LOG OF EXPLORATORY BORING

PROJECT NAME	Field Investigation Report	BORING NO.	MW-20
LOCATION	Vashon Island Landfill	PAGE	8 OF 8
DRILLED BY	Tacoma Pump & Drilling	GROUND ELEV.	365.20'
DRILL METHOD	Hollow-stem Auger	TOTAL DEPTH	121.30'
LOGGED BY	A. Udaloy	DATE COMPLETED	10/21/98

SAMPLE TYPE	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
				145				
				150				
				155				
				160				

WELL COMPLETION DETAILS:

+2.0 to 127.7 feet: nominal 2-inch I.D., flush-threaded, Schedule 40 PVC blank riser pipe.

127.7 to 132.0 feet: nominal 2-inch I.D., flush-threaded, Schedule 40 PVC well screen with 0.020-inch machined slots.

132.0 to 132.9 feet: nominal 2-inch I.D., flush-threaded PVC with slip cap, cap is attached using one stainless steel screw.

34.5 to 35.5 feet: stainless steel centralizer.

126.5 to 127.5 feet: stainless steel centralizer.

132.0 to 132.9 feet: stainless steel centralizer.

0 to 2.0 feet: concrete.

2.0 to 45.0 feet: hydrated 3/4-inch Baroid bentonite chips.

45.0 to 119.0 feet: bentonite grout.

119.0 to 124.4 feet: 3/4-inch Baroid bentonite chips placed into standing water.

124.4 to 134.0 feet: 20 x 40 Colorado silica sand.

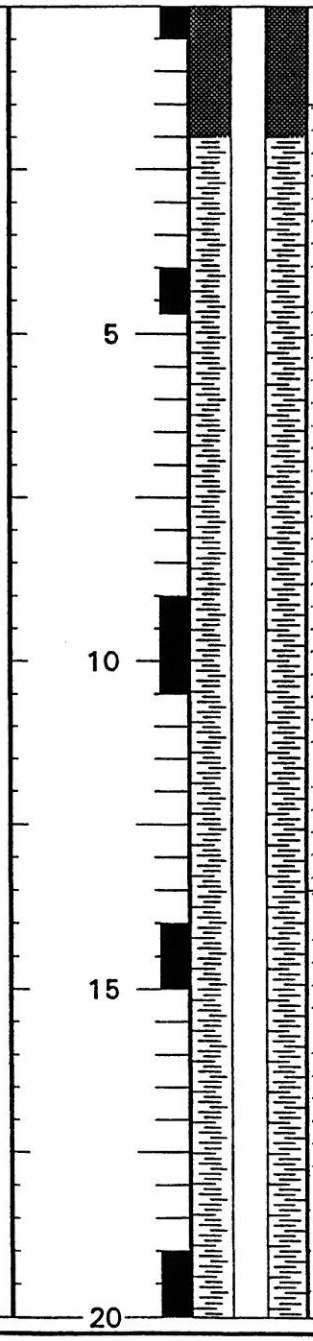
REMARKS

(1) Potable water added during drilling below 131.0 feet. (2) Top of steel casing elevation = 368.18 feet. (3) Northing = 333.12; Easting = 2739.35. (4) Static water elevation after well development = 244.61 feet, measured January 19, 1999. (5) SS = Nominal 2-inch-diameter split-spoon sampler. G = Grab.

LOG OF EXPLORATORY BORING

PROJECT NAME	Field Investigation Report	BORING NO.	MW-21
LOCATION	Vashon Island Landfill	PAGE	1 OF 7
DRILLED BY	Tacoma Pump & Drilling	GROUND ELEV.	343.70'
DRILL METHOD	Hollow-stem Auger	TOTAL DEPTH	112.00'
LOGGED BY	A. Udaloy	DATE COMPLETED	10/21/98

SAMPLE TYPE	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G			**0 to 1.5 feet: SANDY SILT (ML)**, reddish brown, some fine to medium sand, little fine to coarse gravel, few cobbles, damp. (TOPSOIL/FILL)
			1.5 to 13.5 feet: SILTY SAND (SM), yellowish gray, fine to medium, some nonplastic fines, trace to few fine to coarse gravel, trace cobbles, damp. Very slow drilling, very dense. (TILL)
SS	4	50/7"	
SS	9	20-30-40	@ 9.0 to 10.5 feet: brownish gray, trace orange coatings on gravel.
SS	14	15-50	**13.5 to 17.0 feet: SILTY SAND (SP-SM)**, yellowish gray, fine, few fines, damp. Significantly faster drilling. (ADVANCE OUTWASH) @ 13.8 to 14.0 feet: bed of medium to coarse sand with fine gravel.
SS	19	20-50	**17.0 to 26.0 feet: SAND (SP)**, white with brown and black, fine, trace grayish brown fines, trace subangular to subrounded coarse sand, damp. (ADVANCE OUTWASH)



REMARKS

(1) No water added during drilling. (2) Top of steel casing elevation = 346.51 feet. (3) Northing = 95.12; Easting = 2218.51. (4) Static water elevation after well development = 239.42 feet, measured January 19, 1999. (5) SS = Nominal 2-inch-diameter split-spoon sampler. G = Grab.

LOG OF EXPLORATORY BORING

PROJECT NAME	Field Investigation Report	BORING NO.	MW-21
LOCATION	Vashon Island Landfill	PAGE	2 OF 7
DRILLED BY	Tacoma Pump & Drilling	GROUND ELEV.	343.70'
DRILL METHOD	Hollow-stem Auger	TOTAL DEPTH	112.00'
LOGGED BY	A. Udaloy	DATE COMPLETED	10/21/98

SAMPLE TYPE	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
			17.0 to 26.0 feet: SAND (SP), see description on previous page.
SS	21.5	24-50/3"	@ 21.5 feet: common thin laminations, trace coarse sand, rare horizontal orange staining, damp.
SS	24	15-50	@ 24.0 feet: rare coarse sand, rare horizontal orange staining, 1-inch bed of SILTY SAND (SP-SM).
SS	26.5	15-30-35	**26.0 to 33.0 feet: SILTY SAND (SP-SM)**, white with brown and black, fine, few fines, trace medium to coarse sand, damp. Common horizontal laminations. (ADVANCE OUTWASH)
SS	29	10-10-20	@ 29.0 feet: trace coal, occasional brown SILTY SAND (SM) interbeds, subhorizontal bedding.
SS	31.5	20-50/5"	
SS	34	15-30-30	**33.0 to 43.0 feet: SAND (SP)**, white with brown and black, fine to medium, trace fines, trace coarse sand, damp. Grain size decreases downhole. (ADVANCE OUTWASH)
			@ 34.0 feet: 2-inch-thick bed of medium sand.
SS	36.5	15-50	
SS	39	20-50/5"	

REMARKS

(1) No water added during drilling. (2) Top of steel casing elevation = 346.51 feet. (3) Northing = 95.12; Easting = 2218.51. (4) Static water elevation after well development = 239.42 feet, measured January 19, 1999. (5) SS = Nominal 2-inch-diameter split-spoon sampler. G = Grab.

LOG OF EXPLORATORY BORING

PROJECT NAME	Field Investigation Report	BORING NO.	MW-21
LOCATION	Vashon Island Landfill	PAGE	3 OF 7
DRILLED BY	Tacoma Pump & Drilling	GROUND ELEV.	343.70'
DRILL METHOD	Hollow-stem Auger	TOTAL DEPTH	112.00'
LOGGED BY	A. Udaloy	DATE COMPLETED	10/21/98

SAMPLE TYPE	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
			33.0 to 43.0 feet: SAND (SP), see description on previous page.
SS	41.5	25-50/3"	@ 41.5 feet: very fine to fine, trace fine subangular gravel, possibly aeolian.
			43.0 to 49.5 feet: SAND (SP), brownish yellow, fine, trace coarse sand and fine gravel, laminated. Generally rhythmic sequence of fine SAND (SP) grading down to brownish yellow SILTY SAND (SM), then abrupt basal contact with underlying SAND, beds 1- to 2-feet thick. Damp. (ADVANCE OUTWASH)
SS	44	20-50/5"	
SS	46.5	20-30-30	
SS	49	25-50	
			49.5 to 50.5 feet: SILT (ML), brown with gray clayey silt varves, firm, damp. Minimum 0.5-foot thickness. (ADVANCE OUTWASH)
			50.5 to 69.3 feet: SAND (SP), white with brown and black, fine, damp. Grain size decreases to very fine below about 61.0 feet. Laminated. (ADVANCE OUTWASH)
SS	51.5	20-30-35	
SS	54	15-20-30	@ 54.0 to 54.6 feet: interbed of brownish gray fine SILTY SAND (SP-SM) with trace subangular fine gravel.
SS	56.5	20-25-35	@ 56.5 feet: occasional SILTY SAND (SP-SM) interbeds, rare orange staining.
SS	59	10-50	@ 59.0 feet: cross-bedded.

45 50 55 60

REMARKS

(1) No water added during drilling. (2) Top of steel casing elevation = 346.51 feet. (3) Northing = 95.12; Easting = 2218.51. (4) Static water elevation after well development = 239.42 feet, measured January 19, 1999. (5) SS = Nominal 2-inch-diameter split-spoon sampler. G = Grab.

LOG OF EXPLORATORY BORING

PROJECT NAME	Field Investigation Report	BORING NO.	MW-21
LOCATION	Vashon Island Landfill	PAGE	4 OF 7
DRILLED BY	Tacoma Pump & Drilling	GROUND ELEV.	343.70'
DRILL METHOD	Hollow-stem Auger	TOTAL DEPTH	112.00'
LOGGED BY	A. Udaloy	DATE COMPLETED	10/21/98

SAMPLE TYPE	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
			50.5 to 69.3 feet: SAND (SP), see description on previous page.
SS	61.5	50/5"	
SS	64	50/5"	
SS	66.5	45-50/3"	
SS	69	20-50	
			69.3 to 72.0 feet: SILTY SAND (SP-SM), grayish brown, fine to very fine, little brown fines, subhorizontal laminations and occasional cross-beds, trace coal, damp. (ADVANCE OUTWASH)
SS	71.5	20-20-30	
			72.0 to 97.8 feet: SILT (ML), light gray to 88.0 feet, dark gray below, stiff, moist, varved. Orange-brown precipitate on parting plane at 72.3 feet. Brown laminae common to about 77.0 feet. Common orange banding. (LACUSTRINE PRE-VASHON DEPOSITS)
SS	74	20-20-20	
SS	76.5	10-20-20	@ 77.0 feet: SAND (SP), white and black, fine, common orange-stained laminae. @ 77.6 feet: trace coal. @ 77.8 feet: trace soft to firm, wet clay laminae (capillary saturation).
SS	79	10-15-20	

65 70 75 80

REMARKS

(1) No water added during drilling. (2) Top of steel casing elevation = 346.51 feet. (3) Northing = 95.12; Easting = 2218.51. (4) Static water elevation after well development = 239.42 feet, measured January 19, 1999. (5) SS = Nominal 2-inch-diameter split-spoon sampler. G = Grab.

LOG OF EXPLORATORY BORING

PROJECT NAME	Field Investigation Report	BORING NO.	MW-21
LOCATION	Vashon Island Landfill	PAGE	5 OF 7
DRILLED BY	Tacoma Pump & Drilling	GROUND ELEV.	343.70'
DRILL METHOD	Hollow-stem Auger	TOTAL DEPTH	112.00'
LOGGED BY	A. Udaloy	DATE COMPLETED	10/21/98

SAMPLE TYPE	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
			72.0 to 97.8 feet: SILT (ML), see description on previous page.
SS	81.5	10-20-20	@ 80.5 feet: hard orange-red iron concretions, 2-mm-thick layer.
			@ 82.5 feet: 1-mm-thick lens of fine SAND (SP).
SS	84	5-10-15	
			@ 84.4 to 85.0 feet: grayish brown SILTY SAND (SM), fine, wet, with orange laminations.
SS	86.5	10-20-30	
SS	89	10-50	
SS	91.5	20-30-30	@ 92.0 to 93.0 feet: SILTY SAND (SM), fine, wet, common brown laminae.
SS	94	10-20-30	
SS	95.5	10-25-30	@ 95.5 to 95.8 feet: SANDY SILT (ML), gray, some fine sand, wet, 1-cm-thick iron-concreted bed in tip of sampler.
SS	97	15-20-35	
SS	98.5	20-50/5"	**97.8 to 110.0 feet: SAND (SP)**, white with brown and black, fine, damp to about 104.0 feet, wet below 104.0 feet. Description continued on next page.

REMARKS

(1) No water added during drilling. (2) Top of steel casing elevation = 346.51 feet. (3) Northing = 95.12; Easting = 2218.51. (4) Static water elevation after well development = 239.42 feet, measured January 19, 1999. (5) SS = Nominal 2-inch-diameter split-spoon sampler. G = Grab.

LOG OF EXPLORATORY BORING

PROJECT NAME	Field Investigation Report	BORING NO.	MW-21
LOCATION	Vashon Island Landfill	PAGE	6 OF 7
DRILLED BY	Tacoma Pump & Drilling	GROUND ELEV.	343.70'
DRILL METHOD	Hollow-stem Auger	TOTAL DEPTH	112.00'
LOGGED BY	A. Udaloy	DATE COMPLETED	10/21/98

SAMPLE TYPE	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
SS	100	40-50/5"						**97.8 to 110.0 feet: SAND (SP)**, continued: Brown iron-concretions at abrupt upper contact. Common orange laminae. (PRE-VASHON DEPOSITS)
SS	101.5	20-50						
SS	103	30-50/5"	1/19/99 Static					
SS	104.5	25-50/5"	10/28/98 During Instal-lation	105				@ 104.5 to 110.0 feet: very fine to fine with trace fines, overall dark gray color, fines content increases downhole.
SS	106	25-50						
SS	107.5	25-27-40						
SS	109	25-30-35						
				110				**110.0 to 112.0 feet: SILT (ML)**, gray, stiff to hard, moist, laminated. (LACUSTRINE PRE-VASHON DEPOSITS)
SS	110.5	15-20-35						Total depth drilled = 110.5 feet. Total depth sampled = 112.0 feet.
				115				
				120				See Page 7 for Well Completion Details.

REMARKS

(1) No water added during drilling. (2) Top of steel casing elevation = 346.51 feet. (3) Northing = 95.12; Easting = 2218.51. (4) Static water elevation after well development = 239.42 feet, measured January 19, 1999. (5) SS = Nominal 2-inch-diameter split-spoon sampler. G = Grab.

LOG OF EXPLORATORY BORING

PROJECT NAME Field Investigation Report
LOCATION Vashon Island Landfill
DRILLED BY Tacoma Pump & Drilling
DRILL METHOD Hollow-stem Auger
LOGGED BY A. Udaloy

BORING NO. MW-21
PAGE 7 OF 7
GROUND ELEV. 343.70'
TOTAL DEPTH 112.00'
DATE COMPLETED 10/21/98

SAMPLE TYPE	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
				125				**WELL COMPLETION DETAILS:** +1.9 to 100.6 feet: nominal 2-inch I.D., flush-threaded, Schedule 40 PVC blank riser pipe. 100.6 to 110.0 feet: nominal 2-inch I.D., flush-threaded, Schedule 40 PVC well screen with 0.020-inch machined slots. 110.0 to 110.2 feet: nominal 2-inch I.D., flush-threaded PVC with threaded end cap. 29.0 to 30.0 feet: stainless steel centralizer. 98.0 to 99.0 feet: stainless steel centralizer. 109.0 to 110.0 feet: stainless steel centralizer. 0 to 2.0 feet: concrete. 2.0 to 91.5 feet: bentonite grout. 91.5 to 95.0 feet: 3/4-inch hydrated Baroid bentonite chips. 95.0 to 111.0 feet: 20 x 40 Colorado silica sand.
				130				
				135				
				140				

REMARKS

(1) No water added during drilling. (2) Top of steel casing elevation = 346.51 feet. (3) Northing = 95.12; Easting = 2218.51. (4) Static water elevation after well development = 239.42 feet, measured January 19, 1999. (5) SS = Nominal 2-inch-diameter split-spoon sampler. G = Grab.

Boring No. P-4

Logged by: CRL

Dated: 4-27-92

Renumbered as MW-24

N 603.3908
E 2988.0027
Top of PVC Elev.
373.93

Graph/ USCS	Soil Description	Consistency	Depth (ft.)	Sample	(N) Blows (ft)	Water Content (%)	Well As-Built
	See P-3 for stratigraphy		5, 10, 15				
ML	Gray SILT, plastic.	Hard	80, 85, 90		50/6"	27	

Total depth 90.5 feet.

Well As-built
2" 0.0200 PVC screen placed from 90 to 80 feet.

#8 silica sand placed from 90 to 77 feet.
Bentonite grout tremied to bottom of auger from 77 to 2 feet.
Upper 2 feet is concrete plug to hold surface casing.

(No methane or volatile organics noted during drilling of this well)

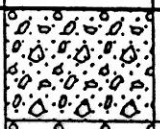
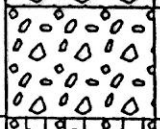
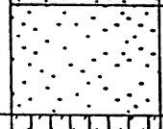
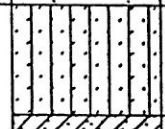
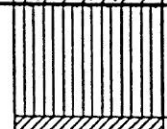
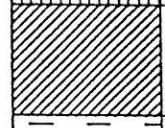
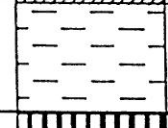
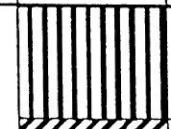
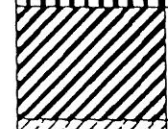
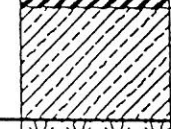
Survey data provided by King County Solid Waste Division.

TERRA ASSOCIATES
Geotechnical Consultants

Boring Log
Vashon Landfill
King County, Washington

Proj. No. T-1996	Date 7/92	Figure 7

UDALOY ENVIRONMENTAL SERVICES
SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SAND OR LARGER BASED ON VISUAL CRITERIA	GRAVEL AND GRAVELLY SOILS — MORE THAN 50% OF COARSE FRACTION IS GRAVEL BASED ON VISUAL CRITERIA	CLEAN GRAVELS (MORE THAN 5% FINES BASED ON VISUAL CRITERIA)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (MORE THAN 5% FINES BASED ON VISUAL CRITERIA)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS — MORE THAN 50% OF COARSE FRACTION IS SAND BASED ON VISUAL CRITERIA	CLEAN SANDS (LESS THAN 5% FINES BASED ON VISUAL CRITERIA)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (MORE THAN 15% FINES BASED ON VISUAL CRITERIA)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SMALLER SILT OR FINES BASED ON VISUAL CRITERIA	SILTS AND CLAYS	NON-PLASTIC TO MEDIUM PLASTICITY (BASED ON TACTILE CRITERIA)		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	HIGHLY PLASTIC (BASE ON TACTILE CRITERIA)		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

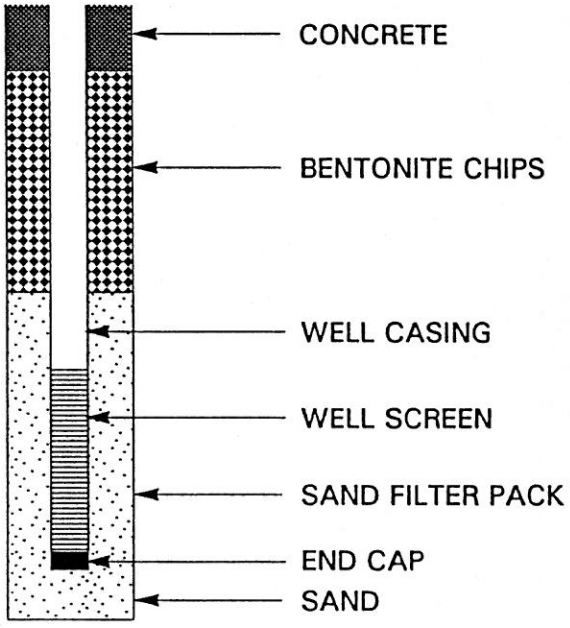
NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS.
HYPHENATED SYMBOLS ARE USED TO INDICATE 5 TO 15 PERCENT FINES BASED ON VISUAL EXAMINATION.

EXPLANATION OF SYMBOLS ON EXPLORATORY BORING LOGS

SAMPLE COLUMN

SAMPLE INTERVAL (Attempted)

WELL DETAILS COLUMN

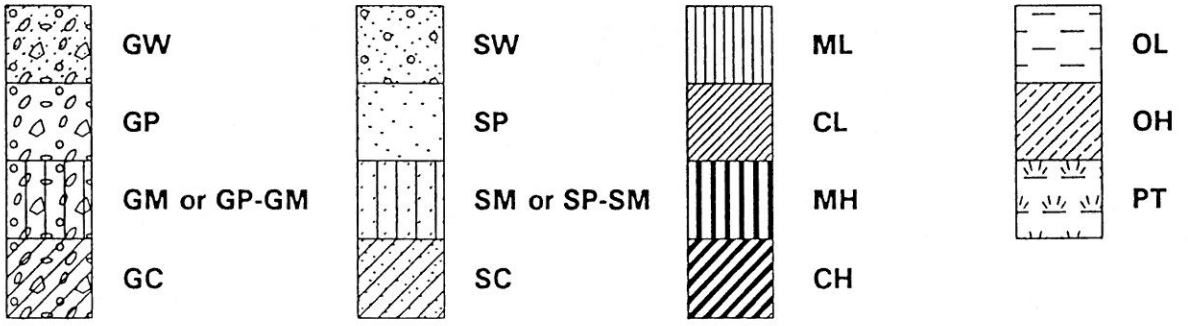


WATER LEVELS

▽ LEVEL AT TIME OF DRILLING

▼ LEVEL AT SPECIFIED DATE

LITHOLOGIC COLUMN



LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-25**
LOCATION	**Vashon Island, Washington**	PAGE	**1 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**397.3**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**275.4'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/11/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	2							**0 to 2.0 feet: SILTY GRAVEL (GM)**, moderate brown fines, medium to coarse, subrounded to subangular, some nonplastic fines, little fine to medium sand, trace roots, dry, uppermost 2" is mat of grass roots. (WEATHERED TILL/FILL)
								2.0 to 4.0 feet: GRAVELLY SILT (ML), moderate brown fines, nonplastic fines, some fine to coarse subrounded to subangular gravel, little fine to medium sand, trace roots, dry. (WEATHERED TILL)
G	5			5				**4.0 to 23.0 feet: GRAVELLY SILT (ML)**, olive gray fines, medium stiff, moderate plasticity, dry to about 8 feet, moist below 8 feet, little to some fine to medium sand, few fine to medium gravel, trace coarse gravel. (TILL)
G	10			10				@ 10.0 feet: basalt cobble.
G	15			15				
				20				

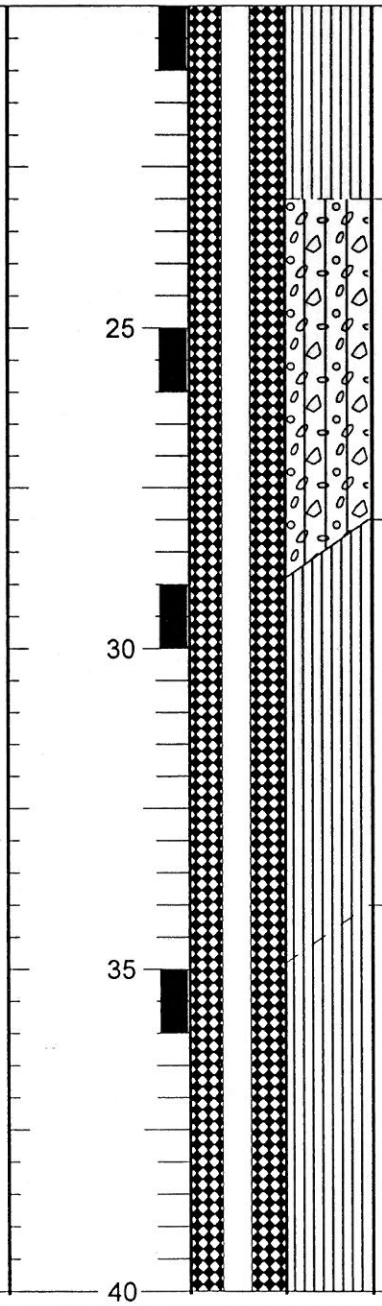
REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 123 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1524.71 E: 3168.16. (7) Top of PVC elevation = 399.22 feet. (8) Perched groundwater noted at ~108 feet below grade on 7/28/2003 during placement of annular backfill. (9) Groundwater elevation = 155.97 feet, October 14, 2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-25**
LOCATION	**Vashon Island, Washington**	PAGE	**2 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**397.3**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**275.4'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/11/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	20		**4.0 to 23.0 feet: GRAVELLY SILT (ML)**, continued.
			23.0 to 28.0 feet: SILTY GRAVEL (GM), olive gray fines, medium to coarse, subangular to subrounded, some nonplastic fines, little sand, moist.
G	25		
			28.0 to 34.0 feet: GRAVELLY SILT (ML), light olive brown fines, nonplastic, medium stiff, some fine to medium sand, few fine to coarse subrounded to subangular gravel, moist. (TILL)
G	29		
			34.0 to 46.0 feet: GRAVELLY SILT (ML), light olive gray fines, moderate plasticity, few fine to coarse gravel, little fine to medium sand, trace clay, moist. (TILL)
G	35		



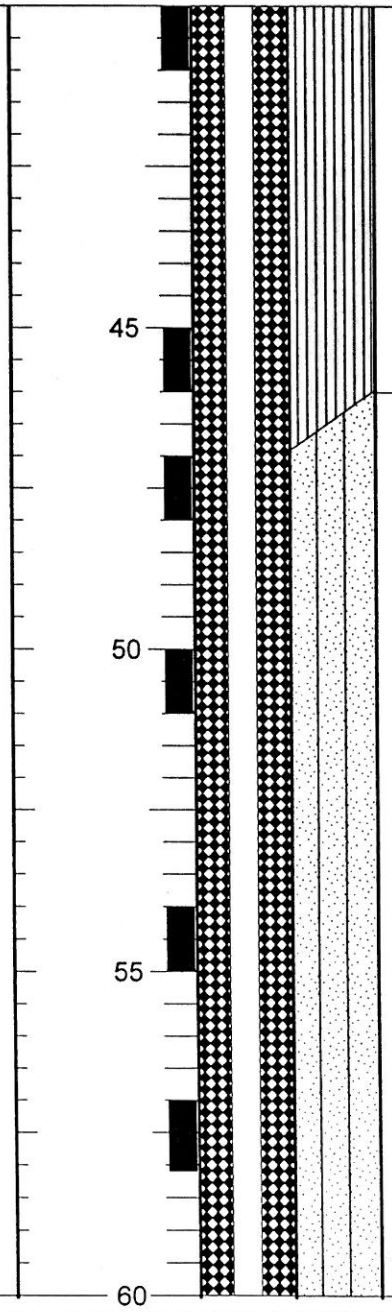
REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 123 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1524.71 E: 3168.16. (7) Top of PVC elevation = 399.22 feet. (8) Perched groundwater noted at ~108 feet below grade on 7/28/2003 during placement of annular backfill. (9) Groundwater elevation = 155.97 feet, October 14, 2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-25**
LOCATION	**Vashon Island, Washington**	PAGE	**3 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**397.3**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**275.4'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/11/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	40		**34.0 to 46.0 feet: GRAVELLY SILT (ML)**, continued.
G	45		
G	47		**46.0 to 61.0 feet: SILTY SAND (SP-SM)**, yellow-brown fines, medium, few fines, trace to few medium to coarse subrounded gravel, trace clay, moist. (ADVANCE OUTWASH)
G	50		@ 50.0 feet: fewer fines, gradational to SP.
G	54		@ 54.0 feet: some fines (SM).
SS	57-58.1	8 41 50/2"	@ 57.0 to 57.6 feet: SP-SM as above; 57.6 to 58.1 feet: SP, fine to medium, trace fines, gravel absent.



REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 123 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1524.71 E: 3168.16. (7) Top of PVC elevation = 399.22 feet. (8) Perched groundwater noted at ~108 feet below grade on 7/28/2003 during placement of annular backfill. (9) Groundwater elevation = 155.97 feet, October 14, 2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-25**
LOCATION	**Vashon Island, Washington**	PAGE	**4 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**397.3**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**275.4'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/11/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
								46.0 to 61.0 feet: SILTY SAND (SP-SM), continued.
								61.0 to 66.0 feet: SAND (SW), yellow brown fines, subrounded to subangular, trace fine gravel, trace fines, moist. (ADVANCE OUTWASH)
G	64			65				
								66.0 to 72.0 feet: SILTY GRAVEL (GP-GM), yellow brown fines, fine to medium with trace coarse, rounded to subangular, few fines as coatings on clasts and in silty sand matrix, some fine to medium sand, clast supported, moist. Basal contact position uncertain. (ADVANCE OUTWASH)
G	70			70				
								72.0 to 85.0 feet: SILTY SAND (SP-SM), yellow brown fines, fine to medium, gravels absent. Grades to trace fines (SP), moist. (ADVANCE OUTWASH)
				75				
G	76							
				80				

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-25**
LOCATION	**Vashon Island, Washington**	PAGE	**5 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**397.3**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**275.4'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/11/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	80		**72.0 to 85.0 feet: SILTY SAND (SP-SM)**, continued. @ 80.0 feet: trace fine to medium subrounded gravel.
			85
			85.0 to 96.0 feet: SAND (SP), yellow brown fines, fine, trace fines, moist. (ADVANCE OUTWASH)
G	86		
			@ 89.0 to 93.0 feet: thin interbeds of SILT (ML), gray with orange-brown stains, laminated.
			90
G	90		
			95
G	95		
			96.0 to 108.0 feet: SILTY SAND (SP-SM), yellow brown fines, fine, few medium, trace coarse, few fines, moist. (ADVANCE OUTWASH)
G	97		
			100

REMARKS

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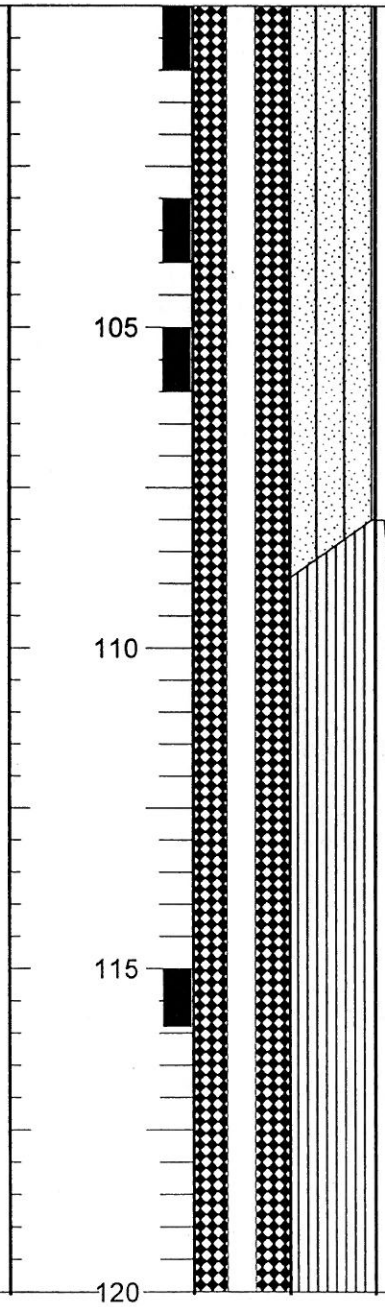
LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-25**
LOCATION	**Vashon Island, Washington**	PAGE	**6 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**397.3**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**275.4'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/11/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	100		**96.0 to 108.0 feet: SILTY SAND (SP-SM)**, continued. @ 100.0 feet: thin interbeds of gray brown clayey silt (ML).
G	103		@ 103.0 feet: thin interbeds of yellow brown fine sandy silt (ML).
G	105		@ 105.0 feet: thin interbeds of gray laminated clayey silt (ML). @ 106.0 to 108.0 feet: cuttings are SP-SM, no returns at 108.0 feet. @ 108.0 to 113.0 feet: cuttings returned after drive shoe advanced to 113.0 feet, cuttings are moist to wet (capillary saturation?). Pull back to 108.0 feet and check for formation water: no free water. Water was noted and presumed to be derived from this interval during annular fill placement.
			108.0 to 148.0 feet: SILT (ML), light gray to dark gray with yellow-brown beds, trace to few fine sand, medium plasticity, soft to medium stiff, wet (capillary saturation) to 123.0 feet, water added during drilling below 123.0 feet. (LACUSTRINE DEPOSITS)
G	115-115.9	45 50/5"	@ 115.0 feet: 100% recovery. 115.0 to 115.3 feet: SILT (ML), gray, trace to few fine sand, medium stiff, saturated, rapid dilatancy, medium plasticity, low dry strength. 115.3 to 115.9 feet: SANDY SILT (ML), yellow brown, few to little fine sand, saturated, rapid dilatancy, medium plasticity.



REMARKS

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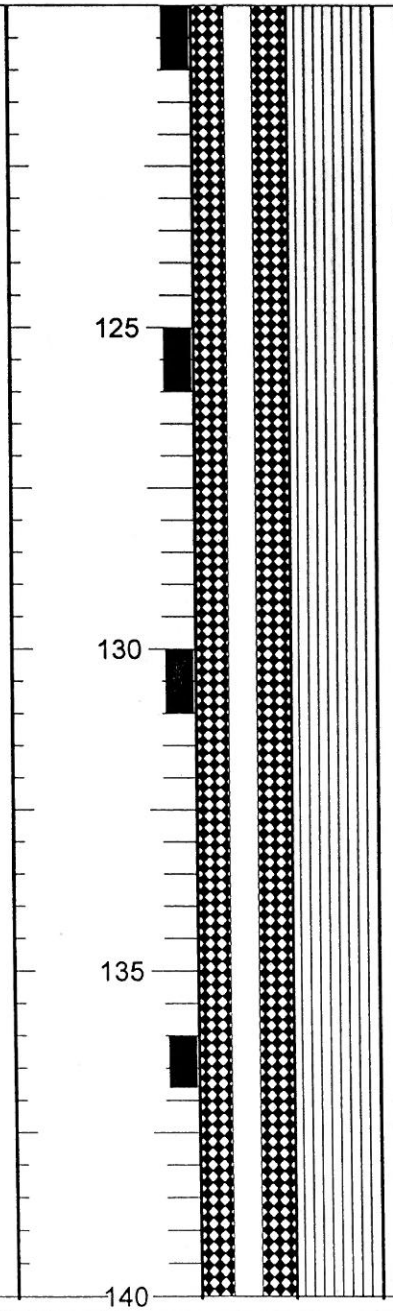
LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-25**
LOCATION	**Vashon Island, Washington**	PAGE	**7 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**397.3**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**275.4'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/11/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	120		**108.0 to 148.0 feet: SILT (ML)**, continued.
			@ 123.0 feet: no cutting returns until water is added; cuttings then are gray ML with trace to few fine sand, trace coarse sand (coarse sand may be residual cuttings from casing and cyclone sidewalls).
G	125		@ 125.0 feet: some fine sand.
G	130		
SB	136-136.8	30 20/4"	@ 136.0 feet: 100% recovery. 136.0 to 136.8 feet: clayey silt (ML), dark gray, trace fine sand, moist.



REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 123 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1524.71 E: 3168.16. (7) Top of PVC elevation = 399.22 feet. (8) Perched groundwater noted at ~108 feet below grade on 7/28/2003 during placement of annular backfill. (9) Groundwater elevation = 155.97 feet, October 14, 2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-25**
LOCATION	**Vashon Island, Washington**	PAGE	**8 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**397.3**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**275.4'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/11/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	140							**108.0 to 148.0 feet: SILT (ML)**, continued.
G	145			145				@ 145.0 feet: thin (1-5 mm) laminae, dark gray, few fine sandy silt interbeds.
								@ 148.0 feet: drill action changes, rougher.
								148.0 to 163.0 feet: GRAVELLY SAND (SW), gray brown fines, subangular, some fine to medium and trace coarse subangular to subrounded gravel, trace fines. (FLUVIAL DEPOSITS)
G	150			150				@ 152.0 feet: circulate to clean carry down.
G	155			155				
				160				

REMARKS

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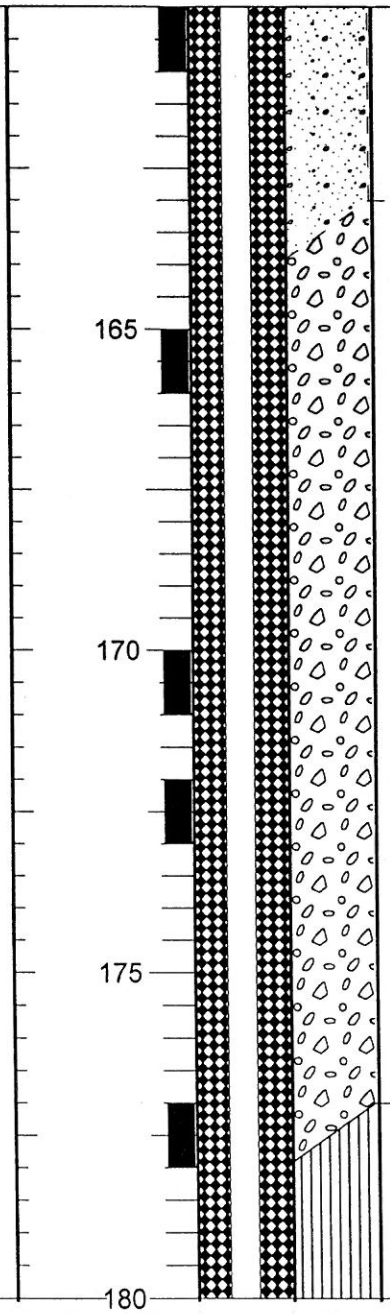
LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-25
LOCATION	Vashon Island, Washington	PAGE	9 of 15
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	397.3
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	275.4'
LOGGED BY	Udaloy	DATE COMPLETED	8/11/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	160		**148.0 to 163.0 feet: GRAVELLY SAND (SW)**, continued.
			163.0 to 177.0 feet: SANDY GRAVEL (GP), gray brown fines, fine to medium, trace coarse, subangular to subrounded, some medium to coarse subangular to subrounded sand, trace fine sand, trace fines. (FLUVIAL DEPOSITS)
G	165		
G	170		
G	173		@ 173.0 feet: color change from overlying gray brown to yellow brown, fines content increases slightly.
			@ 175.0 feet: driller stops adding water, excellent cuttings returns.
G	177		**177.0 to 207.0 feet: SILT (ML), CLAYEY SILT (ML), and CLAY (CL)**, dark gray, trace to little clay, grades to mostly clay, damp, stiff, massive. (LACUSTRINE DEPOSITS)



REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-25**
LOCATION	**Vashon Island, Washington**	PAGE	**10 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**397.3**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**275.4'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/11/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	180							**177.0 to 207.0 feet: SILT (ML), CLAYEY SILT (ML) and CLAY (CL)**, continued. @ 180.0 to 185.0 feet: no cuttings recovery, stop casing at 185.0 feet and circulate until cuttings returned, all cuttings were gray silt (ML), no discernable bedding structures. Field test indicates trace clay. Note: below 180.0 feet, cuttings returns were affected by available compressed air supply.
G	185			185				@ 185.0 feet: no discernable bedding structures. Hydrometer test indicates about 53 percent clay-sized particles.
G	188							@ 188.0 feet: no discernable bedding structures.
G	190			190				@ 190.0 feet: no discernable bedding structures.
G	194							@ 194.0 feet: no discernable bedding structures.
G	197			195				@ 197.0 feet: no discernable bedding structures, cuttings stiff to very stiff.
				200				

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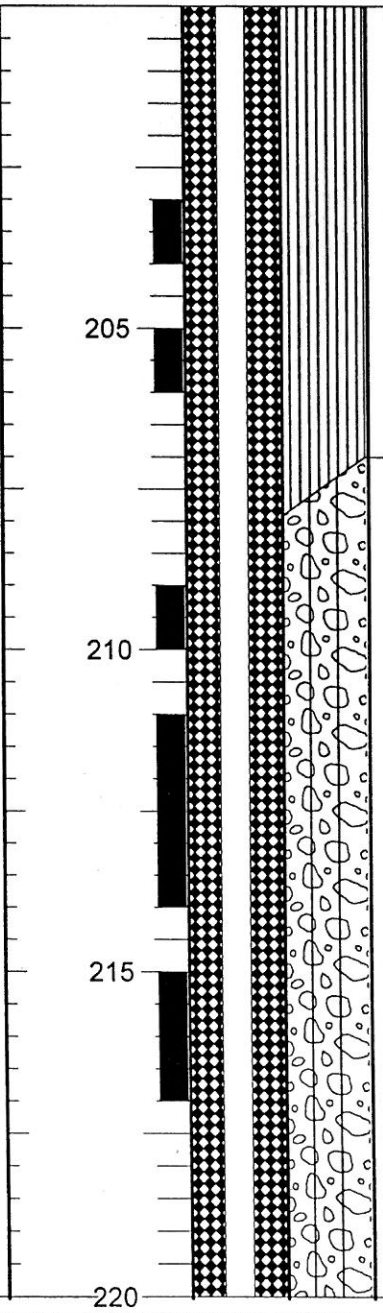
LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-25**
LOCATION	**Vashon Island, Washington**	PAGE	**11 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**397.3**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**275.4'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/11/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
			177.0 to 207.0 feet: SILT (ML), CLAYEY SILT (ML) and CLAY (CL), continued.
G	203		@ 203.0 feet: field test indicates mostly (55% or more) clay, trace of fine sand.
G	205		
			@ 207.0 feet: driller notes change, rougher action.
			207.0 to 244.0 feet: SILTY GRAVEL (GP-GM), gray fines, fine, trace medium and coarse, trace cobbles, subrounded to subrounded, clast supported with matrix of sandy silt, some fine to coarse subrounded to subangular sand, trace to few fines. Sandy silt matrix is stiff to very stiff. Grades downhole to GW-GM and GW. (FLUVIAL DEPOSITS)
G	209		
G	211		
G	215		



REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 123 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1524.71 E: 3168.16. (7) Top of PVC elevation = 399.22 feet. (8) Perched groundwater noted at ~108 feet below grade on 7/28/2003 during placement of annular backfill. (9) Groundwater elevation = 155.97 feet, October 14, 2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-25**
LOCATION	**Vashon Island, Washington**	PAGE	**12 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**397.3**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**275.4'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/11/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	220							**207.0 to 244.0 feet: SILTY GRAVEL (GP-GM)**, continued.
								@ 221.0 to 224.0 feet: no cuttings recovery, rotate casing at 224.0 feet while increasing water flow until circulation resumes.
G	224							@ 224.0 feet: no gravel recovery after weld, rotate until circulation re-established.
G	225			225				
				230				@ 230.0 feet: stop casing advance, sample recovery is for entire 225.0 to 230.0 feet interval. Below 230.0 feet: no sample recovery due to poor compressed air circulation.
				235				@ 235.0 feet: drilled to 235.0 feet, cased to 236.0 feet, check for water: 233.2 feet, not rising, interpreted as residual drilling water.
				240				

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-25**
LOCATION	**Vashon Island, Washington**	PAGE	**13 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**397.3**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**275.4'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/11/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	240		▼ 10/14/03					**207.0 to 244.0 feet: SILTY GRAVEL (GP-GM)**, continued. @ 240.0 to 244.0 feet: yellow-brown fines (GW), trace fines, fine to coarse, trace cobbles, trace wood fragments.
								@ 244.0 feet: color change to gray fines.
G	244			245				**244.0 to 247.5 feet: SILT (ML) or SILTY SAND (SM)**, gray, sandy. Drilling action smoothed, cuttings appear as mostly silt with fine sand. (FLUVIAL DEPOSITS)
			▽ 9/23/03					
								@ 247.5 feet: drilling action changes, rougher.
G	248							**247.5 to 275.4 feet: SILTY GRAVEL (GP-GM)**, gray fines, fine to medium, subrounded to subangular, littler sand, few fines, wet. (FLUVIAL DEPOSITS)
				250				
				255				
G	258							@ 258.0 feet: well filled with filter pack and native soils below this level due to damage during installation. @ 258.0 to 275.4 feet: sample quality affected by air circulation. Gravels are recirculating and do not discharge until they are generally fine gravel or finer.
G	259			260				

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-25**
LOCATION	**Vashon Island, Washington**	PAGE	**14 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**397.3**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**275.4'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/11/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	260							**247.5 to 275.4 feet: SILTY GRAVEL (GP-GM)**, continued.
								@ 260.0 to 275.4 feet: all cuttings reduced in fine gravel or finer, insufficient circulation for recovery of coarser fraction, drill action indicates entire interval is gravelly.
G	262							
G	263							
G	265			265				
				270				
G	272							
				275				Bottom of cased boring: 275.0 feet.
								Bottom of drilled boring: 275.4 feet.
				280				See Page 15 for Well Completion and Liner Details.

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-25**
LOCATION	**Vashon Island, Washington**	PAGE	**15 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**397.3**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**275.4'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/11/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION

285

290

295

300

WELL COMPLETION DETAILS

+2.4 to 248.5 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank riser pipe.

248.5 to 257.9 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC screen with 0.020-inch machined slots and 0.25-inch spacers.

257.9 to 258.6 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank at joint between screen sections.

258.6 to 262.6 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC screen with 0.020-inch machined slots and 0.25-inch spacers.

262.6 to 263.3 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank casing with end cap.

247.0 to 248.0 feet: Stainless steel centralizer.

255.0 to 256.0 feet: Stainless steel centralizer.

262.0 to 263.0 feet: Stainless steel centralizer.

0 to 2.0 feet: Concrete.

2.0 to 245.0 feet: Baroid® 3/4-inch bentonite chips.

245.0 to 267.0 feet: 16 x 30 Colorado™ silica sand.

267.0 to 275.4 feet: 10 x 20 Colorado™ silica sand.

160.0 to 171.4 feet: Slough.

171.4 to 178.4 feet: Slough and bentonite chips.

LINER DETAILS

Liner installed November 11, 2003.

244.7 to 248.4 feet: Nominal 3-inch O.D., flush-threaded, Schedule 80 PVC blank riser pipe.

248.4 to 257.3 feet: Nominal 3-inch O.D., flush-threaded, Schedule 80 PVC screen with 0.020-inch machined slots and 0.25-inch spacers.

257.3 to 258.0 feet: Nominal 3-inch O.D., flush-threaded, Schedule 80 PVC blank casing plus slip cap attached using four aluminum rivets.

A stainless steel eye-bolt is installed in the center of the cap to facilitate liner installation.

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 123 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1524.71 E: 3168.16. (7) Top of PVC elevation = 399.22 feet. (8) Perched groundwater noted at ~108 feet below grade on 7/28/2003 during placement of annular backfill. (9) Groundwater elevation = 155.97 feet, October 14, 2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-26**
LOCATION	**Vashon Island, Washington**	PAGE	**1 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**393.7**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**270.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/6/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	2.5		**0 to 1.5 feet: SILTY GRAVEL (GW-GM)**, gray fines, fine to coarse, subrounded to subangular, some fine to coarse sand, little fines, damp to dry, trace plastic, common cobble-sized concrete rubble, very dense. (FILL)
			1.5 to 7.0 feet: SILTY SAND (SM), yellow brown fines, fine to medium, little fines, some fine to coarse gravel, dense to very dense, moist. (FILL OR WEATHERED TILL)
G	7		**7.0 to 20.0 feet: SILTY SAND (SM)**, gray-brown fines, fine to medium, few to little fines, few fine to medium gravel, damp, dense to very dense. (TILL)
G	9		
			@ 12.0 to 20.0 feet: some fines.
G	14		
G	19		

GROUND WATER LEVEL | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHO-LOGIC COLUMN

5 10 15 20

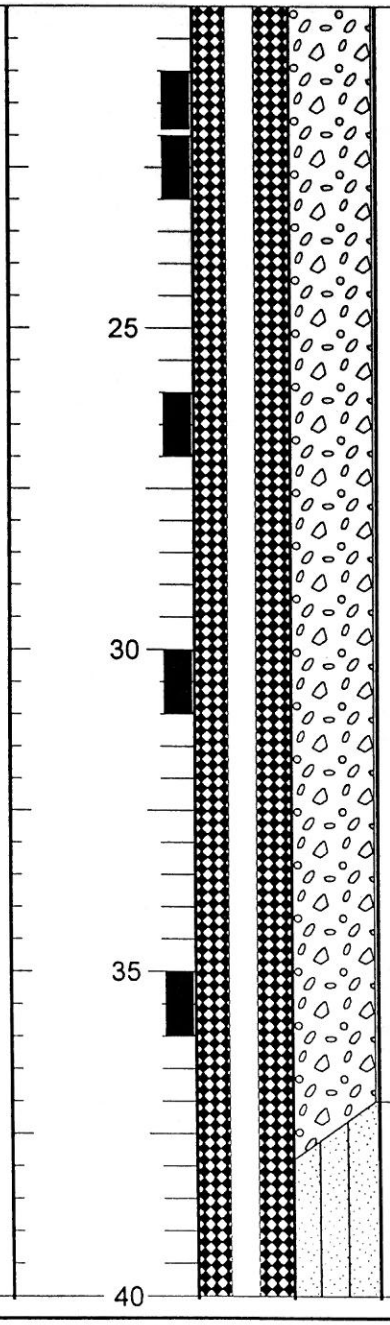
REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 156 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1531.10 E: 2450.01. (7) Top of PVC elevation = 403.40 feet. (8) Perched groundwater noted at 145.5 feet below grade on 8/1/2003 during well construction. Groundwater elevation = 157.88 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-26**
LOCATION	**Vashon Island, Washington**	PAGE	**2 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**393.7**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**270.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/6/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	21		**20.0 to 37.0 feet: GRAVEL (GP)**, gray brown fines, medium to coarse, subrounded to subangular, some fine to medium sand, trace coarse sand and fine gravel, trace cobbles, trace boulders. Trace silt as silty sand coatings on gravel clasts. Damp to dry. (FLUVIAL DEPOSITS)
G	22		@ 21.0 to 24.0 feet: granite boulder, granite surface weathered to grus.
G	26		
G	30		@ 30.0 to 32.0 feet: some fine rounded gravel, trace to few fines, transitional to GP-GM.
G	35		@ 35.0 feet: trace to few fines, transitional to GP-GM.
			37.0 to 42.0 feet: SILTY SAND (SP-SM), yellow brown fines, fine to medium, some fine to medium gravel, trace coarse gravel, few fines, moist. Gradational basal contact. (FLUVIAL DEPOSITS)



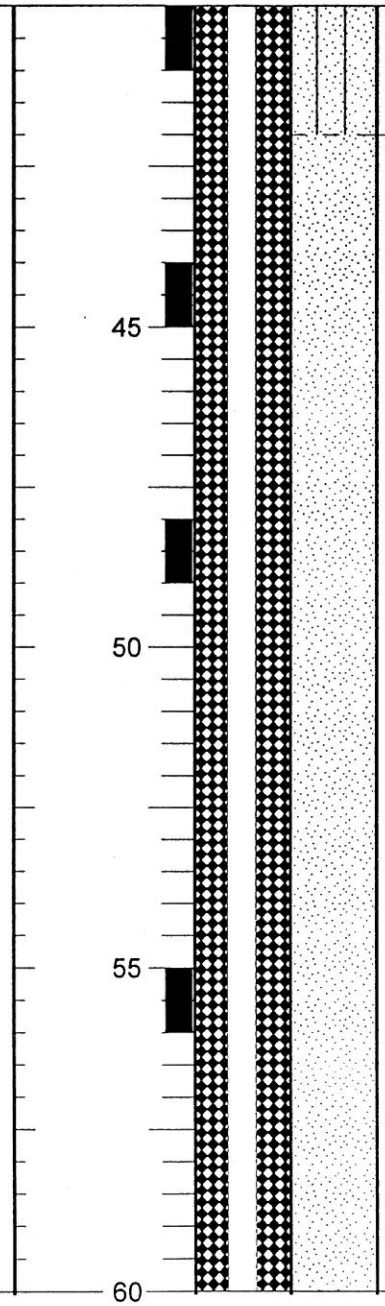
REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 156 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1531.10 E: 2450.01. (7) Top of PVC elevation = 403.40 feet. (8) Perched groundwater noted at 145.5 feet below grade on 8/1/2003 during well construction. Groundwater elevation = 157.88 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-26**
LOCATION	**Vashon Island, Washington**	PAGE	**3 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**393.7**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**270.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/6/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	40		**37.0 to 42.0 feet: SILTY SAND (SP-SM)**, continued.
			42.0 to 106.0 feet: SAND (SP), yellow brown fines, fine, trace medium to coarse gravel, moist. (FLUVIAL DEPOSITS)
G	44		
G	48		
			@ 52.0 feet: single subrounded flattened coarse gravel clast in discharge.
G	55		@ 55.0 feet: install sample-through drill bit. @ 55.0 feet: few fine to coarse gravel, predominantly fine sand.



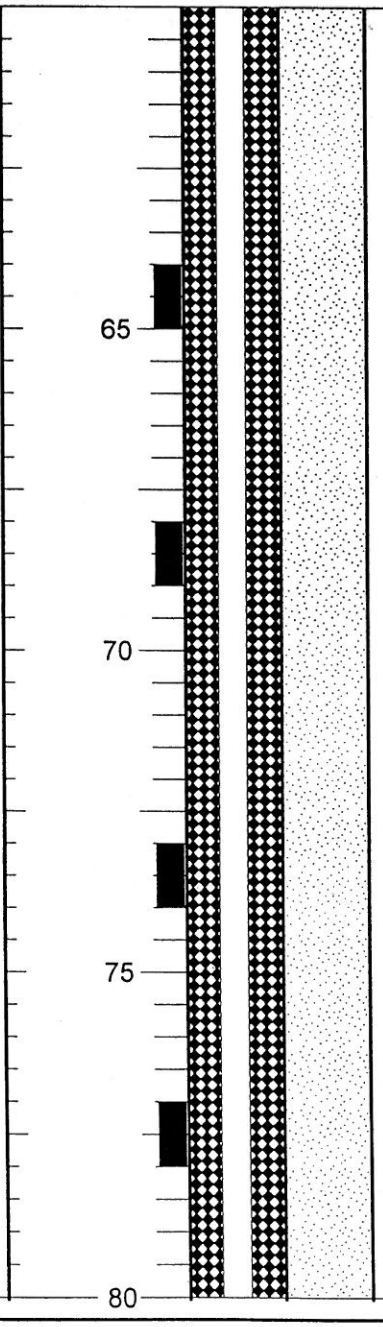
REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 156 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1531.10 E: 2450.01. (7) Top of PVC elevation = 403.40 feet. (8) Perched groundwater noted at 145.5 feet below grade on 8/1/2003 during well construction. Groundwater elevation = 157.88 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-26**
LOCATION	**Vashon Island, Washington**	PAGE	**4 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**393.7**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**270.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/6/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
			42.0 to 106.0 feet: SAND (SP), continued.
G	64		
			@ 66.0 to 69.0 feet: gravels trace to absent.
G	68		
			@ 69.0 to 78.0 feet: few fine to coarse subrounded to subangular gravel.
G	73		
G	77		@ 78.0 to 80.0 feet: trace medium sand, cobble.



REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 156 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1531.10 E: 2450.01. (7) Top of PVC elevation = 403.40 feet. (8) Perched groundwater noted at 145.5 feet below grade on 8/1/2003 during well construction. Groundwater elevation = 157.88 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-26**
LOCATION	**Vashon Island, Washington**	PAGE	**5 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**393.7**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**270.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/6/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
								42.0 to 106.0 feet: SAND (SP), continued.
								@ 82.0 feet: losing air circulation to permeable soils, advance casing and drill plug to minimize air loss.
G	84			85				
G	89			90				
G	95			95				
				100				@ 100.0 feet: drive sample attempted, recovery all slough.

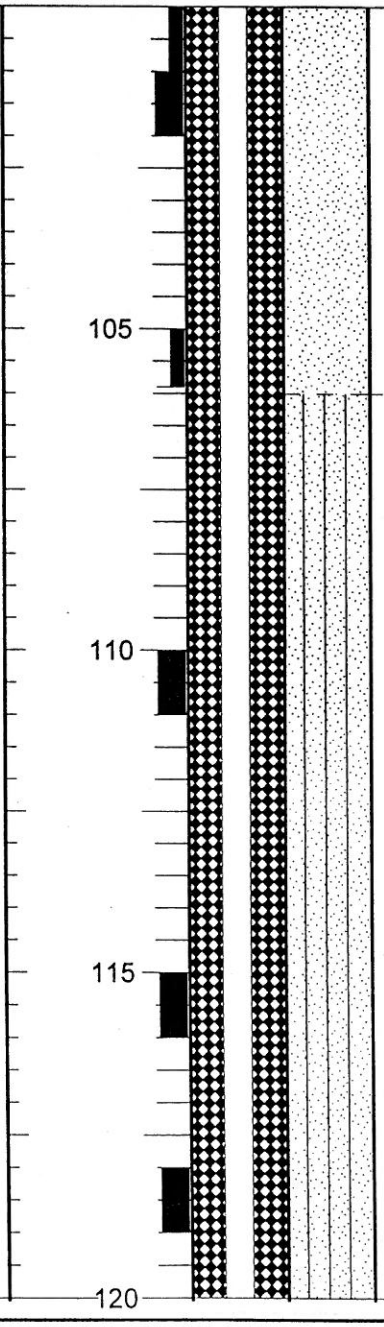
REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 156 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1531.10 E: 2450.01. (7) Top of PVC elevation = 403.40 feet. (8) Perched groundwater noted at 145.5 feet below grade on 8/1/2003 during well construction. Groundwater elevation = 157.88 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-26
LOCATION	Vashon Island, Washington	PAGE	6 of 15
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	393.7
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	270.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/6/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
SS		1	**42.0 to 106.0 feet: SAND (SP)**, continued.
		1	
G	101	1	@ 100.0 feet: drive sample attempted, no recovery, all slough.
SS	105	10	@ 105.0 feet: no sample recovery.
		50/5"	
			106.0 to 120.0 feet: SILTY SAND (SM), brown fines, very fine to fine, trace thin (<5 mm) laminae of gray SILT (ML), with orange-brown stains to 118.0 feet. SILT is soft, with moderate plasticity and very high dry strength; some layers may be CLAYEY SILT or CLAY (CL), damp. Gradational basal contact. (LACUSTRINE DEPOSITS)
G	110		
G	115		@ 115.0 feet: common 1-mm-thick gray CLAYEY SILT or CLAY (CL) layers with orange-brown stains, sticky when wetted.
G	118		



REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 156 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1531.10 E: 2450.01. (7) Top of PVC elevation = 403.40 feet. (8) Perched groundwater noted at 145.5 feet below grade on 8/1/2003 during well construction. Groundwater elevation = 157.88 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-26**
LOCATION	**Vashon Island, Washington**	PAGE	**7 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**393.7**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**270.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/6/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
			120.0 to 123.0 feet: SILTY SAND (SP-SM), brown fines, fine, trace fine to medium gravel, moist, low dry strength. (FLUVIAL/LACUSTRINE DEPOSITS)
G	122		
			123.0 to 149.0 feet: SILTY SAND (SP-SM), brown fines, fine, trace fine to medium subrounded gravels, moist. Common thin (<1 mm) interbeds of fine SANDY SILT (ML). (FLUVIAL DEPOSITS)
SS	125	10 10 10	@ 125.0 feet: 0.7 foot recovered, SILTY SAND (SP-SM), fine, few brown fines, no apparent bedding structures.
G	126.5		@ 126.0 to 136.0 feet: gravel content increases.
G	131		
G	134		

125 130 135 140

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 156 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1531.10 E: 2450.01. (7) Top of PVC elevation = 403.40 feet. (8) Perched groundwater noted at 145.5 feet below grade on 8/1/2003 during well construction. Groundwater elevation = 157.88 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-26**
LOCATION	**Vashon Island, Washington**	PAGE	**8 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**393.7**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**270.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/6/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	140							**123.0 to 149.0 feet: SILTY SAND (SP-SM)**, continued. @ 140.0 to 149.0 feet: few fine to coarse subrounded to subangular gravel.
								@ 142.5 feet: no formation water during annular fill placement.
G	144							
SS	145	12 30 32	▽ 8/1/03	145				@ 145.0 feet: 0.3 feet recovered below coarse gravel fragment. Sample is SILTY SAND (SP-SM), dark grayish brown fines, fine, trace to few fines, wet.
								@ 147.0 to 149.0 feet: little gravel.
G	149							@ 149.0 feet: when drilled out to 149.0 feet and cased to 148.0 feet, insufficient flow to permit grab groundwater sample collection.
				150				**149.0 to 210.0 feet: CLAYEY SILT (ML) to CLAY (CL)**, brown gray to 156.0 feet, light gray to dark gray below 156.0 feet. Varved. Damp to dry. Grain size distributions show about 55% to 80% silt-sized fraction, 20% to 45% clay-sized fraction; tactile tests yield classification as CL per ASTM D-422. (LACUSTRINE DEPOSITS)
				155				
SS	156	55/18"						@ 156.0 feet: 1.2 feet recovered. CLAYEY SILT (CL), light gray and medium gray, trace clay, varved (laminae are <1 mm thick), stiff to very stiff, moderate plasticity, dry. Water added while drilling below 156.0 feet.
				160				@ 160.0 feet: stiff to very stiff.

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 156 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1531.10 E: 2450.01. (7) Top of PVC elevation = 403.40 feet. (8) Perched groundwater noted at 145.5 feet below grade on 8/1/2003 during well construction. Groundwater elevation = 157.88 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-26**
LOCATION	**Vashon Island, Washington**	PAGE	**9 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**393.7**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**270.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/6/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	160							**149.0 to 210.0 feet: CLAYEY SILT (ML) to CLAY (CL),** continued.
G	165			165				@ 165.0 feet: trace basalt coarse gravel or cobble, silt is stiff.
G	170			170				@ 170.0 feet: stiff to very stiff.
G	174			175				@ 174.0 feet: stiff to very stiff.
				180				

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 156 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1531.10 E: 2450.01. (7) Top of PVC elevation = 403.40 feet. (8) Perched groundwater noted at 145.5 feet below grade on 8/1/2003 during well construction. Groundwater elevation = 157.88 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-26
LOCATION	Vashon Island, Washington	PAGE	10 of 15
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	393.7
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	270.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/6/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
								149.0 to 210.0 feet: CLAYEY SILT (ML) to CLAY (CL), continued.
G	185			185				
G	190			190				
G	194							
G	195			195				
				200				

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 156 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1531.10 E: 2450.01. (7) Top of PVC elevation = 403.40 feet. (8) Perched groundwater noted at 145.5 feet below grade on 8/1/2003 during well construction. Groundwater elevation = 157.88 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-26**
LOCATION	**Vashon Island, Washington**	PAGE	**11 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**393.7**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**270.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/6/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
								149.0 to 210.0 feet: CLAYEY SILT (ML) to CLAY (CL), continued.
								@ 200.0 to 205.0 feet: no recovery, circulate at 205.0 feet, all cuttings are gray SILT (ML).
G	205			205				
G	209							
				210				@ 210.0 feet: rougher drilling.
G	211							**210.0 to 226.0 feet: GRAVEL (GP)**, gray fines, fine to medium, rounded, subrounded, and subangular, trace fines, trace to few cobbles, clast-supported. Occasional rounded flattened and oblate flattened clasts. Gradational basal contact. (FLUVIAL DEPOSITS)
								@ 214.0 feet: install additional air compressor.
G	215			215				
				220				

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 156 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1531.10 E: 2450.01. (7) Top of PVC elevation = 403.40 feet. (8) Perched groundwater noted at 145.5 feet below grade on 8/1/2003 during well construction. Groundwater elevation = 157.88 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-26
LOCATION	Vashon Island, Washington	PAGE	12 of 15
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	393.7
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	270.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/6/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
			210.0 to 226.0 feet: GRAVEL (GP), continued.
G	225		
			227.0 to 253.0 feet: GRAVEL (GW), brown-gray fines, fine to coarse, trace fines, little fine to medium sand, few cobbles. Drills with difficulty. (FLUVIAL DEPOSITS)
G	227		
G	234		
G	239		@ 239.0 to 241.0 feet: silty lens, few fines, gravels are subrounded to rounded (GP-GM), loose (drills easily).

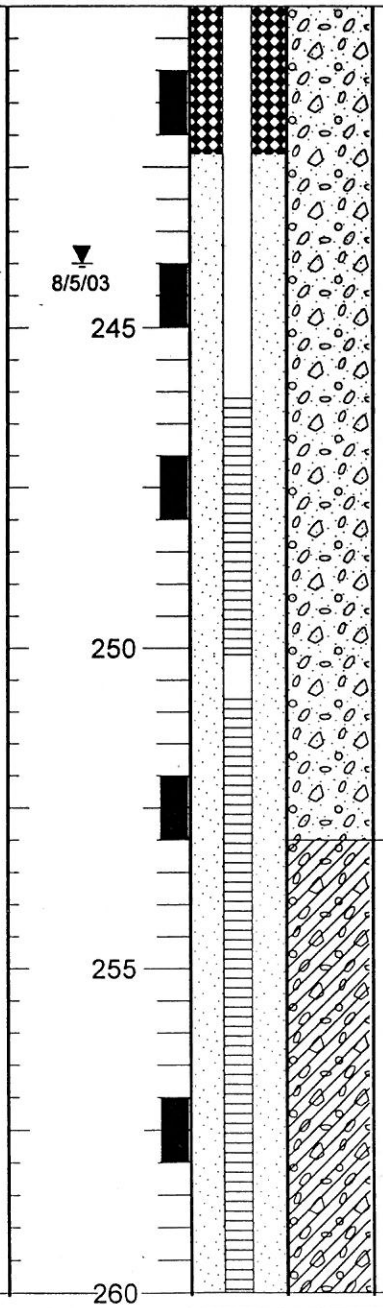
REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 156 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1531.10 E: 2450.01. (7) Top of PVC elevation = 403.40 feet. (8) Perched groundwater noted at 145.5 feet below grade on 8/1/2003 during well construction. Groundwater elevation = 157.88 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-26**
LOCATION	**Vashon Island, Washington**	PAGE	**13 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**393.7**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**270.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/6/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	241		**227.0 to 253.0 feet: GRAVEL (GW),** continued.
G	244		@ 244.0 feet: gravels mostly fine to medium, trace light gray fines, trace to few cobbles, clast supported, matrix medium to coarse sand.
G	247		
G	252		
G	257		**253.0 to 270.0 feet: CLAYEY GRAVEL (GC),** light gray fines, fine to coarse, subrounded to rounded, commonly flattened, few cobbles, trace boulders, some fines, little fine to medium sand. Drills relatively easily. (FLUVIAL DEPOSITS)



REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 156 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1531.10 E: 2450.01. (7) Top of PVC elevation = 403.40 feet. (8) Perched groundwater noted at 145.5 feet below grade on 8/1/2003 during well construction. Groundwater elevation = 157.88 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-26**
LOCATION	**Vashon Island, Washington**	PAGE	**14 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**393.7**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**270.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/6/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	263			265				**253.0 to 270.0 feet: CLAYEY GRAVEL (GC), continued.**
				270				Bottom of cased boring: 266.0 feet. Bottom of drilled boring: 270.0 feet.
				275				
				280				See Page 15 for Well Completion Details.

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 156 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1531.10 E: 2450.01. (7) Top of PVC elevation = 403.40 feet. (8) Perched groundwater noted at 145.5 feet below grade on 8/1/2003 during well construction. Groundwater elevation = 157.88 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-26**
LOCATION	**Vashon Island, Washington**	PAGE	**15 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**393.7**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**270.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/6/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
				285 290 295 300				**WELL COMPLETION DETAILS** +2.7 to 246.1 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank riser pipe. 246.1 to 250.1 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC screen with 0.020-inch machined slots and 0.25-inch spacers. 250.1 to 250.8 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank at joint between screen sections. 250.8 to 260.2 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC screen with 0.020-inch machined slots and 0.25-inch spacers. 260.2 to 260.8 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank casing with end cap. 245.0 to 246.0 feet: Stainless steel centralizer. 252.0 to 253.0 feet: Stainless steel centralizer. 259.5 to 260.5 feet: Stainless steel centralizer. 0 to 2.0 feet: Concrete. 2.0 to 242.3 feet: Pure Gold® bentonite chips. 242.3 to 263.7 feet: 16 x 30 Colorado™ silica sand. 263.7 to 267.4 feet: Pea gravel. 267.4 to 270.0 feet: Slough.

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 156 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1531.10 E: 2450.01. (7) Top of PVC elevation = 403.40 feet. (8) Perched groundwater noted at 145.5 feet below grade on 8/1/2003 during well construction. Groundwater elevation = 157.88 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-27**
LOCATION	**Vashon Island, Washington**	PAGE	**1 of 13**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**380.8**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**237.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/15/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
								0 to 0.4 foot: ASPHALT
								0.4 to 2.5 feet: SILTY GRAVEL (GW-GM), brown fines, subrounded to subangular, some fine to medium sand, few fines, moist. (ROAD SUBGRADE)
								2.5 to 7.0 feet: SILTY GRAVEL (GP-GM), brown fines, medium to coarse, subrounded to subangular, some fine to coarse sand, few fines, few cobbles, trace boulders, dry to moist. Trace wood debris, broken glass and plastic debris at 3.0 to 3.5 feet. (FILL)
G	4			5				
G	8			10				**7.0 to 11.0 feet: SILTY GRAVEL (GM)**, olive gray fines, fine to coarse, subrounded to subangular, some fines, little fine to medium sand, trace cobbles, moist. Gravel content decreases downhole, gradational basal contact. (TILL)
G	12			15				**11.0 to 27.0 feet: SILTY SAND (SM)**, olive gray fines, fine to medium, trace to few coarse, some nonplastic fines, some fine to medium gravel, trace coarse gravel, trace cobbles, moist. (TILL)
G	15			20				

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 115 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 905.52 E: 2333.31. (7) Top of PVC elevation = 383.06 feet. (8) Perched groundwater noted at 248.1 feet below grade on 8/14/2003. Groundwater elevation = 193.8 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-27**
LOCATION	**Vashon Island, Washington**	PAGE	**2 of 13**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**380.8**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**237.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/15/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	20		**11.0 to 27.0 feet: SILTY SAND (SM)**, continued.
			@ 23.0 feet: gravelly.
G	25		@ 25.0 to 28.0 feet: slight increase in moisture content.
			27.0 to 39.0 feet: SILTY SAND (SP-SM), yellow brown fines, fine to medium, subrounded to subangular, trace to few subrounded coarse sand and fine gravel, few fines, moist. Transitional to SP. Basal contact defined as where silt occurs disseminated within matrix. (FLUVIAL DEPOSITS)
G	30		
			@ 33.0 feet: smoother drilling. @ 33.0 to 39.0 feet: trace to few fine subrounded to subangular gravel, drilling action suggests gravel occurs in beds, occasional thin (<5 mm) brown sandy silt (ML) as beds, silt also occurs as thin coatings on gravels.
G	35		
			39.0 to 45.0 feet: SILTY SAND (SM), see description on next page.

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 115 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 905.52 E: 2333.31. (7) Top of PVC elevation = 383.06 feet. (8) Perched groundwater noted at 248.1 feet below grade on 8/14/2003. Groundwater elevation = 193.8 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-27
LOCATION	Vashon Island, Washington	PAGE	3 of 13
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	380.8
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	237.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/15/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	40		**39.0 to 45.0 feet: SILTY SAND (SM)**, yellow brown fines, fine to medium, trace coarse, some fines, some subrounded to subangular fine gravel, damp to moist. Gradational basal contact. (FLUVIAL DEPOSITS)
			@ 42.0 to 44.0 feet: few fine gravel.
G	45		**45.0 to 74.0 feet: SILTY SAND (SP-SM)**, yellow brown to grayish brown fines, fine to medium, trace coarse, trace to few fines (gradational to SP), little to some rounded, subrounded and subangular fine gravel at 45.0 feet, trace to few fine gravel below. Uncertain basal contact due to discharge hose failure. (FLUVIAL DEPOSITS)
G	50		
G	55		@ 55.0 feet: remove standard tri-cone drill bit, install sample-through bit.
			@ 59.0 feet: cobbles.

GROUND WATER LEVEL | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHO-LOGIC COLUMN

45

50

55

60

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 115 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 905.52 E: 2333.31. (7) Top of PVC elevation = 383.06 feet. (8) Perched groundwater noted at 248.1 feet below grade on 8/14/2003. Groundwater elevation = 193.8 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-27**
LOCATION	**Vashon Island, Washington**	PAGE	**4 of 13**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**380.8**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**237.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/15/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	60							**45.0 to 74.0 feet: SILTY SAND (SP-SM)**, continued. @ 60.0 to 76.0 feet: very easy drilling, very easy to drive casing, transitional to SP-SM, sand is fine with trace medium, trace fine to coarse subrounded to subangular gravel.
G	65			65				
G	70			70				
				75				**74.0 to 77.5 feet: SAND (SP)**, yellow brown fines, fine, trace fines, damp. (FLUVIAL DEPOSITS)
G	76							**77.5 to 87.0 feet: SAND (SP)**, yellow brown fines, fine with common interbeds of thin (<3 mm) gray silt (ML) beds, damp to moist, silt beds are soft, moderate plasticity, damp to moist. (FLUVIAL DEPOSITS)
				80				

REMARKS

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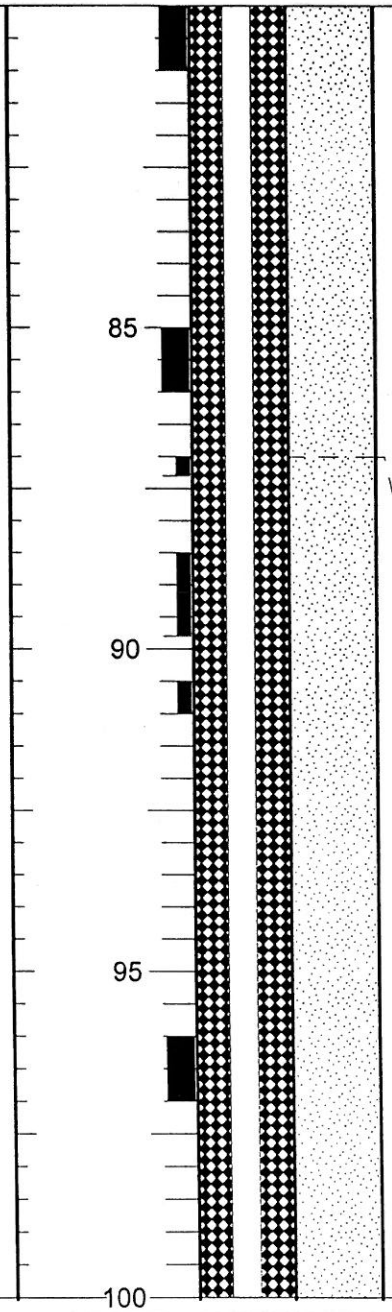
LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-27**
LOCATION	**Vashon Island, Washington**	PAGE	**5 of 13**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**380.8**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**237.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/15/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	80		**77.5 to 87.0 feet: SAND (SP)**, continued.
G	85		
SS	87	100/3"	@ 87.0 feet: no sample recovery, fragments of a quartzite cobble in sampler drive shoe. No silt beds observed in cuttings below 87.0 feet.
SS	88.5	35 40 50/4"	**87.0 to 102.0 feet: SAND (SP)**, yellow brown fines, fine, trace fines, damp. Grades to SILTY SAND (SM). (FLUVIAL DEPOSITS) @ 88.5 feet: 3-inch recovery, fragments of a quartzite cobble plus slough, no formation.
SS	90.5	100	@ 90.5 feet: SILTY SAND (SM), fine, little to some fines.
			@ 92.0 feet: color change to brown fines, moist (possible former perched saturated zone?).
G	96		



REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 115 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 905.52 E: 2333.31. (7) Top of PVC elevation = 383.06 feet. (8) Perched groundwater noted at 248.1 feet below grade on 8/14/2003. Groundwater elevation = 193.8 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-27**
LOCATION	**Vashon Island, Washington**	PAGE	**6 of 13**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**380.8**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**237.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/15/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	100		**87.0 to 102.0 feet: SAND (SP)**, continued. @ 100.0 feet: common orange-brown coatings on sand grains, moist.
G	102		**102.0 to 106.0 feet: SAND (SP)**, brown-orange fines, fine, trace medium to coarse, trace fine gravel, one gravel clast has red-orange stains, moist, with common beds of brown-gray silt (ML), silt is soft, moist, with moderate plasticity. Casing sinks freely from 104.0 to 106.0 feet. (FLUVIAL DEPOSITS)
SS	106	50	**106.0 to 118.0 feet: SILT (ML)**, brownish gray at upper contact, gray below, trace to some fine sand, soft at upper contact to slightly stiff below, moist, nonplastic to low plasticity. (LACUSTRINE DEPOSITS) @ 108.0 to 113.0 feet: poor sample recovery.
SS		50	@ 113.0 feet: no sample recovery.
SS	113.5	100/4"	@ 113.5 feet: 100 percent recovery. SANDY SILT (ML), gray, some fine sand, trace fine gravel, slightly stiff, moderate to low plasticity, moist. @ 115.0 feet: add water during drilling.
G	116		
SS	117	NR	@ 117.0 feet: gray very fine SANDY SILT (ML), soft, moderate plasticity, some very fine sand, moist to saturated (apparent capillary saturation).
			118.0 to 135.0 feet: SILT (ML), gray, soft to stiff. (LACUSTRINE DEPOSITS)

105 110 115 120

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-27**
LOCATION	**Vashon Island, Washington**	PAGE	**7 of 13**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**380.8**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**237.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/15/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	120		**118.0 to 135.0 feet: SILT (ML),** continued.
G	122		
G	124		@ 124.0 feet: trace subangular black (basalt) fine gravel, trace brown laminated silt (ML).
SS	126	100	@ 126.0 feet: no sample recovery. Install secondary air compressor to facilitate sample recovery.
SS	130.5	99/18"	
G	134		@ 132.7 feet: depth to water measured during placement of annular backfill with 8-inch steel casing drive shoe at 134.1 below grade, 08/14/03. Borehole caved to 0.3 feet below drive shoe.
SS	137	10 30 50/5"	**135.0 to 140.0 feet: SAND (SP),** gray fines, fine, few fines. (FLUVIAL/LACUSTRINE DEPOSITS) @ 137.0 feet: 3-inch recovery, SAND (SP), gray fines, fine, trace to few fines. No apparent bedding structures. Based on water levels measured during annular fill placement, sample was likely disturbed by heaving.

GROUND WATER LEVEL: ▽ 8/14/03

DEPTH IN FEET: 125, 130, 135, 140

SAMPLES / WELL DETAILS / LITHOLOGIC COLUMN

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 115 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 905.52 E: 2333.31. (7) Top of PVC elevation = 383.06 feet. (8) Perched groundwater noted at 248.1 feet below grade on 8/14/2003. Groundwater elevation = 193.8 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-27
LOCATION	Vashon Island, Washington	PAGE	8 of 13
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	380.8
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	237.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/15/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	140							**140.0 to 150.0 feet: SILT (ML)**, gray, very stiff to hard. Trace organic material at 140.0 feet, absent below. (LACUSTRINE DEPOSITS)
G	145			145				
G	148							
				150				**150.0 to 156.0 feet: SILTY GRAVEL (GM)**, yellow-brown fines, fine to medium, subrounded to subangular, matrix-supported, matrix is laminated gray clayey silt (CL) with yellow-brown staining adjacent to gravels. (FLUVIAL/LACUSTRINE DEPOSITS)
G	152							
				155				
G	156							**156.0 to 164.0 feet: SILT (ML)**, gray, trace clay, very stiff to hard. (LACUSTRINE DEPOSITS)
				160				

REMARKS

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UDALOY ENVIRONMENTAL SERVICES

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-27
LOCATION	Vashon Island, Washington	PAGE	9 of 13
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	380.8
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	237.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/15/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	160							**156.0 to 164.0 feet: SILT (ML)**, continued.
G	165			165				**164.0 to 174.0 feet: SILTY GRAVEL (GP-GM)**, brown-gray fines, medium to coarse, subrounded to subangular, some fine to medium sand, few to little fines (a portion of the fines may be carry-down). (FLUVIAL DEPOSITS)
G	169			170				
G	172							
G	175			175				**174.0 to 190.0 feet: GRAVELLY SAND (SP)**, brown fines, fine to medium, trace fines, some fine to coarse gravel, trace cobbles, drills easily. (FLUVIAL DEPOSITS)
				180				

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-27
LOCATION	Vashon Island, Washington	PAGE	10 of 13
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	380.8
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	237.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/15/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
								174.0 to 190.0 feet: GRAVELLY SAND (SP), continued.
G	181.5							
G	185			185				@ 185.0 feet: ½-inch-thick by 3-inch-diameter disc of PEAT, brown.
			▼ 10/14/03					
				190				**190.0 to 197.0 feet: SAND (SP)**, yellow brown fines, medium to coarse, subrounded to angular, few fines at upper contact (SP-SM), trace fines below, few fine to medium gravel, transitional to SW. Gradational basal contact. (FLUVIAL DEPOSITS)
G	191							
G	195			195				**197.0 to 211.0 feet: SILTY GRAVEL (GW-GM)**, yellow gray fines, fine to coarse, subrounded to subangular, few fines, little fine to coarse sand. (FLUVIAL DEPOSITS)
				200				

REMARKS

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UDALOY ENVIRONMENTAL SERVICES

? TD=237' elevation 132.7 ft bgs

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-27
LOCATION	Vashon Island, Washington	PAGE	11 of 13
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	380.8
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	237.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/15/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	200							**197.0 to 211.0 feet: SILTY GRAVEL (GW-GM),** continued.
G	205			205				
G	209			210				**211.0 to 214.0 feet: SILTY GRAVEL (GM),** yellow brown fines, medium to coarse, subrounded to subangular, some fines, continuous with and basal unit of overlying GP-GM. (FLUVIAL DEPOSITS)
G	213							**214.0 to 217.0 feet: SILTY SAND (SM),** gray fines with black sand grains, very fine to fine, some fines, smooth drilling, uncertain basal contact. (FLUVIAL DEPOSITS)
G	215			215				$i_z = \frac{190.2 - 186.5}{217 - 193} = 0.15$
								@ 217.0 feet: with drive shoe at 217.0 feet, static water depth is 190.2 feet after 30 minutes.
								217.0 to 227.0 feet: GRAVEL (GP), gray brown fines (fine to medium, rounded to subrounded, some fine to medium sand, trace fines. Transitional to GP-GM. (FLUVIAL DEPOSITS)
				220				

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-27
LOCATION	Vashon Island, Washington	PAGE	12 of 13
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	380.8
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	237.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/15/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	221							**217.0 to 227.0 feet: GRAVEL (GP)**, continued.
G	224			225				$i_z = \frac{205.8 - 190.2}{227 - 217} = 1.56$
								@ 227.0 feet: with drive shoe at 227.0 feet, depth to water is 205.8 feet after 30 minutes, rising very slowly after 30 minutes. ~Elev 175'
G	228							**227.0 to 237.0 feet: SILTY GRAVEL (GM)**, gray fines, medium to coarse, subrounded to subangular, some fines, few to little fine to medium sand, trace cobbles. Easy drilling. (FLUVIAL DEPOSITS)
				230				
G	232							
				235				
G	236							
								Total depth drilled and sampled = 237.0 feet.
								See Page 13 for Well Completion Details.
				240				

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 115 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 905.52 E: 2333.31. (7) Top of PVC elevation = 383.06 feet. (8) Perched groundwater noted at 248.1 feet below grade on 8/14/2003. Groundwater elevation = 193.8 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-27**
LOCATION	**Vashon Island, Washington**	PAGE	**13 of 13**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**380.8**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**237.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/15/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION

245

250

255

260

WELL COMPLETION DETAILS

+2.3 to 186.5 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank riser pipe.

186.5 to 190.6 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC screen with 0.020-inch machined slots and 0.25-inch spacers.

190.6 to 191.4 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank casing at joint between screen sections.

191.4 to 200.7 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC screen with 0.020-inch machined slots and 0.25-inch spacers.

200.7 to 201.3 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank casing and end plug.

185.0 to 186.0 feet: Stainless steel centralizer.
192.0 to 193.0 feet: Stainless steel centralizer.
200.0 to 201.0 feet: Stainless steel centralizer.

0 to 2.0 feet: Concrete.
2.0 to 134.0 feet: Baroid® 3/4-inch bentonite chips.
134.0 to 141.0 feet: Slough.
141.0 to 183.5 feet: Baroid® 3/4-inch bentonite chips.
183.5 to 203.5 feet: Norton™ 16 x 30 silica sand.
203.5 to 237.0 feet: Pea gravel.

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 115 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 905.52 E: 2333.31. (7) Top of PVC elevation = 383.06 feet. (8) Perched groundwater noted at 248.1 feet below grade on 8/14/2003. Groundwater elevation = 193.8 feet on 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-28
LOCATION	Vashon Island, Washington	PAGE	1 of 15
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	393.5
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	277.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	2		**0 to 5.5 feet: SILTY GRAVEL (GM)**, yellow brown fines, fine to coarse, subrounded to subangular, some fines, few to little fine to coarse sand, damp to dry. Very dense to 3.0 feet, dense compacted below 3.0 feet. Trace cobbles, trace boulders, trace organic material. (FILL)
G	3.5		
			@ 4.5 to 5.0 feet: SAND (SP), brown fines, fine to medium, telephone utility conduit bedding.
G	6		**5.5 to 14.0 feet: SILTY SAND (SM)**, yellow brown fines, fine to medium, some fines, some fine to medium subrounded to subangular gravel, damp. Very difficult drilling. (TILL)
G	10		
G	14		**14.0 to 33.5 feet: SILTY SAND (SM)**, gray brown fines, fine to medium, some fines, few fine to medium subrounded to subangular gravel, trace cobbles, trace boulders, damp. Difficult drilling. (TILL)
			@ 18.0 feet: cobble or boulder.

5
10
15
20

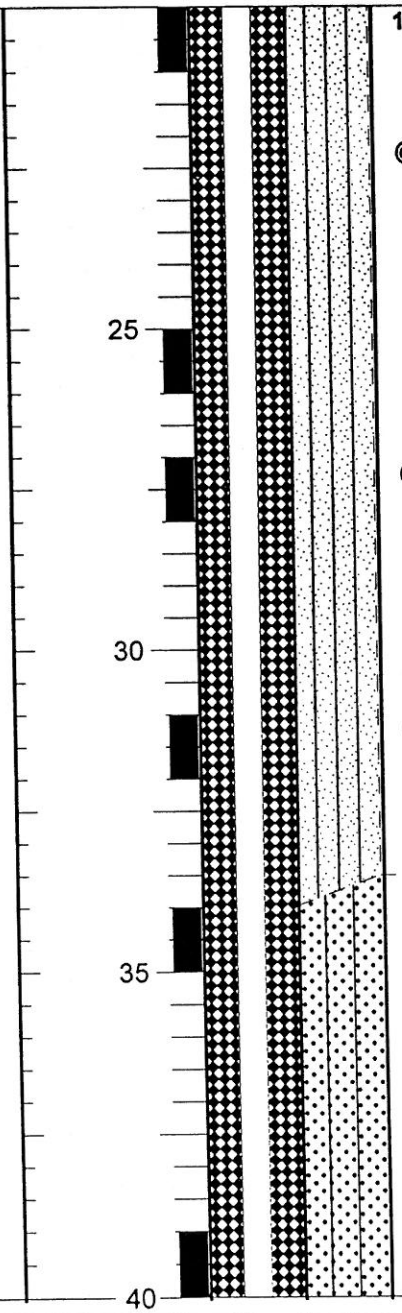
REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 155 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1608.67 E: 2654.33. (7) Top of PVC elevation = 395.59 feet. (8) Perched groundwater noted at 131.4 feet below grade on 8/26/2003. No groundwater in well as of 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-28**
LOCATION	**Vashon Island, Washington**	PAGE	**2 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**393.5**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**277.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/29/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	20		**14.0 to 35.5 feet: SILTY SAND (SM)**, continued.
			@ 22.0 to 24.0 feet: cobbles or boulders.
G	25		
G	27		@ 27.0 feet: little fine to medium gravel, little coarse sand.
G	31		@ 31.0 feet: moist.
G	34		**33.5 to 40.0 feet: SILTY SAND (SW-SM)**, yellow brown fines, subrounded to subangular, trace to few fines, few fine to medium subrounded to subangular gravel, silt occurs both disseminated in matrix and as coatings on fine gravel. Uncertain basal contact. (FLUVIAL DEPOSITS)
G	39		



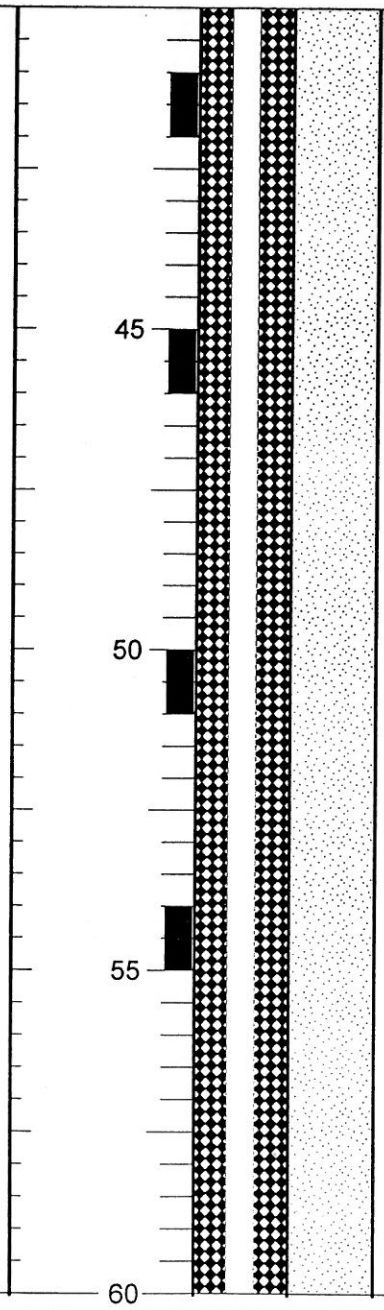
REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 155 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1608.67 E: 2654.33. (7) Top of PVC elevation = 395.59 feet. (8) Perched groundwater noted at 131.4 feet below grade on 8/26/2003. No groundwater in well as of 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-28
LOCATION	Vashon Island, Washington	PAGE	3 of 15
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	393.5
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	277.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	41		**40.0 to 96.5 feet: SAND (SP)**, yellow brown fines, fine, trace coarse, trace fines, few medium to coarse rounded to subrounded gravel, moist. Easy drilling, casing falls freely behind drill bit. (FLUVIAL DEPOSITS)
G	45		
G	50		@ 50.0 feet: trace fines as very thin coatings on coarse sand and fine gravel.
G	54		@ 54.0 feet: damp to moist, trace to few fines (gradational to SP-SM).
			@ 55.0 feet: remove standard tri-cone drill bit, install sample-through drill bit.



REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 155 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1608.67 E: 2654.33. (7) Top of PVC elevation = 395.59 feet. (8) Perched groundwater noted at 131.4 feet below grade on 8/26/2003. No groundwater in well as of 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-28**
LOCATION	**Vashon Island, Washington**	PAGE	**4 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**393.5**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**277.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/29/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
								40.0 to 96.5 feet: SAND (SP), continued.
								@ 60.0 to 66.0 feet: no sample recovery until 66.0 feet.
				65				
G	67							
				70				
G	70							
								@ 74.0 feet: poor sample recovery.
				75				
								@ 76.0 feet: install secondary air compressor to facilitate sample recovery.
G	78							
				80				

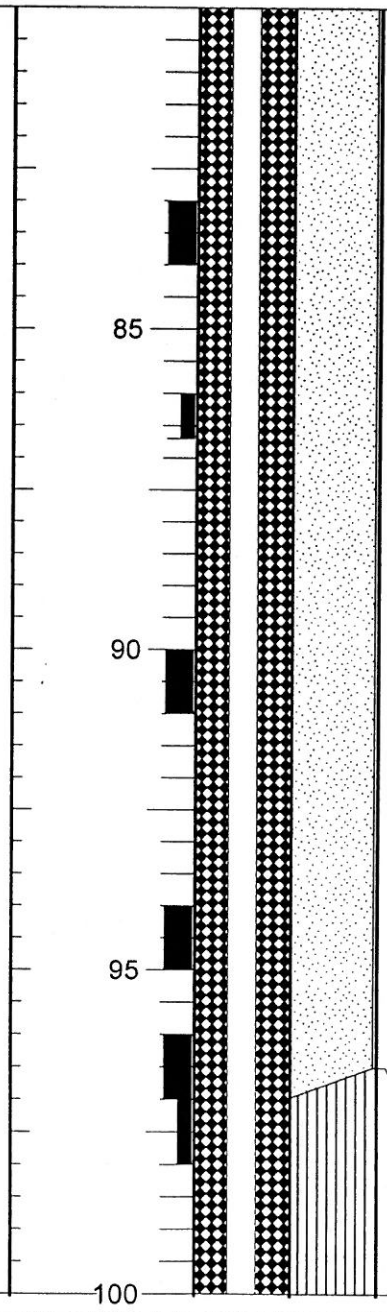
REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 155 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1608.67 E: 2654.33. (7) Top of PVC elevation = 395.59 feet. (8) Perched groundwater noted at 131.4 feet below grade on 8/26/2003. No groundwater in well as of 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-28**
LOCATION	**Vashon Island, Washington**	PAGE	**5 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**393.5**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**277.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/29/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
			40.0 to 96.5 feet: SAND (SP), continued.
G	83		
SS	86	30 50/2"	@ 86.0 feet: 100 percent recovery, SAND (SP), fine, trace to few fines, subangular, damp, granite gravel fragment in drive shoe (gravel is likely carry-down).
G	90		@ 90.0 feet: few fines (gradational to SP-SM).
G	94		
G	96		@ 96.0 feet: trace fine rounded to subrounded gravel, including flattened oblate clasts, few fines, damp.
SS	97	100/12"	**96.5 to 100.0 feet: SILT (ML)**, gray at upper contact, olive brown below, trace to few clay, damp, stiff, micaceous, laminated. (FLUVIAL DEPOSITS) @ 97.0 feet: 100 percent recovery. Includes bed of wet fine SANDY SILT (ML), plus orange staining as subvertical tubular structures (rootlets?).



REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 155 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1608.67 E: 2654.33. (7) Top of PVC elevation = 395.59 feet. (8) Perched groundwater noted at 131.4 feet below grade on 8/26/2003. No groundwater in well as of 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-28**
LOCATION	**Vashon Island, Washington**	PAGE	**6 of 15**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**393.5**
DRILL METHOD	**Dual Rotary, Foremost DR24**	TOTAL DEPTH	**277.0'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/29/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	101							**100.0 to 103.0 feet: SILTY GRAVEL (GW-GM)**, gray brown fines, subrounded, some fine to medium sand, few to little fines, damp. Silt occurs as thin coatings on gravels and in matrix. Clast supported. (FLUVIAL DEPOSITS)
								103.0 to 138.0 feet: SAND (SP), gray brown fines, fine, trace medium to coarse rounded to subrounded gravel, trace fines, trace cobbles, damp. Drills easily. (FLUVIAL DEPOSITS)
G	105			105				@ 105.0 to 110.0 feet: trace subangular to angular medium and coarse sand, trace subrounded flattened fine gravel.
G	110			110				
G	115			115				@ 116.0 feet: trace coarse gravel (may be carry-down), trace cobbles.
				120				

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 155 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1608.67 E: 2654.33. (7) Top of PVC elevation = 395.59 feet. (8) Perched groundwater noted at 131.4 feet below grade on 8/26/2003. No groundwater in well as of 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-28
LOCATION	Vashon Island, Washington	PAGE	7 of 15
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	393.5
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	277.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	120		**103.0 to 138.0 feet: SAND (SP)**, continued. @ 120.0 feet: few fine to medium gravel, trace cobbles.
G	122		@ 122.0 feet: few coarse sand and fine gravel.
G	125		
G	127		@ 127.0 feet: trace cobbles.
			▽ 8/26/03
G	132		@ 131.0 feet: color change to yellow brown fines. Perched water depth: 131.4 feet on 8/26/03 with boring cased to 136.0 feet and drilled to 138.0 feet. Wet below 131.4 feet.
			@ 134.0 feet: grab water sample quality: brown, turbid, opaque, odorless, no sheen, pH = 6.65, specific conductance = 116 µS/cm, temperature = 17°C.
G	136		@ 136.0 to 138.0 feet: thin (1 mm) gray beds of SILTY SAND (SM or SP-SM).
SS	138	15 15 30/2"	**138.0 to 194.0 feet: SILT (ML)**, gray, trace clay, stiff to very stiff to 154.0 feet, very stiff to hard below, wet near upper contact, dry to damp below 142.0 feet. Description continued on next page.
G	139.5		

125 130 135 140

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-28
LOCATION	Vashon Island, Washington	PAGE	8 of 15
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	393.5
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	277.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
								138.0 to 194.0 feet: SILT (ML), continued: Laminated. Occasional layers with trace very fine sand. (LACUSTRINE DEPOSITS)
								@ 138.0 feet: 8-inch recovery. Gray fine to medium SAND (SP) overlying 1-inch gray SILT (ML) with orange stains on upper contact, overlying ½-inch fine gray SAND (SP), overlying gray fine SANDY SILT (ML), and SILTY SAND (SM), wet.
G	143							
				145				
G	149							
				150				
G	154							
				155				@ 155.0 feet: add water during drilling.
G	156							
				160				

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 155 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1608.67 E: 2654.33. (7) Top of PVC elevation = 395.59 feet. (8) Perched groundwater noted at 131.4 feet below grade on 8/26/2003. No groundwater in well as of 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-28
LOCATION	Vashon Island, Washington	PAGE	9 of 15
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	393.5
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	277.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	160							**138.0 to 194.0 feet: SILT (ML), continued.**
G	164			165				@ 164.0 feet: one clast of subrounded coarse basalt gravel.
G	168			170				
G	173			175				
G	177							
G	179			180				

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 155 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1608.67 E: 2654.33. (7) Top of PVC elevation = 395.59 feet. (8) Perched groundwater noted at 131.4 feet below grade on 8/26/2003. No groundwater in well as of 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-28
LOCATION	Vashon Island, Washington	PAGE	10 of 15
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	393.5
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	277.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
								138.0 to 194.0 feet: SILT (ML), continued.
G	183							
				185				
G	188							
				190				
G	192							
G	194							**194.0 to 200.0 feet: SILTY SAND (SM)**, gray fines, fine to medium, some fines, little fine to medium subrounded to subangular gravel. (LACUSTRINE/FLUVIAL DEPOSITS)
				195				@ 195.0 to 203.0 feet: no water added during drilling.
G	198							
				200				

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 155 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1608.67 E: 2654.33. (7) Top of PVC elevation = 395.59 feet. (8) Perched groundwater noted at 131.4 feet below grade on 8/26/2003. No groundwater in well as of 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-28
LOCATION	Vashon Island, Washington	PAGE	11 of 15
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	393.5
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	277.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	202							**200 to 203.0 feet: SILT (ML)**, gray, gravels absent. (LACUSTRINE/FLUVIAL DEPOSITS)
								@ 203.0 feet: resume adding water during drilling.
G	205			205				**203.0 to 226.0 feet: SILTY SAND (SP-SM)**, gray fines, fine to medium, some fine to coarse subrounded to subangular gravel, trace cobbles. Drills easily. (FLUVIAL DEPOSITS)
G	208			210				
G	213			215				
				220				

REMARKS

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UDALOY ENVIRONMENTAL SERVICES

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-28
LOCATION	Vashon Island, Washington	PAGE	12 of 15
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	393.5
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	277.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	DEPTH IN FEET	LITHOLOGIC DESCRIPTION
G	220			**203.0 to 226.0 feet: SILTY SAND (SP-SM)**, continued.
G	223			@ 223.0 feet: fine to coarse sand (SW-SM). Note that fines will be underestimated in sample submitted for grain size analysis due to drilling water flow.
			225	
				226.0 to 232.0 feet: SILTY GRAVEL (GW-GM), gray fines, fine to coarse, subrounded to subangular, some fine to coarse sand, trace to few fines. Transitional to GW. (FLUVIAL DEPOSITS)
G	230		230	@ 230.0 feet: with boring drilled and cased at 231.5 feet, no formation water in casing. With casing pulled back to 230.0 feet and open to 231.5 feet, no formation water.
				232.0 to 260.0 feet: SILT (ML), dark gray and light gray, trace to few clay, very stiff to very hard, dry to damp, laminated. (LACUSTRINE DEPOSITS)
G	234			
SS	235	15 30	235	@ 235.0 feet: no recovery except trace of hard gray SILT (ML).
G	238			
			240	

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-28
LOCATION	Vashon Island, Washington	PAGE	13 of 15
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	393.5
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	277.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
			232.0 to 260.0 feet: SILT (ML), continued.
G	241		
G	244		
			245
G	246		
SS		50	@ 247.0 feet: no sample recovery, only slough.
G	248		
SS	249	100/8"	@ 249.0 feet: SILT (ML), dark gray, hard, no varves or bedding structures.
			250
G	254		
			255
G	257		
			260
			@ 260.0 feet: rough drilling.

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 155 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1608.67 E: 2654.33. (7) Top of PVC elevation = 395.59 feet. (8) Perched groundwater noted at 131.4 feet below grade on 8/26/2003. No groundwater in well as of 10/14/2003.

UDALOY ENVIRONMENTAL SERVICES

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-28
LOCATION	Vashon Island, Washington	PAGE	14 of 15
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	393.5
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	277.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	260							**260.0 to 277.0 feet: SILTY GRAVEL (GW-GM)**, gray fines, rounded, subrounded and subangular, few fines, little fine to coarse sand, trace cobbles, trace boulders, dry to damp. Transitional to GP-GM, medium to coarse. (FLUVIAL DEPOSITS)
G	262							
				265				
G	266							
				270				
G	270							
G	274							
				275				@ 275.0 feet: with boring cased to 275.0 feet and drilled to 277.0 feet, no formation water. After pulling casing back to 272.0 feet, no formation water after standing for 2.5 hours.
								Total depth drilled and sampled = 277.0 feet.
								See Page 15 for Well Completion Details.
				280				

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 155 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1608.67 E: 2654.33. (7) Top of PVC elevation = 395.59 feet. (8) Perched groundwater noted at 131.4 feet below grade on 8/26/2003. No groundwater in well as of 10/14/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-28
LOCATION	Vashon Island, Washington	PAGE	15 of 15
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	393.5
DRILL METHOD	Dual Rotary, Foremost DR24	TOTAL DEPTH	277.0'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION

285

290

295

300

WELL COMPLETION DETAILS

+2.1 to 219.6 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank riser pipe.

219.6 to 223.7 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC screen with 0.020-inch machined slots and 0.25-inch spacers.

223.7 to 224.5 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank casing at joint between screen sections.

224.5 to 234.0 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC screen with 0.020-inch machined slots and 0.25-inch spacers.

234.0 to 234.4 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank casing and end plug.

218.5 to 219.5 feet: Stainless steel centralizer.
224.3 to 225.0 feet: Stainless steel centralizer.
233.2 to 234.2 feet: Stainless steel centralizer.

0 to 2.0 feet: Concrete.
2.0 to 216.5 feet: Baroid® 3/4-inch bentonite chips.
216.5 to 235.8 feet: Norton ™ 16 x 30 silica sand.
235.8 to 277.0 feet: Baroid® 3/4-inch bentonite chips.

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 155 feet. (4) Standard tri-cone bit used to 55 feet depth, sample-through bit used below 55 feet. (5) Reference elevation = ground surface. (6) N: 1608.67 E: 2654.33. (7) Top of PVC elevation = 395.59 feet. (8) Perched groundwater noted at 131.4 feet below grade on 8/26/2003. No groundwater in well as of 10/14/2003.

UDALOY ENVIRONMENTAL SERVICES

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-29
LOCATION	Vashon Island, Washington	PAGE	1 of 14
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	408.00
DRILL METHOD	Dual Rotary	TOTAL DEPTH	261.5'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	2			5				**0 to 5.5 feet: SANDY SILT (ML)**, olive brown to yellow brown, nonplastic, few fine to medium sand, little fine to coarse subrounded to subangular gravel, trace cobbles, compacted, dry. (FILL and WEATHERED TILL)
G	5							**5.5 to 56.5 feet: SANDY SILT (ML)**, olive gray, nonplastic, some fine to medium sand, few medium to coarse subrounded to subangular gravel, trace cobbles, dry to damp, slow drill rate. (TILL)
G	6							
				10				@ below 9.0 feet: olive brown color.
G	10							
				15				
G	15							@ 19.0 feet: little gravel.
				20				

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 138 feet. (4) Standard tri-cone bit used to 57 feet depth, sample-through bit used below 57 feet. (5) Reference elevation = ground surface. (6) N: 1451.61 E: 2917.03. (7) Top of PVC elevation = 410.57 feet. (8) Perched groundwater noted at 133.2 feet below grade on 8/25/2003 during well construction. Regional groundwater elevation = 164.60 feet on 8/29/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-29
LOCATION	Vashon Island, Washington	PAGE	2 of 14
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	408.00
DRILL METHOD	Dual Rotary	TOTAL DEPTH	261.5'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	20		**5.5 to 56.5 feet: SANDY SILT (ML)**, continued.
G	25		
G	30		
G	34		
G	36		@ 35.0 to 36.0 feet: boulder.

GROUND WATER LEVEL | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHO-LOGIC COLUMN

25
30
35
40

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 138 feet. (4) Standard tri-cone bit used to 57 feet depth, sample-through bit used below 57 feet. (5) Reference elevation = ground surface. (6) N: 1451.61 E: 2917.03. (7) Top of PVC elevation = 410.57 feet. (8) Perched groundwater noted at 133.2 feet below grade on 8/25/2003 during well construction. Regional groundwater elevation = 164.60 feet on 8/29/2003.

UDALOY ENVIRONMENTAL SERVICES

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-29
LOCATION	Vashon Island, Washington	PAGE	3 of 14
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	408.00
DRILL METHOD	Dual Rotary	TOTAL DEPTH	261.5'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	44			45				**5.5 to 56.5 feet: SANDY SILT (ML)**, continued.
G	48			50				
G	53			55				
G	57			60				**56.5 to 59.0 feet: SILTY SAND (SW-SM)**, olive brown to yellow brown fines, fine to coarse, subrounded to subangular, few fines, little fine subrounded to subangular gravel, moist. (FLUVIAL DEPOSITS)
								59.0 to 113.0 feet: SAND (SP), yellow brown, fine, few medium, trace coarse, trace fines, trace fine to medium

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 138 feet. (4) Standard tri-cone bit used to 57 feet depth, sample-through bit used below 57 feet. (5) Reference elevation = ground surface. (6) N: 1451.61 E: 2917.03. (7) Top of PVC elevation = 410.57 feet. (8) Perched groundwater noted at 133.2 feet below grade on 8/25/2003 during well construction. Regional groundwater elevation = 164.60 feet on 8/29/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-29
LOCATION	Vashon Island, Washington	PAGE	4 of 14
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	408.00
DRILL METHOD	Dual Rotary	TOTAL DEPTH	261.5'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
								subrounded to subangular gravel, moist. (FLUVIAL DEPOSITS)
G	63			65				
G	68			70				
G	72			75				@ 72.0 feet: yellow gray color, cuttings appear saturated but as if only capillary saturation.
G	76			80				@ 75.0 to 77.0 feet: SILTY SAND (SW-SM), few fine to medium subrounded to subangular gravel, no water enters boring although cuttings appear saturated.

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 138 feet. (4) Standard tri-cone bit used to 57 feet depth, sample-through bit used below 57 feet. (5) Reference elevation = ground surface. (6) N: 1451.61 E: 2917.03. (7) Top of PVC elevation = 410.57 feet. (8) Perched groundwater noted at 133.2 feet below grade on 8/25/2003 during well construction. Regional groundwater elevation = 164.60 feet on 8/29/2003.

UDALOY ENVIRONMENTAL SERVICES

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-29
LOCATION	Vashon Island, Washington	PAGE	5 of 14
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	408.00
DRILL METHOD	Dual Rotary	TOTAL DEPTH	261.5'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	80			85				**59.0 to 113.0 feet: SAND (SP)**, continued. @ 80.0 feet: some fine to medium gravel.
G	88			90				
G	92			95				@ 92.0 feet: trace to few fines. @ 93.0 to 95.0 feet: thin (<5 mm) beds of SILTY SAND (SP-SM or SM).
G	95			100				

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-29
LOCATION	Vashon Island, Washington	PAGE	6 of 14
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	408.00
DRILL METHOD	Dual Rotary	TOTAL DEPTH	261.5'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	100							**59.0 to 113.0 feet: SAND (SP)**, continued.
G	105			105				
G	109			110				
G	111							@ 111.0 to 113.0 feet: no water enters boring, cuttings are moist (not saturated).
G	114			115				**113.0 to 122.0 feet: SANDY SILT (ML)**, yellow brown to dark olive brown, some very fine to fine sand, soft, moist to wet, micaceous. (LACUSTRINE DEPOSITS)
				120				

REMARKS

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UDALOY ENVIRONMENTAL SERVICES

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-29
LOCATION	Vashon Island, Washington	PAGE	9 of 14
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	408.00
DRILL METHOD	Dual Rotary	TOTAL DEPTH	261.5'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	160		**154.0 to 176.0 feet: SILTY SAND (SP-SM)**, continued. @ 160.0 feet: trace to few medium to coarse gravel, few fines.
			165
G	166		
SS	168	40 50/5"	@ 168.0 feet: 0.5 foot recovery of SP, fine, below fragment of weathered granite cobble.
			170
G	172		@ 172.0 feet: sand is medium to coarse, with trace to few fine to medium subrounded gravel.
			@ 174.0 feet: water enters borehole during placement of annular backfill on 8/27/03.
			175
G	175		@ 175.0 feet: sand is fine to medium, with trace to few fine to coarse subrounded gravel.
			176.0 to 206.0 feet: CLAYEY SILT (ML), light gray to dark gray, stiff to very hard, dry, varved. Transitional to silty clay (CL). (LACUSTRINE DEPOSITS)
G	177		
			180

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 138 feet. (4) Standard tri-cone bit used to 57 feet depth, sample-through bit used below 57 feet. (5) Reference elevation = ground surface. (6) N: 1451.61 E: 2917.03. (7) Top of PVC elevation = 410.57 feet. (8) Perched groundwater noted at 133.2 feet below grade on 8/25/2003 during well construction. Regional groundwater elevation = 164.60 feet on 8/29/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-29
LOCATION	Vashon Island, Washington	PAGE	10 of 14
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	408.00
DRILL METHOD	Dual Rotary	TOTAL DEPTH	261.5'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
			176.0 to 206.0 feet: SILT (ML), continued.
G	181		
G	185		
G	188		
SS	189.5	20 20 40	@ 189.5 feet: varves are 2 to 5 mm thick, with few-grain-thick layers of fine sand at 2 cm intervals, includes one 17-mm x 2-mm-thick flattened oval fine gravel (dropstone?), dry, stiff to hard.
G	194		@ 194.0 feet: dry hard chips of varved silt.
G	196.5		@ 196.5 feet: dry, hard chips of varved silt.

GROUND WATER LEVEL | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHO-LOGIC COLUMN

185

190

195

200

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 138 feet. (4) Standard tri-cone bit used to 57 feet depth, sample-through bit used below 57 feet. (5) Reference elevation = ground surface. (6) N: 1451.61 E: 2917.03. (7) Top of PVC elevation = 410.57 feet. (8) Perched groundwater noted at 133.2 feet below grade on 8/25/2003 during well construction. Regional groundwater elevation = 164.60 feet on 8/29/2003.

UDALOY ENVIRONMENTAL SERVICES

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-29
LOCATION	Vashon Island, Washington	PAGE	11 of 14
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	408.00
DRILL METHOD	Dual Rotary	TOTAL DEPTH	261.5'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	200							**176.0 to 206.0 feet: SILT (ML)**, continued.
G	205			205				
								206.0 to 221.0 feet: GRAVELLY SANDY SILT (ML), dark gray to medium gray, low to moderate plasticity, soft, some fine to medium sand, few to little medium to coarse subrounded to subangular gravel, trace cobbles, matrix supported. (FLUVIAL DEPOSITS)
G	209			210				
G	213			215				
SS	215.5							@ 215.5 feet: 0.55 foot recovered, dark gray, thin (2 mm) laminae of very fine to fine SANDY SILT.
G	218			220				

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-29
LOCATION	Vashon Island, Washington	PAGE	12 of 14
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	408.00
DRILL METHOD	Dual Rotary	TOTAL DEPTH	261.5'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	220							**206.0 to 221.0 feet: GRAVELLY SANDY SILT (ML),** continued.
				225				**221.0 to 231.0 feet: SAND (SP),** gray fines, very fine to fine, trace fines, trace thin (1- to 2-mm thick) gray silt beds. (FLUVIAL DEPOSITS)
G	226							
G	230			230				
G	232							**231.0 to 238.0 feet: GRAVELLY SANDY SILT (ML),** light gray, some fine to medium sand, few coarse sand, some medium to coarse rounded, subrounded, and subangular gravel, trace to few cobbles, transitional to SILTY GRAVEL (GM). Poor sample recovery - circulated at 237.0 feet and logged composite sample.
				235				
				240				**238.0 to 260.0 feet: SANDY GRAVEL (GW),** grayish brown to 242.0 feet, gray below 242.0 feet, medium to coarse, rounded, subrounded, and subangular, trace to few fines, some fine to coarse sand, trace to few

REMARKS

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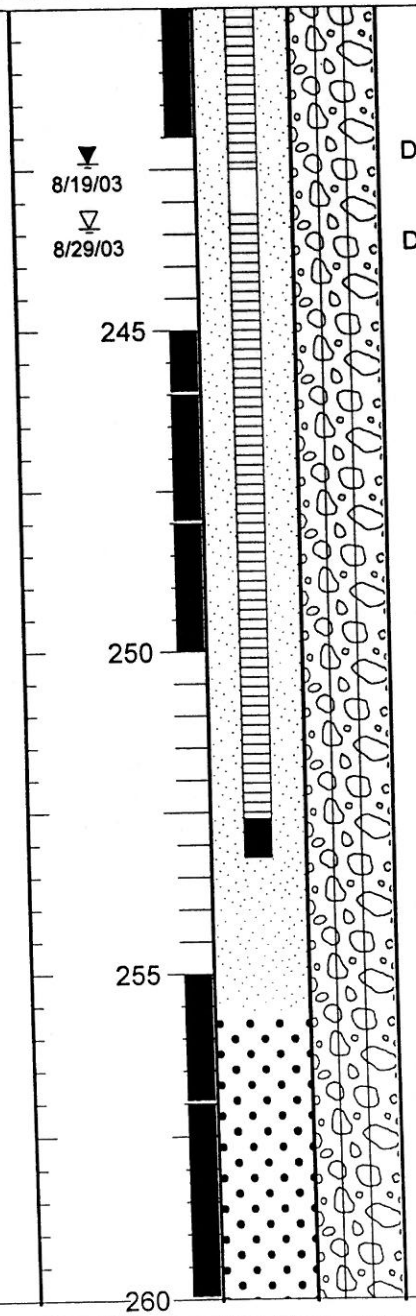
LOG OF EXPLORATORY BORING

PROJECT NAME	**Vashon Island Landfill Closure**	BORING NO.	**MW-29**
LOCATION	**Vashon Island, Washington**	PAGE	**13 of 14**
DRILLED BY	**Tacoma Pump & Drilling**	REFERENCE ELEV.	**408.00**
DRILL METHOD	**Dual Rotary**	TOTAL DEPTH	**261.5'**
LOGGED BY	**Udaloy**	DATE COMPLETED	**8/29/03**

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
G	240		cobbles, wet. (FLUVIAL DEPOSITS)
			Depth to water: 242.4 feet at time of drilling, August 19, 2003.
			Depth to water: 243.4 feet after well development, August 29, 2003.
G	245		
G	246		
G	248		
G	255		@ 255.0 to 257.0 feet: few fines, transitional to silty gravel (GW-GM).
G	257		@ 257.0 to 260.0 feet: fine to medium gravel, few fines (GP-GM).



REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 138 feet. (4) Standard tri-cone bit used to 57 feet depth, sample-through bit used below 57 feet. (5) Reference elevation = ground surface. (6) N: 1451.61 E: 2917.03. (7) Top of PVC elevation = 410.57 feet. (8) Perched groundwater noted at 133.2 feet below grade on 8/25/2003 during well construction. Regional groundwater elevation = 164.60 feet on 8/29/2003.

LOG OF EXPLORATORY BORING

PROJECT NAME	Vashon Island Landfill Closure	BORING NO.	MW-29
LOCATION	Vashon Island, Washington	PAGE	14 of 14
DRILLED BY	Tacoma Pump & Drilling	REFERENCE ELEV.	408.00
DRILL METHOD	Dual Rotary	TOTAL DEPTH	261.5'
LOGGED BY	Udaloy	DATE COMPLETED	8/29/03

SAMPLE METHOD	SAMPLE NUMBER	BLOWS PER 6 INCHES	GROUND WATER LEVEL	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION
G	260			265, 270, 275, 280				**260.0 to 261.5 feet: SILT (ML)**, gray, gravels absent, few to little very fine to fine sand.

Total depth drilled and sampled = 261.5 feet.

WELL COMPLETION DETAILS

+2.6 to +2.2 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank and slip-couple, secured using two stainless steel screws.
+2.2 to 238.4 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 blank riser pipe.
238.4 to 242.5 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC screen with 0.25-inch machined slots 0.025-inch spacers.
242.5 to 243.2 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank at joint between screen sections.
243.2 to 252.6 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC screen with 0.25-inch spacers.
252.6 to 253.2 feet: Nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank casing and end plug.

237.0 to 238.0 feet: Stainless steel centralizer.
245.0 to 246.0 feet: Stainless steel centralizer.
252.0 to 253.0 feet: Stainless steel centralizer.

0 to 3.0 feet: Concrete.
3.0 to 232.6 feet: Baroid® 3/8-inch bentonite chips.
232.6 to 235.8 feet: Slough.
235.8 to 255.6 feet: Norton™ 16 x 30 silica sand.
255.6 to 261.5 feet: Pea gravel.

REMARKS

(1) See General Remarks. (2) Blow counts do not represent SPT values. (3) Water added during drilling below 138 feet. (4) Standard tri-cone bit used to 57 feet depth, sample-through bit used below 57 feet. (5) Reference elevation = ground surface. (6) N: 1451.61 E: 2917.03. (7) Top of PVC elevation = 410.57 feet. (8) Perched groundwater noted at 133.2 feet below grade on 8/25/2003 during well construction. Regional groundwater elevation = 164.60 feet on 8/29/2003.

UDALOY ENVIRONMENTAL SERVICES

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. RE04051

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☒ Construction
☐ Decommission

ORIGINAL INSTALLATION Notice of Intent Number:

Type of Well *("x in box)*

☒ Resource Protection
☐ Geotech Soil Boring

Property Owner King County Water & Waste Management

Site Address 18910 Westside Hwy SW

City Vashon Island

County King

Consulting Firm King County

Unique Ecology Well IDTag No. APS 048 / MW-32

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee
Name (Print Last, First Name) Haenden, Don

Driller/Engineer /Trainee Signature

Driller or Trainee License No. 2914

If trainee, licensed driller's Signature and License Number:

Location SW1/4-1/4 SW1/4 Sec 36 Twn 23 R 02

EWM ☒ or WWM ☐

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____

Long Deg ____ Min ____ Sec ____

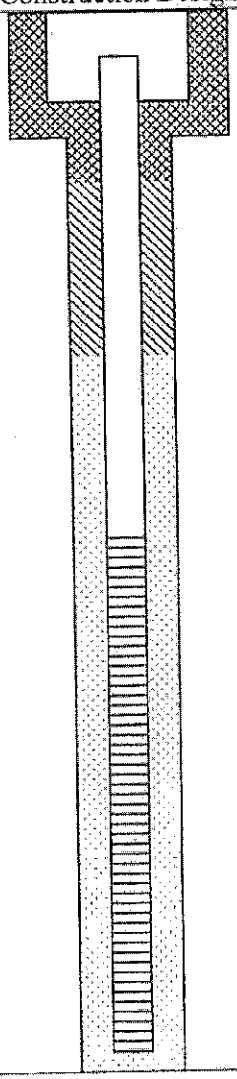
Tax Parcel No. 3623029009

Cased or Uncased Diameter 2" Static Level 19' bgs

Work/Decommission Start Date 12-14-09

Work/Decommission Completed Date 12-14-09

Construction Design



Well Data

MONUMENT TYPE: N/A - Variance

CONCRETE SURFACE SEAL: N/A - Variance

ANNULAR SPACE: N/A

BACKFILL: 0-8'
TYPE: No. 8 Bentonite Chips

PVC BLANK: +2 - 10' bgs

SCREEN: 10-20'
SLOT SIZE: .010
TYPE: 2" Sched 40 PVC Prepack

SAND PACK: 8-20'
MATERIAL: 10/20 Silica Sand

DRILLING METHOD: Hand Auger

WELL DEPTH: 20'

BORING DIAMETER: 3.25"

Formation Description

0-2' SW/SP Fill - brown to Tan

2-5' SM/SC med-coarse Sand w/ Silty Sand. Some fine gravel @ 5'. Wet @ 5'

5-10' SM/SC Silty Sand w/ silt Coarse gravel @ 9'. Iron Stain 6.5-10'

10-16.5 SM - med Sand w/ some silt, Fine Sand @ 13 Iron Stain @ 16. Damp to wet Zones 10-15'

16.5-20' SM - med - coarse Sand Well sorted w/ tr. pebbles Damp 16-18, moist 18-18½ Wet 19-20

20' Bottom of boring.

SCALE: 1"= N/A PAGE 1 OF 3

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. RE04051

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☒ Construction

☐ Decommission

ORIGINAL INSTALLATION Notice of Intent Number:

Consulting Firm King County

Unique Ecology Well IDTag No. APJ049 / MW-30

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) Haraden, Don

Driller/Engineer /Trainee Signature

Driller or Trainee License No. 2914

If trainee, licensed driller's Signature and License Number:

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner King County Water & Waste Management

Site Address 18910 Westside Hwy SW

City Vashon Island

County King

Location SW1/4-1/4 SW1/4 Sec 36 Twn 23 R 02

EWM ☒ or WWM ☐

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Min _____ Sec _____

Long Deg _____ Min _____ Sec _____

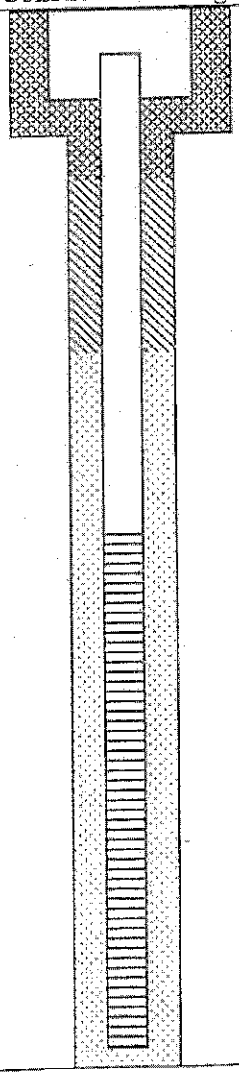
Tax Parcel No. 3623029009

Cased or Uncased Diameter 2" Static Level 4.65' bgs

Work/Decommission Start Date 12-14-09

Work/Decommission Completed Date 12-14-09

Construction Design



Well Data

MONUMENT TYPE: N/A - Variance

CONCRETE SURFACE SEAL: N/A - Variance

ANNULAR SPACE: N/A

BACKFILL: 0-3

TYPE: No 8 Bentonite Chips

PVC BLANK: +1.2' - 4.02 bgs

SCREEN: 4.02 - 9.02' bgs

SLOT SIZE: .010

TYPE: 2" Sched 40 PVC Prepack

SAND PACK: 3' - 9.02'

MATERIAL: 10/20 Silica

DRILLING METHOD: Hand Auger

WELL DEPTH: 9.02' bgs

BORING DIAMETER: 3.25'

Formation Description

0-2' SW/SP Fill/Fill

2-5' SM/SC med-coarse sand w/silty sand. Fine gravel @ 5'/wet @ 5'

5'-18' SM/SC silty sand/silt Coarse Gravel @ 9'. Iron staining 6.5-10

Bottom of boring 11' bgs

SCALE: 1"= N/A PAGE 2 OF 3

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. RE09051

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission ("x" in box)

☒ Construction

☐ Decommission

ORIGINAL INSTALLATION Notice of Intent Number:

Consulting Firm King County

Unique Ecology Well IDTag No. AAT 050 / MW-31

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) Harader, Don

Driller/Engineer /Trainee Signature

Driller or Trainee License No. 2914

If trainee, licensed driller's Signature and License Number:

Type of Well ("x in box)

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner King County Water & Waste Management

Site Address 18910 Westside Hwy SW

City Vashon Island

County King

Location SW1/4-1/4 SW1/4 Sec 36 Twn 23 R 02

EWM ☒ or WWM ☐

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____

Long Deg ____ Min ____ Sec ____

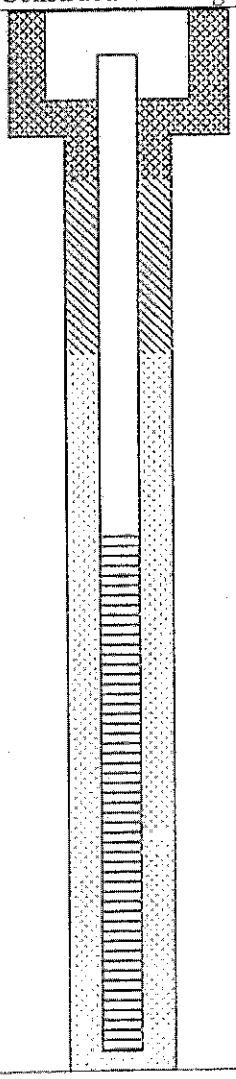
Tax Parcel No. 3623029009

Cased or Uncased Diameter 2" Static Level ~9.02' bgs

Work/Decommission Start Date 12-15-09

Work/Decommission Completed Date 12-15-09

Construction Design



Well Data

MONUMENT TYPE: N/A - Variance

CONCRETE SURFACE SEAL: N/A - Variance

ANNULAR SPACE: N/A

BACKFILL: 0-4

TYPE: #0 Bentonite Chips

PVC BLANK: +2 - 5' BGS

SCREEN: 5-10'

SLOT SIZE: .010

TYPE: 2" sched 40 PVC (Prepack)

SAND PACK: 4 - 10

MATERIAL: 10/20 silica

DRILLING METHOD: Hand Auger

WELL DEPTH: 10.2' bgs

BORING DIAMETER: 3.25"

Formation Description

0-3 SM/SC silty Sand & Sandy silt

3-6.5 SM silty Sand some med gravel starting @ 5'

6.5-9' SM Med - Course sand w/some fine sand lenses wet

9-11' SC Very fine Sand & silt moist

SCALE: 1"= N/A PAGE 3 OF 3

Department of Natural Resources & Parks
Water & Land Resources Division
Science & Technical Support Section

King County

King Street Center, KSC-NR-0600
201 South Jackson Street, Suite 600
Seattle, WA 98104

Boring and Well Installation Log

Project name/Location: West KC Vashon Landfill Hillslope	Elevation: ✓	Drilling Method: Stainless steel AMS Hand Auger	BH-30 MW-30 APJ-049
		Sampling Method:	
Contractor: ESN NW		Hammer Wt: ~15 lb	
Driller: Don Harndon #2914		Date: 12/14/09	Page 1 of 1
Start Time 1300	Stop time: 1530	Logger: BILIR	

Time	Moisture	Core Sample Recovery	Blows	Air Sampling	Depth In Feet	USCS Code	Notes	Well Construction Details
1320	Damp		Auger	20.6 O2 0 methane @BZ	1	SW/SP	FILL/SOIL; multi/variecolored, very loose, fine with medium sand	0
					2	SM/SC	MEDIUM-COARSE SAND with Silty Sand, varicolored browns, rooting, red iron oxide stains	
1328			14	20.5 O2 @ BH 0 methane @	3			2.8
			Auger	20.5 O2 @ SW 0 methane @	4		fine gravel @ 5'	3.8
	Moist				5	SM/SC	very fine-FINE SAND with SILT brownish/gray; black organics, very dense	BTD
	Wet							
1339				20.7 O2 @ BH 0 methane @	6			
				20.6 O2 0 methane (sample)	7			
					8		reddish brown organics & stains (6.5-8.5)	
1400				20.6 O2 0 methane (sample)	9	SM	MEDIUM-COARSE SAND; grayish-brownish-multicolored, very dense, reddish stains (8.5-10')	8.8
					10			
				20.7 O2 0 methane (sample)	11			
1430								
1600					12		BHTD = 11.5' bgs	
					13		- snap lock well cap	
					14		- stick up = 1.2' ags	
					15		- Bentonite pellets = 0-2.8' bgs	
					16		- pre packed screen = 3.8'-8.8' bgs	
					17		- 2" diameter PVC casing	
					18		- flat bottom screw cap	
					19		- borehole caved in 8.8'-11.5' bgs	
					20		- supplemented 10/20 CO. Si. Sand	
							- water level ATD = 5.85 BTOC	
							- well depth ATD = 10.21' BTOC	
							(on 12/22/09 DTW = 5.81' BTOC)	
							(on 1/26/10 DTW = 5.76' BTOC)	
							TOC = mark on snap cap	
							GS = Wooden platform (top)	

Department of Natural Resources & Parks
Water & Land Resources Division
Science & Technical Support Section

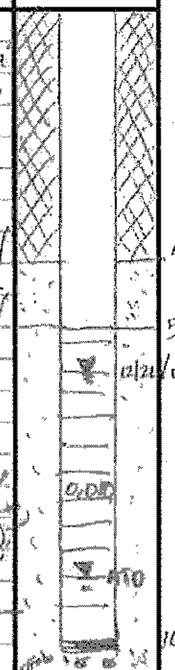
King County

King Street Center, KSC-NR-0600
201 South Jackson Street, Suite 600
Seattle, WA 98104

Boring and Well Installation Log

Project name/Location: KC Vashon Landfill Hillslope (West)	Elevation: ✓	Drilling Method: Stainless Steel AMS Hand Auger	BH-31 / MW-31 / APJ 050
Contractor: ESN NW		Sampling Method:	
Driller: Don Harndon #2914		Hammer Wt: ~15 lb	
Start Time: 0945	Stop time: 1200	Date: 12/15/09	Page 1 of 1
		Logger: BILIR	

Time	Moisture	Core Recovery	Blows	Air Sampling	Depth In Feet	USCS Code	Notes	Well Construction Details
0950	Damp		Auger	20.7 O2, 0 methane @BH	0–1	SM/SC	SILTY SAND? SANDY SILT: 2.5Y 4/2 tanish/orange-ish; light mica flecks, rooting, loose, med. dense, trace black oxide stains	
			14		3			
			Auger		4	SM	MEDIUM SAND w/ some fine sand varicolored, 2.5Y 7/2 light gray, mica flecks; fining (?) w/ red iron oxide stain (5'–6.5')	4
	Moist				5			5
					6			12/22/09
1000	Wet		27	20.7 O2, 0 methane @BH	7		trace gravels at 6.5'	
			Auger		7–9	SM	FINE SAND w/ medium/coarse sand: bluish gray, coarse down, pebbles up to 1 cm (black 5Y 3/1), silty lens (<1 cm w/ white quartz), red stains (6.5'–7.5')	ATD
				20.9 O2, 0 methane	10	SC	Very fine sand - silt	10
1040								
1130					11		BHTD = 10.5' bgs	
					12		– snaplock well cap	
					12–13		– stickup = 2.08' ags	
					13		– Bentonite pellets = 0'–4' bgs	
					13–14		– prepacked screen = 5'–10' bgs	
					14		– 2" diameter PVC casing	
					14–15		– flat bottom screw cap	
					15		– supplemented 10/20 CO, SI sand	
					15–16		– water level ATD = 11.02' BTOC	
					16		– well depth ATD = 12.275' BTOC	
					17		(on 12/22/09 DTW = 7.78 BTOC)	
					17		(on 1/26/10 DTW = 7.91 BTOC)	
					18			
					19–20		TOC = mark on snap cap; GS = top of wood platform	



Department of Natural Resources & Parks
Water & Land Resources Division
Science & Technical Support Section

King County

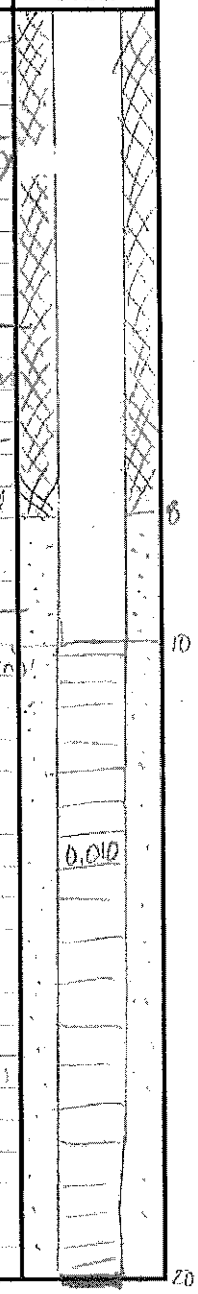
King Street Center, KSC-NR-0600
201 South Jackson Street, Suite 600
Seattle, WA 98104

Boring and Well Installation Log

Project name/Location: KC Vashon Landfill West Hillslope	Elevation: ✓	Drilling Method: Stainless Steel AMS Hand Auger	BH-32 MW-32 APJ-048
		Sampling Method:	
Contractor: ESN NW		Hammer Wt: ~15lb	
Driller: Don Harndon #2914		Date: 12/14/09	Page 1 of 2
Start Time 0930	Stop time: 1245	Logger: BILIR	

Time	Moisture	Core Recovery	Blows	Air Sampling	Depth In Feet	USCS Code	Notes
0930	DAMP		Auger	20.7 O_2 @BH 0 Methane	0	SW/GP	SOIL/FILL; brownish tan, very loose
	↓		↓		1		
					2	SM/SC	Medium-Coarse Sand with silty sand; 10YR 4/2 to 2.5Y 5/4 brown to light olive brown; very loose
	DRY		7		3		
			Auger		4		
0945	WET		↓	21 O_2 @BH 0 Methane	5		fine gravels @5
	DAMP					SM/SC	Silty SAND w/ SILT; light brownish gray 2.5Y 6/2, medium dense, loose; Rust iron oxide stains (6.5-10'), roofing (7.5-10')
	↓		+50/4		6		
			Auger		7		
1002			↓	20.7 O_2 @BH 0 Methane			← dark grayish brown fine sand (7.5-8')
	↓				8		
					9		coarse gravel at 9'
1015	MOIST			20.7 O_2 @BH 0 methane	10	SM	MEDIUM SAND with some SILT, 2.5Y 5/1 - 5/2 (gray - grayish brown) light gray MICA (9.5'-12')
	DAMP		+50				
	WET		Auger		11		
1035	DAMP WET		↓	20 O_2 @BH 0 methane	12		
	DAMP				13		V. FINE Sand @13; dense; 2.5Y 5/2 grayish brown
1050	WET				14		
1115	DAMP				15		red iron oxide stain ↓
	↓		+50		16	SM	Med-Coarse Sand; multicolored; v. dense-loose well sorted; trace pebbles
1120	MOIST		Auger	20.7 O_2 0 methane @sample @BH:17	17		
	↓ WET		↓		18		
1200	WET		+50	20.7 O_2 0 Methane @19.75 @sample	19		
1230					20		BHTD = 20' bgs

Well Construction Details



Department of Natural Resources & Parks
Water & Land Resources Division
Science & Technical Support Section

King Street Center, KSC-NR-0600
201 South Jackson Street, Suite 600
Seattle, WA 98104

King County

Boring and Well Installation Log

Project name/Location: Vashon Landfill KC West hillslope	Elevation: ✓	Drilling Method: SS AMS Hand Auger	BH-32 MW-32 APJ-D48
		Sampling Method:	
Contractor: ESN NW		Hammer Wt: ~15 lb	
Driller: DON HACNOON #2914		Date: 12/14/09	Page 2 of 2
Start Time 0930	Stop time: 1245	Logger: BILIR	

Time	Moisture	Core Recovery	Blows	Air Sampling	Depth In Feet	USCS Code	Notes	Well Construction Details
					1		Notes:	
					2		-Snap lock wellcap	
					3		-Stick up = 1.93 ags	
					4		-Bentonite Pellets 0-4' bgs	
					5		-prepacked screen = 10-20' bgs	
					6		-2" diameter PVC casing	
					7		-flat bottom screw cap	
					8		-Supplemented 10/20 CO. Si. sand	
					9		-water level ATD: dRY (moist tip)	
					10		-well depth ATD = 21.89' TOC	
					11		(on 12/22/09 DTW = DRY)	
					12		(on 1/ /10 DTW =)	
					13			
					14			
					15			
					16			
					17			
					18			
					19		TOC = mark on snapcap	
					20		GS = top of wood platform	

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090057	MW-33	1 of 3

Project Name: King County Closed Landfills
Location: 162681.9114N, 1227883.1443E (NAD 83/91) / Vashon Island Landfill
Driller/Method: Holt Services / Sonic
Sampling Method: Continuous Core

Ground Surface Elev (NGVD 88) 357.07
Top of Casing Elev. (NGVD 88) 359.7725
Depth to Water (ft BGS) 112.51
Start/Finish Date 3/9/2015-3/13/2015

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Laboratory Tests	PID (ppm)	Unit	Material Type	Description	Depth (ft)
0 / 355	Above ground monument (KCSWD specification) Thermos cap Concrete surface seal from 0 to 3 feet						Slightly moist, dark brown, sandy, SILT (ML); Topsoil, roots	0
5 / 350		1	0% CH4, 0% CO2, 20.1% O2 measured in breathing zone, 2 feet above drill casing	0.0	Fill		Slightly moist, gray to brown, sandy, SILT (ML) with cobbles; fine to medium sand, fine to coarse subrounded gravel, subrounded cobbles Glass shard at 6.5 feet Becomes gray	5
10 / 345							Slightly moist, gray, gravelly, silty, SAND (SM) with cobbles; fine to medium sand, coarse gravel	10
15 / 340		2	0.5% CH4, 0% CO2, 20.5% O2	7.0			REFUSE includes plastic, metal, wood, fiberglass, K2 skis. Interspersed gray, silty, sand matrix.	15
20 / 335					Refuse		Dark brown, silty, sand matrix REFUSE includes wood, fiberglass, metal. Light brown to gray, silty, sand matrix.	20
25 / 330		3	0.03% CH4, 0% CO2, 21.2% O2	1.5			Dark brown, silty, sand matrix	25
30 / 325							Slightly moist, gray, SAND (SP); trace silt, trace refuse, fine to coarse sand Slightly gravelly, fine to medium sand, coarse gravel to cobbles Trace gravel	30
35 / 320	10-inch diameter conductor casing to 40 feet	4	0.0 ppm H2S, 0.4% CH4	1.1			1-inch-thick bed of slightly moist, green to gray, silty, SAND (SM), fine to medium sand at 36 feet	35
40 / 315					Qva B		Slightly moist, gray, SAND (SP); trace gravel 1-inch-thick bed of slightly moist, gray, SILT (ML) at 42.5 feet	40
45 / 310	8-inch diameter drill casing below 40 feet	5	0.0 ppm H2S, 0.4% CH4	0.8			1-inch-thick bed of slightly moist, gray, SILT (ML) at 49.8 feet	45

Sampler Type:
- ◯ No Recovery
- ▮ Continuous Core

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: AHP
Approved by: John Strunk
Figure No. C - 2

KCSWD_SONIC LOG KC VASHON.GPJ June 30, 2015

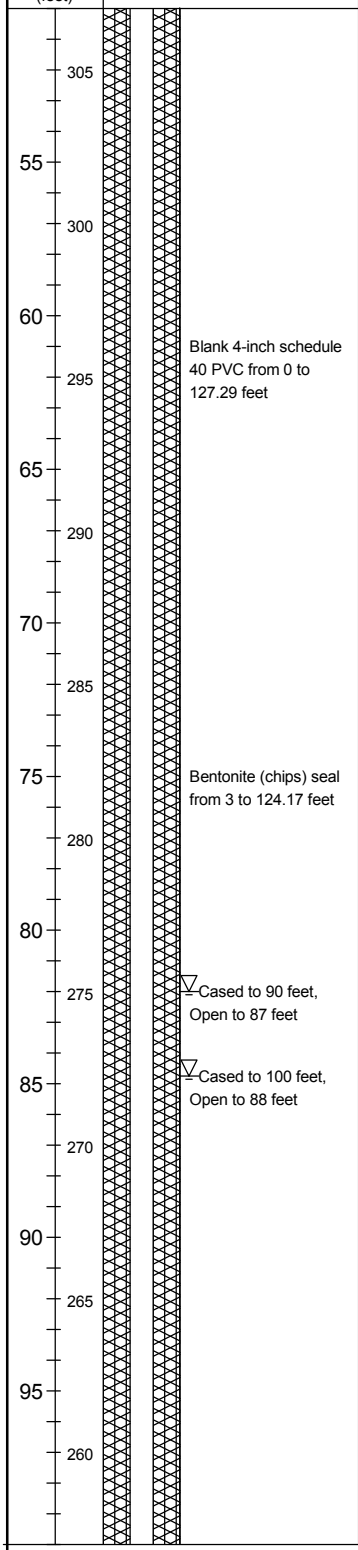
Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090057	MW-33	2 of 3

Project Name: King County Closed Landfills
Location: 162681.9114N, 1227883.1443E (NAD 83/91) / Vashon Island Landfill
Driller/Method: Holt Services / Sonic
Sampling Method: Continuous Core

Ground Surface Elev (NGVD 88) 357.07
Top of Casing Elev. (NGVD 88) 359.7725
Depth to Water (ft BGS) 112.51
Start/Finish Date 3/9/2015-3/13/2015



Depth / Elevation (feet)	Sample Type/ID	Laboratory Tests	PID (ppm)	Unit	Material Type	Description	Depth (ft)
55 / 305						Slightly moist, gray, slightly gravelly, SAND (SP); fine to medium sand, coarse gravel	55
						Slightly moist, gray, SILT (ML)	
	6	0.0 ppm H2S, 0.5% CH4	0.2			Slightly moist, gray, slightly gravelly, SAND (SP); mostly fine sand, coarse gravel	
60 / 300						Light brown, no gravel	60
						No recovery	
				Qva B		Slightly moist, gray, slightly silty, SAND (SP-SM); fine sand	
65 / 295						Moist, brown, SAND (SP); fine to medium sand	65
	7	0.0 ppm H2S, 0.4% CH4	0.5			Slightly moist, gray, slightly silty, SAND (SP-SM); fine sand	
						Slightly moist, brown, SILT (ML)	
70 / 290						Slightly moist, gray, slightly silty, SAND (SP-SM); trace silty sand interbeds ~0.5 inch thick	70
						Slightly moist, gray, SILT (ML); trace fine sand	
						No recovery	
						Slightly moist, gray, silty, SAND (SM); fine sand	
75 / 285						Moist, gray, SILT (ML) Red mottling at 73 feet	75
	8	0.0 ppm H2S, 0.4% CH4	0.5			Slightly moist, gray, slightly silty, SAND (SP-SM); fine sand	
80 / 280						Slightly moist, gray, SAND (SP); trace silt, fine sand	80
						Wet at 80 feet Moist at 81 feet	
				Cc1		Slightly moist, gray, SILT (ML); white laminae	
85 / 275	9	0.0 ppm H2S, 0.4% CH4	0.0			Slightly moist, gray, SAND (SP); trace silt, fine to medium sand	85
						86 feet to 91.5 feet: water in casing/borehole	
90 / 270						Slightly moist, gray, SILT (ML)	90
						Brown	
95 / 265	10	0.0 ppm, H2S, 0.4% CH4	0.0	Cf		Slightly moist to moist, gray	95
260							

Sampler Type:
- ◯ No Recovery
- ▮ Continuous Core

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: AHP
Approved by: John Strunk
Figure No. C - 2

KCSWD_SONIC LOG KC VASHON.GPJ June 30, 2015

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090057	MW-33	3 of 3

Project Name: King County Closed Landfills
Location: 162681.9114N, 1227883.1443E (NAD 83/91) / Vashon Island Landfill
Driller/Method: Holt Services / Sonic
Sampling Method: Continuous Core

Ground Surface Elev (NGVD 88) 357.07
Top of Casing Elev. (NGVD 88) 359.7725
Depth to Water (ft BGS) 112.51
Start/Finish Date 3/9/2015-3/13/2015

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Laboratory Tests	PID (ppm)	Unit	Material Type	Description	Depth (ft)
							7.10 pH, 1011 µS/cm, 11.6ºC, DTW = 85 feet	
105 / 255		11	0.0 ppm H2S, 0.3% CH4	0.0			Slightly moist, gray, silty, SAND (SM); fine sand	105
250							Slightly moist, gray, slightly sandy, SILT (ML); low plasticity	
110	Cased to 120 feet, Open to 120 feet						Gray, slightly sandy, SILT (ML); low plasticity	110
245		12	0.0 ppm H2S, 0.3% CH4	1.7	Cf		Slightly moist, gray, SAND (SP); trace silt, fine sand	
							Slightly moist to moist, gray, slightly sandy, SILT (ML); low plasticity, fine sand	
115							No recovery	115
							Gray to olive gray	
240	Cased to 130 feet, Open to 130 feet	13	0.0 ppm H2S, 0.3% CH4	1.2			Slightly moist to moist, gray, silty, SAND (SM); fine sand	
120							Moist, gray, SILT (ML); low plasticity	120
235								
					Cc2		Moist, gray, slightly silty, SAND (SP); fine sand	
125	Filter pack of 10/20 Colorado silica sand from 124.17 to 139.25 feet Centralizer at 127.29 feet	14	0.0 ppm H2S, 0.3% CH4	1.8			7.15 pH, 1095 µS/cm, 14.0ºC Brown	125
230							Slightly moist to moist, trace silt	
130	Cased to 140 feet, Open to 140 feet						Slightly moist to moist, brown to olive gray, SILT (ML); low plasticity, hard Gray at 129.75 feet	130
225	20-slot 4-inch PVC from 127.29 to 137.29 feet						Moist, gray, SAND (SP); trace silt, fine sand	
135	Centralizer at 137.29 feet Sump from 137.29 to 137.67 feet	15	0.0 ppm H2S, 0.4% CH4	0.7				135
220							Driller's Note: Heaving sands during well completion, used approx. 450 gallons of water to wash down heave	
140							Moist, gray, silty, SAND (SM); dilatent, fine sand	140
							Wet, gray, slightly sandy, SILT (ML); medium plasticity 7.32 pH, 991 µS/cm, 11.7ºC Moist	
215	Bentonite seal (chips) from 139.25 to 145 feet							
145		16	0.0 ppm H2S, 0.0% CH4	0.3			Slightly moist to moist	145
210	Native backfill from 145 to 150 feet						Slightly moist, gray, SAND (SP); trace silt, fine to medium sand Bottom of boring at 150 feet	
							No recovery	

Sampler Type:
- ○ No Recovery
- ▮ Continuous Core

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: AHP
Approved by: John Strunk
Figure No. C - 2

KCSWD_SONIC LOG_KC VASHON.GPJ June 30, 2015

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090057	MW-34	1 of 5

Project Name: King County Closed Landfills
Location: 163134.5971N, 1227773.7704E (NAD 83/91) / Vashon Island Landfill
Driller/Method: Holt Services / Sonic
Sampling Method: Continuous Core

Ground Surface Elev (NGVD 88) 383.26
Top of Casing Elev. (NGVD 88) 385.8802
Depth to Water (ft BGS) 201.1
Start/Finish Date 3/18/2015-3/26/2015

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Laboratory Tests	PID (ppm)	Unit	Material Type	Description	Depth (ft)
0 / 383	Above ground 3-foot monument (KCSWD specification) Thermos cap Concrete surface seal from 0 to 3 feet						FILL: Slightly moist to moist, gray, gravelly, SILT (ML); coarse subrounded gravel	0
							Slightly moist to moist, gray, gravelly, silty, SAND (SM); fine subangular gravel	
5 / 380		1	0 ppm H2S, 0% CH4, 20.6% O2	0.0			Slightly moist, light brown, gravelly, silty, SAND (SM); trace cobbles, fine to coarse subrounded gravel	5
							Moist, brown, SILT (ML); trace fine subrounded gravel	
10 / 375	10-inch diameter conductor casing to 20 feet	2	0.0 ppm H2S, 0.0% CH4, 20.6% O2	0.0			Slightly moist, brown, gravelly, silty, SAND (SM); trace subrounded cobbles, fine to coarse subrounded gravel	10
							Slightly moist, brown, gravelly, silty, SAND (SM); trace subrounded cobbles, fine to coarse subrounded gravel	
15 / 370		3			Qvt A			15
20 / 365	Drilled to 20 feet, Open to 20 feet, Cased to 10 feet	4	0.0 ppm H2S, 0.0% CH4, 20.9% O2	0.0			Slightly moist, brown, gravelly, slightly silty, SAND (SP-SM); trace subrounded cobbles, fine to coarse sand, fine to coarse subrounded gravel	20
25 / 360	8-inch drill casing below 20 feet	5					Slightly moist, brown, gravelly, silty, SAND (SM); trace subrounded cobbles, fine to coarse sand, fine to coarse subrounded gravel	25
							Gradational boundary	
30 / 355		6	0.0 ppm H2S, 0.0% CH4, 20.9% O2	0.0			Slightly moist to moist, brown, SAND (SP); trace silt, trace fine to coarse gravel	30
35 / 350								35
40 / 345	Bentonite seal from 3 to 80 feet (chips)	7	0.0 ppm H2S, 0.0% CH4, 21.1% O2	0.0	Qva B		Gravelly, mostly fine sand Trace gravel, fine to coarse sand	40
45 / 340							Gravelly, trace cobbles, fine subrounded gravel	45
							Trace gravel	
50 / 335		8	0.0 ppm H2S, 0.0% CH, 20.9% O2	0.0			gravelly, fine subrounded gravel	50
							Mostly medium to coarse sand Trace coarse sand, trace gravel, fine to medium sand	
55 / 330							Gravelly, fine to medium sand, fine subrounded gravel	55
60 / 325							Mostly fine sand, no gravel	60

Sampler Type:
- ◯ No Recovery
- ▮ Continuous Core

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: AHP
Approved by: John Strunk
Figure No. C - 3

KCSWD_SONIC LOG KC VASHON.GPJ June 30, 2015

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090057	MW-34	2 of 5

Project Name: King County Closed Landfills
Location: 163134.5971N, 1227773.7704E (NAD 83/91) / Vashon Island Landfill
Driller/Method: Holt Services / Sonic
Sampling Method: Continuous Core

Ground Surface Elev (NGVD 88) 383.26
Top of Casing Elev. (NGVD 88) 385.8802
Depth to Water (ft BGS) 201.1
Start/Finish Date 3/18/2015-3/26/2015

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Laboratory Tests	PID (ppm)	Unit	Material Type	Description	Depth (ft)
65 / 320	Blank 4-inch schedule 40 PVC from 0 to 235.3 feet	9	0.0 ppm H2S, 0.0% CH4, 20.9% O2	0.0			Trace silt, trace gravel, fine to medium sand Trace subrounded gravel, fine to coarse sand Fine to medium sand, no gravel	65
70 / 315				0.0			Mostly fine sand	70
75 / 310		10	0.0 ppm H2S, 0.0% CH4, 20.9% O2				Fine to medium sand Gravelly, fine to coarse sand, fine subrounded gravel	75
80 / 305				0.0	Qva B		Slightly moist to moist, brown, SAND (SW); trace silt, fine sand (bordering on silt size) Slightly moist to moist, brown, SAND (SP); mostly fine sand	80
85 / 300		11	0.0 ppm H2S, 0.0% CH4, 21.0% O2				Moist to wet Moist, brown to gray, silty, SAND (SM); fine sand, iron oxide staining Slightly moist to moist, brown, SAND (SP); trace silt, trace organics, fine sand 1/2-inch, moist, brown, SILT (ML) layer at 86.5 feet, trace iron oxide staining	85
90 / 295	Bentonite seal from 80 to 228 feet (grout)						Slightly moist, trace subrounded coarse gravel	90
95 / 290		12	0.0 ppm H2S, 0.0% CH4, 20.8% O2		Cc1?		Brown, silty lenses ~0.25 inches-thick at 95 feet with trace brown and black organics	95
100 / 285							Sand becomes brown yellow	100
105 / 280		13	0.0 ppm H2S, 0.0% CH4, 20.7% O2				Moist, light brown SILT (ML) with fine sandy layers; trace gravel, iron oxide mottling Wet	105
110 / 275		14	0.0 ppm H2S, 0.0% CH4, 20.6% O2	0.0			Moist, light brown grading to gray	110
115 / 270		15	0.0 ppm H2S, 0.0% CH4, 20.9% O2	0.0	Cf		Becomes gray Slightly moist Wet	115
							Slightly moist to moist, gray, silty, SAND (SM); fine	

Sampler Type:
- No Recovery
- Continuous Core

PID - Photoionization Detector
- Static Water Level
- Water Level (ATD)

Logged by: AHP
Approved by: John Strunk
Figure No. C - 3

KCSWD_SONIC LOG_KC VASHON.GPJ June 30, 2015

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090057	MW-34	3 of 5

Project Name: King County Closed Landfills
Location: 163134.5971N, 1227773.7704E (NAD 83/91) / Vashon Island Landfill
Driller/Method: Holt Services / Sonic
Sampling Method: Continuous Core

Ground Surface Elev (NGVD 88) 383.26
Top of Casing Elev. (NGVD 88) 385.8802
Depth to Water (ft BGS) 201.1
Start/Finish Date 3/18/2015-3/26/2015

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Laboratory Tests	PID (ppm)	Unit	Material Type	Description	Depth (ft)
125 / 260							sand	
		16	0.0 ppm H2S, 0.0% CH4, 21.0% O2	0.0	Cf		Moist, gray, SILT (ML); trace fine sand	125
130 / 255								130
135 / 250		17	0.0 ppm H2S, 0.0% CH4	0.0	Cc2		Moist, gray, SAND (SP); trace silt, fine sand	135
140 / 245					Cf		Moist, gray, slightly sandy, SILT (ML); fine sand	140
		18	0.0 ppm H2S, 0.0% CH4	0.0			Moist, gray, slightly silty, SAND (SP-SM); fine sand Moist to wet, gray SILT (ML) Moist Slightly moist to moist	
150 / 240							Slightly moist, brown yellow, SAND (SP); fine sand, no apparent bedding	150
155 / 230	▽ Drilled to 160 feet, Open to 160 feet, Cased to 150 feet	19	0.0 ppm H2S, 0.0% CH4	0.0			Slightly moist to moist, light brown to gray, sandy, SILT (ML); fine sand Moist to wet, brown to gray, CLAY (CL) Moist	155
160 / 225								160
165 / 220		20	0.0 ppm H2S, 0.0% CH4	0.0			Slightly moist; trace fine to medium sand, trace silty nodules	165
		○					No Recovery	
170 / 215		21	0.0 ppm H2S, 0.0% CH4, 20.5% O2	0.0			Light brown, slightly gravelly, very silty, SAND (SM); trace coarse sand, fine to medium sand, fine subrounded gravel	170
175 / 210		22	0.0 ppm H2S, 0.0% CH4, 20.5% O2	0.0	Cc3		Dry, light brown, SAND (SP); trace silt, trace silty nodules, fine to medium sand	175
205								

Sampler Type:
○ No Recovery
▮ Continuous Core

PID - Photoionization Detector
▼ Static Water Level
▽ Water Level (ATD)

Logged by: AHP
Approved by: John Strunk
Figure No. C - 3

KCSWD_SONIC LOG_KC VASHON.GPJ June 30, 2015

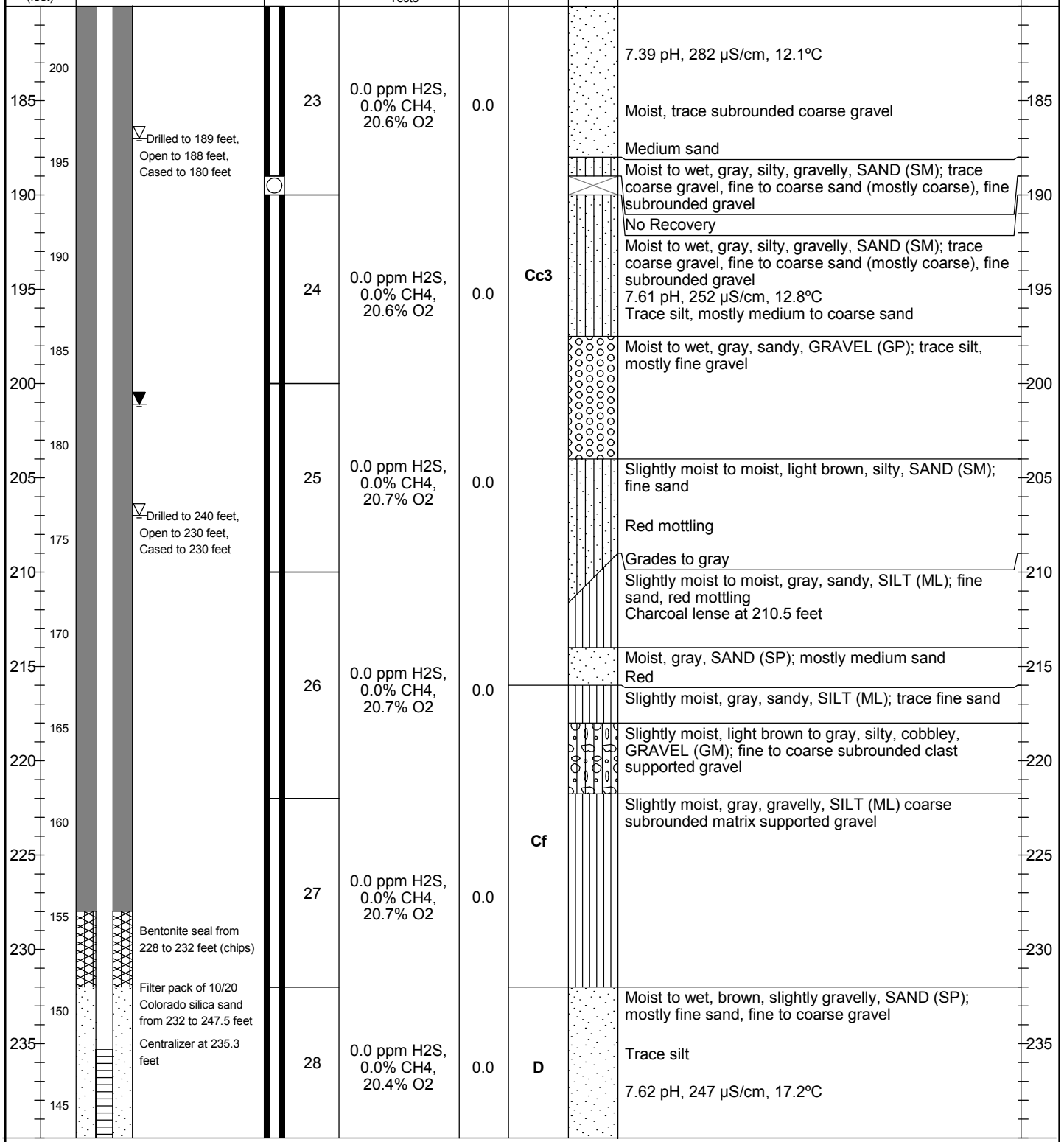
Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090057	MW-34	4 of 5

Project Name: King County Closed Landfills
Location: 163134.5971N, 1227773.7704E (NAD 83/91) / Vashon Island Landfill
Driller/Method: Holt Services / Sonic
Sampling Method: Continuous Core

Ground Surface Elev (NGVD 88) 383.26
Top of Casing Elev. (NGVD 88) 385.8802
Depth to Water (ft BGS) 201.1
Start/Finish Date 3/18/2015-3/26/2015



Sampler Type:
- No Recovery
- Continuous Core

PID - Photoionization Detector
- Static Water Level
- Water Level (ATD)

Logged by: AHP
Approved by: John Strunk
Figure No. C - 3

KCSWD_SONIC LOG KC VASHON.GPJ June 30, 2015

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090057	MW-34	5 of 5

Project Name: King County Closed Landfills
Location: 163134.5971N, 1227773.7704E (NAD 83/91) / Vashon Island Landfill
Driller/Method: Holt Services / Sonic
Sampling Method: Continuous Core

Ground Surface Elev (NGVD 88) 383.26
Top of Casing Elev. (NGVD 88) 385.8802
Depth to Water (ft BGS) 201.1
Start/Finish Date 3/18/2015-3/26/2015

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Laboratory Tests	PID (ppm)	Unit	Material Type	Description	Depth (ft)
140 / 245	20-slot 4-inch PVC from 235.3 to 245.3 feet Centralizer at 245.3 Sump from 245.3 to 245.6 feet	28			D		8.52 pH, 247µS/cm, 12.4ºC	245
135 / 250	Native backfill from 247.5 to 250.5 feet	29					Driller's Note: Heaving sands during well completion, used approx. 450 gallons of water to wash down heave Slightly moist, gray, SILT (ML); medium plasticity Bottom of boring at 250.5 feet	250
130 / 255								255
125 / 260								260
120 / 265								265
115 / 270								270
110 / 275								275
105 / 280								280
100 / 285								285
95 / 290								290
90 / 295								295
85								

Sampler Type:
- No Recovery
- Continuous Core

PID - Photoionization Detector
- Static Water Level
- Water Level (ATD)

Logged by: AHP
Approved by: John Strunk
Figure No. C - 3

KCSWD_SONIC LOG_KC VASHON.GPJ June 30, 2015

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090057	MW-35	1 of 3

Project Name: King County Closed Landfills
Location: 162559.4857N, 1227651.2087E (NAD 83/91) / Vashon Island Landfill
Driller/Method: Holt Services / Sonic
Sampling Method: Continuous Core

Ground Surface Elev (NGVD 88) 358.75
Top of Casing Elev. (NGVD 88) 361.4655
Depth to Water (ft BGS) 117
Start/Finish Date 3/13/2015-3/18/2015

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Laboratory Tests	PID (ppm)	Unit	Material Type	Description	Depth (ft)
0 / 358	Above ground 3-foot monument (KCSWD specification) Thermos cap Concrete surface seal from 0 to 3 feet						FILL: Moist, light brown, gravelly, slightly silty, SAND (SP-SM); fine to coarse sand, fine to coarse gravel, organics (roots)	
5 / 355		1	0.0 ppm H2S, 0.0% CH4, 20.8% O2	0.0	Qvt A		Slightly moist, gray to brown, sandy, gravelly, SILT (ML); trace cobble, fine rounded gravel Moist to wet Slightly moist	5
10 / 350								10
15 / 345	10-inch conductor casing to 20 feet	2	0.0 ppm H2S, 0.0% CH4, 21.0% O2	0.0			Slightly moist to moist, brown, slightly gravelly, SAND (SP); trace cobble, fine to medium sand, fine subrounded gravel, stratification	15
20 / 340							Mostly fine sand	20
25 / 335	8-inch drill casing below 20 feet	3	0.0 ppm H2S, 0.0% CH4, 21.0% O2	0.0			Trace silt, fine to medium sand With cobbles Mostly fine sand	25
30 / 330					Qva B		Slightly moist to moist, brown, SAND (SP); trace cobble, fine to medium sand, stratification Trace gravel and coarse sand 32 to 33 feet	30
35 / 325		4	0.0 ppm H2S, 0.0% CH4, 21.0% O2	0.0				35
40 / 320							No recovery	40
45 / 315		5	0.0 ppm H2S, 0.3% CH4, 21.0% O2	0.0			Slightly moist to moist, brown, SAND (SP); trace cobble, mostly fine sand, stratification Fine to medium sand Mostly fine sand	45
310							No recovery	

Sampler Type:
- ◯ No Recovery
- ▮ Continuous Core

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: AHP
Approved by: John Strunk
Figure No. C - 4

KCSWD_SONIC LOG KC VASHON.GPJ June 30, 2015

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090057	MW-35	2 of 3

Project Name: King County Closed Landfills
Location: 162559.4857N, 1227651.2087E (NAD 83/91) / Vashon Island Landfill
Driller/Method: Holt Services / Sonic
Sampling Method: Continuous Core

Ground Surface Elev (NGVD 88) 358.75
Top of Casing Elev. (NGVD 88) 361.4655
Depth to Water (ft BGS) 117
Start/Finish Date 3/13/2015-3/18/2015

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Laboratory Tests	PID (ppm)	Unit	Material Type	Description	Depth (ft)
55 / 305	Blank 4-inch schedule 40 PVC from 0 to 114.5 feet	6	0.0 ppm H2S, 0.5% CH4, 20.5% O2	3.7	Qva B		Slightly moist to moist, brown, SAND (SP); trace cobble, mostly fine sand, stratification	55
60 / 300							No recovery	60
							Slightly moist to moist, brown, SAND (SP); trace silt, trace cobble, fine sand, stratification	
		7	0.0 ppm H2S, 0.5% CH4, 20.6% O2	1.3			Slightly moist, light brown, SILT (ML); low to medium plasticity	
65 / 295							Slightly moist, light brown, slightly silty, SAND (SP-SM); mostly fine sand	65
		8	0.0 ppm H2S, 0.4% CH4, 20.7% O2	1.5			Slightly moist, light brown, SAND (SP); trace silt, mostly fine sand	
70 / 290					Cc1			70
75 / 285	Bentonite (chips) seal from 3 to 111.5 feet	9	0.0 ppm H2S, 0.4% CH4, 20.8% O2	0.9			Slightly moist to moist, light brown, SILT (ML)	75
							Slightly moist, light brown, SAND (SP); trace silt, mostly fine sand	
80 / 280							Silty SAND (SM) nodules at 82 feet	80
		10	0.0 ppm H2S, 0.4% CH4, 20.8% O2	0.9			Dry to slightly moist, light brown, slightly silty, SAND (SP-SM); fine to medium sand	
85 / 275							Slightly moist to moist, with silt, iron oxide staining at contact	85
							Moist, gray, SILT (ML); trace fine sand, silt borders on fine sand size	
90 / 270							Moist, light brown, SILT (ML)	90
		11	0.0 ppm H2S, 0.4% CH4, 20.2% O2	0.7	Cf			
95 / 265								95
260								

Sampler Type:
- ◯ No Recovery
- ▮ Continuous Core

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: AHP
Approved by: John Strunk
Figure No. C - 4

KCSWD_SONIC LOG_KC VASHON.GPJ June 30, 2015

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090057	MW-35	3 of 3

Project Name: King County Closed Landfills
Location: 162559.4857N, 1227651.2087E (NAD 83/91) / Vashon Island Landfill
Driller/Method: Holt Services / Sonic
Sampling Method: Continuous Core

Ground Surface Elev (NGVD 88) 358.75
Top of Casing Elev. (NGVD 88) 361.4655
Depth to Water (ft BGS) 117
Start/Finish Date 3/13/2015-3/18/2015

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Laboratory Tests	PID (ppm)	Unit	Material Type	Description	Depth (ft)
105 / 255		11		0.7			Moist, gray, SILT (ML) Light brown	
					Cf		Moist, gray, slightly silty, SAND (SP-SM); fine sand	105
		12	0.0 ppm H2S, 0.3% CH4, 21.3% O2	0.0				
110 / 250							Slightly moist to moist, gray, SILT (ML)	110
	Filter pack of 10/20 Colorado silica sand from 111.5 to 125.2 feet Centralizer at 114.5 feet							
115 / 245							Slightly moist, light brown, SAND (SP); trace silt, fine sand	115
	Drilled to 130 feet, Open to 121 feet, Cased to 120 feet 20-slot 4-inch PVC from 114.5 to 124.5 feet	13	0.0 ppm H2S, 0.3% CH4, 21.1% O2	0.2	Cc2			
120 / 240							Moist to wet, gray, fine to medium sand	120
							6.93 pH, 1022 µS/cm, 15.7ºC	
125 / 235	Centralizer at 124.5 feet Sump from 124.5 to 124.8 feet Bentonite chips from 125.2 to 127 feet						Moist to wet, gray, SILT (ML); low to medium plasticity	125
		14	0.0 ppm H2S, 0.4% CH4, 20.2% O2	0.5	Cf		Slightly moist	
130 / 230	Native backfill from 127 to 133 feet						Slightly moist to dry	130
							Slightly moist, gray, SAND (SP); trace silt, fine to medium sand Bottom of boring at 133 feet	
135 / 225								135
140 / 220								140
145 / 215								145
210								

Sampler Type:
- No Recovery
- Continuous Core

PID - Photoionization Detector
- Static Water Level
- Water Level (ATD)

Logged by: AHP
Approved by: John Strunk
Figure No. C - 4

KCSWD_SONIC LOG_KC VASHON.GPJ June 30, 2015

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090057	MW-36	1 of 4

Project Name: King County Closed Landfills
Location: 162951.3403N, 1227572.5516E (NAD 83/91) / Vashon Island Landfill
Driller/Method: Holt Services / Sonic
Sampling Method: Continuous Core

Ground Surface Elev (NGVD 88) 375.25
Top of Casing Elev. (NGVD 88) 378.2412
Depth to Water (ft BGS) 146.1
Start/Finish Date 3/27/2015-4/2/2015

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Laboratory Tests	PID (ppm)	Unit	Material Type	Description	Depth (ft)
375	Above ground monument (KCSWD specification) Thermos cap Concrete surface seal from 0 to 3 feet						Slightly moist, brown, gravelly, very silty, SAND (SM) with cobbles; fine to coarse sand, fine to coarse sub-rounded to sub-angular gravel, sub-rounded cobbles, matrix supported	
5 370		1	0.0 ppm H2S, 0.0% CH4, 20.7% O2	0.2	Qvt A			5
10 365		2	0.0 ppm H2S, 0.0% CH4, 20.8% O2	0.2				10
15 360	10-inch conductor casing to 20 feet							15
20 355	9-inch drill casing below 20 feet						Slightly moist, brown, gravelly, slightly silty, SAND (SP-SM); fine to coarse sand, fine sub-rounded to sub-angular gravel	20
							Slightly moist, brown, slightly gravelly to gravelly, SAND (SP); trace silt, trace cobbles, fine to medium sand, fine subrounded gravel	
25 350	Bentonite seal from 3 to 35 feet (chips)	3	0.0 ppm H2S, 0.0% CH4, 20.2% O2	0.1			Fine to coarse sand Fine to medium sand	25
30 345							Slightly moist, brown, slightly silty, gravelly, SAND (SP-SM); trace cobble, fine to coarse sand	30
35 340		4	0.0 ppm H2S, 0.0% CH4, 21.3% O2	0.0	Qva B		Slightly moist, brown, SAND (SP); trace gravel, fine to coarse sand (mostly fine) Becomes gravelly, with cobbles	35
40 335							Medium to coarse sand Fine to medium sand	40
45 330		5	0.0 ppm H2S, 0.0% CH4, 20.1% O2	0.0				45

Sampler Type:
- No Recovery
- Continuous Core

PID - Photoionization Detector
- Static Water Level
- Water Level (ATD)

Logged by: AHP
Approved by: John Strunk
Figure No. C - 5

KCSWD_SONIC LOG KC VASHON.GPJ June 30, 2015

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090057	MW-36	2 of 4

Project Name: King County Closed Landfills
Location: 162951.3403N, 1227572.5516E (NAD 83/91) / Vashon Island Landfill
Driller/Method: Holt Services / Sonic
Sampling Method: Continuous Core

Ground Surface Elev (NGVD 88) 375.25
Top of Casing Elev. (NGVD 88) 378.2412
Depth to Water (ft BGS) 146.1
Start/Finish Date 3/27/2015-4/2/2015

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Laboratory Tests	PID (ppm)	Unit	Material Type	Description	Depth (ft)
325							Trace cobbles, medium to coarse sand, fine subrounded gravel Trace fine rounded gravel, fine to medium sand	
55 320		6	0.0 ppm H2S, 0.0% CH4, 20.1% O2	0.5				55
60 315	Blank 4-inch schedule 40 PVC from 0 to 154 feet	7					Slightly moist to moist	60
65 310		8	0.0 ppm H2S, 0.0% CH4, 20.1% O2	0.3	Qva B		Slightly moist, brown, SILT (ML); trace fine sand Slightly moist, brown, SAND (SP); trace iron oxide staining, fine to medium sand	65
70 305		9	0.0 ppm H2S, 0.0% CH4, 20.0% O2	0.0			Trace silt, trace organics, sand is fine at 74.5 feet Fine to medium sand Slightly moist, brown, slightly sandy to sandy, SILT (ML); trace iron oxide staining, fine sand Slightly moist, brown to gray, SAND (SP); fine sand Slightly moist, brown, SILT (ML); low plasticity	70
75 300								75
80 295							No Recovery	80
85 290	Bentonite seal from 35 to 148 feet (grout)	10	0.0 ppm H2S, 0.0% CH4, 20.9% O2	0.0			Slightly moist, brown, SAND (SW); mostly fine sand	85
90 285		11	0.0 ppm H2S, 0.0% CH4, 20.8% O2	0.0	Cf		Slightly moist, brown, slightly silty, SAND (SP-SM); mostly fine sand Occasional silt nodules from 87 to 89 feet Moist, brown, SILT (ML) Sandy at 93.25 feet, fine sand	90
95 280							Slightly moist to moist, light brown, silty, SAND (SM): fine sand Slightly moist to moist, light brown, SAND (SP); fine sand	95
		12	0.0 ppm H2S, 0.0% CH4, 20.7% O2	0.0	Cc1		No Recovery Slightly moist to moist, light brown, SAND (SP); fine sand	

Sampler Type:
- ◯ No Recovery
- ▮ Continuous Core

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: AHP
Approved by: John Strunk
Figure No. C - 5

KCSWD_SONIC LOG_KC VASHON.GPJ June 30, 2015

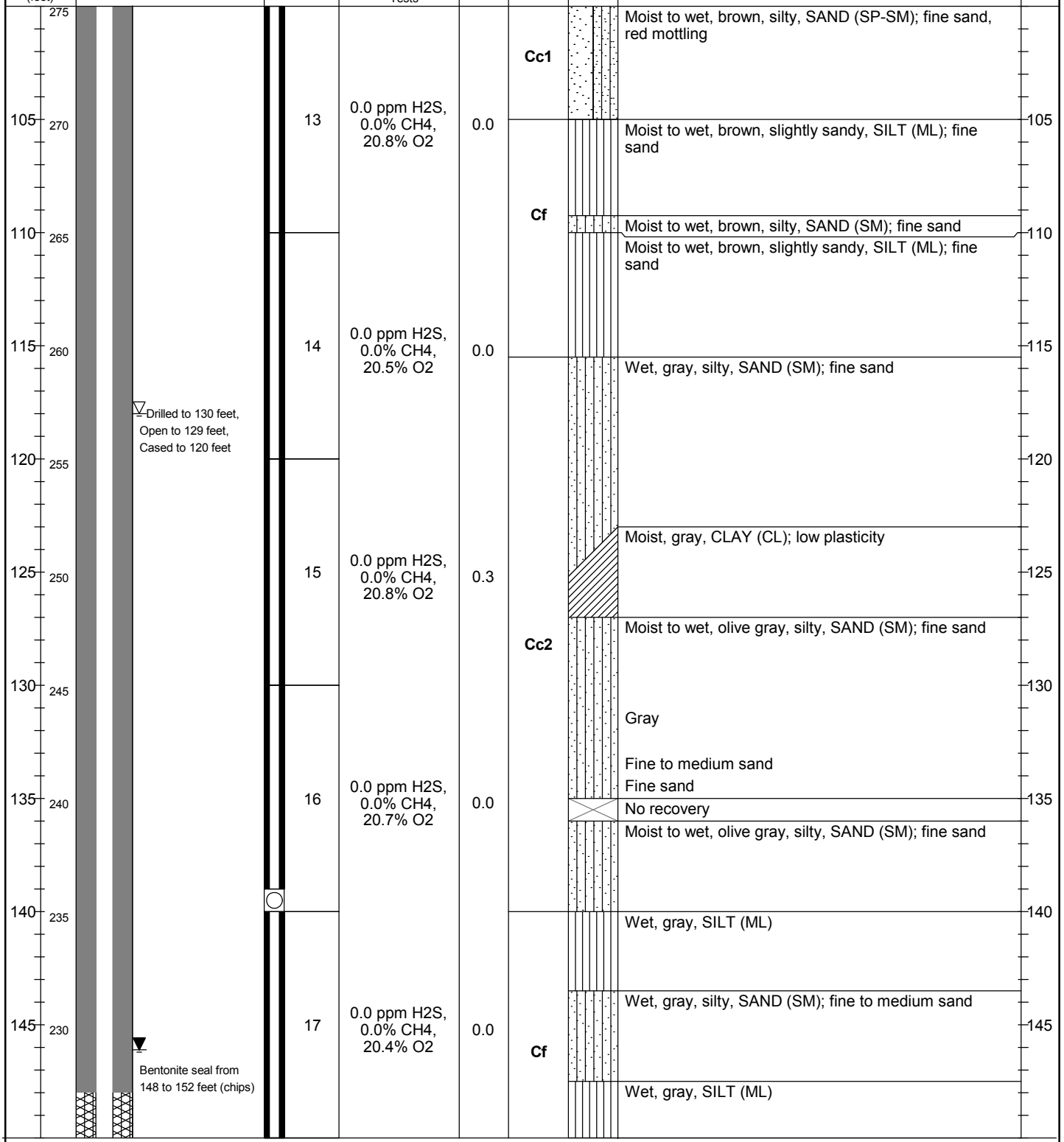
Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090057	MW-36	3 of 4

Project Name: King County Closed Landfills
Location: 162951.3403N, 1227572.5516E (NAD 83/91) / Vashon Island Landfill
Driller/Method: Holt Services / Sonic
Sampling Method: Continuous Core

Ground Surface Elev (NGVD 88) 375.25
Top of Casing Elev. (NGVD 88) 378.2412
Depth to Water (ft BGS) 146.1
Start/Finish Date 3/27/2015-4/2/2015



Sampler Type:
- No Recovery
- Continuous Core

PID - Photoionization Detector
- Static Water Level
- Water Level (ATD)

Logged by: AHP
Approved by: John Strunk
Figure No. C - 5

KCSWD_SONIC LOG_KC VASHON.GPJ June 30, 2015

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090057	MW-36	4 of 4

Project Name: King County Closed Landfills
Location: 162951.3403N, 1227572.5516E (NAD 83/91) / Vashon Island Landfill
Driller/Method: Holt Services / Sonic
Sampling Method: Continuous Core

Ground Surface Elev (NGVD 88) 375.25
Top of Casing Elev. (NGVD 88) 378.2412
Depth to Water (ft BGS) 146.1
Start/Finish Date 3/27/2015-4/2/2015

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Laboratory Tests	PID (ppm)	Unit	Material Type	Description	Depth (ft)
225	Drilled to 160 feet, Open to 152 feet, Cased to 160 feet				Cf		Moist, gray, CLAY (CL) Slightly moist at 152 feet	
155 / 220	Centralizer at 154 feet Filter pack of 10/20 Colorado silica sand from 152 to 165 feet	18					Wet, olive gray to brown, SAND (SP); trace silt, fine to medium sand	155
160 / 215	Schedule 80 4-inch PVC from 154 to 164 feet				Cc3		Wet, gray, slightly silty, SAND (SP-SM); fine to medium sand	160
	Centralizer at 164 feet Sump from 164 to 164.3 feet							
165 / 210	Bentonite seal from 165 to 166 feet (chips)	19					Slightly moist to moist, gray, SILT (ML); trace fine sand	165
	Native backfill from 166 to 170 feet						Slightly moist, gray, slightly silty, SAND (SP-SM); fine sand Bottom of boring at 170 feet	
170 / 205								170
175 / 200								175
180 / 195								180
185 / 190								185
190 / 185								190
195 / 180								195

Sampler Type:
- ○ No Recovery
- ▮ Continuous Core

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: AHP
Approved by: John Strunk
Figure No. C - 5

KCSWD_SONIC LOG_KC VASHON.GPJ June 30, 2015

Golder Associates
CONSULTING GEOTECHNICAL AND MINING ENGINEERS

REPORT TO
HARPER OWES

GEOTECHNICAL MEMORANDUM #4
SUBTASK 1/TASK 1B
GEOTECHNCIAL DATA DEVELOPMENT
VASHON LANDFILL LEACHATE CONTROL

Distribution:

2 copies - Harper Owes
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August 1986

853-1047.001

RECORD OF BOREHOLE P-1

LOCATION See Figure 2 DATUM 393 ft. MSL DATE 3-12-86

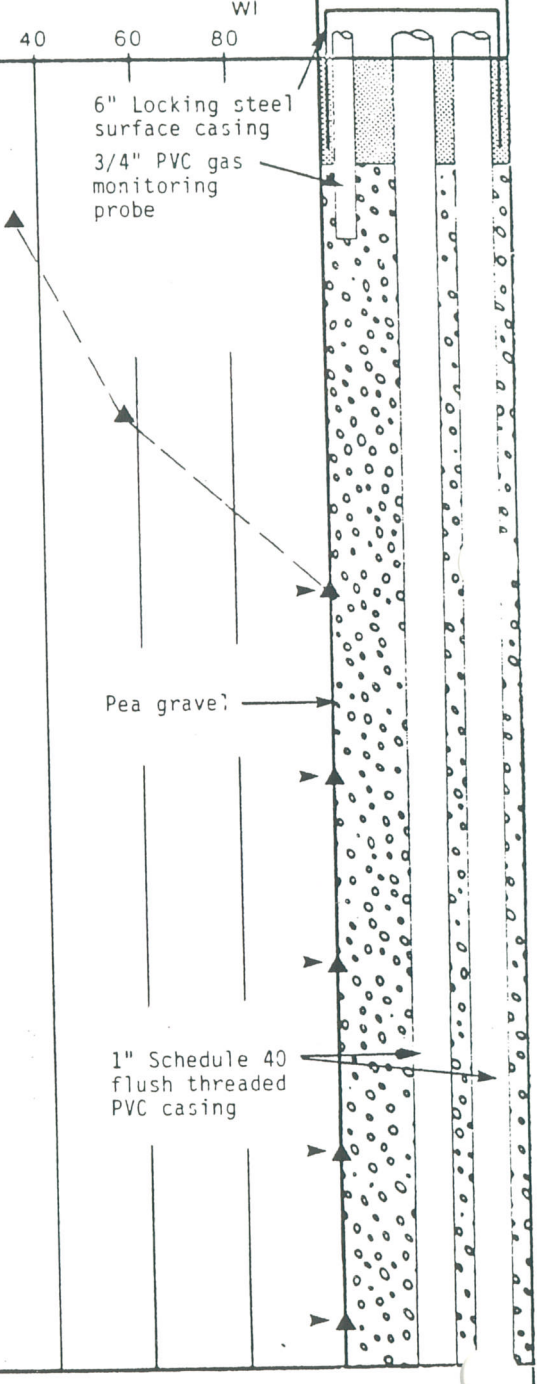
SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. BORING METHOD– HOLLOW STEM AUGER

ELEVN / DEPTH	DESCRIPTION	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/6 IN.	DEPTH
393.0 / 0.0	Dense to very dense, grayish-brown, fine to coarse SAND and SILT, trace gravel to silty SAND, some gravel (Till)	SM	1	DO	17 11 25	5
			2	DO	6 22 35	10
			3	DO	7 50/4"	15
			4	DO	50/6"	20
			5	DO	50/5"	25
			6	DO	50/4"	30
			7	DO	50/4"	

STANDARD PENETRATION TEST
▲ 'N' BLOWS PER FOOT
20 40 60 80

WATER CONTENT, PERCENT
Wp Wn Wl
20 40 60 80

PIEZOMETER INST.



REMARKS: DO = Drive Open
Piezometers have been grouted due to breakage

VERTICAL SCALE
1 IN. TO 5 FT.

Golder Associates

VASHON LANDFILL
JOB# 853-1047.07

RECORD OF BOREHOLE P-1

LOCATION See Figure 2 | DATUM 393 ft. MSL | DATE 3-12-86

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. | BORING METHOD– HOLLOW STEM AUGER

ELEVN / DEPTH	DESCRIPTION	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/6 IN.	DEPTH
	Dense to very dense, grayish-brown, fine to coarse SAND and SILT, trace gravel to [illegible]y SAND, some gravel (Till)	SM	8	DO	50/4"	40
			9	DO	50/5"	45
347.0 / 46.0	Very dense, brown to grayish-brown, fine to medium SAND, trace gravel, little silt (Proglacial sand)	SP	10	DO	50/6"	50
			11	DO	50/6"	55
			12	DO	50/6"	60
			13	DO	50/6"	65
			14	DO	50/4"	

STANDARD PENETRATION TEST
▲ 'N' BLOWS PER FOOT
20 40 60 80

WATER CONTENT, PERCENT
Wp Wn Wl
20 40 60 80

PIEZOMETER INST.

1" Schedule 40 flush threaded PVC casing

Pea gravel

REMARKS:

VERTICAL SCALE
1 IN. TO 5 FT.

Golder Associates

VASHON LANDFILL
JOB# 853-1047.07

RECORD OF BOREHOLE P-1

LOCATION See Figure 2 DATUM 393 ft. MSL DATE 3-12-86

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. BORING METHOD - CABLE TOOL

ELEVN / DEPTH	DESCRIPTION	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/6 IN.	DEPTH	STANDARD PENETRATION TEST ▲ 'N' BLOWS PER FOOT 20 40 60 80 / WATER CONTENT, PERCENT Wp Wn Wl 20 40 60 80	PIEZOMETER INST.
	Very dense, brown to grayish-brown, fine to medium SAND, trace gravel, little silt (Proglacial sand)	SP	15	DO	50/6"	75		Pea gravel
			16	DO	7 41 50/2"	80		1" Schedule 40 flush threaded PVC casing
			17	DO	50/5"	85		
			18	DO	50/6"	90		#8 Aqua sand
			19	DO	34 50/5"	95		1" Schedule 40 PVC screen .020" slots
			20	DO	41 50/4"	100		Cap
289.5								
103.5		ML	21	DO	21 50/6"			

REMARKS:

VERTICAL SCALE
1 IN. TO 5 FT.

Golder Associates

VASHON LANDFILL
JOB# 853-1047.07

RECORD OF BOREHOLE P-1

Figure A-7

LOCATION See Figure 2 DATUM 393 ft. MSL DATE 3-12-86

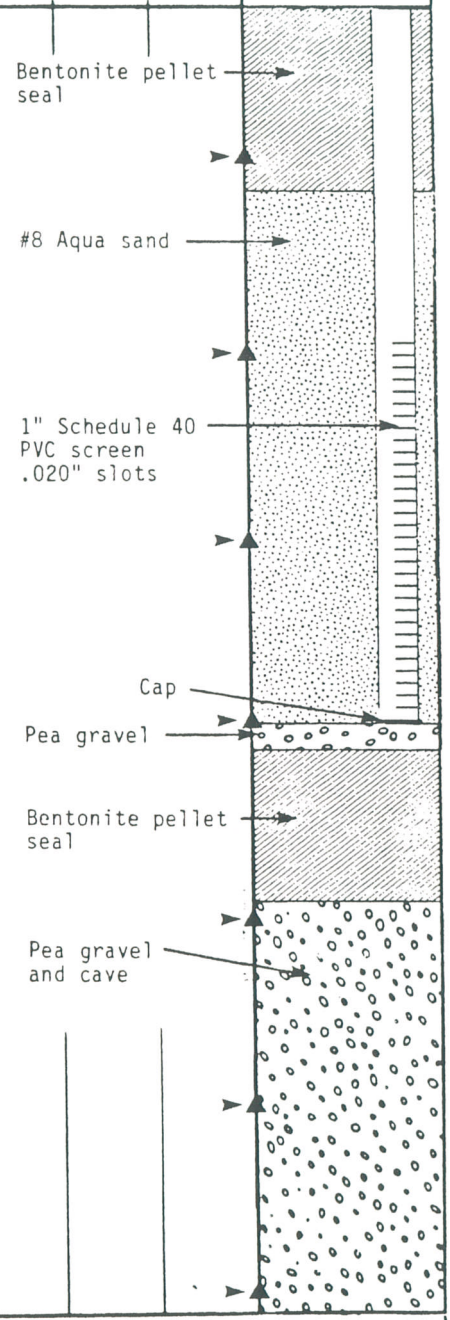
SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. BORING METHOD- HOLLOW STEM AUGER

ELEVN / DEPTH	DESCRIPTION	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/6 IN.	DEPTH
	Very hard, dark gray to orange-brown SILT, trace sand (Upper lacustrine silt)	ML				
283.5			22	DO	32 50/5"	
109.5	Very dense, grayish-brown, silty fine to medium SAND	SM				110
			23	DO	50/6"	115
			24	DO	50/5"	120
271.0						
122.0	Very hard, dark gray SILT, trace sand to sandy SILT (Lower lacustrine silt)	ML	25	DO	50/5"	125
266.0						
127.0	Very dense, very hard, dark gray, interbedded, SILT and fine SAND	ML/SM	26	DO	23 50/6"	130
			27	DO	50/5"	135
256.0						
137.0	Very hard, dark gray, sandy SILT	ML	28	DO	42 50/3"	
253.0	End of hole at 140.0 feet					

STANDARD PENETRATION TEST
▲ 'N' BLOWS PER FOOT
20 40 60 80

WATER CONTENT, PERCENT
Wp Wn Wl
20 40 60 80

PIEZOMETER INST.



REMARKS:

VERTICAL SCALE
1 IN. TO 5 FT.

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VASHON LANDFILL
JOB# 853-1047.07

RECORD OF BOREHOLE P-1A

Figure A-8

LOCATION See Figure 2 DATUM 394.02 ft. MSL DATE 3/25/86

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. BORING METHOD – HOLLOW STEM AUGER

ELEVN / DEPTH	DESCRIPTION	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/6 IN	DEPTH
	For lithology, see log of boring P-1					5, 10, 15, 20, 25, 30

STANDARD PENETRATION TEST
▲ 'N' BLOWS PER FOOT
20 40 60 80

WATER CONTENT, PERCENT
Wp Wn Wl
20 40 60 80

PIEZOMETER INST.

6" Locking steel surface casing
Cement grout
1" Schedule 40 flush threaded PVC casing
Pea gravel

REMARKS:

VERTICAL SCALE
1 IN. TO 5 FT.

Golder Associates

VASHON LANDFILL
JOB# 853-1047/29