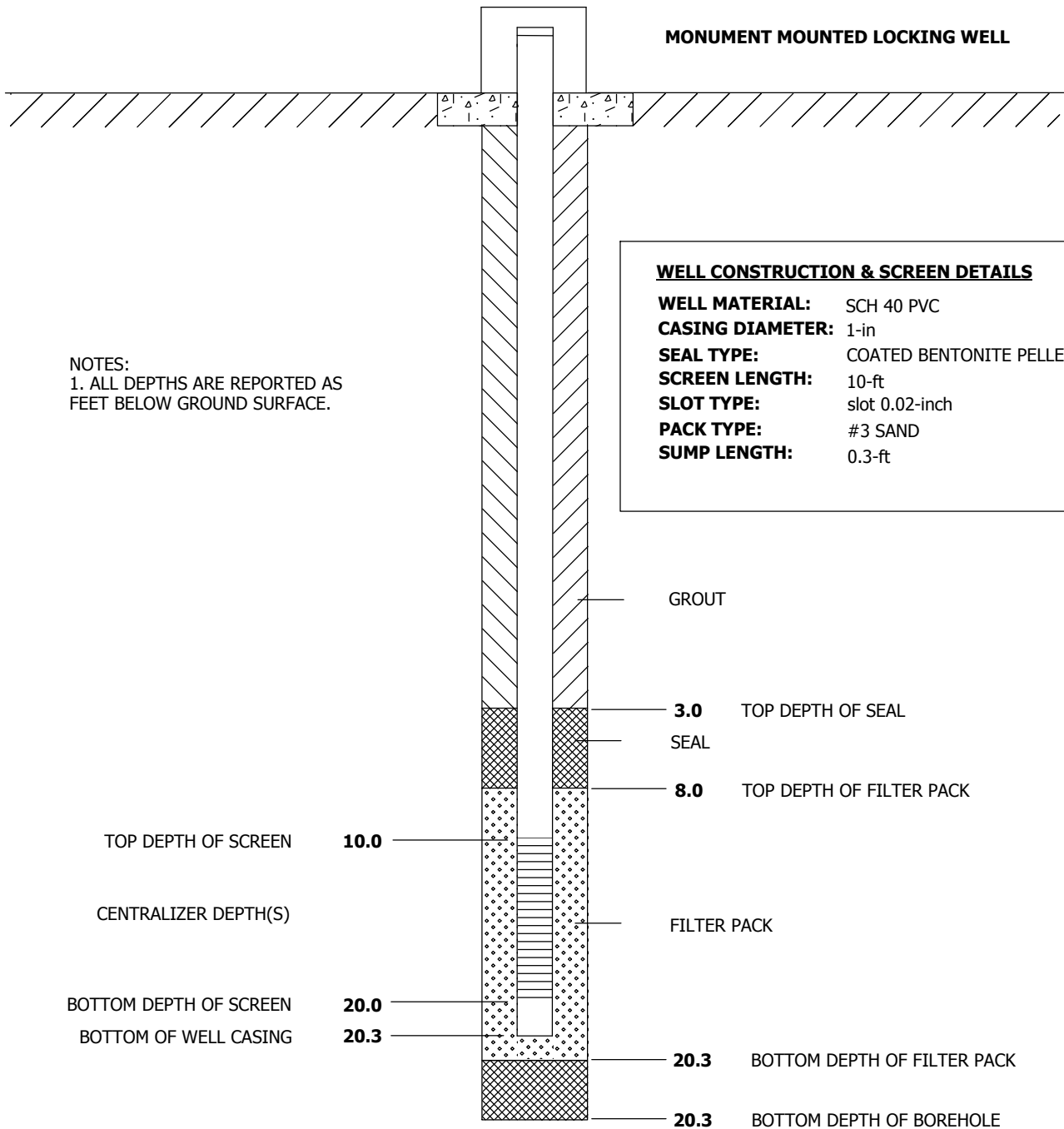


# WELL COMPLETION DIAGRAM

<b>PROJECT NO:</b> 315024.IM.02	<b>PROJECT:</b> PG&E Topock IM Investigation (Phase 5 2004)	<b>WELL NO:</b> MW-36-020
<b>LOCATION:</b> Floodplain well field Topock, CA. - Central dune area, approximately 350' north of railroad, 400' east of extraction well bench.		
<b>DRILLING CONTRACTOR:</b> Prosonic Corp. Mareta, OH		<b>DRILLING START DATE:</b> 05/03/2004
<b>DRILLING METHOD:</b> Rotosonic		<b>DRILLING END DATE:</b> 05/03/2004
<b>LOGGER:</b> J. Wellmeyer		<b>WELL COMPLETION DATE:</b> 05/03/2004
<b>TOP OF WELL CASING (NGVD 29):</b> 469.32		<b>NORTHING COORDINATE (CCS DAND 27, ZONE 5):</b> 2102542.57
<b>GROUND SURFACE ELEVATION (NGVD 29):</b> 466.50		<b>EASTING COORDINATE (CCS NAD 27 ZONE 5):</b> 7616267.10



**WELL CONSTRUCTION & SCREEN DETAILS**

<b>WELL MATERIAL:</b>	SCH 40 PVC
<b>CASING DIAMETER:</b>	1-in
<b>SEAL TYPE:</b>	COATED BENTONITE PELLETS
<b>SCREEN LENGTH:</b>	10-ft
<b>SLOT TYPE:</b>	slot 0.02-inch
<b>PACK TYPE:</b>	#3 SAND
<b>SUMP LENGTH:</b>	0.3-ft

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

WELL DIAGRAM IS NOT TO SCALE

**SOIL BORING LOG**

<b>PROJECT NAME:</b> PG&E Topock IM Investigation (Phase 1 2004)		<b>HOLE DEPTH (ft):</b> 108.0	<b>DRILLING CONTRACTOR:</b> Prosonic Corp. Mareta, OH	
<b>SURFACE ELEVATION:</b> 466.8 ft. MSL	<b>NORTHING (CCS NAD 27 Z 5):</b> 2,102,532.37	<b>EASTING (CCS NAD 27 Z 5):</b> 7,616,267.51	<b>DATE AND TIME STARTED:</b> 04/30/2004	<b>DATE AND TIME COMPLETED:</b> 05/01/2004
<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' east of MW-20 bench			<b>LOGGED BY:</b> J. Wellmeyer / PHX	

DEPTH BGS (feet)	SAMPLE			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.
	INTERVAL	TYPE/NUMBER	RECOVERY (ft)			
5		CC1 Box 1	5	SP	<b>POORLY GRADED SAND (SP)</b> - lt yellowish brn, 10YR6/4 f-m sand, well rnd, qtz dredge, loose, dry.  - slightly damp  - saturated  - 10&R4/1 dk gray, f-m well rnd qtz sand, firm, moist, abundant fine-grained organic streaks and particulates	Start exploratory pilot hole 9:17 AM. Collect standard penetration tests (SPT) using 24 split-spoon sampler at 10 foot intervals at base of sonic-advance continuous core (CC) runs.  9:20, heaving sands
10						water added
15		CC2 Box 2 Box 3 Box 4	10			
20						
25		CC3 Box 5 Box 6 Box 7	10			heaving sands, SPT washed
30					- gradational color change to dark grayish brn 10YR4/2	
35		CC4 Box 8 Box 9 Box 10	10		- brn 10YR4/3	

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<b>SURFACE ELEVATION:</b> 466.8 ft. MSL	<b>NORTHING (CCS NAD 27 Z 5):</b> 2,102,532.37	<b>EASTING (CCS NAD 27 Z 5):</b> 7,616,267.51		<b>DATE AND TIME STARTED:</b> 04/30/2004	<b>DATE AND TIME COMPLETED:</b> 05/01/2004
<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' east of MW-20 bench				<b>LOGGED BY:</b> J. Wellmeyer / PHX	

DEPTH BGS (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE/NUMBER	RECOVERY (ft)			
40				SP	<b>POORLY GRADED SAND (SP)</b> - lt yellowish brn 10YR6/4, f-m sand, well rnd, qtz dredge, loose, dry.	<b>DRILLING OBSERVATIONS AND OPERATIONS, DAILY START AND END TIMES, DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.</b>
45		CC5 Box 11 Box 12	10	SW	<b>WELL GRADED SAND WITH GRAVEL (SW)</b> - brn 10YR4/3, 95% f-vc sand, 5% gravel <0.5, trace fines, loose.  - 50% c-vc sand, 30% f-m sand, 20% gravel up to 3, well rnd  - small pocket of red brn clay	
50				SW	- small pockets of light yellowish brn clay	
55		CC6 Box 13 Box 14 Box 15	10	SW	- sand content fining	
60				SW	- small pockets of light yellowish brn clay	
65		CC7 Box 15 Box 16 Box 17 Box 18	10	SW	<b>WELL GRADED SAND (SW)</b> - dk yellowish brn 10YR4/4, 70% m-c sand, 15% f sand, 10% vc sand, 5% clay, very well rnd qtz sand.  - red brn clay sheet - iron staining	
				SW	<b>WELL GRADED SAND WITH GRAVEL (SW)</b> - 10YR4/4, 65% m-c sand, 15% gravel, 10% f sand, 10% vc sand, trace clay, well rnd, loose.	
				SP	<b>POORLY GRADED SAND (SP)</b> - 10YR4/4, 70% m-sand, 20% c sand, 10% f sand, trace fines, loose.	
				SW	<b>WELL GRADED SAND WITH GRAVEL (SW)</b> - brn 10YR4/3, 95% f-vc sand, 5% gravel < 1/2, trace fines, loose.	
70						

**SOIL BORING LOG**

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<b>SURFACE ELEVATION:</b> 466.8 ft. MSL	<b>NORTHING (CCS NAD 27 Z 5):</b> 2,102,532.37	<b>EASTING (CCS NAD 27 Z 5):</b> 7,616,267.51	<b>DATE AND TIME STARTED:</b> 04/30/2004	<b>DATE AND TIME COMPLETED:</b> 05/01/2004
<b>DRILLING METHOD:</b> Rotosonic		<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' east of MW-20 bench			<b>LOGGED BY:</b> J. Wellmeyer / PHX	

DEPTH BGS (feet)	SAMPLE			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.
	INTERVAL	TYPE/NUMBER	RECOVERY (ft)			
75		CC8 Box 18 Box 19 Box 20	10	SM	<b>SILTY SAND (SM)</b> - 7.5YR4/4, 60% f sand, 30% silt, 10% clay, some CaCO3 concretions, loose.	drill chatter at 76' - 2 layer pure red clay
				CH	<b>FAT CLAY (CH)</b> - brn 7.5YR4/4, some organics, CaCO3?, concretions.	
				SM	<b>SILTY SAND (SM)</b> - 40% f sand, 20% m sand, 30% silt, 10% clay.	
				GC	<b>CLAYEY GRAVEL (GC)</b> - 7.5YR4/4, 35% clay, 30% gravel up to 3, 20% m-c sand, 10% f sand, 5% silt, matrix supported, heavily weathered.	
80					<b>WELL GRADED GRAVEL (GW)</b> - 95% gravel up to 3 including pea gravel, 5% sands, trace fines, very well rnd, clast supported, fining upward, loose.	only 1/2 of core recovered
85		CC9 Box 21 Box 22	5	GW	- fluvial gravel zone	
90					<b>POORLY GRADED SAND (SP)</b> - brn 10YR4/4, 65% m sand, 15% f sand, 10% c-vc sand, 5% fines, trace gravel, loose.	hard drilling, lots of chatter on core pipe
95		CC10 Box 22 Box 23 Box 24	10	GW	<b>WELL GRADED GRAVEL (GW)</b> - brn 10YR4/3, 70% gravel up to 2, 15% m-c sand, well rnd, clast supported, fining upward.  - 70% gravel up to 4, 20% sand, 10% silt	
100					- dusky red 10YR3/4, ang lithic, consolidated <b>CONSOLIDATED CONGLOMERATE (BR)</b> 10R3/4 dusky red, ang lithics, consolidated.	top weathered Miocene conglomerate (Tmc unit)
105		CC11 Box 25 Box 26 Box 27	10	BR		drill chatter, samples very hot  very hard drilling

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<b>LOCATION:</b> Floodplain area, approx. 400' east of MW-20 bench			<b>LOGGED BY:</b> J. Wellmeyer / PHX	

DEPTH BGS (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE/ NUMBER	RECOVERY (ft)			
	X			BR	<p><b>CONSOLIDATED CONGLOMERATE (BR)</b> 10R3/4 dusky red, ang lithics, consolidated.</p> <p>- hard cemented red conglomerate</p>	<p>high vibrations on drill</p> <p>core barrel refusal</p> <p>stop at 8:35 AM</p>
					<p style="text-align: center;">Boring Terminated at 108 ft</p> <p><b>ABBREVIATIONS</b></p> <p>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</p>	