Project No.
19633.000.002

December 20, 2022

Mr. Steve Arthur
Ridgeline Property Group
915 Highland Pointe Drive, Suite 250
Roseville, CA 95678

Subject: Pacific Gateway
Tracy, California

DOUBLE RING INFILTRATION TESTING RESULTS

Dear Mr. Arthur:

As requested, we performed double-ring infiltration testing at the subject property in Tracy, California. The purpose of our services was to provide information pertinent to the design of the proposed project basins. A discussion of our field services and the results of our infiltration testing are provided below.

INFILTRATION FIELD TESTING

At each of the five proposed basin locations, we retained the services of a subcontractor to drill one boring to a depth of 20 feet. We reviewed subsurface conditions at each location and selected the most appropriate elevations for infiltration testing. We performed our double-ring tests at the approximate depth below the existing surface, as shown on Table 1 below. An ENGEO representative conducted two infiltration tests at various elevations within each of the five basin locations. The double-ring infiltration tests were performed in general conformance with ASTM D3385-18 and the Multi-Agency Post-Construction Stormwater Standards Manual. The approximate locations of our geotechnical borings and infiltration tests are provided in the attached figures.

The infiltration test maintains a constant head within the rings. Specialized Mariotte Tubes were used to maintain the water levels at the selected head elevation in both the inner ring and the annular space throughout the test. A constant head was achieved in DR-7 and DR-8 by manually adding a selected amount of water over a measured time interval due to the rapid infiltration rates of the targeted soil layers. Each infiltration test was run until the infiltration rate stabilized.

INFILTRATION TEST RESULTS

The infiltration rate for the double-ring infiltrometer was calculated using the following equation from ASTM D3385.

$$VIR = \Delta VIR / (AIR * \Delta t)$$

Where:

VIR = inner ring incremental infiltration velocity, cm/hr
ΔVIR = volume of liquid used during time interval to maintain constant head in the inner ring, cm^3
AIR = interior area of inner ring, cm^2
Δt = time interval, h

Based on the encountered soil types, the site soil would be anticipated to have infiltration rates varying from Type A to Type D soil, as presented in Table 3-1 of the Multi-Agency Post Construction Stormwater Standards Manual. Our double-ring infiltration test results are summarized in Table 1 below, along with a description of the soil type at each test location.

TABLE 1: Double-Ring Infiltrometer Test Results

TEST LOCATION	BASIN IDENTIFICATION	DEPTH (Below the existing ground surface, ft)	SOIL TYPE	INFILTRATION RATE (inches/hour)
DR-1	Basin 1	7	Sandy silt	1.8
DR-2	Basin 1	12	Silty sand	1.0
DR-3	Basin 2	5	Lean clay	0.3
DR-4	Basin 2	11½	Sandy lean clay	1.2
DR-5	Basin 3	3	Lean clay	0.3
DR-6	Basin 3	9½	Sandy lean clay	0.9
DR-7	Basin 4	9	Poorly graded gravel with silt and sand	15.0
DR-8	Basin 4	12	Poorly graded gravel with clay and sand	15.0
DR-9	Basin 5	4	Lean clay with sand	0.5
DR-10	Basin 5	9	Sandy silt	0.8

We strived to perform our professional services in accordance with generally accepted principles and practices currently employed in the area, there is no warranty, express or implied. If you have any questions regarding the contents of this letter, please do not hesitate to contact us.

Sincerely,

ENGEO Incorporated

Chase Dunn

Steve Harris, GE

cd/sh/dt

Attachments: Figure 1 – Vicinity Map
Figure 2 – Site Plan - Proposed Basin 1
Figure 3 – Site Plan - Proposed Basin 2
Figure 4 – Site Plan - Proposed Basin 3
Figure 5 – Site Plan - Proposed Basin 4
Figure 6 – Site Plan - Proposed Basin 5
Boring Logs 1 through 5

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

PROJECT SITE

N

0 1,500 3,000

FEET

BASEMAP SOURCE: GOOGLE EARTH MAPPING SERVICE 2022

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VICINITY MAP

PACIFIC GATEWAY

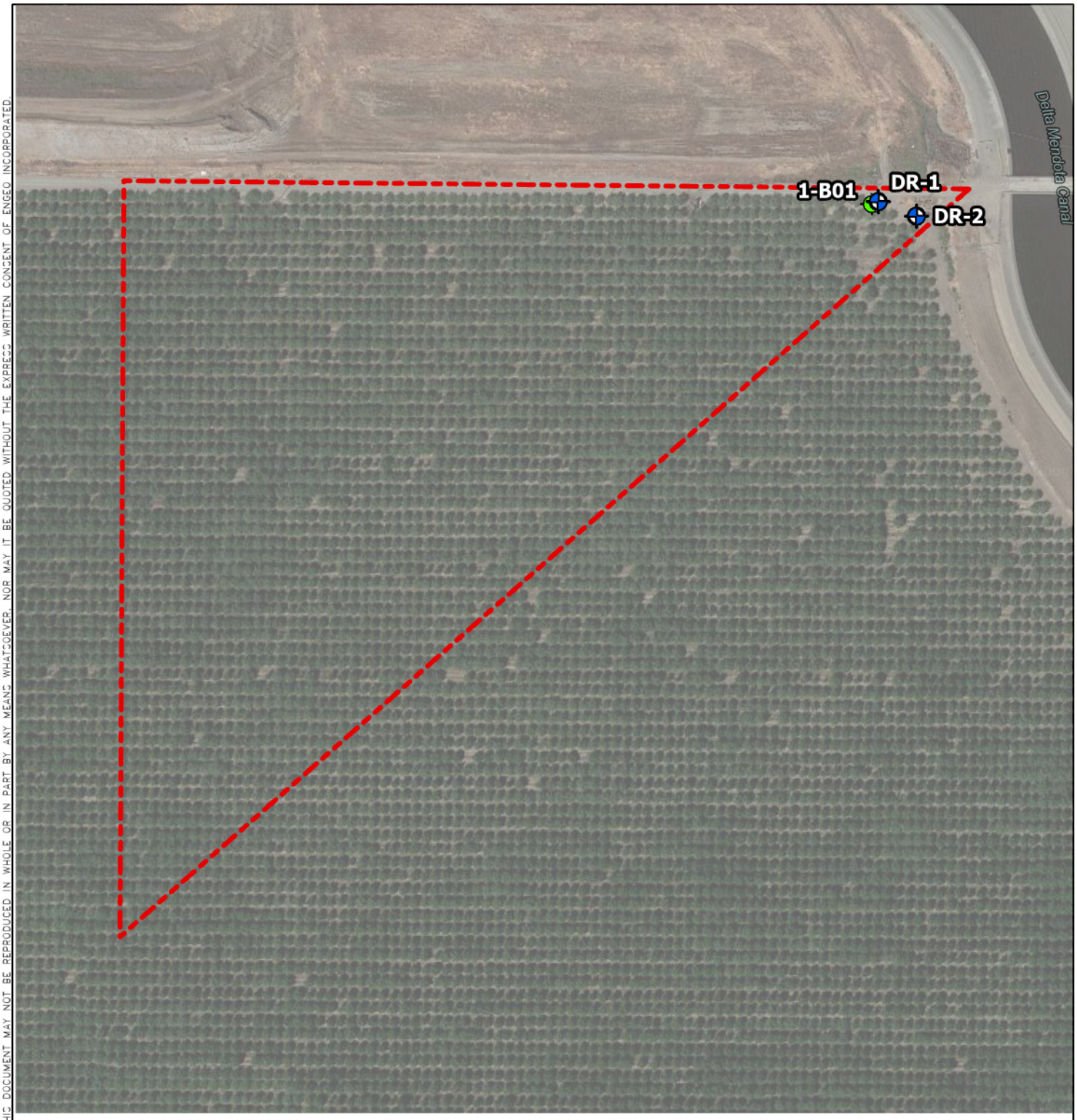
TRACY, CALIFORNIA

PROJECT NO. :	19633.000.002
SCALE:	AS SHOWN
DRAWN BY: QRL	CHECKED BY: SDH

FIGURE NO. 1

PATH: G:\DRAFTING\PROJECTS_18000 TO 19999\19633\19633000002\PACIFIC GATEWAY.APRX
LAYOUT: VICINITY USER: QLIANG

ORIGINAL FIGURE PRINTED IN COLOR



N

0 100 200

FEET

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

- PROJECT SITE PROPOSED BASIN 1
- BORING (ENGEO, 2022)
- DOUBLE-RING TEST LOCATION (ENGEO, 2022)

BASEMAP SOURCE: GOOGLE EARTH MAPPING SERVICE 2021

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SITE PLAN - PROPOSED BASIN 1

PACIFIC GATEWAY

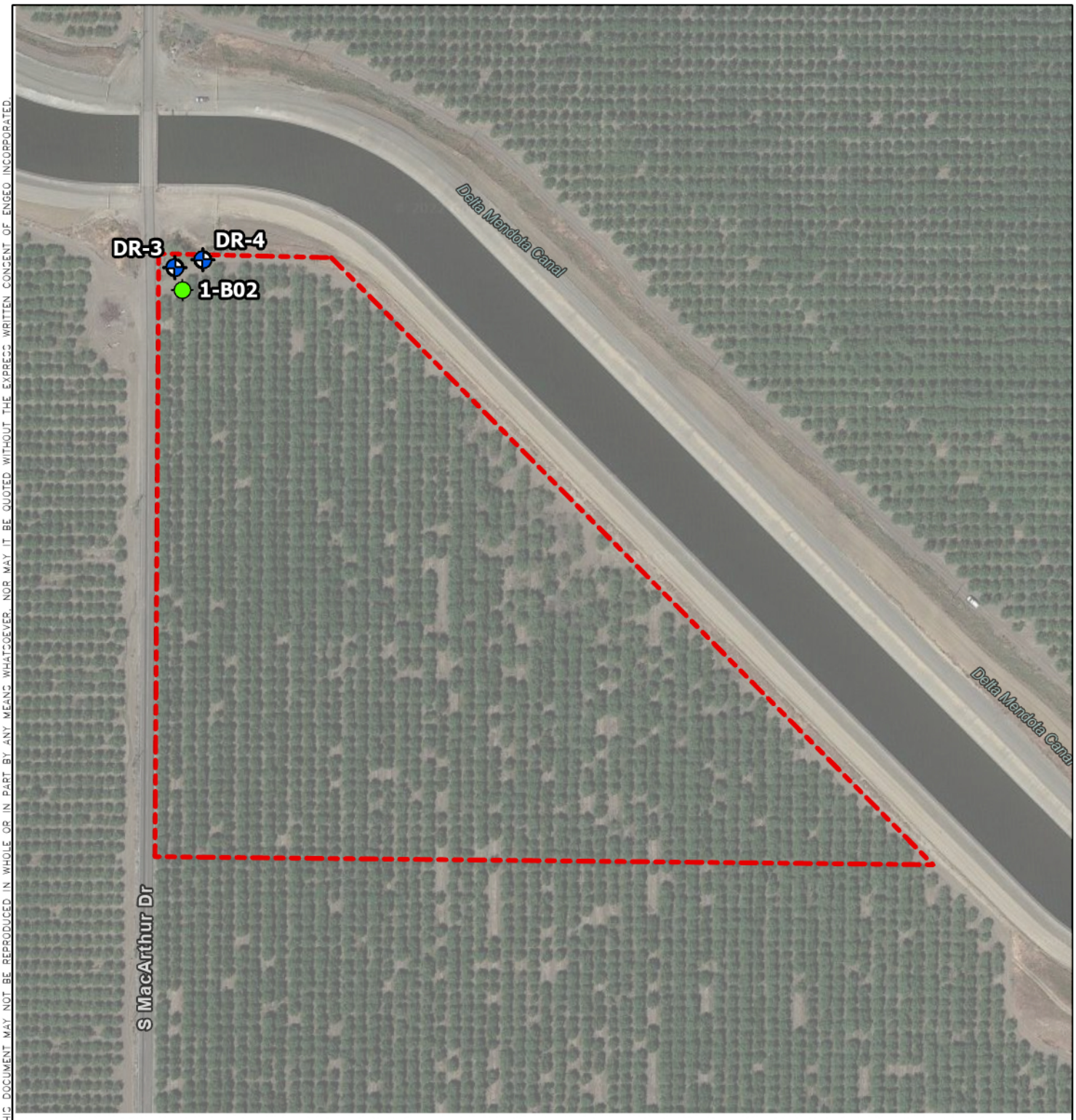
TRACY, CALIFORNIA

PROJECT NO. :	19633.000.002
SCALE:	AS SHOWN
DRAWN BY: QRL	CHECKED BY: SDH

FIGURE NO. 2

PATH: G:\DRAFTING\PROJECTS_18000 TO 19999\19633\19633000002\PACIFIC GATEWAY.APRX
LAYOUT: SITE PLAN USER: QLIANG

ORIGINAL FIGURE PRINTED IN COLOR



N

0 100 200

FEET

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

- PROJECT SITE PROPOSED BASIN 2
- BORING (ENGEO, 2022)
- DOUBLE-RING TEST LOCATION (ENGEO, 2022)

BASEMAP SOURCE: GOOGLE EARTH MAPPING SERVICE 2021

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SITE PLAN - PROPOSED BASIN 2

PACIFIC GATEWAY

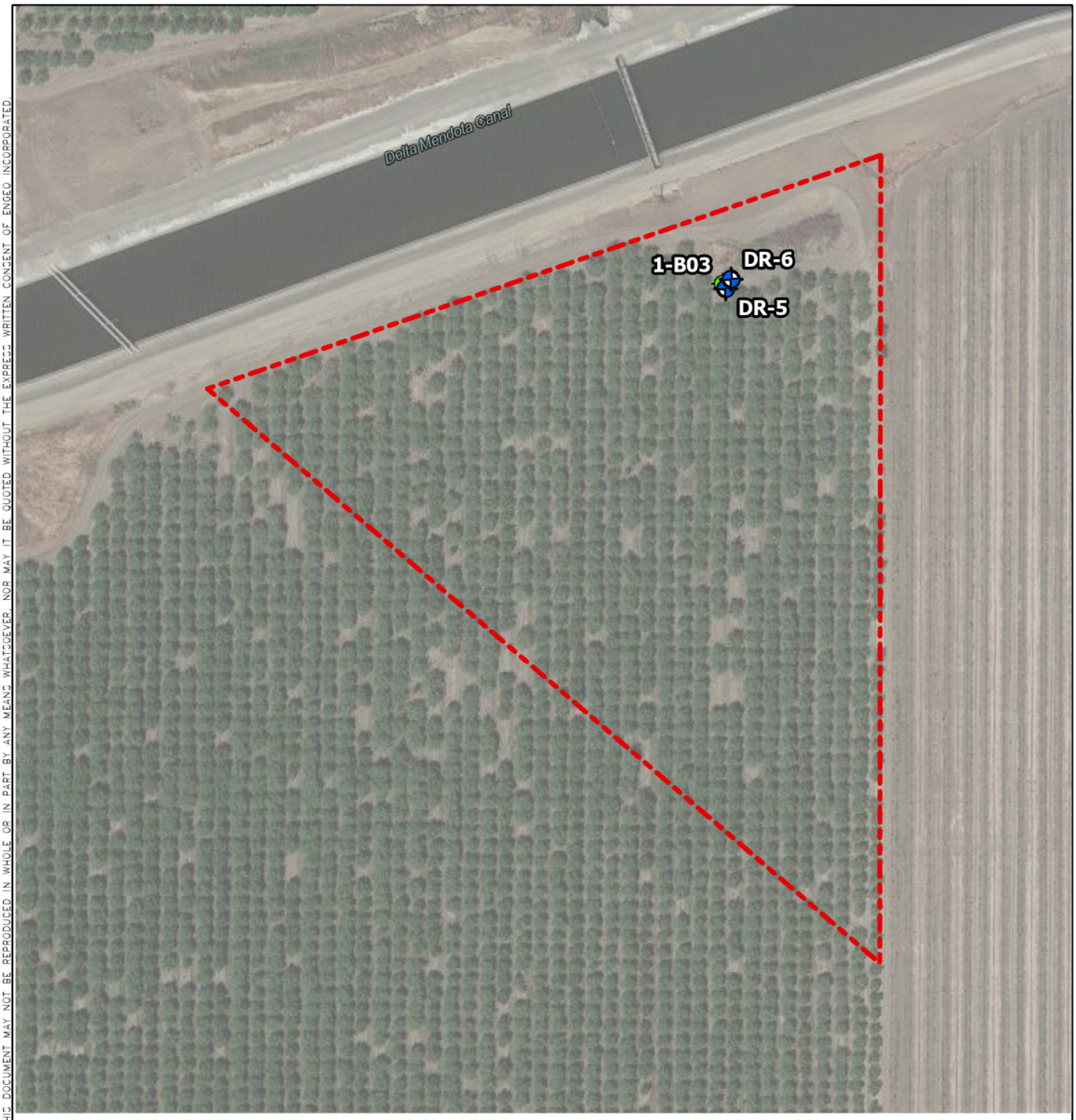
TRACY, CALIFORNIA

PROJECT NO. :	19633.000.002
SCALE:	AS SHOWN
DRAWN BY: QRL	CHECKED BY: SDH

FIGURE NO. 3

PATH: G:\DRAFTING\PROJECTS_18000 TO 19999\19633\19633000002\PACIFIC GATEWAY.APRX
LAYOUT: SITE PLAN USER: QLIANG

ORIGINAL FIGURE PRINTED IN COLOR



N

0 75 150

FEET

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

- PROJECT SITE PROPOSED BASIN 3
- BORING (ENGEO, 2022)
- DOUBLE-RING TEST LOCATION (ENGEO, 2022)

BASEMAP SOURCE: GOOGLE EARTH MAPPING SERVICE 2021

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SITE PLAN - PROPOSED BASIN 3

PACIFIC GATEWAY

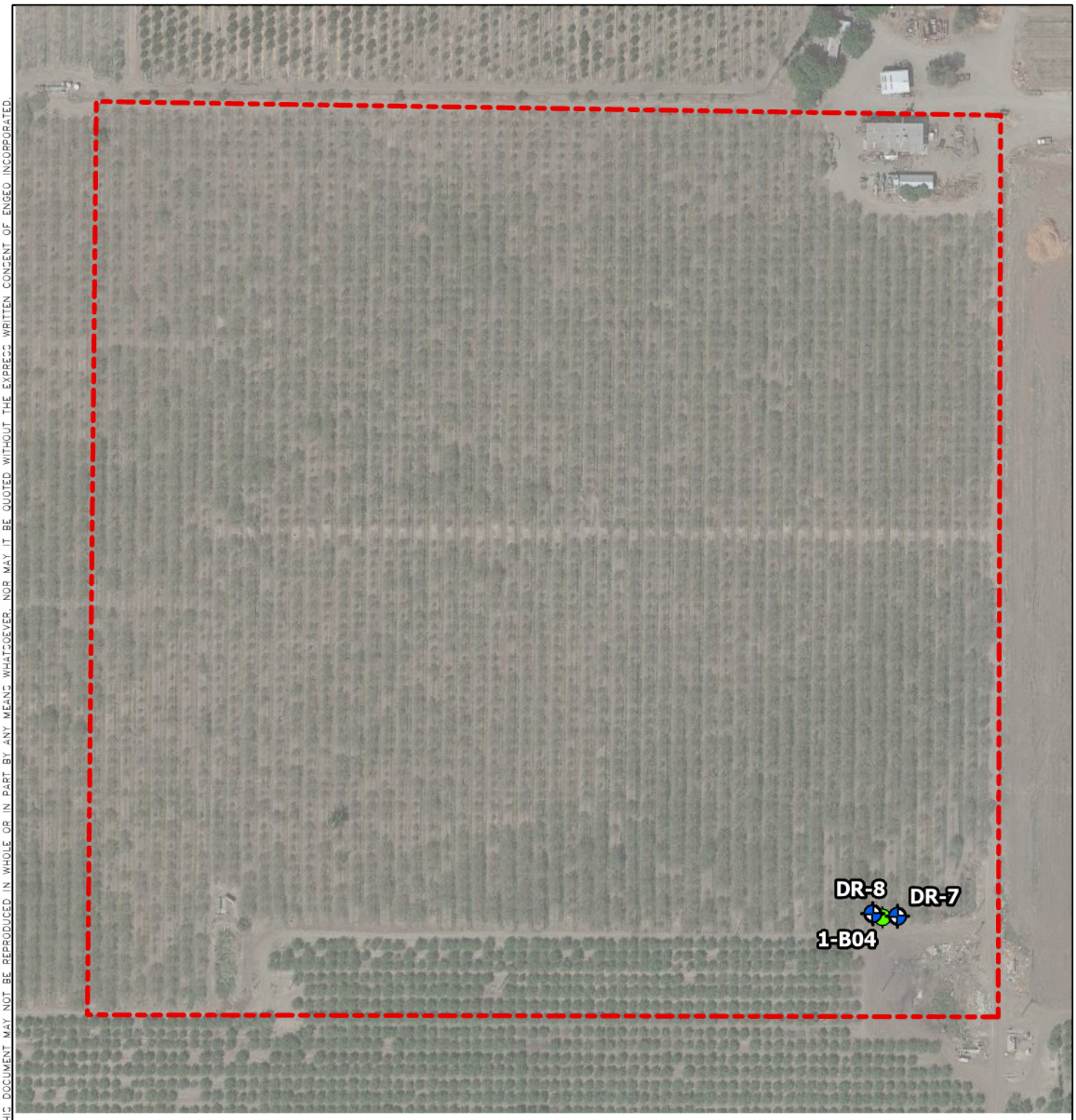
TRACY, CALIFORNIA

PROJECT NO. :	19633.000.002
SCALE:	AS SHOWN
DRAWN BY: QRL	CHECKED BY: SDH

FIGURE NO. 4

PATH: G:\DRAFTING\PROJECTS_18000 TO 19999\19633\19633000002\PACIFIC GATEWAY.APRX
LAYOUT: SITE PLAN USER: QLIANG

ORIGINAL FIGURE PRINTED IN COLOR



N

0 100 200

FEET

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

- PROJECT SITE PROPOSED BASIN 4
- BORING (ENGEO, 2022)
- DOUBLE-RING TEST LOCATION (ENGEO, 2022)

BASEMAP SOURCE: GOOGLE EARTH MAPPING SERVICE 2021

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SITE PLAN - PROPOSED BASIN 4

PACIFIC GATEWAY

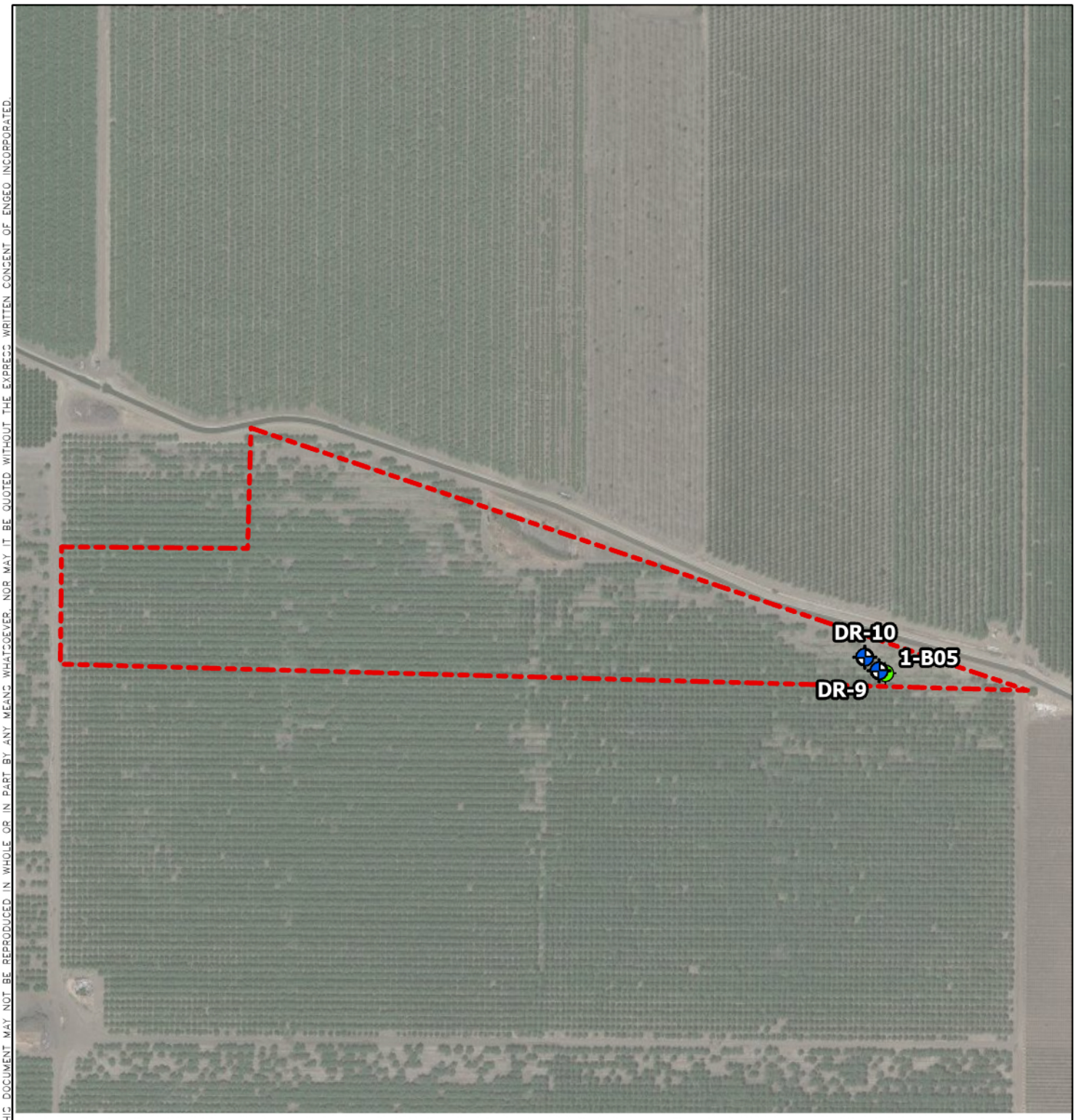
TRACY, CALIFORNIA

PROJECT NO. :	19633.000.002
SCALE:	AS SHOWN
DRAWN BY: QRL	CHECKED BY: SDH

FIGURE NO. 5

PATH: G:\DRAFTING\PROJECTS_18000 TO 19999\19633\19633000002\PACIFIC GATEWAY.APRX
LAYOUT: SITE PLAN USER: QLIANG

ORIGINAL FIGURE PRINTED IN COLOR



N

0 200 400

FEET

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

- PROJECT SITE PROPOSED BASIN 5
- BORING (ENGEO, 2022)
- DOUBLE-RING TEST LOCATION (ENGEO, 2022)

BASEMAP SOURCE: GOOGLE EARTH MAPPING SERVICE 2021

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SITE PLAN - PROPOSED BASIN 5

PACIFIC GATEWAY

TRACY, CALIFORNIA

PROJECT NO. :	19633.000.002
SCALE:	AS SHOWN
DRAWN BY: QRL	CHECKED BY: SDH

FIGURE NO. 6

PATH: G:\DRAFTING\PROJECTS_18000 TO 19999\19633\19633000002\PACIFIC GATEWAY.APRX
LAYOUT: SITE PLAN USER: QLIANG

ORIGINAL FIGURE PRINTED IN COLOR

KEY TO BORING LOGS

MAJOR TYPES			DESCRIPTION
COARSE-GRAINED SOILS MORE THAN HALF OF MAT'L LARGER THAN #200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LESS THAN 5% FINES	GW - Well graded gravels or gravel-sand mixtures GP - Poorly graded gravels or gravel-sand mixtures
		GRAVELS WITH OVER 12 % FINES	GM - Silty gravels, gravel-sand and silt mixtures GC - Clayey gravels, gravel-sand and clay mixtures
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LESS THAN 5% FINES	SW - Well graded sands, or gravelly sand mixtures SP - Poorly graded sands or gravelly sand mixtures
		SANDS WITH OVER 12 % FINES	SM - Silty sand, sand-silt mixtures SC - Clayey sand, sand-clay mixtures
FINE-GRAINED SOILS MORE THAN HALF OF MAT'L SMALLER THAN #200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50 % OR LESS		ML - Inorganic silt with low to medium plasticity CL - Inorganic clay with low to medium plasticity OL - Low plasticity organic silts and clays
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50 %		MH - Elastic silt with high plasticity CH - Fat clay with high plasticity OH - Highly plastic organic silts and clays
	HIGHLY ORGANIC SOILS		PT - Peat and other highly organic soils

For fine-grained soils with 15 to 29% retained on the #200 sieve, the words "with sand" or "with gravel" (whichever is predominant) are added to the group name.

For fine-grained soil with >30% retained on the #200 sieve, the words "sandy" or "gravelly" (whichever is predominant) are added to the group name.

GRAIN SIZES

U.S. STANDARD SERIES SIEVE SIZE					CLEAR SQUARE SIEVE OPENINGS			
200	40	10	4	3/4 "	3"	12"		
SILTS AND CLAYS	SAND			GRAVEL			COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE			

RELATIVE DENSITY

SANDS AND GRAVELS	BLOWS/FOOT (S.P.T.)
VERY LOOSE	0-4
LOOSE	4-10
MEDIUM DENSE	10-30
DENSE	30-50
VERY DENSE	OVER 50

CONSISTENCY

SILTS AND CLAYS	STRENGTH*
VERY SOFT	0-1/4
SOFT	1/4-1/2
MEDIUM STIFF	1/2-1
STIFF	1-2
VERY STIFF	2-4
HARD	OVER 4

SAMPLER SYMBOLS

- Modified California (3" O.D.) sampler
- California (2.5" O.D.) sampler
- S.P.T. - Split spoon sampler
- Shelby Tube
- Dames and Moore Piston
- Continuous Core
- Bag Samples
- Grab Samples
- NR No Recovery

MOISTURE CONDITION

DRY	Dusty, dry to touch
MOIST	Damp but no visible water
WET	Visible freewater

LINE TYPES

- ———— Solid - Layer Break
- – – – – – Dashed - Gradational or approximate layer break

GROUNDWATER SYMBOLS

- Groundwater level during drilling
- Stabilized groundwater level

(S.P.T.) Number of blows of 140 lb. hammer falling 30" to drive a 2-inch O.D. (1-3/8 inch I.D.) sampler

* Unconfined compressive strength in tons/sq. ft., asterisk on log means determined by pocket penetrometer

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LOG OF BORING 1-B01

LATITUDE: 37.666966 LONGITUDE: -121.426855

Geotechnical Exploration
Pacific Gateway
Tracy, California
19633.000.002

DATE DRILLED: 12/2/2022
HOLE DEPTH: Approx. 21½ ft.
HOLE DIAMETER: 4.5 in.
SURF ELEV (WGS84): Approx. 195 ft.

LOGGED / REVIEWED BY: CM. Dunn / ZAC
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Rope and Cathead

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Shear Strength (psf) *field approximation	Unconfined Strength (tsf) *field approximation	Strength Test Type
			SILTY SAND (SM), brown, medium dense, moist, fine-grained sand, 30-40% fines			28									
			SANDY LEAN CLAY (CL), brown, stiff, moist, medium plasticity, 30-40% fine-grained sand			12									
5	190		CLAYEY SAND (SC), brown, loose, moist, fine-grained sand, 25-35% fines			19									
			SANDY SILT (ML), brown, medium stiff, moist, non-plastic, 35-45% fine-grained sand			10									
10	185		SILTY SAND (SM), brown, medium dense, moist, fine-grained sand, 30-40% fines			16									
15	180		POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), brown, medium dense, moist, fine- to coarse-grained sand, 5-12% fines, 30-40% fine to coarse gravel			23									
20	175		SILTY SAND WITH GRAVEL (SM), brown, medium dense, moist, fine- to coarse-grained sand, 12-20% fines, 20-30% fine to coarse gravel			17									
			Bottom of boring at approximately 21 1/2 feet below existing grade. Groundwater not encountered during drilling.												

LOG OF BORING 1-B02

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LATITUDE: 37.658188 LONGITUDE: -121.41592

Geotechnical Exploration
Pacific Gateway
Tracy, California
19633.000.002

DATE DRILLED: 12/2/2022
HOLE DEPTH: Approx. 21½ ft.
HOLE DIAMETER: 4.5 in.
SURF ELEV (WGS84): Approx. 188 ft.

LOGGED / REVIEWED BY: CM. Dunn / ZAC
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Rope and Cathead

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Shear Strength (psf) *field approximation	Unconfined Strength (tsf) *field approximation	Strength Test Type
0	188		LEAN CLAY (CL), dark brown, very stiff to hard, moist, medium plasticity, <15% fine-grained sand, contains carbonates			40								>4.5*	PP
	185					22									
5						73								>4.5*	PP
	180					26								4.0*	PP
10			LEAN CLAY WITH SAND (CL), brown, hard, moist, medium plasticity, 15-25% fine-grained sand			68								>4.5*	PP
			SANDY LEAN CLAY (CL), brown, hard, moist, low plasticity, 35-45% fine-grained sand												
	175		SILTY SAND (SM), brown, dense, moist, fine- to medium-grained sand, 25-35% fines			30									
15															
	170		SILTY SAND WITH GRAVEL (SM), brown, very dense, moist, fine- to coarse-grained sand, 15-25% fines, 20-30% fine to coarse gravel			55									
20															
			Bottom of boring at approximately 21 1/2 feet below existing grade. Groundwater not encountered during drilling.												

LOG - GEOTECHNICAL_SU+QU W/ ELEV 1-B01_1-B05.GPJ ENGEO INC.GDT 12/20/22

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LOG OF BORING 1-B03

LATITUDE: 37.655847 LONGITUDE: -121.407512

Geotechnical Exploration
Pacific Gateway
Tracy, California
19633.000.002

DATE DRILLED: 12/2/2022
HOLE DEPTH: Approx. 21½ ft.
HOLE DIAMETER: 4.5 in.
SURF ELEV (WGS84): Approx. 192 ft.

LOGGED / REVIEWED BY: CM. Dunn / ZAC
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Rope and Cathead

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Shear Strength (psf) *field approximation	Unconfined Strength (tsf) *field approximation	Strength Test Type
			LEAN CLAY (CL), dark grayish brown, hard, moist, medium to high plasticity, <15% fine-grained sand, contains manganese nodules			22								>4.5*	PP
	190					13								4.25*	PP
5						26								>4.5*	PP
	185		LEAN CLAY WITH SAND (CL), brown, very stiff, moist, medium plasticity, 20-29% fine-grained sand			18								4.0*	PP
			SANDY LEAN CLAY (CL), brown, hard, moist, medium plasticity, 30-40% fine-grained sand												
10						30								>4.5*	PP
	180		grades to increasing sands content, contains gravel												
15			LEAN CLAY WITH SAND (CL), brown, stiff, moist, medium plasticity, 15-25% fine-grained sand			15									
	175														
20			grades to hard			33									
			Bottom of boring at approximately 21 1/2 feet below existing grade. Groundwater not encountered during drilling.												

LOG - GEOTECHNICAL_SU+QU W/ ELEV 1-B01_1-B05.GPJ ENGEO INC.GDT 12/20/22

LOG OF BORING 1-B04

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LATITUDE: 37.671124 LONGITUDE: -121.407554

Geotechnical Exploration
Pacific Gateway
Tracy, California
19633.000.002

DATE DRILLED: 12/2/2022
HOLE DEPTH: Approx. 21½ ft.
HOLE DIAMETER: 4.5 in.
SURF ELEV (WGS84): Approx. 148 ft.

LOGGED / REVIEWED BY: CM. Dunn / ZAC
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Rope and Cathead

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Shear Strength (psf) *field approximation	Unconfined Strength (tsf) *field approximation	Strength Test Type
			LEAN CLAY (CL), dark grayish brown, very stiff, moist, medium to high plasticity, <15% fine-grained sand			29							1750*	3.5*	PP+TV
	145		LEAN CLAY WITH SAND (CL), brown, medium stiff, moist, medium plasticity, 15-25% fine-grained sand			6									
5			grades to very stiff			19								2.75*	PP
			SANDY LEAN CLAY (CL), brown, hard, moist, low to medium plasticity, 35-45% fine-grained sand			16								>4.5*	PP
	140		POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), yellowish brown, very dense, moist, fine to coarse gravel, 5-12% fines, 35-45% fine- to coarse-grained sand												
10						53									
	135		POORLY GRADED GRAVEL WITH CLAY AND SAND (GP-GC), yellowish brown, dense, moist, fine to coarse gravel, 5-12% fines, 25-35% fine- to coarse-grained sand												
15						30									
	130		CLAYEY SAND (SC), brown, medium dense, moist, fine-grained sand, 40-49% fines												
20						19									
			Bottom of boring at approximately 21 1/2 feet below existing grade. Groundwater not encountered during drilling.												

LOG - GEOTECHNICAL_SU+QU W/ ELEV 1-B01_1-B05.GPJ ENGEO INC.GDT 12/20/22

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LOG OF BORING 1-B05

LATITUDE: 37.660539 LONGITUDE: -121.371812

Geotechnical Exploration
Pacific Gateway
Tracy, California
19633.000.002

DATE DRILLED: 12/2/2022
HOLE DEPTH: Approx. 21½ ft.
HOLE DIAMETER: 4.5 in.
SURF ELEV (WGS84): Approx. 129 ft.

LOGGED / REVIEWED BY: CM. Dunn / ZAC
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Rope and Cathead

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Shear Strength (psf) *field approximation	Unconfined Strength (tsf) *field approximation	Strength Test Type
			LEAN CLAY WITH SAND (CL), dark brown, hard, moist, medium to high plasticity, 15-25% fine-grained sand, contains carbonates			58								>4.5*	PP
			grades to brown, 20-29% fine-grained sand			18								>4.5*	PP
	125														
5						33								>4.5*	PP
			LEAN CLAY (CL), brown, hard, moist, medium to high plasticity, <15% fine-grained sand												
			LEAN CLAY WITH SAND (CL), brown, very stiff, moist, medium plasticity, 15-25% fine-grained sand			16								2.75*	PP
			SANDY SILT (ML), brown, stiff, moist, low plasticity to non-plastic, 30-40% fine-grained sand												
	120														
10			grades to medium stiff			9									
			SANDY ELASTIC SILT (MH), brown, stiff, moist, medium plasticity, 30-40% fine-grained sand												
	115														
15						11									
	110														
20						11									
			Bottom of boring at approximately 21 1/2 feet below existing grade. Groundwater not encountered during drilling.												

LOG - GEOTECHNICAL_SU+QU W/ ELEV 1-B01_1-B05.GPJ ENGEO INC.GDT 12/20/22