Watkins-Johnson Environmental, Inc.
LITHOLOGY LOG

Page 1 of ~~2~~ 3 RC 10-29-92

Site ID: 937GW39

Project Name: PS TEK Presidio IRA	Project No.: 0330.230	Coordinates:	
Drilling Company: HEW	Driller: Jasper Booker	Ground Elevation:	Total Drilled Depth: ~~18'~~ 45.5' RC 10-29-92
Drilling Equipment: CME-55	Drilling Method: HSA	Boring Diameter: 6", 12"	Date/Time Drilling Started: 10/29/92 : 0825
			Date/Time Total Depth Reached: 10/29/92 / 0945 ; ~~18'~~ RC 10-29-92
Type of Sampling Device: 5' continuous ; 18" split spoon		Water Level (BGS): First 6.5' Final	
Sample Hammer: Type Automatic Driving Wt. 140 Drop 30"		Hydrogeologist: Riley Conkin	Checked by/Date: EMY 11/03/92

Location Description (include sketch in field logbook)
Located between Wells 937-23 and 937-10 adjacent to perimeter fence. East of Building 999.

Depth (ft)	Interval	% Recovery	Blow Counts	Description (include in order lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy (structure, density, consistency, etc. as applicable)	USCS Symbol	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, tag number, odor, organic vapor measurements, etc.)
0				FILL MATERIAL; sands & gravels, clasts up to 1" in diameter, dry, weathered subangular fragments of serpentinite in silt matrix.							0830
1		100	continuous				DRY	30	30	40	
2											
3			16	SAND, fine grained, medium dense Light yellowish brown 2.5Y6/3, little moist, poorly graded, minor silt; clast of weathered serpentinite appx. 1" in diameter in interval.	SP		LM	-	95	5	0845: collected sample for analysis from 3-4.5' bgs.
4			18 / 17								
5				SAND, as above							
6		100	continuous								
7		100	4 / 3 / 3	SAND, fine grained, dark yellowish brown 10YR4/4, loose, contains minor silt, fe-oxide staining throughout interval, wet; poorly graded.	SP		WET	-	95	5	0910: collected sample for analysis from 6.5'-8' bgs. First water encountered at 6.5'
8											
9				SAND, as above, color change from 8'-10' dark olive grey 5Y3/2	SP		WET	-	95	5	
10				SAND, as above, dark yellowish brown 10YR4/4, minor clast of subangular gravel	SP		WET	2	95	3	RC 10-29-92
11											
12											
13											

0330-001/JUN1992

D-196

Watkins-Johnson Environmental, Inc.
LITHOLOGY LOG (continued)

Page 2 of 3 RC 10-28-92

Site ID 737 GW39

Depth (ft)	Interval	% Recovery	Blow Counts	Description (include in order lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy (structure, density, consistency, etc. as applicable))	USCS Symbol	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, tag number, odor, organic vapor measurements, etc.)
13		100	continuous	SAND, ~~RC 10-28~~ fine to medium grained Sand, dark greenish gray 5GY4/1, wet, poorly graded, ~~medium~~ RC 10-28-92 loose.	SP		WET	-	100	-	0845; Cored to 18', set up to ream 6" augers w/metal plug to bedrock. Reamed with 12" augers to 45.5', encountered hard drilling at 44' bgs - contact w/weathered bedrock. Lead auger had weathered bedrock in it when pulled to surface.
14											
15											
16											
17											
18				~~DRILL 18~~ ~~RC 10-28-92~~ SAND, as above from 18' to 44', logged from drill cuttings on augers.	SP		WET	-	100	-	
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											

0330-001/JUN1992

D-177

Watkins-Johnson Environmental, Inc.
LITHOLOGY LOG (continued)

Site ID: 937GW39

Depth (ft)	Interval	% Recovery	Blow Counts	Description (include in order lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy (structure, density, consistency, etc. as applicable)	USCS Symbol	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, tag number, odor, organic vapor measurements, etc.)
30				SAND, as above	SP		WET	-	100	-	
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
41											
42									SAND		Contact between ~~Colma Formation~~ 10-29-92 and weathered bedrock at 44' bgs.
43											
44				weathered bedrock, logged weathered serpentinite fragments in clay matrix on lead auger, very stiff, dark olive grey 5Y3/2							Driller noted harder drilling at 44', refusal at 45½'.
45											
				OPTOT 45.5'							
46											
47											

0330-001/JUN 1992

Watkins-Johnson Environmental, Inc.
WELL CONSTRUCTION SUMMARY

Well No.	Combo/Key #
937GW39	

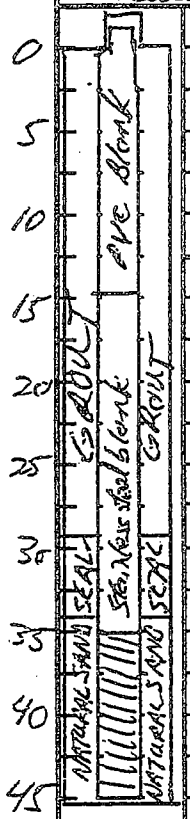
Project Name	Project No.	Coordinates
PS TEPS Presidio IRA	0330.230	

Drilling Company	Driller	Elevation
HEW	JASPER BOOKER	Ground Level / Top of Casing

Drilling Equipment	Drilling Method	Total Drilled Depth	Borehole Diameter	Drilling Fluid
CME-55	HSA	45.5'	12"	—

Drill Bit(s)	Hydrogeologist	Checked by/Date
12" HSA	Riley Conkin	ERY 11/3/92

Location Description (include sketch in field logbook)
Located between Wells 937-23 and 937-10 adjacent to perimeter fence. East of Bldg 949.



ANNULAR CONSTRUCTION

Description	Type	Interval From (ft BGS)	Interval To (ft BGS)	Quantity
Filter Pack	#2/12 LONESTAR SAND	45.0	~~35.0~~ 34.0	0.5 bags
Filter Pack Blotter (if applicable)	—			
Seal	PC 11-30-92 SUPER GEL-X Extra High Yield Drilling Fluid-bentonite slurry	34.0	29.0	2 bags
Grout	AMC Lonestar Portland Cement Type I-II High Grade Wyoming Bentonite Powder (5%)	29.0	0.0	28 bags

CONSTRUCTION TIME LOG

Activity	Start Date	Start Time	Finish Date	Finish Time
Drilling	10/29/92	0825	10/29/92	0945
Reaming	↓	1100	↓	1345
Geophysical Logging				
Casing/Screen Placement	10/30/92	0900	10/30/92	0910
Filter Pack	10/30/92	0910	10/30/92	0940
Seal	10/30/92	0940	10/30/92	0950
Grout	10/30/92	0950	10/30/92	1245
Preliminary Surge/ Development				
Other:				

WELL STRING DESIGN

Surface Casing [length, diameter (OD), thickness]:
3' x 8" x 1/4" steel stove pipe.

Casing [type, diameter (ID), thread type]:
Stainless Steel, 4", Flush Threaded; C3&C4-PVC, 4", FST sch40

Screen [type, slot-size, diameter (ID), thread type]:
Stainless Steel, 0.010", 4", Flush Threaded

Casing/Screen Sequence & Interval (starting at bottom):

	BLANK CASING From (ft BGS)	BLANK CASING To (ft BGS)		SCREEN From (ft BGS)	SCREEN To (ft BGS)
C1	35	25	S1	45	35
C2	25	15	S2		
C3	15	5	S3		
C4	5		S4		
C5			S5		
C6					
C7					
C8					
C9					
C10					
C11					

WATER ADDED DURING DRILLING/CONSTRUCTION

Total Amount (gals): 50

COMMENTS:
- Pumped down a bentonite powder slurry from approximately 34' to 29'.
- Due to flowing sands majority of filter pack is natural sand from 45' to ~~35'~~ 34' approximately. PC 10-30-92

0330-002/JUN1992

Watkins-Johnson Environmental, Inc.
WELL DEVELOPMENT DATA

SITE ID: 937GW39

PROJECT:

PROJECT NO.:

HYDROGEOLOGIST: Jay Hetzel

DRILLER:

DATE(S) INSTALLED:

DATE(S) DEVELOPED: 11-3-92

Casing Diameter	4 in.
Borehole Diameter	12 in.
Total Well Depth	46.35 ft.
Static Water Level	9.46 ft.
Saturated Thickness	36.89 ft.
Casing volume	24.4 gal.
Annulus Volume (Assume 30% porosity)	12.5 gal.
Total Well Volume	36.9 gal.

DEVELOPMENT EQUIPMENT: 9 foot Stainless Steel bailer Steel Cable, winch Truck.

DEVELOPMENT METHODS/NOTES: Very much Sand in well initially, but cleared up. No odors or Sheen. Removed 185 gallons Total.

TURBIDITY METER: HF Scientific, Serial No. 000302

pH/TEMP METER: Type: Orion SA 230, Serial Number: 4938

Calibration: pH 7.00 = 7.00 at 17.8 °C, Time 8:50; pH 10.00 = 10.00 at 17.6 °C, Time 8:51

CONDUCTIVITY METER: Type: Orion 122, Serial Number: 9811077

Conductance Standard: 1,000 µS/cm at 25°C

Measured Value: 1021 µS/cm at 18.6°C, Time 8:49

Calibrated Conductivity = Measured Conductance + (0.02) (measured conductance) (25°C - Actual Temp): N/A /cm at 25°C, Time

Time	Number of Well Casings	Gallons Removed	°C	E.C. µS/cm	Turbidity NTU	~~Pump Rate GPM~~ pH	Approx. Pump Depth ft.	Visual Description
9:15	initial	—	17.3	>2,000	>200	7.87	N/A	murky DK Gray w/much Sand.
9:20	1	37	16.8	>2,000	>200	7.91	N/A	murky DK. Gray
9:28	2	74	17.0	>2,000	>200	7.79	N/A	"
9:37	3	111	16.6	>2,000	>200	7.82	N/A	Turbid med. Gray Clearing up some
9:46	4	148	16.8	>2,000	>200	7.48	N/A	Turbid LT. Gray
9:55	5	185	16.8	>2,000	>200	7.43	N/A	"
		Development Complete						