

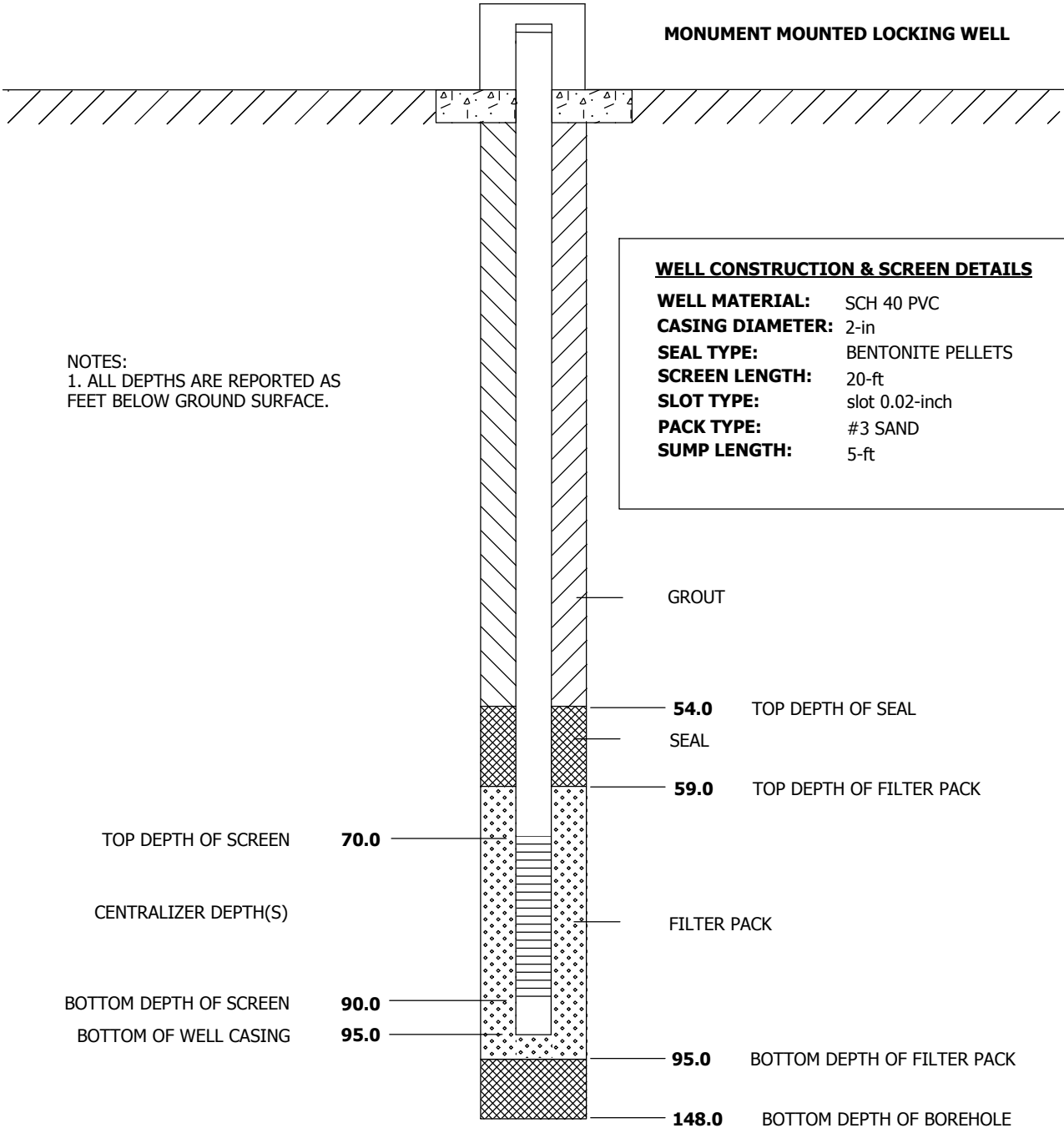
# WELL COMPLETION DIAGRAM

**PROJECT NO:** 315024.IM.02      **PROJECT:** PG&E Topock IM Investigation (Phase 5 2004)      **WELL NO:** MW-28-90

**LOCATION:** Floodplain well field Topock, CA. - Adjacent to Colorado R. approximately 900' north of railroad, 550' east of old Route 66

<b>DRILLING CONTRACTOR:</b> Prosonic Corp. Mareta, OH	<b>DRILLING START DATE:</b> 04/15/2004
<b>DRILLING METHOD:</b> Rotosonic	<b>DRILLING END DATE:</b> 04/16/2004
<b>LOGGER:</b> J. Wellmeyer	<b>WELL COMPLETION DATE:</b> 04/17/2004
<b>TOP OF WELL CASING (NGVD 29):</b> 467.66	<b>NORTHING COORDINATE (CCS DAND 27, ZONE 5):</b> 2103005.68
<b>GROUND SURFACE ELEVATION (NGVD 29):</b> 464.89	<b>EASTING COORDINATE (CCS NAD 27 ZONE 5):</b> 7616289.73

## MONUMENT MOUNTED LOCKING WELL



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

**WELL CONSTRUCTION & SCREEN DETAILS**

**WELL MATERIAL:** SCH 40 PVC  
**CASING DIAMETER:** 2-in  
**SEAL TYPE:** BENTONITE PELLETS  
**SCREEN LENGTH:** 20-ft  
**SLOT TYPE:** slot 0.02-inch  
**PACK TYPE:** #3 SAND  
**SUMP LENGTH:** 5-ft

WELL DIAGRAM IS NOT TO SCALE



**ALISTO ENGINEERING GROUP**  
WALNUT CREEK, CALIFORNIA

# LOG OF WELL MW-28

SEE SITE PLAN

ALISTO PROJECT NO: 10-320-09

DATE DRILLED: 04/13/99

CLIENT: Pacific Gas and Electric Co.

LOCATION: Topock Compressor Station

DRILLING METHOD: Hollow-stem auger; split spoon

DRILLING COMPANY: Gregg Drilling

CASING ELEVATION:

LOGGED BY: Dan Hidalgo

APPROVED BY: Dan Hidalgo

WELL DIAGRAM	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
<p>2' Sch. 40 PVC Casing</p> <p>2' 0.020" Slotted PVC Screen</p> <p>Enviroplug Bentonite Chips</p> <p>#3 Lanester Sand</p>	<p>5</p> <p>10</p> <p>15</p> <p>20</p> <p>25</p> <p>30</p>			<p>SP</p>	<p>SAND: pinkish-gray; very fine- to fine-grained, dune sand; moist.</p> <p>At approximately 12 feet, wet.</p> <p>At 20 feet color change to light brown.</p> <p>Total depth of borehole is 23 feet.</p>

## SOIL BORING LOG

<b>PROJECT NAME:</b> PG&E Topock IM Investigation (Phase 1 2004)		<b>HOLE DEPTH (ft):</b> 148.0	<b>DRILLING CONTRACTOR:</b> Prosonic Corp. Maretta, OH	
<b>SURFACE ELEVATION:</b> 464.9 ft. MSL	<b>NORTHING (CCS NAD 27 Z 5):</b> 2,103,005.68	<b>EASTING (CCS NAD 27 Z 5):</b> 7,616,289.73	<b>DATE AND TIME STARTED:</b> 04/15/2004 10:00:00 AM	<b>DATE AND TIME COMPLETED:</b> 04/16/2004 5:30:00 PM
<b>DRILLING METHOD:</b> Rotasonic		<b>WATER LEVEL (ft):</b> ---	<b>DRILLING EQUIPMENT:</b> All Terrain Sonic Rig with continuous 4" core, 6" casing	
<b>LOCATION:</b> Floodplain area, approx. 400' northeast of MW-20 bench			<b>LOGGED BY:</b> J. Wellmeyer / PHX	

DEPTH BGS (feet)	SAMPLE			SPT RESULTS 6"-6"-6" (N)	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.
	USCS CODE	TYPE/ NUMBER	RECOVERY (ft)			
5	SP	CC1 Box 1 Box 2		11-8-7-8	<p><b>POORLY GRADED SAND (SP)</b> - pale brn 10YR6/3, 50% m sand, 25% f sand, 10% vf sand, 5% c sand, &lt;2% fines, subround to subang, loose, dry.</p> <p>- plastic and organics</p>	<p>04/15/2004, start exploratory pilot hole 10:00 AM. Collect standard penetration tests (SPT) using 24" split-spoon sampler at 10 foot intervals at base of sonic-advance continuous core (CC) runs.</p> <p>lost 2' of sample at bottom of run, auger bit used to recover it heaving sands, used water</p>
10						
15		CC2 Box 2 Box 3 Box 4			<p>- dark grayish brn 10YR4/2, 90% f-m sand with some clay, rounded, qtz dominated, loose, some black fines increasing at depth</p>	
20				7-5-5-5		
25		CC3 Box 5 Box 6			<p>- brn 10YR4/3, fewer black fines</p> <p>- brn 10YR4/3, 95% f-m sand, 5% vf sand, rounded, qtz dominated, loose</p>	
30				6-5-14-20		
35		CC4 Box 7 Box 8 Box 9				

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	USCS CODE	TYPE/NUMBER	RECOVERY (ft)			
40	SP			15 - 60(6")	<b>POORLY GRADED SAND (SP)</b> - pale brn 10YR6/3, 50% m sand, 25% f sand, 10% vf sand, 5% c sand, <2% fines, subround to subang, loose, dry.  - brn 10YR4/3, 50% m sand, 40% c sand, 10% f sand, rounded	stopped drilling 12:30, resumed at 14:00           fluvial
45	SW	CC5 Box 9 Box 10 Box 11		5-15-50(3.5")	<b>WELL GRADED SAND WITH GRAVEL (SW)</b> - lt brn, 80% f-vc sand, 20% gravel up to 1.75", subang, qtz, loose.  - 75% f-vc sand, 25% gravel up to 3", rounded to subang gravel, well rounded sand  - gravel up to 1.5", sand coarser at depth	
50	SP			11-12-15-11	<b>POORLY GRADED SAND (SP)</b> - 90% f-c sand with few rounded cobbles up to 3", no small gravels.	
55	GW	CC6 Box 11 Box 12 Box 13		17-8-9-10	<b>WELL GRADED GRAVEL (GW)</b> - lt brn, 50% gravel, 50% c-f sand, well rounded up to 1", moist, massive, loose.	
60	SW			11-12-15-11	<b>POORLY GRADED SAND WITH GRAVEL (SP)</b> - brn 10YR3/5, 95% f-m sand, well rounded up to 0.75", qtz dominated with some pyroxene, loose.  <b>WELL GRADED SAND (SW)</b> - lt brn 7.5YR4/3, clay pocket, trace gravel, massive, soft.  - 85% vf-c sand, 15% vc sand & gravel up to 4", rounded to subang, loose, light brn	
65	SC	CC7 Box 13 Box 14 Box 15			<b>CLAYEY SAND</b> - brn 10YR4/3, 40% c-sand, 35% f-m sand, 25% clay, organic content.  - large woody debris, green staining	
70	GW				<b>WELL GRADED GRAVEL (GW)</b> - 60% gravel, 30% f-c sand, ang to rounded, tuff & granite, loose.	

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	USCS CODE	TYPE/ NUMBER	RECOVERY (ft)			
75		CC8 Box 16 Box 17		4- 50(6")	<b>POORLY GRADED SAND WITH GRAVEL (SP)</b> - brn 10YR4/3, 80% f-m sand, 20% gravel up to 0.75", mostly subround, massive, loose.  - 70% f sand, 20% m sand, 10% vf sand	fining upwards
80	SP					
85		CC9 Box 18 Box 19		26- 50(3")	<b>WELL GRADED SAND WITH GRAVEL (SW)</b> - brn 10YR4/3, 70% f-vc sand, 30% gravel to 4", mostly subround qtz sand, mostly subang to rounded gneiss and schist gravel, moist.	fining upwards
90	SW					
95		CC10 Box 20 Box 21 Box 22		62- 50(3")	<b>POORLY GRADED SAND (SP)</b> - brn 10YR4/3, 60% m sand, 30% f sand, 10% vf sand, loose, rounded.  <b>POORLY GRADED GRAVEL (GP)</b> - dk yellowish brn 10YR4/4, 80% gravel up to 4", 20% m-c sand, very well rounded, tight packing, clast supported.  <b>WELL GRADED GRAVELLY SAND (GW/SW)</b> - reddish brn 5YR4/3, 50% m-vc sand, 45% rounded to subang gravel 0.25" up to 3", 5% silt.	hard drilling
100	GP					
105		CC11 Box 22 Box 23 Box 24 Box 25			- 60% f-vc sand, 40% granitic gravel, less silt	



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	USCS CODE	TYPE/NUMBER	RECOVERY (ft)			
110	SW/SC			45- 60(5")	<b>WELL GRADED SAND WITH CLAY (SW/SC)</b> - reddish brn 5YR4/4, 55% f-vc sand, 30% clay, 15% gravel up to 0.25" (few up to 2"), rounded, compacted/cemented, dry interior.	core is hot
115	SW	CC12 Box 25 Box 26 Box 27			<b>WELL GRADED GRAVELLY SAND (SW)</b> - reddish brn 5YR4/4, 60% f-vc sand, 40% ang gravel up to 1.5".	hard drilling
120				43- 50(3")	<b>WELL GRADED SAND WITH GRAVEL AND SILT (SW/SM)</b> - reddish brn 5YR4/4, 35% subrnd gravel up to 1/2", 45% vf-c sand, 10% silt, clast supported.  - reddish brn 5YR4/3 to 3/3	
125		CC13 Box 18 Box 19 Box 30				
130	SW/SM			34 - 50(5")	- brn 10YR4/3 to 10YR3/3, gravels up to 1.25, loose, wet	
135		CC14 Box 30 Box 31 Box 32			- subang to ang gravels up to 3"	
140	GW			70	<b>SANDY GRAVEL (GW)</b> - reddish brn, 55% subang gravel, 40% f-vc sand, 5% fines, loose, wet.	pause to decon pipe, resume @ 16:30

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	USCS CODE	TYPE/ NUMBER	RECOVERY (ft)			
145	GW				<b>SANDY GRAVEL (GW)</b> - sandy gravel with fines up to 20%, wet.  <b>CONSOLIDATED CONGLOMERATE (BR)</b> reddish brn, stiff, consolidated conglomerate, 40% gravel, 40% sand, 20% clay / silt	141' - top of weathered Miocene conglomerate (Tmc unit) hard drilling less transmissive
	BR	CC15 Box 33 Box 34 Box 35		100		
					Boring Terminated at 148 ft	Stop drilling @ 17:30
					<b>ABBREVIATIONS</b> 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	