

UNIFIED SOIL CLASSIFICATION SYSTEM

PRIMARY DIVISIONS			GROUP SYMBOL	TYPICAL NAMES
COARSE GRAINED SOILS more than half is larger than #200 sieve	GRAVELS half of coarse fraction larger than #4 sieve	CLEAN GRAVELS (less than 5% fines)	GW	Well graded gravels, gravel-sand mixtures; little or no fines
			GP	Poorly graded gravels or gravel-sand mixtures; little or no fines
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	SANDS half of coarse fraction smaller than # 4 sieve	CLEAN SANDS (less than 5% fines)	SW	Well graded sands, gravelly sands, little or no fines
			SP	Poorly graded sands or gravelly sands, little or no fines
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, sand-clay mixtures, plastic fines
FINE GRAINED SOILS more than half is smaller than #200 sieve	SILTS AND CLAYS liquid limit less than 50%	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts, with slight plasticity	
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays silty clays, lean clays	
		OL	Organic silts and organic silty clays of low plasticity	
	SILTS AND CLAYS liquid limit less than 50%	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	
		CH	Inorganic clays of high plasticity, fat clays	
		OH	Organic clays of medium to high plasticity, organic silts	
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils

WELL LOG
KEY TO ABBREVIATIONS

Drilling Method

HSA - Hollow stem auger
CFA - Continuous flight auger
Air - Reverse air circulation

Gravel Pack

CA - Coarse aquarium sand

Sampling Method

Cal. Mod. - California modified split-spoon sampler (2" inner diameter) driven 18" by a 140-pound hammer having a 30" drop. Where penetration resistance is designated "P", sampler was instead pushed by drill rig.
Disturbed - Sample taken from drill-return materials as they surfaced.
n/a - Not applicable

Moisture Content

Dr - Dry
Dp - Damp
Mst - Moist
Wt - Wet
Sat - Saturated

Sorting

PS - Poorly sorted
MS - Moderately sorted
WS - Well sorted

Plasticity

L - Low
M - Moderate
H - High

H-NU (ppm)

ND - No detection

Density

Sands and gravels

VL - Very loose
L - Loose
MD - Medium dense
D - Dense
VD - Very dense

Silts and clays

VS - Very soft
Sft - Soft
MSt - Medium Stiff
Stf - Stiff
VSt - Very stiff
Hd - Hard

Symbols

▽ - First encountered ground water
▽ - Static ground water level

sampled interval  sample recovery

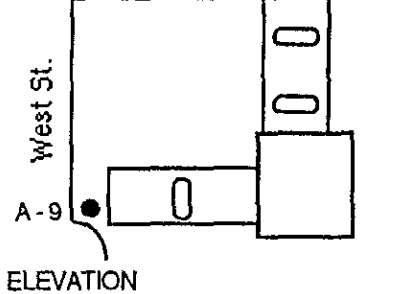
GRAIN-SIZE SCALE

GRADE LIMITS		GRADE NAME
inches	U.S. Standard sieve size	
12.0		Boulders
3.0	3.0 in.	Cobbles
0.19	No. 4	Gravel
0.08	No. 10	coarse Sand
	No. 40	medium Sand
	No. 200	fine Sand
		Silt
		Clay Size

LOCATION MAP MacArthur

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL / A-9
BORING NO.
PAGE 1 OF 1



PROJECT NO. 130-12.03
LOGGED BY: MD
DRILLING METHOD: HSA
SAMPLING METHOD: CAL MOD
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020
GRAVEL PACK: 12 X 20 SAND

CLIENT: G.R. ARCO
DATE DRILLED: 12-15-87
LOCATION: MacArthur & West
HOLE DIAMETER: 12"
HOLE DEPTH: 45'
WELL DEPTH: 40'
WELL DIAMETER: 6"

WELL COMPLETION	MOISTURE CONTENT	TIP	PENETRATION RESISTANCE (BLOWS/FT)	DEPTH (FEET)	SAMPLE	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
				2			CL	ASPHALT & GRAVEL _ FILL.
		Dp	P	4				CLAY; tan; silty; 10-15% fine to coarse sand; trace fine gravel; iron oxide stains; trace organics. @3 1/2'; no product odor.
				6				
				8				
		Mst	8	10				@9'; as above; no sand or gravel; gray mottle around rootholes; rootholes moist; stiff; faint product odor.
				12				
		Wt	25	14			SW	SAND; dark brown-gray; trace to 10% fines; fine to coarse grained; mostly coarse sand; trace fine gravel; angular to sub rounded; medium dense. @14'; no product odor.
				16				
		Wt	24	20				@19'; as above; medium dense; no product odor.
				22				
		Wt	35	24				@24'; as above; dense; no product odor.
				26				
		Wt	14	30			SP/CL	INTERBEDDED SAND & CLAY; SAND: tan; 10-15% low plasticity fines; very fine grained; iron oxide stains; CLAY: tan; iron oxide stains; silty; trace fine to coarse sand; bedds up to 8" thick. @30'; no product odor.
				32				
		Wt	23	34			SC-CL	CLAY to CLAYEY SAND; brick red; 50% fine to coarse sand; trace fine gravel; sand and gravel rounded.
				36				
		Wt	25	38			SC	CLAYEY SAND; medium brown; iron oxide stains; 25-35% low plasticity fines; fine to medium grained; medium dense. @39'; no product odor.
				40				
				42				
				44				

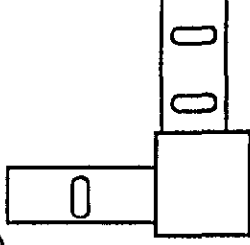
BOTTOM OF BORING AT ~45'

LOCATION MAP MacArthur

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL / A-10
BORING NO.
PAGE 1 OF 1

West St.



ELEVATION ● A-10

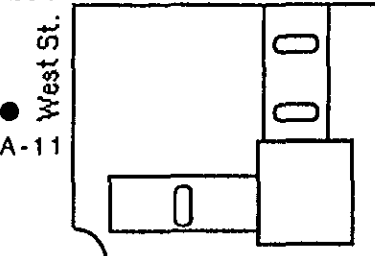
PROJECT NO. 130-12.03
LOGGED BY: MD
DRILLING METHOD: HSA
SAMPLING METHOD: CAL MOD
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020
GRAVEL PACK: 12 X 20 SAND

CLIENT: G.R. ARCO
DATE DRILLED: 12-15-87
LOCATION: MacArthur & West
HOLE DIAMETER: 8"
HOLE DEPTH: 30 1/2'
WELL DEPTH: 30'
WELL DIAMETER: 3"

WELL COMPLETION	MOISTURE CONTENT	TIP	PENETRATION RESISTANCE (BLOWS/FT)	DEPTH (FEET)	SAMPLE	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
				2			ML	ASPHALT & GRAVEL - FILL.
			P	4				SILT; tan; iron oxide stains; trace clay; 5-15% fine to coarse gravel; trace organics. @3 1/2'; no product odor.
				6				
				8				
			7	10			CL	CLAY; tan; iron oxide stains; silty; trace fine sand; rootholes. @9'; no product odor.
				12				
			21	14				@14'; as above; 20-30% sand; 5-10% fine to coarse gravel; very stiff; no product odor.
				16				
				18				
			26	20			SW	SAND; medium brown; 10-15% low plasticity fines; fine to coarse grained; well graded; 5-10% fine to medium gravel; angular; medium dense. @19'; no product odor.
				22				
			26	24				@24'; as above; predominately coarse sand; medium dense; no product odor.
				26				
				28				
			14	30			CL	@29'; as above; no product odor. CLAY; tan; iron oxide stains; 5-15% fine to medium sand; trace coarse sand; trace organics; silty.
				32				
				34				
				36				
				38				
				40				
				42				
				44				

BOTTOM OF BORING AT 30 1/2'

LOCATION MAP MacArthur



ELEVATION

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL / A-11
BORING NO.
PAGE 1 OF 1

PROJECT NO. 130-12.03
LOGGED BY: MD
DRILLING METHOD: HSA
SAMPLING METHOD: CAL MOD
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020
GRAVEL PACK: 12 X 20 SAND

CLIENT: G.R. ARCO
DATE DRILLED: 12-16-87
LOCATION: MacArthur & West
HOLE DIAMETER: 8"
HOLE DEPTH: 30 1/2'
WELL DEPTH: 30'
WELL DIAMETER: 3"

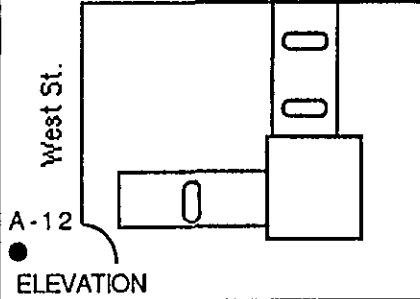
WELL COMPLETION	MOISTURE CONTENT	TIP	PENETRATION RESISTANCE (BLOWS/FT)	DEPTH (FEET)	SAMPLE	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
				2			CL	ASPHALT & GRAVEL - FILL.
				4			CL	CLAY; tan-orange; iron oxide stains; silty; trace fine sand; rootholes; gray mottle at rootholes; trace organics.
				6			CL	@3 1/2'; no product odor.
				8			CL	
				10			CL	@9'; as above; water in rootholes; stiff; no product odor.
				12			CL	
				14			CL	@14'; as above; medium brown; 5-10% fine to coarse sand; trace fine gravel; water in rootholes; very stiff; no product odor.
				16			CL	
				18			SW	SAND; dark reddish brown; 5% low plasticity fines; fine to coarse grined; 5% fine to medium gravel; angular to sub rounded; dense.
				20			SW	@19'; no product odor.
				22			SW	@24'; as above; very dense; no product odor.
				24			SW	
				26			SW	
				28			SP/CL	INTERBEDDED CLAY & SAND; CLAY: tan; iron oxide stains; silty; trace fine sand; low plasticity; SAND: tan; iron oxide stains; 10-15% low plasticity fines; very fine grained; bedds ~ 4-6" thick in sample tube.
				30			SP/CL	@29'; no product odor.
				32				
				34				
				36				
				38				
				40				
				42				
				44				

BOTTOM OF BORING AT 30 1/2'

LOCATION MAP MacArthur

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL / A-12
BORING NO.
PAGE 1 OF 1



PROJECT NO. 130-12.03
LOGGED BY: MD
DRILLING METHOD: HSA
SAMPLING METHOD: CAL MOD
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020
GRAVEL PACK: 12 X 20 SAND

CLIENT: G.R. ARCO
DATE DRILLED: 12-16-87
LOCATION: MacArthur & West
HOLE DIAMETER: 8"
HOLE DEPTH: 30 1/2'
WELL DEPTH: 30'
WELL DIAMETER: 3"

WELL COMPLETION	MOISTURE CONTENT	TIP	PENETRATION RESISTANCE (BLOWS/FT)	DEPTH (FEET)	SAMPLE	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
				2			CL	ASPHALT.
				4				CLAY; tan; silty; 10-15% fine sand; trace organics; roots; rootholes; rootholes dry.
				6				@3 1/2'; no product odor.
				8				
				10				@9'; as above; trace sand; no organics; rootholes mottled gray; rootholes wet; stiff; no product odor.
				12				
				14			SW	SAND; medium brown; 10-15% low plasticity fines; fine to coarse grained; trace fine gravel; angular to sub rounded; well graded; medium dense.
				16				@14'; no product odor.
				18				
				20				@19'; as above; thin interbedds of medium grained sand; medium dense; no product odor.
				22				
				24				
				26			CL	CLAY; tan; iron oxide stains; trace fine sand; silty; very stiff; no product odor.
				28				
				30			SW	SAND; as above; some 2" clay interbedds; medium dense.
				32				@29'; no product odor.
				34				
				36				
				38				
				40				
				42				
				44				

BOTTOM OF BORING AT 30 1/2'