



**GEOTECHNICAL ENGINEERING
SERVICES REPORT
NO. 1-40411**

**AGUA FRIA
WASTEWATER IMPROVEMENTS
PHASE 3**

SANTA FE, NEW MEXICO

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PREPARED FOR:

BOHANNAN HUSTON, INC.

October 11, 2024
Job No. 1-40411

**Bohannon Huston, Inc.
7500 Jefferson St. NE
Albuquerque, NM 87109**

Attn: Andrew Swartswalter, PE

**RE: Geotechnical Engineering Service Report
Agua Fria Wastewater Improvements, Phase 3
Santa Fe, New Mexico**

Dear Mr. Swartswalter:

Submitted herein is the Geotechnical Engineering Services Report for the above-referenced project. The report contains the results of our field investigation and laboratory testing as well as recommendations pertaining to trench excavation, backfill and pavement design.

It has been a pleasure to serve you on this project. If you should have any questions, please contact this office.

Respectfully submitted:
GEO-TEST, INC.

Patrick R. Whorton, PE



Reviewed By:

Patrick J. Byres, PE

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INTRODUCTION

This report presents the results of our geotechnical engineering services investigation performed by this firm for the proposed Agua Fria Wastewater Improvements Phase 3 project in Santa Fe, New Mexico. The objectives of this investigation were to evaluate the nature and engineering properties of the subsurface soils along the subject roadway sections to provide recommendations for trenching and backfill as well as pavement design.

The investigation includes subsurface exploration, selected soil sampling, laboratory testing of the samples, performing an engineering analysis and preparation of this report.

PROPOSED CONSTRUCTION

It is understood that the project consists of the installation of subsurface sanitary gravity fed sewer lines and low-pressure force mains beneath 8 residential streets within the Agua Fria neighborhood. A list of the subject streets and the corresponding exploratory boring locations are provided within the Field Exploration section of this report. The new sewer lines will be installed at depths of between 3 and 8 feet below existing grades. In addition, the subject roadways will be paved with hot mix asphalt or gravel.

Should project details vary significantly from those outlined above, this firm should be notified for review and revision of recommendations contained herein.

FIELD EXPLORATION

A total of twenty-one (21) exploratory borings were drilled along the subject roadway sections to a depth of 10 feet below existing surface grades or to practical auger refusal as follows:

Roadway	Exploratory Borings
Avenida de Sensario	1, 2 & 3
Caja del Oro Grant Rd.	4
Alamo Lane / La Junta del Alamo	7, 9 & 10
Lopez Lane	8, 11-14
Camino dos Antonios	19 & 20
Callejon de Rita	21 – 24
Plaza Montoya	25
Avenida de Montoya	27
Case Road	30

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The locations of the borings performed are shown on the attached Boring Location Maps, Figures 1-7. The soils encountered in the borings were continuously examined, visually classified and logged during the drilling operation. The boring logs are presented in a following section of this report. Drilling was accomplished using a truck mounted drill rig equipped with 2.25-inch inner diameter hollow stem auger. Subsurface soils were sampled at five foot intervals utilizing an open tube split barrel sampler driven by a standard penetration test hammer.

Thirty-four (34) borings were originally proposed for the project to cover a total of 12 roadway alignments. Thirteen (13) borings covering 4 of the proposed roadways and portions of the other roadways were not performed for the following reasons:

Roadway	Boring Numbers	Reason Not Explored
Alamo Lane	5 & 6	Omitted from scope
3945 Agua Fria	15 & 16	Landowner did not grant permission
Ledd Drive	17 & 18	Conflicting/unknown below grade utilities
Plaza Montoya	26	Omitted from scope
Avenida de Montoya	28	Omitted from scope
Case Road	30	Omitted from scope
3917 Agua Fria	31 & 32	Landowner did not grant permission
Skeeter Lane	33 & 34	Not accessible to drilling equipment

A description of the issues encountered as provided by the Field Engineer and the discussion which led to the elimination of these borings from the scope is included as Appendix A to this report.

LABORATORY TESTING

Selected samples were tested in the laboratory to determine certain engineering properties of the soils. Moisture contents were determined to evaluate the various soil deposits with depth. The results of these tests are shown on the boring logs.

Sieve analysis and Atterberg limits tests were performed to aid in soil classification. The results of these tests are presented in the Summary of Laboratory Results and on the individual test reports presented in a following section of this report.

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SURFACE CONDITIONS

Avenida de Sesario is a two-lane low traffic dirt road servicing residential and commercial properties.

Caja del Oro Grant Rd. is a two-lane collector roadway within a residential area. Based on the exploratory boring performed, the roadway is paved with 5 inches of asphalt over 4 inches of base course.

Alamo Lane is an unstriped two-lane residential road servicing a residential neighborhood. Based on the exploratory boring conducted, the road is paved with 3 inches of asphalt over 3 inches of asphalt millings.

La Junta del Alamo is a two-lane residential road which is paved with 2 inches of asphalt to approximately 100 feet east of Lopez Lane. The remainder of the roadway is an unpaved dirt road.

Lopez Lane is a two-lane collector roadway paved with 3 to 4 inches of asphalt over 1.5 to 6 inches of base course.

Camino Dos Antonios, Callejon de Rita, Plaza Montoya, Avenida de Montoya and Case Road are two-lane low traffic dirt roads servicing residential properties.

SUBSURFACE CONDITIONS

As indicated by the exploratory borings, the subsurface profile beneath subject roadways was found to be as follows:

Along the proposed **Avenida de Sensario** alignment, medium to very dense non-plastic well and poorly graded gravel with sand was encountered at the surface and extended to depths of 7 to 8 feet below surface grade and to the full depth explored at the Boring 1 location. Below the gravel at the Boring 2 location, very firm low plasticity silty clayey sand was encountered and extended to the full depth explored. Below the gravel at the Boring 3 location, very dense non-plastic poorly graded sand with silt and gravel was encountered and extended to the full depth explored.

The subsurface soils below the portion of **Caja del Oro Grant Rd.** explored consisted of medium dense non-plastic silty sand which was encountered directly below the pavement section and extended to the full depth explored. It is likely this soil is man-made fill associated with an existing storm drain present below the roadway.

Along the **Alamo Lane and La Junta del Alamo** alignment, the subsurface profile varied from each location explored. At the Boring 7 location, below the existing pavement, medium dense non-plastic poorly graded gravel with sand

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was encountered and extended to a depth of 4 feet below surface grade where very firm low plasticity silty, clayey sand was encountered and extended to the full depth explored. At the Boring 9 location below the existing pavement, firm low plasticity sandy silty clay was encountered and extended to a depth of 4 feet below surface grade where dense non-plastic poorly graded gravel with sand was encountered and extended to the full depth explored. At the Boring 10 location, firm to very firm low plasticity silty, clayey sand was encountered and extended to a depth of 4 feet below surface grade where dense non-plastic poorly graded gravel with sand was encountered and extended to the full depth explored.

Along the **Lopez Lane** alignment at the Boring 8 and Boring 13 locations, medium dense non-plastic silty sand was encountered below the existing pavement and extended to depths of 2 and 6 feet below surface grade respectively. Below the existing pavement at the other boring locations and below the silty sand in Borings 8 and 13, firm low to medium plasticity sandy clay was encountered and extended to depths of 4 to 7 feet below surface grade where very dense non-plastic silty sand with gravel and silty gravel with sand was encountered and extended to the full depths explored.

Along the **Camino Dos Antonios** alignment, firm low plasticity silty clayey sand with gravel was encountered and extended to a depth of 4 feet below surface grade at the Boring 19 location and to a depth of 7 feet below surface grade at the Boring 20 location. Below the silty clayey sand very dense well graded gravel with sand was encountered and extended to a depth of 6 feet at the Boring 19 location and to a depth of 8.5 feet below surface grade at the Boring 20 location where practical auger refusal was encountered. Below the gravel at the Boring 19 location, poorly graded sand with silt and gravel was encountered and extended to the full depth explored.

Along the **Callejon de Rita** alignment at the Boring 21 location, firm medium plasticity clayey sand was encountered and extended to a depth of 4 feet below surface grade where medium to very dense non-plastic poorly graded sand with silt and gravel was encountered and extended to the full depth explored. At the Boring 22 location, medium plasticity clayey sand was encountered below the surface and extended to a depth of 4 feet below surface grade where medium dense non-plastic silty sand was encountered and extended to a depth of 6 feet where poorly graded sand with silt and gravel was encountered and extended to the full depth explored. The Boring 23 location was found to be similar to the Boring 22 profile except the silty sand was encountered between depth of 2 to 7 feet below surface grade. At the Boring 24 location, medium plasticity sandy clay was encountered at the surface and extended to a depth of 3 feet below surface grade where poorly graded sand was encountered and extended to the full depth explored.

As indicated by Boring 25, the subsurface profile below **Plaza Montoya** consisted of a surficial layer of moderate to very firm medium plasticity sandy clay which was encountered below the existing gravel pavement and extended

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to a depth of 6.5 feet below surface grade where very dense non-plastic poorly graded sand with silt and gravel was encountered and extended to the full depth explored.

As indicated by Boring 27, the subsurface profile below **Avenida de Montoya** consisted of a surficial layer of firm medium plasticity sandy clay which was encountered below the existing gravel pavement and extended to a depth of 4 feet below surface grade where dense non-plastic well graded gravel with silt and sand was encountered and extended to the full depth explored.

As indicated by Boring 30, the subsurface profile below **Case Rd.** consisted of a surficial layer of moderately firm medium plasticity clayey sand which was encountered below the existing gravel pavement and extended to a depth of 4 feet below surface grade where medium dense non-plastic poorly graded sand with silt and gravel was encountered and extended to a depth of 7 feet below surface grade where very dense non-plastic well graded gravel with silt and sand was encountered and extended to the full depth explored.

No free groundwater was encountered in the borings and soil moisture contents were found to be relatively low throughout the site.

TRENCH EXCAVATION & BACKFILL

Given the relatively large size of the project, the subsurface soils encountered throughout the explored areas varied from each location as discussed in the preceding section. However, the soil and rock encountered may be categorized into two general types, fine and course grained soils.

The fine-grained soils encountered consisted of silty sand, sandy clay, clayey sand, sandy-silty clay and silty-clayey sand. These soils were mostly encountered near the surface and likely contain man-made fills associated with existing subsurface utilities and surface development. The fine-grained soils encountered may be readily excavated using normal earthmoving equipment. The excavated soils may also be reused as trench backfill provided they meet the specifications and are placed according to the method discussed below.

The course-grained soils encountered consisted of poor and well graded gravels with varying amounts of silt and sand as well as silty and clean sands with gravel. These soils were generally encountered below the fine-grained soils discussed above but were also encountered near or at the surface in some areas of the site. The course-grained soils encountered were found to be dense to very dense, with difficult drilling encountered throughout and practical auger refusal achieved in many locations. Given the relatively high in-situ density of these soils, greater effort will be required to excavate these soils than the fine-grained soils. Solid bedrock or large diameter particles (boulders) were not encountered; however, heavy ripping or rock breaking

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equipment may be required to excavate into the course grained strata. The depth to course strata per roadway is presented in the table below:

Roadway	Depth to Course-Grained (difficult to excavate)
Avenida de Sensario	Surface
Alamo Lane / La Junta del Alamo	Surface to 4 feet
Lopez Lane	7 to 8 feet
Camino dos Antonios	4 to 7 feet
Callejon de Rita	6 to 7 feet
Plaza Montoya	7 feet
Avenida de Montoya	4 feet
Case Road	7 feet

The following general guidelines should be included in the project construction specifications to provide a basis for quality control for any required trench excavations and backfill. It is recommended that all backfill be placed and compacted under engineering observation and in accordance with the following:

- 1) Excavated slopes for foundation and utility construction should be designed and constructed in accordance with 29 CFR 1926, Subpart P, and any applicable state or local regulations. Excavated temporary and permanent slopes should not exceed 1.5 to 1 (horizontal to vertical).
- 2) Excavated soils may be used as trench backfill, however, moisture conditioning may be required in areas of the site with relatively high in-situ moisture content. Any imported soils to be used as backfill should be approved by the geotechnical engineer prior to placement.
- 3) Trench backfill should be placed in maximum 12-inch loose lifts and compacted with approved compaction equipment. Lifts should be reduced to 6-inch loose lifts if handheld compaction equipment is used. All compaction of fill shall be accomplished to a minimum of 95 percent of the maximum dry density as determined in accordance with ASTM D-1557 and the moisture content of the backfill, during compaction, should be within 2 percent of the optimum moisture content, or in accordance with project specifications, local requirements or governing jurisdiction.
- 4) Tests for degree of compaction should be determined by the ASTM D-1556 method or ASTM D-6938. Observation and field tests should be performed during fill and backfill placement by the geotechnical engineer to assist the contractor in obtaining the required degree of compaction. If less than 95 percent is indicated, additional compaction

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effort should be made with adjustment of the moisture content as necessary until 95 percent compaction is obtained.

PAVEMENT SECTION DESIGN

The existing near surface soils underlying the subject roadways range in classification from sandy clay (CL) to well graded gravel (GW) according to the Unified Soil Classification System (USCS). These soils classify as A-6 to A-1-a according to the American Association of State Highway and Transportation Officials (AASHTO) soil classification system. According to the NMDOT, these soils possess correlated R-values of about 10 to 72 respectively. As such, the clay soils encountered would be considered very poor subgrade soils and the gravel an excellent subgrade soil.

Given this large variation in subgrade quality as well as anticipated traffic loads of the subject roadways ranging from low traffic residential roads to relatively high traffic collectors; multiple pavement sections are required to account for these variations.

Recommended flexible pavement sections are presented in the table below. Sections are composed of Hot Mix Asphalt (HMA) and Aggregate Base Course (ABC). The sections will require subgrade preparation prior to placement.

Preparation of native subgrade shall consist of scarifying the cut surface to a depth of 12 inches, moisture conditioned to ± 2 percent of optimum moisture content and compacting to a minimum of 95 percent of maximum dry density as determined in accordance with ASTM D-1557.

Alternative pavement sections are provided which require the use of engineered subgrade. Should the alternative section be utilized, the native subgrade should be overexcavated to such an extent as to allow for a minimum of 12 inches of engineered subgrade meeting the following specifications:

Engineered subgrade should be non-plastic, free of vegetation and debris and contain no rocks larger than 3 inches. Gradation of the backfill material, as determined in accordance with ASTM D-422, should be as follows:

Size	Percent Passing
3 inch	100
No. 4	60 - 100
No. 200	5 - 35

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Prior to the placement of engineered subgrade, the native cut surface should be densified as discussed above. Engineered subgrade for use with alternative pavement sections or to adjust grade as required shall be placed in 18-inch loose lifts and compacted with approved compaction equipment. Loose lifts should be reduced to 8 inches if handheld compaction equipment is used. All compaction of fill or backfill shall be accomplished to a minimum of 95 percent of the maximum dry density as determined in accordance with ASTM D-1557. The moisture content of the structural fill during compaction should be within 2 percent of the optimum moisture content.

Tests for degree of compaction should be determined by the ASTM D-1556 method or ASTM D-6938. Observation and field tests should be carried on during fill and backfill placement by the geotechnical engineer to assist the contractor in obtaining the required degree of compaction. If less than 95 percent is indicated, additional compaction effort should be made with adjustment of the moisture content as necessary until 95 percent compaction is obtained.

Recommended Flexible Pavement Sections

Roadway	Correlated R-Value	Estimated ESALs	With Native Subgrade	With Engineered Subgrade
Avenida de Sensario	72	10,000	3 inches HMA	N/A
Caja del Oro Grant Rd.	72	1,000,000	4 inches HMA Over 8 inches ABC	N/A
Alamo Lane & La Junta del Alamo	28	10,000	3 inches HMA Over 6 inches ABC	3 inches HMA
Lopez Lane	11	1,000,000	N/A	4 inches HMA Over 8 inches ABC
Camino dos Antonios	28	10,000	3 inches HMA Over 6 inches ABC	3 inches HMA
Callejon de Rita	10	75,000	4 inches HMA Over 8 inches ABC	3 inches HMA Over 6 inches ABC
Plaza Montoya	10	10,000	3 inches HMA Over 6 inches ABC	3 inches HMA
Avenida de Montoya	10	10,000	3 inches HMA Over 6 inches ABC	3 inches HMA
Case Road	28	10,000	3 inches HMA Over 6 inches ABC	3 inches HMA

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The HMA should be SPIII or SPIV, compacted to a target density of 94.5 percent, with a minimum compaction of 92 and a maximum compaction of 97 percent of the theoretical maximum density. The recommended Performance Grade (PG) asphalt binder used should be 58-28 according to the NMDOT Design Manual given regional temperature fluctuations. Aggregate base course should meet NMDOT Type I Base Course specifications.

MOISTURE PROTECTION

Increases in the subgrade moisture content can weaken the subgrade soils, thereby shortening pavement life and causing localized failure. Therefore, all paved areas should be graded to drain and not allow any ponding on the surface of the paved areas. Positive drainage should be provided away from the perimeter of all paved areas for a distance of at least 10 feet. It is recommended that the pavement be graded with a 2 percent crown or slope to facilitate drainage.

The foregoing recommendations should only be considered minimum requirements for overall site development. It is recommended that a civil/drainage engineer be consulted for more detailed grading and drainage recommendations.

REVIEW AND INSPECTION

This report has been prepared to aid in the evaluation of this site and to assist in the design of this project. It is recommended that the geotechnical engineer be provided the opportunity to review the final design drawings and specifications in order to determine whether the recommendations in this report are applicable to the final design. Review of the final design drawings and specifications should be noted in writing by the geotechnical engineer.

In order to permit correlation between the conditions encountered during construction and to confirm recommendations presented herein, it is recommended that the geotechnical engineer be retained to perform continuous observations and testing during the earthwork portion of this project. Observation and testing should be performed during construction to confirm that suitable fill soils are placed upon competent materials and properly compacted and foundation elements penetrate the recommended soils.

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CLOSURE

Our conclusions, recommendations and opinions presented herein are:

- 1) Based upon our evaluation and interpretation of the findings of the field and laboratory program.
- 2) Based upon an interpolation of soil conditions between and beyond the explorations.
- 3) Subject to confirmation of the conditions encountered during construction.
- 4) Based upon the assumption that sufficient observation will be provided during construction.
- 5) Prepared in accordance with generally accepted professional geotechnical engineering principles and practice.

This report has been prepared for the sole use of Bohannon Huston, Inc., specifically to aid in the design of the Agua Fria Wastewater Improvements, Phase 3 project in Santa Fe, New Mexico, and not for the use by any third party without consent.

We make no other warranty, either expressed or implied. Any person using this report for bidding or construction purposes should perform such independent investigation as they deem necessary to satisfy themselves as to the surface and subsurface conditions to be encountered and the procedures to be used in the performance of work on this project. If conditions encountered during construction appear to be different than indicated by this report, this office should be notified.

All soil samples will be discarded 60 days after the date of this report unless we receive a specific request to retain the samples for a longer period of time.

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BORING LOCATION MAP



Agua Fria Wastewater Improvements Ph. 3
Santa Fe, New Mexico
Job No. 1-40411

Figure 1
Avenida de Sensario



GEO-TEST
GEOTECHNICAL ENGINEERING
AND MATERIAL TESTING

BORING LOCATION MAP



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Santa Fe, New Mexico
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Figure 2
Alamo Lane / La Junta del Alamo



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AND MATERIAL TESTING

BORING LOCATION MAP



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Figure 3
Lopez Lane



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BORING LOCATION MAP



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Figure 4
Camino Dos Antonios & Case Rd.



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BORING LOCATION MAP



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Figure 5
Callejon de Rita



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BORING LOCATION MAP



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Figure 6
Plaza Montoya



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BORING LOCATION MAP



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Figure 7
Avenida de Montoya



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Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/09/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 1

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE	
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft
									20 40 60 80
			SS	19-11-13 24	1				
			SS	11-15-16 31	2				
5			AC		2		GP	POORLY GRADED GRAVEL with SAND, non-plastic, medium dense to dense, dry, brown	
10								Stopped Auger @ 10 feet Stopped Sampler @ 4 feet	
15									

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

- SS - Split Spoon
- AC - Auger Cuttings
- UD/SL - Undisturbed Sleeve
- AMSL - Above Mean Sea Level
- CS - Continuous Sampler
- UD - Undisturbed
- ST - Shelby Tube

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.



Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/09/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 2

During Drilling: none

After 24 Hours:

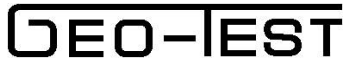
DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE				
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft			
5		X	SS	12-12-24 36	2		GP	POORLY GRADED GRAVEL with SAND, non-plastic, dense to medium dense, dry, brown	20	40	60	80
		X	SS	9-9-12 21	2				21			
		X	SS	10-10-11 21	2				21			
10		X	SS	15-12-22 34	16		SC-SM	SILTY, CLAYEY SAND, low plasticity, very firm, moist, brown				
								Stopped Auger @ 9 feet Stopped Sampler @ 10.5 feet				
15												

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

- SS - Split Spoon
- AMSL - Above Mean Sea Level
- AC - Auger Cuttings
- CS - Continuous Sampler
- UD/SL - Undisturbed Sleeve
- UD - Undisturbed
- ST - Shelby Tube

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.



Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/16/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 3

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE					
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80				
5		X	SS	17-22-24 46	2			GW	WELL GRADED GRAVEL with SAND, non-plastic, dense to very dense, dry, brown				
		X	SS	20-50/6"	1								
10			AC		5		SP-SM	POORLY GRADED SAND with SILT and GRAVEL, non-plastic, very dense, dry, reddish brown					
15								Stopped Auger @ 10 feet Sampler REFUSAL @ 3.5 feet					

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

- SS - Split Spoon
- AMSL - Above Mean Sea Level
- AC - Auger Cuttings
- CS - Continuous Sampler
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Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/26/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 4

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE	
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft
									20 40 60 80
							AC	5 inches ASPHALT over 4 inches Base Course	
			SS	7-5-6 11			SM	SILTY SAND with GRAVEL, non-plastic, medium dense, dark brown * Possible Fill	11
5			SS	6-6-9 15	4				15
10								Auger REFUSAL @ 7.5 feet on Dense Gravel or possible abandoned utility	
15									

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

- SS - Split Spoon
- AC - Auger Cuttings
- UD/SL - Undisturbed Sleeve
- AMSL - Above Mean Sea Level
- CS - Continuous Sampler
- UD - Undisturbed
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Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/09/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 7

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE	
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft
							AC	3 inches ASPHALT over 3 inches ASPHALT MILLINGS	20 40 60 80
			SS	12-14-16 30	4		GP	POORLY GRADED GRAVEL with SAND, non-plastic, medium dense, dry, brown	30
			SS	7-12-9 21					21
5			SS	7-15-28 43	3		SC-SM	SITY, CLAYEY SAND with GRAVEL, low plasticity, very firm, moist, reddish brown	43
10								Auger REFUSAL @ 8 feet on dense gravel Stopped Sampler @ 5.5 feet	
15									

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

SS - Split Spoon
 AC - Auger Cuttings
 UD/SL - Undisturbed Sleeve

AMSL - Above Mean Sea Level
 CS - Continuous Sampler
 UD - Undisturbed
 ST - Shelby Tube

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Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/26/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 8

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	SAMPLE					SUBSURFACE PROFILE				
			TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft			
									20	40	60	80
							AC	4 inches ASPHALT over 4 inches BASE COURSE				
			AC		6		SM	SILTY SAND with GRAVEL, non-plastic, slightly moist, light brown				
			AC		10		CL	SANDY CLAY, medium plasticity, moist, brown				
5			AC		3		SM	SILTY SAND with GRAVEL, non-plastic, dry, light brown				
10								Auger REFUSAL @ 8 feet				
15												

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

- SS - Split Spoon
- AMSL - Above Mean Sea Level
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- UD/SL - Undisturbed Sleeve
- UD - Undisturbed
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Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/09/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 9

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE	
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft
							AC	2 inches ASPHALT	20 40 60 80
			SS	23-10-8 18	4		CL-ML	SANDY, SILTY CLAY, low plasticity, firm, slightly moist to moist, brown	18
			SS	7-9-8 17	10				17
5			SS	9-16-26 42	1		GP	POORLY GRADED GRAVEL with SAND, non-plastic, dense, dry, brown	42
10								Auger REFUSAL @ 8 feet on dense gravel Stopped Sampler @ 5.5 feet	
15									

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

- SS - Split Spoon
- AC - Auger Cuttings
- UD/SL - Undisturbed Sleeve
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Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/09/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 10

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE	
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft
			SS	9-12-15 27	4		SC-SM	SILTY, CLAYEY SAND, low plasticity, firm to very firm, slightly moist, brown	20 40 60 80
			SS	9-11-22 33	6				
5			SS	15-24-22 46	3				
			AC		2		GP	POORLY GRADED GRAVEL with SAND, non-plastic, dense, dry, brown	
10								Stopped Auger @ 10 feet Stopped Sampler @ 5.5 feet	
15									

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

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- AMSL - Above Mean Sea Level
- AC - Auger Cuttings
- CS - Continuous Sampler
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Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/26/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 11

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	SAMPLE					SUBSURFACE PROFILE										
			TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80									
							AC	3.5 inches ASPHALT over 1.5 inches GRAVEL										
5			AC		5		CL	SANDY CLAY, medium plasticity, dry, brown										
10			AC		4		SM	SILTY SAND with GRAVEL, non-plastic, dry, light brown										
15								Stopped Auger @ 10 feet										

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

- SS - Split Spoon
- AMSL - Above Mean Sea Level
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- CS - Continuous Sampler
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Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/26/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 12

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE	
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft
									20 40 60 80
							AC	3 inches ASPHALT over 4 inches BASE COURSE	
			SS	5-10-11 21	10		CL	SANDY CLAY, low plasticity, firm, moist, brown	21
5			SS	9-11-14 25	10				25
							SM	SILTY SAND with GRAVEL, non-plastic, very dense, dry, brown	
10			SS	29-50/6"	3			Stopped Auger @ 9 feet Sampler REFUSAL @ 10 feet	
15									

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

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Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/26/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 13

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE					SUBSURFACE PROFILE		N blows/ft
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	
							AC	4 inches ASPHALT over 4 inches BASE COURSE	
			SS	5-11-16 27	3		SM	SILTY SAND, non-plastic, medium dense, dry to moist, brown	27
5			SS	6-8-8 16	8		CL	SANDY CLAY, low plasticity, moist, brown	16
			AC		2		GM	SILTY GRAVEL with SAND, non-plastic, dry, brown	
10								Stopped Auger @ 10 feet Stopped Sampler @ 5.5 feet	
15									

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

- SS - Split Spoon
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Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/26/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 14

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE					
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80				
							AC	3 inches ASPHALT over 6 inches BASE COURSE					
5			AC		7		CL	SANDY CLAY, medium plasticity, slightly moist, brown					
10			AC		3		GM	SILTY GRAVEL with SAND, non-plastic, dry, light brown					
15								Stopped Auger @ 10 feet					

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

- SS - Split Spoon
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Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/17/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 19

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE										
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80									
			SS	7-8-9 17	11		SC-SM	SILTY, CLAYEY SAND with GRAVEL, low plasticity, firm, moist, dark brown/black										
5			AC		8		GW	WELL GRADED GRAVEL with SAND, non-plastic, dry, brown										
			AC		3		SP-SM	POORLY GRADED SAND with SILT and GRAVEL, non-plastic, dry, reddish brown										
10								Stopped Auger @ 10 feet Stopped Sampler @ 3.5 feet										
15																		

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

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Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/17/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 20

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE	
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft
5			SS	6-9-14 23	6		SC-SM	SILTY, CLAYEY SAND with GRAVEL, low plasticity, firm, dry, dark brown/black	20 40 60 80
			SS	8-11-10 21	4				
			AC		2		GW	WELL GRADED GRAVEL with SAND, non-plastic, very dense, dry, reddish brown	
10								Auger REFUSAL @ 8.5 feet Stopped Sampler @ 5.5 feet	
15									

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

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Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/20/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 21

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE					
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80				
0							AC	3 inches BASE COURSE					
5			SS	3-4-6 10	8		SC	CLAYEY SAND, medium plasticity, firm, slightly moist, brown					10
5			SS	5-5-15 20	3		SP-SM	POORLY GRADED SAND with SILT and GRAVEL, non-plastic, medium to very dense, slightly moist to dry, reddish brown					20
10			SS	29-50/6"				Stopped Auger @ 10 feet Stopped Sampler @ 5.5 feet					
15													

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

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Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/20/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 22

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	SAMPLE					SUBSURFACE PROFILE		N blows/ft			
			TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	20	40	60	80	
							AC	2 inches BASE COURSE					
			AC		8		SC	CLAYEY SAND, medium plasticity, moist, brown					
5			AC		6		SM	SILTY SAND, non-plastic, dry, brown					
			AC		3		SP-SM	POORLY GRADED SAND with SILT and GRAVEL, non-plastic, dry, reddish brown					
10								Stopped Auger @ 10 feet					
15													

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

- SS - Split Spoon
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Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/20/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 23

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE INTERVAL	SAMPLE					SUBSURFACE PROFILE				
			TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80			
			AC		11		AC	3 inches BASE COURSE				
			AC				SC	CLAYEY SAND, medium plasticity, moist, brown				
			SS	6-5-9 14	3							14
5			SS	9-15-18 33	3		SM	SILTY SAND, non-plastic, medium dense, dry, brown				33
			SS	21-50/3"	2		SP-SM	POORLY GRADED SAND with SILT and GRAVEL, non-plastic, very dense, dry, light brown				
10								Stopped Auger @ 10 feet Stopped Sampler @ 5.5 feet				
15												

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

- SS - Split Spoon
- AMSL - Above Mean Sea Level
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- CS - Continuous Sampler
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Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/20/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 24

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE				
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80			
			AC		8		SC	SANDY CLAY, medium plasticity, slightly moist, brown				
5			SS	5-10-21 31	3		SP-SM	POORLY GRADED SAND, non-plastic, dense, dry, light brown			31	
10			AC		2			Stopped Auger @ 10 feet Stopped Sampler @ 5.5 feet				
15												

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

- SS - Split Spoon
- AMSL - Above Mean Sea Level
- AC - Auger Cuttings
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Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/26/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 25

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE	
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80
5		7-7-7 14	SS	7-7-7 14	9		CL	SANDY CLAY, medium plasticity, moderately to very firm, slightly moist, brown	14
		8-12-21 33	SS	8-12-21 33	8				33
10			AC		4		SP-SM	POORLY GRADED SAND with SILT and GRAVEL, non-plastic, very dense, dry, light brown	
15								Stopped Auger @ 9 feet Sampler REFUSAL @ 10 feet	

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

- SS - Split Spoon
- AMSL - Above Mean Sea Level
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Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/26/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 27

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE	
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft 20 40 60 80
0 - 1									
1 - 5		8-8-14 22	SS	8-8-14 22	10		CL	SANDY CLAY, medium plasticity, firm, moist, brown	22
5 - 6		12-16-21 37	SS	12-16-21 37	6		GW-GM	WELL GRADED GRAVEL with SILT and SAND, non-plastic, dense, dry, light brown	37
6 - 8.5			AC		5				
8.5 - 15								Auger REFUSAL @ 8.5 feet Stopped Sampler @ 5.5 feet	

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

- SS - Split Spoon
- AMSL - Above Mean Sea Level
- AC - Auger Cuttings
- CS - Continuous Sampler
- UD/SL - Undisturbed Sleeve
- UD - Undisturbed
- ST - Shelby Tube

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.



Project: Agua Fria Wastewater Improvements Ph. 3
 Date: 09/20/2024 Project No: 1-40411
 Elevation: Type: 2.25" ID HSA

LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 30

During Drilling: none

After 24 Hours:

DEPTH (Ft)	LOG	SAMPLE						SUBSURFACE PROFILE	
		SAMPLE INTERVAL	TYPE	N. BLOWS/FT	MOISTURE %	DRY DENSITY (pcf)	USC	DESCRIPTION	N blows/ft
									20 40 60 80
4.5 - 7.0	[Hatched pattern]	4-5-7	SS	12	8		SC	CLAYEY SAND, medium plasticity, moderately firm, moist, brown	12
5.0 - 7.0	[Dotted pattern]	5-7-7	SS	14	3		SP-SM	POORLY GRADED SAND with SILT and GRAVEL, non-plastic, medium dense, dry, brown	14
10.0	[Auger cuttings pattern]		AC		2		GW-GM	WELL GRADED GRAVEL with SILT and SAND, non-plastic, very dense, dry, brown	
10.0 - 15.0								Stopped Auger @ 10 feet Stopped Samper @ 5.5 feet	

LOG OF TEST BORING 1-40411.GPJ GEO TEST.GDT 10/3/24

LEGEND

- SS - Split Spoon
- AMSL - Above Mean Sea Level
- AC - Auger Cuttings
- CS - Continuous Sampler
- UD/SL - Undisturbed Sleeve
- UD - Undisturbed
- ST - Shelby Tube

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

SUMMARY OF LABORATORY RESULTS

TEST HOLE	DEPTH (FEET)	UNIFIED CLASS	(% MOIST)	LL	PI	SIEVE ANALYSIS PERCENT PASSING											
						NO 200	NO 100	NO 40	NO 10	NO 4	3/8"	1/2"	3/4"	1"	1 1/2"	2"	4"
1	1.0	GP	1.3	NP	NP	5	7	12	24	34	53	59	85	100			
1	3.0		1.7														
1	7.5		1.7														
2	1.0		1.8														
2	3.0		1.7														
2	5.0		1.9														
2	10.0	SC-SM	15.6	24	6	50	73	92	100								
3	1.0		1.6														
3	3.0	GW	1.5	NP	NP	4	6	12	23	31	42	49	58	60	85	100	
3	8.0	SP-SM	5.2	NP	NP	9	21	36	55	68	87	95	98	100			
4	5.0	SM	4.3	NP	NP	19	25	38	54	64	78	88	94	100			
7	1.0		4.0														
7	5.0	SC-SM	3.3	23	5	24	30	44	60	71	87	93	100				
8	1.5		6.1														
8	3.0	CL	10.3	28	12	57	71	84	93	96	98	100					
8	6.5		2.7														
9	1.0		4.3														
9	3.0	CL-ML	10.0	24	7	54	67	85	97	98	99	100					
9	5.0		1.4														

SUMMARY OF LABORATORY RESULTS: 1-40411.GPJ GEO TEST.GDT 10/3/24



LL = LIQUID LIMIT
PI = PLASTICITY INDEX
NP = NON PLASTIC or NO VALUE

Project: Agua Fria Wastewater Improvements Ph. 3
Location: Santa Fe, NM
Number: 1-40411

SUMMARY OF LABORATORY RESULTS

TEST HOLE	DEPTH (FEET)	UNIFIED CLASS	(% MOIST)	LL	PI	SIEVE ANALYSIS PERCENT PASSING											
						NO 200	NO 100	NO 40	NO 10	NO 4	3/8"	1/2"	3/4"	1"	1 1/2"	2"	4"
10	1.0		4.5														
10	3.0		6.0														
10	5.0		2.8														
10	7.5		1.5														
11	3.5		4.5														
11	8.5	SM	3.7	NP	NP	21	28	41	64	73	85	89	98	100			
12	3.0		10.3														
12	5.0	CL	10.2	27	9	61	77	91	97	98	99	100					
12	9.0		3.3														
13	2.0		3.3														
13	5.0	SM	8.1	NP	NP	41	53	59	86	92	98	100					
13	8.5		2.2														
14	2.5		7.5														
14	7.5	GM	2.7	NP	NP	18	22	29	36	41	51	57	75	86	100		
19	3.0	SC-SM	11.5	24	7	42	56	72	84	88	90	90	100				
19	5.0		7.9														
19	8.0		3.1														
20	3.0		5.7														
20	5.0	SC-SM	3.9	22	7	25	34	48	60	65	76	80	100				

SUMMARY OF LABORATORY RESULTS_1-40411.GPJ GEO TEST.GDT 10/3/24



LL = LIQUID LIMIT
PI = PLASTICITY INDEX
NP = NON PLASTIC or NO VALUE

Project: Agua Fria Wastewater Improvements Ph. 3
Location: Santa Fe, NM
Number: 1-40411

SUMMARY OF LABORATORY RESULTS

TEST HOLE	DEPTH (FEET)	UNIFIED CLASS	(% MOIST)	LL	PI	SIEVE ANALYSIS PERCENT PASSING											
						NO 200	NO 100	NO 40	NO 10	NO 4	3/8"	1/2"	3/4"	1"	1 1/2"	2"	4"
20	8.0		2.4														
21	3.0	SC	7.6	27	11	42	58	81	94	97	99	100					
21	5.0		2.6														
22	1.5		7.8														
22	5.0		6.3														
22	8.5	SP-SM	2.8	NP	NP	9	15	25	47	58	74	82	92	100			
23	1.0		11.0														
23	3.0		2.6														
23	5.0	SM	2.8	NP	NP	19	25	34	43	62	84	93	100				
23	10.0		2.0														
24	1.5	CL	8.3	29	15	54	65	80	95	98	100						
24	5.0		3.2														
24	9.0		2.1														
25	3.0		9.0														
25	5.0	CL	7.8	31	16	65	74	85	95	98	100						
25	8.5		3.8														
27	3.0	CL	10.0	27	14	60	77	93	98	99	100						
27	5.0		5.9														
27	6.5		5.4														

SUMMARY OF LABORATORY RESULTS_1-40411.GPJ GEO TEST.GDT 10/3/24



LL = LIQUID LIMIT
PI = PLASTICITY INDEX
NP = NON PLASTIC or NO VALUE

Project: Agua Fria Wastewater Improvements Ph. 3
Location: Santa Fe, NM
Number: 1-40411

SUMMARY OF LABORATORY RESULTS

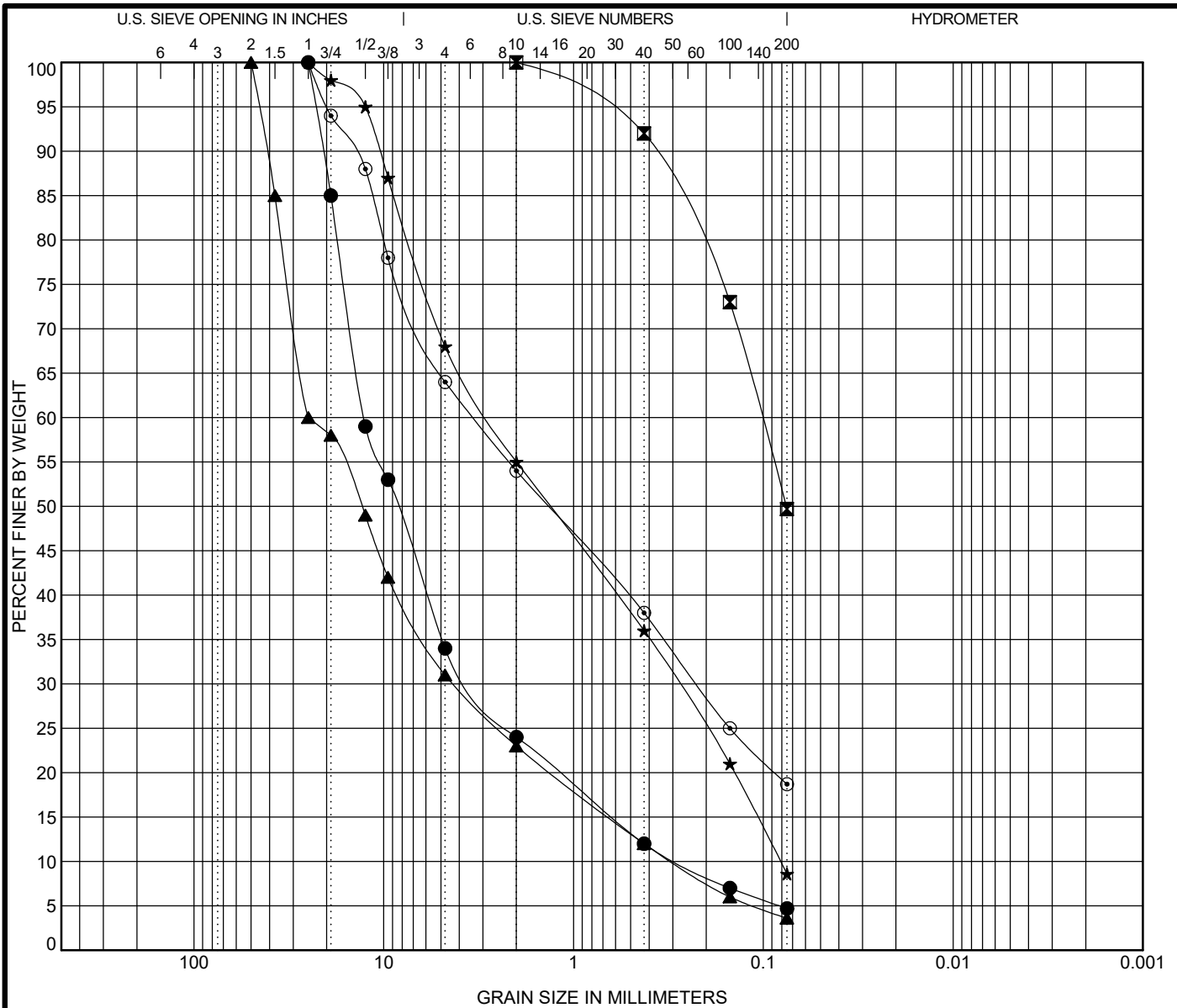
TEST HOLE	DEPTH (FEET)	UNIFIED CLASS	(% MOIST)	LL	PI	SIEVE ANALYSIS PERCENT PASSING											
						NO 200	NO 100	NO 40	NO 10	NO 4	3/8"	1/2"	3/4"	1"	1 1/2"	2"	4"
30	3.0		8.0														
30	5.0		3.3														
30	8.5	GW-GM	1.7	NP	NP	11	16	23	35	47	65	75	91	94	100		

SUMMARY OF LABORATORY RESULTS_1-40411.GPJ GEO TEST.GDT 10/3/24



LL = LIQUID LIMIT
 PI = PLASTICITY INDEX
 NP = NON PLASTIC or NO VALUE

Project: Agua Fria Wastewater Improvements Ph. 3
 Location: Santa Fe, NM
 Number: 1-40411



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● 1	1.0 POORLY GRADED GRAVEL with SAND(GP)	NP	NP	NP	3.17	45.34
☒ 2	10.0 SILTY, CLAYEY SAND(SC-SM)	24	18	6		
▲ 3	3.0 WELL-GRADED GRAVEL with SAND(GW)	NP	NP	NP	2.42	83.24
★ 3	8.0 POORLY GRADED SAND with SILT and GRAVEL(SP-SM)	NP	NP	NP	0.35	34.39
⊙ 4	5.0 SILTY SAND with GRAVEL(SM)	NP	NP	NP		

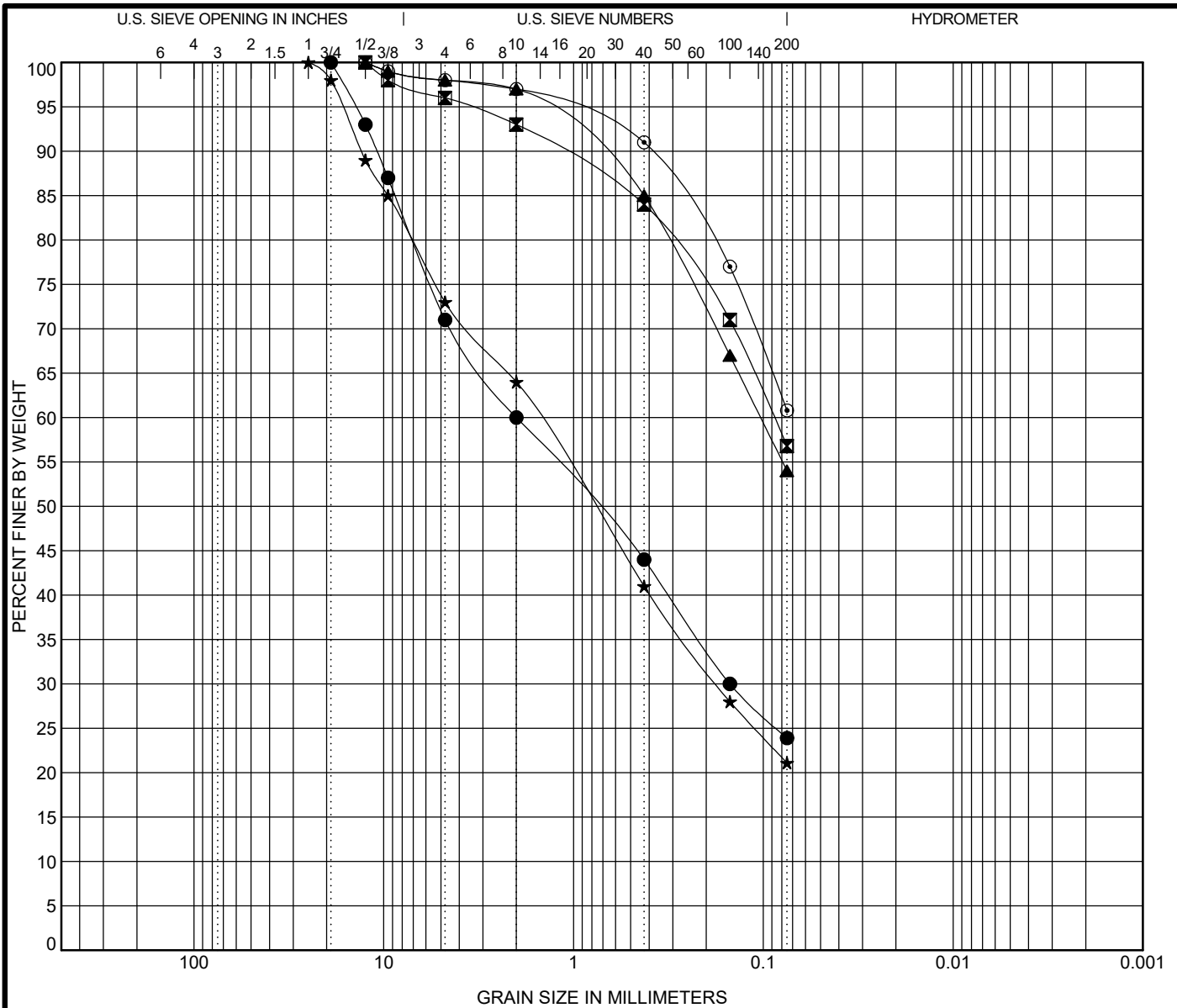
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 1	1.0	25	12.703	3.361	0.28	66.0	29.3	4.7
☒ 2	10.0	2	0.102			0.0	50.3	49.7
▲ 3	3.0	50	25	4.263	0.3	69.0	27.4	3.6
★ 3	8.0	25	2.789	0.28	0.081	32.0	59.4	8.6
⊙ 4	5.0	25	3.361	0.224		36.0	45.3	18.7



GRAIN SIZE DISTRIBUTION

Project: Agua Fria Wastewater Improvements Ph. 3
 Location: Santa Fe, NM
 Number: 1-40411

U.S. GRAIN SIZE 1-40411.GPJ GEO TEST.GDT 10/3/24



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● 7	SILTY, CLAYEY SAND with GRAVEL(SC-SM)	23	18	5		
■ 8	SANDY LEAN CLAY(CL)	28	16	12		
▲ 9	SANDY SILTY CLAY(CL-ML)	24	17	7		
★ 11	SILTY SAND with GRAVEL(SM)	NP	NP	NP		
⊙ 12	SANDY LEAN CLAY(CL)	27	18	9		

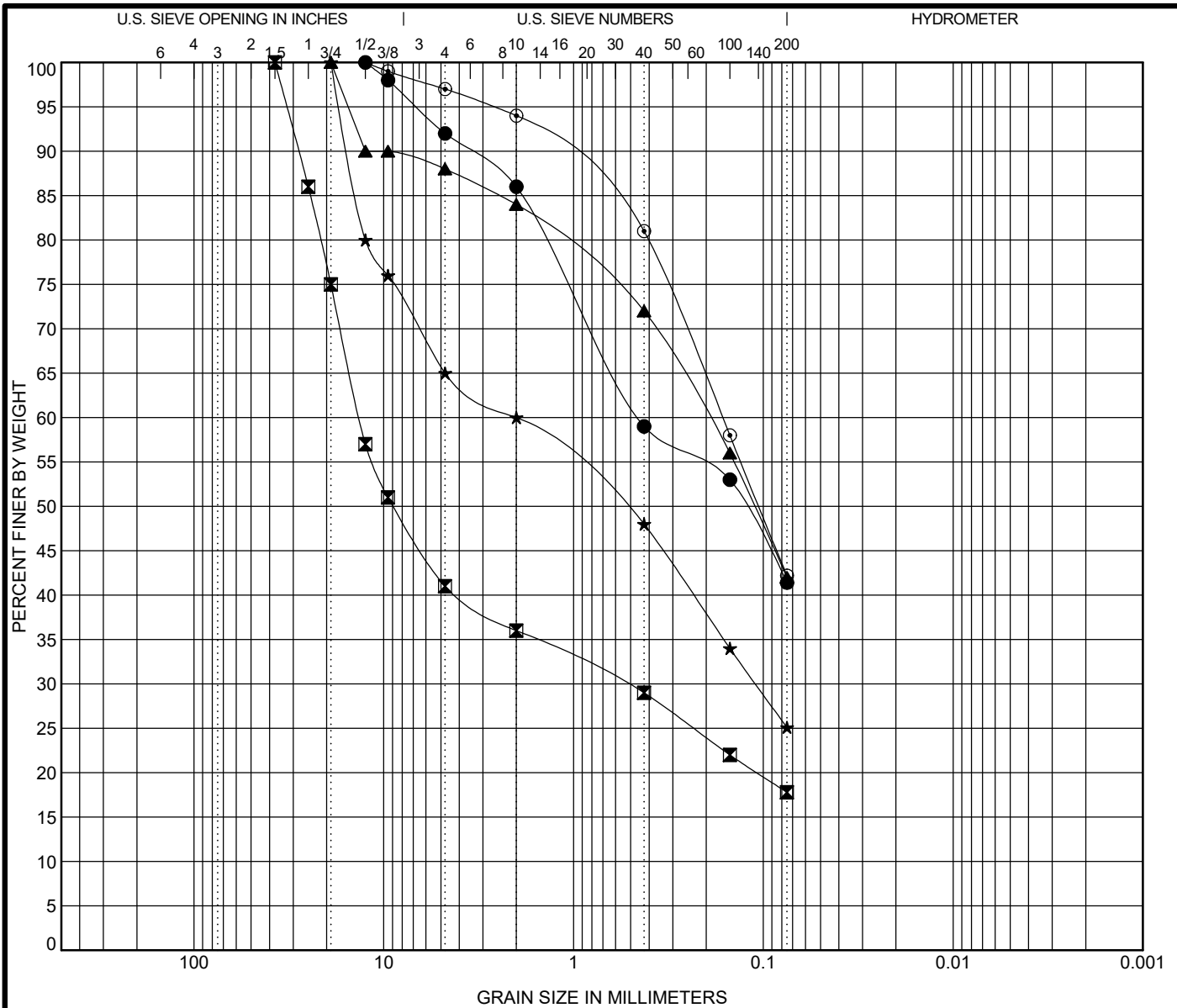
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 7	5.0	19	2	0.15	29.0	47.1	23.9	
■ 8	3.0	12.5	0.088		4.0	39.2	56.8	
▲ 9	3.0	12.5	0.103		2.0	44.0	54.0	
★ 11	8.5	25	1.528	0.176	27.0	51.9	21.1	
⊙ 12	5.0	12.5			2.0	37.2	60.8	



GRAIN SIZE DISTRIBUTION

Project: Agua Fria Wastewater Improvements Ph. 3
 Location: Santa Fe, NM
 Number: 1-40411

U.S. GRAIN SIZE 1-40411.GPJ GEO TEST.GDT 10/3/24



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● 13	5.0 SILTY SAND(SM)	NP	NP	NP		
☒ 14	7.5 SILTY GRAVEL with SAND(GM)	NP	NP	NP		
▲ 19	3.0 SILTY, CLAYEY SAND(SC-SM)	24	17	7		
★ 20	5.0 SILTY, CLAYEY SAND with GRAVEL(SC-SM)	22	15	7		
⊙ 21	3.0 CLAYEY SAND(SC)	27	16	11		

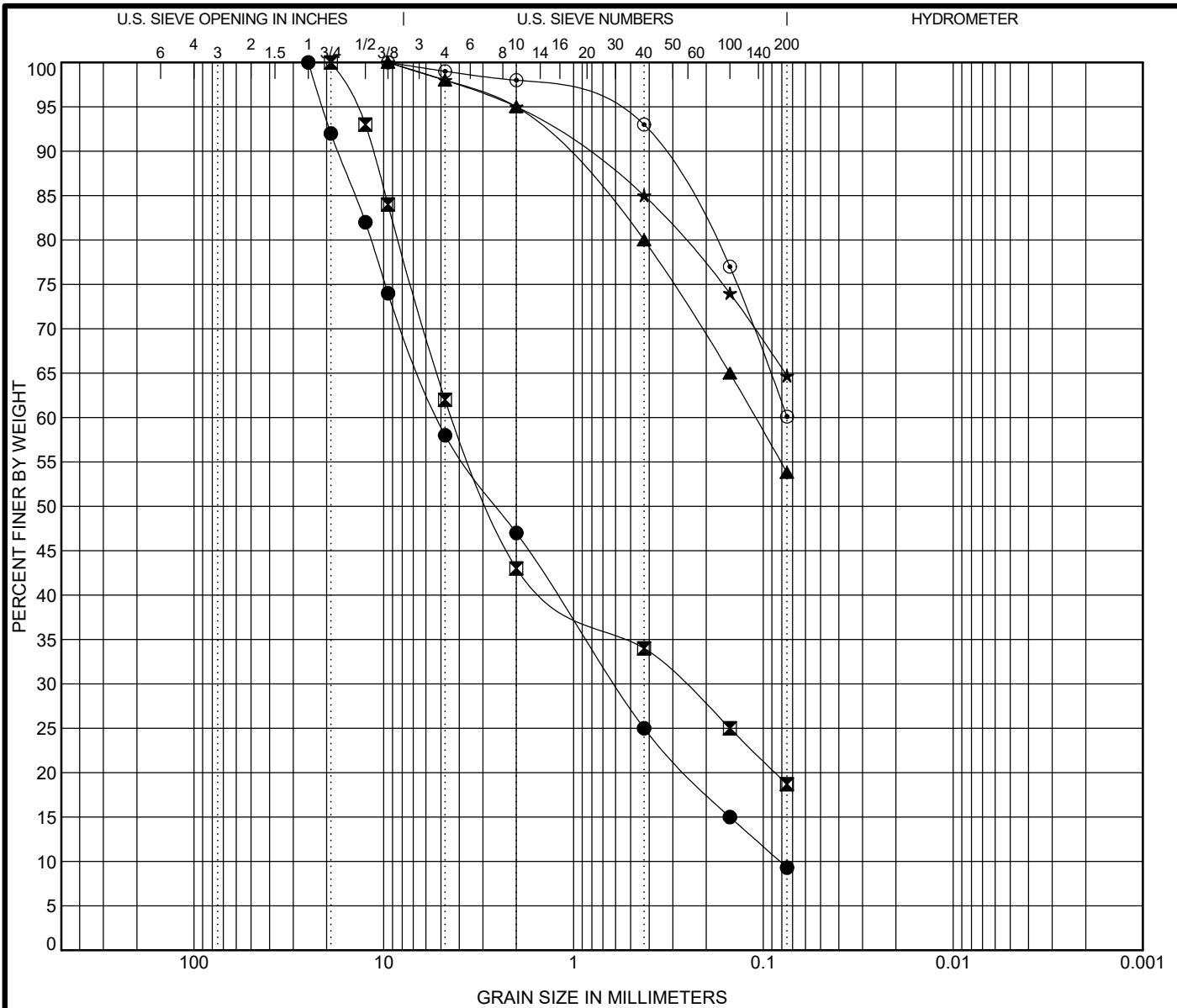
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 13	5.0	12.5	0.45		8.0	50.6	41.4	
☒ 14	7.5	37.5	13.403	0.53	59.0	23.2	17.8	
▲ 19	3.0	19	0.195		12.0	46.0	42.0	
★ 20	5.0	19	2	0.11	35.0	39.9	25.1	
⊙ 21	3.0	12.5	0.164		3.0	54.8	42.2	



GRAIN SIZE DISTRIBUTION

Project: Agua Fria Wastewater Improvements Ph. 3
 Location: Santa Fe, NM
 Number: 1-40411

U.S. GRAIN SIZE 1-40411.GPJ GEO TEST.GDT 10/3/24



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● 22	8.5 POORLY GRADED SAND with SILT and GRAVEL(SP-SM)	NP	NP	NP	0.86	63.43
■ 23	5.0 SILTY SAND with GRAVEL(SM)	NP	NP	NP		
▲ 24	1.5 SANDY LEAN CLAY(CL)	29	14	15		
★ 25	5.0 SANDY LEAN CLAY(CL)	31	15	16		
○ 27	3.0 SANDY LEAN CLAY(CL)	27	13	14		

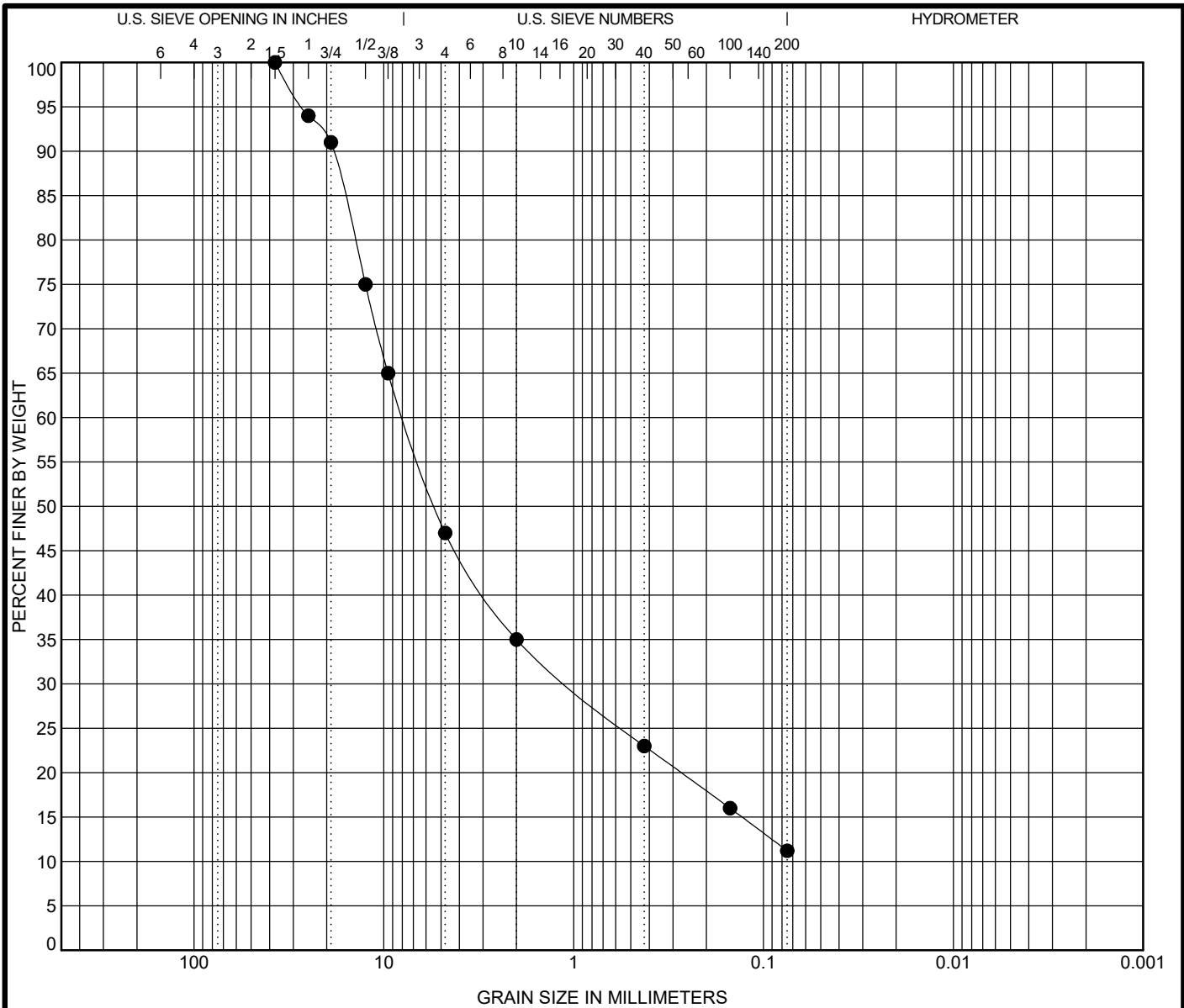
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 22	8.5	25	5.18	0.604	0.082	42.0	48.7	9.3
■ 23	5.0	19	4.337	0.268		38.0	43.3	18.7
▲ 24	1.5	9.5	0.11			2.0	44.2	53.8
★ 25	5.0	9.5				2.0	33.3	64.7
○ 27	3.0	9.5				1.0	38.9	60.1



GRAIN SIZE DISTRIBUTION

Project: Agua Fria Wastewater Improvements Ph. 3
 Location: Santa Fe, NM
 Number: 1-40411

U.S. GRAIN SIZE 1-40411.GPJ GEO TEST.GDT 10/3/24



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● 30 8.5	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	NP	NP	NP	2.23	124.25

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 30 8.5	37.5	7.836	1.049		53.0	35.8	11.2	



GRAIN SIZE DISTRIBUTION

Project: Agua Fria Wastewater Improvements Ph. 3
 Location: Santa Fe, NM
 Number: 1-40411

U.S. GRAIN SIZE 1-40411.GPJ GEO TEST.GDT 10/3/24

Borehole	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Size (mm)	% <#200 Sieve	Classification	Water Content (%)	Dry Density (pcf)	AASHTO CLASS	Corr. R-Value
1	1.0	NP	NP	NP	25	5	GP	1.3		A-1-a	72
3	3.0	NP	NP	NP	50	4	GW	1.5		A-1-a	72
4	5.0	NP	NP	NP	25	19	SM	4.3		A-1-b	72
7	5.0	23	18	5	19	24	SC-SM	3.3		A-1-b	60
8	3.0	28	16	12	12.5	57	CL	10.3		A-6	11
9	3.0	24	17	7	12.5	54	CL-ML	10.0		A-4	28
12	5.0	27	18	9	12.5	61	CL	10.2		A-4	23
13	5.0	NP	NP	NP	12.5	41	SM	8.1		A-4	46
19	3.0	24	17	7	19	42	SC-SM	11.5		A-4	28
20	5.0	22	15	7	19	25	SC-SM	3.9		A-2-4	38
21	3.0	27	16	11	12.5	42	SC	7.6		A-6	11
23	5.0	NP	NP	NP	19	19	SM	2.8		A-1-b	69
24	1.5	29	14	15	9.5	54	CL	8.3		A-6	10
25	5.0	31	15	16	9.5	65	CL	7.8		A-6	10
27	3.0	27	13	14	9.5	60	CL	10.0		A-6	10

SUMMARY AASHTO 1-40411.GPJ GEO-TEST.GDT 10/3/24



Summary of Laboratory Results

Project: Agua Fria Wastewater Improvements Ph. 3
 Location: Santa Fe, NM
 Number: 1-40411

GEO-TEST

GEO-TEST

Report 1-40411

APPENDIX A

FIELD ENGINEER NOTES

GEO-TEST, INC.
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FAX (505) 471-2245

8528 CALLE ALAMEDA NE
ALBUQUERQUE,
NEW MEXICO
87113
(505) 857-0933
FAX (505) 857-0803

2805-A LAS VEGAS CT.
LAS CRUCES,
NEW MEXICO
88007
(575) 526-6260
FAX (575) 523-1660

Patrick Whorton

From: Andrew Swartswalter <aswartzwalter@bhinc.com>
Sent: Sunday, September 15, 2024 3:25 PM
To: Timothy Matson; Patrick Whorton
Cc: Todd Burt; Sydney Cleverly
Subject: RE: Agua Fria Sewer Ph.2

Tim – Thank you for the project updates.

[@Patrick Whorton](#) - With all the information provided about the various locations. I think it makes sense to get the streets and bores that you can successfully get.

If we can get a bore at Camino dos Antonios, Case Road and/or possibly 3917 Agua it should give us enough information for the soils in that little area.

I looked a little more into Skeeter and surrounding areas, I don't have any great options for getting near that portion of the project.

The 3rd boring on Avenida de Sesario that was moved from Caja Del Oro should give us a good idea of the what the soil looks like adjacent to the Santa Fe River? Would you agree – something we could assume for Skeeter and some of the areas north of Agua Fria that back up to the wash?

I'd say continue with what you can achieve, and we will have to make some assumptions on the other areas. I would like to wrap up the field work in September so we can get a report in early October.

Let me know if you have any questions. I will be out of the office starting Wednesday for a few weeks. Please contact Todd Burt (505-377-8167) if you have any immediate concerns.

Thanks,

Andrew Swartswalter PE, MBA

Vice President [Water Systems](#)

Bohannon Huston

p. 505.823.1000 | **c.** 505.221.7801

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Upcoming Out of Office: 9/18-10/04

From: Timothy Matson <tmatson@geotestnm.com>
Sent: Friday, September 13, 2024 3:52 PM
To: Andrew Swartswalter <aswartzwalter@bhinc.com>

Cc: Patrick Whorton <pwhorton@geotestnm.com>; Todd Burt <tburt@bhinc.com>; Sydney Cleverly <SCleverly@bhinc.com>

Subject: RE: Agua Fria Sewer Ph.2

Andrew,

Thought I would give you an update on the project. Attached is a pdf showing the borings that we have completed to date. We moved #3 off of Caja Del Oro Grant Road and onto Avenida De Sesario, due to conflicts with underground utilities and unmarked "storm drain" that the county said was some kind of private line and not one of theirs??? This may also be a potential problem with the second one on Caja Del Oro Grant Road #4. I was hoping to have #4 and all of the ones on Lopez Lane done, but I have been having problems with USIC marking the Century Link lines. The original one call ticket expired already, and I will have to call in a new one, today and should be cleared by Wednesday of next week, so, hopefully we can do those Thursday or Friday of next week.

Borings North of Agua Fria

Today I met with the landowner of the compound at the 3945 Agua Fria line(#14 & #15). He does not give us permission to drill in his driveway. He wants to get with you or the county about what your plans are. His name is Justin Young, 505-660-9600 and his e-mail is justin@augustconstructionllc.com I also gave him your information.

I also met with someone from Agua Fria Community Water, they have 3 meters on the sidewalk on Agua Fria, just outside the driveway where bores #14 & 15 were to go. They only mark up to the meter, meaning that there are a minimum of 3 waterlines in the vicinity of where our boring locations were to be, therefore we will not be doing those borings, since we don't have permission and that there are un-marked lines, that no one will mark. Your SUE shows these meters but does not show the waterlines coming out of them or where they go.

He said that we have the same scenario on Ledd Drive (#17 & #18), not with permission, but with un-marked waterlines. There are some meters at the sidewalk on Agua Fria, and he told me that there is a waterline down that road, which has not been marked and will not be marked by anyone. Your SUE does not show that waterline. There is a marked gas line and that is shown on your SUE and they marked it again today from my one call ticket. Your SUE also shows a fiber optic line or telephone line and that line has not been marked since I called 811. Even if all the lines were marked, the roadway is so narrow, there would be no room to move our rig to make it work.

There is good news in this e-mail, on Camino Dos Antonios, the meters are NOT located on the sidewalk on Agua Fria, and are in front of the residences, and Agua Fria Water said that he can mark those lines at our boring locations. He also said, that when they installed that waterline, it was very rocky, (gravels and cobbles). The One Call Ticket for this road will clear on Tuesday, so we will see what gets marked and what doesn't.

On Case Road, there appears to be a well near the intersection of Case Road and Agua Fria, there are no meters at the sidewalk, and I didn't see anything about a waterline on your SUE, so my bet is that any waterlines that feed the houses are private and will not be located. This ticket also closes on Tuesday, and we will see then what is marked.

The driveways at 3197 Agua Fria, the western one has a meter at the sidewalk, again Agua Fria said they would only mark to the meter and the eastern driveway doesn't have a meter, but it looks like they may have a well, but can't get close enough to tell for certain, since there is a gate. This driveway is also very narrow and if there is an underground utility within the driveway, we won't have any room to move to miss it. This one will also be cleared by 811 on Tuesday, so we hope to know more then.

The 2 borings behind the houses on Skeeter Lane and not accessible to any of our drill rigs.

Tim,

I just wanted to follow up from our conversation on the phone. I have relayed this situation/experience to the PM for Santa Fe County who coordinates with the Village Association.

I will review the proposed bore locations, and work on identifying the most important / strategic bore locations for this project.

Thank for bringing this to our attention.

Respectfully,

Andrew Swartswalter PE, MBA

Vice President [Water Systems](#)

Bohannon Huston

p. 505.823.1000 | c. 505.221.7801

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Upcoming Out of Office: 8/23-8/26, 9/18-10/04

From: Timothy Matson <tmatson@geotestnm.com>

Sent: Tuesday, August 13, 2024 4:31 PM

To: Andrew Swartswalter <aswartswalter@bhinc.com>

Cc: Patrick Whorton <pwhorton@geotestnm.com>; Todd Burt <tburt@bhinc.com>; Martha Goodwin <mgoodwin@bhinc.com>; pbyres@aol.com

Subject: Agua Fria Sewer Ph.2

Good afternoon. Andrew.

Just wanted to let you know what happened today when trying to mark some of the borings for this project. Patrick put together a boring location map, which I have attached the kmz. I drove down Avenida De Sesario from Caja Del Oro Road, I was going to mark boring nos. 1 & 2. I drove down to the end of the road and made a U-turn near the driveway that leads up to Reliable Tech Heating Cooling & Plumbing. I made the U-turn and was going back east, to put a stake on the side of the road near boring 1. Prior to exiting the vehicle, I heard some shouting and looked to my right and saw 3 men walking down the dirt driveway between the addresses of 2349 & 2351. I have attached a screen shot, I was just east of the 1 location, and they were walking down the driveway from the south. They were screaming at me to leave and threatening me with hand gestures (gun in the air with their hand, hand slitting throat), one was trying to antagonize me to get out of my vehicle and approach them and I could tell that they would have assaulted me if I would have got out of my vehicle. I couldn't hear exactly what they were saying, but knew I was being threatened. Then one of the younger ones started running toward my and picked up rocks, then I left, I could see him throwing rocks at me. I don't know if your surveyor had any problems over there or if the City was aware of their threat.

So, to make a long story short, I did not mark the borings on that road and do not feel safe marking borings that are on what look like private driveways, mainly the ones off of Agua Fria, that Patrick has marked as B15, B16, B19, B20, B29-B32.

Also, These areas look like driveways that are on private property. Moreover, a private utility locator should be used, since the utility companies only mark to the meter and some of the meters are on Agua Fria.

I did mark and got a county permit for borings B3-B14. For the borings on Lopez Lane and Caja Del Oro Grant Road, we will need traffic control, more than just signs, we will need to shut down a lane and have flagger on Caja del Oro Road and Lopez Lane, which I see on the proposal was not part of our scope of work. I remember we did a similar project and some of the borings are on road next to the ones on this phase. I can't imagine that our report will change from the first report, except pavement section for the larger roads (Lopez Lane, Caja del Oro Grant Road and Alamo Road), all which look like they have been recently paved. Please give me or Patrick a call to discuss, how we want to proceed, especially with the borings that are not specifically within the city/county ROW. I will be out with the drill rig the rest of the week but will have my cell phone available in between borings. I'm about to leave the office now, but can be reached on cell phone tonight.

Tim Matson



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Bore No.	Street Associated	Gravity / Low Pressure	Notes
1	Avenida De Sesario	Low Pressure	*Incident Area - if not collected ok.
2	Avenida De Sesario	Low Pressure	Collect
3	Avenida De Sesario	Low Pressure	Collect
4	Caja Del Oro	Low Pressure	Omit - Not critical
5	Alamo Lane	Gravity	Outside Scope - Not Required!
6	Alamo Lane	Gravity	Outside Scope - Not Required!
7	Alamo Lane	Gravity	Collect
8	La Junta Del Alamo	Gravity	Collect
9	La Junta Del Alamo	Gravity	Collect
10	La Junta Del Alamo	Gravity	Collect
11	Lopez Lane	Low Pressure	Not critical
12	Lopez Lane	Low Pressure	Collect
13	Lopez Lane	Gravity	Collect
14	Lopez Lane	Gravity	Collect
15	3945 Agua Fria	Gravity	Collect *1
16	3945 Agua Fria	Gravity	Collect *1
17	Ledd Drive	Low Pressure	Collect
18	Ledd Drive	Gravity	Collect
19	Camino dos Antonios	Low Pressure	Collect
20	Camino dos Antonios	Low Pressure	Collect
21	Callejon De Rita	Gravity	Collect
22	Callejon De Rita	Low Pressure	Collect
23	Callejon De Rita	Low Pressure	Collect
24	Callejon De Rita	Low Pressure	Collect
25	Plaza Montoya	Gravity	Collect *2
26	Plaza Montoya	Gravity	Collect *2
27	Avenida De Montoya	Gravity	Collect *3
28	Avenida De Montoya	Gravity	Collect *3
29	Case Road	Low Pressure	collect
30	Case Road	Low Pressure	collect
31	3197 Agua Fria	Low Pressure	collect
32	3197 Agua Fria	Low Pressure	collect
33	Skeeter	Gravity	collect
34	Skeeter	Gravity	collect

Legend:	
Green	Required/Needed
Yellow	If possible, acquire
Red	Delete - Not. Required

*1 - Bores 15 & 16 could be combined into one at midpoint

*2 - Bores 25 and 26 could be combined into one at midpoint

*3 - Bores 27 and 28 could be combined into one at midpoint