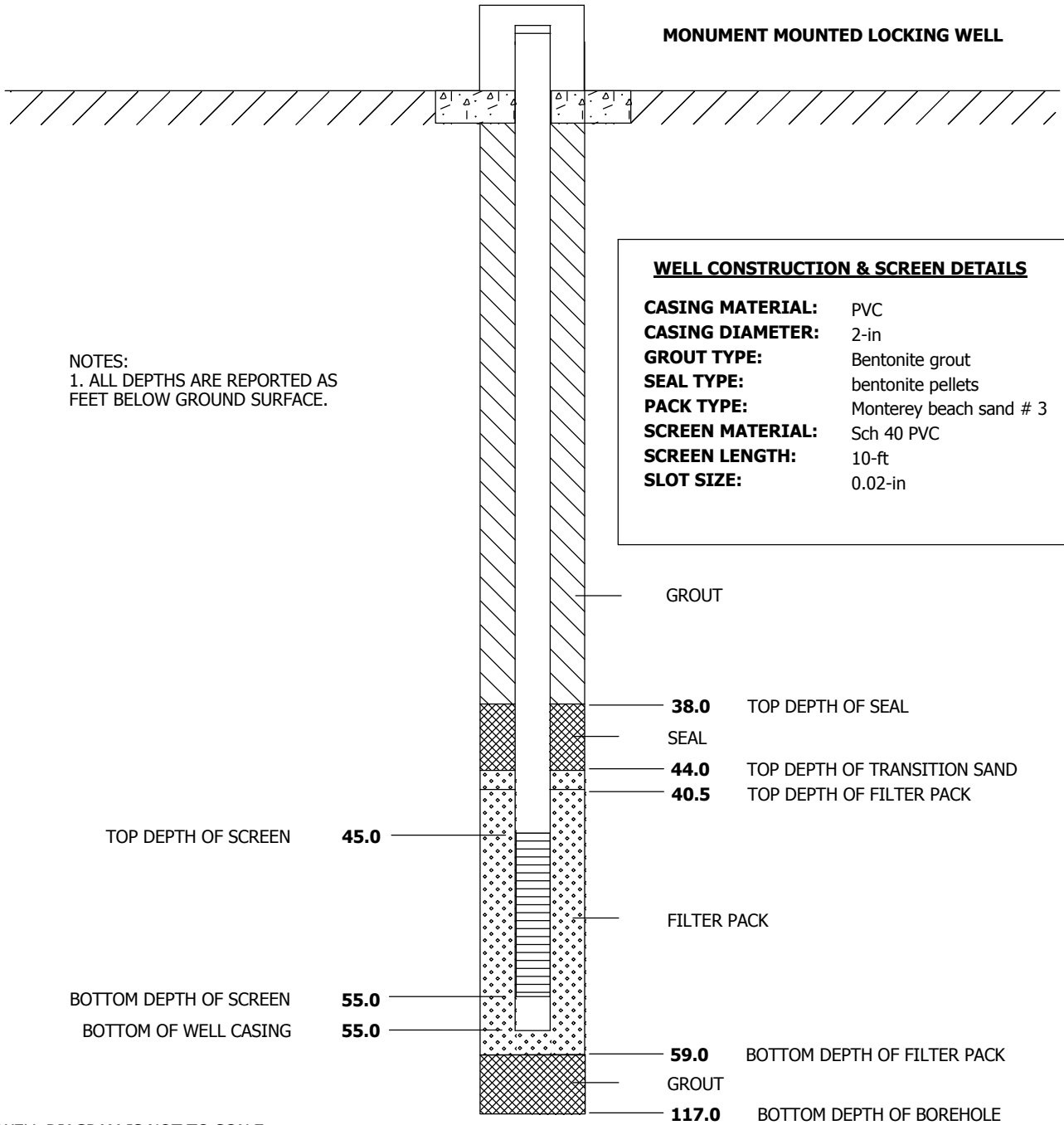
WELL COMPLETION DIAGRAM

PROJECT NO: 326128.01.16.EN	**PROJECT:** IMPM Drill Program	**WELL NO:** ***MW-47-055***

LOCATION: PG&E Compressor Station - Flood Plain, Topock, California

DRILLING CONTRACTOR: Prosonic (Chato = Driller)	**DRILLING START DATE:** 3/13/2006
DRILLING METHOD: Rotosonic	**DRILLING END DATE:** 3/15/2006
LOGGER: Loren Kelly	**WELL COMPLETION DATE:** 3/15/2006
TOP OF WELL CASING (NGVD 29): 483.87	**NORTHING COORDINATE (CCS DAND 27, ZONE 5):** 2103450.05
GROUND SURFACE ELEVATION (NGVD 29): 482.59	**EASTING COORDINATE (CCS NAD 27 ZONE 5):** 7615629.49



WELL CONSTRUCTION & SCREEN DETAILS

CASING MATERIAL:	PVC
CASING DIAMETER:	2-in
GROUT TYPE:	Bentonite grout
SEAL TYPE:	bentonite pellets
PACK TYPE:	Monterey beach sand # 3
SCREEN MATERIAL:	Sch 40 PVC
SCREEN LENGTH:	10-ft
SLOT SIZE:	0.02-in

NOTES:
1. ALL DEPTHS ARE REPORTED AS FEET BELOW GROUND SURFACE.

WELL DIAGRAM IS NOT TO SCALE

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SHEET 1 of 9	**PROJECT NUMBER:** 326128.01.16.EN	**BORING NUMBER:** *MW-47*

SOIL BORING LOG

PROJECT NAME: IMPM Drill Program		**HOLE DEPTH (ft):** 288.0	**DRILLING CONTRACTOR:** Prosonic Corp. Phoenix, AZ	
SURFACE ELEVATION: 482.6 ft. MSL	**NORTHING (CCS NAD 27 Z 5):** 2,103,450.05	**EASTING (CCS NAD 27 Z 5):** 7,615,629.49	**DATE STARTED:** 2/27/2006	**DATE COMPLETED:** 3/13/2006
DRILLING METHOD: Rotosonic			**DRILLING EQUIPMENT:** Sonic AT (track mounted)	
LOCATION: PG&E Compressor Station - Flood Plain, Topock, California			**LOGGED BY:** B. Moayyad, K. Ebel	

DEPTH BGS (feet)	SAMPLE INTERVAL	SAMPLE TYPE/ NUMBER	SAMPLE RECOVERY (ft)	USCS CODE	SOIL DESCRIPTION SOIL NAME, USCS SYMBOL, COLOR, PERCENT COMPOSITION, GRADING, GRAIN SHAPE, MINERALOGY, DENSITY/CONSISTENCY, STRUCTURE, MOISTURE.	COMMENTS DRILLING OBSERVATIONS AND OPERATIONS, DAILY START AND END TIMES , DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.
5			6	SP	**POORLY GRADED SAND (SP)** - very lt brn (10YR7/3), =2% fines, 98% f to m lithic quartz sand, subang to subrnd, dry - fine roots, iron staining, some iron oxide coating on grains	Hand augured to 5' bgs
10			10	SP	- slightly moist - dry	Rapid drill rate, no chatter
15				SW	**WELL GRADED SAND w/ GRAVEL (SW)** - lt yellowish brn (10YR6/4), 45% gravel up to 7cm, 50% f to m sand, 5% fines, loose, met subang gravel, dry(moist@ 17')	
20				SW	- cobble present in slough - one subrnd chert gravel - Possible Fluvially Reworked Alluvium - lt grey (10YR7/2), subang to rnd met gravel up to 9cm, 2% to 5% fines - dk yellowish brn (10YR4/4), mostly c sand subang to ang, met, some Miocene conglomerate gravel	
25				SW	- 65% sand, 30% gravel up to 4cm, 5% fines	
30			16	SW	**WELL GRADED SAND w/ GRAVEL (SW)** - dk yellowish brn (10YR3/6), 35% gravel up to 4cm, 55% m to c sand, 10% silty fines, met clasts are grain supported some mm siltstone - some oxide staining	
35				SW	**WELL GRADED SAND w/ GRAVEL AND CLAY (SW)** - dk yellowish brn (10YR3/6), 30% subang met gravel up to 7 cm, 55% subrnd to subang m to c sand, 15% clayey fines, m density, moist	Drill rate slowed to clean out 8" pipe

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			2.5	SW	**WELL GRADED SAND w/ GRAVEL (SW)** - dr yellowish brn (10YR3/6), 30% gravel, 60% sand, 10% silty fines	Drilling smooth but preceeds less rapidly
40			10	SW	**WELL GRADED SAND w/ GRAVEL (SW)** - 40% subang met gravel up to 6cm, 55% subrnd to ang sand, 5% fines - more gravel below 38' - gravel is mostly fine	
45						
50			10	SW	**WELL GRADED SAND w/ GRAVEL (SW)** - Pale brn (10YR6/3), 30% subang met gravel up to 5cm, 60% subrnd to subang m to c met sand, 10% silty fines, wet	Soil sample collected
				SP	**POORLY GRADED SAND w/ GRAVEL (SP)** - pale brn (10TR6/3), 30% f subang gravel up to 2 cm, 65% mostly c sand, =2% fines	
55				SW	**WELL GRADED SAND w/ GRAVEL (SW)** - yellowish brn (10YR5/4), 40% subang met gravel up to 9cm, 55% f to c met sand, 5% silty fines, clast supported, m density, wet	
60			9.5	GW	**WELL GRADED GRAVEL w/ SILT AND SAND (GW)** - brn (7.5YR5/4), 55% subang to ang met gravel up to 4cm, 25% f to c sand, 20% silty fines, dense, moist to dry - soil dries out - lt grey (10YR7/2) and powder dry - moist sandy zone, 55% gravel, 35% sand, 10% fines - dry silty lt grey GW below 65'	Collected Isoflow sample Drill rate slows to 2' / min
65						
70				SW	**WELL GRADED SAND w/ GRAVEL (SW)** - yellowish brn (10YR5/4), 35% subang met gravel up to 4cm, 60% subrnd sand, 5% silty fines, loose, moist to wet	Moderate Drill Rate

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326128.01.16.EN	*MW-47*

SOIL BORING LOG

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LOCATION: PG&E Compressor Station - Flood Plain, Topock, California			**LOGGED BY:** B. Moayyad, K. Ebel	

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			9.5	SW	**WELL GRADED SAND w/ SILT AND GRAVEL (SW)** - yellowish brn (10YR5/4), 30% gravel, 50% sand, 20% silty fines, massive, dense, moist	
				GW	**WELL GRADED GRAVEL w/ SILT AND SAND (GW)** - lt gray, 65% ang met gravel, 25% subang sand, 10% fines, dry	Collected soil sample
75						
				SM	**SILTY SAND W/ GRAVEL (SM)** - brn (10YR5/3), 22% subang met gravel up to 3.5cm, 50% subrnd to subang f to c sand, 23% silty fines, m density, wet	Collected Isoflow sample Moderate Drill Rate
80						
				SW	**WELL GRADED SAND w/ SILT AND GRAVEL (SW)** - brn, 30% subang fine gravel, 65% subang to subrnd m to c sand, 10% silty fines, m dense, wet - silty zone, 15% fines	Driller reports harder drilling, likely stiff clay
85						
			19			
90					- massive silty zone	
				GW	**WELL GRADED GRAVEL w/ SILT AND SAND (GW)** - brn, 55% subrnd to subang met gravel up to 4.5cm, 35% f to c sand, 10% silty fines, lose to medium, wet	
				SW	**SILTY SAND w/ GRAVEL (SM)** - 20% subang to subrnd met gravel, 60% subang f to c sand, 20% silty fines, massive, blocky, wet	Green alteration mineral in milky quartz fragment
95						
						Drill Rate = 1.5' / min
100						
				SW	**WELL GRADED SAND w/ GRAVEL (SW)** - grayish brn (10YR5/2), 15% subang to subrnd met gravel up to 2.5cm, 80% subrnd m to c sand, 5% silty fines, loose, wet	Soil sample collected
			12.5		- becomes brn and gravelly, 30% gravel up to 3.5cm, 63% m to c sand, 7% fines	
105						

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					WELL GRADED SAND w/ GRAVEL (SW) - grayish brn (10YR5/2), 15% subang to subrnd met gravel up to 2.5cm, 80% subrnd m to c sand, 5% silty fines, loose, wet	Core barrel fills at 108' bgs
					- silty with calcite nodules	
110				GW	**WELL GRADED GRAVEL w/ SILT AND SAND (GW)** - brn, 60% gravel up to 4cm, 30% sand, 10% fines, dry	
			7	SW	**WELL GRADED SAND w/ SILT AND GRAVEL (SW)** - brn (7.5YR4/3), 25% subang met gravel up to 3.5cm, 65% subrnd f to c sand, 5% fines, loose, wet	Significant rig chatter
115					- greenish grey sand lenses	Driller reports intermittent hard layers
					- 4" gravel zone	
120			10	SM	**SILTY SAND w/ GRAVEL (SM)** - dusky red (2.5YR4/4), 15% subang met gravel up to 2.5cm, 60% subrnd to subang f to c sand, 20% fines, massive, blocky, clast supported, moist to wet	
125				GW	**WELL GRADED GRAVEL w/ SILT AND SAND (GW)** - light brownish gray (10YR6/2), 65% ang met gravel up to 4cm, 25% f to c sand, 5% silty fines, dry	Significant rig chatter
				SW	**WELL GRADED SAND w/ SILT AND GRAVEL (SW)** - dusky red, 15% gravel, 75% sand, 10% fines	
130			9	SM	**SILTY SAND w/ GRAVEL (SM)** - dusky red (2.5YR4/6), 15% subang to subrnd met gravel up to 3cm, 60% sand, 25% fines, massive, dense, clast supported, wet	
135					- more loose and less silty	
				SW	**WELL GRADED SAND w/ SILT (SW)** - dusky red (2.5YR4/6), 5% gravel, 90% subrnd f to c sand, 5% fines, loose, wet	
140					**POORLY GRADED SAND w/ SILT (SP)** - brn (7.5YR4/4), 5% subrnd to subang met gravel up to 4cm, 85% f to c sand, 10% fines, poorly graded, wet, no odor	

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			6	SP	**POORLY GRADED SAND w/ SILT (SP)** - brn (7.5YR4/4), 5% subrnd to subang met gravel up to 4cm, 85% f to c sand, 10% fines, poorly graded, wet, no odor	
145			3	SM	**SILTY SAND W/ GRAVEL (SM)** - brn (7.5YR4/4), 20% subang to subrnd gravel up to 6cm, 60% f to c sand, 20% silty fines, well graded, m consolidated, met, wet, no odor	
150			5	SM	**SILTY SAND w/ GRAVEL (SM)** - dk yellowish brn (10YR4/4), 25% subang to subrnd up to 4cm met gravel, 60% well graded f to c sand, 15% fines, wet, no odor	
155			4	SW	**WELL GRADED SAND w/ SILT AND SAND (SW)** - dr yellowish brn (10YR4/4), 10% subang to subrnd up to 3cm met gravel, 75%well graded f to c sand, 15% fines, moist to wet	
			2	SW	**SILTY SAND (SM)** - brn (7.5YR4/4), 5% ang to subrnd met gravel up to 1.5cm increasing with depth, 85% poorly graded m to c sand, 10% fines, loose, wet	
			2	SM	**SILTY SAND w/ GRAVEL (SM)** - dk yellowish brn (10YR4/4), 15% subang to subrnd up to 2.5cm met gravel, 75% well graded f to c sand, 10% fines, mostly met, trace chert, loose, wet, no odor	Collected Isoflow sample
160			4	SM	**SILTY SAND W/ GRAVEL (SM)** - brn (7.5YR4/4), 25% subang to subrnd gravel up to 6.5cm, 60% m to c sand, 15% silty fines, well graded, m consolidated, met, wet, no odor	Drill rate = 0.75' to 1.5' / min
165			4	SW	**SILTY SAND (SW)** - mottled dk reddish brn (5YR3/4), 10% subang to subrnd gravel up to 2.5cm, 50% well graded f to m sand, 40% silt, metamorphic, dry to damp, no odor, interbedded sandy silt laminations	
170			5.5	SW	**SAND w/ GRAVEL (SW)** - dk reddish brn (5YR3/4), 20% subang to subrnd gravel up to 5cm, 75% f to c sand, 5% fines, well graded, loose, met, wet	
175			2.5	SM	**SILTY SAND w/ GRAVEL (SM)** - brn (7.5YR4/4), 15% subang to subrnd gravel, 70% f to m sand, 15% fines, poorly graded, met,increasingly consolidated, slightly to moderately calcareous, moist to wet	

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			2	SM	**SILTY SAND w/ GRAVEL (SM)** - reddish brn (5YR4/4), 20% subang to subrnd gravel, 60% m to c sand, 20% fines, poorly graded, m consoldated, very calcareous, dry to damp, no odor	
			4	SW	**SILTY SAND (SW)** - brn (7.5YR4/3), 10% subrnd to subang gravel up to 4.6cm, 70% f to c sand, 20% fines, well graded, met, moist to wet, no odor	Collected Isoflow sample
180						
			8	SM	**SILTY SAND W/ GRAVEL (SM)** - brn (7.5YR4/4), 20% subrnd to subang gravel up to 2.4cm, 65% f to c sand, 15% clayey fines lenses, well graded, met, very calcareous, dry to damp with locally moist areas, no odor	Drill Rate - 1.6' / min
185						
190			6	SM	**SILTY SAND w/ GRAVEL (SM)** - dr brn (7.5YR3/4), 10% subrnd to subang gravel up to 4cm, 75% f to c sand, 15% fines, well graded, loose to poorly consolidated, met, moist to wet, no odor	
195						
			2	GM	**SILTY GRAVEL w/ SAND (GM)** - reddish brn (5YR4/4), 45% subang to subrnd gravel up to 5.5cm, 40% f to c sand, 15% fines, slight to moderately calcareous, met, dry to damp with locally moist areas	
			10	SM	**SILTY SAND w/ GRAVEL (SM)** - reddish brn (5YR4/4), 15% subang to subrnd gravel up to 5cm, 70% well graded f to c sand, 15% fines, moderately calcareous, loose to poorly consolidated, met, moist to wet - clay locally, slight decrease in gravel	Collected Isoflow sample Drill Rate = 1.5' to 2' / min
200						
205						
210					**SILTY SAND w/ GRAVEL (SM)** - reddish brn (5YR4/4), 20% subang to subrnd gravel up to 6.5cm, 65% well graded f to c sand, 15% mostly clay fines, moderately to very calcareous, poorly graded, moist to wet - mostly met w. chloritic alteration	

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			7	SM	**SILTY SAND w/ GRAVEL (SM)** - reddish brn (5YR4/4), 20% subang to subrnd gravel up to 6.5cm, 65% well graded f to c sand, 15% mostly clay fines, moderately to very calcareous, poorly graded, moist to wet	
215			3	GM	**SILTY GRAVEL w/ SAND (GM)** - reddish brn (5YR4/4), subang to subrnd gravel up to 5cm, f to c sand, mostly clay fines, slight to moderately calcareous, moderate to well consoldated, met, dry to moist - minor chert, choloric alteration in parts	
220			3.5	SW	**SILTY SAND (SW)** - reddish brn (5YR4/4), 5% subang to subrnd gravel up to 2cm, 85% subang to subrnd sand, 15% fines, nom to slightly calcareous, well graded, loose to poorly consolidated, moist to wet - minor cloride alteration, increase in silt and clay locally	Collected Isoflow sample Drill Rate = 1.5' / min
225			2.5	GW	**GRAVEL W/ SAND (GM)** - reddish brn (5YR4/4), 80% subang to subrnd gravel up to 6cm, 15% well graded f to c sand, 5% fines, nom to slightly calcareous, loose to poorly consoldated, met, wet, no odor - locally silty and sandy	
			4	GM	**SILTY GRAVEL W/ SAND (GM)** - reddish brn (5YR4/4), 45% subang to subrnd gravel up to 5cm, 40% well graded f to c sand, 15% fines, poor to mod consolidated, mostly met, wet, no odor - minor chert, clayey locally, increase in fines locally	
230			6	SM	**SILTY SAND w/ GRAVEL (SM)** - reddish brn (5YR4/4), 15% subang to subrnd gravel up to 3cm, 75% f to c sand, 10% fines, loose to mod consolidated, mostly met, wet, no odor - minor sed increase in fines, clay locally	
235			2		- met, increased silt and clay fraction, increased gravel, 25% subang to subrnd gravel up to 6.5cm, 55% sand, 20% fines	
			2	GW	**SILTY GRAVEL w/ SAND (GW)** - reddish brn (5YR4/4), 45% well graded subang to subrnd gravel up to 3cm, 35% well graded sand, 20% silt, mod to very calcareous, mod to well consolidated, mostly met, minor sed, dry to moist, no odor	Collected Isoflow sample Drill Rate = 1' / min
240					**SILTY GRAVEL w/ SAND (GW)** - reddish brn (5YR4/4), 55% well graded subang to subrnd gravel up to 7cm, 30% well graded sand, 15% silt, mod to very calcareous, mostly well consolidated, locally hard, mostly met, minor sed, dry to moist, no odor - locally very altered	
245						

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250			16	GW	**SILTY GRAVEL w/ SAND (GW)** - reddish brn (5YR4/4), 55% well graded subang to subrnd gravel up to 7cm, 30% well graded sand, 15% silt, mod to very calcareous, mostly well consolidated, locally hard, mostly met, minor sed, dry to moist, no odor	Drill rate = 0.75' / min
255						
260			10	GW	**SILTY GRAVEL w/ SAND (GW)** - reddish brn (5YR4/4), 65% well graded subang to subrnd gravel up to 8cm, 20% well graded sand, 15% silt, very calcareous, mostly well consolidated, mod to locally altered, mostly met, minor sed, dry to moist, no odor	Collected Isoflow sample Drill Rate = 1' / min
265				GW	**SILTY GRAVEL w/ SAND (GW)** - reddish brn (5YR4/4), 40% well graded subang to subrnd gravel up to 5.5cm, 35% well graded sand, 25% silt, mod to very calcareous, well consolidated, mod altered locally, mostly met, minor sed, dry to moist, no odor	
			2.5	SW	**SILTY SAND w/ GRAVEL (SW)** - reddish brn (5YR4/4), 35% gravel up to 8cm, 45% well graded f to c sand, 20% fines, very calcareous, well consolidated, locally very altered, mostly met gravel, dry to moist, no odor	Drill Rate = 0.50' / min
270			0	GW	**SILTY GRAVEL w/ SAND (GW)** - reddish brn (5YR4/4), 65% well graded subang to subrnd gravel up to 5.5cm, 25% well graded f to c sand, 10% silt, very calcareous, well consolidated, mod to locally very altered, mostly met gravel, minor sed, damp to moist, no odor	
275			5	GW	**SILTY GRAVEL w/ SAND (GW)** - reddish brn (5YR4/4), 55% well graded subang to subrnd gravel up to 11.5cm, 30% well graded sand, 15% silt, very calcareous, well consolidated, very altered locally, mostly met, minor sed, damp to moist, no odor - gravel/sand fractions somewhat variable	
			2	SM	**SILTY SAND w/ GRAVEL (SM)** - reddish brn (5YR3/4), 30% poorly graded subang to subrnds gravel up to 11.5cm, 40% well graded sand, 30% fines, very calcareous, well consolidated to locally hard, mod to very altered in parts, mostly met, damp to moist, no odor	
280			3	GW	**SILTY GRAVEL w/ SAND (GW)** - reddish brn (5YR3/4), 55% well graded subang to subrnd gravel up to 5.5cm, 30% well graded sand, 15% silt, very calcareous, well consolidated to commonly hard, mod to very altered locally, mostly met, minor sed, dry to moist, no odor	Collected Isoflow sample

CH2MHILL

PROJECT NUMBER: 326128.01.16.EN

BORING NUMBER: *MW-47*

SOIL BORING LOG

PROJECT NAME: IMPM Drill Program		**HOLE DEPTH (ft):** 288.0	**DRILLING CONTRACTOR:** Prosonic Corp. Phoenix, AZ	
SURFACE ELEVATION: 482.6 ft. MSL	**NORTHING (CCS NAD 27 Z 5):** 2,103,450.05	**EASTING (CCS NAD 27 Z 5):** 7,615,629.49	**DATE STARTED:** 2/27/2006	**DATE COMPLETED:** 3/13/2006
DRILLING METHOD: Rotosonic			**DRILLING EQUIPMENT:** Sonic AT (track mounted)	
LOCATION: PG&E Compressor Station - Flood Plain, Topock, California			**LOGGED BY:** B. Moayyad, K. Ebel	

DEPTH BGS (feet)	SAMPLE INTERVAL	SAMPLE TYPE/ NUMBER	SAMPLE RECOVERY (ft)	USCS CODE	SOIL DESCRIPTION SOIL NAME, USCS SYMBOL, COLOR, PERCENT COMPOSITION, GRADING, GRAIN SHAPE, MINERALOGY, DENSITY/CONSISTENCY, STRUCTURE, MOISTURE.	COMMENTS DRILLING OBSERVATIONS AND OPERATIONS, DAILY START AND END TIMES , DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.
285			0	BR	**MIOCENE CONGLOMERATE BEDROCK (BR)** - 60% well graded subang to rnd gravel up to 10cm, 30% well graded sand, 10% fines, very calcareous, well consolidated to mostly hard, mod to very altered locally, mostly met, dry to moist	
					Boring Terminated at 288 ft	

ABBREVIATIONS

cc = continuous core run
brn = brown
lt = light
dk = dark
vf = very fine-grained
f = fine-grained
m = medium-grained
c = coarse-grained
vc = very coarse-grained
ang = angular
subang = subangular
subrnd = subrounded
rnd = rounded
br = bedrock formation
ss = sandstone
conglom = conglomerate
comptd = compacted
qtz = quartz

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