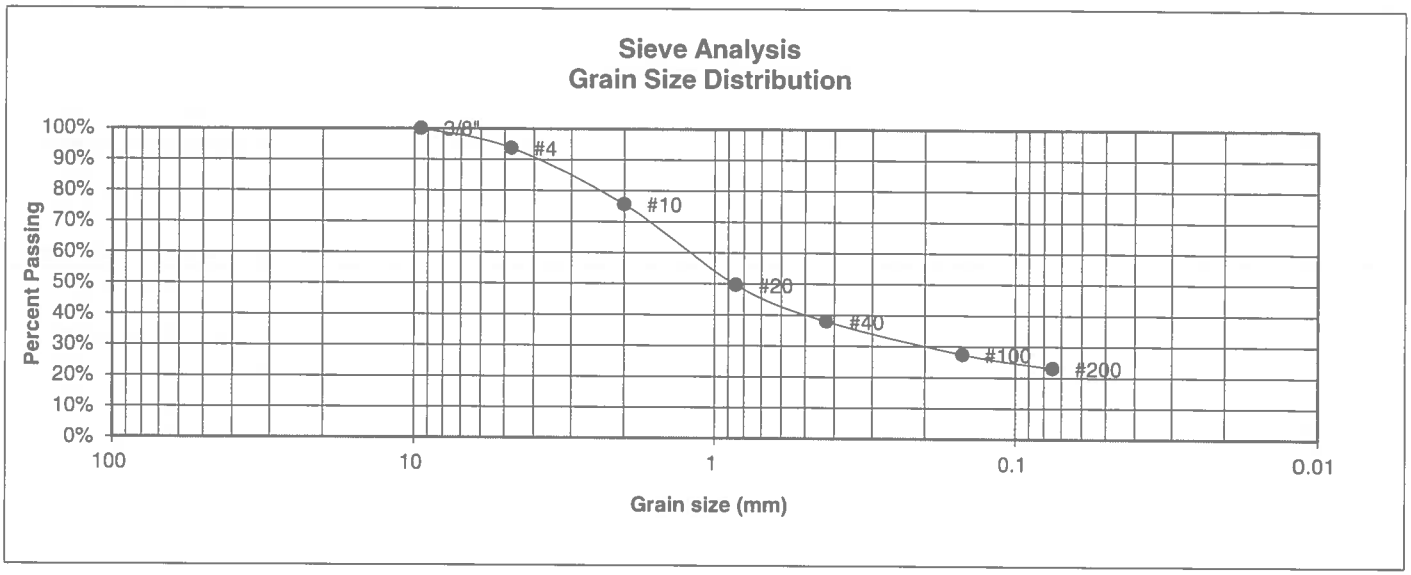
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/10/20

JOB NO.: 200160

FIG NO.: C-4

UNIFIED CLASSIFICATION	SC	CLIENT	SMH CONSULTANTS
SOIL TYPE #	2	PROJECT	13235 VOLLMER ROAD
TEST BORING #	1	JOB NO.	200160
DEPTH (FT)	15	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	93.7%
10	75.6%
20	49.6%
40	37.9%
100	27.4%
200	23.0%

Atterberg Limits

Plastic Limit	21
Liquid Limit	41
Plastic Index	20

Swell

Moisture at start

Moisture at finish

Moisture increase

Initial dry density (pcf)

Swell (psf)

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LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			2/10/20

JOB NO.: 200160

FIG NO.: C-5

APPENDIX D: Soil Survey Descriptions

El Paso County Area, Colorado

26—Elbeth sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 367y
Elevation: 7,300 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Elbeth and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Elbeth

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from arkose

Typical profile

A - 0 to 3 inches: sandy loam
E - 3 to 23 inches: loamy sand
Bt - 23 to 68 inches: sandy clay loam
C - 68 to 74 inches: sandy clay loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:
Hydric soil rating: No

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 17, Sep 13, 2019

El Paso County Area, Colorado

40—Kettle gravelly loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 368g
Elevation: 7,000 to 7,700 feet
Farmland classification: Not prime farmland

Map Unit Composition

Kettle and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kettle

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from arkose

Typical profile

E - 0 to 16 inches: gravelly loamy sand
Bt - 16 to 40 inches: gravelly sandy loam
C - 40 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

Other soils

Percent of map unit:
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 17, Sep 13, 2019

El Paso County Area, Colorado

68—Peyton-Pring complex, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369f
Elevation: 6,800 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Peyton and similar soils: 40 percent
Pring and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peyton

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Arkosic alluvium derived from sedimentary rock and/or arkosic residuum weathered from sedimentary rock

Typical profile

A - 0 to 12 inches: sandy loam
Bt - 12 to 25 inches: sandy clay loam
BC - 25 to 35 inches: sandy loam
C - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 3 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: Sandy Divide (R049BY216CO)
Hydric soil rating: No

Description of Pring

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Arkosic alluvium derived from sedimentary rock

Typical profile

A - 0 to 14 inches: coarse sandy loam
C - 14 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Loamy Park (R048AY222CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:
Hydric soil rating: No

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 17, Sep 13, 2019

March 4, 2020

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ENGINEERING, INC.

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

SMH Consultants
411 S. Tejon Street, Suite 1
Colorado Springs, CO 80903

Attn: Brett Louk

Re: Wastewater Study
Aztec Residential Subdivision
13235 Vollmer Road
Parcel No. 52000-00-303
El Paso County, Colorado

Dear Mr. Louk:

GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The site is located in a portion of the NW¼ of Section 10, Township 12 South, Range 65 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located approximately 5 miles northeast of Colorado Springs city limits, southeast of Swan Road and Vollmer Road 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 gradually to moderately sloping to the south to south-southeast, and to the north. The Palmer Divide bisects the central portion of the site. The head of a minor drainage is located in the southern portion of the property. Water was not observed in the drainage at the time of this investigation. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have included undeveloped and a rural residential. The southern portion of the site is located in the northeastern extent of the Black Forest burn scar. The site contains field grasses, weeds, kinnikinnick, and ponderosa pines in the western portion of the site and around the existing house located on Lot 4. Site photographs, taken January 24, 2020, are included in Appendix A.

Total acreage involved in the proposed subdivision is 37.7-acres. Four rural residential lots are proposed as part of the replat. The proposed lot sizes range from 4.79-acres to 18.60-acres. An existing house is located on Lot 4 which will remain. The new lots will be serviced by individual wells and on-site wastewater treatment systems. The Site Plan with the proposed replat is presented in Figure 3.

SCOPE OF THE REPORT

The scope of the report will include the following:

- A general geologic analysis utilizing published geologic data. Detailed site-specific mapping will be conducted to obtain general information in respect to major geographic and geologic features, geologic descriptions and their effects on the development of the property with regards to on-site wastewater Treatment Systems.

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), previously the

Soil Conservation Service (SCS) survey was also reviewed to evaluate the site. The position of mappable units within the subject property are shown on the Geologic Map. Our mapping procedures involved both field reconnaissance and measurements, and aerial photo reconnaissance and interpretation. The same mapping procedures have also been utilized to produce the Geology/Engineering Geology Map which identified pertinent geologic conditions affecting development. The field mapping was performed by personnel of Entech Engineering, Inc. on January 24, 2020.

Two test borings and two test pits were excavated on the site to determine general suitability for the use of on-site wastewater treatment systems and general soil characteristics for residential construction. The locations of the test pits are indicated on the Site Plan/Test Pit Location Map, Figure 3. The Test Pit Logs are presented in Appendix B. Results of this testing will be discussed later in this report.

Laboratory testing was also performed on some of the soils to classify and determine the soils engineering characteristics. Laboratory tests included grain-size analysis, ASTM D-422, and Atterberg Limits, ASTM D-4318. Results of the laboratory testing are included in Appendix C. A Summary of Laboratory Test Results is presented in Table 1.

SOIL AND GEOLOGIC CONDITIONS

Soil Survey

The Natural Resource Conservation Service (NRCS) (Reference 1, Figure 4), previously the Soil Conservation Service (Reference 2) has mapped three soil types on the site. Complete descriptions of the soil types are presented in Appendix D. In general, the soils consist of sandy loam to gravelly loamy sand and sandy clay loam. The soils are described as follows:

Type	Description
26	Elbeth Sandy Loam, 8 – 15% Slopes
40	Kettle Gravelly Loamy Sand, 3 – 8% Slopes
68	Peyton-Pring Complex, 3 – 8% Slopes

The soils have been described to have moderate to rapid permeabilities. The soils are described as well suited for use as homesites. Possible hazards with soils erosion are 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

The soils encountered in the test borings and test pits consisted of silty to slightly silty sand and sandy clay loam overlying weathered to formational clayey to silty sandstone. Bedrock was encountered at depths ranging from 3 to 7 feet. The upper sands were encountered at medium dense states and moderate moisture conditions, and the sandstone was encountered at very dense states and moderate moisture conditions. The samples of sand tested had approximately 8 to 25 percent of the soil size particles passing the No. 200 sieve. Atterberg Limits Testing resulted in the sand being non-plastic. The samples of sandstone tested had 17 to 23 percent of

the soil size particles passing the No. 200 sieve. Atterberg Limits Testing on a sample of clayey sandstone resulted in a liquid limit of 41 and a plastic index of 20. FHA Swell Testing on a sample of the clayey sandstone resulted in an expansion pressure of 360 psf, which indicates a low expansion potential. Highly expansive claystone and siltstone lenses are commonly interbedded in the Dawson Formation.

Groundwater

Groundwater or signs of seasonally occurring water were not encountered in the test pits, which were excavated to 8 feet. Groundwater was not encountered in the test borings, which were drilled to 20 feet. It is anticipated groundwater will not affect shallow foundations on the majority of the site. Areas of potentially seasonal shallow groundwater have been mapped in the head of a minor drainage in the southern portion of the site that are discussed in the following sections. Fluctuations in groundwater conditions may occur due to variations in rainfall or other factors not readily apparent at this time. 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 features during construction.

Geology

Approximately 13 miles west of the site is a major structural feature known as the Rampart Range Fault. This fault marks the boundary between the Great Plains Physiographic Province and the Southern Rocky Mountain Province. The site exists within a large structural feature known as the Denver Basin. Bedrock in the area is typically gently dipping in a northerly direction (Reference 3). The bedrock underlying the site consists of the Dawson Formation of Cretaceous Age. The Dawson Formation typically consists of coarse-grained arkosic sandstone with interbedded layers claystone or siltstone.

The geology of the site was evaluated using the *Geologic Map of the Black Forest,* by Thorson in 2003, (Reference 4, Figure 5). The Geology Map for the site is presented in Figure 6. Three mappable units were identified on this site which is described as follows:

Qau **Alluvium, Undivided of Holocene and Pleistocene Age:** These are sheetwash and stream deposited alluvium that exists in the western portion of the site associated with alluvial-filled valley heads. These materials typically consist of silty to clayey sands and gravel.

QTa **Alluvium of Palmer Divide of Early Pleistocene or Pliocene Age:** These materials consist of water-deposited stream terrace deposits located along the Palmer Divide. They typically consist of silty to clayey sands with gravelly lenses and may contain areas of pebble and cobble lenses.

Qc/Tkd **Colluvium of Quaternary Age overlying Dawson Formation of Tertiary to Cretaceous Age:** The materials consist of colluvial or residual soils overlying the bedrock materials on-site. The colluvial soils were deposited by the action of sheetwash and gravity. The residual soils were derived from the in-situ weathering of

the bedrock on site. These materials typically consist of silty to clayey sand with potential areas of sandy clays. The bedrock consists of the Dawson Formation. The Dawson Formation typically consists of coarse-grained, arkosic sandstone with interbedded lenses of fine-grained sandstone, siltstone and claystone.

The soils listed above were mapped from site-specific mapping, the *Geologic Map of the Black Forest Quadrangle* distributed by the Colorado Geologic Survey in 2003 (Reference 4, Figure 5), The *Geologic Map of the Colorado Springs-Castle Rock Area,* distributed by the US Geological Survey in 1979 (Reference 5), and the *Geologic Map of the Pueblo 1° x 2° Quadrangle,* distributed by the US Geological Survey in 1978 (Reference 6). The test borings and test pits were used in evaluating the site and is included in Appendix B. The Geology Map prepared for the site is presented in Figure 6.

Drainage Areas

The head of a minor drainage exists in the southern portion of the site (Lot 1) that flows in southeasterly direction. No water was observed flowing in the drainages at the time of the investigation. An area of potentially seasonal shallow groundwater has been mapped in the drainage (Figure 6).

In potentially seasonal shallow groundwater areas, we would anticipate the potential for periodically high subsurface moisture conditions and highly organic soils. Due to the potential for seasonal high groundwater conditions, on-site wastewater treatment systems are not recommended in these areas. Due to lot sizes, it is anticipated these areas can be avoided. The site does not lie within any floodplain zones according to the FEMA Map No. 08041CO320 dated December 7, 2018 (Figure 7, Reference 7). Exact locations of floodplain and specific drainage studies are beyond the scope of this report. Individual wastewater treatment systems must be located a minimum of 25 feet from dry gulches and 50 feet from water courses or floodplains.

ON-SITE WASTEWATER TREATMENT

The Natural Resource Conservation Service (Reference 1), previously the Soil Conservation Service (Reference 2) has been mapped with three soil descriptions. The Soil Survey Map (Reference 1) is presented in Figure 4, and the Soil Survey Descriptions (Reference 2) are presented in Appendix D. The soils are described as having moderate to rapid percolation rates. The existing system on Lot 4 is a low pressure dosed system. Observations Of the leach area indicated that the system is operating properly. Records for the existing septic system located on Lot 4 are included in Appendix E.

Soils encountered in the tactile test pits consisted of gravelly sandy clay loam and gravelly sandy loam overlying weathered to formational silty sandstone. The limiting layers encountered in the test pit is the sandy clay loam and clayey sandstone, which corresponds with USDA Soil Types 3A and 4A with an LTAR values of 0.30 and 0.20 gallons per day per square foot. Weathered bedrock was encountered at approximately 3 feet in the test pit on Lot 3. Signs of seasonally occurring groundwater were not observed in the test pits. Absorption fields must be maintained a minimum of 4 feet above groundwater or bedrock, or confining layer. Should groundwater or bedrock be encountered within 6 feet of the surface, designed systems will be required. Designed

systems are anticipated for Lot 3 and proposed Lot 2, however, areas may be encountered on the lots where conventional systems would be suitable.

In summary, it is our opinion the site is suitable for individual on-site wastewater treatment systems (OWTS) and that contamination of surface and subsurface water resources should not occur provided the OWTS sites are evaluated and installed according to El Paso County and State Guidelines and properly maintained. Based on the testing performed designed systems will be required for the new lot. The Septic Suitability Map is presented in Figure 8. Areas that should be avoided by septic systems are indicated on the septic suitability map. A possible house location, water well, and two septic sites for the new lots are indicated on Figure 8. **Individual soil testing is required for proposed construction on each lot prior to construction.** Absorption fields must be located a minimum of 100 feet from any well, including those on adjacent properties. Absorption fields must also be located a minimum of 50 feet from any drainages, floodplains or ponded areas and 25 feet from dry gulches.

CLOSURE

This report has been prepared for SMH Consultants, for application to the proposed project in accordance with generally accepted geologic soil and engineering practices. No other warranty expressed or implied is made.

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

Respectfully Submitted,

ENTECH ENGINEERING, INC.

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Geologist

Reviewed by:

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

LLL/ao

Encl.

Entech Job No. 200160
AAprojects/2020/200160 wws

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2. United States Department of Agriculture Soil Conservation Service. June 1981. *Soil Survey of El Paso County Area, Colorado.*

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4. Thorson, Jon P., 2003. *Geologic Map of the Black Forest Quadrangle, El Paso County, Colorado.* Colorado Geological Survey. Open-File Report 03-6.

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6. Scott, Glen R.; Taylor Richard B.; Epis, Rudy C; and Wobus, Reinhard A. 1978. *Geologic Structure Map of the Pueblo 1° x 2° Quadrangle, South-Central Colorado.* Sheet 2. U.S. Geologic Survey. Map I-1022.

7. Federal Emergency Management Agency. December 7, 2018. *Flood Insurance Rate Maps for the City of Colorado Springs, Colorado.* Map Number 08041CO320G

TABLES

TABLE 1

SUMMARY OF LABORATORY TEST RESULTS

CLIENT SMH CONSULTANTS
PROJECT 13235 VOLLMER ROAD
JOB NO. 200160

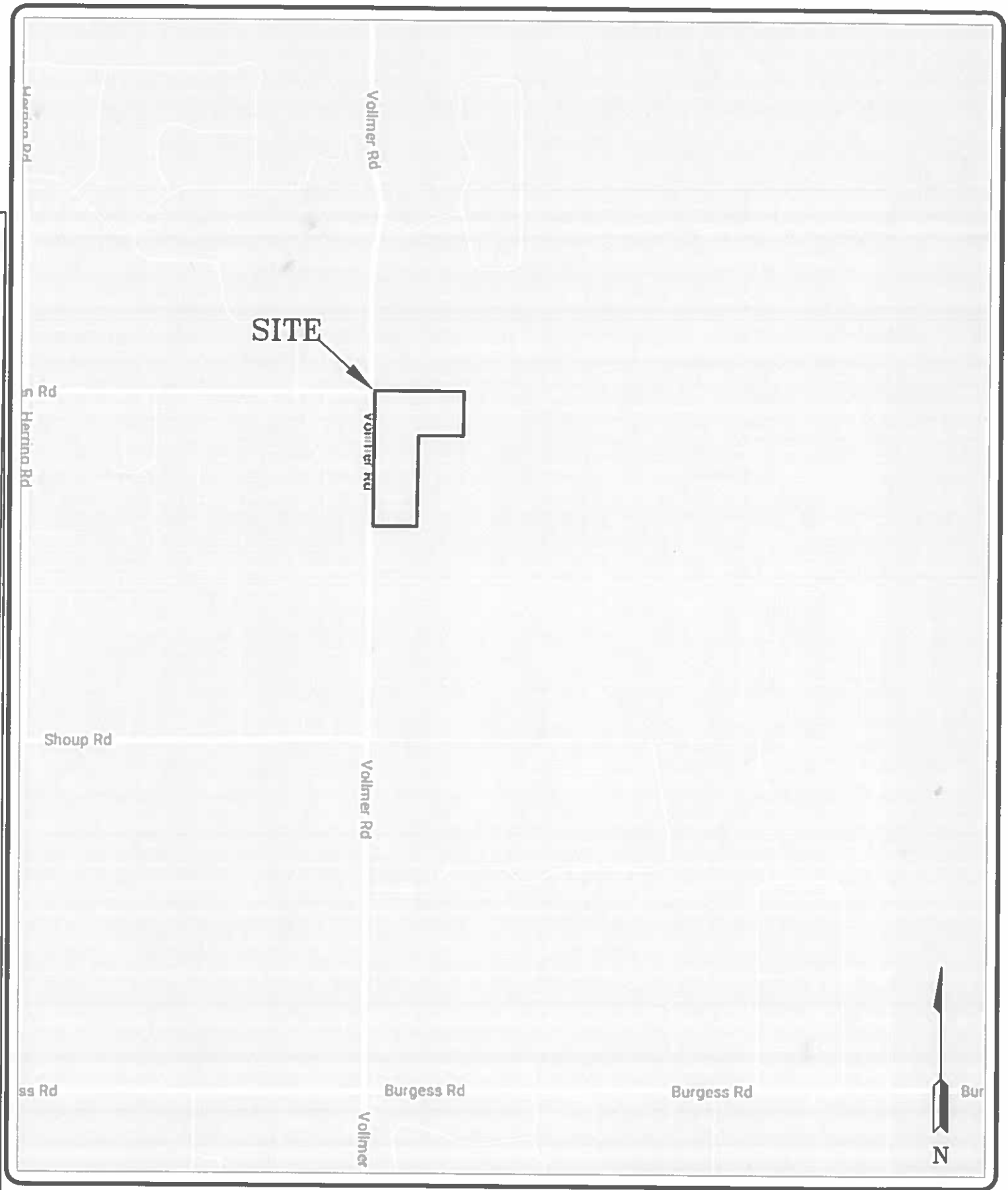
SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT (%)	PLASTIC INDEX (%)	SULFATE (WT %)	FHA SWELL (PSF)	SWELL/ CONSOL (%)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION
1	1	2-3			25.1						SM	SAND, SILTY
1	2	5			17.8	NV	NP				SM	SAND, SILTY
1	TP-2	5-6			8.0						SM-SW	SAND, SLIGHTLY SILTY
2	TP-1	6-7			16.5				360		SC	SANDSTONE, CLAYEY
2	1	15			23.0	41	20				SC	SANDSTONE, CLAYEY

Table 2: Summary Tactile Test Pit Results

Test Pit No.	USDA Soil Type	LTAR Value	Depth to Bedrock (ft.)	Depth to Seasonally Occurring Groundwater (ft.)
1	4A*	0.20*	3*	N/A
2	3A*	0.30*	N/A	N/A

*- Conditions that will require an engineered OWTS

FIGURES



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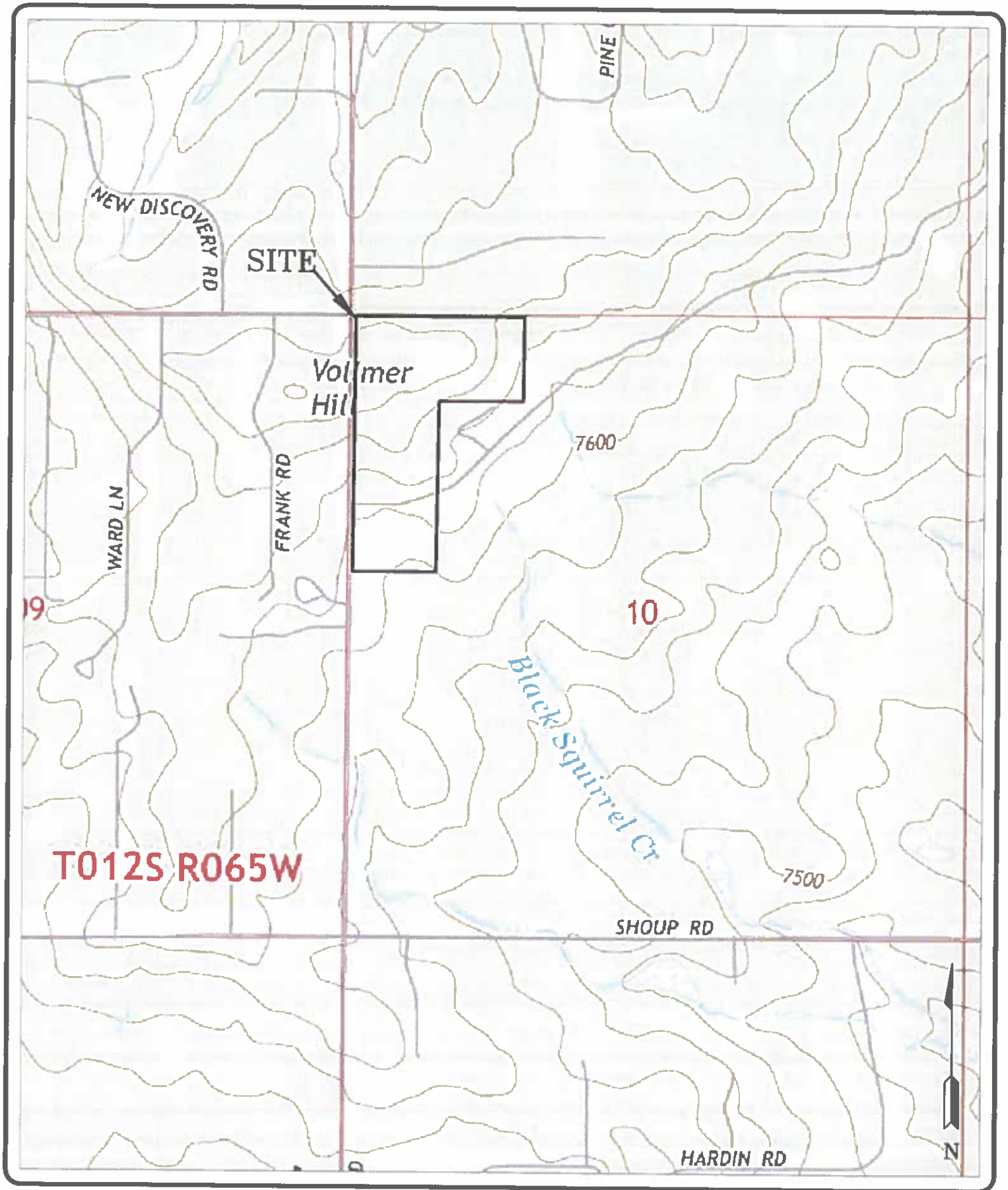
VICINITY MAP
AZTEC RESIDENTIAL SUBDIVISION
13235 VOLLMER ROAD
EL PASO COUNTY, CO.
FOR: SMH CONSULTANTS

DRAWN:	DATE:	CHECKED:	DATE:
LLL	3/4/20		

JOB NO.: 200160

FIG NO.: 1



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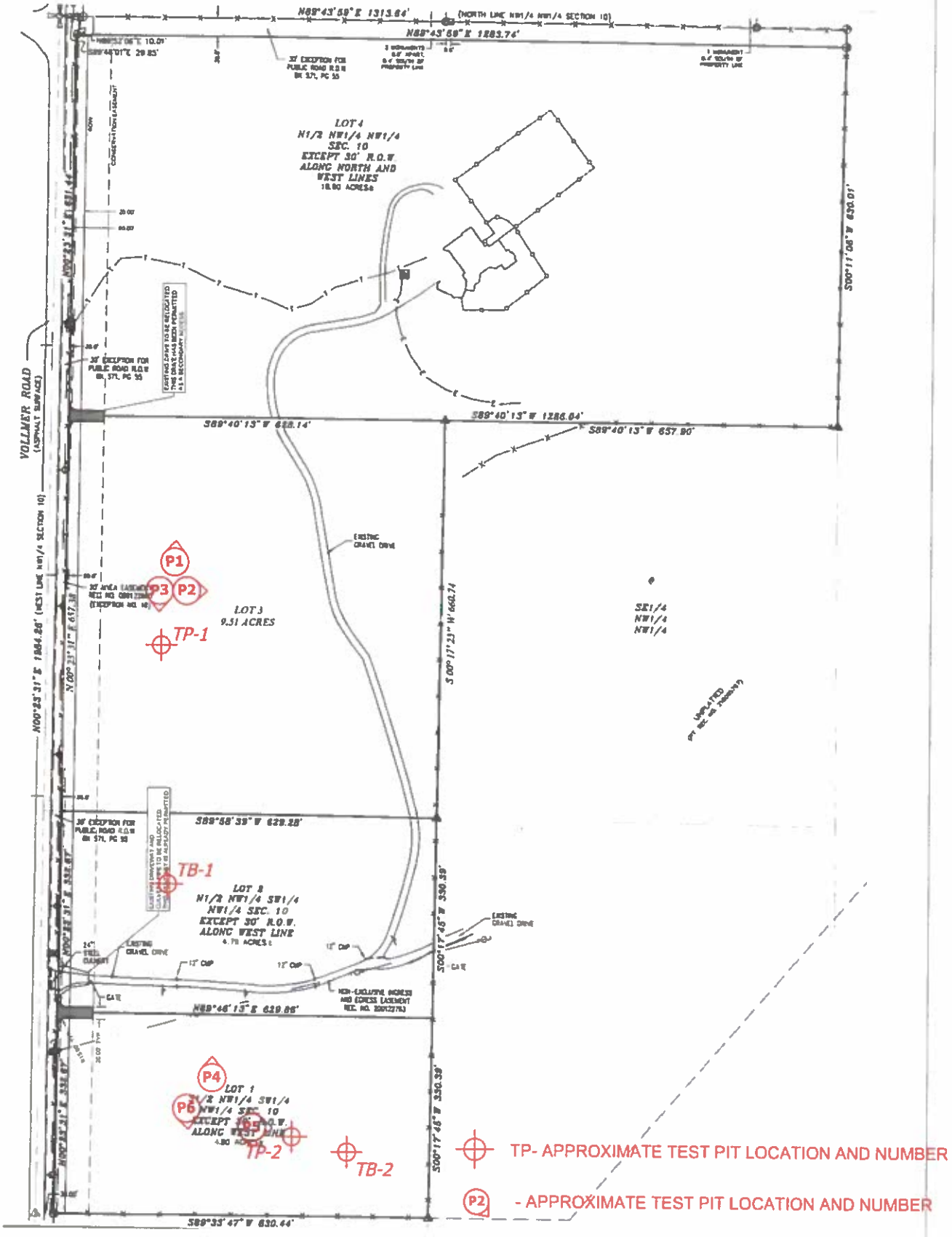
USGS MAP
AZTEC RESIDENTIAL SUBDIVISION
13235 VOLLMER ROAD
EL PASO COUNTY, CO.
FOR: SMH CONSULTANTS

DRAWN:	DATE:	CHECKED:	DATE:
LLL	3/4/20		

JOB NO.: 200160

FIG NO.: 2



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SITE PLAN/TESTING LOCATION MAP
AZTEC RESIDENTIAL SUBDIVISION
13235 VOLLMER ROAD
EL PASO COUNTY, CO.
FOR: SMH CONSULTANTS

DRAWN:	DATE:	CHECKED:	DATE:
LLL	3/4/20		

JOB NO.: 200160

FIG NO.: 3

N

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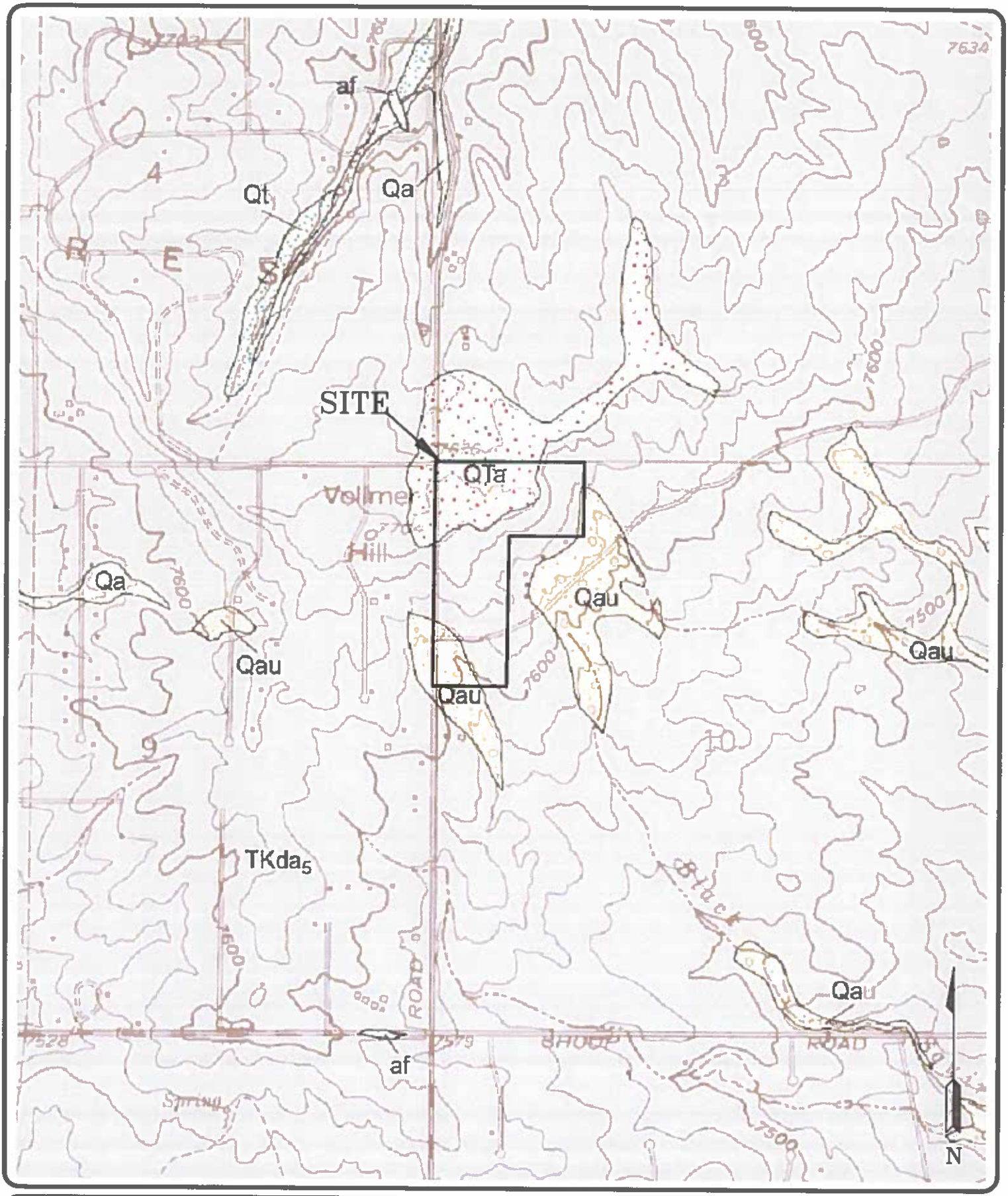
SOIL SURVEY MAP
AZTEC RESIDENTIAL SUBDIVISION
13235 VOLLMER ROAD
EL PASO COUNTY, CO.
SMH CONSULTANTS

DRAWN:	DATE:	CHECKED:	DATE:
LLL	3/4/20		

JOB NO.: 200160

FIG NO.: 4



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BLACK FOREST QUADRANGLE GEOLOGIC MAP
AZTEC RESIDENTIAL SUBDIVISION
13235 VOLLMER ROAD
EL PASO COUNTY, CO.
SMH CONSULTANTS

DRAWN:	DATE:	CHECKED:	DATE:
LLL	3/4/20		

JOB NO.: 200160

FIG NO.: 5

Legend:

Qau - Alluvium Undivided of Holocene and Pleistocene Age:
sheetwash and stream deposited alluvium associated with alluvial-filled valley heads

QTa - Alluvium of Palmer Divide of Early Pleistocene or Pliocene Age:
stream terrace deposits located along the Palmer Divide

QcTKd - Colluvium of Quaternary Age overlying Dawson Formation of Tertiary to Cretaceous Age:
colluvial and residual soils overlying arkosic sandstone with interbedded fine-grained sandstone, siltstone and claystone

psw - potentially shallow groundwater area

N

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ENGINEERING GEOLOGY MAP
AZTEC RESIDENTIAL SUBDIVISION
13235 VOLLMER ROAD
EL PASO COUNTY, CO.
SMH CONSULTANTS

DRAWN:	DATE:	CHECKED:	DATE:
LLL	3/4/20		

JOB NO.: 200160

FIG NO.: 6

N

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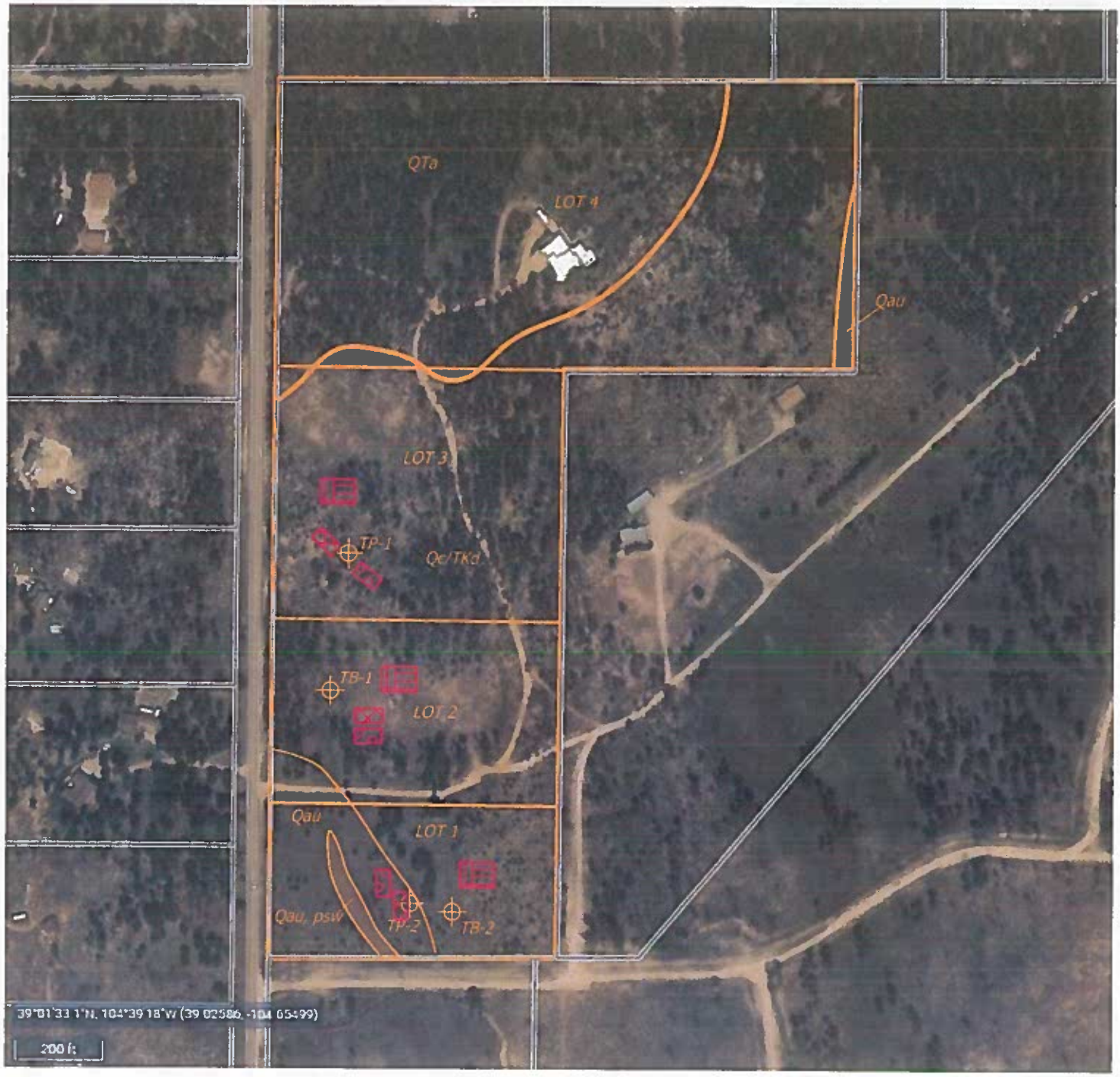
FEMA FLOODPLAIN MAP
AZTEC RESIDENTIAL SUBDIVISION
13235 VOLLMER ROAD
EL PASO COUNTY, CO.
SMH CONSULTANTS

DRAWN:	DATE:	CHECKED:	DATE:
LLL	3/4/20		

JOB NO.: 200160

FIG NO.: 7



LEGEND:

- POSSIBLE OWTS LOCATIONS
- POSSIBLE OWTS ALTERNATE LOCATIONS
- POSSIBLE HOUSE LOCATIONS
- AREAS WHERE OWTS ARE NOT RECOMMENDED

W *- WATER WELLS MUST BE A MINIMUM OF 100 FT FROM OWTS ABSORPTION FIELDS

N

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SEPTIC SUITABILITY MAP
AZTEC RESIDENTIAL SUBDIVISION
13235 VOLLMER ROAD
EL PASO COUNTY, CO.
SMH CONSULTANTS

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LLL	3/4/20		

JOB NO.: 200160

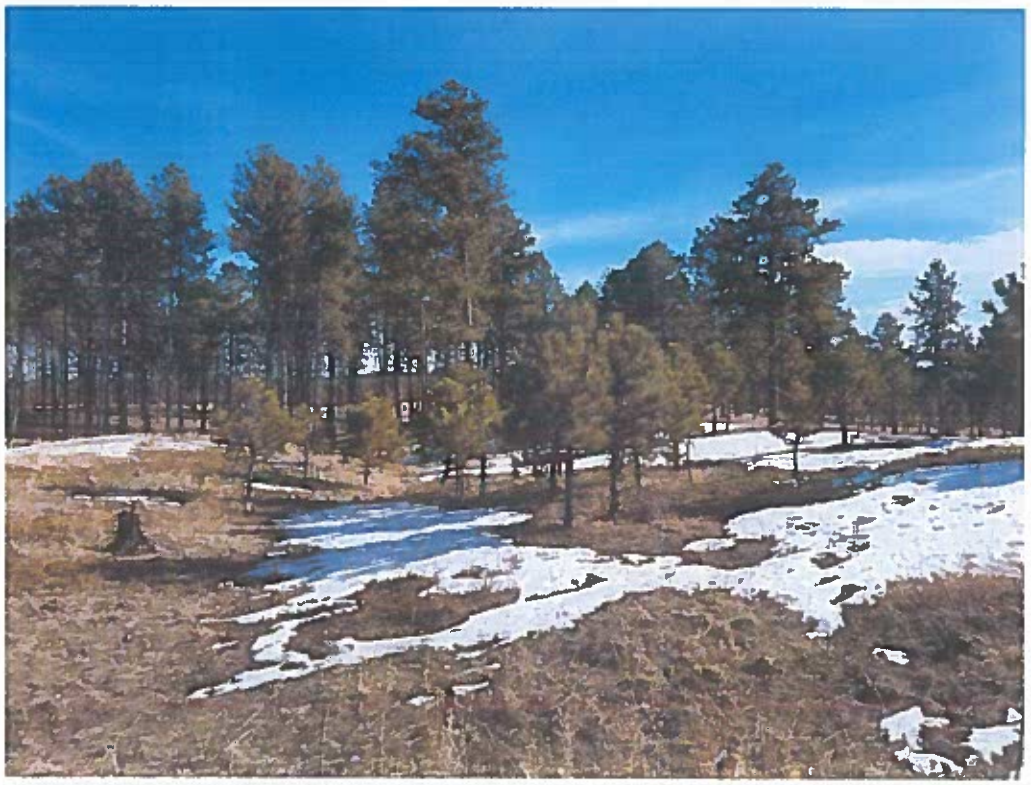
FIG NO.: 8

APPENDIX A: Photographs

1

Looking north towards Lot 1 in the eastern portion of the site.

January 24, 2020

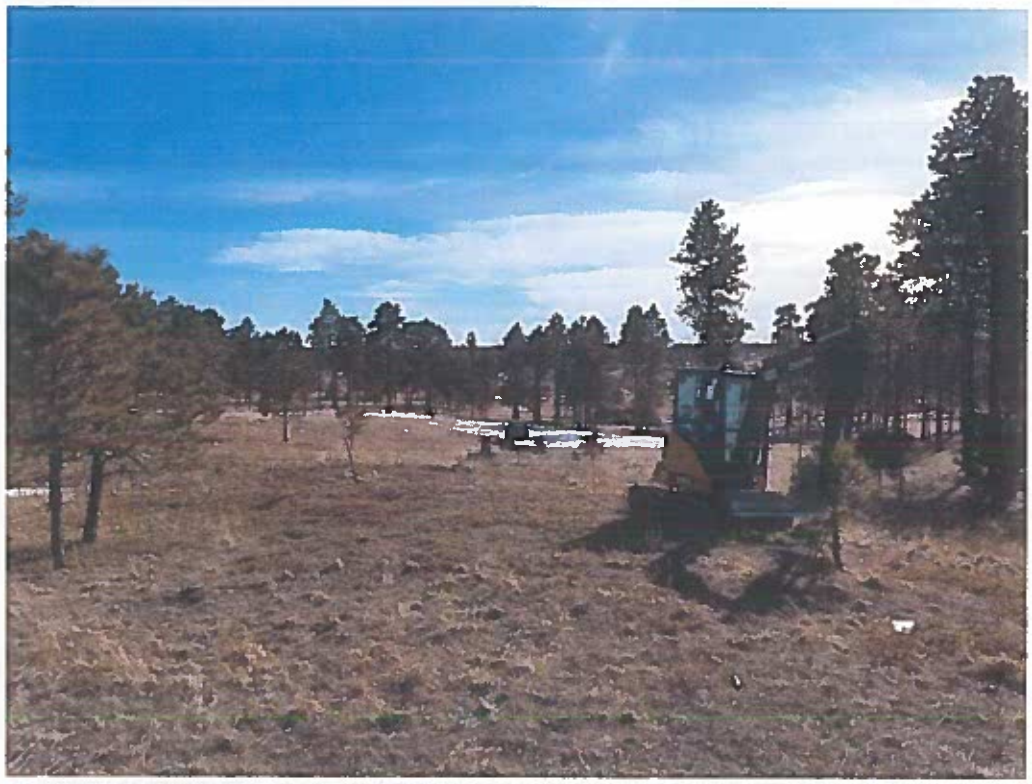


2

Looking east from the central portion of the site.

January 24, 2020

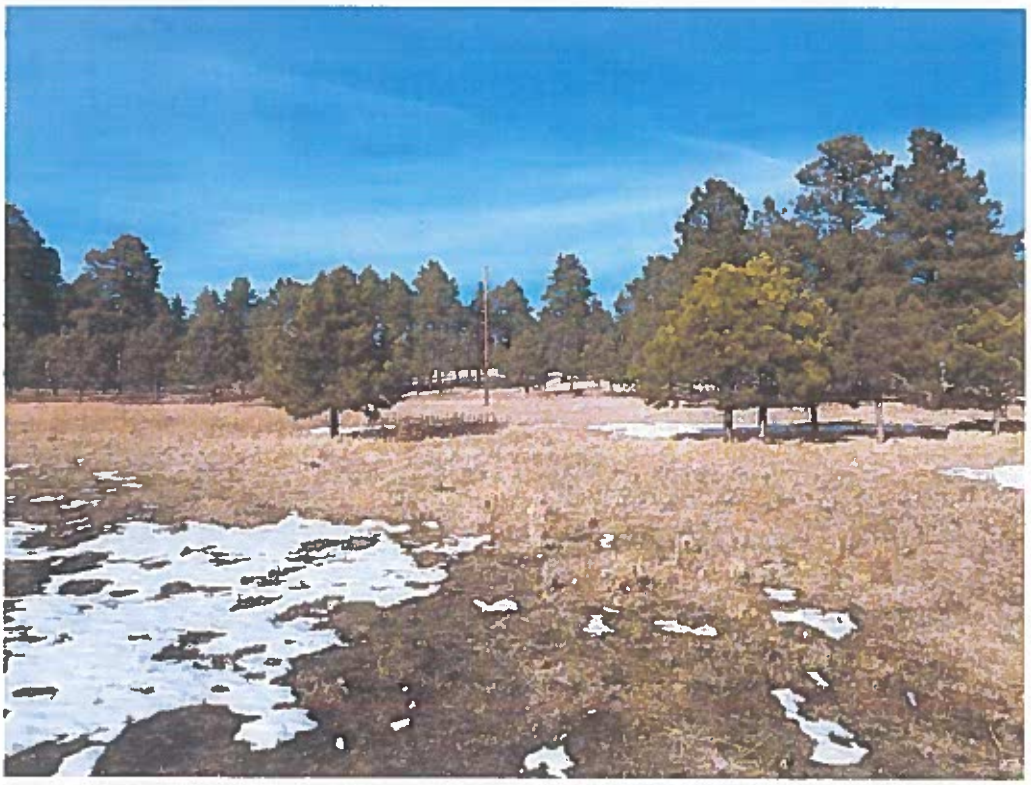
Job No. 200160



3

Looking south from the central portion of the site.

January 24, 2020



4

Looking north from the southern portion of the site.

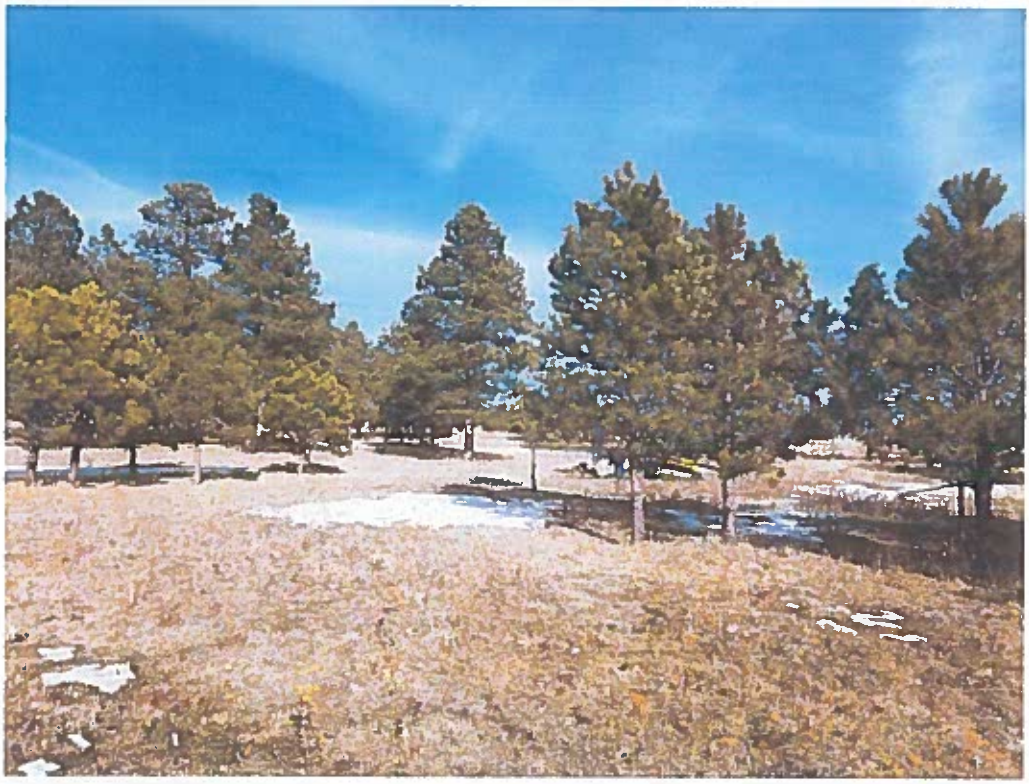
January 24, 2020

Job No. 200160

5

Looking south along head of minor drainage in the southern portion of the site.

January 24, 2020



6

Looking east from the southern portion of site.

January 24, 2020

Job No. 200160

APPENDIX B: Test Boring and Test Pit Logs

TEST BORING NO. 1
DATE DRILLED 2/4/2020
Job # 200160

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 20', 2/4/20						
SAND, SILTY, FINE TO COARSE GRAINED, TAN, LOOSE TO MEDIUM DENSE, MOIST				9	5.6	1
	5			13	6.0	1
SANDSTONE, CLAYEY, FINE TO COARSE GRAINED, VERY DENSE, MOIST	10			50/5"	9.7	2
	15			50/6"	11.1	2
	20			50/6"	10.2	2

TEST BORING NO. 2
DATE DRILLED 2/4/2020
CLIENT SMH CONSULTANTS
LOCATION 13235 VOLLMER ROAD

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 20', 2/4/20						
SAND, SILTY, FINE TO COARSE GRAINED, TAN, LOOSE TO DENSE, MOIST				6	5.3	1
	5			30	8.3	1
SANDSTONE, SILTY, FINE TO COARSE GRAINED, BROWN, VERY DENSE, MOIST	10			50/5"	6.1	2
	15			50/4"	6.1	2
	20			50/6"	6.5	2

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TEST BORING LOG

DRAWN	DATE	CHECKED:	DATE:
			2/13/20

JOB NO.: 200160
FIG NO.: B-1

LOT NO. 3
TEST PIT NO. 1
DATE EXCAVATED 1/24/2020
Job # 200160

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
topsoil sandy loam, brown	1			ma		3A
weathered to formational silty sandstone, fine to coarse grained, tan	2					
	3					
weathered to formational clayey sandstone, fine to coarse grained, tan	4			ma		4A
	5					
	6					
	7					
	8					
	9					
	10					

LOT NO. 1
TEST PIT NO. 2
DATE EXCAVATED 1/24/2020
CLIENT SMH CONSULTANTS
LOCATION 13235 VOLLMER RD

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
topsoil sandy loam, brown	1			ma		3A
sand clay loam, fine to coarse grained, light brown	2					
	3					
	4					
sandy loam, fine to coarse grained, tan	5			gr	w	2A
	6					
	7					
	8					
	9					
	10					

Soil Structure Shape
granular - gr
platy - pl
blocky - bl
prismatic - pr
single grain - sg
massive - ma

Soil Structure Grade
weak - w
moderate - m
strong - s
loose - l

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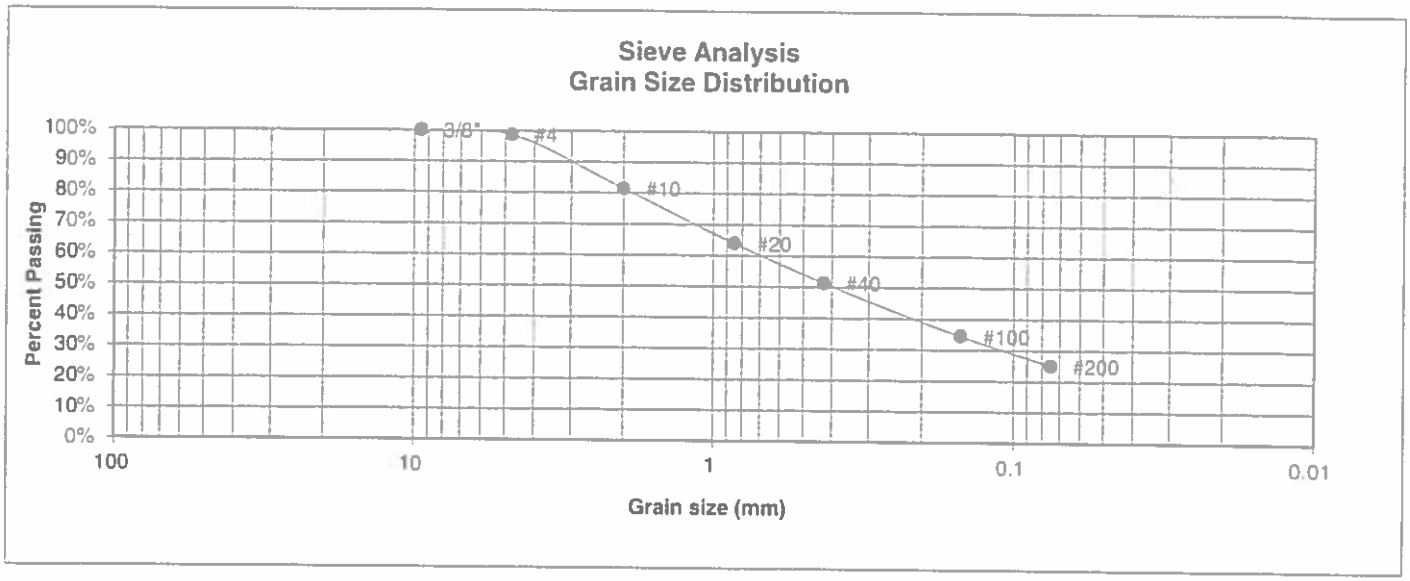
TEST PIT LOG

DRAWN	DATE	CHECKED	DATE
		LLL	2/10/25

JOB NO. 200160
FIG NO. B-2

APPENDIX C: Laboratory Test Results

UNIFIED CLASSIFICATION	SM	CLIENT	SMH CONSULTANTS
SOIL TYPE #	1	PROJECT	13235 VOLLMER ROAD
TEST BORING #	1	JOB NO.	200160
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	98.6%
10	81.4%
20	64.0%
40	51.3%
100	34.5%
200	25.1%

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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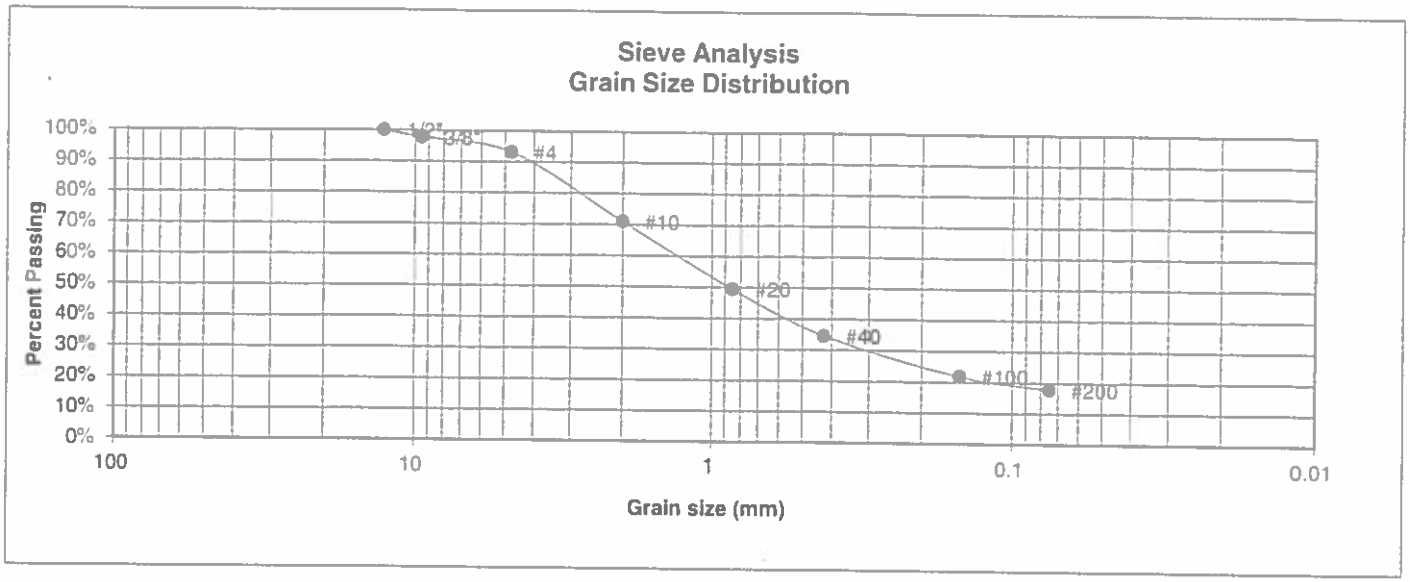
LABORATORY TEST RESULTS

DRAWN	DATE	CHECKED	DATE
			2/10/20

JOB NO.: 200160

FIG NO. C-1

UNIFIED CLASSIFICATION	SM	CLIENT	SMH CONSULTANTS
SOIL TYPE #	1	PROJECT	13235 VOLLMER ROAD
TEST BORING #	2	JOB NO.	200160
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	97.7%
4	93.1%
10	70.9%
20	49.5%
40	34.6%
100	21.9%
200	17.8%

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)

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LABORATORY TEST RESULTS

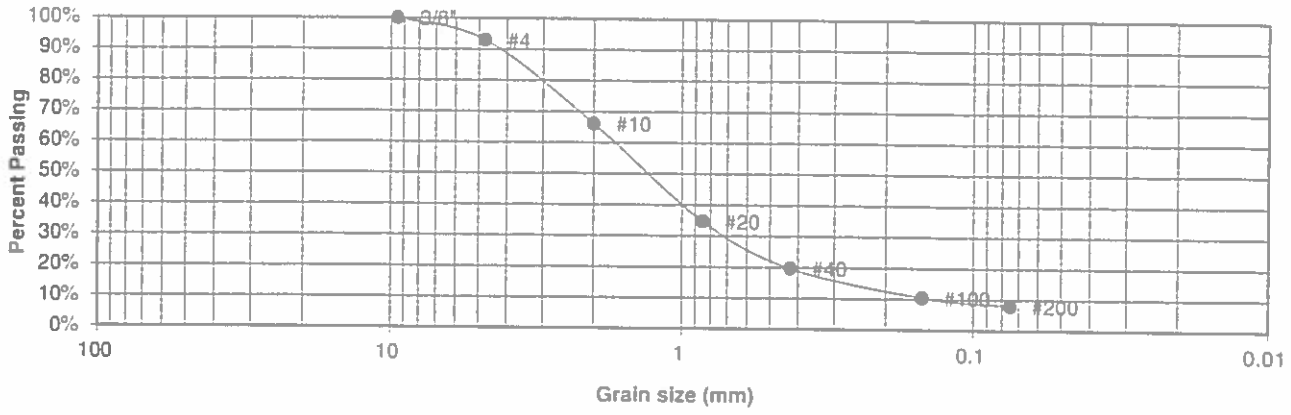
DRAWN	DATE	CHECKED	DATE
			2/10/20

JOB NO.: 200160

FIG NO.: C-2

BORING NO.	TP-2	UNIFIED CLASSIFICATION	SM-SW	TEST BY	BL
DEPTH(ft)	5-6	AASHTO CLASSIFICATION		JOB NO.	200160
CLIENT	SMH CONSULTANTS				
PROJECT	13235 VOLLMER ROAD				

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	93.0%
10	66.1%
20	34.7%
40	19.7%
100	10.5%
200	8.0%

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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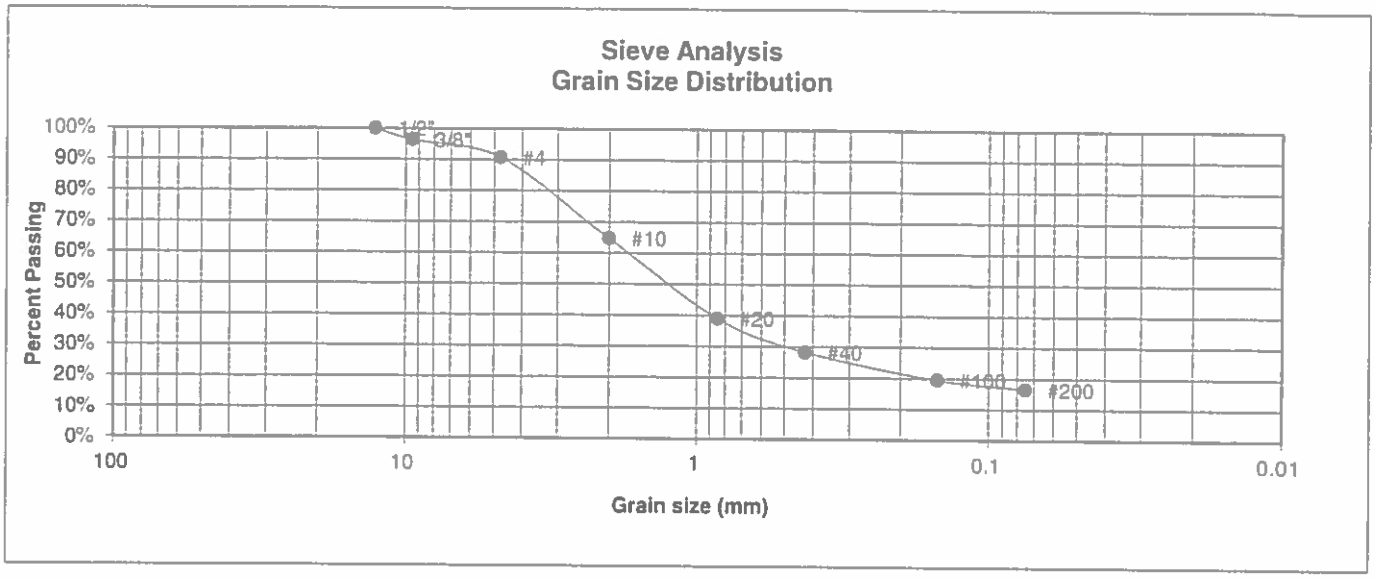
LABORATORY TEST RESULTS

DRAWN	DATE	CHECKED	DATE
		LLL	2/10/25

JOB NO. 200160

FIG NO. C-3

BORING NO.	TP-1	UNIFIED CLASSIFICATION	SC	TEST BY	BL
DEPTH(ft)	6-7	AASHTO CLASSIFICATION		JOB NO.	200160
CLIENT	SMH CONSULTANTS				
PROJECT	13235 VOLLMER ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	96.3%
4	90.7%
10	64.7%
20	39.0%
40	28.2%
100	19.5%
200	16.5%

Atterberg Limits

Plastic Limit	
Liquid Limit	
Plastic Index	

Swell

Moisture at start	12.3%
Moisture at finish	20.5%
Moisture increase	8.2%
Initial dry density (pcf)	99
Swell (psf)	360

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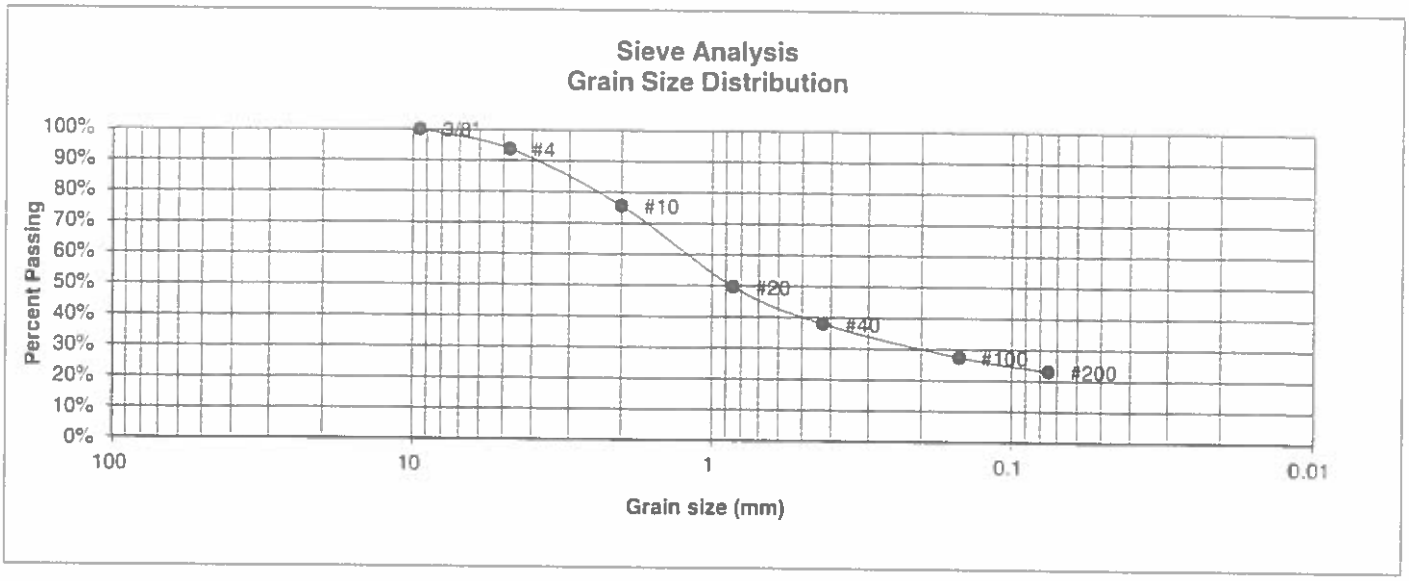
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED: LLL	DATE: 7/19/22

JOB NO. 200160

FIG NO. C-4

UNIFIED CLASSIFICATION	SC	CLIENT	SMH CONSULTANTS
SOIL TYPE #	2	PROJECT	13235 VOLLMER ROAD
TEST BORING #	1	JOB NO.	200160
DEPTH (FT)	15	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	93.7%
10	75.6%
20	49.6%
40	37.9%
100	27.4%
200	23.0%

Atterberg Limits

Plastic Limit	21
Liquid Limit	41
Plastic Index	20

Swell

Moisture at start

Moisture at finish

Moisture increase

Initial dry density (pcf)

Swell (psf)

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LABORATORY TEST RESULTS

DRAWN	DATE	CHECKED	DATE
		L	2/10/20

JOB NO 200160

FIG NO C-5

APPENDIX D: Soil Survey Descriptions

El Paso County Area, Colorado

26—Elbeth sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 367y
Elevation: 7,300 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Elbeth and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Elbeth

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from arkose

Typical profile

A - 0 to 3 inches: sandy loam
E - 3 to 23 inches: loamy sand
Bt - 23 to 68 inches: sandy clay loam
C - 68 to 74 inches: sandy clay loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:
Hydric soil rating: No

Pleasant
Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 17, Sep 13, 2019

El Paso County Area, Colorado

40—Kettle gravelly loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 368g
Elevation: 7,000 to 7,700 feet
Farmland classification: Not prime farmland

Map Unit Composition

Kettle and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kettle

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from arkose

Typical profile

E - 0 to 16 inches: gravelly loamy sand
Bt - 16 to 40 inches: gravelly sandy loam
C - 40 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

Other soils

Percent of map unit:
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 17, Sep 13, 2019

El Paso County Area, Colorado

68—Peyton-Pring complex, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369f
Elevation: 6,800 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Peyton and similar soils: 40 percent
Pring and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peyton

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Arkosic alluvium derived from sedimentary rock and/or arkosic residuum weathered from sedimentary rock

Typical profile

A - 0 to 12 inches: sandy loam
Bt - 12 to 25 inches: sandy clay loam
BC - 25 to 35 inches: sandy loam
C - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 3 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: Sandy Divide (R049BY216CO)
Hydric soil rating: No

Description of Pring

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Arkosic alluvium derived from sedimentary rock

Typical profile

A - 0 to 14 inches: coarse sandy loam
C - 14 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Loamy Park (R048AY222CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:
Hydric soil rating: No

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 17, Sep 13, 2019

APPENDIX E: El Paso County Health Department Septic Records

1A 1H

EL PASO COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT — Permit # ON [illegible]
INDIVIDUAL SEWAGE DISPOSAL SYSTEM INSPECTION FORM — Date 15 Dec. 99

APPROVED: YES ✓ NO __ #5200000303 ENVIRONMENTALIST J. Christensen

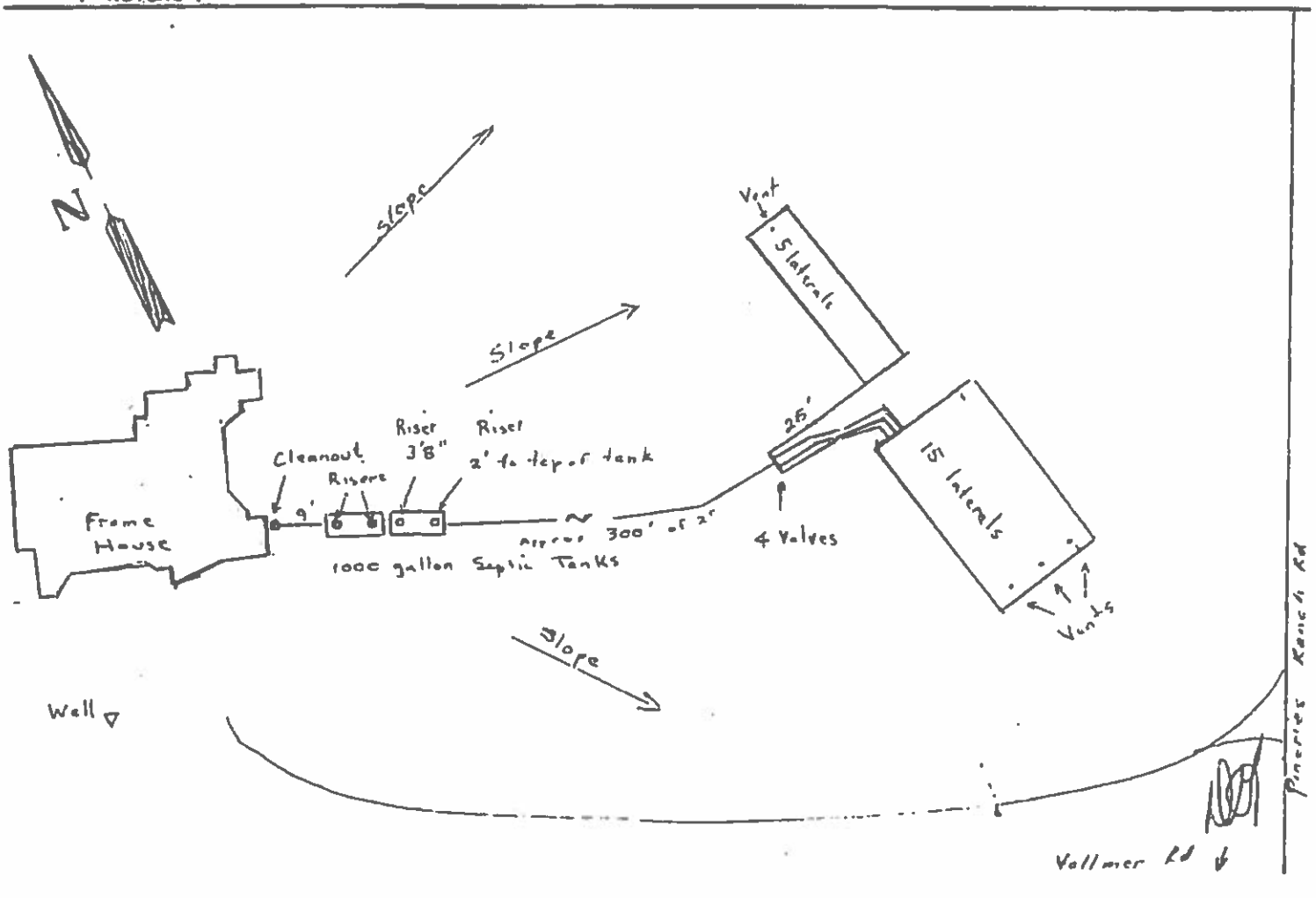
Address 13235 Vollmer Rd. Bogue Owner Peter Spahn

Legal Description NW¼ of NW¼ of section 10, R65W of the 6th pm
Residence ✓, # of bedrooms 3; Commercial ____; System Installer Slimline Loop

SEPTIC TANK:
Commercial ✓; Noncommercial ____, L ____, W ____, WD ____
Construction Material Concrete, capacity 2 x 1000 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: Low-Pressure Dosing System
Chamber: Type ____, number of chambers ____, bed ____, trench ____
sq. ft./section ____, reduction allowed ____%, sq. ft required ____
total sq. ft. installed 4000, depth of installation 2'
Engineer Design (Y) or N, Designing Engineer Paul Bryant,
Approval letter provided? (Y) or N 18 Jan 2000
Well 50 feet from tank (Y) or N 100 feet from leach field (Y) or N
Well installed at time of septic system inspection (Y) 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: Pump + Alarm to be installed in 2nd Chamber of 2nd septic tank. Field zones were covered - backfilled plus snow covered at time of inspection with exception of ends. 2" sch 40 line from septic tank outlet to valves. 1½" laterals.



EL PASO COUNTY

DEPARTMENT OF HEALTH AND ENVIRONMENT
301 S Union Blvd, Colorado Springs, Colorado 719-578-3126

PAID 2-7-99

INDIVIDUAL SEWAGE DISPOSAL SYSTEM PERMIT

WATER SOURCE: WELL
OWNER NAME: PETER SPAHN
ADDRESS: 13251 VOLLMER RD
CITY,STATE,ZIP: COLORADO SPRINGS 80908

PERMIT NUMBER: ON0000760
DATE PERMITTED: 7/13/99
PHONE NUMBER: 7194952203

INSTALLED BY: LOOP, SLIM

This permit is issued in accordance with 25-10-107 Colorado Revised Statues. 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). 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.

PERMIT FEE(NON REFUNDABLE) :
New Permit---$ 300.00 pd
ISDS Repair -$ 50.00
Voided/Altered permit --$ 25.00

PERMIT EXPIRATION DATE :
Expires twelve months from date of issue

DIRECTOR, EL PASO COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT

Janet Christensen 578-3141
ENVIRONMENTALIST / PHONE NUMBER

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

MINIMUM SEPTIC TANK SIZE: P.E DESIGN GALLONS *MINIMUM ABSORPTION AREA REQUIRED* P.E. DESIGN SQ FT

PLANNING DEPARTMEN OK ENUMERATION OK FLOOD PLAIN OK WASTEWATER N/A

COMMENTS:

THIS SYSTEM MUST BE DESIGNED BY A COLORADO REGISTERED PROFESSIONAL ENGINEER DUE TO BEDROCK AT 3 FEET BELOW NATIVE GROUND SURFACE. THE SYSTEM MUST BE INSPECTED BY THE HEALTH DEPARTMENT PRIOR TO BACKFILL AND A LETTER OF APPROVAL BY THE ENGINEER MUST BE FURNISHED THIS OFFICE FOR FINAL APPROVAL OF SYSTEM.

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.

13251 Vollmer Rd #5200000366 E. 12-15-99

Inspector Janet Record I.D. 760

ASAP

PAID 12-7-99

EL PASO COUNTY ENVIRONMENTAL HEALTH SERVICES

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

APPLICATION FOR A ☒ NEW ☑ REMODEL ☐ REPAIR OR ☐ ADDITION TO AN INDIVIDUAL SEWAGE DISPOSAL SYSTEM

Owner PETER R & KATHERINE F SPAHN Daytime Phone (719) 495-2203

Address of Property 13251 VOLLMER RD. City & Zip COLORADO SPRINGS, 80908

Legal Description NW1/4 OF THE NW1/4 OF SECTION 10, T12S R65W OF THE 6th PM.

master EL PASO COUNTY, CO

Tax Schedule # 52000-00-119 Lot Size 40 ACRES Septic Contractor HS EXCAVATION (SIM LOOP)

Inside City Limits ☒ No ☐ Yes-City _____ Water Supply ☒ Well or Spring ☐ Cistern ☐ Public

Type of Building ☒ Frame ☐ Mobile ☐ Modular ☐ Other _____

Owner's MAILING Address 13251 VOLLMER RD. City, State & Zip COLORADO SPRINGS, CO 80908

☐ MAIL PERMIT OR ☒ PICK UP PERMIT

MAXIMUM POTENTIAL BEDROOMS 3 PRS

Basement Y (N) Percolation Test Attached (Y) N Garbage Disposal (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 Peter R. Spahn Katherine F. Spahn Date 7/7/99

DEPARTMENT OF HEALTH USE ONLY

P.E. design	P.E. design	07/08/99
Minimum Absorption Area	Minimum Tank Capacity	Date of Site Inspection

REMARKS Perc test performed 12/98.

This system must be designed by a Colorado registered professional engineer due to bedrock at 3 Ft. below native ground surface. The system must be inspected by the Health Dept. prior to backfill and ~~made~~ a letter of approval by the engineer must be furnished this office for final approval of system.

EHS INSPECTOR Janet Christensen DATE 07/09/99 (APPROVED) DENIED

PERMIT # ON0000760 (FEE) NO FEE DATE TO PLANNING DEPT 7/8/99

DATE ~~TO WASTEWATER DISTRICT~~ attached OK

699.DEB

1) We require a copy of your percolation **(PERC) TEST** with an original professional engineer's (PE) stamp and signature.

2) A **PLOT PLAN** must be drawn (not to scale) on a 8 ½ x 11 sheet of paper. The plot plan must include
   1) a north bearing
   2) property lines
   3) property dimensions
   4) all buildings (proposed or existing)
   5) proposed septic system site
   6) designated alternate septic system site
   7) driveway (proposed or existing and name of adjoining street)

3) Initial any of the following features that apply to your property and include them on your plot plan.

PBS Well(s) ____ Adjacent property well(s) ___ Subsoil drain

____ Cistern ____ Water line

4) 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)

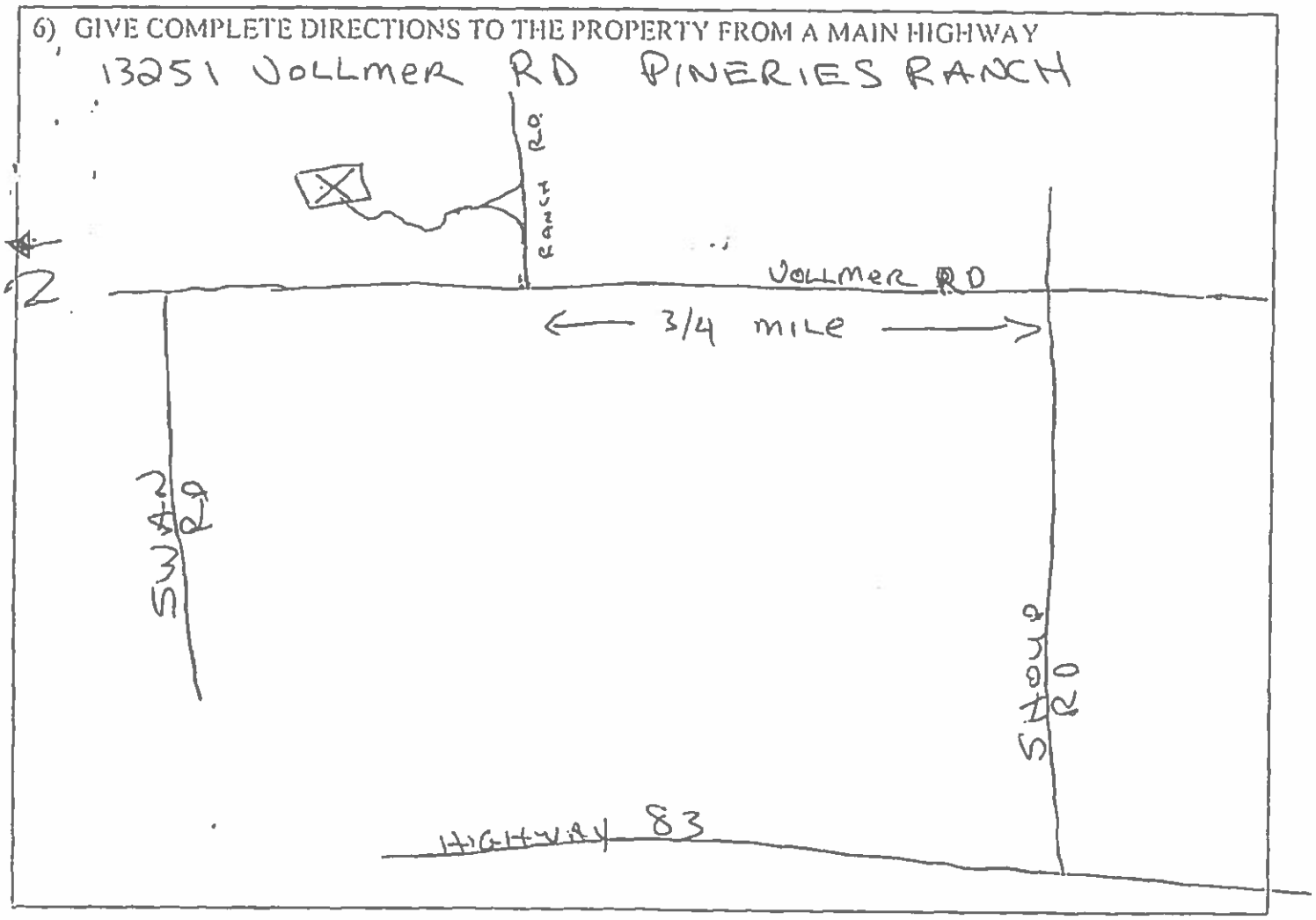
_____Pond(s) _____Stream(s)

_____Dry Gulch(es) _____Natural drainage course(s)

5) **PROPERTY ADDRESS OR LOT NUMBER MUST BE POSTED AND CLEARLY VISIBLE FROM ROAD. PERC HOLES MUST BE CLEARLY MARKED.**

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

13251 VOLLMER RD PINERIES RANCH



Appendix F

Colorado Analytical LABORATORIES, INC.

Analytical Results

TASK NO: 191212008

Report To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Bill To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Task No.: 191212008
Client PO:
Client Project: Abeyta

Date Received: 12/12/19
Date Reported: 1/6/20
Matrix: Water - Drinking

Lab Number	Customer Sample ID	Sample Date/Time	Test	Result	Method	Date Analyzed
191212008-01L	Abeyta	12/11/19 2:28 PM	Total Coliform	**Absent**	SM 9223	12/13/19
			E-Coli	**Absent**	SM 9223	12/13/19

Abbreviations/ References:

Absent = Coliform Not Detected
Present = Coliform Detected - Chlorination Recommended
Date Analyzed = Date Test Completed
SM = "Standard Methods for the Examination of Water and Wastewater"; APHA; 19th Edition; 1995

DATA APPROVED FOR RELEASE BY

Drinking Water Chain of Custody

1/2

Colorado Analytical LABORATORIES, INC.

Commerce City Lab
10411 Heinz Way
Commerce City CO 80640

Lakewood Service Center
12860 W. Cedar Dr, Suite 100A
Lakewood CO 80228

Phone: 303-659-2313

www.coloradolab.com

Report To Information	Bill To Information (If different from report to)	Project Information
Company Name: JDS-Hydro	Company Name:	PWSID: N/A
Contact Name: Dave Schwoenke	Contact Name:	System Name:
Address: 5540 Tech Center Dr	Address:	Compliance Samples: Yes ☐ No ☒
City: CS State: CO Zip: 80919	City: State: Zip:	Send Results to CDPHE: Yes ☐ No ☒
Phone: 719-227-0072	Phone:	Task Number (Lab Use Only) CAL Task No. 191212008
Email: dschwoenke@jdshydro.com	Email:	
Sample Collector: Stephanie Schwoenke		ARF
Sample Collector Phone: 719-321-5341	PO Number:	

Abeyta

Date	Time	Client Sample ID / Sample Pt ID	No. of Containers	Residual Chlorine (mg/L) P/A Samples Only	Total Coliform P/A	504.1 EDB/DBCP	505 Pests/PCBs	515.4 Herbicides	524.2 VOCs	525.2 SOCs-Pest	531.1 Carbamates	547 Glyphosate	548.1 Endothall	549.2 Diquat	524.2 TTHMs	552.2 HAA5s	Lead/Copper	Nitrate	Nitrite	Fluoride	Inorganics	Alk./Lang. Index (Circle)	TOC, DOC (Circle)	SUVA, UV 254 (Circle)	Cyanide	Gross Alpha/Beta	Radium 226/228	Radon	Uranium	CRadge 2 of 5
12/11	3:23pm	#1	3																							X			
12/11	2:26pm	#2	1																						X				
12/11	2:28pm	#3	2															X	X	X		X							X
12/11	2:30pm	#4	1																						X				
	2:31pm	#5	1																		X								
	2:33pm	#6	2							X																			
	2:37pm	#7	1											X															
	2:40pm	#8	1					X																					
V	2:34pm	#9	1										X																
	3:42pm	#10	2									X																	

Instructions:
Please see enclosed doc. for all analytes desired. No bottle recd for Chlorite. Field pH: 6.15 Field temp: 11.7°C

C/S Info:
Delivered Via: Fedex C/S Charge: K

Seals Present Yes ☐ No ☒ Headspace Yes ☒ No ☐
Temp. 4 °C /Ice ✓ Sample Pres. Yes ☐ No ☒

Relinquished By:	Date/Time:	Received By:	Date/Time:	Relinquished By:	Date/Time:	Received By:	Date/Time:
	12/11 3:33pm	gAdams	12/12/19 805			✓	

PHASE I, II, V Drinking Water Analyses (check requested analysis)

Subcontract Analyses

Drinking Water Chain of Custody

2/2

Colorado Analytical LABORATORIES, INC.

Brighton Lab
240 South Main Street
Brighton, CO 80601

Lakewood Lab
12860 W. Cedar Dr, Suite 100A
Lakewood CO 80228

Phone: 303-659-2313
Fax: 303-659-2315

www.coloradolab.com

Report To Information	Bill To Information (If different from report to)	State Form / Project Information
Company Name: JDS-Hydro	Company Name:	PWSID: N/A
Contact Name: Doug Schwenke	Contact Name:	System Name:
Address: 5540 Tech Center Dr	Address:	Address: 13235 Vollmer St
City CS State CO Zip 80919	City State Zip	City CS State CO Zip 80908
Phone: 719-227-0072 Fax:	Phone: Fax:	County: El Paso
Email: dschwenke@jdshydro.com	Email:	Compliance Samples: Yes ☐ No ☒
Sampler Name: Stephanie Schwenke	PO No.:	Send Forms to State: Yes ☐ No ☒

CAL Task No. 191212008

Task Number Abeyta ARF

Date	Time	Client Sample ID / EP Code	No. of Containers	Residual Chlorine (mg/L) P/A Samples Only	PHASE I, II, V Drinking Water Analyses (check analysis): Total Coliform P/A	504.1 EDB/DBCP	505 Pests/PCBs	515.4 Herbicides	524.2 VOCs	525.2 SOCs-Pest	531.1 Carbamates	547 Glyphosate	548.1 Endothall	549.2 Diquat	524.2 TTHMs	552.2 HAA5s	Lead/Copper	Nitrate	Nitrite	Fluoride	Inorganics	Alk./Lang. Index	TOC, DOC (Circle)	SUVA, UV 254 (Circle)	Subcontract Analyses: Gross Alpha/Beta	Radium 226	Radium 228	Radon	Uranium
12/11	2:45pm	#11	2																				X						
	3:47pm	#12	3				X																						
	3:52pm	#13	3			X																							
	3:53pm	#14	3						X																				
	3:57pm	#15	2								X																		
↓	2pm	#11b	1		X																								

Page 3 of 5

Instructions: 29 + 2 blanks

C/S Info:

Delivered Via: Fedex C/S Charge ☒ K

Seals Present Yes ☐ No ☒ Headspace Yes ☒ No ☐

Temp. 4 °C /Ice Y Sample Pres. Yes ☒ No ☐

Relinquished By:	Date/Time:	Received By:	Date/Time:	Relinquished By:	Date/Time:	Received By:	Date/Time:
	12/11 3:52pm	Adam	12/12/19 805				

CAL Task No.
191212008

New Groundwater Source Sampling Request

ARF

Field Measurements
pH
Turbidity
Conductivity

General Parameters
Total Organic Carbon
Sodium
Calcium
Magnesium
Potassium
Total Hardness – CaCO3
Total Alkalinity
Bicarbonate Alkalinity
Strontium
Total Dissolved Solids (TDS)

Microbiological
Total Coliform
E.Coli

VOCs
Vinyl chloride
Benzene
Carbon tetrachloride
1,2-Dichlororethane
Trichloroethylene
1,1,1 Trichloroethane
1,1-Dichloroethylene
Cis-1,2 Dichloroethylene
1,2-Dichloropropane
Ethylbenzene
Monochlorobenzene
o-Dichlorobenzene
p-Dichlorobenzene
Styrene
Tetrachloroethylene
Toluene
Trans-1,2 Dichloroethylene
Xylenes (total)
Dichloromethane (methylene chloride)
1,2,4-Trichlorobenzene
1,1,2-Trichloroethane

Radionuclides
Radium 226 and Radium 228
Gross alpha particle activity -
Including Radium 226 but not radon & uranium
Beta particle and photon radioactivity

ARF

Inorganics
Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Copper
Cyanide (as free Cyanide)
Fluoride
Iron
Lead
Manganese
Mercury
Nickel
Nitrate
Nitrite
Selenium
Thallium
Uranium

Secondary MCLs
Aluminum
Chloride
Silver
Sulfate
Zinc

Synthetic Organic Chemicals (SOC)
Alachlor
Aldibarb1
Aldicarb sulfoxide
Aldicarb sulfone
Altrazine
Carbofuran
Chlordane
Dibromochloropropane
2,4 D
Ethylene dibromide
Heptachlor
Heptachlor epoxide
Lindane
Methoxychlor
Polychlorinated biphenyls
Pentachlorophenol
Toxaphene
2,4,5-TP(Silvex)
Benzopyrene
Dalapon
Di(2-ethylhexyl) adipate
Di(2-ethylhexyl)phthalate
Dinoseb
Dioxin
Diquat
Endothall
Endrin
Glyphosate
Hexachlorobenzene
Hexachlorocyclopentadiene
Oxamyl (Vydate)
Picloram
Simazine

Colorado Analytical LABORATORIES, INC.

Analytical Results

TASK NO: 191212008

Report To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Bill To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Task No.: 191212008
Client PO:
Client Project: Abeyta

Date Received: 12/12/19
Date Reported: 1/6/20
Matrix: Water - Drinking

Customer Sample ID Abeyta
Sample Date/Time: 12/11/19 2:28 PM
Lab Number: 191212008-01

Test	Result	Method	ML	Date Analyzed	Analyzed By
Bicarbonate	**42.6 mg/L as CaCO3**	SM 2320-B	0.1	12/16/19	ERL
Calcium as CaCO3	**26.0 mg/L**	EPA 200.7	0.1	12/16/19	MBN
Carbonate	**< 0.1 mg/L as CaCO3**	SM 2320-B	0.1	12/16/19	ERL
Hydroxide	**< 0.1 mg/L as CaCO3**	SM 2320-B	0.1	12/16/19	ERL
Langelier Index	**-2.24 units**	SM 2330-B		12/18/19	SAN
pH	**6.42 units**	SM 4500-H-B	0.01	12/12/19	MBN
Temperature	**20 °C**	SM 4500-H-B	1	12/12/19	MBN
Total Alkalinity	**42.6 mg/L as CaCO3**	SM 2320-B	0.1	12/16/19	ERL
Total Dissolved Solids	**80 mg/L**	SM 2540-C	5	12/17/19	ISG

Abbreviations/ References:

ML = Minimum Level = LRL = RL
mg/L = Milligrams Per Liter or PPM
ug/L = Micrograms Per Liter or PPB
mpn/100 mls = Most Probable Number Index/ 100 mls
Date Analyzed = Date Test Completed

DATA APPROVED FOR RELEASE BY

Drinking Water Chain of Custody

1/2

Colorado Analytical LABORATORIES, INC.

Commerce City Lab
10411 Heinz Way
Commerce City CO 80640

Lakewood Service Center
12860 W. Cedar Dr, Suite 100A
Lakewood CO 80228

Phone: 303-659-2313

www.coloradolab.com

Report To Information	Bill To Information (If different from report to)	Project Information
Company Name: JDS-Hydro	Company Name:	PWSID: N/A
Contact Name: Dave Schwoenke	Contact Name:	System Name:
Address: 5540 Tech Center Dr	Address:	Compliance Samples: Yes ☐ No ☒
City: CS State: CO Zip: 80919	City: State: Zip:	Send Results to CDPHE: Yes ☐ No ☒
Phone: 719-227-0072	Phone:	Task Number (Lab Use Only) CAL Task No. 191212008
Email: dschwoenke@jdshydro.com	Email:	
Sample Collector: Stephanie Schwoenke		ARF
Sample Collector Phone: 719-321-5341	PO Number:	

Abeyta

Date	Time	Client Sample ID / Sample Pt ID	No. of Containers	Residual Chlorine (mg/L) P/A Samples Only	Total Coliform P/A	504.1 EDB/DBCP	505 Pests/PCBs	515.4 Herbicides	524.2 VOCs	525.2 SOCs-Pest	531.1 Carbamates	547 Glyphosate	548.1 Endothall	549.2 Diquat	524.2 TTHMs	552.2 HAA5s	Lead/Copper	Nitrate	Nitrite	Fluoride	Inorganics	Alk./Lang. Index (Circle)	TOC, DOC (Circle)	SUVA, UV 254 (Circle)	Cyanide	Gross Alpha/Beta	Radium 226/228	Radon	Uranium	CRadge 2 of 5
12/11	3:23pm	#1	3																							X			
12/11	2:26pm	#2	1																						X				
12/11	2:28pm	#3	2															X	X	X		X							X
12/11	2:30pm	#4	1																						X				
	2:31pm	#5	1																		X								
	2:33pm	#6	2							X																			
	2:37pm	#7	1											X															
	2:40pm	#8	1					X																					
V	2:34pm	#9	1										X																
	3:42pm	#10	2									X																	

Instructions:
Please see enclosed doc. for all analytes desired. No bottle recd for Chlorite. Field pH: 6.15 Field temp: 11.7°C

C/S Info:
Delivered Via: Fedex C/S Charge: K

Seals Present Yes ☐ No ☒ Headspace Yes ☒ No ☐
Temp. 4 °C /Ice ✓ Sample Pres. Yes ☐ No ☒

Relinquished By:	Date/Time:	Received By:	Date/Time:	Relinquished By:	Date/Time:	Received By:	Date/Time:
	12/11 3:33pm	gAdams	12/12/19 805			✓	

PHASE I, II, V Drinking Water Analyses (check requested analysis)

Subcontract Analyses

Drinking Water Chain of Custody

2/2

Colorado Analytical LABORATORIES, INC.

Brighton Lab
240 South Main Street
Brighton, CO 80601

Lakewood Lab
12860 W. Cedar Dr, Suite 100A
Lakewood CO 80228

Phone: 303-659-2313
Fax: 303-659-2315

www.coloradolab.com

Report To Information	Bill To Information (If different from report to)	State Form / Project Information
Company Name: JDS-Hydro	Company Name:	PWSID: N/A
Contact Name: Doug Schwenke	Contact Name:	System Name:
Address: 5540 Tech Center Dr	Address:	Address: 13235 Vollmer St
City CS State CO Zip 80919	City State Zip	City CS State CO Zip 80908
Phone: 719-227-0072 Fax:	Phone: Fax:	County: El Paso
Email: dschwenke@jdshydro.com	Email:	Compliance Samples: Yes ☐ No ☒
Sampler Name: Stephanie Schwenke	PO No.:	Send Forms to State: Yes ☐ No ☒

CAL Task No. 191212008

Task Number Abeyta ARF

Date	Time	Client Sample ID / EP Code	No. of Containers	Residual Chlorine (mg/L) P/A Samples Only	PHASE I, II, V Drinking Water Analyses (check analysis): Total Coliform P/A	504.1 EDB/DBCP	505 Pests/PCBs	515.4 Herbicides	524.2 VOCs	525.2 SOCs-Pest	531.1 Carbamates	547 Glyphosate	548.1 Endothall	549.2 Diquat	524.2 TTHMs	552.2 HAA5s	Lead/Copper	Nitrate	Nitrite	Fluoride	Inorganics	Alk./Lang. Index	TOC, DOC (Circle)	SUVA, UV 254 (Circle)	Subcontract Analyses: Gross Alpha/Beta	Radium 226	Radium 228	Radon	Uranium
12/11	2:45pm	#11	2																				X						
	3:47pm	#12	3				X																						
	3:52pm	#13	3			X																							
	3:53pm	#14	3						X																				
	3:57pm	#15	2								X																		
↓	2pm	#11b	1		X																								

Page 3 of 5

Instructions: 29 + 2 blanks

C/S Info:

Delivered Via: Fedex C/S Charge ☒ K

Seals Present Yes ☐ No ☒ Headspace Yes ☒ No ☐

Temp. 4 °C /Ice Y Sample Pres. Yes ☒ No ☐

Relinquished By:	Date/Time:	Received By:	Date/Time:	Relinquished By:	Date/Time:	Received By:	Date/Time:
	12/11 3:52pm	Adam	12/12/19 805				

CAL Task No.
191212008

New Groundwater Source Sampling Request

ARF

Field Measurements
pH
Turbidity
Conductivity

General Parameters
Total Organic Carbon
Sodium
Calcium
Magnesium
Potassium
Total Hardness – CaCO3
Total Alkalinity
Bicarbonate Alkalinity
Strontium
Total Dissolved Solids (TDS)

Microbiological
Total Coliform
E.Coli

VOCs
Vinyl chloride
Benzene
Carbon tetrachloride
1,2-Dichlororethane
Trichloroethylene
1,1,1 Trichloroethane
1,1-Dichloroethylene
Cis-1,2 Dichloroethylene
1,2-Dichloropropane
Ethylbenzene
Monochlorobenzene
o-Dichlorobenzene
p-Dichlorobenzene
Styrene
Tetrachloroethylene
Toluene
Trans-1,2 Dichloroethylene
Xylenes (total)
Dichloromethane (methylene chloride)
1,2,4-Trichlorobenzene
1,1,2-Trichloroethane

Radionuclides
Radium 226 and Radium 228
Gross alpha particle activity -
Including Radium 226 but not radon & uranium
Beta particle and photon radioactivity

ARF

Inorganics
Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Copper
Cyanide (as free Cyanide)
Fluoride
Iron
Lead
Manganese
Mercury
Nickel
Nitrate
Nitrite
Selenium
Thallium
Uranium

Secondary MCLs
Aluminum
Chloride
Silver
Sulfate
Zinc

Synthetic Organic Chemicals (SOC)
Alachlor
Aldibarb1
Aldicarb sulfoxide
Aldicarb sulfone
Altrazine
Carbofuran
Chlordane
Dibromochloropropane
2,4 D
Ethylene dibromide
Heptachlor
Heptachlor epoxide
Lindane
Methoxychlor
Polychlorinated biphenyls
Pentachlorophenol
Toxaphene
2,4,5-TP(Silvex)
Benzopyrene
Dalapon
Di(2-ethylhexyl) adipate
Di(2-ethylhexyl)phthalate
Dinoseb
Dioxin
Diquat
Endothall
Endrin
Glyphosate
Hexachlorobenzene
Hexachlorocyclopentadiene
Oxamyl (Vydate)
Picloram
Simazine

Colorado Analytical LABORATORIES, INC.

Analytical Results

TASK NO: 191212008

Report To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Bill To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Task No.: 191212008
Client PO:
Client Project: Abeyta

Date Received: 12/12/19
Date Reported: 1/6/20
Matrix: Water - Drinking

Customer Sample ID Abeyta
Sample Date/Time: 12/11/19 2:28 PM
Lab Number: 191212008-01

Test	Result	Method	ML	Date Analyzed	Analyzed By	MCL
Glyphosate	**< 6.0 ug/L**	EPA 547	6.0 ug/L	12/23/19	Outside Lab	700

Abbreviations/ References:

ML = Minimum Level = LRL = RL
MCL = Maximum Contaminant Level per The EPA
mg/L = Milligrams Per Liter or PPM
ug/L = Micrograms Per Liter or PPB
mpn/100 mls = Most Probable Number Index/ 100 mls
Date Analyzed = Date Test Completed

DATA APPROVED FOR RELEASE BY

Drinking Water Chain of Custody

1/2

Colorado Analytical LABORATORIES, INC.

Commerce City Lab
10411 Heinz Way
Commerce City CO 80640

Lakewood Service Center
12860 W. Cedar Dr, Suite 100A
Lakewood CO 80228

Phone: 303-659-2313

www.coloradolab.com

Report To Information	Bill To Information (If different from report to)	Project Information
Company Name: JDS-Hydro	Company Name:	PWSID: N/A
Contact Name: Dave Schwoerke	Contact Name:	System Name:
Address: 5540 Tech Center Dr	Address:	Compliance Samples: Yes ☐ No ☒
City: CS State: CO Zip: 80919	City: State: Zip:	Send Results to CDPHE: Yes ☐ No ☒
Phone: 719-227-0072	Phone:	Task Number (Lab Use Only) CAL Task No. 191212008
Email: dschwoerke@jdshydro.com	Email:	
Sample Collector: Stephanie Schwoerke		ARF
Sample Collector Phone: 719-321-5341	PO Number:	

Abeyta

Date	Time	Client Sample ID / Sample Pt ID	No. of Containers	Residual Chlorine (mg/L) P/A Samples Only	Total Coliform P/A	504.1 EDB/DBCP	505 Pests/PCBs	515.4 Herbicides	524.2 VOCs	525.2 SOCs-Pest	531.1 Carbamates	547 Glyphosate	548.1 Endothall	549.2 Diquat	524.2 TTHMs	552.2 HAA5s	Lead/Copper	Nitrate	Nitrite	Fluoride	Inorganics	Alk./Lang. Index (Circle)	TOC, DOC (Circle)	SUVA, UV 254 (Circle)	Cyanide	Gross Alpha/Beta	Radium 226/228	Radon	Uranium	Chlorite
12/11	3:23pm	#1	3																							X			
12/11	2:26pm	#2	1																						X				
12/11	2:28pm	#3	2															X	X	X		X							X
12/11	2:30pm	#4	1																						X				
	2:31pm	#5	1																		X								
	2:33pm	#6	2							X																			
	2:37pm	#7	1											X															
	2:40pm	#8	1					X																					
V	2:34pm	#9	1										X																
	3:42pm	#10	2									X																	

Instructions:
Please see enclosed doc. for all analytes desired. No bottle recd for Chlorite. Field pH: 6.15 Field temp: 11.7°C

C/S Info:
Delivered Via: Fedex C/S Charge: K

Seals Present Yes ☐ No ☒ Headspace Yes ☒ No ☐
Temp. 4 °C /Ice ✓ Sample Pres. Yes ☐ No ☒

Relinquished By:	Date/Time:	Received By:	Date/Time:	Relinquished By:	Date/Time:	Received By:	Date/Time:
	12/11 3:33pm	gAdams	12/12/19 805			✓	

PHASE I, II, V Drinking Water Analyses (check requested analysis)

Subcontract Analyses

Drinking Water Chain of Custody

2/2

Colorado Analytical LABORATORIES, INC.

Brighton Lab
240 South Main Street
Brighton, CO 80601

Lakewood Lab
12860 W. Cedar Dr, Suite 100A
Lakewood CO 80228

Phone: 303-659-2313
Fax: 303-659-2315

www.coloradolab.com

Report To Information	Bill To Information (If different from report to)	State Form / Project Information
Company Name: JDS-Hydro	Company Name:	PWSID: N/A
Contact Name: Doug Schwenke	Contact Name:	System Name:
Address: 5540 Tech Center Dr	Address:	Address: 13235 Vollmer St
City CS State CO Zip 80919	City State Zip	City CS State CO Zip 80908
Phone: 719-227-0072 Fax:	Phone: Fax:	County: El Paso
Email: dschwenke@jdshydro.com	Email:	Compliance Samples: Yes ☐ No ☒
Sampler Name: Stephanie Schwenke	PO No.:	Send Forms to State: Yes ☐ No ☒

CAL Task No. 191212008

Task Number Abeyta ARF

Date	Time	Client Sample ID / EP Code	No. of Containers	Residual Chlorine (mg/L) P/A Samples Only	PHASE I, II, V Drinking Water Analyses (check analysis): Total Coliform P/A	504.1 EDB/DBCP	505 Pests/PCBs	515.4 Herbicides	524.2 VOCs	525.2 SOCs-Pest	531.1 Carbamates	547 Glyphosate	548.1 Endothall	549.2 Diquat	524.2 TTHMs	552.2 HAA5s	Lead/Copper	Nitrate	Nitrite	Fluoride	Inorganics	Alk./Lang. Index	TOC, DOC (Circle)	SUVA, UV 254 (Circle)	Subcontract Analyses: Gross Alpha/Beta	Radium 226	Radium 228	Radon	Uranium
12/11	2:45pm	#11	2																				X						
	3:47pm	#12	3				X																						
	3:53pm	#13	3			X																							
	3:55pm	#14	3						X																				
	3:57pm	#15	2								X																		
↓	2pm	#11b	1		X																								

Page 3 of 5

Instructions: 29 + 2 blanks

C/S Info:

Delivered Via: Fedex C/S Charge ☒ K

Seals Present Yes ☐ No ☒ Headspace Yes ☒ No ☐

Temp. 4 °C /Ice Y Sample Pres. Yes ☒ No ☐

Relinquished By:	Date/Time:	Received By:	Date/Time:	Relinquished By:	Date/Time:	Received By:	Date/Time:
	12/11 3:32pm	Adam	12/12/19 805				

CAL Task No.
191212008

New Groundwater Source Sampling Request

ARF

Field Measurements
pH
Turbidity
Conductivity

General Parameters
Total Organic Carbon
Sodium
Calcium
Magnesium
Potassium
Total Hardness – CaCO3
Total Alkalinity
Bicarbonate Alkalinity
Strontium
Total Dissolved Solids (TDS)

Microbiological
Total Coliform
E.Coli

VOCs
Vinyl chloride
Benzene
Carbon tetrachloride
1,2-Dichlororethane
Trichloroethylene
1,1,1 Trichloroethane
1,1-Dichloroethylene
Cis-1,2 Dichloroethylene
1,2-Dichloropropane
Ethylbenzene
Monochlorobenzene
o-Dichlorobenzene
p-Dichlorobenzene
Styrene
Tetrachloroethylene
Toluene
Trans-1,2 Dichloroethylene
Xylenes (total)
Dichloromethane (methylene chloride)
1,2,4-Trichlorobenzene
1,1,2-Trichloroethane

Radionuclides
Radium 226 and Radium 228
Gross alpha particle activity -
Including Radium 226 but not radon & uranium
Beta particle and photon radioactivity

ARF

Inorganics
Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Copper
Cyanide (as free Cyanide)
Fluoride
Iron
Lead
Manganese
Mercury
Nickel
Nitrate
Nitrite
Selenium
Thallium
Uranium

Secondary MCLs
Aluminum
Chloride
Silver
Sulfate
Zinc

Synthetic Organic Chemicals (SOC)
Alachlor
Aldibarb1
Aldicarb sulfoxide
Aldicarb sulfone
Altrazine
Carbofuran
Chlordane
Dibromochloropropane
2,4 D
Ethylene dibromide
Heptachlor
Heptachlor epoxide
Lindane
Methoxychlor
Polychlorinated biphenyls
Pentachlorophenol
Toxaphene
2,4,5-TP(Silvex)
Benzopyrene
Dalapon
Di(2-ethylhexyl) adipate
Di(2-ethylhexyl)phthalate
Dinoseb
Dioxin
Diquat
Endothall
Endrin
Glyphosate
Hexachlorobenzene
Hexachlorocyclopentadiene
Oxamyl (Vydate)
Picloram
Simazine

Colorado Analytical LABORATORIES, INC.

Analytical Results

TASK NO: 191212008

Report To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Bill To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Task No.: 191212008
Client PO:
Client Project: Abeyta

Date Received: 12/12/19
Date Reported: 1/6/20
Matrix: Water - Drinking

Customer Sample ID Abeyta
Sample Date/Time: 12/11/19 2:28 PM
Lab Number: 191212008-01

Test	Result	Method	ML	Date Analyzed	Analyzed By	MCL
Chloride	**1.6 mg/L**	EPA 300.0	0.1 mg/L	12/12/19	MAT	
Fluoride	**0.18 mg/L**	EPA 300.0	0.09 mg/L	12/12/19	MAT	4
Nitrate Nitrogen	**0.40 mg/L**	EPA 300.0	0.05 mg/L	12/12/19	MAT	10
Nitrite Nitrogen	**< 0.03 mg/L**	EPA 300.0	0.03 mg/L	12/12/19	MAT	1
Sulfate	**2.7 mg/L**	EPA 300.0	0.1 mg/L	12/12/19	MAT	
Cyanide-Free	**< 0.005 mg/L**	EPA 335.4	0.005 mg/L	12/18/19	CES	
Dibromochloropropane	**< 0.02 ug/L**	EPA 504.1	0.02 ug/L	12/17/19	SPF	0.2
Ethylene dibromide	**< 0.01 ug/L**	EPA 504.1	0.01 ug/L	12/17/19	SPF	0.05
Aldrin	**< 0.05 ug/L**	EPA 505	0.05 ug/L	12/14/19	SPF	
Chlordane	**< 0.2 ug/L**	EPA 505	0.2 ug/L	12/14/19	SPF	2
Dieldrin	**< 0.05 ug/L**	EPA 505	0.05 ug/L	12/14/19	SPF	
Endrin	**< 0.01 ug/L**	EPA 505	0.01 ug/L	12/14/19	SPF	2
Heptachlor epoxide	**< 0.02 ug/L**	EPA 505	0.02 ug/L	12/14/19	SPF	0.2
Hexachlorobenzene	**< 0.1 ug/L**	EPA 505	0.1 ug/L	12/14/19	SPF	1
Hexachlorocyclopentadiene	**< 0.1 ug/L**	EPA 505	0.1 ug/L	12/14/19	SPF	50
Lindane	**< 0.02 ug/L**	EPA 505	0.02 ug/L	12/14/19	SPF	0.2
Methoxychlor	**< 0.1 ug/L**	EPA 505	0.1 ug/L	12/14/19	SPF	40
Polychlorinated biphenyl's	**< 0.1 ug/L**	EPA 505	0.1 ug/L	12/14/19	SPF	0.5
Toxaphene	**< 1 ug/L**	EPA 505	1 ug/L	12/14/19	SPF	3

Abbreviations/ References:

ML = Minimum Level = LRL = RL
MCL = Maximum Contaminant Level per The EPA
mg/L = Milligrams Per Liter or PPM
ug/L = Micrograms Per Liter or PPB
mpn/100 mls = Most Probable Number Index/ 100 mls
Date Analyzed = Date Test Completed

DATA APPROVED FOR RELEASE BY

Colorado Analytical LABORATORIES, INC.

Analytical Results

TASK NO: 191212008

Report To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Bill To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Task No.: 191212008
Client PO:
Client Project: Abeyta

Date Received: 12/12/19
Date Reported: 1/6/20
Matrix: Water - Drinking

Customer Sample ID Abeyta
Sample Date/Time: 12/11/19 2:28 PM
Lab Number: 191212008-01

Test	Result	Method	ML	Date Analyzed	Analyzed By	MCL
2,4,5-TP	**< 0.2 ug/L**	EPA 515.4	0.2 ug/L	12/19/19	mbs	50
2,4,-D	**< 0.1 ug/L**	EPA 515.4	0.1 ug/L	12/19/19	mbs	70
Dalapon	**< 1.0 ug/L**	EPA 515.4	1.0 ug/L	12/19/19	mbs	200
Dicamba	**< 0.5 ug/L**	EPA 515.4	0.5 ug/L	12/19/19	mbs	
Dinoseb	**< 0.2 ug/L**	EPA 515.4	0.2 ug/L	12/19/19	mbs	7
Pentachlorophenol	**< 0.04 ug/L**	EPA 515.4	0.04 ug/L	12/19/19	mbs	1
Picloram	**< 0.1 ug/L**	EPA 515.4	0.1 ug/L	12/19/19	mbs	500
Alachlor	**< 0.2 ug/L**	EPA 525.2	0.2 ug/L	12/19/19	LEH	2
Atrazine	**< 0.1 ug/L**	EPA 525.2	0.1 ug/L	12/19/19	LEH	3
Benzo(a)pyrene	**< 0.02 ug/L**	EPA 525.2	0.02 ug/L	12/19/19	LEH	0.2
Butachlor	**< 0.25 ug/L**	EPA 525.2	0.25 ug/L	12/19/19	LEH	
Di(2-ethylhexyl)adipate	**< 0.6 ug/L**	EPA 525.2	0.6 ug/L	12/19/19	LEH	400
Di(2-ethylhexyl)phthalate	**< 0.6 ug/L**	EPA 525.2	0.6 ug/L	12/19/19	LEH	6
Heptachlor	**< 0.04 ug/L**	EPA 525.2	0.04 ug/L	12/19/19	LEH	0.4
Metolachlor	**< 0.25 ug/L**	EPA 525.2	0.25 ug/L	12/19/19	LEH	
Metribuzin	**< 0.25 ug/L**	EPA 525.2	0.25 ug/L	12/19/19	LEH	
Propachlor	**< 0.25 ug/L**	EPA 525.2	0.25 ug/L	12/19/19	LEH	
Simazine	**< 0.07 ug/L**	EPA 525.2	0.07 ug/L	12/19/19	LEH	4
3-Hydroxycarbofuran	**< 0.5 ug/L**	EPA 531.1	0.5 ug/L	1/3/20	MBS	
Aldicarb	**< 0.6 ug/L**	EPA 531.1	0.6 ug/L	1/3/20	MBS	
Aldicarb sulfone	**< 1.0 ug/L**	EPA 531.1	1.0 ug/L	1/3/20	MBS	

Abbreviations/ References:

ML = Minimum Level = LRL = RL
MCL = Maximum Contaminant Level per The EPA
mg/L = Milligrams Per Liter or PPM
ug/L = Micrograms Per Liter or PPB
mpn/100 mls = Most Probable Number Index/ 100 mls
Date Analyzed = Date Test Completed

DATA APPROVED FOR RELEASE BY

Colorado Analytical LABORATORIES, INC.

Analytical Results

TASK NO: 191212008

Report To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Bill To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Task No.: 191212008
Client PO:
Client Project: Abeyta

Date Received: 12/12/19
Date Reported: 1/6/20
Matrix: Water - Drinking

Customer Sample ID Abeyta
Sample Date/Time: 12/11/19 2:28 PM
Lab Number: 191212008-01

Test	Result	Method	ML	Date Analyzed	Analyzed By	MCL
Aldicarb sulfoxide	**< 0.7 ug/L**	EPA 531.1	0.7 ug/L	1/3/20	MBS	
Carbaryl	**< 0.5 ug/L**	EPA 531.1	0.5 ug/L	1/3/20	MBS	
Carbofuran	**< 0.9 ug/L**	EPA 531.1	0.9 ug/L	1/3/20	MBS	40
Methomyl	**< 0.5 ug/L**	EPA 531.1	0.5 ug/L	1/3/20	MBS	
Oxamyl	**< 1.0 ug/L**	EPA 531.1	1.0 ug/L	1/3/20	MBS	200
Endothall	**< 9 ug/L**	EPA 548.1	9 ug/L	12/18/19	LEH	100
Diquat	**< 0.4 ug/L**	EPA 549.2	0.4 ug/L	12/16/19	Michael	20
1,1,1,2-Tetrachloroethane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
1,1,1-Trichloroethane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	200
1,1,2,2-Tetrachloroethane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
1,1,2-Trichloroethane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	5
1,1-Dichloroethane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
1,1-Dichloroethylene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	7
1,1-Dichloropropene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
1,2,3-Trichlorobenzene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
1,2,3-Trichloropropane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
1,2,4-Trichlorobenzene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	70
1,2,4-Trimethylbenzene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
1,2-Dichloroethane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	5
1,2-Dichloropropane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	5

Abbreviations/ References:

ML = Minimum Level = LRL = RL
MCL = Maximum Contaminant Level per The EPA
mg/L = Milligrams Per Liter or PPM
ug/L = Micrograms Per Liter or PPB
mpn/100 mls = Most Probable Number Index/ 100 mls
Date Analyzed = Date Test Completed

DATA APPROVED FOR RELEASE BY

Colorado Analytical LABORATORIES, INC.

Analytical Results

TASK NO: 191212008

Report To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Bill To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Task No.: 191212008
Client PO:
Client Project: Abeyta

Date Received: 12/12/19
Date Reported: 1/6/20
Matrix: Water - Drinking

Customer Sample ID Abeyta
Sample Date/Time: 12/11/19 2:28 PM
Lab Number: 191212008-01

Test	Result	Method	ML	Date Analyzed	Analyzed By	MCL
1,3,5-Trimethylbenzene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
1,3-Dichloropropane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
1,3-Dichloropropene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
Benzene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	5
Bromobenzene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
Bromochloromethane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
Bromodichloromethane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
Bromoform	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
Bromomethane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
Carbon Tetrachloride	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	5
Chlorodibromomethane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
Chloroethane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
Chloroform	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
Chloromethane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
cis-1,2-Dichloroethylene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	70
Dibromomethane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
Dichlorodifluoromethane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
Dichloromethane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	5
Ethylbenzene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	700
Fluorotrichloromethane	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
Hexachlorobutadiene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
Isopropylbenzene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	

Abbreviations/ References:

ML = Minimum Level = LRL = RL
MCL = Maximum Contaminant Level per The EPA
mg/L = Milligrams Per Liter or PPM
ug/L = Micrograms Per Liter or PPB
mpn/100 mls = Most Probable Number Index/ 100 mls
Date Analyzed = Date Test Completed

DATA APPROVED FOR RELEASE BY

Colorado Analytical LABORATORIES, INC.

Analytical Results

TASK NO: 191212008

Report To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Bill To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Task No.: 191212008
Client PO:
Client Project: Abeyta

Date Received: 12/12/19
Date Reported: 1/6/20
Matrix: Water - Drinking

Customer Sample ID Abeyta
Sample Date/Time: 12/11/19 2:28 PM
Lab Number: 191212008-01

Test	Result	Method	ML	Date Analyzed	Analyzed By	MCL
m-Dichlorobenzene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
Monochlorobenzene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	100
Naphthalene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
n-Butylbenzene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
n-Propylbenzene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
o-Chlorotoluene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
o-Dichlorobenzene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	600
Para-Dichlorobenzene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	75
p-Chlorotoluene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
p-Isopropyltoluene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
sec-Butylbenzene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
Styrene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	100
tert-Butylbenzene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	
Tetrachloroethylene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	5
Toluene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	1000
Total Trihalomethanes	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	80
trans-1,2-Dichloroethylene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	100
Trichloroethylene	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	5
Vinyl chloride	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	2
Xylenes (total)	**< 0.5 ug/L**	EPA-524.2	0.5 ug/L	12/19/19	LEH	10000
Total Organic Carbon	**< 0.5 mg/L**	SM 5310-C	0.5 mg/L	12/17/19	ISG	

Abbreviations/ References:

ML = Minimum Level = LRL = RL
MCL = Maximum Contaminant Level per The EPA
mg/L = Milligrams Per Liter or PPM
ug/L = Micrograms Per Liter or PPB
mpn/100 mls = Most Probable Number Index/ 100 mls
Date Analyzed = Date Test Completed

DATA APPROVED FOR RELEASE BY

Colorado Analytical LABORATORIES, INC.

Analytical Results

TASK NO: 191212008

Report To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Bill To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Task No.: 191212008
Client PO:
Client Project: Abeyta

Date Received: 12/12/19
Date Reported: 1/6/20
Matrix: Water - Drinking

Customer Sample ID Abeyta
Sample Date/Time: 12/11/19 2:28 PM
Lab Number: 191212008-01

Test	Result	Method	ML	Date Analyzed	Analyzed By	MCL
Total						
Calcium	**10.1 mg/L**	EPA 200.7	0.1 mg/L	12/16/19	MBN	
Iron	**< 0.005 mg/L**	EPA 200.7	0.005 mg/L	12/16/19	MBN	0.3
Magnesium	**1.44 mg/L**	EPA 200.7	0.02 mg/L	12/16/19	MBN	
Potassium	**1.2 mg/L**	EPA 200.7	0.1 mg/L	12/16/19	MBN	
Sodium	**8.0 mg/L**	EPA 200.7	0.1 mg/L	12/16/19	MBN	N/A
Aluminum	**< 0.001 mg/L**	EPA 200.8	0.001 mg/L	12/13/19	IPC	0.05
Antimony	**< 0.001 mg/L**	EPA 200.8	0.001 mg/L	12/13/19	IPC	0.006
Arsenic	**< 0.001 mg/L**	EPA 200.8	0.001 mg/L	12/13/19	IPC	0.01
Barium	**0.034 mg/L**	EPA 200.8	0.001 mg/L	12/13/19	IPC	2
Beryllium	**< 0.001 mg/L**	EPA 200.8	0.001 mg/L	12/13/19	IPC	0.004
Cadmium	**< 0.001 mg/L**	EPA 200.8	0.001 mg/L	12/13/19	IPC	0.005
Chromium	**< 0.001 mg/L**	EPA 200.8	0.001 mg/L	12/13/19	IPC	0.1
Copper	**0.0625 mg/L**	EPA 200.8	0.0008 mg/L	12/13/19	IPC	1.3
Lead	**0.0008 mg/L**	EPA 200.8	0.0001 mg/L	12/13/19	IPC	0.015
Manganese	**< 0.0008 mg/L**	EPA 200.8	0.0008 mg/L	12/13/19	IPC	0.05
Mercury	**< 0.0001 mg/L**	EPA 200.8	0.0001 mg/L	12/13/19	IPC	0.002
Nickel	**< 0.001 mg/L**	EPA 200.8	0.001 mg/L	12/13/19	IPC	N/A
Selenium	**0.002 mg/L**	EPA 200.8	0.001 mg/L	12/13/19	IPC	0.05
Silver	**< 0.0001 mg/L**	EPA 200.8	0.0001 mg/L	12/13/19	IPC	
Strontium	**0.096 mg/L**	EPA 200.8	0.005 mg/L	12/13/19	IPC	
Thallium	**< 0.001 mg/L**	EPA 200.8	0.001 mg/L	12/13/19	IPC	0.002

Abbreviations/ References:

ML = Minimum Level = LRL = RL
MCL = Maximum Contaminant Level per The EPA
mg/L = Milligrams Per Liter or PPM
ug/L = Micrograms Per Liter or PPB
mpn/100 mls = Most Probable Number Index/ 100 mls
Date Analyzed = Date Test Completed

DATA APPROVED FOR RELEASE BY

Colorado Analytical LABORATORIES, INC.

Analytical Results

TASK NO: 191212008

Report To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Bill To: Doug Schwenke
Company: JDS Hydro Consultants
5540 Tech Center Dr.
Suite 100
Colorado Springs CO 80919

Task No.: 191212008
Client PO:
Client Project: Abeyta

Date Received: 12/12/19
Date Reported: 1/6/20
Matrix: Water - Drinking

Customer Sample ID Abeyta
Sample Date/Time: 12/11/19 2:28 PM
Lab Number: 191212008-01

Test	Result	Method	ML	Date Analyzed	Analyzed By	MCL
Total						
Uranium	**< 0.0002 mg/L**	EPA 200.8	0.0002 mg/L	12/13/19	IPC	0.03
Zinc	**0.095 mg/L**	EPA 200.8	0.001 mg/L	12/13/19	IPC	5
Total Hardness	**31.2 mg/L as CaCO3**	SM 2340-B	0.1 mg/L as CaCO3	12/16/19	MBN	

Abbreviations/ References:

ML = Minimum Level = LRL = RL
MCL = Maximum Contaminant Level per The EPA
mg/L = Milligrams Per Liter or PPM
ug/L = Micrograms Per Liter or PPB
mpn/100 mls = Most Probable Number Index/ 100 mls
Date Analyzed = Date Test Completed

DATA APPROVED FOR RELEASE BY

Drinking Water Chain of Custody

1/2

Colorado Analytical LABORATORIES, INC.

Commerce City Lab
10411 Heinz Way
Commerce City CO 80640

Lakewood Service Center
12860 W. Cedar Dr, Suite 100A
Lakewood CO 80228

Phone: 303-659-2313

www.coloradolab.com

Report To Information	Bill To Information (If different from report to)	Project Information
Company Name: JDS-Hydro	Company Name:	PWSID: n/a
Contact Name: Dave Schwoenke	Contact Name:	System Name:
Address: 5540 Tech Center Dr	Address:	Compliance Samples: Yes ☐ No ☒
City: CS State: CO Zip: 80919	City: State: Zip:	Send Results to CDPHE: Yes ☐ No ☒
Phone: 719-227-0072	Phone:	Task Number (Lab Use Only) CAL Task No. 191212008
Email: dschwoenke@jdshydro.com	Email:	
Sample Collector: Stephanie Schwoenke		ARF
Sample Collector Phone: 719-321-5341	PO Number:	

Abeyta

Date	Time	Client Sample ID / Sample Pt ID	No. of Containers	Residual Chlorine (mg/L) P/A Samples Only	Total Coliform P/A	504.1 EDB/DBCP	505 Pests/PCBs	515.4 Herbicides	524.2 VOCs	525.2 SOCs-Pest	531.1 Carbamates	547 Glyphosate	548.1 Endothall	549.2 Diquat	524.2 TTHMs	552.2 HAA5s	Lead/Copper	Nitrate	Nitrite	Fluoride	Inorganics	Alk./Lang. Index (Circle)	TOC, DOC (Circle)	SUVA, UV 254 (Circle)	Cyanide	Gross Alpha/Beta	Radium 226/228	Radon	Uranium	Page 8 of 11
12/11	3:23pm	#1	3																							X			
12/11	2:26pm	#2	1																						X				
12/11	2:28pm	#3	2															X	X	X		X							X
12/11	2:30pm	#4	1																						X				
	2:31pm	#5	1																		X								
	2:33pm	#6	2							X																			
	2:37pm	#7	1											X															
	2:40pm	#8	1					X																					
	2:34pm	#9	1										X																
	3:42pm	#10	2									X																	

Instructions:
Please see enclosed doc. for all analytes desired. No bottle recd for Chlorite. Field pH: 6.15 Field temp: 11.7°C

C/S Info:
Delivered Via: Fedex C/S Charge: K

Seals Present Yes ☐ No ☒ Headspace Yes ☒ No ☐
Temp. 4 °C /Ice ✓ Sample Pres. Yes ☐ No ☒

Relinquished By:	Date/Time:	Received By:	Date/Time:	Relinquished By:	Date/Time:	Received By:	Date/Time:
	12/11 3:33pm	gAdams	12/12/19 805			✓	

2/2

Drinking Water Chain of Custody

Colorado Analytical LABORATORIES, INC.

Brighton Lab
240 South Main Street
Brighton, CO 80601

Lakewood Lab
12860 W. Cedar Dr, Suite 100A
Lakewood CO 80228

Phone: 303-659-2313
Fax: 303-659-2315

www.coloradolab.com

Report To Information	Bill To Information (If different from report to)	State Form / Project Information
Company Name: JDS-Hydro	Company Name:	PWSID: N/A
Contact Name: Doug Schwenke	Contact Name:	System Name:
Address: 5540 Tech Center Dr	Address:	Address: 13235 Vollmer St
City CS State CO Zip 80919	City State Zip	City CS State CO Zip 80908
Phone: 719-227-0072 Fax:	Phone: Fax:	County: El Paso
Email: dschwenke@jdshydro.com	Email:	Compliance Samples: Yes ☐ No ☒
Sampler Name: Stephanie Schwenke	PO No.:	Send Forms to State: Yes ☐ No ☒

CAL Task No. 191212008

Task Number Abeyta ARF

Date	Time	Client Sample ID / EP Code	No. of Containers	Residual Chlorine (mg/L) P/A Samples Only	PHASE I, II, V Drinking Water Analyses (check analysis): Total Coliform P/A	504.1 EDB/DBCP	505 Pests/PCBs	515.4 Herbicides	524.2 VOCs	525.2 SOCs-Pest	531.1 Carbamates	547 Glyphosate	548.1 Endothall	549.2 Diquat	524.2 TTHMs	552.2 HAA5s	Lead/Copper	Nitrate	Nitrite	Fluoride	Inorganics	Alk./Lang. Index	TOC, DOC (Circle)	SUVA, UV 254 (Circle)	Subcontract Analyses: Gross Alpha/Beta	Radium 226	Radium 228	Radon	Uranium
12/11	2:45pm	#11	2																				X						
	3:47pm	#12	3				X																						
	3:53pm	#13	3			X																							
	3:55pm	#14	3						X																				
	3:57pm	#15	2								X																		
↓	2pm	#11b	1		X																								

Page 9 of 11

Instructions: 29 + 2 blanks

C/S Info:

Delivered Via: Fedex C/S Charge ☒ K

Seals Present Yes ☐ No ☒ Headspace Yes ☒ No ☐

Temp. 4 °C /Ice Y Sample Pres. Yes ☒ No ☐

Relinquished By:	Date/Time:	Received By:	Date/Time:	Relinquished By:	Date/Time:	Received By:	Date/Time:
	12/11 3:57pm	Adam	12/12/19 805				

CAL Task No.
191212008

New Groundwater Source Sampling Request

ARF

Field Measurements
pH
Turbidity
Conductivity

General Parameters
Total Organic Carbon
Sodium
Calcium
Magnesium
Potassium
Total Hardness – CaCO3
Total Alkalinity
Bicarbonate Alkalinity
Strontium
Total Dissolved Solids (TDS)

Microbiological
Total Coliform
E.Coli

VOCs
Vinyl chloride
Benzene
Carbon tetrachloride
1,2-Dichlororethane
Trichloroethylene
1,1,1 Trichloroethane
1,1-Dichloroethylene
Cis-1,2 Dichloroethylene
1,2-Dichloropropane
Ethylbenzene
Monochlorobenzene
o-Dichlorobenzene
p-Dichlorobenzene
Styrene
Tetrachloroethylene
Toluene
Trans-1,2 Dichloroethylene
Xylenes (total)
Dichloromethane (methylene chloride)
1,2,4-Trichlorobenzene
1,1,2-Trichloroethane

Radionuclides
Radium 226 and Radium 228
Gross alpha particle activity -
Including Radium 226 but not radon & uranium
Beta particle and photon radioactivity

ARF

Inorganics
Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Copper
Cyanide (as free Cyanide)
Fluoride
Iron
Lead
Manganese
Mercury
Nickel
Nitrate
Nitrite
Selenium
Thallium
Uranium

Secondary MCLs
Aluminum
Chloride
Silver
Sulfate
Zinc

Synthetic Organic Chemicals (SOC)
Alachlor
Aldibarb1
Aldicarb sulfoxide
Aldicarb sulfone
Altrazine
Carbofuran
Chlordane
Dibromochloropropane
2,4 D
Ethylene dibromide
Heptachlor
Heptachlor epoxide
Lindane
Methoxychlor
Polychlorinated biphenyls
Pentachlorophenol
Toxaphene
2,4,5-TP(Silvex)
Benzopyrene
Dalapon
Di(2-ethylhexyl) adipate
Di(2-ethylhexyl)phthalate
Dinoseb
Dioxin
Diquat
Endothall
Endrin
Glyphosate
Hexachlorobenzene
Hexachlorocyclopentadiene
Oxamyl (Vydate)
Picloram
Simazine

Hazen Research, Inc.
4601 Indiana Street
Golden, CO 80403 USA
Tel: (303) 279-4501
Fax: (303) 278-1528

Lab Control ID: 19M03573
Received: Dec 16, 2019
Reported: Feb 20, 2020
Purchase Order No.
None Received

Customer ID: 20040H
Account ID: Z01034

Stuart Nielson
Colorado Analytical Laboratories, Inc.
10411 Heinz Way
Commerce City, CO 80640

ANALYTICAL REPORT

By: _____
Jessica Axen
Analytical Laboratories Director

Hazen Research, Inc.
4601 Indiana Street
Golden, CO 80403 USA
Tel: (303) 279-4501
Fax: (303) 278-1528

Lab Control ID: 19M03573
Received: Dec 16, 2019
Reported: Feb 20, 2020
Purchase Order No.
None Received

Customer ID: 20040H
Account ID: Z01034

ANALYTICAL REPORT

Stuart Nielson
Colorado Analytical Laboratories, Inc.

Lab Sample ID	19M03573-001							
Customer Sample ID	**191212009-01 - Abeyta** sampled on 12/11/19 @ 1426 by Stephanie S.							
Parameter	**Units**	**Code**	Result	Precision* +/-	Detection Limit	Method	Analysis Date / Time	Analyst
Gross Alpha	**pCi/L**	**T**	2.2	1.7	0.1	SM 7110 B	12/19/19 @ 0815	SS
Gross Beta	**pCi/L**	**T**	<3.7	2.4	3.7	SM 7110 B	12/19/19 @ 0815	SS
Radium-226	**pCi/L**	**T**	0.6	0.2	0.1	SM 7500-Ra B	2/5/20 @ 1045	SA
Radium-228	**pCi/L**	**T**	2.2	0.9	0.3	EPA Ra-05	2/13/20 @ 0825	JR

Certification ID's: CO/EPA CO00008; CT PH-0152; KS E-10265; NJ CO008; NYSELAP (NELAC Certified) 11417; RI LAO00284; WI 998376610, TX T104704256-15-6

*Variability of the radioactive decay process (counting error) at the 95% confidence level, 1.96 sigma.

Codes: (T) = Total (D) = Dissolved (S) = Suspended (R) = Total Residual (AR) = As Received < = Less Than

HAZEN RESEARCH, INC.
RADIOCHEMISTRY LABORATORY Date: 12/19/2019

Batch QC Summary Form

Analyte: Gross Alpha

Control Standard/LFB: ID: C-11 pCi/mL: 57.4 (use 1 diluted)

Spike Solution: ID: C-11 pCi/mL: 57.4 (use 1 mL)

Spike Recovery Calculation: Sample: Tap*

$$\text{Calculation: } \frac{(54.7)\ (1.000) - (0.0)\ (0.200)}{57.4} \times 100 = 95\%$$

Batch QC Evaluation:

Parameter	Criteria	Pass	Fail	N/A
Control Std./LFB	+/- 30 %	x		
Spike Recovery	70 - 130 %	x		
Blank	< or = 3 x Uncertainty	x		
Duplicate 1	95% confidence interval overlap	x		
Duplicate 2 *	95% confidence interval overlap			x

* Required for batch size greater than 10 samples.

Conclusions:

x Batch QC Passes**
_____ Batch QC Fails
_____ Batch QC Passes, with exceptions**:

Reruns Required: _____

Narrative:

**All QC data provided in this section of the report met the acceptance criteria specified in the analytical methods and procedures. State Maximum Contamination Levels (MCLs) are not evaluted in this report.

Batch Listing by Lab Control Number:

19M03594	
19M03559	
19M03571	
19M03572	
19M03573	
19M03590	
19M03596	
19M03552	
19M03577	

Evaluator: Lynnea Rockwell

12/20/2019
Date

HAZEN RESEARCH, INC.
RADIOCHEMISTRY LABORATORY Date: 12/19/2019

Batch QC Summary Form

Analyte: Gross Beta

Control Standard/LFB: ID: C-11 pCi/mL: 44 (use 1 diluted)

Spike Solution: ID: C-11 pCi/mL: 44 (use 1 mL)

Spike Recovery Calculation: Sample: Tap*

$$\text{Calculation: } \frac{(38.5)\ (1.000) - (0.0)\ (0.200)}{44} \times 100 = 88\%$$

Batch QC Evaluation:

Parameter	Criteria	Pass	Fail	N/A
Control Std./LFB	+/- 20 %	x		
Spike Recovery	80 - 120 %	x		
Blank	< or = 3 x Uncertainty	x		
Duplicate 1	95% confidence interval overlap	x		
Duplicate 2 *	95% confidence interval overlap			x

* Required for batch size greater than 10 samples.

Conclusions:

x Batch QC Passes**
_____ Batch QC Fails
_____ Batch QC Passes, with exceptions**:

Reruns Required: _____

Narrative:

**All QC data provided in this section of the report met the acceptance criteria specified in the analytical methods and procedures. State Maximum Contamination Levels (MCLs) are not evaluted in this report.

Batch Listing by Lab Control Number:

19M03594	
19M03559	
19M03571	
19M03572	
19M03573	
19M03590	
19M03596	
19M03552	
19M03577	

Evaluator: Lynnea Rockwell

12/20/2019
Date

HAZEN RESEARCH, INC.
RADIOCHEMISTRY LABORATORY Date: 02/05/2020

Batch QC Summary Form

Analyte: Radium-226

Control Standard/LFB: ID: NBL-6A pCi/mL: 23 (use 2 diluted)

Spike Solution: ID: NBL-6A pCi/mL: 23 (use 2 mL)

Spike Recovery Calculation: Sample: 20M01235-002b

Calculation: $\frac{(44.3)\ (1.000) - (0.0)\ (1.000)}{46} \times 100 =$ 96%

Batch QC Evaluation:

Parameter	Criteria	Pass	Fail	N/A
Control Std./LFB	+/- 20 %	x		
Spike Recovery	80 - 120 %	x		
Blank	< or = 3 x Uncertainty	x		
Duplicate 1	95% confidence interval overlap	x		
Duplicate 2 *	95% confidence interval overlap			x

* Required for batch size greater than 10 samples.

Conclusions:

x Batch QC Passes**
_____ Batch QC Fails
_____ Batch QC Passes, with exceptions**:

Reruns Required: _____

Narrative:

**All QC data provided in this section of the report met the acceptance criteria specified in the analytical methods and procedures. State Maximum Contamination Levels (MCLs) are not evaluted in this report.

Batch Listing by Lab Control Number:

20M01235	
19M03579	
19M03580	
19M03581	
19M03582	
19M03583	
19M03584	
19M03573	

Evaluator: Lynnea Rockwell

02/10/2020
Date

HAZEN RESEARCH, INC.
RADIOCHEMISTRY LABORATORY Date: 02/13/2020

Batch QC Summary Form

Analyte: Radium-228

Control Standard/LFB: ID: NBL-7A pCi/mL: 13.2 (use 10 diluted)

Spike Solution: ID: NBL-7A pCi/mL: 13.2 (use 10 mL)

Spike Recovery Calculation: Sample: 19M03571-002d

$$\text{Calculation: } \frac{(140.4)\ (1.000) - (0.9)\ (1.000)}{132} \times 100 = 106\%$$

Batch QC Evaluation:

Parameter	Criteria	Pass	Fail	N/A
Control Std./LFB	+/- 20 %	x		
Spike Recovery	80 - 120 %	x		
Blank	< or = 3 x Uncertainty	x		
Duplicate 1	95% confidence interval overlap	x		
Duplicate 2 *	95% confidence interval overlap			x

* Required for batch size greater than 10 samples.

Conclusions:

x Batch QC Passes**
_____ Batch QC Fails
_____ Batch QC Passes, with exceptions**:

Reruns Required: _____

Narrative:

**All QC data provided in this section of the report met the acceptance criteria specified in the analytical methods and procedures. State Maximum Contamination Levels (MCLs) are not evaluted in this report.

Batch Listing by Lab Control Number:

19M03549	
20M01235	
19M03561	
19M03571	
19M03573	
19M03579	

Evaluator: Lynnea Rockwell

02/20/2020
Date

Chain of Custody Form

19M03573

Colorado Analytical Laboratories, Inc.

Commerce City Lab
10411 Heinz Way
Commerce City CO 80640

Lakewood Service Center
12860 W. Cedar Dr, Suite 100A
Lakewood CO 80228

Phone: 303-659-2313

www.coloradolab.com

Report To Information	Bill To Information (If different from report to)	Project Name / Number
Company Name: Colorado Analytical Lab	Company Name: _____	191212009
Contact Name: Stuart Nielson	Contact Name: _____	JDS Hydro - Abeyta
Address: 10411 Heinz Way	Address: _____	Task Number (Lab Use Only)
City Commerce City State CO Zip 80640	City State Zip	CAL Task No. 191212009
Phone:303-659-2313	Phone:	
Email: stuartnielson@coloradolab.com	Email:	ARF
Sample Collector: Stephanie S.		
Sample Collector Phone:	PO No.:	

Sample Matrix (Select One Only)

- Waste Water ☐
- Ground Water ☐
- Surface Water ☐
- Soil ☐
- Sludge ☐
- Drinking Water ☒

Tests Requested

Date	Time	Sample ID	No. of Containers	Grab	or (Check One Only) Composite	Gross Alpha/Beta	Radium 226	Radium 228
12/11/19	1426	*191212009-01 Abeyta*	4	☐	☐	☒	☒	☒

Instructions: *Send via Fed Ex SD to Hazen Research*

3.0 1374 2379 9506

C/S Info:

Deliver Via: C/S Charge ☐

Seals Present Yes ☐ No ☐

Temp. °C/Ice Sample Pres. Yes ☐ No ☐

Relinquished By:	Date/Time:	Received By:	Date/Time:	Relinquished By:	Date/Time:	Received By:	Date/Time:
[signature]	12/16/19 1015	[signature]	12/16/19 @ 1405				