

WELL COMPLETION DIAGRAM

PROJECT NO: 315024.IM.02

PROJECT: PG&E Topock IM Investigation (Phase 5 2004)

WELL NO: MW-40D

LOCATION: I-40 median Topock, CA. - 1.5 miles east of Park Moabi exit, west of Bat Cave Wash crossing.

DRILLING CONTRACTOR: WDC Exploration and Wells, Montclair, CA

DRILLING START DATE: 04/26/2004

DRILLING METHOD: Rotosonic

DRILLING END DATE: 05/01/2004

LOGGER: T. Henderson, S.Cooper, B. Moayyad, R. Crotty

WELL COMPLETION DATE: 05/02/2004

TOP OF WELL CASING (NGVD 29): 566.08

NORTHING COORDINATE (CCS DAND 27, ZONE 5): 2101864.35

GROUND SURFACE ELEVATION (NGVD 29): 566.50

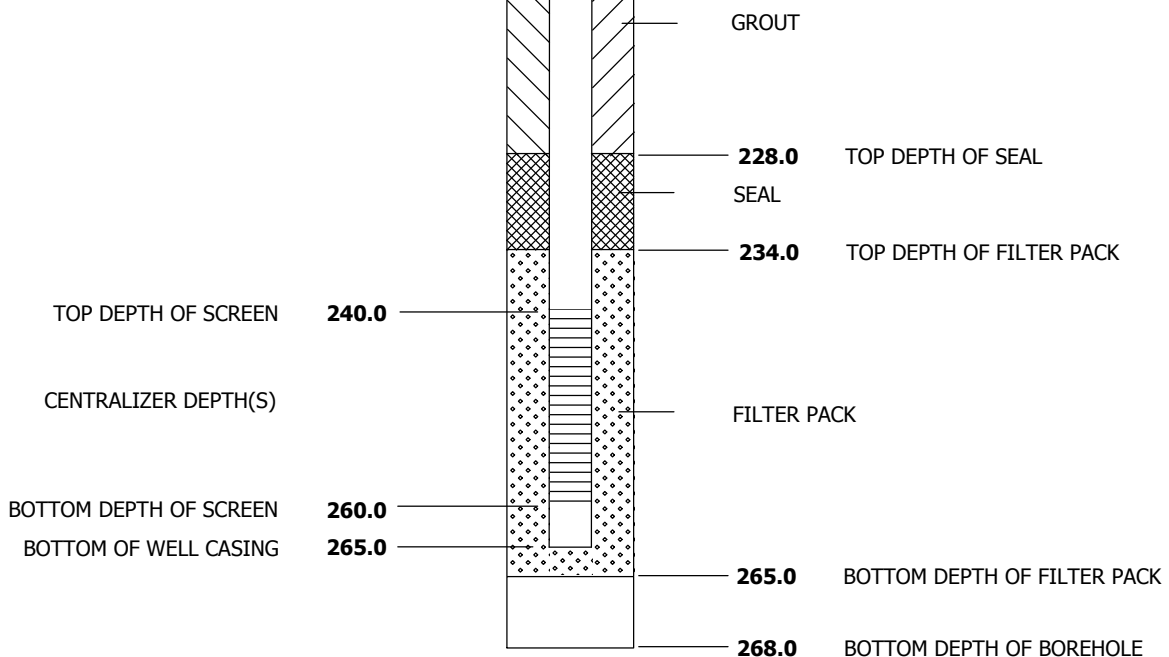
EASTING COORDINATE (CCS NAD 27 ZONE 5): 7614370.53

FLUSH 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

SHEET 1 of 9				PROJECT NUMBER: 315024.IM.02		BORING NUMBER: MW-40	
SOIL BORING LOG							
PROJECT NAME: PG&E Topock IM Investigation (Phase 1 2004)				HOLE DEPTH (ft): 268.0		DRILLING CONTRACTOR: WDC Exploration and Wells, Montclair, CA	
SURFACE ELEVATION: 566.5 ft. MSL		NORTHING (CCS NAD 27 Z 5): 2,101,864.35		EASTING (CCS NAD 27 Z 5): 7,614,370.53		DATE AND TIME STARTED: 04/26/2004 4:30:00 PM	
						DATE AND TIME COMPLETED: 05/01/2004	
DRILLING METHOD: Rotasonic				WATER LEVEL (ft): ---		DRILLING EQUIPMENT: Standard Access Rig with continuous 4 core, 6 casing	
LOCATION: I-40 median Topock, CA. - 1.5 miles east of Park Moabi exit, west of Bat Cave Wash crossing.						LOGGED BY: T. Henderson, S.Cooper	
DEPTH BGS (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION	COMMENTS	
	INTERVAL	TYPE/ NUMBER	RECOVERY (ft)		SOIL NAME, USCS SYMBOL, COLOR, PERCENT COMPOSITION, GRADING, GRAIN SHAPE, MINERALOGY, DENSITY/CONSISTENCY, STRUCTURE, MOISTURE.	DRILLING OBSERVATIONS AND OPERATIONS, DAILY START AND END TIMES , DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.	
5					Lost setting conductor pipe	lost setting conductor pipe	
10					WELL GRADED SAND WITH CLAY AND GRAVEL (SW/SC) - dk grayish brn 2.5YR4/2, 60% well graded subang sand, 30% well graded subang to subrnd gravel up to 3, 10% fines, schist, gneiss, qtz, no plasticity, wet.	water added to push core out	
15		CC102	10				
20					- dark grayish brn 10YR4/2, gravel up to 2, moist		
25		CC103	10	SW/SC	- dry		
30					- dark yellowish brn 10YR4/4, 70% well graded subang sand, 20% well graded subang f gravel up to 0.5, 10% clay fines, slightly consolidated, matrix supported, dry		
35		CC104	10		- light gray 10YR7/1, more gravel, cobbles up to 1.5		

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					WELL GRADED SAND WITH CLAY AND GRAVEL (SW/SC) - dk grayish brn 2.5YR4/2, 60% well graded subang sand, 30% well graded subang to subrnd gravel up to 3, 10% fines, schist, gneiss, qtz, no plasticity, wet.		
40							
45		CC105	10				
50					- light brnish gray 10YR6/2, gravel up to 1, unconsolidated, dry		
55		CC106	10	SW/SC	- slightly more gravel, ang clasts of qtz, amphiboles, green mineralogy, more consolidated		
					- brn 10YR4/3, dry to moist		
60						driller reports drilling's been hard all the way through	
65		CC107	10		- cobbles up to 2		
70					- less gravel, dry		

SOIL BORING LOG


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75		CC108	10	SW/SC	WELL GRADED SAND WITH CLAY AND GRAVEL (SW/SC) - dk grayish brn 2.5YR4/2, 60% well graded subang sand, 30% well graded subang to subrnd gravel up to 3, 10% fines, schist, gneiss, qtz, no plasticity, wet. -30% gravel, ang mineralogy, gneiss, qtz, feldspar, green mm - moist	drillers added water to get core out. began Cr6+ sampling here. MW-40D-100
80		CC109	10		GW/GM	
85	CLAYEY GRAVEL WITH SAND (SC) - dk grayish brn 10YR4/2, 60% well graded ang to subang sand, 20% well graded subang gravel up to 0.5, 20% fines, medium plasticity, matrix supported, wet. - light brnish gray 10YR6/2, 20% f sand, unconsolidated, dry					
90		CC110	10	SC	- grayish brn 2.5YR5/2, 40% well graded subang sand, 40% fines, 20% well graded subround to subang gravel up to 0.5, high plasticity, wet - sandier	
95					CLAYEY GRAVEL WITH SAND (SC) - dk grayish brn 10YR4/2, 60% well graded ang to subang sand, 20% well graded subang gravel up to 0.5, 20% fines, medium plasticity, matrix supported, wet. - light brnish gray 10YR6/2, 20% f sand, unconsolidated, dry	
100		CC111	10		- brn 7.5YR4/3, reddish staining, 60% well graded subang sand, 20% well graded subang gravel up to 1, 20% clay fines, medium plasticity	
105						

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SHEET 4 of 9				PROJECT NUMBER: 315024.IM.02		BORING NUMBER: MW-40	
SOIL BORING LOG							
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110				SC	CLAYEY GRAVEL WITH SAND (SC) - dk grayish brn 10YR4/2, 60% well graded ang to subang sand, 20% well graded subang gravel up to 0.5, 20% fines, matrix supported, medium plasticity, wet.	very wet, drillers lost 2'	
					- more gravel		
					- low plasticity, moist		
115		CC112	*				
					- slightly coarser grained sand		
120							
					- clayey sand with gravel, wet		
125		CC113	8				
					- brn 7.5YR4/3		
130							
				- dark grayish brn 10YR4/2, m-c sand, gneiss, feldspar, green mm, matrix supported, low plasticity, wet			
135							
					- more clay, moist		
					- wet		
140					- dry		

SHEET 5 of 9				PROJECT NUMBER: 315024.IM.02		BORING NUMBER: MW-40	
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145				SC	CLAYEY GRAVEL WITH SAND (SC) - dk grayish brn 10YR4/2, 60% well graded ang to subang sand, 20% well graded subang gravel up to 0.5, 20% fines, matrix supported, medium plasticity, wet.	9:05 Cr6+ and clazone	
150		CC115	20	SM		9:15 Cr6+	
155				SC	CLAYEY GRAVEL WITH SAND (SC) - brn 10YR4/3, 60% well graded subang f-c sand, 20% well graded subang gravel up to 0.5, 20% fines, consolidated, low plasticity, matrix supported, moist.	Cr6+	
160				SP/SM	POORLY GRADED SAND WITH SILT AND GRAVEL (SP/SM) - dk grayish brn 2.5YR4/2, 60% poorly graded m sand, 30% well graded subrnd to subang gravel, 10% fines, no plasticity, matrix supported, moist.		
165		CC116	10		CLAYEY GRAVEL WITH SAND (SC) - dk grayish brn 10YR4/2, 45% well graded subang sand, 30% clay fines, 25% well graded subang gravel up to 1, qtz, feldspar, green mm, gneiss, matrix supported, moist.		
170				SC	- 55% sand		
					- increased gravel up to 1		
175		CC117	*		- poorly graded m sand		


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SHEET 6 of 9				PROJECT NUMBER: 315024.IM.02				BORING NUMBER: MW-40			
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180				SC	CLAYEY GRAVEL WITH SAND (SC) - dk grayish brn 10YR4/2, 45% well graded subang sand, 30% clay fines, 25% well graded subang gravel up to 1, qtz, feldspar, green mm, gneiss, matrix supported, moist. - 70% poorly graded ang to subang m-c sand, 15% well graded subang gravel, 15% fines, no plasticity, wet - 50% well graded subang sand, 40% fines, 10% well graded subang gravel up to 1, medium dry strength, m plasticity, moist, brn 10YR4/3 - red staining, more gravel, more cohesive, harder - coarser sand						
185											
190											
195		CC118	20	ML	SANDY SILT WITH GRAVEL (ML) - brn 10YR4/3, 60% fines, 30% well graded sand and gravel, matrix supported, very high dry strength, low plasticity, moist.						
200				SM	SILTY SAND WITH GRAVEL (SM) - brn 10YR4/3, 50% well graded subang sand, 40% fines, 10% well graded subang gravel up to 0.5, low plasticity, moist. - broken up - gravel up to 2						
205											
210		CC119	7								
					- small brick-red colored lens	only recovered to 205' on this run. However 205-208' was recovered on next run					

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215		CC120	13	SP/SM	POORLY GRADED SAND WITH SILT AND GRAVEL (SP/SM) - dk grayish brn 10YR4/2, 70% poorly graded subang m-c sand, 20% well graded gravel up to 1, 10% fines, qtz, feldspar, mm, unconsolidated, no plasticity, wet.		
220					CLAYEY GRAVEL WITH SAND (SC) - brn 7.5YR4/4, reddish staining, 50% well graded subang sand, 30% well graded subang gravel, 20% fines, matrix supported, high dry strength, medium plasticity, moist.		
225					- dark grayish brn 10YR4/2, 60% well graded subang sand, 30% well graded subang gravel, 20% clay fines.		
230		CC121	20	SC	- more clay		
235					- red stains, drier		
240					- dark grayish brn 10YR4/2		
245					- rnd gravels		


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250		CC122	*	SC	CLAYEY GRAVEL WITH SAND (SC) - brn 7.5YR4/4, reddish staining, 60% well graded subang sand, 30% well graded subang gravel, 10% fines, high dry strength, medium plasticity, matrix supported, moist. - ang gravels	pipe breaks at 268' bgs, becomes very difficult to drill	
				CL	LEAN CLAY (CL) - brn 10YR4/3, 80% clay fines, 10% well graded sand, 10% well graded subang gravel up to 0.5, high plasticity, moist.		
255				SP	POORLY GRADED SAND WITH GRAVEL (SP) - brn 7.5YR4/3, 80% poorly graded subang f-m sand, 15% silt fines, 5% well graded subang gravel up to 2, igneous and mm minerals, m density, no plasticity, wet. igneous and metamorphic minerals		
260				SM	SILTY SAND WITH GRAVEL (SM) - 15% gravel, 15% fines.		
265				SC	CLAYEY GRAVEL WITH SAND (SC) - brn 7.5YR4/3, 25% fines, no plasticity, slightly sticky, wet.		
				GC	CLAYEY GRAVEL (GC) - lt greenish gray (10YR7/1) and brn (7.5YR4/2), 60% ang gravel up to 2, 25% fines, 15% well graded fines, very stiff, moist to dry.		
				BR	SILTY SAND - 20% ang gravel up to 1, 15% fines, moist to dry, reddish brn 2.5YR4/4.		
					Boring Terminated at 268 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		

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					ss = sandstone conglom = conglomerate comptd = compacted qtz = quartz			


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