APPENDIX B

Boring & Test Pit Logs

Coarse-Grained Soils - More than 50% [1] Retained on No. 200 Sieve	Gravels - More than 50% [1] of Coarse Fraction Retained on No. 4 Sieve	≦5% Fines [5]	GW	Well-graded gravel and gravel with sand, little to no fines
			GP	Poorly-graded gravel and gravel with sand, little to no fines
		≧15% Fines [5]	GM	Silty gravel and silty gravel with sand
			GC	Clayey gravel and clayey gravel with sand
	Sands - 50% [1] or More of Coarse Fraction Passes No. 4 Sieve	≦5% Fines [5]	SW	Well-graded sand and sand with gravel, little to no fines
			SP	Poorly-graded sand and sand with gravel, little to no fines
		≧15% Fines [5]	SM	Silty sand and silty sand with gravel
			SC	Clayey sand and clayey sand with gravel
Fine-Grained Soils - 50% [1] or More Passes No. 200 Sieve	Silts and Clays Liquid Limit Less than 50		ML	Silt, sandy silt, gravelly silt, silt with sand or gravel
			CL	Clay of low to medium plasticity; silty, sandy, or gravelly clay, lean clay
			OL	Organic clay or silt of low plasticity
	Silts and Clays Liquid Limit 50 or More		MH	Elastic silt, clayey silt, silt with micaceous or diato-maceous fine sand or silt
			CH	Clay of high plasticity, sandy or gravelly clay, fat clay with sand or gravel
			OH	Organic clay or silt of medium to high plasticity
Highly Organic Soils			PT	Peat, muck and other highly organic soils

Terms Describing Relative Density and Consistency

Coarse-Grained Soils	Density	SPT [2] blows/foot
	Very Loose	0 to 4
	Loose	4 to 10
	Medium Dense	10 to 30
	Dense	30 to 50
	Very Dense	>50

Fine-Grained Soils	Consistency	SPT [2] blows/foot
	Very Soft	0 to 2
	Soft	2 to 4
	Medium Stiff	4 to 8
	Stiff	8 to 15
	Very Stiff	15 to 30
	Hard	>30

Test Symbols

FC = Fines Content
G = Grain Size
M = Moisture Content
A = Atterberg Limits
C = Consolidation
DD = Dry Density
K = Permeability
Str = Shear Strength
Env = Environmental
PiD = Photoionization Detector

Component Definitions

Descriptive Term	Size Range and Sieve Number
Boulders	Larger than 12"
Cobbles	3" to 12"
Gravel	3" to No. 4 (4.75 mm)
Coarse Gravel	3" to 3/4"
Fine Gravel	3/4" to No. 4 (4.75 mm)
Sand	No. 4 (4.75 mm) to No. 200 (0.075 mm)
Coarse Sand	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	Smaller than No. 200 (0.075 mm)

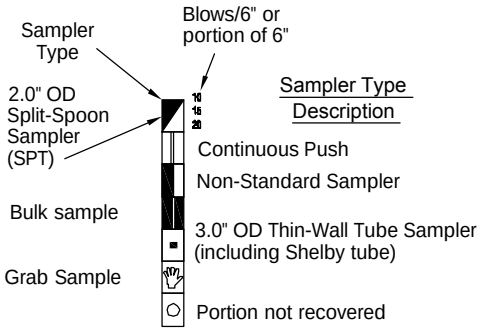
[3] Estimated Percentage

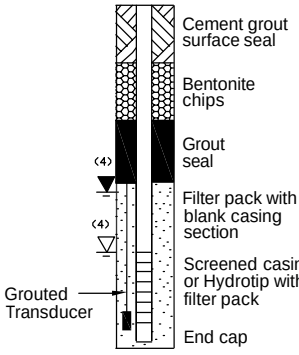
Percentage by Weight	Modifier
<5	Trace
5 to 15	Slightly (sandy, silty, clayey, gravelly)
15 to 30	Sandy, silty, clayey, gravelly)
30 to 49	Very (sandy, silty, clayey, gravelly)

Moisture Content

Dry - Absence of moisture, dusty, dry to the touch
Slightly Moist - Perceptible moisture
Moist - Damp but no visible water
Very Moist - Water visible but not free draining
Wet - Visible free water, usually from below water table

Symbols





(1) Percentage by dry weight
(2) (SPT) Standard Penetration Test (ASTM D-1586)
(3) In General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)
(4) Depth of groundwater — ATD = At time of drilling; Static water level (date); BGS = below ground surface
(5) Combined USCS symbols used for fines between 5% and 15% as estimated in General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)

Classifications of soils in this report are based on visual field and/or laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual and/or laboratory classification methods of ASTM D-2487 and D-2488 were used as an identification guide for the Unified Soil Classification System.

Aspect CONSULTING

Exploration Log Key

DATE:
DESIGNED BY:
DRAWN BY:
REVISED BY:

PROJECT NO.

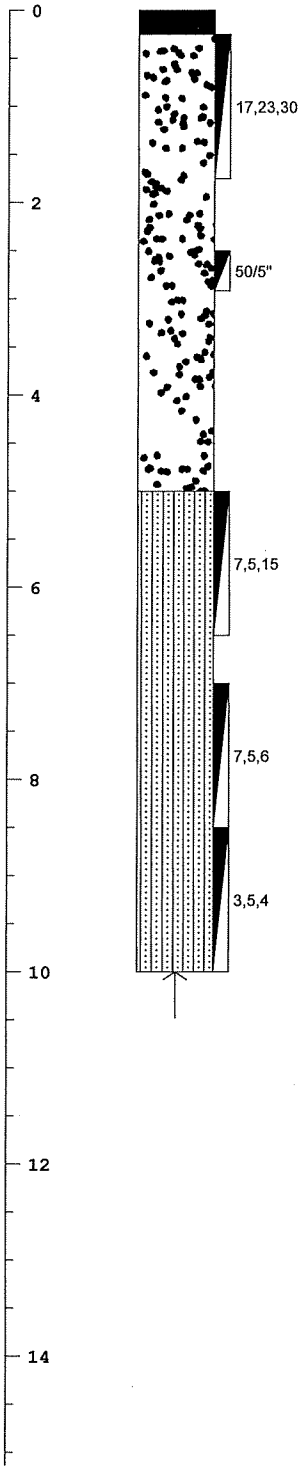
FIGURE NO.
B-1

Q:_ACAD Standards\Standard Details\Exploration Log Key B1.dwg

Boring and Monitoring Well Logs

LOG OF BORING
BORING B-1

PROJECT: **Vashon Transfer Station Pavement Investigation** DATE: **7-6-2017**
BORING LOCATION: **See Figure 2** START: **8:05 AM**
BORING METHOD: **Hollow-Stem Auger** FINISH: **8:45 AM**
DRILLER: **Holocene Drilling** LOGGER: **Tim Hyden**
DEPTH TO - Water: **N/A** Caving: **N/A** DATE CHECKED: **N/A**

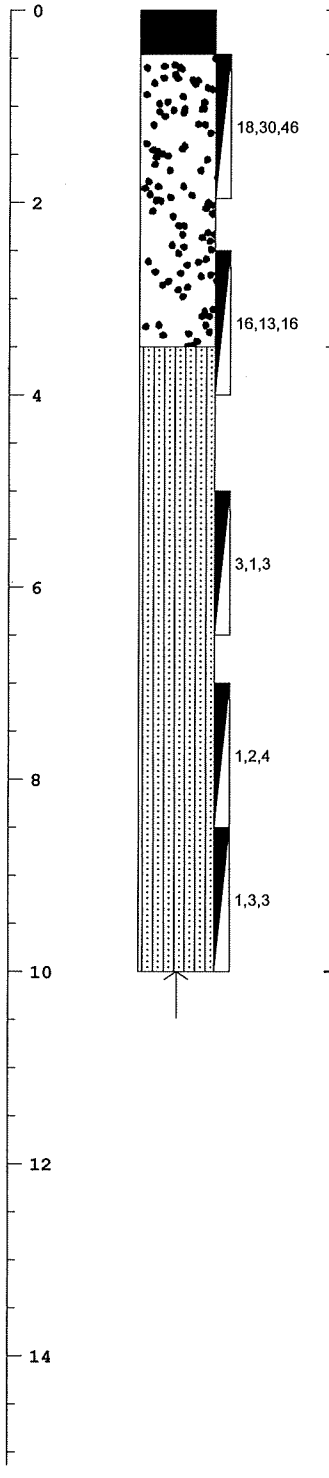


ELEVATION/ DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Moist (%)	-200 (%)	Remarks
			Asphalt Pavement			
		GP	Light Brown, Very Dense, Poorly Graded Sandy Gravel, Moist.			13" Recovery.
						8" Recovery.
						Small Piece of Plastic at 4'.
		SM	Gray with Some Mottling, Loose to Medium Dense Predominantly Fine Silty Sand with Some Gravel, Wet.			17" Recovery
						18" Recovery. Plastic in Sampler.
						17" Recovery.

FIGURE **3**

LOG OF BORING
BORING B-2

PROJECT: **Vashon Transfer Station Pavement Investigation** DATE: **7-6-2017**
BORING LOCATION: **See Figure 2** START: **8:50 AM**
BORING METHOD: **Hollow-Stem Auger** FINISH: **9:45 AM**
DRILLER: **Holocene Drilling** LOGGER: **Tim Hyden**
DEPTH TO - Water: **N/A** Caving: **N/A** DATE CHECKED: **N/A**



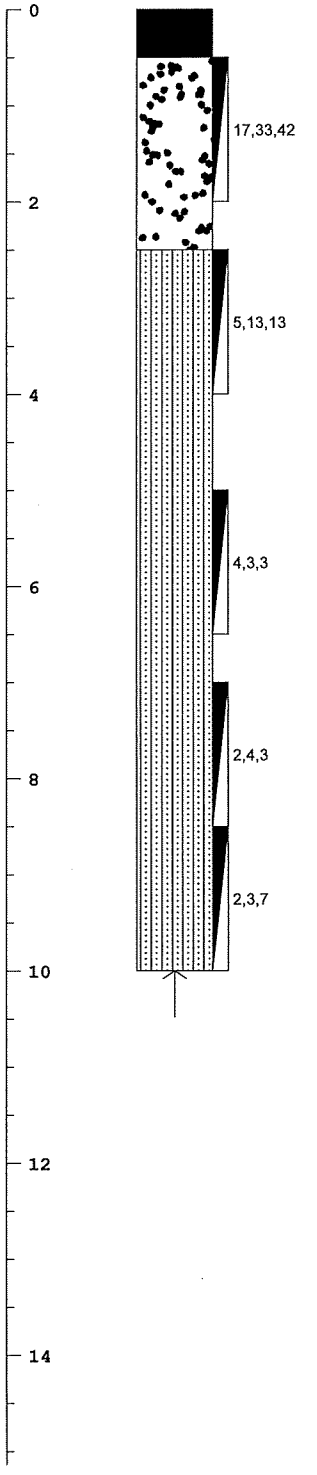
ELEVATION/ DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Moist (%)	-200 (%)	Remarks
			Asphalt Pavement			
		GP	Light Brown, Medium Dense to Very Dense, Poorly Graded Sandy Gravel, Moist.			17" Recovery.
						14" Recovery.
		SM	Gray with Some Mottling, Medium Dense, Fine Silty Sand with Some Gravel, Non-Plastic, Wet.			
			Gray and Reddish Brown with Some Mottling, Very Loose to Loose, Fine Silty Sand with a Trace of Gravel, Low Plasticity to Non-Plastic, Wet.			17" Recovery.
						14" Recovery. Organics and Paper Refuse at 8'.
						12" Recovery. Plastic, Wood, Glass and Paper Intermixed in Sampler.

FIGURE **4**

LOG OF BORING
BORING B-3

PROJECT: **Vashon Transfer Station Pavement Investigation**
BORING LOCATION: **See Figure 2**
BORING METHOD: **Hollow-Stem Auger**
DRILLER: **Holocene Drilling**
DEPTH TO - Water: **N/A** Caving: **N/A**

DATE: **7-6-2017**
START: **9:50 AM**
FINISH: **10:30 AM**
LOGGER: **Tim Hyden**
DATE CHECKED: **N/A**



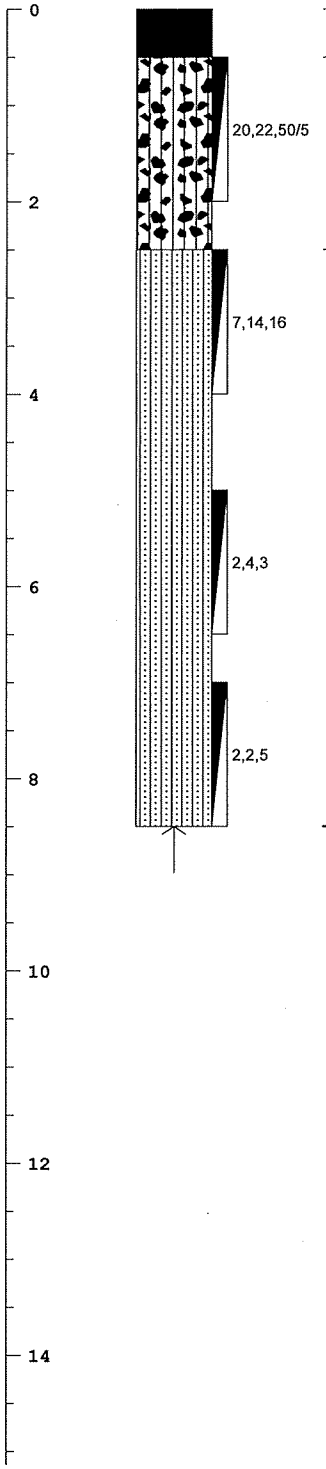
ELEVATION/ DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Moist (%)	-200 (%)	Remarks
			Asphalt Pavement			
		GP	Light Brown to Gray, Very Dense, Poorly Graded Sandy Gravel, Moist.			18" Recovery.
		SM	Gray Mottled with Iron Staining, Medium Dense, Fine Silty Sand with Some Gravel, Non-plastic, Moist to Wet.			16" Recovery.
			Gray with Minor Iron Staining, Loose, Fine Silty Sand with a Trace of Gravel, Non-plastic, Moist to Wet.			13" Recovery.
						14" Recovery. Charcoal and Plastic in Sampler.
						9" Recovery. Approx 30% by Volume (Charcoal, Plastic, Paper, Wood Fragments).

FIGURE **5**

LOG OF BORING
BORING B-4

PROJECT: **Vashon Transfer Station Pavement Investigation**
BORING LOCATION: **See Figure 2**
BORING METHOD: **Hollow-Stem Auger**
DRILLER: **Holocene Drilling**
DEPTH TO - Water: **N/A** Caving: **N/A**

DATE: **7-6-2017**
START: **10:35**
FINISH: **11:25 AM**
LOGGER: **Tim Hyden**
DATE CHECKED: **N/A**

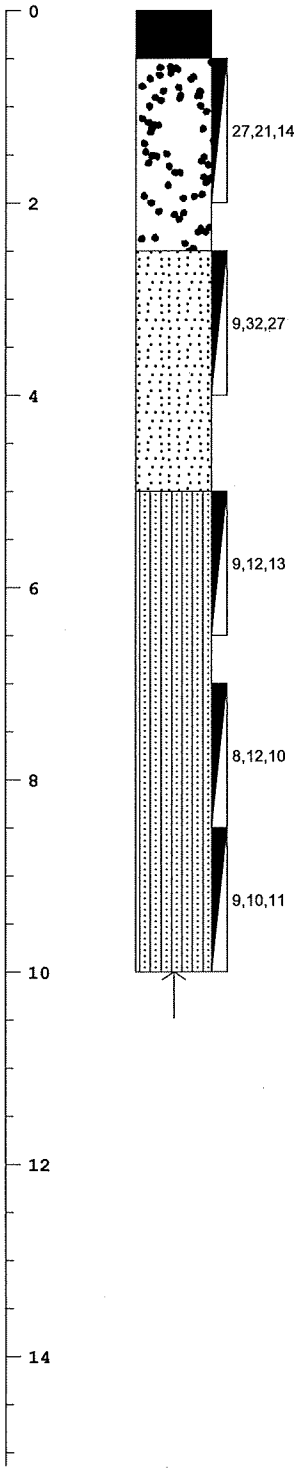


ELEVATION/ DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Moist (%)	-200 (%)	Remarks
			Asphalt Pavement			
		GM	Gray, Very Dense, Silty, Sandy Gravel, Non-plastic, Moist.			18" Recovery
		SM	Gray with Occasional Iron Staining, Medium Dense, Fine Silty Sand with Trace of Gravel, Non-plastic, Moist to Wet.			18" Recovery
			Gray with Occasional Iron Staining, Loose, Fine Silty Sand with Trace of Gravel, Non-plastic, Moist to Wet.			8" Recovery. Trace Charcoal and Organics
						7" Recovery. Charcoal, Wood Debris, Plastic in Sampler.

FIGURE **6**

LOG OF BORING
BORING B-5

PROJECT: **Vashon Transfer Station Pavement Investigation** DATE: **7-6-2017**
BORING LOCATION: **See Figure 2** START: **11:30 AM**
BORING METHOD: **Hollow-Stem Auger** FINISH: **12:30 PM**
DRILLER: **Holocene Drilling** LOGGER: **Tim Hyden**
DEPTH TO - Water: **N/A** Caving: **N/A** DATE CHECKED: **N/A**



ELEVATION/ DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Moist (%)	-200 (%)	Remarks
			Asphalt Pavement			
		GP	Gray, Sandy, Poorly Graded Gravel, Moist.			16" Recovery.
		SP	Gray with Minor Iron Staining, Medium Dense to Very Dense, Gravelly Poorly Graded Sand with Silt, Non-plastic, Wet.			14" Recovery.
		SM	Gray with Minor Iron Staining, Medium Dense, Fine Silty Sand with Trace of Gravel, Non-plastic, Wet.			14" Recovery.
						14" Recovery.
						16" Recovery.

FIGURE **7**

KEY TO SYMBOLS

Symbol Description

Strata symbols

Asphalt Pavement

Poorly graded gravel

Poorly graded sand

Silty sand

Silty gravel

Misc. Symbols

Boring terminated

Soil Samplers

Standard penetration test

Notes:

1. Holocene Drilling completed five exploratory borings on July 6, 2017.
2. A Brainard-Kilman BK-81 truck-mounted drill rig was used to advance the 4.25-inch I.D. hollow stem auger.
3. SPT testing was performed using an automatic hammer.

FIGURE 8

KING COUNTY MATERIALS LABORATORY

GEOTECHNICAL BORING LOG

VASHON ISLAND TRANSFER STATION PAVEMENT INVESTIGATION

Aspect CONSULTING	King County Vashon Island Landfill - 090057		Environmental Exploration Log	
	Project Address & Site Specific Location Vashon Island, East side of South Slope		*Coordinates (SPN NAD83 ft)* E:1228104 N:162678	*Exploration Number* **B-06**
Contractor Holt Services, Inc	*Equipment* Rotary drill rig	*Sampling Method* Rotary core	*Ground Surface (GS) Elev. (NAVD88)* 365.183'	
Operator Pete	*Exploration Method(s)* Sonic	*Work Start/Completion Dates* 4/4/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0	365	Gravel and topsoil surface restoration.			PID= 52.7		Dry to slightly moist, brown, Topsoil; fine to medium sand, fine subrounded gravel, numerous organics (root mass, grass)	0
		3/8-inch Bentonite chip backfill 1-25 ft bgs					**Fill** Slightly moist, brown, gravelly, silty SAND (SM); fine to medium sand, fine subrounded to subangular gravel.	
					PID= 151			
5	360		S1		PID= 41.2			5
10	355		S2		CH4= 0% PID= 204			10
					PID= 98.1			
15	350				PID= 224			15
					PID= 970		**Vashon Advance Outwash/Unit B** Moist, brown, SAND (SP); fine to medium sand, fine subrounded gravel.	
20	345		S3		CH4= 0% PID= 146			20
					PID= 98.9			
					PID= 25.0			
25	340				CH4= 0%		Bottom of exploration at 25 ft. bgs.	25

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ◧ Continuous core 4" ID

Water Level
- No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: MML
Approved by: JJS

Exploration Log B-06
Sheet 1 of 1

ASPECT STANDARD EXPLORATION LOG TEMPLATE \\BISERVER1.ASPECT.LOCAL\PROJECTS\GINTW\PROJECTS\KC VASHON_AUGUST 2016 AND LATER.GPJ October 3, 2018

Aspect CONSULTING	King County Vashon Island Landfill - 090057		Environmental Exploration Log	
	Project Address & Site Specific Location Vashon Island, South east corner of South Slope		*Coordinates (SPN NAD83 ft)* E:1227949 N:162513	*Exploration Number* **B-07**
Contractor Holt Services, Inc	*Equipment* Rotary drill rig	*Sampling Method* Rotary core	*Ground Surface (GS) Elev. (NAVD88)* 322.485'	
Operator Pete	*Exploration Method(s)* Sonic	*Work Start/Completion Dates* 4/4/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0	322	Gravel and topsoil surface restoration.			PID= 131.1		Dry to slightly moist, brown, Topsoil; fine to medium sand, fine subrounded gravel, numerous organics (root mass, grass)	0
		3/8-inch Bentonite chip backfill 1-25 ft bgs					**Fill** Moist, brown, slightly gravelly, silty SAND (SM); fine to medium sand, fine subrounded to subangular gravel, rare root fibers.	
	320				PID= 108.3			
5			S1		PID= 21.9			5
	315							
10					CH4= 0% PID= 86.5			10
	310				PID= 123.5		**Landfill Debris** Very moist, black to gray, silty, sandy, gravelly Fill; plastic scraps, paper, cardboard, glass, garbage bags, etc.	
15			S2		PID= 18.7		Moist, brown SAND (SP); trace silt, fine to medium sand, trace root fibers, 5-10% debris (plastic scraps, garbage bags, glass).	15
	305							
20					CH4= 0%		Landfill debris becomes rare (~1%) with roots and branches.	20
					PID= 13.5		**Vashon Advance Outwash/Unit B** Moist, brown, SAND (SP); fine to medium sand, fine subrounded gravel.	
	300		S3		PID= 20.1			
25					CH4= 0%		Bottom of exploration at 25 ft. bgs.	25
	295							

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ◧ Continuous core 4" ID

Water Level
- No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: MML
Approved by: JJS

Exploration Log B-07
Sheet 1 of 1

ASPECT STANDARD EXPLORATION LOG TEMPLATE \\BISERVER1.ASPECT.LOCAL\PROJECTS\GINT\WPROJECTS\KC VASHON_AUGUST 2016 AND LATER.GPJ October 3, 2018

Aspect CONSULTING	King County Vashon Island Landfill - 090057		Environmental Exploration Log	
	Project Address & Site Specific Location Vashon Island, South end of South Slope		*Coordinates (SPN NAD83 ft)* E:1227832 N:162514	*Exploration Number* **B-08**
Contractor Holt Services, Inc	*Equipment* Rotary drill rig	*Sampling Method* Rotary core	*Ground Surface (GS) Elev. (NAVD88)* 331.764'	
Operator Pete	*Exploration Method(s)* Sonic	*Work Start/Completion Dates* 4/4/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		Gravel and topsoil surface restoration.			PID= 62.8		Dry to slightly moist, brown, Topsoil; fine to medium sand, fine subrounded gravel, numerous organics (root mass, grass)	
	330	3/8-inch Bentonite chip backfill 1-25 ft bgs			PID= 330		**Fill** Moist, brown, slightly gravelly, silty SAND (SM); fine to medium sand, fine subrounded to subangular gravel, rare root fibers.	
					PID= 362			
5			S1		CH4= 0.1%			5
					PID= 50.7			
	325				PID= 398		**Vashon Advance Outwash/Unit B** Moist, brown, gravelly SAND (SP); fine to medium sand, fine subrounded gravel.	
					PID= 35.2			
10					CH4= 0%			10
					PID= 86.5		Sand becomes fine between 11 and 11.5 ft bgs.	
	320							
					PID= 301			
15			S2				Sand becomes fine to coarse 15 to 16.5 ft bgs.	15
					PID= 247			
	315							
					PID= 51.0		3-inch lens of brittle, slightly silty sand.	
20					CH4= 0%			20
	310				PID= 78.5			
			S3					
					PID= 69.6			
25					CH4= 0%		1.5-inch silty sand lens.	25
	305						Bottom of exploration at 25 ft. bgs.	

Legend

Sample Method: Continuous core 4" ID

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: MML
Approved by: JJS

Exploration Log B-08

Sheet 1 of 1

ASPECT STANDARD EXPLORATION LOG TEMPLATE \\BISERVER1.ASPECT.LOCAL\PROJECTS\GINTW\PROJECTS\KC VASHON_AUGUST 2016 AND LATER.GPJ October 3, 2018

Aspect CONSULTING	King County Vashon Island Landfill - 090057		Environmental Exploration Log	
	Project Address & Site Specific Location Vashon Island, South end of South Slope		*Coordinates (SPN NAD83 ft)* E:1227788 N:162585	*Exploration Number* **B-09**
Contractor Holt Services, Inc	*Equipment* Rotary drill rig	*Sampling Method* Rotary core	*Ground Surface (GS) Elev. (NAVD88)* 358.793'	
Operator Pete	*Exploration Method(s)* Sonic	*Work Start/Completion Dates* 4/4/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0		Gravel and topsoil surface restoration.			PID= 132		**Fill** Moist, brown, gravelly, silty SAND (SM); fine to medium sand, fine to coarse subrounded to subangular gravel, rare root fibers, cobbles.	0
		3/8-inch Bentonite chip backfill 1-40 ft bgs			PID= 213		Becomes brown gray.	
	355		S1					
5					PID= 95.6		Grades to dark brown gray.	5
	350				PID= 40.1			
10					CH4= 0% PID= 91.5			10
	345		S2		PID= 142.6			
15					PID= 54.2		**Alluvium** Moist, orange brown, gravelly, SAND (SP); trace silt, fine to medium sand, fine subround to subangular gravel. Grades to brown. Woody branches, and twigs between 17.5 to 18.	15
	340				PID= 45.1		**Vashon Advance Outwash/Unit B** Moist, gray brown, gravelly SAND (SP); fine to medium sand, fine subrounded gravel.	
20					CH4= 0% PID= 38.4			20
	335		S3		PID= 149.1			
25					PID= 144.9			25
	330				PID= 36.3		Sand becomes fine between 29 to 29.5.	
30					PID= 108		Sand becomes fine to coarse; gravel becomes trace, fine, and subrounded.	30
	325				PID= 65.4			
35			S4		PID= 17.2			35
	320				PID= 35.1		Sand becomes fine 39 to 40.	
40					CH4= 0%		Bottom of exploration at 40 ft. bgs.	40

Legend

Sample Method: Continuous core 4" ID

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: MML
Approved by: JJS

Exploration Log B-09
Sheet 1 of 1

ASPECT STANDARD EXPLORATION LOG TEMPLATE \\BISERVER1.ASPECT.LOCAL\PROJECTS\GINTW\PROJECTS\KC VASHON_AUGUST 2016 AND LATER.GPJ October 3, 2018

Aspect CONSULTING	King County Vashon Island Landfill - 090057		Environmental Exploration Log	
	Project Address & Site Specific Location Vashon Island, Southwest corner of South Pond		*Coordinates (SPN NAD83 ft)* E:1227715 N:162694	*Exploration Number* **B-10**
Contractor Holt Services, Inc	*Equipment* Rotary drill rig	*Sampling Method* Rotary core	*Ground Surface (GS) Elev. (NAVD88)* 359.497'	
Operator Pete	*Exploration Method(s)* Sonic	*Work Start/Completion Dates* 4/3/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0	359.5	Gravel and topsoil surface restoration.					**Fill** Moist, brown, gravelly, silty SAND (SM); fine to medium sand, fine to coarse subrounded to subangular gravel, rare root fibers, cobbles.	0
		3/8-inch Bentonite chip backfill 1-30 ft bgs			PID= 221			
5	355		S1		PID= 150.8			5
					PID= 116			
10	350				CH4= 0%		**Vashon Advance Outwash/Unit B** Moist, brown, slightly gravelly SAND (SP); fine to medium sand, fine subrounded gravel.	10
					PID= 20.1			
15	345		S2		CH4= 0% PID= 8.1			15
					PID= 10.7		Oxidized layer 0.5 inches thick.	
20	340				PID= 3.8 CH4= 0%			20
					PID= 48.8			
25	335		S3		CH4= 0% PID= 22.1			25
					PID= 12.1		Sand becomes silty and fine between 28 to 28.5.	
30	330				PID= 23.5		Bottom of exploration at 30 ft. bgs.	30

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ◧ Continuous core 4" ID

Water Level
- No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: MML
Approved by: JJS

Exploration Log B-10
Sheet 1 of 1

ASPECT STANDARD EXPLORATION LOG TEMPLATE \\BISERVER1.ASPECT.LOCAL\PROJECTS\GINT\WPROJECTSIKC VASHON_AUGUST 2016 AND LATER.GPJ October 3, 2018

Aspect CONSULTING	King County Vashon Island Landfill - 090057		Environmental Exploration Log	
	Project Address & Site Specific Location Vashon Island, Outside of fence on West Perimeter Road		*Coordinates (SPN NAD83 ft)* E:1227868 N:163713	*Exploration Number* **B-11**
Contractor Holt Services, Inc	*Equipment* Rotary drill rig	*Sampling Method* Rotary core	*Ground Surface (GS) Elev. (NAVD88)* 405.979'	
Operator Pete	*Exploration Method(s)* Sonic	*Work Start/Completion Dates* 4/5/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0	405	Gravel and topsoil surface restoration.			PID= 219		Dry to slightly moist, brown, silty, sandy Topsoil; fine to medium sand, fine subrounded gravel, numerous organics (root mass, grass)	0
		3/8-inch Bentonite chip backfill 1-20 ft bgs					**Fill** Moist, brown, gravelly, silty SAND (SM); fine to medium sand, fine subrounded to subangular gravel, rare root fibers, rare scattered pieces of glass (<1%).	
							Vashon Till/Unit A Moist, brown, gravelly silty SAND (SM); fine to medium sand, fine to coarse subrounded to subangular gravel.	
					PID= 102			
5	400		S1		PID= 176		Becomes gray.	5
					PID= 146			
10	395				CH4= 0.1% PID= 240			10
					PID= 271			
15	390		S2		PID= 216			15
					PID= 267			
20	385				CH4= 0%		Bottom of exploration at 20 ft. bgs.	20

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ◧ Continuous core 4" ID

Water Level
- No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: MML
Approved by: JJS

Exploration Log B-11
Sheet 1 of 1

ASPECT STANDARD EXPLORATION LOG TEMPLATE \\BISERVER1.ASPECT.LOCAL\PROJECTS\GINTW\PROJECTS\KC VASHON_AUGUST 2016 AND LATER.GPJ October 3, 2018

Aspect CONSULTING	King County Vashon Island Landfill - 090057		Environmental Exploration Log	
	Project Address & Site Specific Location Vashon Island, Outside of fence on West Perimeter Road		*Coordinates (SPN NAD83 ft)* E:1227829 N:163599	*Exploration Number* **B-12**
Contractor Holt Services, Inc	*Equipment* Rotary drill rig	*Sampling Method* Rotary core	*Ground Surface (GS) Elev. (NAVD88)* 402.774'	
Operator Pete	*Exploration Method(s)* Sonic	*Work Start/Completion Dates* 4/5/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
0		Gravel and topsoil surface restoration.			PID= 209		Dry to slightly moist, brown, silty, sandy Topsoil; fine to medium sand, fine subrounded gravel, numerous organics (root mass, grass)	0
							Fill Moist, brown, gravelly, SAND (SP); fine to medium sand, fine subrounded to subangular gravel, rare root fibers, rare scattered pieces of glass (<1%).	
	400	3/8-inch Bentonite chip backfill 1-20 ft bgs			PID= 94.4		**Vashon Till/Unit A** Moist, brown, gravelly silty SAND (SM); fine to medium sand, fine to coarse subrounded to subangular gravel.	
5			S1		PID= 915		Becomes gray.	5
	395				PID= 472			
10					CH4= 0%			10
					PID= 383			
	390				PID= 560			
15			S2		PID= 398		Includes cobbles.	15
	385				PID= 748			
20					CH4= 0.1%		Bottom of exploration at 20 ft. bgs.	20

Legend

Sample Method
- ◯ No Soil Sample Recovery
- ◧ Continuous core 4" ID

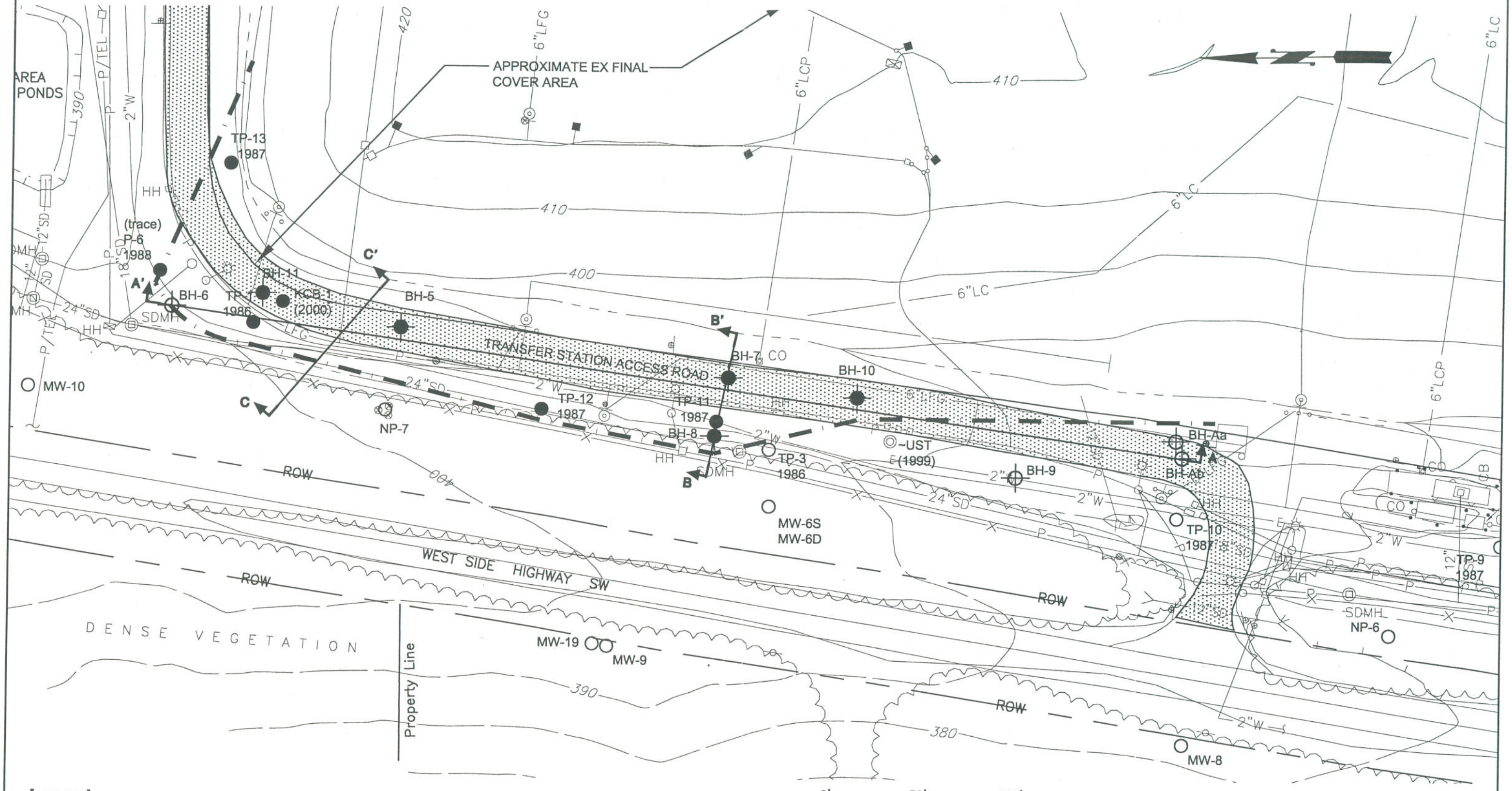
Water Level
- No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: MML
Approved by: JJS

Exploration Log B-12
Sheet 1 of 1

ASPECT STANDARD EXPLORATION LOG TEMPLATE \\BISERVER1.ASPECT.LOCAL\PROJECTS\GINTW\PROJECTSIKC VASHON_AUGUST 2016 AND LATER.GPJ October 3, 2018



Legend

- No Refuse Found (HWA, 2001)
- Refuse Found (HWA, 2001)
- Refuse Found Interpreted Limits of Refuse (HWA, 2001)

Previous Explorations-See Appendix for Logs and Sources

- ◎ ~UST excavation (1999) - No Refuse
- ○ No Refuse Found
- ● Refuse Found

A A' Geologic Cross Section

C:\1PROJECTS\98\98158-401\98158401002.DWG

HWA GEOSCIENCES INC.

TRANSFER STATION ACCESS ROAD ASSESMENT VASHON, WASHINGTON

SITE AND EXPLORATION PLAN

DRAWN BY PL	FIGURE NO. 2
CHECKED BY SG	
DATE 06.12.01	PROJECT NO. 98158-4.01

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N-VALUE

COHESIONLESS SOILS			COHESIVE SOILS		
Density	N (blows/ft)	Approximate Relative Density(%)	Consistency	N (blows/ft)	Approximate Undrained Shear Strength (psf)
Very Loose	0 to 4	0 - 15	Very Soft	0 to 2	<250
Loose	4 to 10	15 - 35	Soft	2 to 4	250 - 500
Medium Dense	10 to 30	35 - 65	Medium Stiff	4 to 8	500 - 1000
Dense	30 to 50	65 - 85	Stiff	8 to 15	1000 - 2000
Very Dense	over 50	85 - 100	Very Stiff	15 to 30	2000 - 4000
			Hard	over 30	>4000

USCS SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP DESCRIPTIONS	
Coarse Grained Soils	Gravel and Gravelly Soils	Clean Gravel (little or no fines)	GW	Well-graded GRAVEL
	More than 50% of Coarse Fraction Retained on No. 4 Sieve		GP	Poorly-graded GRAVEL
		Gravel with Fines (appreciable amount of fines)	GM	Silty GRAVEL
			GC	Clayey GRAVEL
	Sand and Sandy Soils	Clean Sand (little or no fines)	SW	Well-graded SAND
More than 50% Retained on No. 200 Sieve Size			SP	Poorly-graded SAND
	50% or More of Coarse Fraction Passing No. 4 Sieve	Sand with Fines (appreciable amount of fines)	SM	Silty SAND
			SC	Clayey SAND
Fine Grained Soils	Silt and Clay	Liquid Limit Less than 50%	ML	SILT
			CL	Lean CLAY
			OL	Organic SILT/Organic CLAY
50% or More Passing No. 200 Sieve Size	Silt and Clay	Liquid Limit 50% or More	MH	Elastic SILT
			CH	Fat CLAY
			OH	Organic SILT/Organic CLAY
Highly Organic Soils			PT	PEAT

TEST SYMBOLS

%F	Percent Fines	
AL	Atterberg Limits:	PL = Plastic Limit LL = Liquid Limit
CBR	California Bearing Ratio	
CN	Consolidation	
DD	Dry Density (pcf)	
DS	Direct Shear	
GS	Grain Size Distribution	
K	Permeability	
MD	Moisture/Density Relationship (Proctor)	
MR	Resilient Modulus	
PID	Photoionization Device Reading	
PP	Pocket Penetrometer Approx. Compressive Strength (tsf)	
SG	Specific Gravity	
TC	Triaxial Compression	
TV	Torvane Approx. Shear Strength (tsf)	
UC	Unconfined Compression	

SAMPLE TYPE SYMBOLS

- 2.0" OD Split Spoon (SPT) (140 lb. hammer with 30 in. drop)
- Shelby Tube
- 3-1/4" OD Split Spoon with Brass Rings
- Small Bag Sample
- Large Bag (Bulk) Sample
- Core Run
- Non-standard Penetration Test (3.0" OD split spoon)

GROUNDWATER SYMBOLS

- Groundwater Level (measured at time of drilling)
- Groundwater Level (measured in well or open hole after water level stabilized)

COMPONENT DEFINITIONS

COMPONENT	SIZE RANGE
Boulders	Larger than 12 in
Cobbles	3 in to 12 in
Gravel	3 in to No 4 (4.5mm)
Coarse gravel	3 in to 3/4 in
Fine gravel	3/4 in to No 4 (4.5mm)
Sand	No. 4 (4.5 mm) to No. 200 (0.074 mm)
Coarse sand	No. 4 (4.5 mm) to No. 10 (2.0 mm)
Medium sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074mm)

COMPONENT PROPORTIONS

PROPORTION RANGE	DESCRIPTIVE TERMS
< 5%	Clean
5 - 12%	Slightly (Clayey, Silty, Sandy)
12 - 30%	Clayey, Silty, Sandy, Gravelly
30 - 50%	Very (Clayey, Silty, Sandy, Gravelly)
Components are arranged in order of increasing quantities.	

NOTES: Soil classifications presented on exploration logs are based on visual and laboratory observation.
Soil descriptions are presented in the following general order:

Density/consistency, color, modifier (if any) GROUP NAME, additions to group name (if any), moisture content. Proportion, gradation, and angularity of constituents, additional comments. (GEOLOGIC INTERPRETATION)

Please refer to the discussion in the report text as well as the exploration logs for a more complete description of subsurface conditions.

MOISTURE CONTENT

DRY	Absence of moisture, dusty, dry to the touch.
MOIST	Damp but no visible water.
WET	Visible free water, usually soil is below water table.

HWA GEOSCIENCES INC.

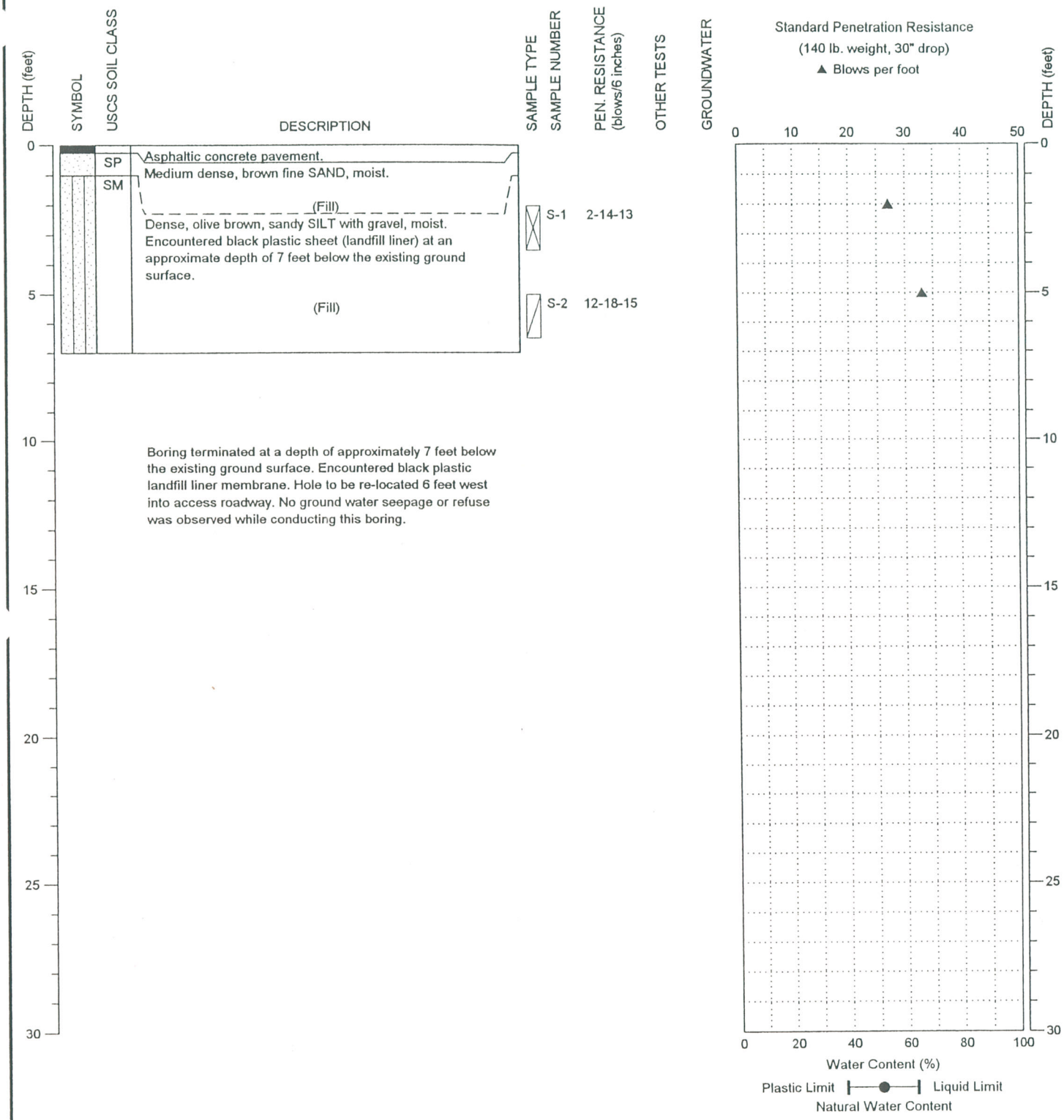
Vashon Island Landfill Access Road Evaluation
Vashon Island Landfill
King County, Washington

LEGEND OF TERMS AND SYMBOLS USED ON EXPLORATION LOGS

PROJECT NO.: 98158-4.1 FIGURE: A-1

DRILLING COMPANY: Cascade Drilling, Inc.
DRILLING METHOD: CME-75, 4 1/4" HSA
SAMPLING METHOD: Autohammer
SURFACE ELEVATION: 385 ± feet

LOCATION: See Figure 2.
DATE STARTED: 6/4/2001
DATE COMPLETED: 6/4/2001
LOGGED BY: S. Nelson



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Vashon Island Landfill Access Road Evaluation
Vashon Island Landfill
King County, Washington

BORING:
BH- 4a

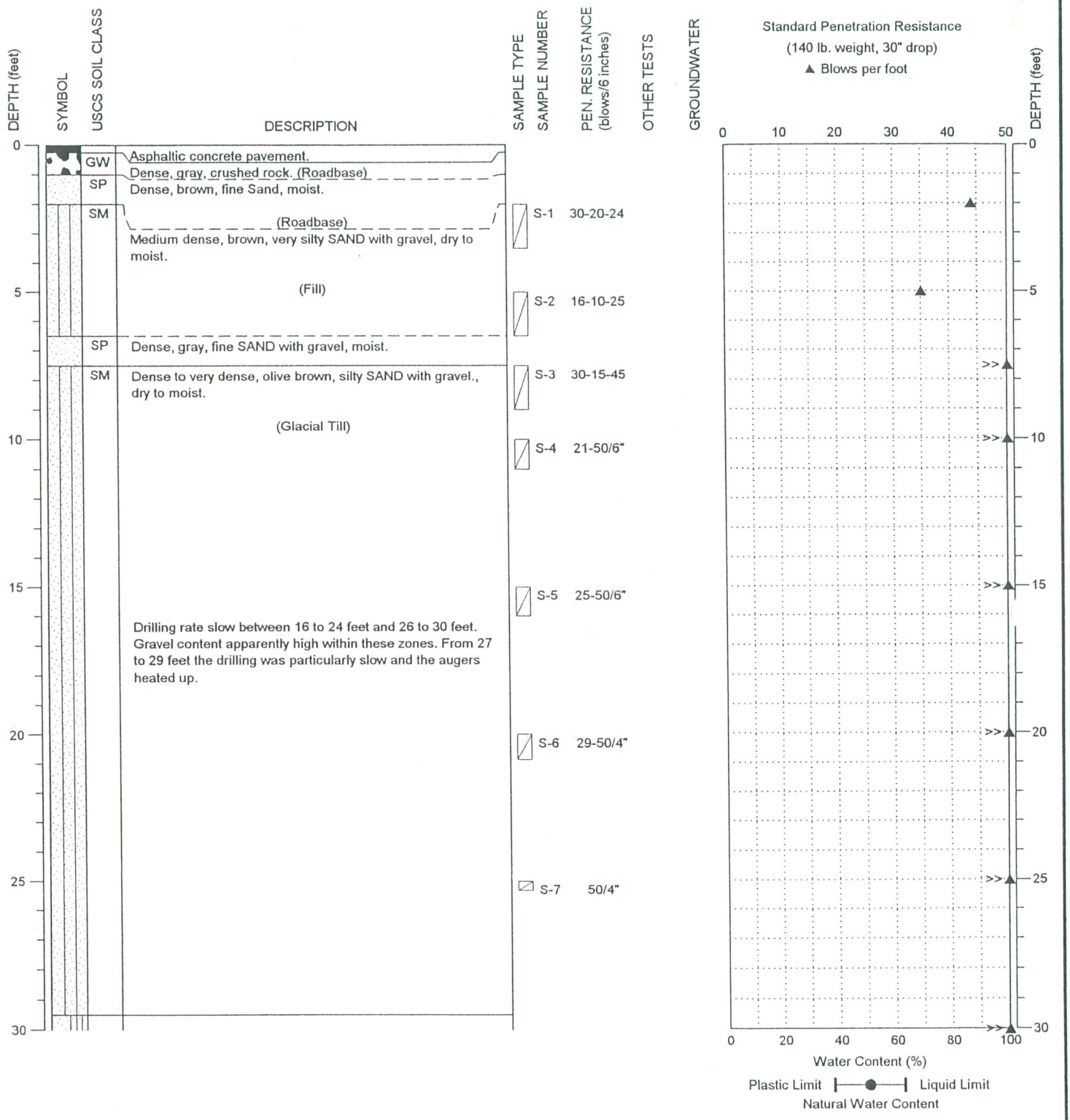
PAGE: 1 of 1

PROJECT NO.: 98158-4.1 FIGURE: A-2

BORING 98158.GPJ 3/8/02

DRILLING COMPANY: Cascade Drilling, Inc.
DRILLING METHOD: CME-75, 4 1/4" HSA
SAMPLING METHOD: Autohammer
SURFACE ELEVATION: 385 ± feet

LOCATION: See Figure 2.
DATE STARTED: 6/4/2001
DATE COMPLETED: 6/4/2001
LOGGED BY: S. Nelson



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Vashon Island Landfill Access Road Evaluation
Vashon Island Landfill
King County, Washington

BORING:
BH- 4b

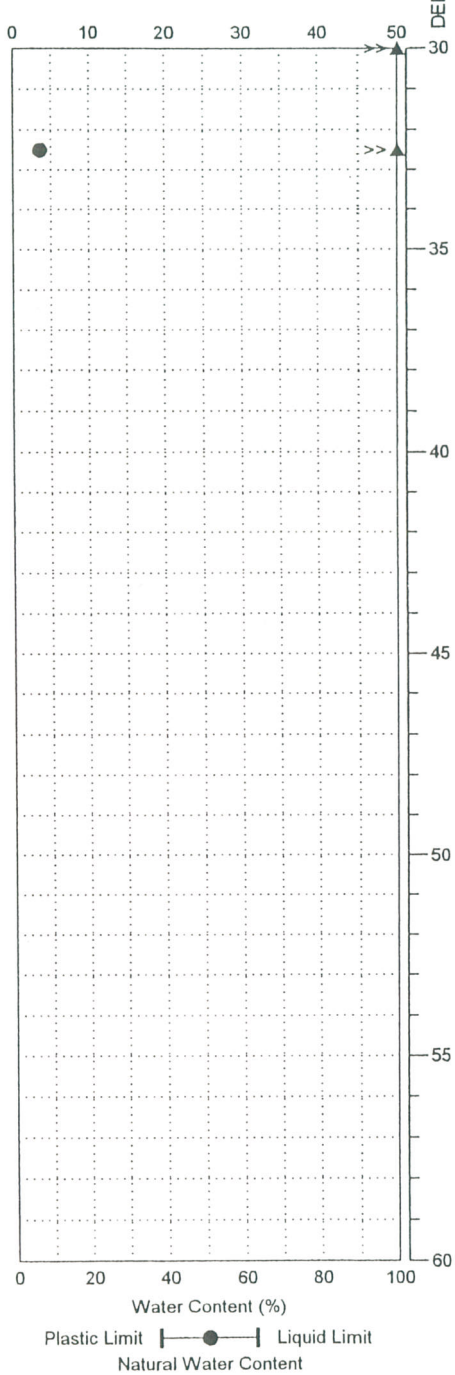
PROJECT NO.: 98158-4.1 FIGURE: A-3

DRILLING COMPANY: Cascade Drilling, Inc.
DRILLING METHOD: CME-75, 4 1/4" HSA
SAMPLING METHOD: Autohammer
SURFACE ELEVATION: 385 ± feet

LOCATION: See Figure 2.
DATE STARTED: 6/4/2001
DATE COMPLETED: 6/4/2001
LOGGED BY: S. Nelson

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
30		SP SM	Dense to very dense, olive, fine SAND with silt and gravel, moist. (Advance Outwash)		S-8	26-37-50/5"		
					S-9	27-40-50/4"		
35			Boring terminated at approximately 33.83 feet below the existing ground surface. No ground water seepage or refuse was observed while conducting this boring.					
40								
45								
50								
55								
60								

Standard Penetration Resistance
(140 lb. weight, 30" drop)
▲ Blows per foot



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

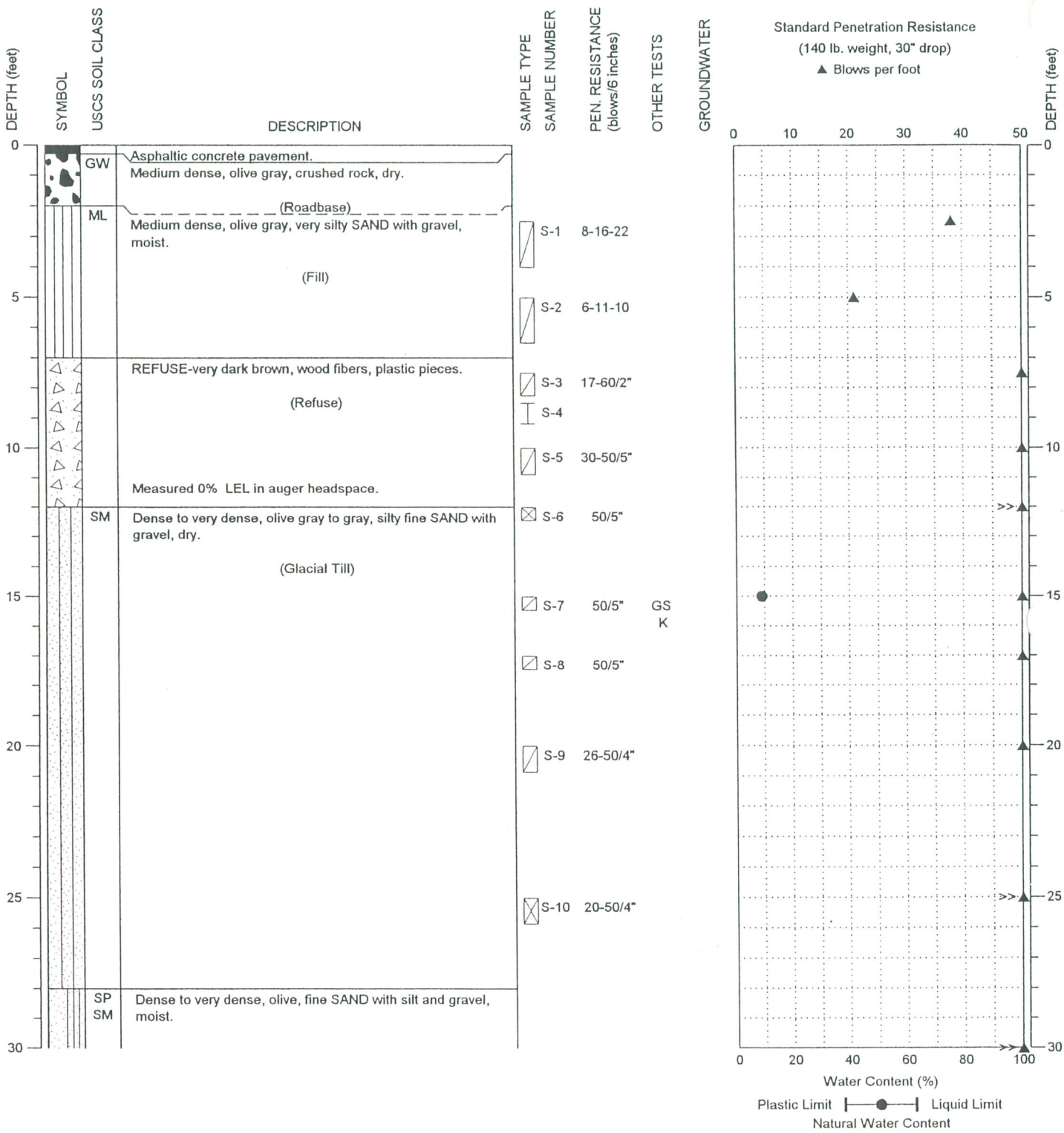
Vashon Island Landfill Access Road Evaluation
Vashon Island Landfill
King County, Washington

BORING:
BH- 4b

PROJECT NO.: 98158-4.1 FIGURE: A-3

DRILLING COMPANY: Cascade Drilling, Inc.
DRILLING METHOD: CME 75, 4 1/4" HSA
SAMPLING METHOD: Autohammer
SURFACE ELEVATION: 402 ± feet

LOCATION: See Figure 2.
DATE STARTED: 6/6/2001
DATE COMPLETED: 6/6/2001
LOGGED BY: S. Nelson



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Vashon Island Landfill Access Road Evaluation
Vashon Island Landfill
King County, Washington

BORING:
BH- 5

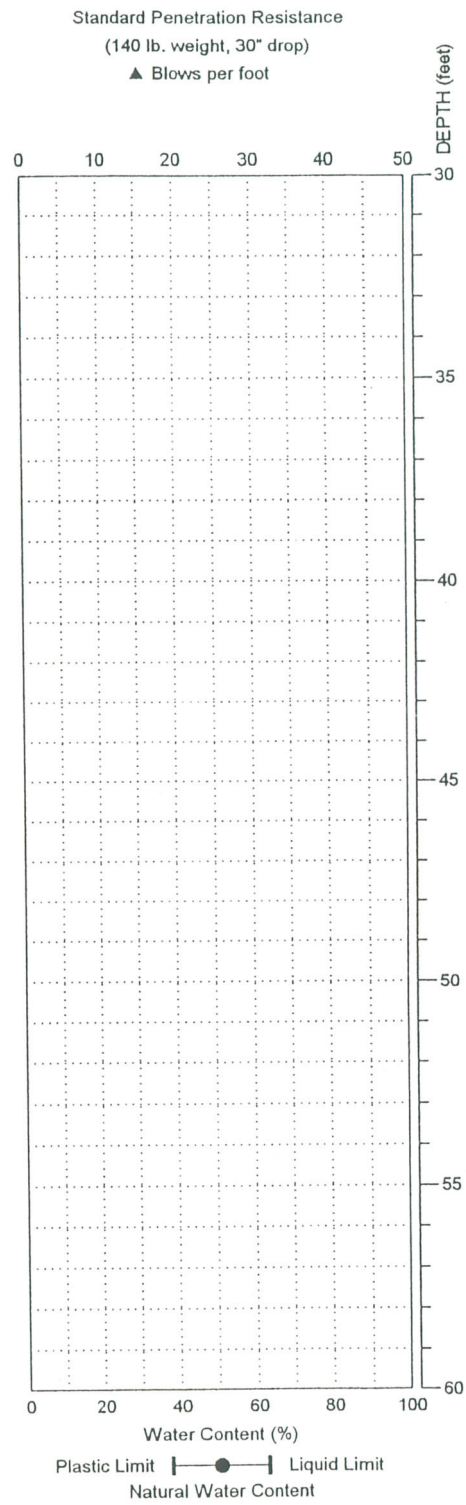
PROJECT NO.: 98158-4.1 FIGURE: A-4

DRILLING COMPANY: Cascade Drilling, Inc.
DRILLING METHOD: CME 75, 4 1/4" HSA
SAMPLING METHOD: Autohammer
SURFACE ELEVATION: 402 ± feet

LOCATION: See Figure 2.
DATE STARTED: 6/6/2001
DATE COMPLETED: 6/6/2001
LOGGED BY: S. Nelson

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
30			(Advance Outwash)	X	S-11	29-50/5"		

Boring terminated at a depth of approximately 30.9 feet below the existing ground surface. Refuse observed from a depth of approximately 7 to 12 feet below the existing ground surface. No ground water seepage was observed while conducting this boring.



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

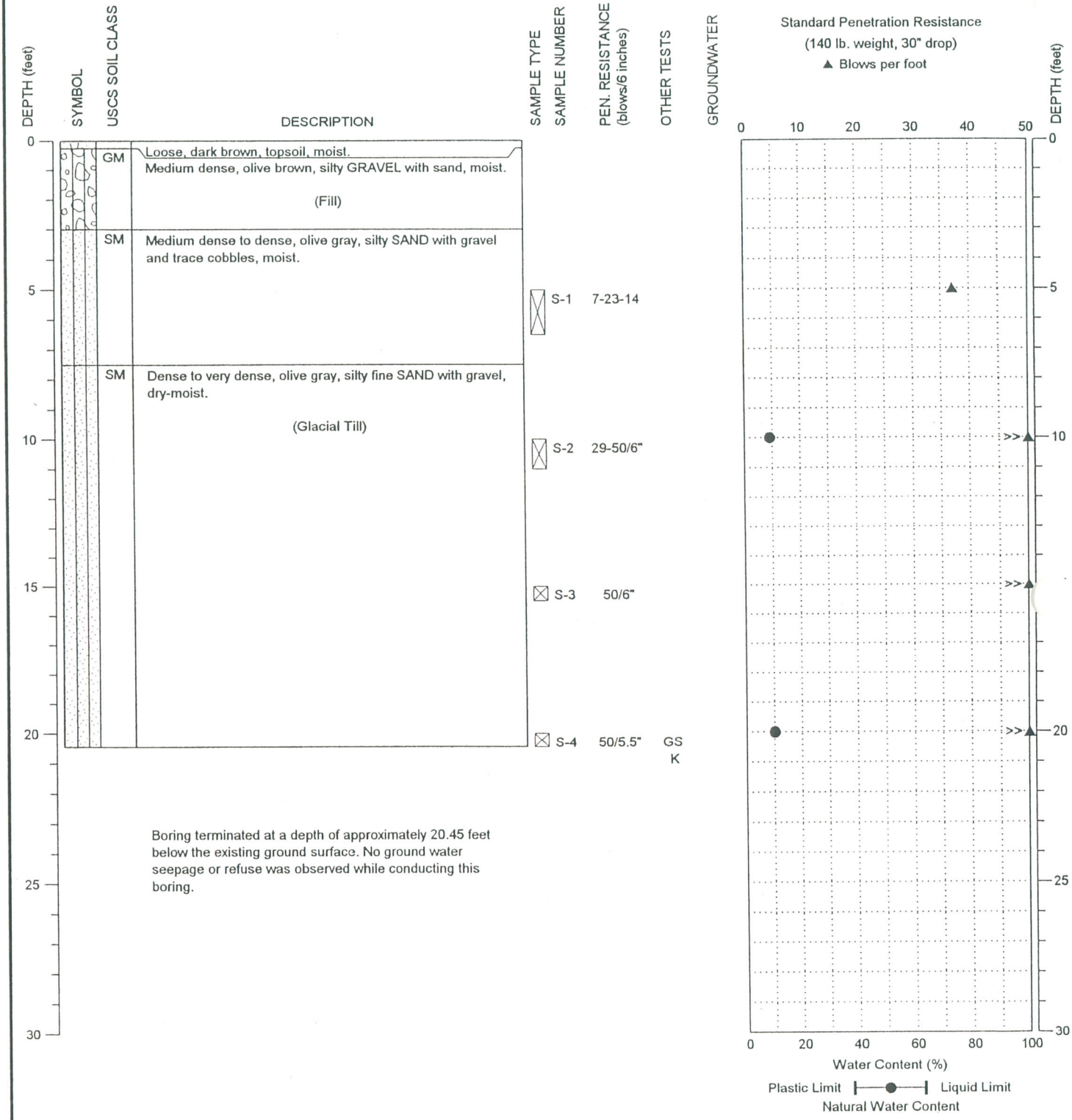
Vashon Island Landfill Access Road Evaluation
Vashon Island Landfill
King County, Washington

BORING:
BH- 5

PROJECT NO.: 98158-4.1 FIGURE: A-4

DRILLING COMPANY: Cascade Drilling, Inc.
DRILLING METHOD: CME 75, 4 1/4" HSA
SAMPLING METHOD: Autohammer
SURFACE ELEVATION: 402 ± feet

LOCATION: See Figure 2.
DATE STARTED: 6/5/2001
DATE COMPLETED: 6/5/2001
LOGGED BY: S. Nelson



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Vashon Island Landfill Access Road Evaluation
Vashon Island Landfill
King County, Washington

BORING:
BH- 6

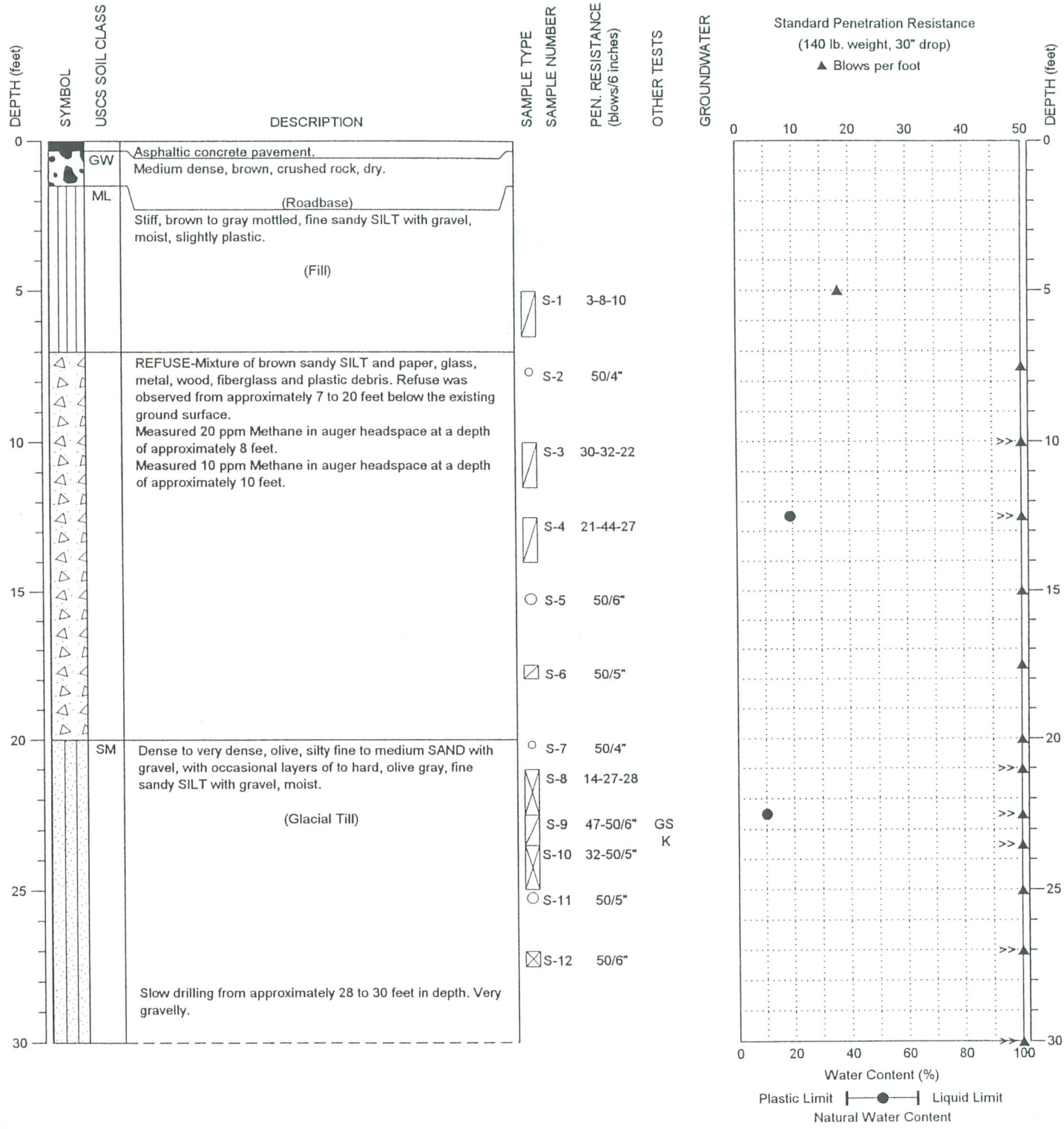
PAGE: 1 of 1

PROJECT NO.: 98158-4.1 FIGURE: A-5

BORING 98158.GPJ 3/8/02

DRILLING COMPANY: Cascade Drilling, Inc.
DRILLING METHOD: CME 75, 4 1/4" HSA
SAMPLING METHOD: Autohammer
SURFACE ELEVATION: 395 ± feet

LOCATION: See Figure 2.
DATE STARTED: 6/5/2001
DATE COMPLETED: 6/5/2001
LOGGED BY: S. Nelson



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Vashon Island Landfill Access Road Evaluation
Vashon Island Landfill
King County, Washington

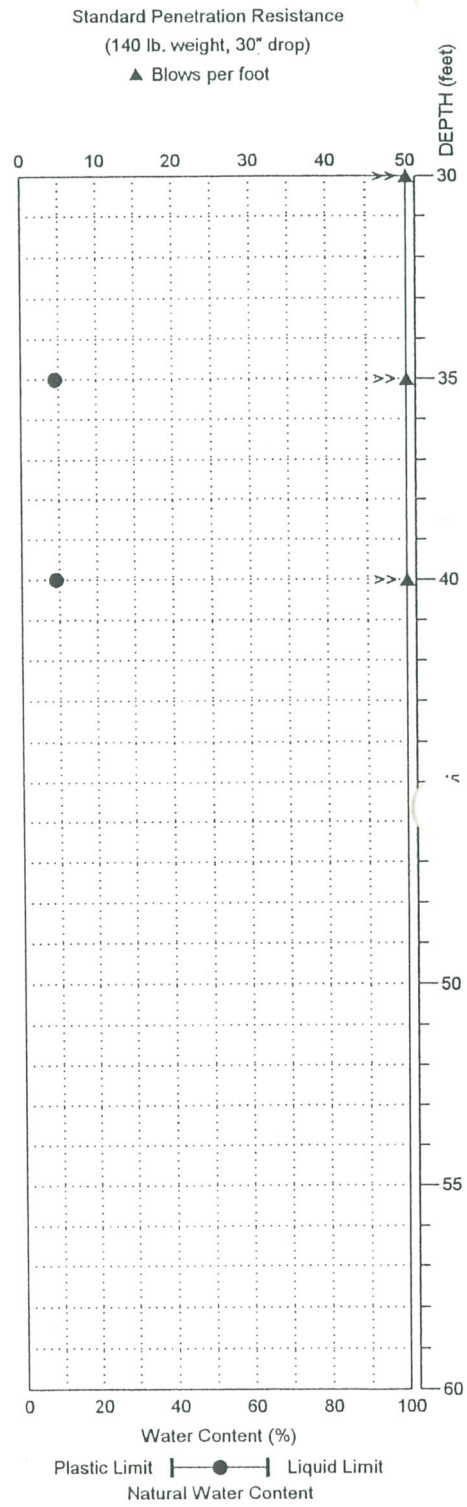
BORING:
BH- 7

PROJECT NO.: 98158-4.1 FIGURE: A-6

DRILLING COMPANY: Cascade Drilling, Inc.
DRILLING METHOD: CME 75, 4 1/4" HSA
SAMPLING METHOD: Autohammer
SURFACE ELEVATION: 395 ± feet

LOCATION: See Figure 2.
DATE STARTED: 6/5/2001
DATE COMPLETED: 6/5/2001
LOGGED BY: S. Nelson

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE / SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
30		ML	Hard, fine sandy SILT with gravel, moist, slightly plastic.	S-13	50/5"		
35		SP SM	Dense to very dense, brownish gray, fine SAND with silt and gravel, moist. (Advance Outwash)	S-14	50/6"		
40				S-15	32-50/5"		
45			Boring terminated at approximately 40.9 feet below the existing ground surface. Refuse was observed from a depth of approximately 7 to 20 feet below the existing ground surface. No ground water seepage was observed while conducting this boring.				
50							
55							
60							



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Vashon Island Landfill Access Road Evaluation
Vashon Island Landfill
King County, Washington

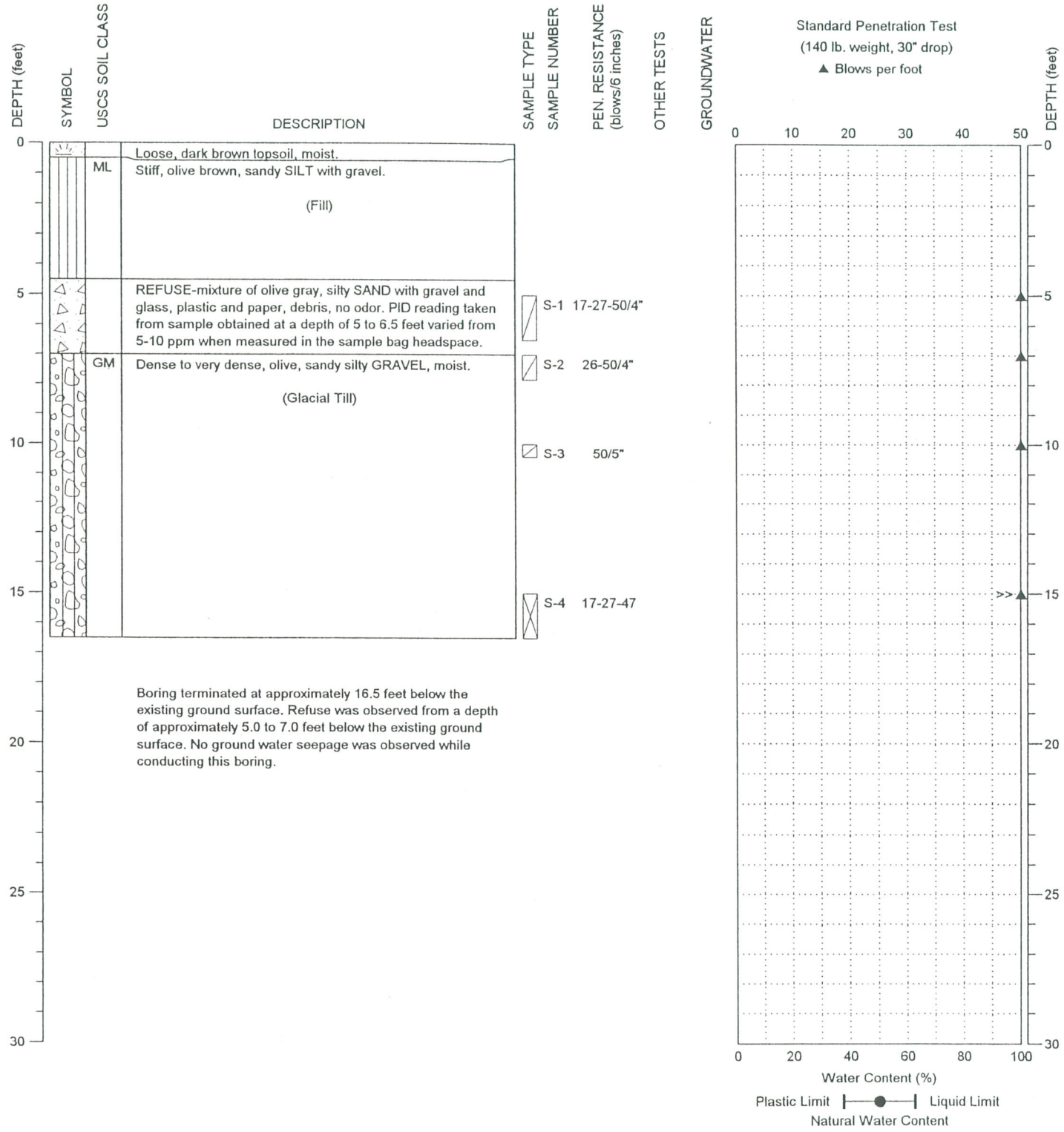
BORING:
BH- 7

PROJECT NO.: 98158-4.1 FIGURE: A-6

BORING 98158.GPJ 3/8/02

DRILLING COMPANY: Cascade Drilling, Inc.
DRILLING METHOD: CME 75, 4 1/4" HSA
SAMPLING METHOD: Autohammer
SURFACE ELEVATION: 395 ± feet

LOCATION: See Figure 2.
DATE STARTED: 6/6/2001
DATE COMPLETED: 6/6/2001
LOGGED BY: S. Nelson



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Vashon Island Landfill Access Road Evaluation
Vashon Island Landfill
King County, Washington

BORING:
BH- 8

PAGE: 1 of 1

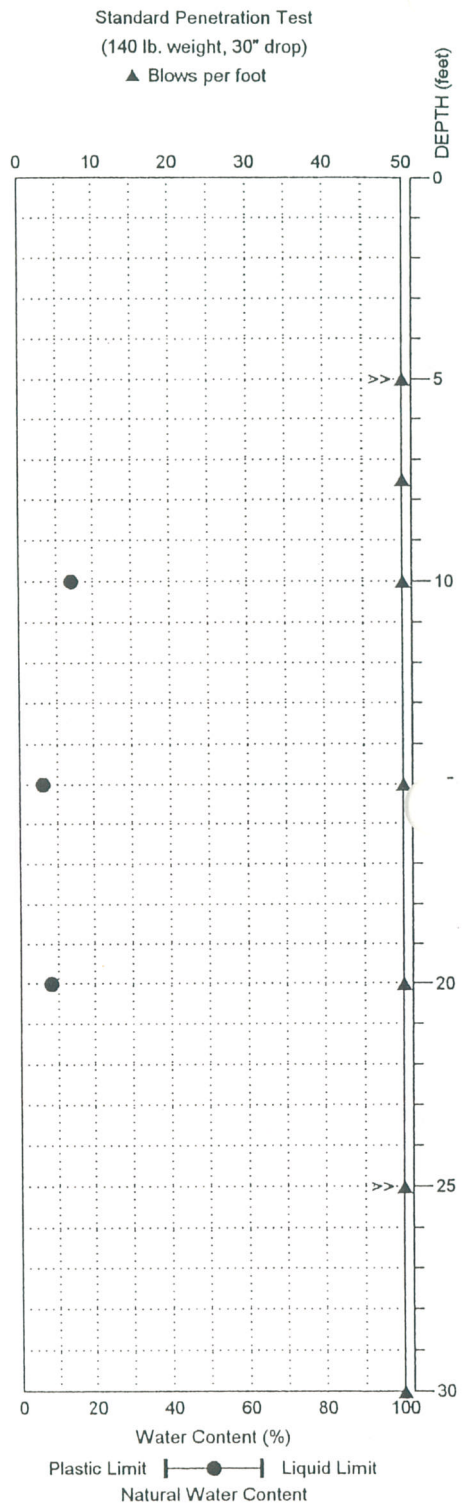
PROJECT NO.: 98158-4.1 FIGURE: A-7

BORING 98158.GPJ 3/8/02

DRILLING COMPANY: Cascade Drilling, Inc.
DRILLING METHOD: CME 75, 4 1/4" HSA
SAMPLING METHOD: Autohammer
SURFACE ELEVATION: 387 ± feet

LOCATION: See Figure 2.
DATE STARTED: 6/4/2001
DATE COMPLETED: 6/4/2001
LOGGED BY: S. Nelson

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
0		GW	Loose, silty crushed rock,dry.					
		SP	Loose, fine to medium SAND, moist.					
		SM	Medium dense, grayish brown, very silty SAND with gravel, moist. (Fill)					
5					S-1	10-26-50/5"		
		SM	Dense to very dense, olive gray to gray, silty fine SAND with gravel, moist. Contains occasional layers of hard, gray, slightly fine sandy SILT with fine gravel. (Glacial Till)		S-2	50/4"		
10					S-3	30-50/5"		
15					S-4	45-50/3"		
20					S-5	50/5"	GS K	
25					S-6	50/3"		
30								



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Vashon Island Landfill Access Road Evaluation
Vashon Island Landfill
King County, Washington

BORING:
BH- 9

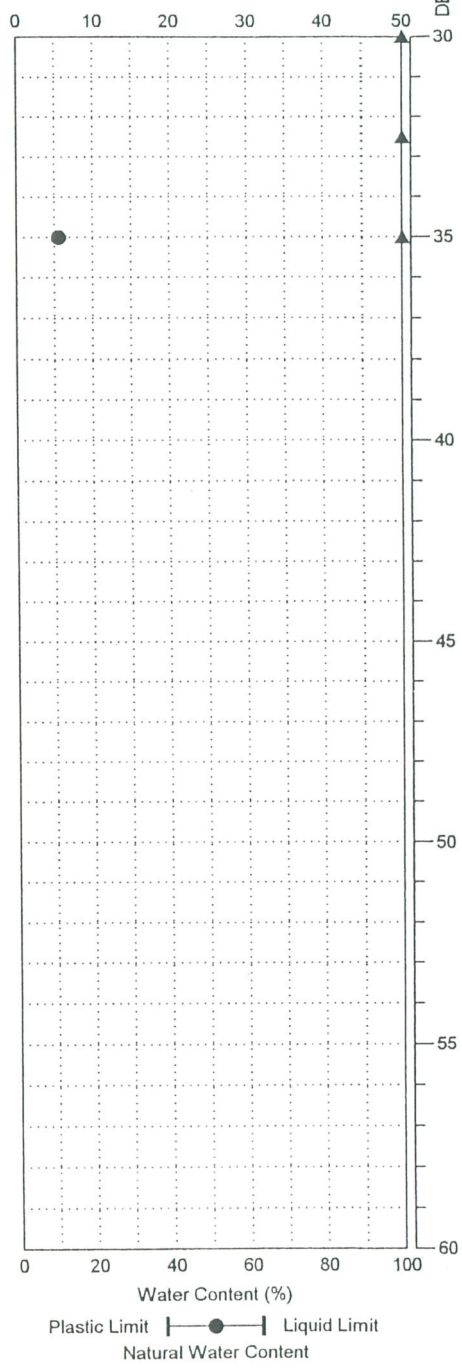
PROJECT NO.: 98158-4.1 FIGURE: A-8

DRILLING COMPANY: Cascade Drilling, Inc.
DRILLING METHOD: CME 75, 4 1/4" HSA
SAMPLING METHOD: Autohammer
SURFACE ELEVATION: 387 ± feet

LOCATION: See Figure 2.
DATE STARTED: 6/4/2001
DATE COMPLETED: 6/4/2001
LOGGED BY: S. Nelson

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
30				O	S-7	50/4"		
		SP	Dense to very dense, olive, fine SAND with gravel, moist. (Advance Outwash)	O	S-8	50/3"		
35				☒	S-9	50/6"		
40			Boring terminated at a depth of approximately 35.5 feet below the existing ground surface. No refuse or ground water seepage was observed while conducting this boring.					
45								
50								
55								
60								

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

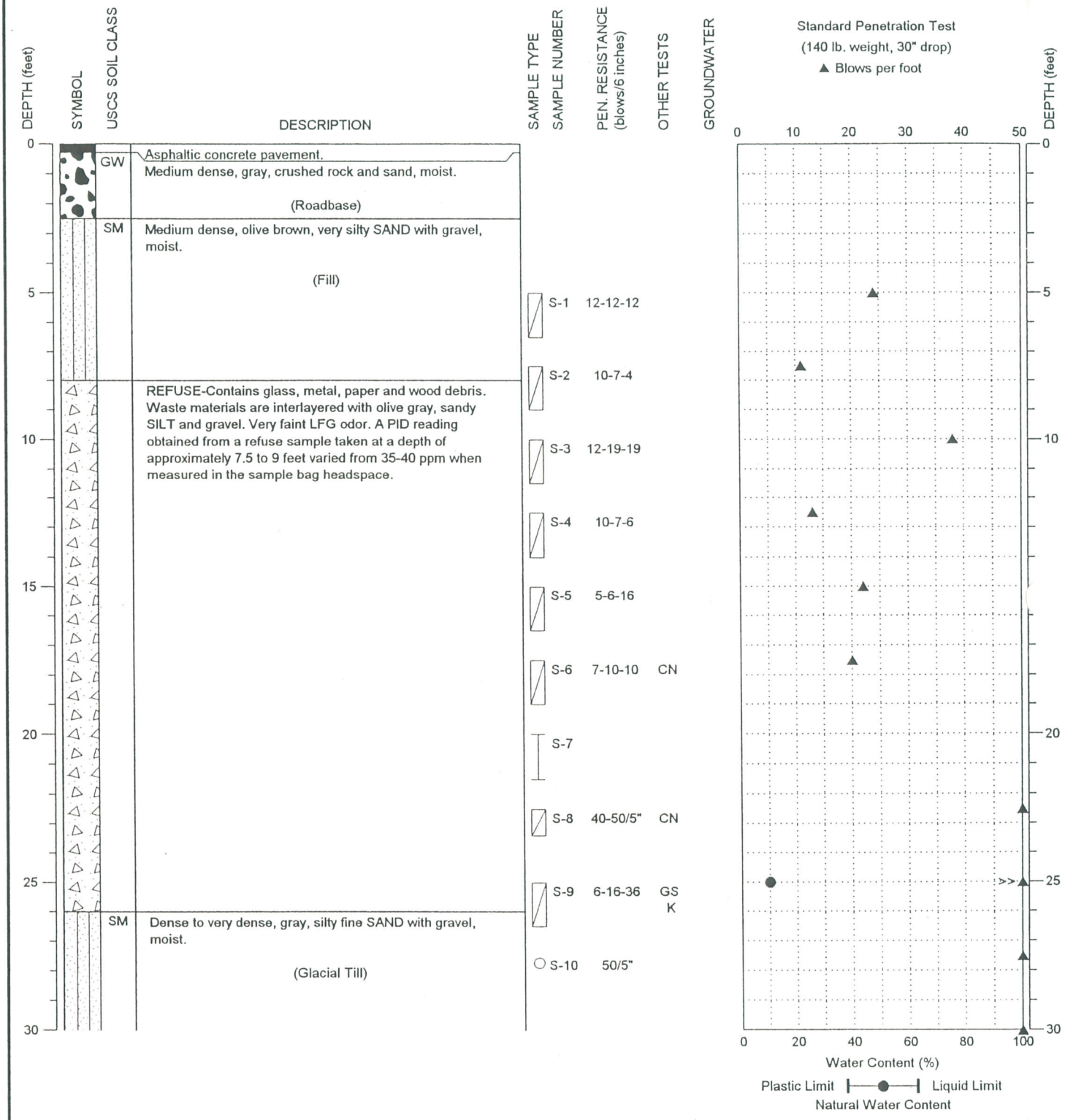
Vashon Island Landfill Access Road Evaluation
Vashon Island Landfill
King County, Washington

BORING:
BH- 9

PROJECT NO.: 98158-4.1 FIGURE: A-8

DRILLING COMPANY: Cascade Drilling, Inc.
DRILLING METHOD: CME 75, 4 1/4" HSA
SAMPLING METHOD: Autohammer
SURFACE ELEVATION: 383 ± feet

LOCATION: See Figure 2.
DATE STARTED: 6/6/2001
DATE COMPLETED: 6/6/2001
LOGGED BY: S. Nelson



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

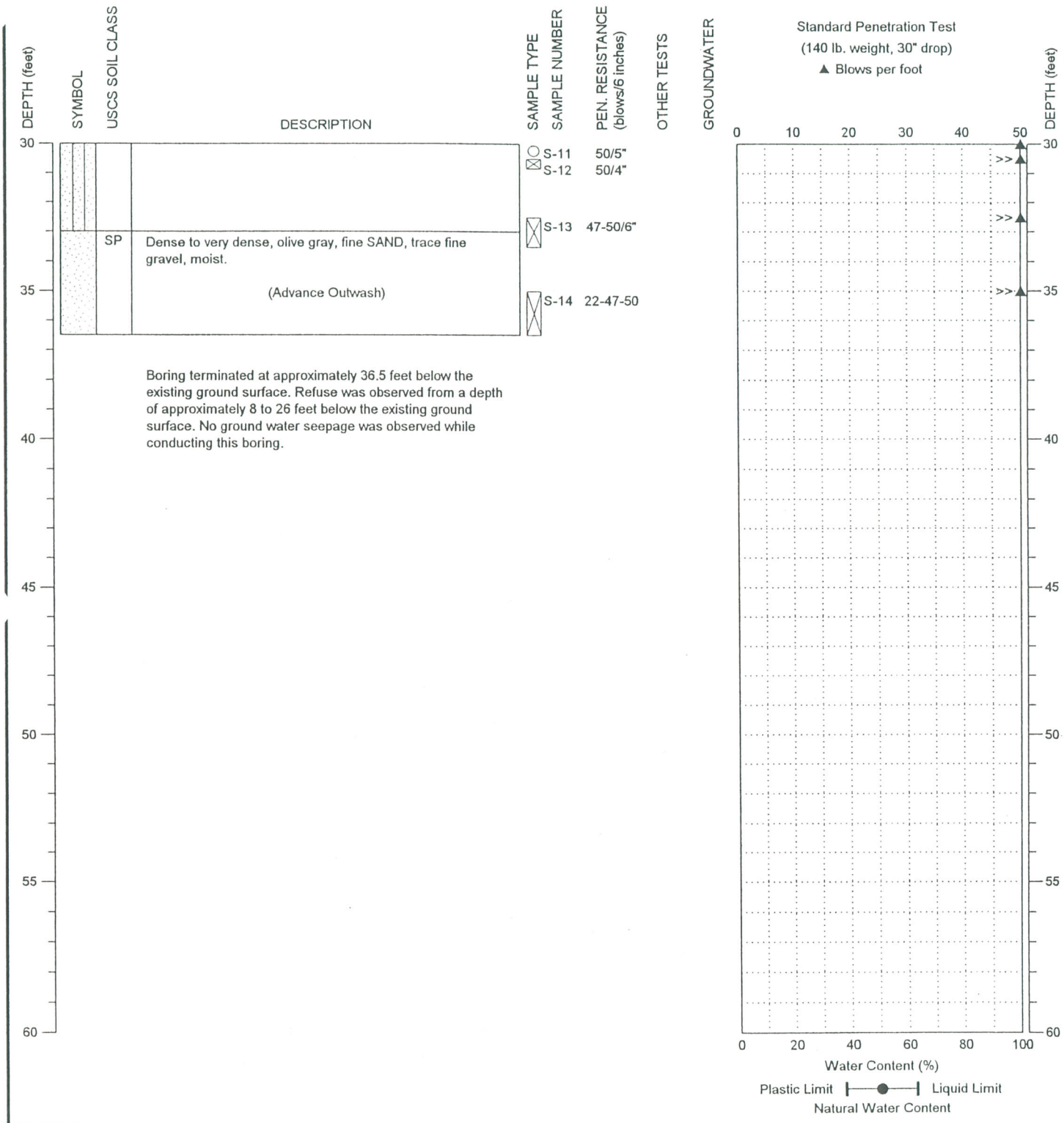
Vashon Island Landfill Access Road Evaluation
Vashon Island Landfill
King County, Washington

BORING:
BH-10

PROJECT NO.: 98158-4.1 FIGURE: A-9

DRILLING COMPANY: Cascade Drilling, Inc.
DRILLING METHOD: CME 75, 4 1/4" HSA
SAMPLING METHOD: Autohammer
SURFACE ELEVATION: 383 ± feet

LOCATION: See Figure 2.
DATE STARTED: 6/6/2001
DATE COMPLETED: 6/6/2001
LOGGED BY: S. Nelson



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

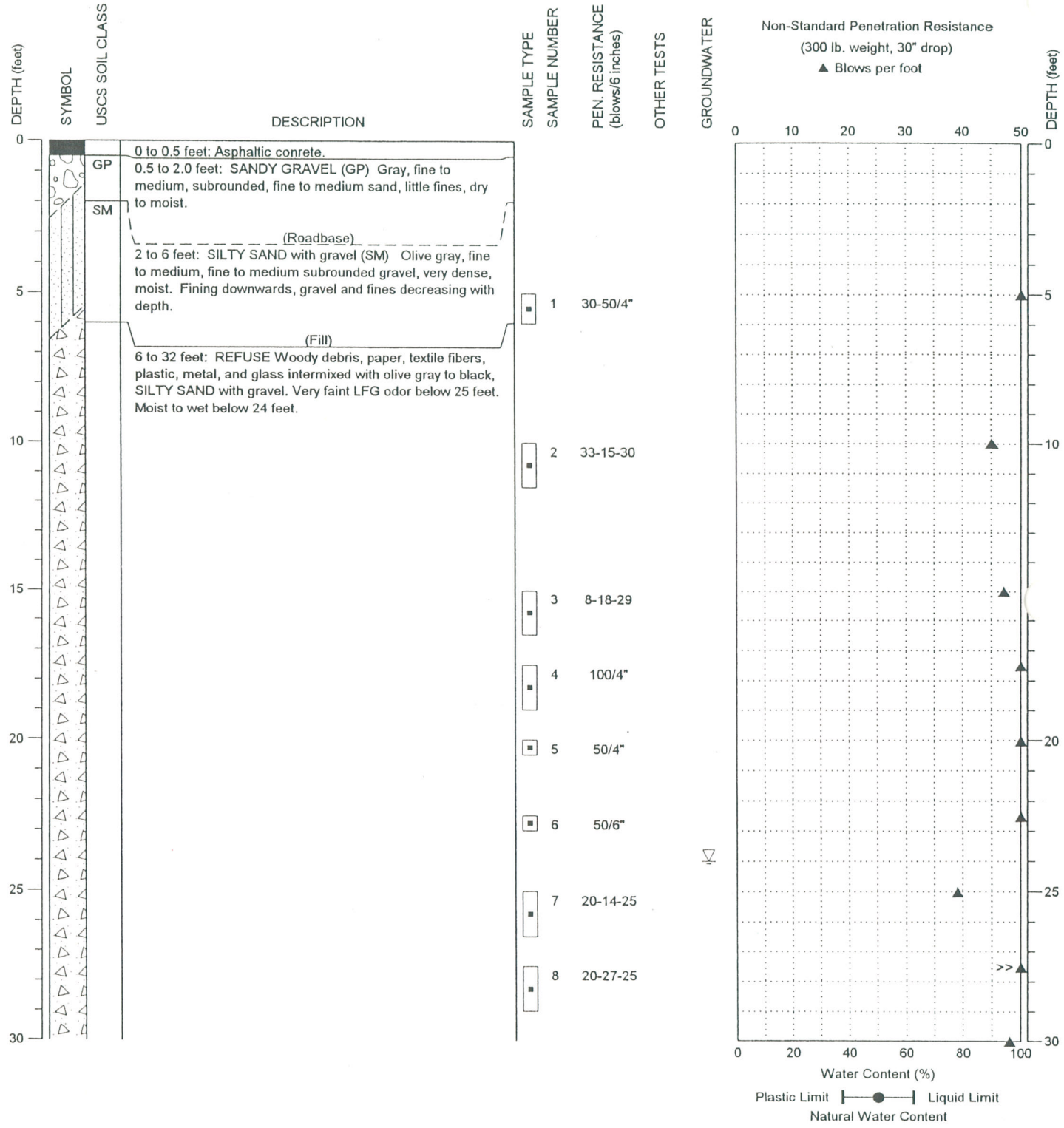
Vashon Island Landfill Access Road Evaluation
Vashon Island Landfill
King County, Washington

BORING:
BH-10

PROJECT NO.: 98158-4.1 FIGURE: A-9

DRILLING COMPANY: Cascade Drilling, Inc.
DRILLING METHOD: CME 75, 4 1/4" HSA
SAMPLING METHOD: Wire line jars and D&M sampler
SURFACE ELEVATION: 402 ± feet

LOCATION: 12 ft NNE of KCB-1
DATE STARTED: 1/21/2002
DATE COMPLETED: 1/21/2002
LOGGED BY: S. Nelson



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Vashon Island Landfill Access Road Evaluation
Vashon Island Landfill
King County, Washington

BORING:
BH-11

PROJECT NO.: 98158-4.1 FIGURE: A-10

BORING 98158.GPJ 3/8/02

DRILLING COMPANY: Cascade Drilling, Inc.
DRILLING METHOD: CME 75, 4 1/4" HSA
SAMPLING METHOD: Wire line jars and D&M sampler
SURFACE ELEVATION: 402 ± feet

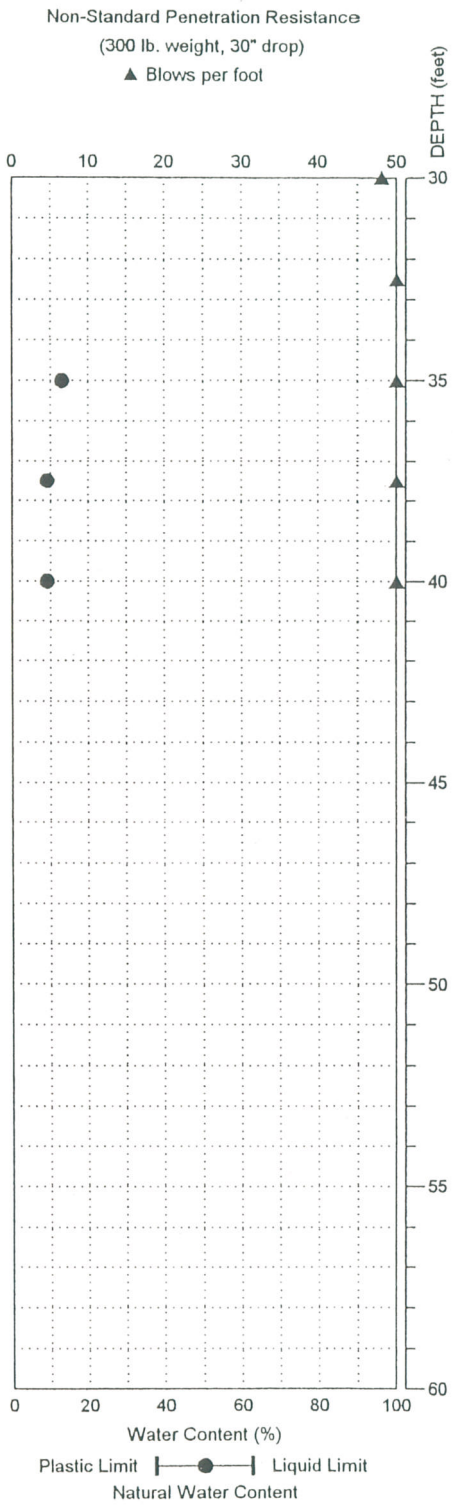
LOCATION: 12 ft NNE of KCB-1
DATE STARTED: 1/21/2002
DATE COMPLETED: 1/21/2002
LOGGED BY: S. Nelson

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
30					9	23-23-25	
		SM	32 to 37 feet: SILTY SAND with Gravel (SM). Olive gray, fine to medium sand, non-plastic fines, fine to medium subrounded gravel, dense to very dense. Wet at 32 to 33 feet, moist below.		10	100/5"	
35			(Glacial Till)		11	50/4"	K GS DD
		SP	37 to 40.5 feet: SAND (SP) Olive brown, fine, few fine subround gravel, trace fines, moist.		12	60/6"	%F DD
40			(Advance Outwash)		13	60/5"	%F DD
45							
50							
55							
60							

Boring terminated at a depth of approximately 40.5 feet below the existing ground surface (bgs). Refuse was observed from a depth of approximately 6 to 32 feet bgs. The refuse was wet from approximately 24 to 32 feet bgs.

Borehole was abandoned with medium bentonite chips as auger flights were removed.

GROUNDWATER



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Vashon Island Landfill Access Road Evaluation
Vashon Island Landfill
King County, Washington

BORING:
BH-11

PROJECT NO.: 98158-4.1 FIGURE: A-10

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT King County Ground Water Study - Vashon

Location Northeast corner

Boring No. MW-1

Surface Elevation 403.64 ft.

Drilling Method Hollow Stem Auger (6" i.

Total Depth 130 ft.

Drilled By Unitas/Kring

Date Completed 9/8/83

Logged By CEWells

WELL DETAILS	PENETRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERMEABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
Bentonite; 3" dia. Sch. 80 PVC riser	N=24		1	D&M			0.0-35.0' Gravelly sandy silt (Till)- grey-tan, with some clay, occasional cobbles, some thin seams of clean sand, wet in sand seams, otherwise damp.	
	N=40	10	2	"				
	N=90		3	"		SM-GM		
	N=50/6"	20	4	"				
	N=50/5"		5	"				
	N= 50/5.5"	30	6	"				
	N= 100/3"		7	"			35.0'-46.0' Gravelly silty sand- grey, occasional cobbles, dense, damp.	
	N= 100/3"	40	8	"		SM		
	N= 100/4"		9	"			46.0'-77.0' Sand, gravelly sand- grey-tan, medium grained, poorly graded to well graded, variable sand-gravel ratios, with some cobbles, moderately hard, moist to wet.	
	N= 100/5"	50	10	"				
	N=50/6"		11	"				
	N=50/6"	60	12	"		SW		
	N=49		13	"				
	N=50/6"	70	14	"				

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT King County Ground Water Study - Vashon

Boring No. MW-1

WELL DETAILS	PENETRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERMEABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
	N=50/6"		15	D&M				
	N=59	80	16	"			77.0'-130' Sand- Grey, very fine to medium grained, poorly graded to moderately poorly graded, distinctly stratified, with thin silt seams from 100 to 115 ft., damp to 121 ft., saturated below 121 ft.	
	N=85/11"		17	"				
	N=69	90	18	"				
	N=90/11"		19	"		SP		
	N=50/6"	100	20	"				
	N=73		21	"				
	N=60	110	22	"				
	N=85		23	"				
	N=77/9"	120	24	"				
	N=44		25	"				
	N=50/5"	130	26	"			Note: Penetration rate/ "N" value are based on blow counts using a Dames and Moore sampler.	
		140						

Bentonite

3" Sch. 80 PVC riser

3" dia. PVC screen
0.010" slots

Gravel Backfill

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT King County Ground Water Study - Vashon

Location South side

Surface Elevation 313.31 ft.

Total Depth 85 ft.

Date Completed 9/9/83

Boring No. MW-2

Drilling Method Hollow Stem Auger (6" i.d.

Drilled By Unitas/Kring

Logged By CEWells

WELL DETAILS	PENETRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERMEABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
Bentonite; 3" dia. Sch. 80 PVC riser	N=9		1	D&M			0.0'-39.0' Sand- Tan and light grey, fine to moderately poorly graded, loose, with rare gravels, few dark brown, 1/8" thick organic seams at approximately 35 ft., damp.	
	N=12	10	2	"				
	N=10		3	"				
						SP		
	N=22	20	4	"				
	N=21		5	"				
	N=20	30	6	"				
	N=21		7	"				
	N=20	40	8	"			39.0'-67.0' Silt- Dark grey, non-plastic, moderately dense, varied below 50 ft., rare 1/8" seams of very fine grained, poorly graded sand, damp to wet.	
	N=22		9	"				
	N=24	50	10	"				
						ML		
	N=26		11	"				
	N=22	60	12	"				
	N=24		13	"				
	N=27	70	14	"		SP	67.0'-78.0' Sand- Light brown to grey, fine to medium grained, poorly	

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT King County Ground Water Study - Vashon

Boring No. MW-2

WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
3" dia. Sch. 80 PVC, 0.010" slots Gravel Backfill	N=28		15	D&M		SP	graded, wet to saturated.	
	N=30	80	16	"		ML	78.0'-85.0' Silt- Dark grey, dense to very dense, hard, with some clay, damp.	
	N=70		17	"				
		90						
		100						
		110						
		120						
		130						
		140					Note: Penetration rate/ "N" value are based on blow counts using a Dames and Moore sampler.	

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT King County Ground Water Study - Vashon

Location South side

Boring No. MW-3

Surface Elevation 313.54 ft.

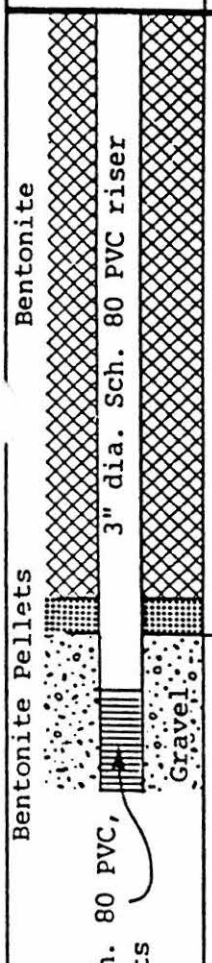
Drilling Method Hollow Stem Auger (6" i.d.)

Total Depth 40 ft.

Drilled By Unitas/Kring

Date Completed 9/12/83

Logged By CEWells

WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		10 20 30 40 50 60 70	None taken.				See log for MW-2.	

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT King County Ground Water Study - Vashon

Location West side

Boring No. MW-4

Surface Elevation 374.33 ft.

Drilling Method Hollow Stem Auger (6" i.d.)

Total Depth 110 ft.

Drilled By Unitas/Kring

Date Completed 9/14/83

Logged By CEWells

WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
Bentonite 3" dia. Sch. 80 PVC riser	N=68		1	D&M			0.0'-23.0' Gravelly sandy silt (Till)- Grey-tan, with some cobbles, well graded, moderately dense, dry.	
	N=36	10	2	"				
	N=48		3	"		SM-GM		
	N=50	20	4	"				
	N=38		5	"			23.0'-36.0' Sand, gravelly sand- Grey or grey-tan, medium to coarse grained sand with gravel to one inch diameter, occasional cobbles, well graded, damp.	
	N=36	30	6	"		SW		
	N=34		7	"			36.0'-103.0' Sand- Grey-tan or grey, variable/stratified, fine to very coarse, poorly graded to well graded, loose, occasional silty sand zones, gravelly zones below 75 ft., damp to wet.	
	N=37	40	8	"				
	N=35		9	"				
	N=28	50	10	"				
	N=30		11	"		SP		
	N=41	60	12	"				
	N=36		13	"				
	N=40	70	14	"				

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT King County Ground Water Study - Vashon

Boring No. MW-4

WELL DETAILS	PENETRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERMEABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
Bentonite; 3" dia. Sch. 80 PVC riser; Gravel Backfill; 3" dia. Sch. 80 PVC, 0.010" slots	N=31		15	D&M				
	N=44	80	16	"				
	N=46		17	"		SP		
	N=54	90	18	"				
	N=55		19	"				
	N=53	100	20	"				
	N=37		21	"			103.0'-110.0' Silt- Grey, dense, with some very fine sand, wet to saturated.	
	N=30	110	22	"		ML		
		120						
		130						
		140					Note: Penetration rate/ "N" value are based on blow counts using a Dames and Moore sampler.	

RECORD OF BOREHOLE MW-5

Figure A-5
Page 1 of 5

LOCATION See Figure 2 DATUM 355.86 ft. MSL DATE 3-6-86

SAMPLER HAMMER WEIGHT 320 LB., DROP 19 IN. BORING METHOD – CABLE TOOL

ELEVATION / DEPTH	DESCRIPTION	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/6 IN.	DEPTH
355.9						
1.0	Very dense, brown, SAND and GRAVEL, some silt to gravelly fine to coarse SAND, some silt (Till)	GM SW	1	DO	50 5/6"	5
342.9						
13.0	Very dense, brown, stratified, fine to coarse SAND, some to little silt, trace gravel (Proglacial sand)	SP	2	DO	10 41 51	10
			3	DO	6 16 50 4"	15
			4	DO	20 30 50 4"	
			5	DO	5 20 43	20
			6	DO	10 44 50 2"	25
			7	DO	17 30 4	30

PENETRATION TEST*
▲ "N" BLOWS PER FOOT
20 40 60 80

WATER CONTENT, PERCENT
Wp Wn Wl
20 40 60 80

PIEZOMETER INST.

8" Locking steel monument
Cement grout
3/4" PVC gas monitoring probe
Pea gravel
2" Schedule 40 PVC casing

REMARKS: DO = Drive Open
* 320 lbs. hammer falling 1.6 ft.

VERTICAL SCALE
1 IN. TO 5 FT.

Golder Associates

VASHON LANDFILL
JOB # 853-1047.05

RECORD OF BOREHOLE MW-5

Figure A-5
Page 2 of 5

L[illegible]TION See Figure 2 DATUM 355.86 ft. MSL DATE 3-6-86

SAMPLER HAMMER WEIGHT 320 LB., DROP 19 IN. BORING METHOD – CABLE TOOL

ELEVATION / DEPTH	DESCRIPTION	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/6 IN.	DEPTH	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, stratified, fine to coarse SAND, some to little silt, trace gravel (Proglacial sand)	SP	8	DO	14 32 50/4"	40		Pea gravel; 2" Schedule 40 PVC casing
			9	DO	1 16 50	45		
			10	DO	11 50/4"			
			11	DO	9 18 51	50		
			12	DO	2 4 47	55		
			13	DO	1 31 50/4"	60		
			14	DO	23 50/6"	65		
			15	DO	10 41 50/4"			

REMARKS:

VERTICAL SCALE

Golder Associates

VASHON LANDFILL

RECORD OF BOREHOLE MW-5

Figure A-5

LOCATION See Figure 2 DATUM 355.86 ft. MSL DATE 3-6-86

SAMPLER HAMMER WEIGHT 320 LB., DROP 19 IN. BORING METHOD- CABLE TOOL

ELEV / DEPTH	DESCRIPTION	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/6 IN.	DEPTH
	Very dense, brown, stratified, fine to coarse SAND, some to little silt, trace gravel (Proglacial sand)	SP	16	DO	7 50 50/4"	75
			17	DO	1 12 48	
275.4 / 80.5	Dense, dark gray, medium SAND	SP	18	DO	3 12 25	80
272.4 / 83.5	Very hard, brownish-gray, SILT to fine sandy SILT, trace clay (Upper lacustrine silt)	ML/CL	19	DO	6 12 50/4"	85
			20	DO	19 50/5"	90
260.9 / 95.0	Hard, brownish gray, interbedded, silty SAND and sandy SILT, trace clay	SM/ML	21	DO	1 1 37	95
255.9 / 100.0	Hard, grayish-brown, stratified, sandy SILT and clayey SILT	ML/CL	22	DO	4 24 26	100
250.9						

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

WATER CONTENT, PERCENT Wp Wn Wl 20 40 60 80

PIEZOMETER INST.

2" Schedule 40 PVC screen .020" slots

4/10/86

#8 Monterey sand

Cap

Pea gravel

Bentonite pellet seal

2" Schedule 40 PVC casing

Pea gravel

Bentonite pellet seal

REMARKS:

VERTICAL SCALE

Golder Associates

VASHON LANDFILL

RECORD OF BOREHOLE MW-5

Figure A-5
Page 4 of 5

I ATION See Figure 2 DATUM 355.86 ft. MSL DATE 3-6-86

SAMPLER HAMMER WEIGHT 320 LB., DROP 19 IN. BORING METHOD – CABLE TOOL

LEVN / EPTH	DESCRIPTION	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	BLOWS/6 IN.	DEPTH
05.0	Very dense to very hard, dark gray, stratified, silty fine SAND, fine sandy SILT and SILT, trace fine sand	ML / CL	23	DO	12 34 50 5"	
245.9						110
110.0	Very dense to very hard, grayish-brown, medium to fine SAND and SILT	SM	24	DO	75 6"	
			25	DO	43 50 4"	115
235.9						
120.0	Very dense, brownish-gray, silty fine to medium SAND	SM	26	DO	36 50 2"	120
231.9						
124.0	Very hard, dark gray, clayey SILT (Lower lacustrine silt)	CH	27	DO	24 50 4"	125
224.9						130
131.0	Very dense, brown, fine to coarse SAND, little silt, trace fine gravel	SM / SP	28	DO	37 50 4"	135
			29	DO	25 50 6"	

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

WATER CONTENT, PERCENT
Wp Wn Wl
20 40 60 80

PIEZOMETER INST.

Pea gravel
#8 Monterey sand
4/10/86
2" Schedule 40 PVC screen .020 slots
Cap
Bentonite pellet seal
Pea gravel

REMARKS:

VERTICAL SCALE

Golder Associates

VASHON LANDFILL

RECORD OF BOREHOLE MW-5

Figure A-5
Page 5 of 5

LOCATION See Figure 2 DATUM 355.86 ft. MSL DATE 3-6-86

SAMPLER HAMMER WEIGHT 320 LB., DROP 19 IN. BORING METHOD- CABLE TOOL

ELEVN / DEPTH	DESCRIPTION	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/6 IN.	DEPTH	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, fine to coarse SAND, little silt, trace fine gravel	SM / SP				140		Pea gravel
			30	DO	31 / 50/4"			
210.9 / 145.0	Very dense, dark gray, fine sandy SILT to silty fine SAND	SM / ML			18 / 46	145		
			31	DO	50/3"			
206.9 / 149.0	Very dense, dark gray, fine SAND, trace silt	SP			16 / 46			
204.9 / 151.0	End of hole at 151.0 feet		32	DO	50/5"	150		

REMARKS:

VERTICAL SCALE
1 IN. TO 5 FT.

Golder Associates

VASHON LANDFILL
JOB # 852-1047.05

RECORD OF BOREHOLE MW6

Figure A-6

LOCATION See Figure 2 DATUM 392.42 ft. MSL DATE 3-19-86

SAMPLER HAMMER WEIGHT 320 LB., DROP 19 IN. BORING METHOD – CABLE TOOL

ELEV./DEPTH	DESCRIPTION	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/6 IN.	DEPTH	PENETRATION TEST * ▲ 'N' BLOWS PER FOOT 20 40 60 80	WATER CONTENT, PERCENT Wp Wn Wl 20 40 60 80	PIEZOMETER INST.
2.4 / .0	Dense to very dense, grayish-brown, silty SAND and GRAVEL to gravelly, silty SAND (Till)	GM	1	DO	2 14 19	5			8" Locking steel monument; Cement grout; 3/4" PVC gas monitoring probe
			2	DO	50/4"	10			8" Steel casing
			3	DO	50/4"	15			
			4	DO	50/5"	20			
			5	DO	50/4"	25			Pea gravel
			6	DO	50/5"	30			2" Schedule 40 PVC casing
50.2	Very dense, brown, medium SAND trace gravel and silt to gravelly SAND, little silt (Proglacial sand)								

REMARKS. DO = Drive Open

* 320 lbs. hammer falling 1.6 ft.

VERTICAL SCALE

Golder Associates

VASHON LANDFILL

RECORD OF BOREHOLE MW6

Figure A-6

LOCATION See Figure 2 DATUM 392.42 ft. MSL DATE 3-19-86

SAMPLER HAMMER WEIGHT 320 LB., DROP 19 IN. BORING METHOD – CABLE TOOL

LEVN / EPTH	DESCRIPTION	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/6 IN.	DEPTH	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, medium SAND trace gravel and silt to gravelly SAND, little silt (Proglacial sand)	SP/SW	7	DO	100/6"			
			8	DO	13 50/5"	40		
			9	DO	21 50/4"	45		
			10	DO	18 50/6"	50		Pea gravel; 2" Schedule 40 PVC casing
			11	DO	70/6"	55		
			12	DO	17 50/5"	60		
			13	DO	9 22 50/2"	65		

REMARKS:

VERTICAL SCALE

RECORD OF BOREHOLE MW6

Figure A-6
Page 3 of 5

L ATION See Figure 2 DATUM 392.42 ft. MSL DATE 3-19-86

SAMPLER HAMMER WEIGHT 320 LB., DROP 19 IN. BORING METHOD– CABLE TOOL

LEVN / EPTH	DESCRIPTION	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/6 IN.	DEPTH
	Very dense, brown, medium SAND trace gravel and silt to gravelly SAND, little silt(Proglacial sand)	SP/SW	14	DO	17 50/5"	
			15	DO	5 15 50/4"	75
			16	DO	9 50/6"	80
			17	DO	7 36 50/4"	85
304.4 88.0	Very dense, brown, fine SAND and silty fine SAND	SM	18	DO	10 28 50	90
299.4 93.0	Very dense, brown, medium SAND trace gravel and silt to gravelly SAND, little silt (Proglacial sand)	SP	19	DO	2 23 50	95
			20	DO	11 40 50	100

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

WATER CONTENT, PERCENT
Wp Wn Wl
20 40 60 80

PIEZOMETER INST.

Pea gravel

2" Schedule 40 PVC casing

#8 Aqua sand

REMARKS:

VERTICAL SCALE

VASHON LANDFILL

RECORD OF BOREHOLE MW6

Figure A-6

LOCATION See Figure 2 DATUM 392.42 ft. MSL DATE 3-19-86

SAMPLER HAMMER WEIGHT 320 LB., DROP 19 IN. BORING METHOD – CABLE TOOL

EVN/PTH	DESCRIPTION	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/6 IN.	DEPTH	PENETRATION TEST * ▲ 'N' BLOWS PER FOOT (20 40 60 80) / WATER CONTENT, PERCENT (Wp Wn Wl; 20 40 60 80)	PIEZOMETER INST.
79.9 / 12.5	Very hard, grayish-brown, SILT (Upper lacustrine silt)	SP	21	DO	4 48 50/4"	110		#8 Aqua Sand; 2" Schedule 40 PVC screen .020" slots; 4/10/86; Pea gravel; Bentonite pellet seal
			22	DO	5 36 50/4"			
		ML	23	DO	4 17 47	115		
			24	DO	5 24 48	120		2" Schedule 40 PVC casing
			25	DO	12 45 50/4"	125		Pea gravel
			26	DO	3 9 34	130		
			27	DO	31 35 50/4"	135		Bentonite pellet seal

REMARKS:

VERTICAL SCALE

VASHON LANDFILL

RECORD OF BOREHOLE MW6

Figure A-6

ATION See Figure 2 DATUM 392.42 ft. MSL DATE 3-19-86

SAMPLER HAMMER WEIGHT 320 LB., DROP 19 IN. BORING METHOD – CABLE TOOL

ELEVN / DEPTH	DESCRIPTION	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/6 IN.	DEPTH	PENETRATION TEST * ▲ 'N' BLOWS PER FOOT 20 40 60 80 / WATER CONTENT, PERCENT Wp Wn Wl 20 40 60 80	PIEZOMETER INST.
251.5			28	DO	2 9 50/5"			Bentonite pellet seal
140.9	Very dense, brown, fine to medium SAND, trace to little silt	SP						
249.4								Cave
143.0	Hard, dark gray, SILT (Upper lacustrine unit)	ML	29	DO	14 20 50/4"	145		
244.4								
148.0	Very dense, brown to brownish-gray, fine to coarse SAND, little to trace gravel and silt	SW	30	DO	50/4"	150		2" Schedule 40 PVC Screen .020" slots
			31	DO	4 22 50	155		#8 Aqua sand
235.4								4/10/86
157.0	Very dense, brownish-gray, gravelly SAND, trace silt	SP	32	DO	2 17 35			
233.4								Cap
159.0		SP			5			
232.1								
160.3	Very hard, brownish-gray, SILT and medium to fine SAND (Lower lacustrine unit)	ML	33	DO	17 50/2"	160		Pea gravel
230.4								Bentonite pellet seal
162.0	Very dense, gray, fine to coarse SAND, little gravel	SW	34	DO	2 9 12			Cave
225.9			35	DO	3 15 50			
166.5	End of hole at 166.5 feet.							

REMARKS:

VERTICAL SCALE

Golder Associates

VASHON LANDFILL

CHM HILL

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-7
106241.E3.ZZ	MW-7C	SHEET 1 OF 4

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N583.02, E2987.97

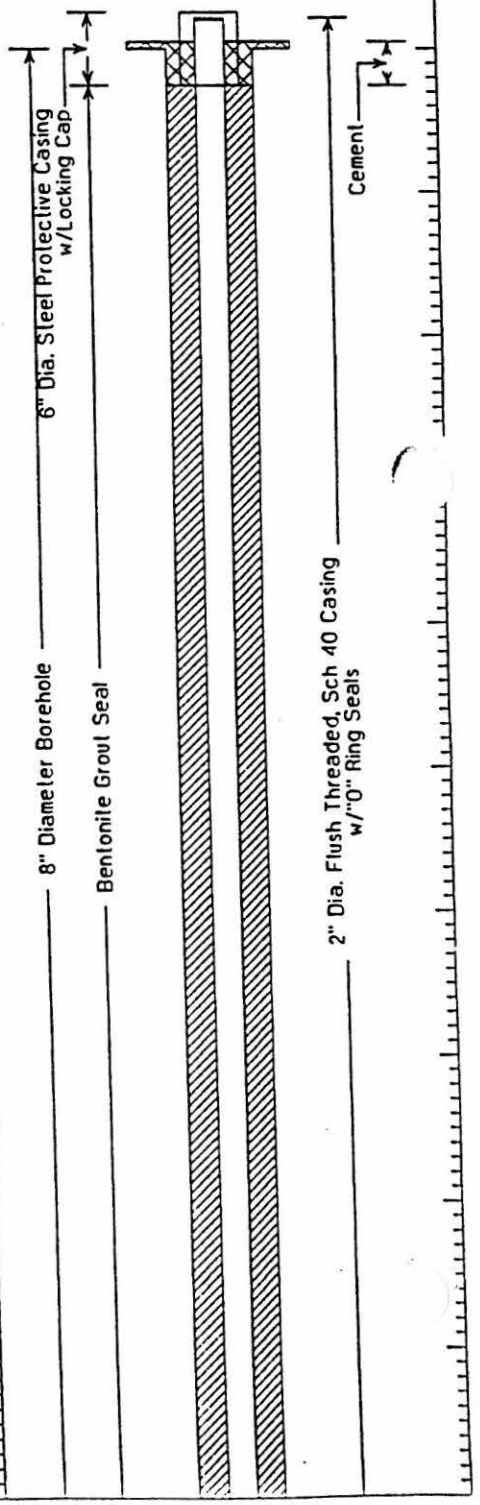
ELEVATION 371.09 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 04/21/95 FINISH 04/28/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
10.0					SILTY SAND (SM), light brown/gray, moist, firm, trace gravel up to 1" diameter
20.0	20 21.5	SS	8"	50-100/6"	
30.0					
40.0	40 41.5	SS	1.0'	75-100/6"	
50.0					WELL GRADED SAND WITH GRAVEL (SW), gray brown, moist, firm
60.0	60 61.5	SS	18"	50-200	SILTY SAND WITH GRAVEL (SM), gray brown, moist, firm
70.0					
80.0	80 81.5	SS	18"	13-65-50/5"	SANDY SILT (ML), gray brown, moist, firm
90.0					SILT (ML), gray brown, moist, firm, dense
100					

WELL COMPLETION DIAGRAM



V:\MW-7\CLOG Use WELLBORE template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-7
106241.E3.ZZ	MW-7C	SHEET 2 OF 4

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N583.02, E2987.97

ELEVATION 371.09 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

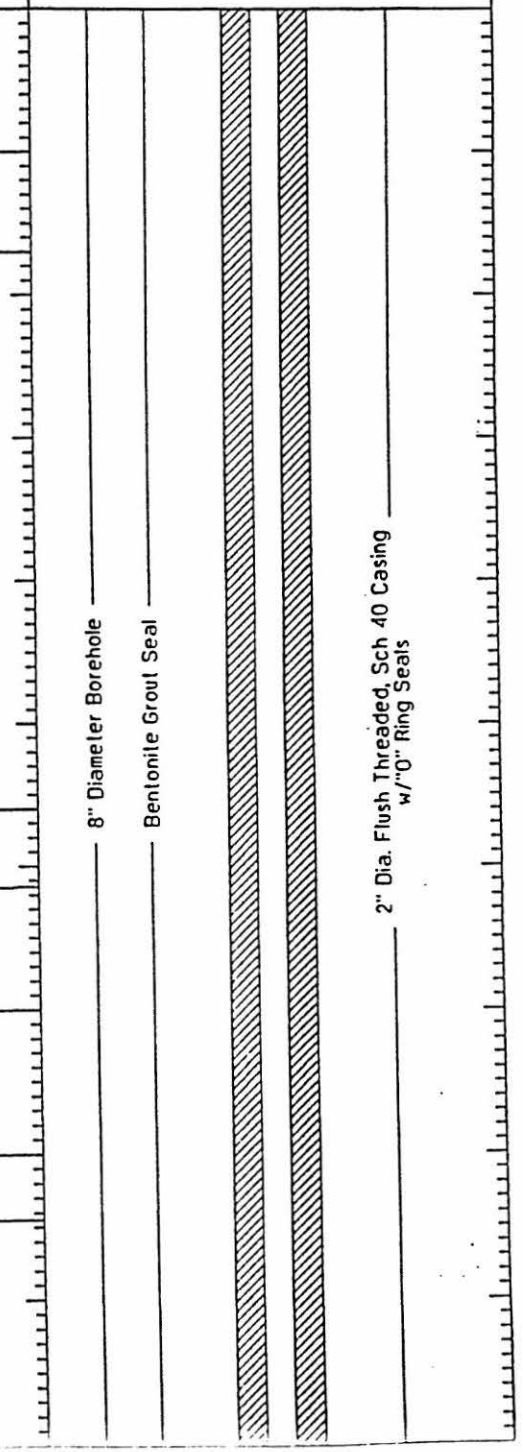
DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 04/21/95 FINISH 04/28/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
	100	SS	1.0'	25-45-25/5"	SILT WITH SAND (ML), gray, moist, firm
110.0					SILT (ML), trace fine sand, wet, firm, high plasticity
	120				SILT WITH SAND (ML), gray, saturated, firm, slightly plastic
120.0	121.5	SS	1.5'	13-20-50/5"	
130.0					
	140				
140.0	141.5	SS	1.2'	35-50-50/5"	
150.0					
	160				
160.0	161.5	SS	1.5	2-2-3	SILTY SAND (SW), gray, wet, firm
					SILT (ML), gray, moist, firm, dense
170.0					SANDY SILT (ML), gray, firm, saturated
	180				
180.0	181.5	SS	1.4'	15-35-50/4"	FAT CLAY (CH), gray, dry, brittle, very dense, very hard
					SANDY SILT (ML), gray/brown, damp, firm, hard and very hard, dense
190.0					

WELL COMPLETION DIAGRAM

DEPTH OF CASING, DRILLING RATE
DRILLING FLUID LOSS
TESTS AND INSTRUMENTATION



PROJECT NUMBER	BORING NUMBER	Renumbered as MW-7
106241.E3.ZZ	MW-7C	SHEET 3 OF 4

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N583.02, E2987.97

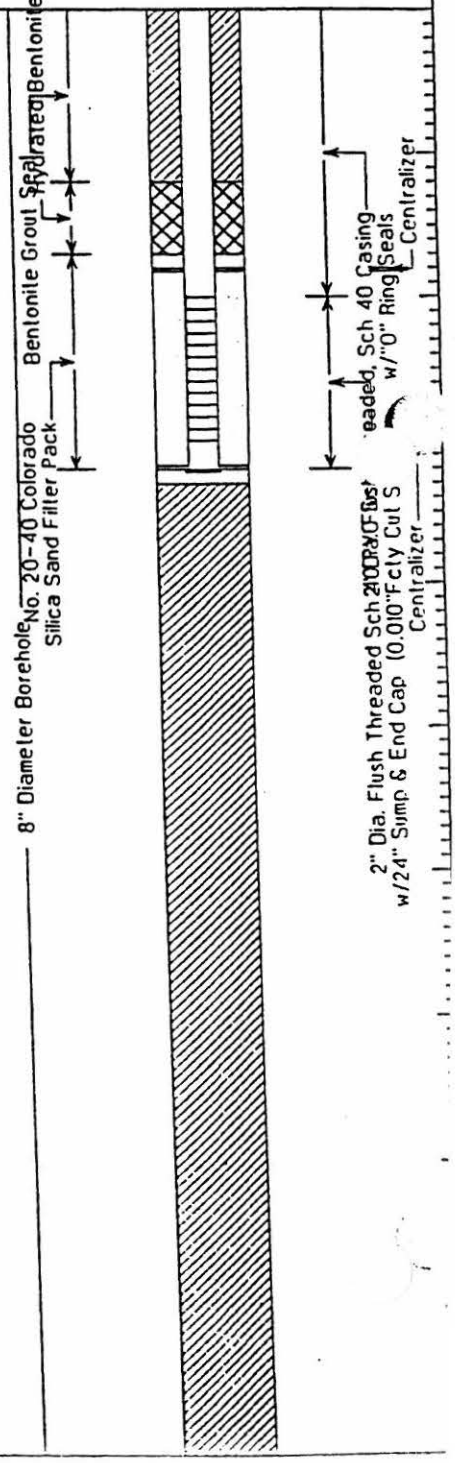
ELEVATION 371.09 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 04/21/95 FINISH 04/28/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
210.0	200	SS	1.0'	8-15-30	CLAYEY SAND (SC), gray/brown, moist, firm, dense, trace 1/4" gravel
					SILT WITH GRAVEL (ML), gray/brown, moist, firm, gravel sub angular up to 2 diameter
220.0	220				
	221.5	SS	6"	12-16-30	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), gray, saturated, firm
230.0					SILT (ML), gray, moist (wet), dense to very dense
240.0	240				
	241.5	SS	1.2'	18-30-30	FAT CLAY (CH), gray/brown, dry/moist, brittle, very dense
250.0					SILTY GRAVEL WITH SAND (GM), gray/brown, wet, saturated, wood fragments (3%)
260.0	260				
	261.5	SS	.5'	6-15-25	POORLY GRADED SAND WITH SILT (SP-SM), gray, wet, white pumice or tuff, trace silt, trace gravel 1/4-1/2" diameter
270.0					Wood fragments in sample
					SILTY GRAVEL WITH SAND (GM), gray/brown, wet, saturated, wood fragments (3%)
280.0	280				
	281.5	SS	1.0'	2-2-27	POORLY GRADED SAND WITH SILT (SP), gray, wet, saturated, firm, dense, trace silt
290.0					
					CLAY (CL), dark gray, moist, firm, dense
	300				

WELL COMPLETION DIAGRAM: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION



VIHW-7CLOG Use WELLBORE Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-7
106241.E3.ZZ	MW-7C	SHEET 4 OF 4

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N583.02, E2987.97

ELEVATION 371.09 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 04/21/95 FINISH 04/28/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	WELL COMPLETION DIAGRAM: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
310.0	300	SS	1.0'	35-50-50/2"		
320.0	320 / 321.5	SS	1.2'	15-35-50/4"		
340.0	340 / 341.5	SS	1.0'	20-30-50/5"		
350.0	350 / 351.5	SS	1.5'	35-75/5"	TOTAL DEPTH = 351.5 FEET	8" Diameter Borehole
360.0						
370.0						
380.0						
390.0						

VIMW-7CLOG
Use WELLBORE Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-7
106241.E3.77	MW-7C	SHEET 1 OF 4

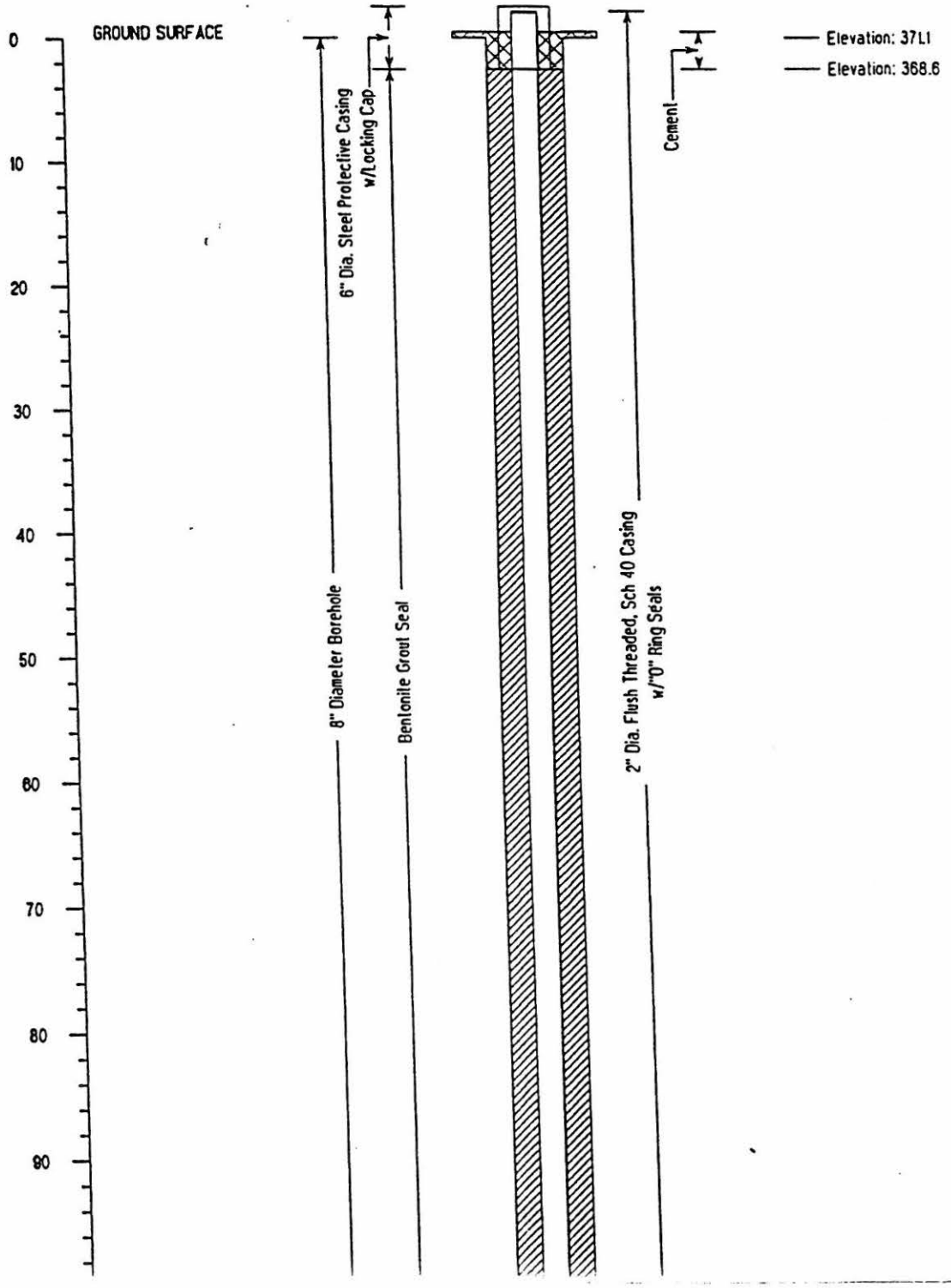
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N583.02, E2987.97

ELEVATION 371.09 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 04/21/95 FINISH 04/28/95 LOGGER T.O'CONNOR



See Borehole/Well Construction Log For Details

VIHM-7C.LOG
Use VIWELL Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-7
106241.E3.77	MW-7C	SHEET 2 OF 4

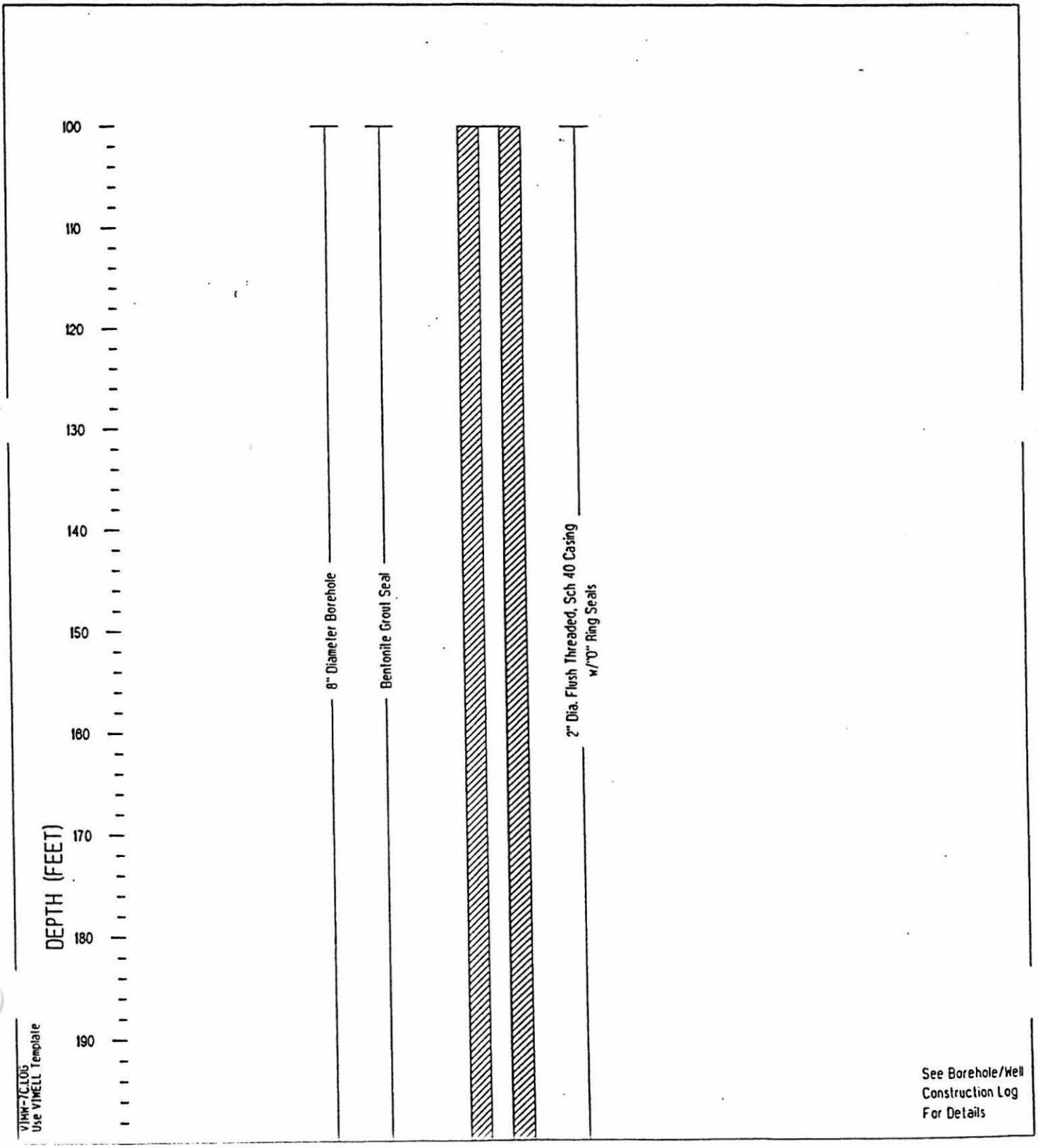
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N583.02, E2987.97

ELEVATION 371.09 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 04/21/95 FINISH 04/28/95 LOGGER T.O'CONNOR



VIHW-7.LOG
Use VIWELL Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-7
106241.E3.ZZ	MW-7C	SHEET 3 OF 4

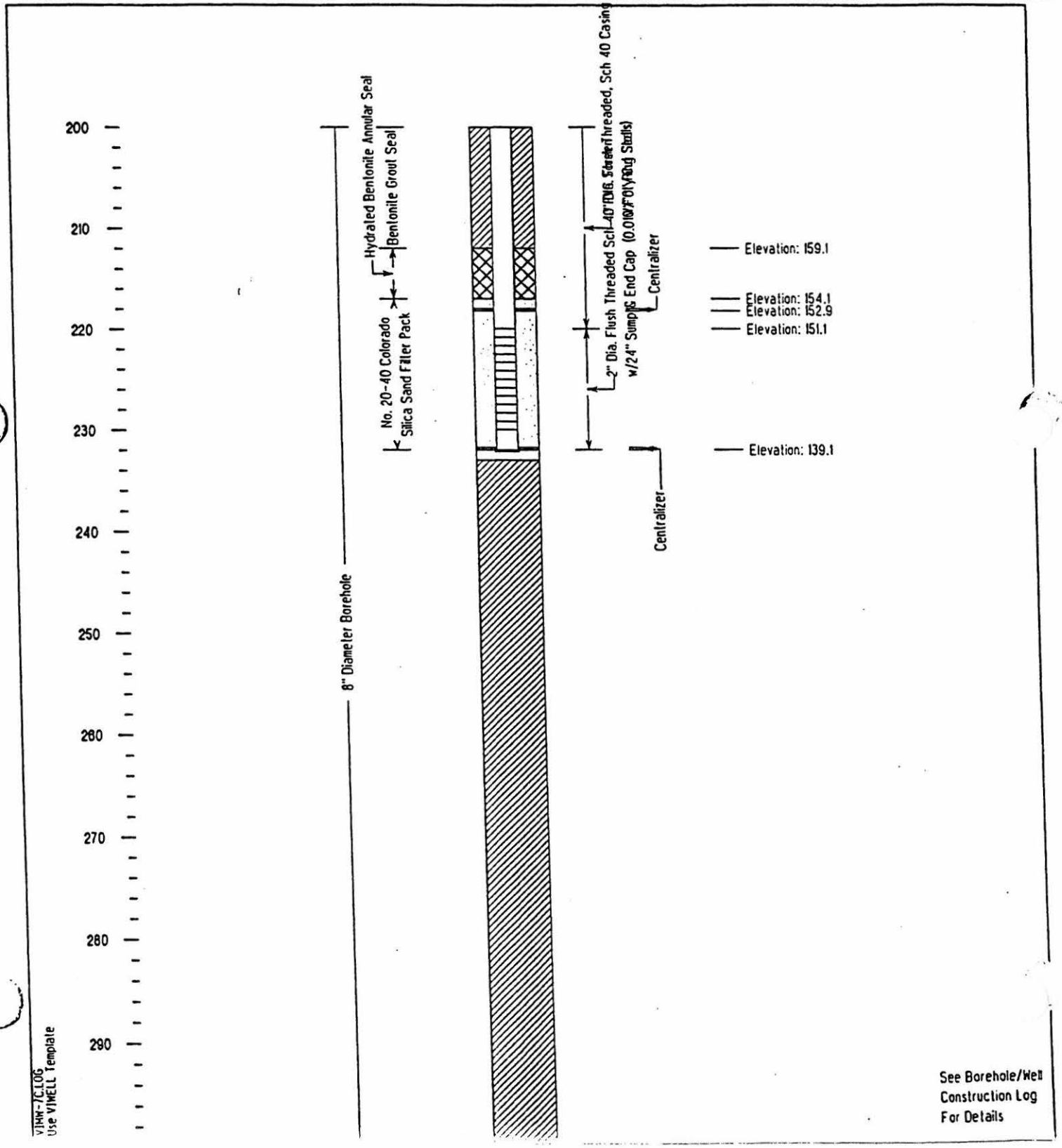
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N583.02, E2987.97

ELEVATION 371.09 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 04/21/95 FINISH 04/28/95 LOGGER T.O'CONNOR



See Borehole/Well Construction Log For Details

VIMW-7C.LOG
Use VIWELL Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-7
106241.E3.77	MW-7C	SHEET 4 OF 4

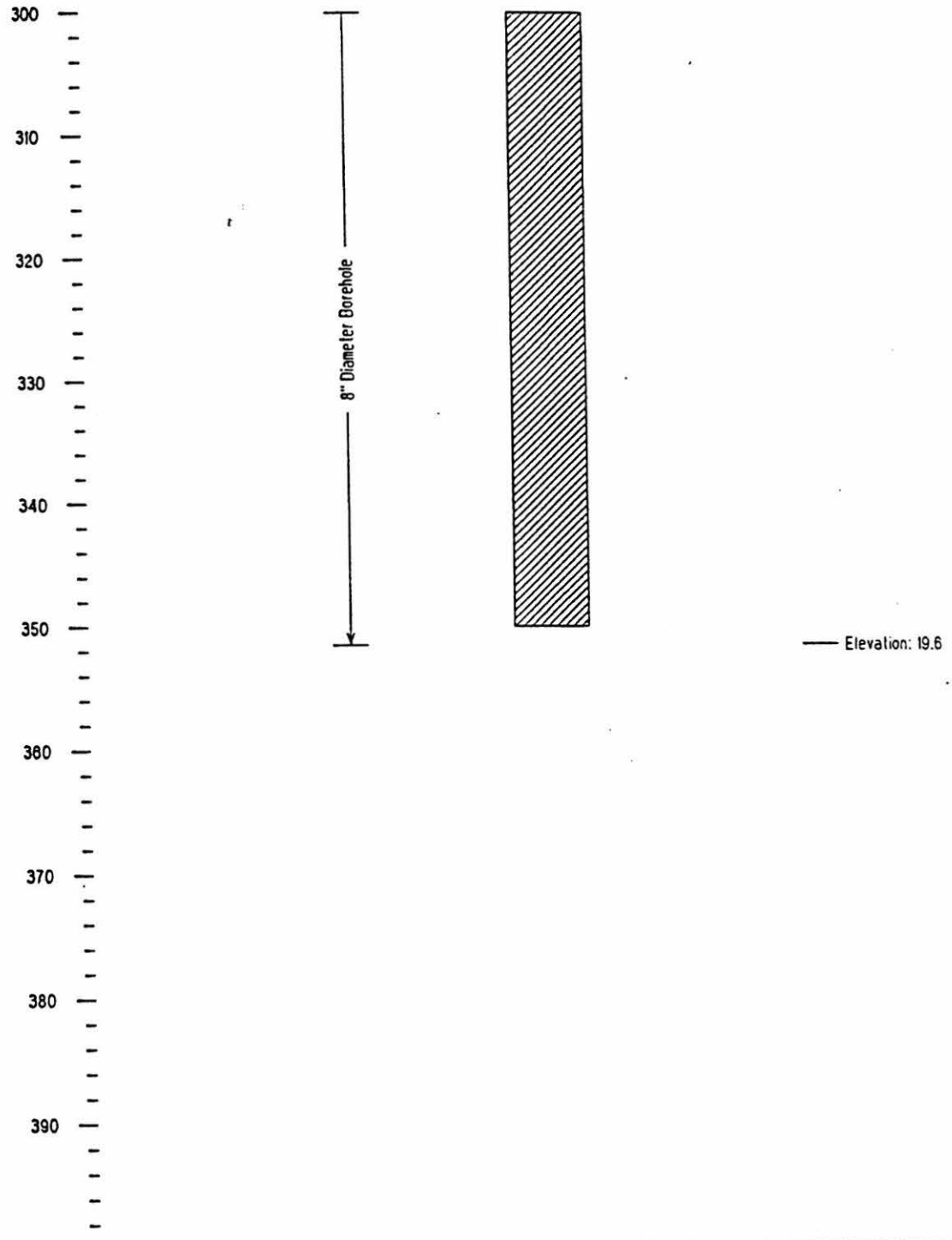
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N583.02, E2987.97

ELEVATION 371.09 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 04/21/95 FINISH 04/28/95 LOGGER T.O'CONNOR



See Borehole/Well Construction Log For Details

VIHW-7CL06
Use VIWELL Template

CH2M HILL

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-8
106241.E3.ZZ	MW-8B	SHEET 1 OF 2

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N972.30, E2217.04

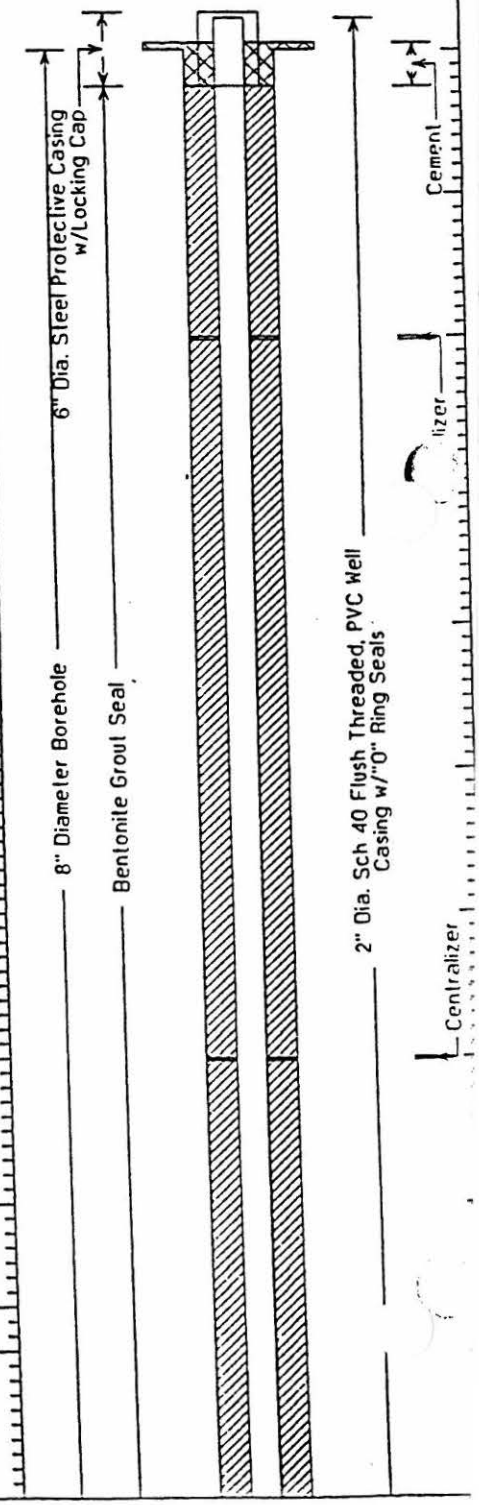
ELEVATION 381.24 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/28/95 FINISH 06/30/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
10.0					SILTY SAND (SM), brown-tan, moist, firm, trace gravel
20.0	20				
	21	SS	1.0'	7-10-25	
30.0					POORLY GRADED SAND WITH SILT (SP-SM), brown, moist, firm
40.0	40				
	41	SS	1.0'		Trace gravel, up to 1" diameter
50.0					
60.0	60				
	61	SS	1.0'	12-15-35	OVA=20.2 CGI=20%
70.0					
80.0	80				
	81	SS	.6'	20-25-30	SILT (ML), olive, moist, firm, trace iron oxide staining, brittle
90.0					SILTY SAND (SM), brown, moist, firm, fine grained sand
	100				

WELL COMPLETION DIAGRAM



VIHM-8B.LOG Use WELLBORE Template

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
106241.E3.ZZ	MW-8B	Renumbered as MW-8

SHEET 2 OF 2

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N972.30, E2217.04

ELEVATION 381.24 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/28/95 FINISH 06/30/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
	100				
	101	SS	1.0'	17-27-40	SILT (ML), olive, moist, firm
110.0					
	120				
120.0	121	SS	1.0'	15-12"-35/6"	SANDY SILT (ML), dark gray, brown, moist, firm, iron oxide staining, stratified layering
					SILT (ML), dark gray, moist-wet, firm, trace fine sand
	140				
140.0	141	SS	1.0'	3'-12"-10/6"	
150.0					SILTY SAND (SM), dark gray, moist, firm
	160				WELL GRADED SAND (SM), brown-tan, moist, firm
180.0	161	SS	1.0'	25-40-50/4"	SANDY LEAN CLAY (CL), grayish brown, moist, firm, horizontal layers
170.0					SILTY SAND (SM), brown-gray, moist-wet, medium coarse sand
180.0					TOTAL DEPTH = 180 FEET
190.0					

WELL COMPLETION DIAGRAM: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION

8" Diameter Borehole
Hydrated Bentonite Annular Seal
Bentonite Grout Seal
No. 20-40 Colorado Silica Sand Filter Pack
2" Dia. Sch 40 Flush Threaded, PVC Well Casing w/"O" Ring Seals
Centralizer
168/213
178/203
Screen Slot (
Centralizer
Threaded Sch 4' Cap (0.010"Fact

VIHW-8D.LOG Use WELLBORE Template

CH2M HILL

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-8
106241.E3.77	MW-8B	SHEET 1 OF 2

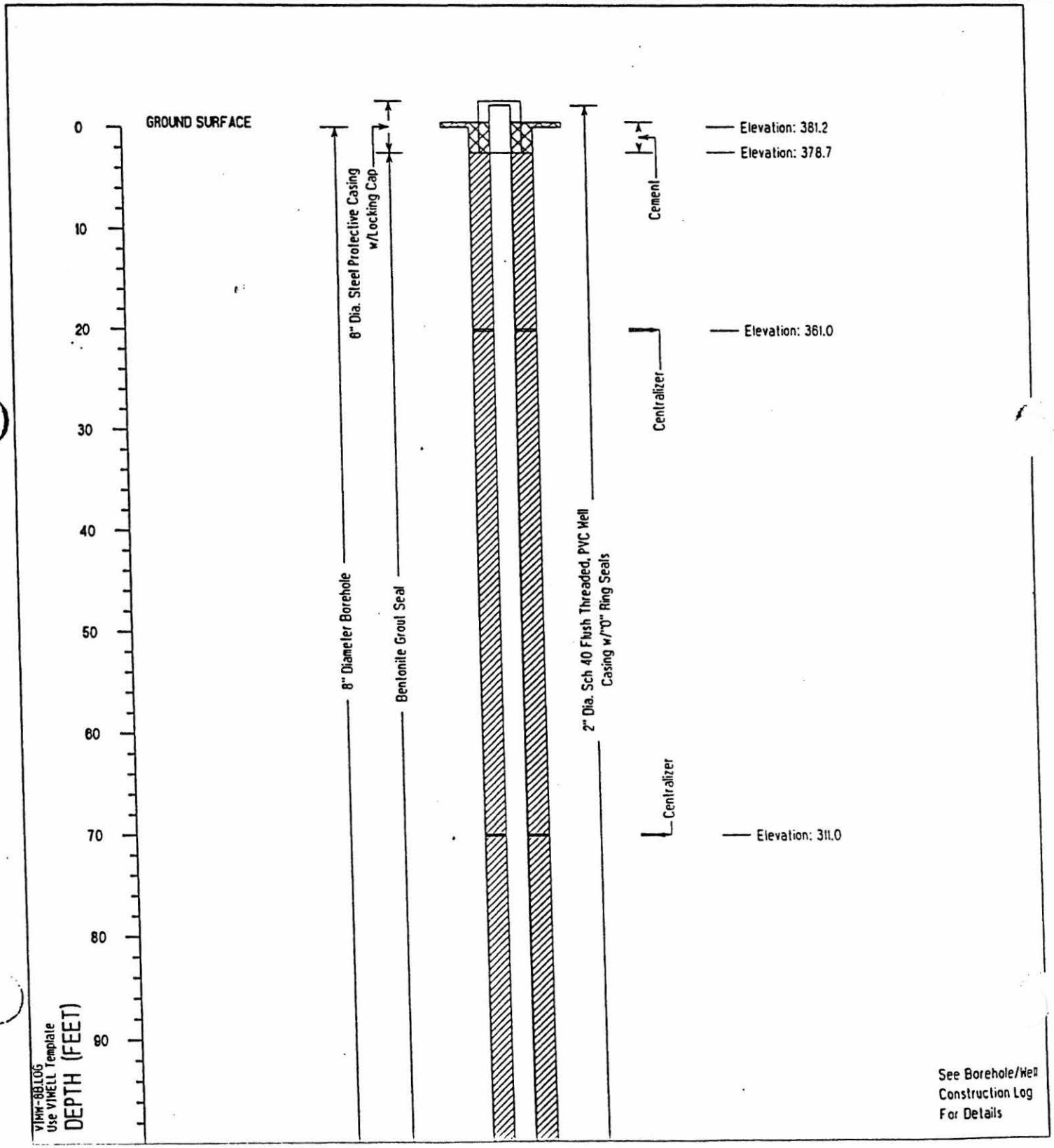
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N972.30, E2217.04

ELEVATION 381.24 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/28/95 FINISH 06/30/95 LOGGER T.O'CONNOR



VIMW-8BLOG
Use VIWELL Template

See Borehole/Well Construction Log For Details

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-8
106241.E3.ZZ	MW-8B	SHEET 2 OF 2

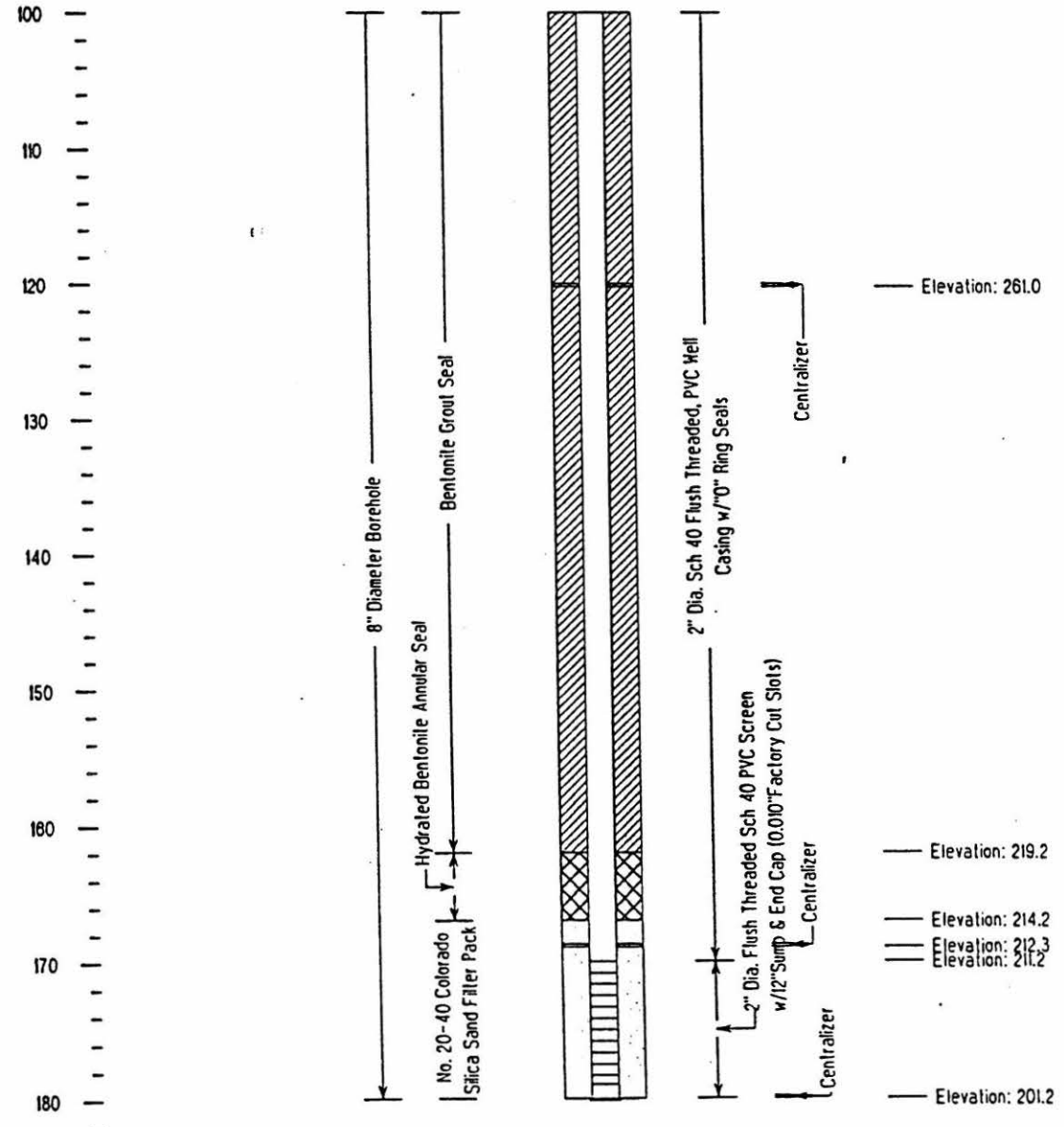
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N972.30, E2217.04

ELEVATION 381.24 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/28/95 FINISH 06/30/95 LOGGER T.O'CONNOR



See Borehole/Well Construction Log For Details

V:\MW-8B\LOG
Use V:\WELL Template

CHM HILL

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-9
106241.E3.ZZ	MW-98	SHEET 1 OF 2

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N1291.50, E2269.88

ELEVATION 400.60 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/01/95 FINISH LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
10.0	20				SILTY SAND, (SM) brown, moist, firm, trace pea gravel
20.0	21	SS	6"	50/4"	Gravel up to 1" diameter
30.0					POORLY GRADED SAND, (SP) brown, moist, firm, trace silt, trace gravel, up to 1" in diameter
40.0	40				
	41	SS	1.0	80/6" 100/1"	SILTY SAND, (SM) brown, moist, firm, trace gravel; OVA=1000; CGI=0
50.0					POORLY GRADED SAND, (SP) gray to light brown, moist, firm
					WELL GRADED SAND, (SW) gray to light brown, moist, firm
60.0	60				
	61	SS	1.1	35-50/6-50/3"	POORLY GRADED SAND WITH SILT AND GRAVEL, (SP-SM) olive, moist, firm; OVA=20; CGI=0
70.0					
80.0	80				
	81	SS	1.2	25-35-50/5"	POORLY GRADED SAND WITH SILT, (SP-SM), olive, moist, firm
90.0					
	100				

WELL COMPLETION DIAGRAM

6" Dia. Steel Protective Casing w/Locking Cap

8" Diameter Borehole

Bentonite Grout Seal

2" Dia. Flush-Threaded, Sch 40 PVC Casing w/"O" Ring Seals

Cement

Centralizer

VIMW-98.LOG Use WELLBORE Template

CH2M HILL

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-9
106241.E3.ZZ	MW-9B	SHEET 2 OF 2

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N1291.50, E2269.88

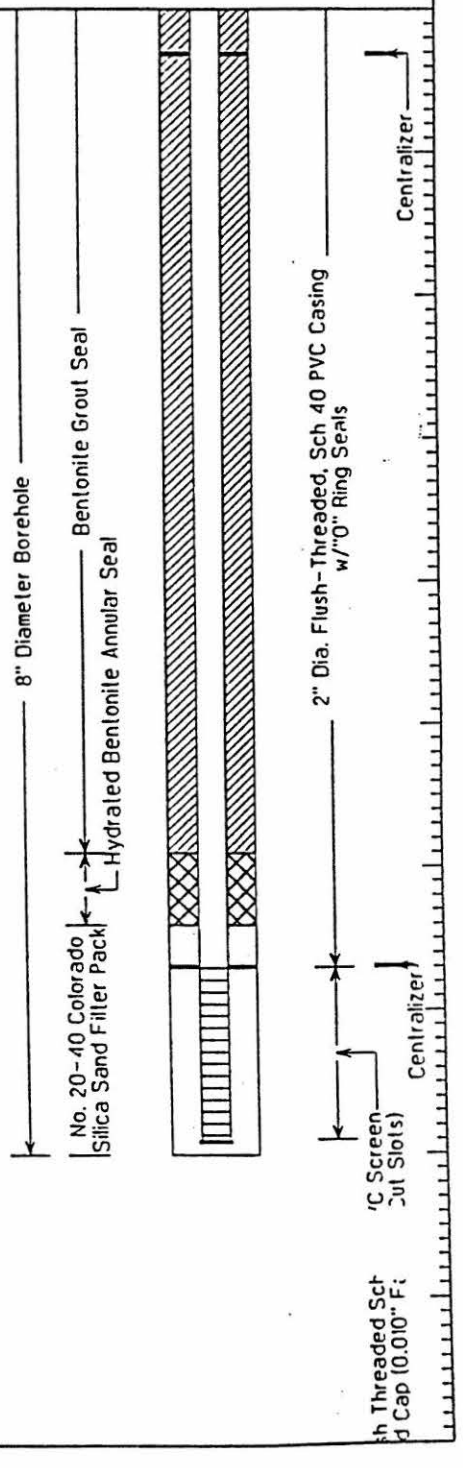
ELEVATION 400.60 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/01/95 FINISH _____ LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
	100				
	101	SS	1.5	10-25-40	SILT, (ML) olive, moist, brittle Red iron oxide deposit .1" thick with wood/fine sand, no silt
110.0					SILTY SAND, (SM), olive, moist, firm
	120				
120.0	121	SS	1.5	3-3-10	
0.0					SILT, (ML) grayish brown, moist, firm, plastic
	140				
140.0	141	SS	1.0	7-25-40	06/13/95, water level @ 143.0'
150.0					POORLY GRADED SAND WITH GRAVEL, (GP) gray, moist, firm, pea size gravel
	160				
160.0	161	SS	1.2	9-12-11	06/14/95, water level @ 163.20'
170.0					POORLY GRADED GRAVEL, moist, firm, size gravel
180.0					GRAVEL, (SW) gray, moist, pea sized to 1/2" diameter, subrounded, trace coarse sand
					TOTAL DEPTH = 180 FEET
190.0					

WELL COMPLETION DIAGRAM: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION



VIHW-9B.LOG
Use WELLBORE Template

CH2M HILL

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-9
106241.E3.ZZ	MW-99	SHEET 1 OF 2

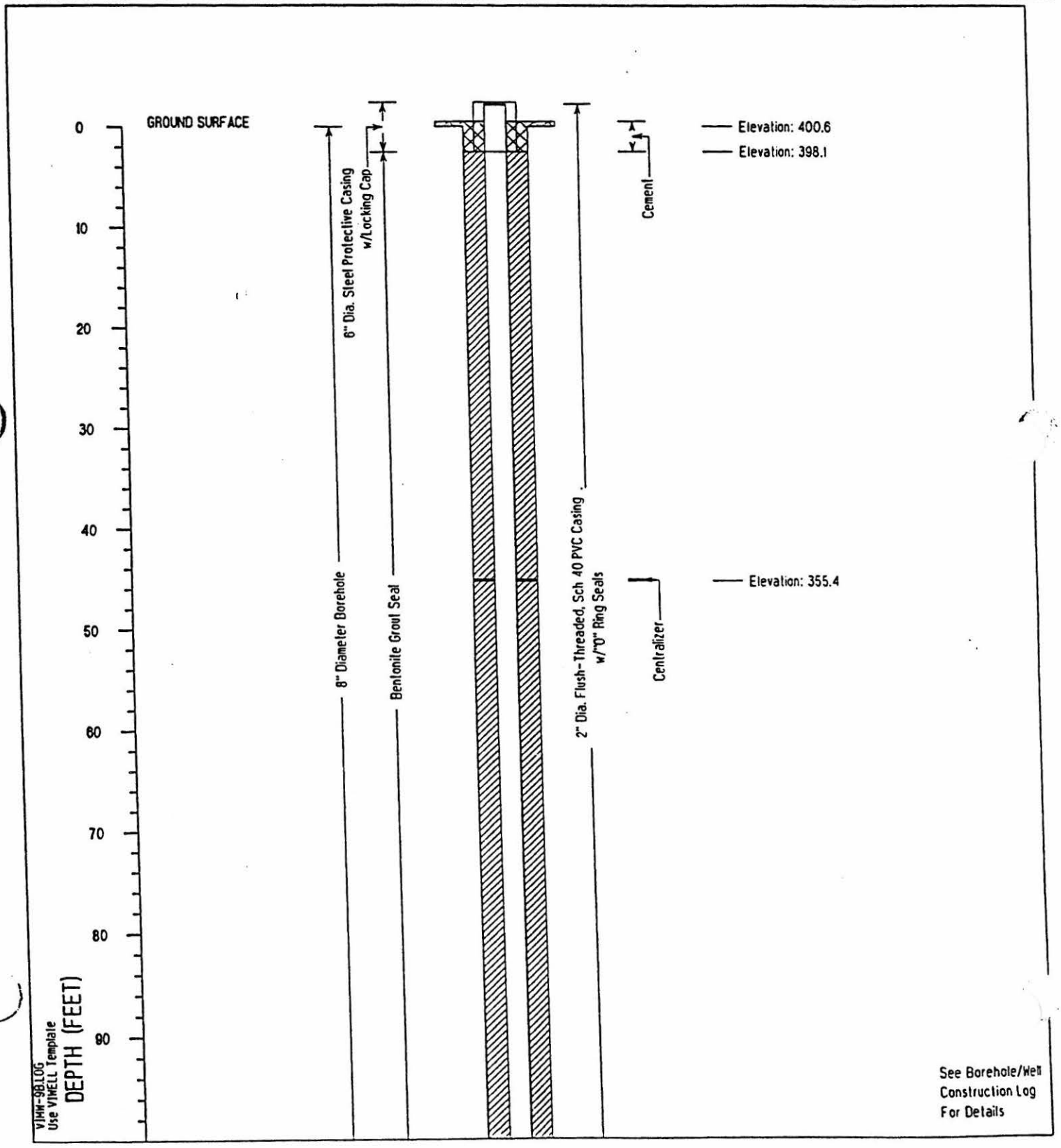
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N1291.50, E2269.86

ELEVATION 400.60 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/01/95 FINISH _____ LOGGER T.O'CONNOR



See Borehole/Well Construction Log For Details

VIHW-98.LOG
Use VIWELL Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-9
106241.E3.77	MW-9B	SHEET 2 OF 2

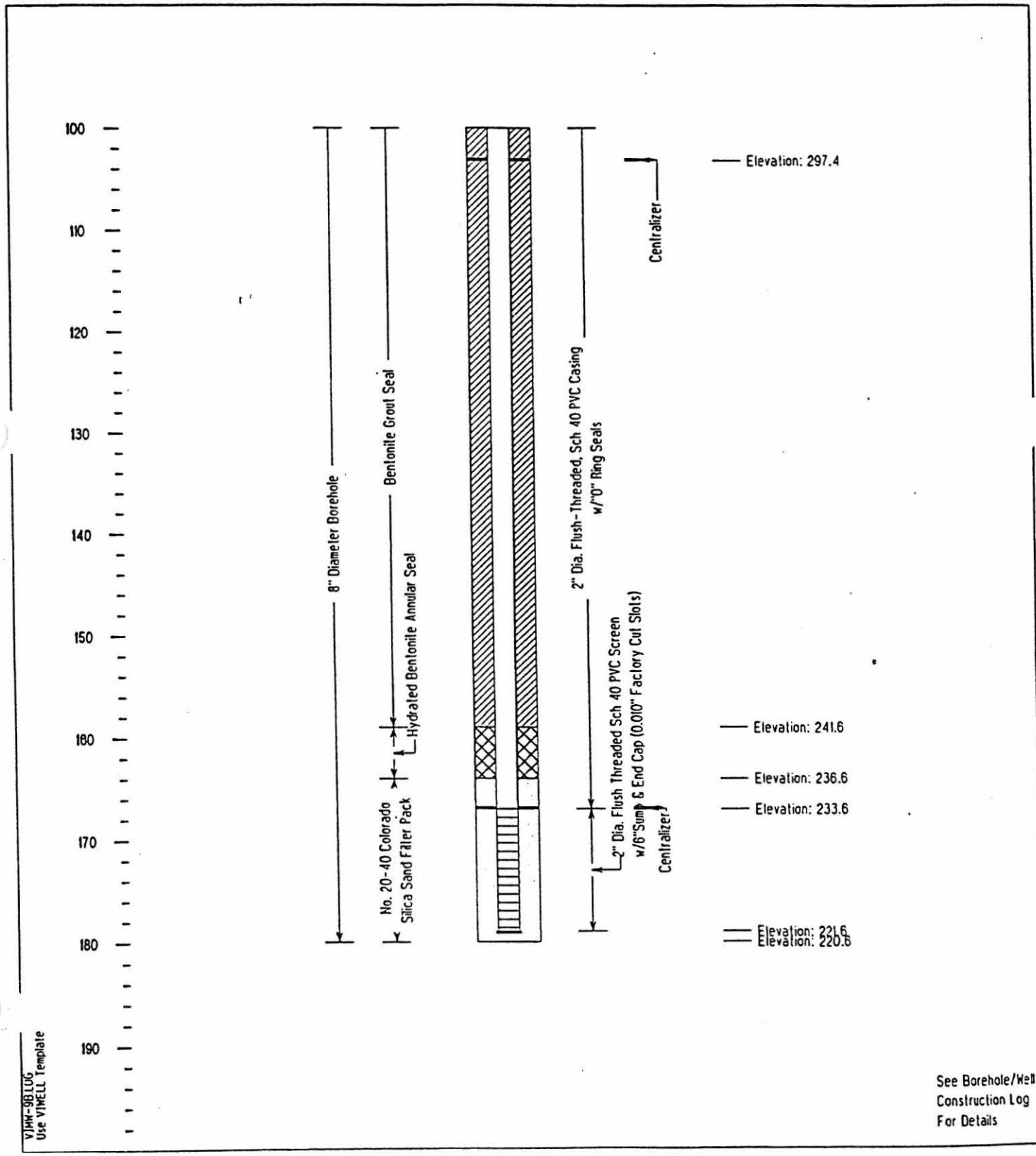
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N1291.50, E2269.88

ELEVATION 400.60 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/01/95 FINISH _____ LOGGER T.O'CONNOR



See Borehole/Well Construction Log For Details

V:\MW-9B.LOG
Use V:\WELL Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-10
106241.E3.ZZ	MW-10B	SHEET 1 OF 2

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N1597.18, E2406.73

ELEVATION 405.34 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/26/95 FINISH 07/01/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION
10.0	20				SILTY SAND (SM), brown, moist, firm, trace gravel up to 1 1/2" diameter
20.0	21	SS	1.0'	50/5"	
30.0					SILTY SAND WITH GRAVEL (SM), brown, moist, firm, gravel up to 1" diameter
40.0	40				
	41	SS	1'	35-50/4"	
50.0					POORLY GRADED SAND WITH GRAVEL (SP), olive gray, moist, firm, gravel up to 1" diameter
60.0	60				
	61	SS	1.0'	7/22/28	
70.0					
80.0	80				
	81	SS	1.0'	15/25/30	POORLY GRADED SAND WITH SILT (SP), olive gray, moist, trace gravel up to 1" diameter
90.0					
	100				

WELL COMPLETION DIAGRAM

- 6" Dia Steel Protective Casing w/Locking Cap
- 8" Diameter Borehole
- Bentonite Grout Seal
- Cement
- 2" Dia. Flush Threaded Sch 40 PVC Casing w/"O" Ring Seals

VIMW-10B.LOG
Use WELLBORE Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-10
106241.E3.ZZ	MW-10B	SHEET 2 OF 2

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N1597.18, E2406.73

ELEVATION 405.34 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/26/95 FINISH 07/01/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION	WELL COMPLETION DIAGRAM
	100					
	101	SS	1.1	50/20/35	SILT (ML), brown-tan, moist, firm, trace iron oxide staining	
					POORLY GRADED SAND WITH SILT (SP), olive gray, moist, firm	
110.0					SILT (ML), brown-gray, moist, firm, trace fine sand, slightly plastic	
	120					
120.0	121	SS	6"		SILTY SAND (SM), brown-gray, moist, firm	
130.0						
					SAND WITH GRAVEL (SW), brown-tan, moist, firm	
	140					
140.0	141	SS	1.5	6/12/20	POORLY GRADED SAND WITH SILT (SP-SM), brown-tan, moist, firm, medium to coarse grained	
150.0						
	160					
160.0	161	SS	1.0		SILT (ML), dark gray, moist, hard, brittle	
					TOTAL DEPTH = 161 FEET	
170.0						
180.0						
190.0						

WELL COMPLETION DIAGRAM: 8" Diameter Borehole; Bentonite Grout Seal; Hydrated Bentonite Annular Seal; Bentonite chips; Sand Pack; 2" Dia. Flush Threaded Sch 40 PVC Casing w/"O" Ring Seals; Centralizer; Centralizer; 2"Dia Flush Threaded Sch 40 PVC Screen (Sump & End Cap (0.010"Factory Cut Slots))

VIHM-WBLOG Use WELLBORE template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-10
106241.E3.77	MW-10B	SHEET 1 OF 3

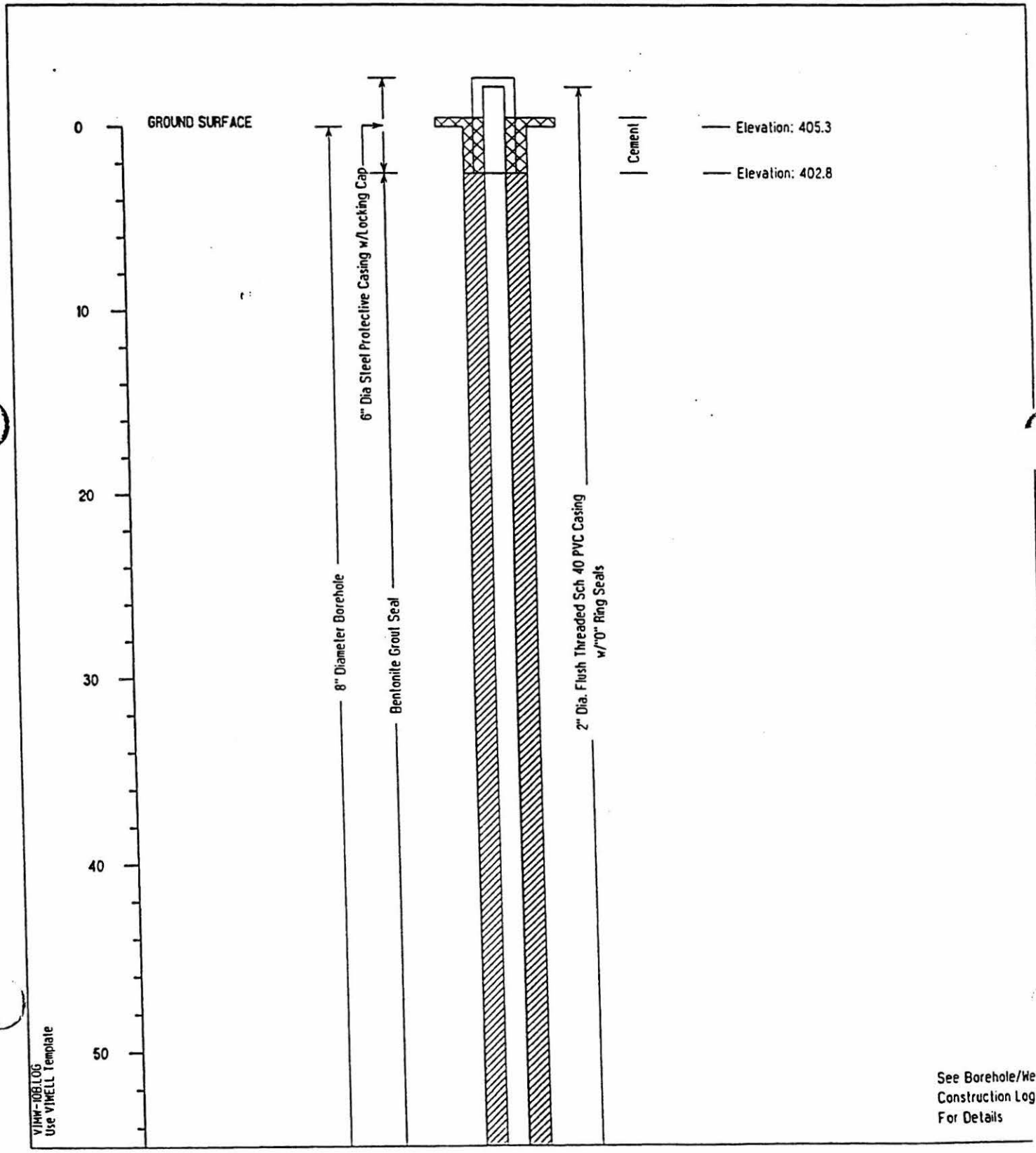
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N1597.18, E2406.73

ELEVATION 405.34 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/26/95 FINISH 07/01/95 LOGGER T.O'CONNOR



VIMW-10B.LOG
Use VIWELL Template

See Borehole/Well Construction Log For Details

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-10
106241.E3.77	MW-10B	SHEET 2 OF 3

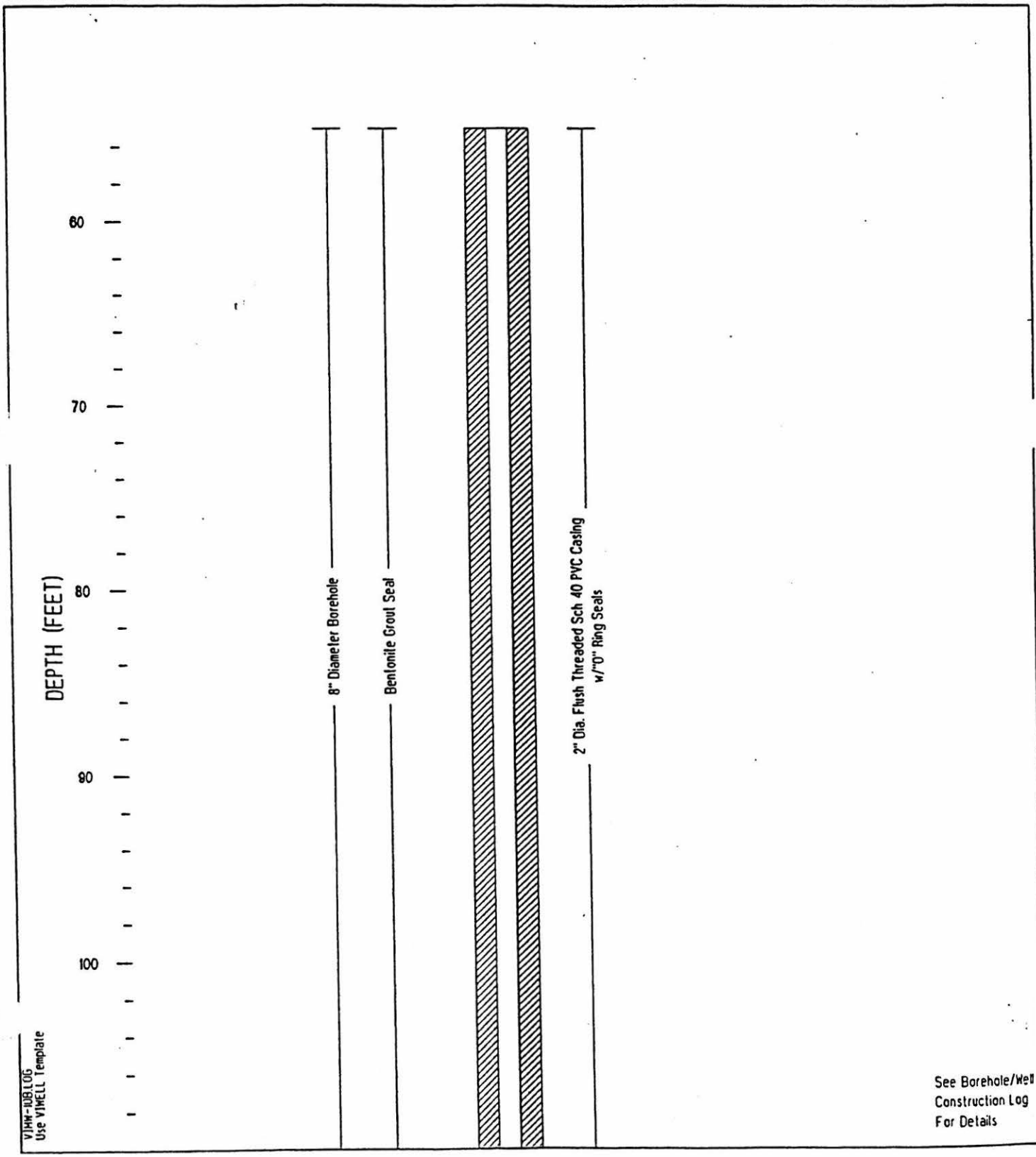
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N1597.18, E2406.73

ELEVATION 405.34 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/26/95 FINISH 07/01/95 LOGGER T.O'CONNOR



See Borehole/Well Construction Log For Details

VIHM-WBLOG
Use VIWELL Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-10
106241.E3.77	MW-10B	SHEET 3 OF 3

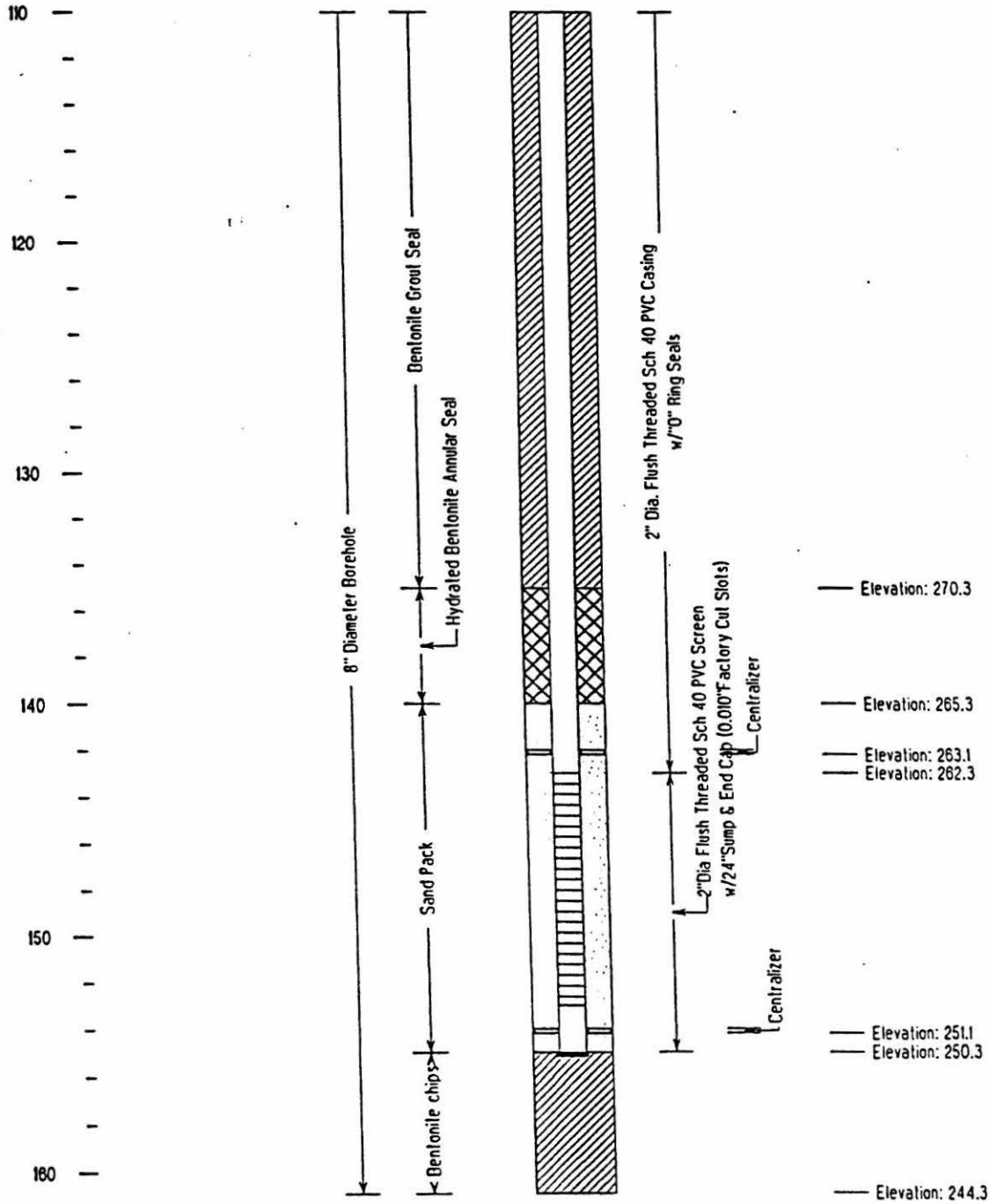
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N1597.18, E2406.73

ELEVATION 405.34 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/26/95 FINISH 07/01/95 LOGGER T.O'CONNOR



See Borehole/Well Construction Log For Details

V)HW-10B.LOG
Use VIWELL Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-11
106241.E3.ZZ	MW-1C	SHEET 1 OF 4

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N1471.91, E3023.75

ELEVATION 404.28 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 05/04/95 FINISH 05/15/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION
					SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
					SILTY SAND, (SM) light brown, moist, firm, trace gravel
10.0					SILTY SAND WITH GRAVEL, (SM) very dense, firm, wet, gravel 1/4"-1" diameter
	20				Dark grayish brown
20.0					Reached H20 @ 18'
	21		5"	50/5"	Gravel layer @ 20'
30.0					
	40				
40.0	41		4"	150/6"	
50.0					POORLY GRADED SAND, (SP) dark grayish brown, moist, firm
	60				
60.0	61		1.0	15-45-50/4"	SILTY SAND WITH GRAVEL, (SM) light brown, moist, firm, trace gravel up to 1/2" diameter
70.0					
	80				
80.0	81		1.0'	25-15-15	
90.0					
	100				

WELL COMPLETION DIAGRAM

- 8" Diameter Borehole
- 6" Dia Steel Prolective Casing w/Locking Cap
- Bentonite Grout Seal
- Concrete Pad
- Centralizer
- 2" Dia. Flush Threaded Sch 40 PVC Casing w/"O" Ring Seals
- Centralizer

VHW-1C.LOG Use WELLBORE Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-11
106241.E3.ZZ	MW-1C	SHEET 2 OF 4

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N1471.91, E3023.75

ELEVATION 404.28 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 05/04/95 FINISH 05/15/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
	100				
	101		1.2	120/6"	SILTY SAND, (SM) dark grayish brown, moist, firm
110.0					SILT, (ML) brownish gray, firm, moist, trace fine sand
	120				
120.0	121		1.0	15-100/6"	Trace iron oxide staining
					SILTY SAND, (SM) dark grayish brown, moist, firm, dense
130.0					SILT, (ML) dark gray, moist to wet, plastic, slight to moderate dilatancy
	140				
140.0	141		1.1	15-35-35	
150.0					WELL GRADED SAND WITH SILT AND GRAVEL, (SW-SM) grayish brown, firm, moist
	160				
160.0	161		1.0	8-15-25	
170.0					
	180				
180.0	181		1.2	35-100/4"	SANDY SILT, (ML), dark gray, massive, moist to dry, firm, dense, vertical layering
190.0					
	200				

WELL COMPLETION DIAGRAM: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION

- 8" Diameter Borehole
- Bentonite Grout Seal
- 2" Dia. Flush Threaded Sch 40 PVC Casing w/"O" Ring Seals
- Centralizer

VIAM-IL.LOG Use WELLBORE Template

CH2M HILL

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-11
106241.E3.ZZ	MW-1C	SHEET 3 OF 4

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N1471.91, E3023.75

ELEVATION 404.28 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

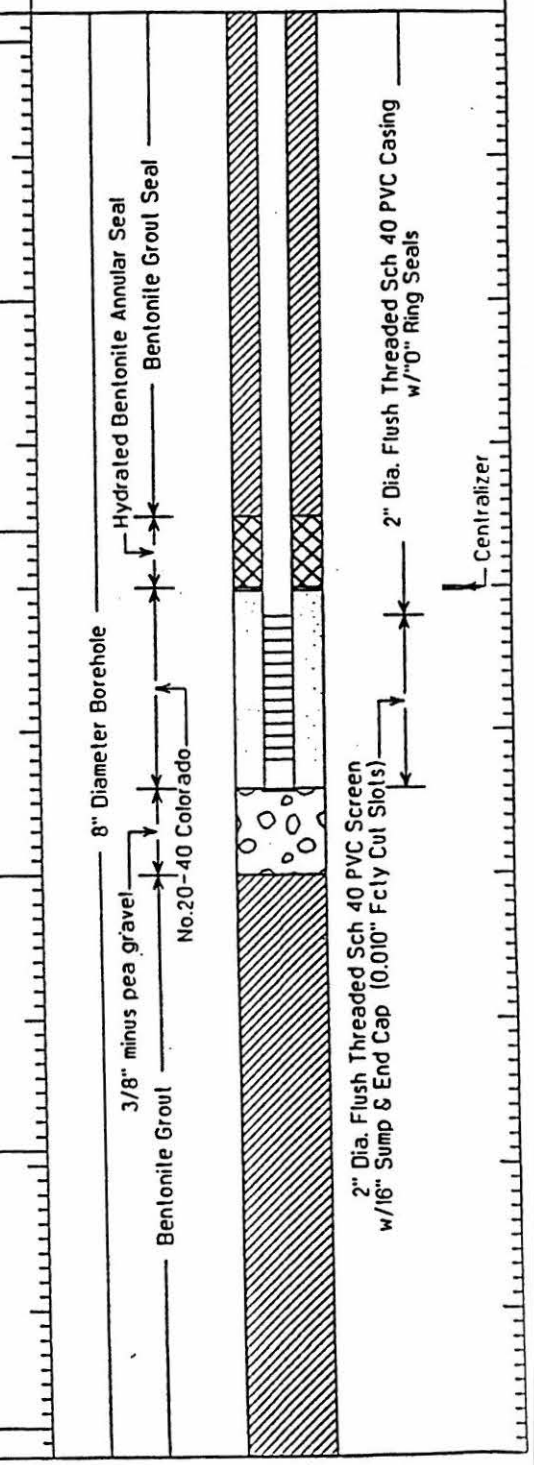
DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 05/04/95 FINISH 05/15/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
210.0	200		.5"	50/6"-50/1"	SANDY SILT, (ML), as above.
					SILTY SAND WITH GRAVEL, (SM) dark gray, firm, moist
	220				
220.0	221		.6"	50-100/5"	WELL GRADED SAND WITH SILT AND GRAVEL, (SW-SM) very dark gray, firm, moist
230.0					
	240				SILTY SAND WITH GRAVEL, (SM) dark gray, firm, moist, gravel 1/4-1/2" diameter
240.0	241		1.0'	25-45-50/5"	
250.0					
	260				
260.0	261		1.0	15-35-50/5"	SANDY SILT, (ML) dark gray, firm, moist, brittle, trace pea gravel
270.0					
	280				
280.0	281		1.0	15-35-50/5"	SILTY GRAVEL WITH SAND, (GM) dark gray, dense, moist, gravel ranging from 1/8-1" diameter, subangular
290.0					
	300				SANDY SILT, (ML) dark gray, firm, dense.

WELL COMPLETION DIAGRAM

DEPTH OF CASING, DRILLING RATE
DRILLING FLUID LOSS
TESTS AND INSTRUMENTATION



VIHW-1C.LOG Use WELLBORE Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-11
106241.E3.ZZ	MW-1C	SHEET 4 OF 4

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N1471.91, E3023.75

ELEVATION 404.28 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 05/04/95 FINISH 05/15/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	WELL COMPLETION DIAGRAM: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	300				SANDY SILT (ML), as above.	
	301		.5	6-30-30	POORLY GRADED SAND, (SP) dark gray, firm, saturated, trace white tuffaceous material	
310.0						
	320					
320.0	321		1.0'	3-5-3		
330.0					Trace wood chips	
	340					
340.0	341		1.5'			
350.0						
360.0					POORLY GRADED SAND WITH GRAVEL (SW) dark gray, firm, moist	
370.0					TOTAL DEPTH = 375 FEET	
380.0						
390.0						

8" Diameter Borehole

Bentonite Grout

V:\HW-E.LOG\ Use WELLBORE Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-11
106241.E3.77	MW-1C	SHEET 1 OF 4

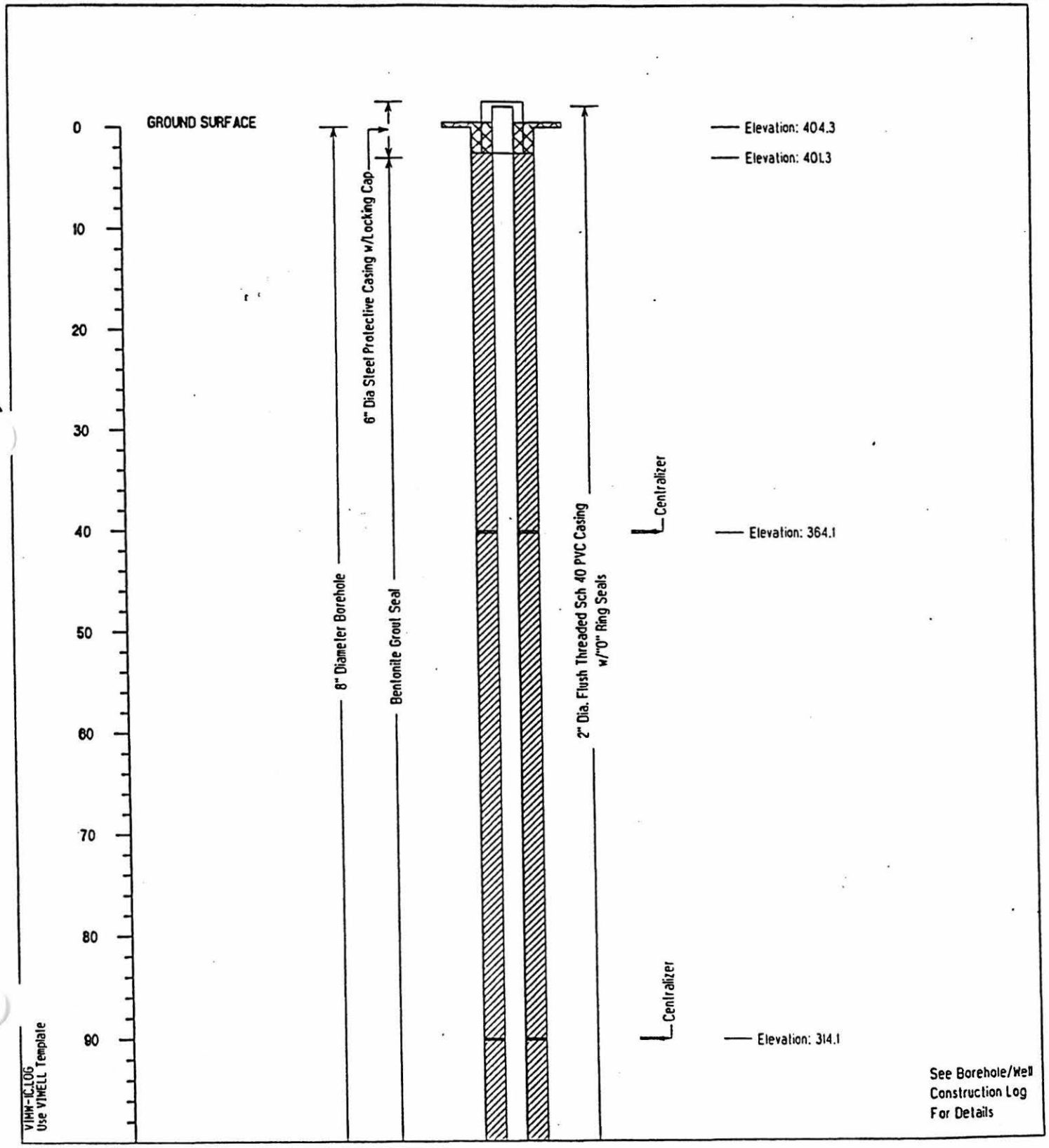
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N1471.91, E3023.75

ELEVATION 404.28 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 05/04/95 FINISH 05/15/95 LOGGER T.O'CONNOR



VIMW-1C.LOG
Use VIWELL Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-11
106241.E3.77	MW-1C	SHEET 2 OF 4

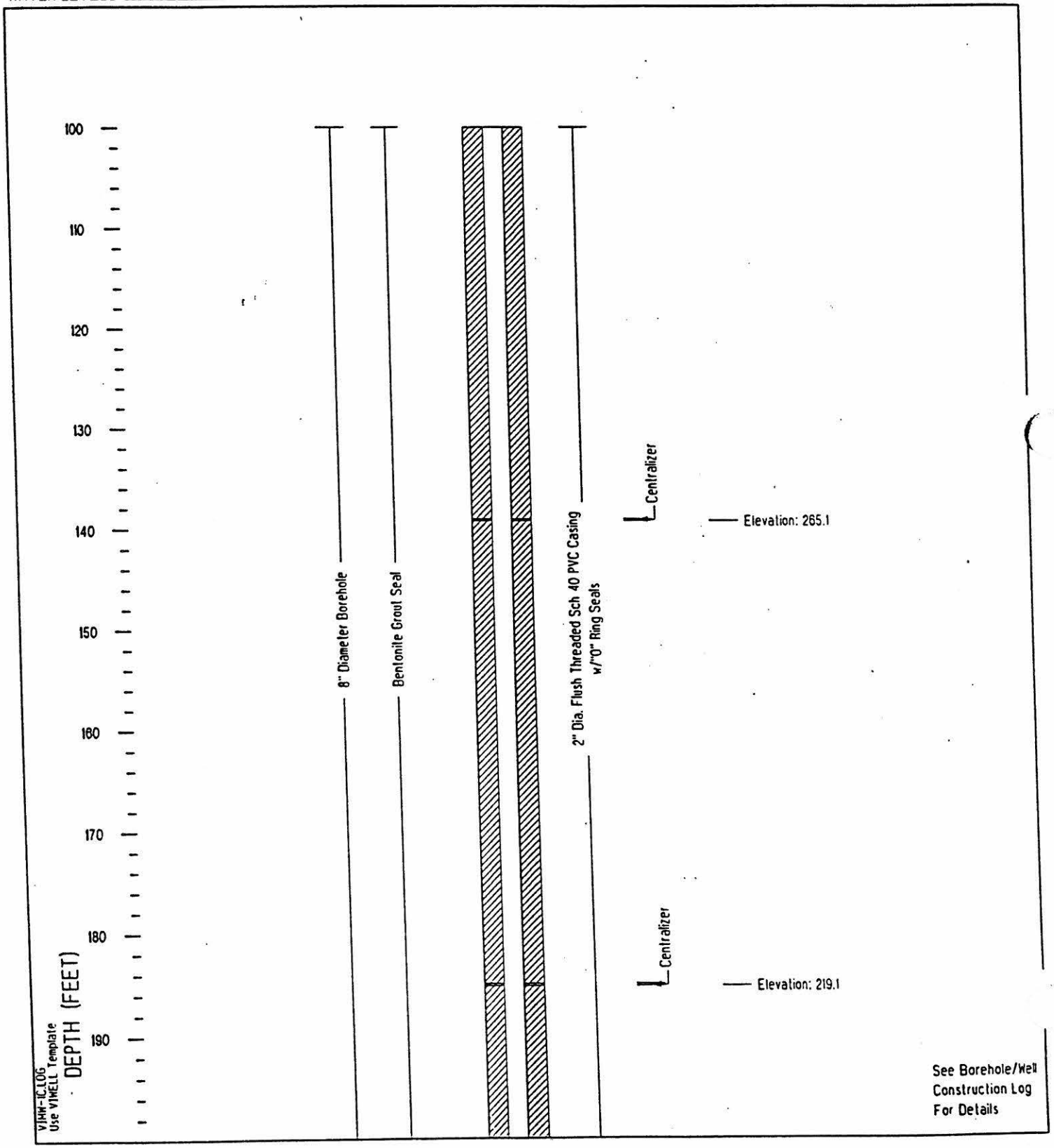
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N1471.91, E3023.75

ELEVATION 404.28 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 05/04/95 FINISH 05/15/95 LOGGER T.O'CONNOR



V:\HW-1C.LOG
Use V:\WELL Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-11
106241.E3.77	MW-1C	SHEET 3 OF 4

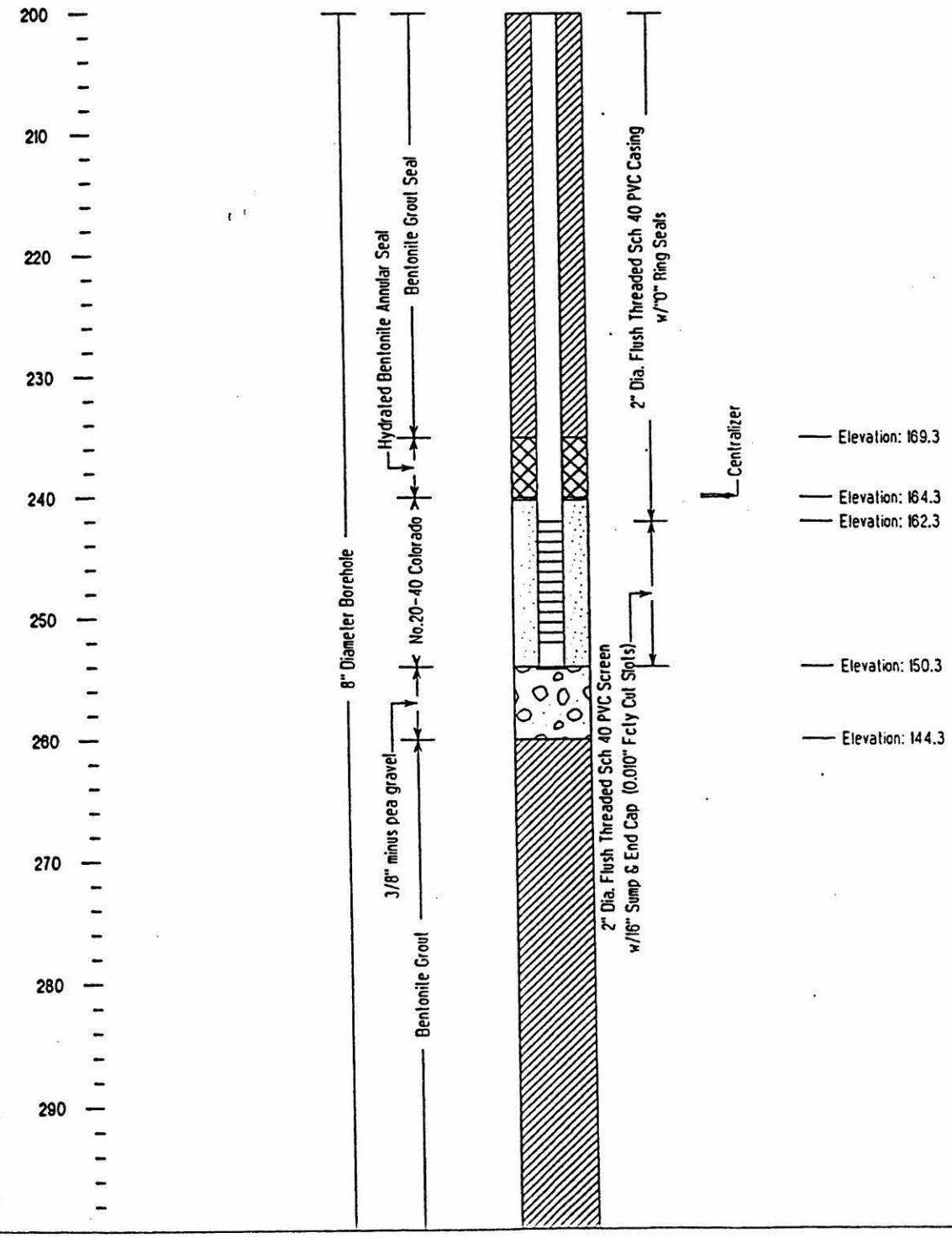
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N1471.91, E3023.75

ELEVATION 404.28 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 05/04/95 FINISH 05/15/95 LOGGER T.O'CONNOR



See Borehole/Well Construction Log For Details

V1HM-1C.LOG
Use V1WELL Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-11
106241.E3.77	MW-1C	SHEET 4 OF 4

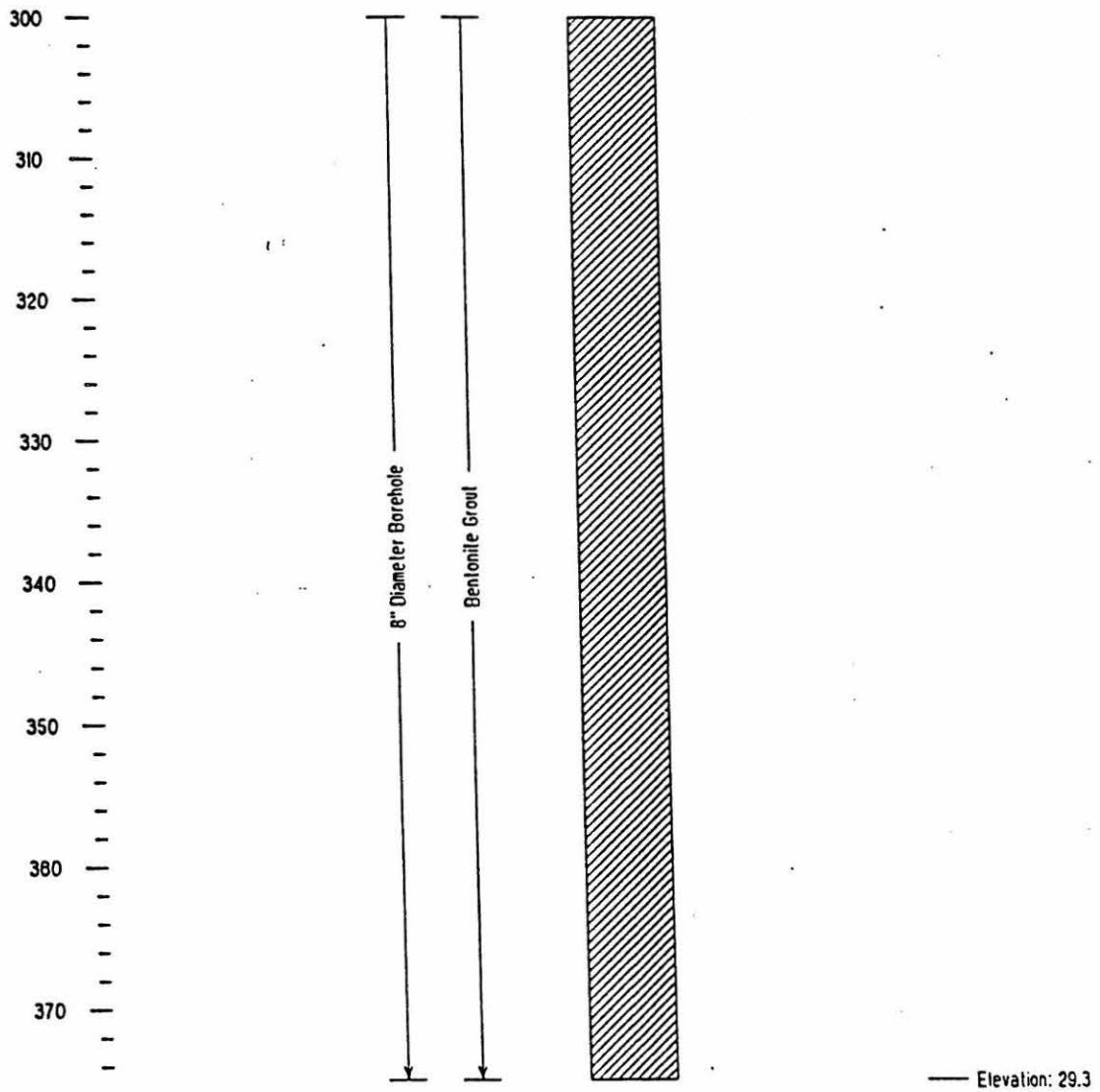
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N1471.91, E3023.75

ELEVATION 404.28 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 05/04/95 FINISH 05/15/95 LOGGER T.O'CONNOR



V:\MW-1C.LOG
Use VIWELL Template

See Borehole/Well Construction Log For Details

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-12
106241.E3.ZZ	MW-2C	SHEET 1 OF 4

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N133.51, E2370.88

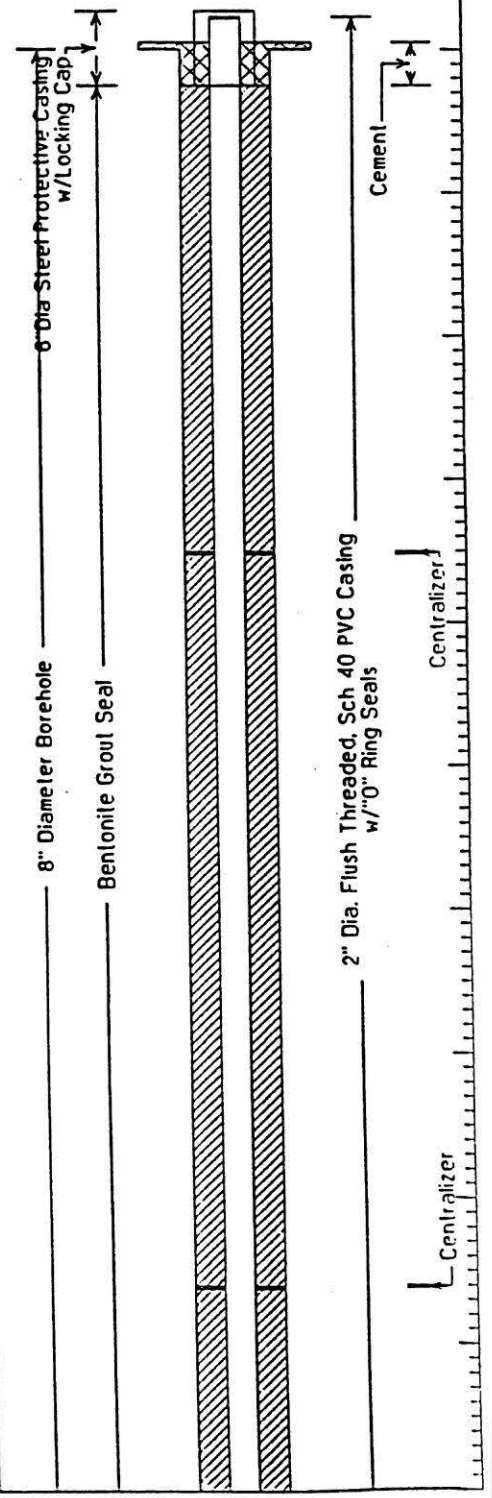
ELEVATION 310.12 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 05/19/95 FINISH 05/26/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
10.0					SILTY SAND (SM), gray brown, moist, firm
20.0	20				
	21		1.1	7-12-25	SILT (ML), brown/light brown, moist, firm, dense, brittle
30.0					POORLY GRADED SAND (SP), light brown, moist, firm, trace silt
	40				SILTY SAND (SM), gray, moist to wet
40.0	41.5		0.9"	18-20-50	SILT (ML), olive gray, moist to wet, firm, brittle, vertical layering, trace iron oxide mottling, non-plastic
50.0					Slightly plastic
60.0	60				
	61		1.0'	6-15-32	WELL GRADED SAND (SW), light gray, moist, firm, trace silt
70.0					SANDY SILT (ML), gray/brown, wet to moist, firm
80.0	80				
	81.5		1.0'	15-20-35	SILT (ML), dark gray, massive, dry, firm, dense, brittle
90.0					SILTY SAND (SM), light gray, moist to wet
					Trace Gravel
	100				WELL SORTED SAND (SW), light gray, moist, firm

WELL COMPLETION DIAGRAM



VIHW-2C.LOG Use WELLBORE Template

Renamed MW-12

CH2M HILL

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-12
106241.E3.ZZ	MW-2C	SHEET 2 OF 4

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N133.51, E2370.88

ELEVATION 310.12 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

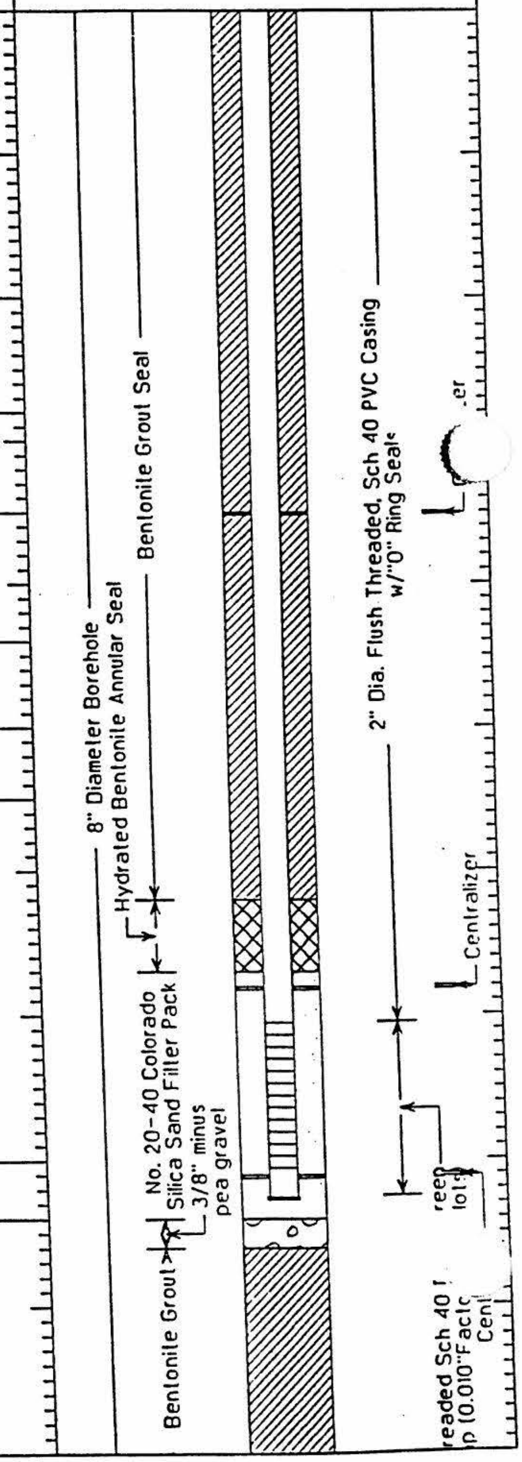
DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 05/19/95 FINISH 05/26/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
	100 – 101.5		1.5'	2-2-2	SILTY SAND (SM), dark gray, moist, firm
110.0					
120.0	120 – 121.5		1.3'	2-2-12	SANDY SILT (ML), dark gray, wet, firm
					SILT (ML), gray, moist, firm, plastic
130.0					
					WELL GRADED SAND (SW), light gray, moist, firm, trace silt
140.0	144 – 145.5		1.5	7-7-30	SILTY-CLAYEY SAND (SM-SC), dark gray, moist, firm
150.0					SAND WITH GRAVEL, light brown/gray, trace silt.
160.0	160 – 161.5		8"		POORLY GRADED SAND (SP), olive gray, wet, firm
170.0					
180.0	180 – 181.5		0.6"	2-10-18	POORLY GRADED SAND WITH SILT (SP-SM), gray, wet, firm, dense.
					SILT (ML), gray, moist, firm, dense
190.0					
	200				

WELL COMPLETION DIAGRAM

DEPTH OF CASING, DRILLING RATE DRILLING FLUID LOSS TESTS AND INSTRUMENTATION



VIHW-2C.LOG Use WELLBORE Template

CHM HILL

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-12
106241.E3.ZZ	MW-2C	SHEET 3 OF 4

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N133.51, E2370.88

ELEVATION 310.12 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 05/19/95 FINISH 05/26/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	WELL COMPLETION DIAGRAM: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
200.0	200.0	SS	1'	10-25-35	SANDY SILTY (ML), dark gray/black, moist, firm	8" Diameter Borehole; Bentonite Grout
					SILT (ML), dark gray, wet, firm, trace wood fragments	
210.0					POORLY GRADED SAND (SP), gray, moist, trace silt with white pumice	
	220					
220.0	221.5	SS	0.9	15-15-30	POORLY GRADED SAND WITH SILT (SP-SM), dark gray, wet, dense, white pumice, trace non-plastic silt	
230.0					WELL GRADED SAND (SW), gray, wet, wood fragments, some fine gravel, subrounded up to 1/4" in diameter	
					POORLY GRADED SAND (SP), gray, wet, trace wood fragements, trace subrounded gravel	
	240					
240.0	241.5	SS	1.5	7-30-50/4"	SILTY SAND (SM), dark gray, wet, dense, trace of gray non-plastic silt	
					SILTY SAND WITH GRAVEL (SP), dark gray, wet, firm	
250.0						
	260					
260.0	261.5	SS	0.5		POORLY GRADED SAND WITH GRAVEL (SP), gray, wet, gravel is subrounded to rounded, up to 1.5 inches in diameter	
					SILTY SAND (SM), gray, wet, firm, up to trace subrounded gravel (up to 3%) 1/2 inch in diameter	
270.0						
	280					
280.0	281.5	SS	1.0	5-7-30	POORLY GRADED SAND (SP), gray, very wet, medium dense, trace silt	
290.0						
	300					

VIHW-2CLOG Use WELLBORE Template

CH2M HILL

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-12
106241.E3.ZZ	MW-2C	SHEET 4 OF 4

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N133.51, E2370.88

ELEVATION 310.12 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 05/19/95 FINISH 05/26/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	WELL COMPLETION DIAGRAM: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
300		SS	0.8	1-1-6	POORLY GRADED SAND (SP), gray, wet, fine grain sand	Bentonite Grout
					TOTAL DEPTH = 301.5 FEET	8" Diameter Borehole
310.0						
320.0						
330.0						
340.0						
350.0						
360.0						
370.0						
380.0						
390.0						

VIHW-2C.LOG Use WELLBORE Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-12
106241.E3.77	MW-2C	SHEET 1 OF 4

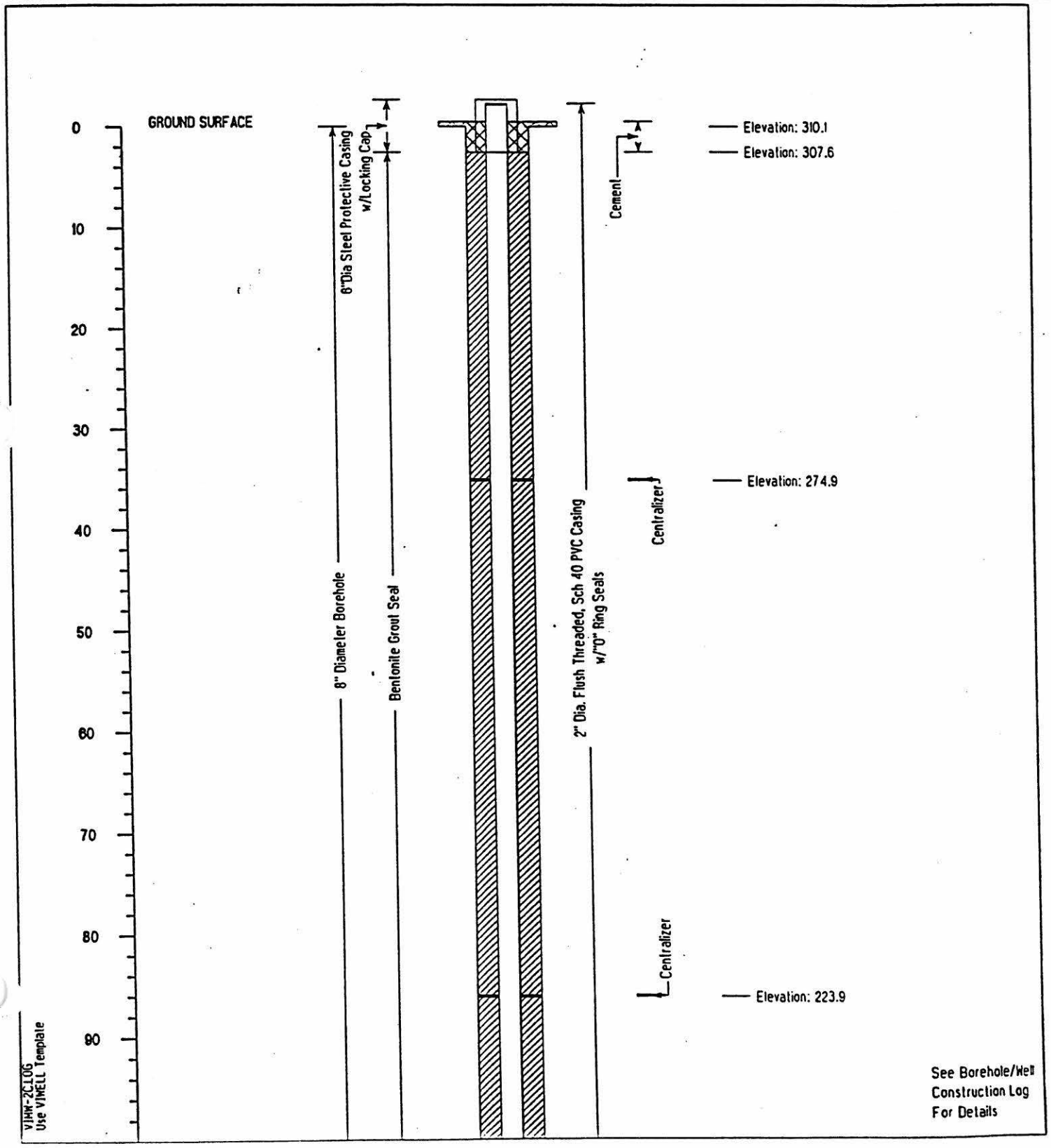
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N133.51, E2370.88

ELEVATION 310.12 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 05/19/95 FINISH 05/26/95 LOGGER T.O'CONNOR



See Borehole/Well Construction Log For Details

VIHW-2C1.06
Use VIWELL Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-12
106241.E3.ZZ	MW-2C	SHEET 2 OF 4

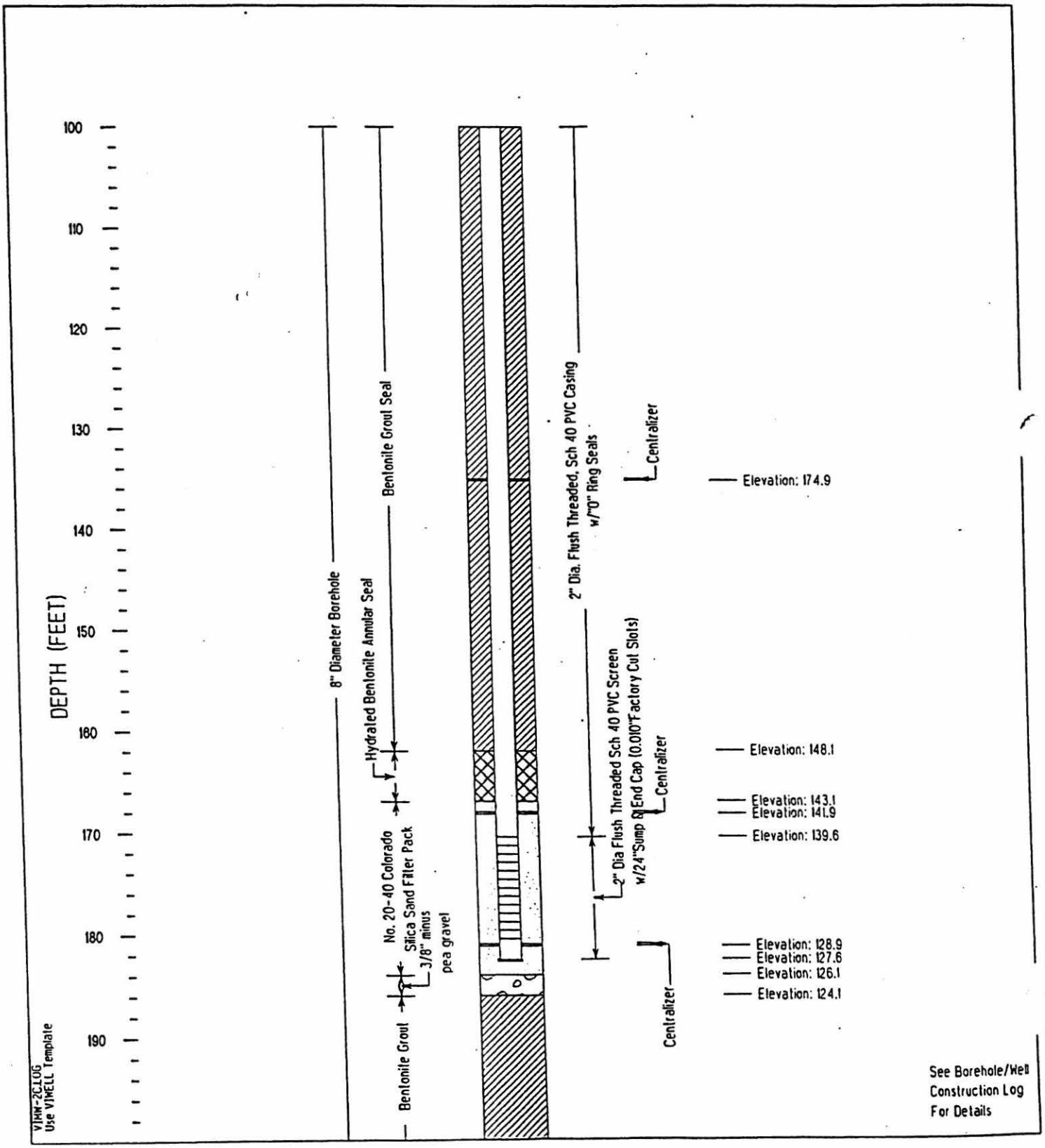
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N133.51, E2370.88

ELEVATION 310.12 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 05/19/95 FINISH 05/26/95 LOGGER T.O'CONNOR



VIHW-2C.LOG
Use VIWELL Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-12
106241.E3.ZZ	MW-2C	SHEET 3 OF 4

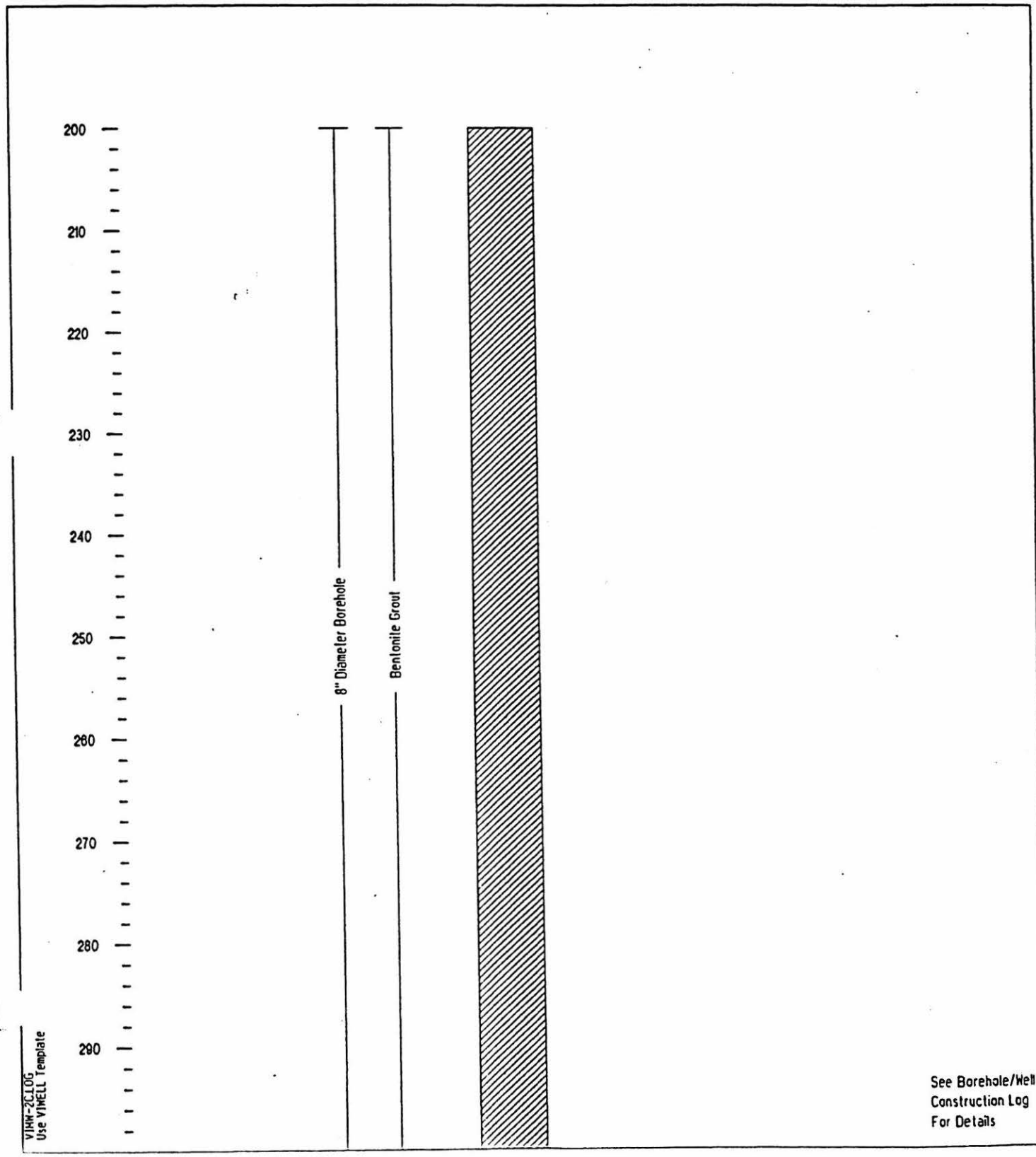
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N133.51, E2370.88

ELEVATION 310.12 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 05/19/95 FINISH 05/26/95 LOGGER T.O'CONNOR



VIHW-2CLOG
Use VIWELL Template

CH2M HILL

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-12
106241.E3.ZZ	MW-2C	SHEET 4 OF 4

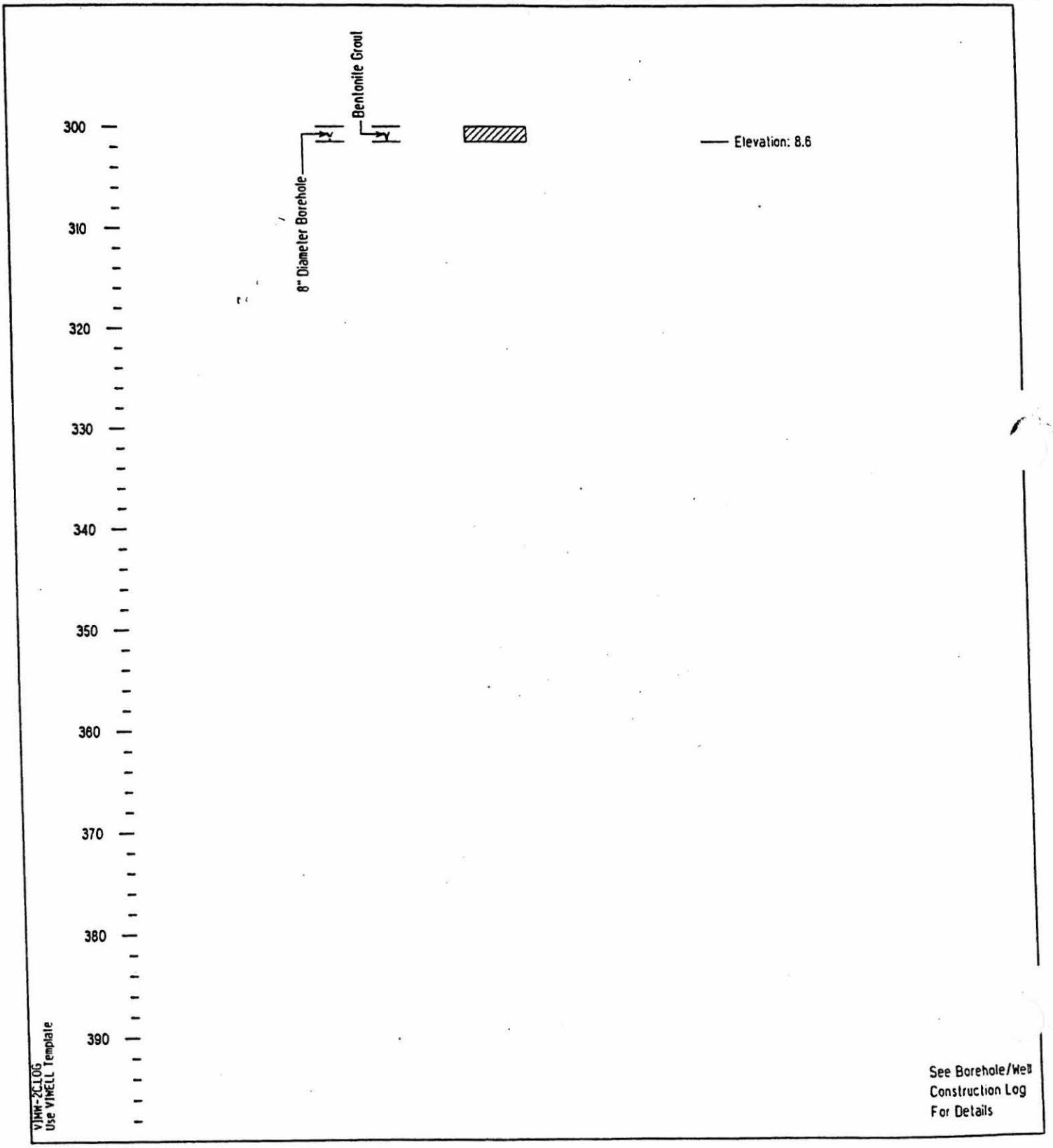
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N133.51, E2370.88

ELEVATION 310.12 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 05/19/95 FINISH 05/26/95 LOGGER T.O'CONNOR



VJHW-2C1.06
Use VIWELL Template

See Borehole/Well Construction Log For Details

Boring No. P-3

1 of 3

Renumbered as MW-13

Logged by: CRL

Dated: 4-22-92

N 614.2871
E 2987.4369
Top of PVC Elev.
374.07

Graph/ USCS	Soil Description	Consistency	Depth (ft.)	Sample	(N) Blows (ft)	Water Content (%)	Well As-Built
SM	Gray-brown, silty SAND, with gravel, moist, with seepage zones below 20 feet. (Till)	very dense	5		50/6"	9	
			10		50/6"	13	
			15		50/6"	12	
	(No methane or volatile organics noted during drilling)		20		50/3"	11	
			25		50/6"	10	
	boulder at 34 feet		30		50/4"	12	
SM/SP	Gray-brown, silty to slightly silty medium SAND, dry to moist.	very dense	35		50/6"	10	
			40		50/6"	8	
			45		200/9"	—	
			50				

Continued

TERRA ASSOCIATES
Geotechnical Consultants

Boring Log
Vashon Landfill
King County, Washington

Proj. No. T-1996 | Date 7/92 | Figure 4

Boring No. P-3

2 of 3

Logged by: CRL

Dated: 4-22-92

Renumbered as MW-13

Graph/ USCS	Soil Description	Consistency	Depth (ft.)	Sample	(N) Blows (ft)	Water Content (%)	Well As-Built
SM	Gray-brown, silty to slightly silty SAND, dry to moist. (No methane or volatile organics noted during drilling)	very dense	55		50/5"	12	
			60		50/6"	10	
			65		50/5"	7	
			70		50/6"	15	
			75		50/6"	11	
			80		50/5"	5	
			85		50/6"	8	
			90		50/6"	20	
	becomes finer grained and saturated at 90 feet.		95		50/6"	24	
ML	Gray, fine sandy SILT dilatent, saturated.	very dense	100		50/6"	26	
SM							

Continued

TERRA ASSOCIATES
Geotechnical Consultants

Boring Log
Vashon Landfill
King County, Washington

Proj. No. T-1996 | Date 7/92 | Figure 5

Boring No. P-3

3 of 3

Logged by: CRL

Dated: 4-22-92

Renumbered as MW-13

Graph/ USCS	Soil Description	Consistency	Depth (ft.)	Sample	(N) Blows (ft)	Water Content (%)	Well As-Built
SM	Gray fine to medium SAND with silt, saturated.	very dense			50/6"	22	
ML	Gray SILT with fine sand, saturated.	very dense	105		50/2"	31	
SM/SP	Dark gray, medium SAND with silt, saturated.	very dense	110		50/6"	27	
ML	Gray SILT, slightly plastic	hard	115		50	32	

Total depth 115.5 feet

Wel As-built:

2" 0.0200 PVC Screen placed from 113 to 108 feet.

Pea-gravel placed from 115 to 113 feet.
#8 Silica Sand placed from 113 to 106 feet.
Bentonite grout tremied to bottom of auger from 106 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.

CHM HILL

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-14
106241.E3.ZZ	MW-4B	SHEET 1 OF 2

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N713.05, E2126.69

ELEVATION 373.62 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/19/95 FINISH 06/21/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
10.0					SILTY SAND (SM), light brown, moist, firm, trace gravel
20.0	20 21.5	SS	1.2'	13-13-13	
30.0					
40.0	40 41.5	SS	1.0	30-50-4"	POORLY GRADED SAND WITH SILT (SP-SM)
50.0					
60.0	60 61.5	SS	1.0'	13-30-40	
70.0					POORLY GRADED SAND (SP), moist, firm, very fine to fine grained
					SILTY SAND (SM), olive, moist, firm
80.0	80 82	SS	1.0'	15-25-25	WELL GRADED SAND (SW), brown/tan, firm, moist
90.0					SILTY SAND (SM), olive, firm, moist
	100				

WELL COMPLETION DIAGRAM

- 6" Dia. Steel Protective Casing w/Locking Cap
- 8" Diameter Borehole
- Cement Bentonite Grout Seal
- 2" Dia. Flush Threaded, Sch 40 PVC Casing w/"O" Ring Seals
- Cement
- Centralizer
- Centralizer

VIHW-4B.LOG Use WELLBORE Template

CH2M HILL

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-14
106241.E3.ZZ	MW-4B	SHEET 2 OF 2

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N713.05, E2126.69

ELEVATION 373.62 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

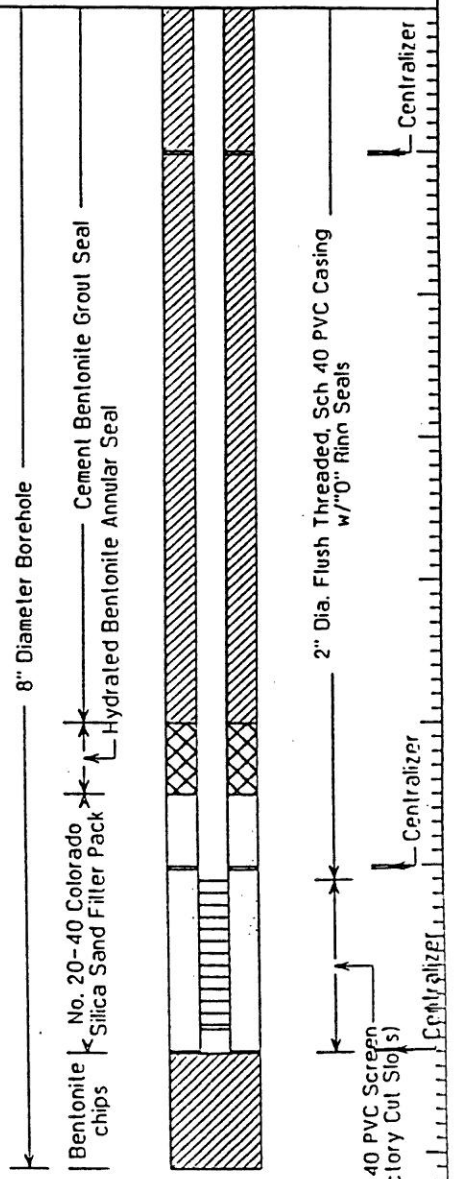
DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/19/95 FINISH 06/21/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
	100	SS	9"	75-40-45	
110.0					SILT (ML), brown-gray, moist, firm, trace fine sand
	120				
120.0	121.5	SS	1.0'	15-30-50/5"	SILTY SAND, olive, moist, firm
130.0					
	140				
140.0	141.5	SS	0.6"	9-30-45	
150.0					SILT (ML), brown, moist, trace sand, plastic,
	160				
160.0	161	SS	9"		POORLY GRADED SAND WITH SILT (SP-SM), olive, moist, firm
					SILTY SAND (SM), gray, moist to wet, firm, trace pea gravel
170.0					SILT (ML), gray, moist to wet, firm, dense to very dense, trace wood chips
					SILTY SAND (SM), gray, moist, firm
	180				
180.0	181.4	SS	11"	10-30-50/5"	SAND AND GRAVEL, brown, moist, firm, gravel up to 1" diameter
					TOTAL DEPTH = 181.4 FEET
190.0					

WELL COMPLETION DIAGRAM

DEPTH OF CASING, DRILLING RATE DRILLING FLUID LOSS TESTS AND INSTRUMENTATION



VJHM-4B.LOG Use WELLBORE Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-14
106241.E3.77	MW-4B	SHEET 1 OF 2

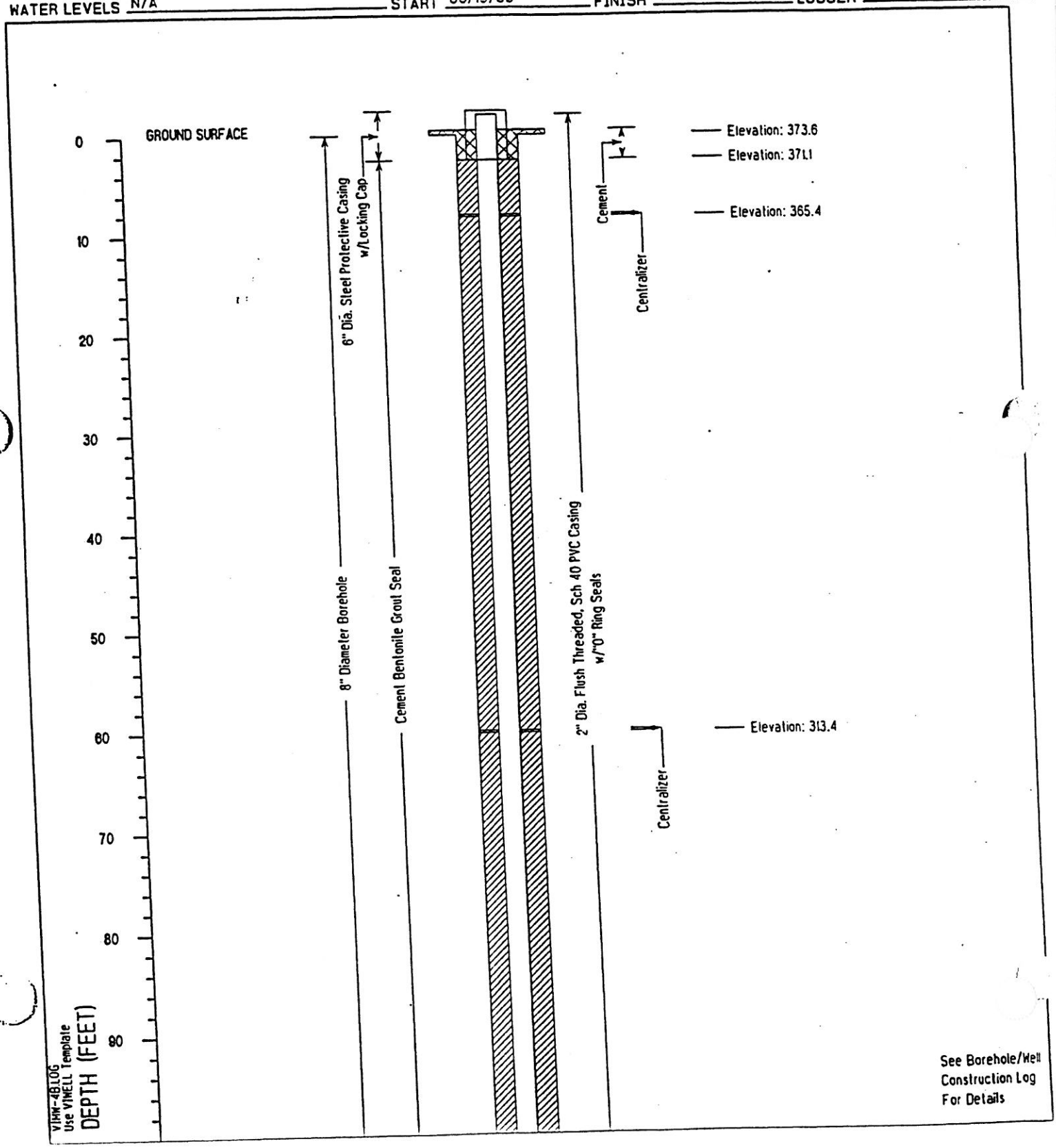
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N713.05, E2126.69

ELEVATION 373.62 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/19/95 FINISH 06/21/95 LOGGER T.O'CONNOR



VIHW-4BLOG
Use VIWELL Template

See Borehole/Well Construction Log For Details

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-14
106241.E3.77	MW-4B	SHEET 2 OF 2

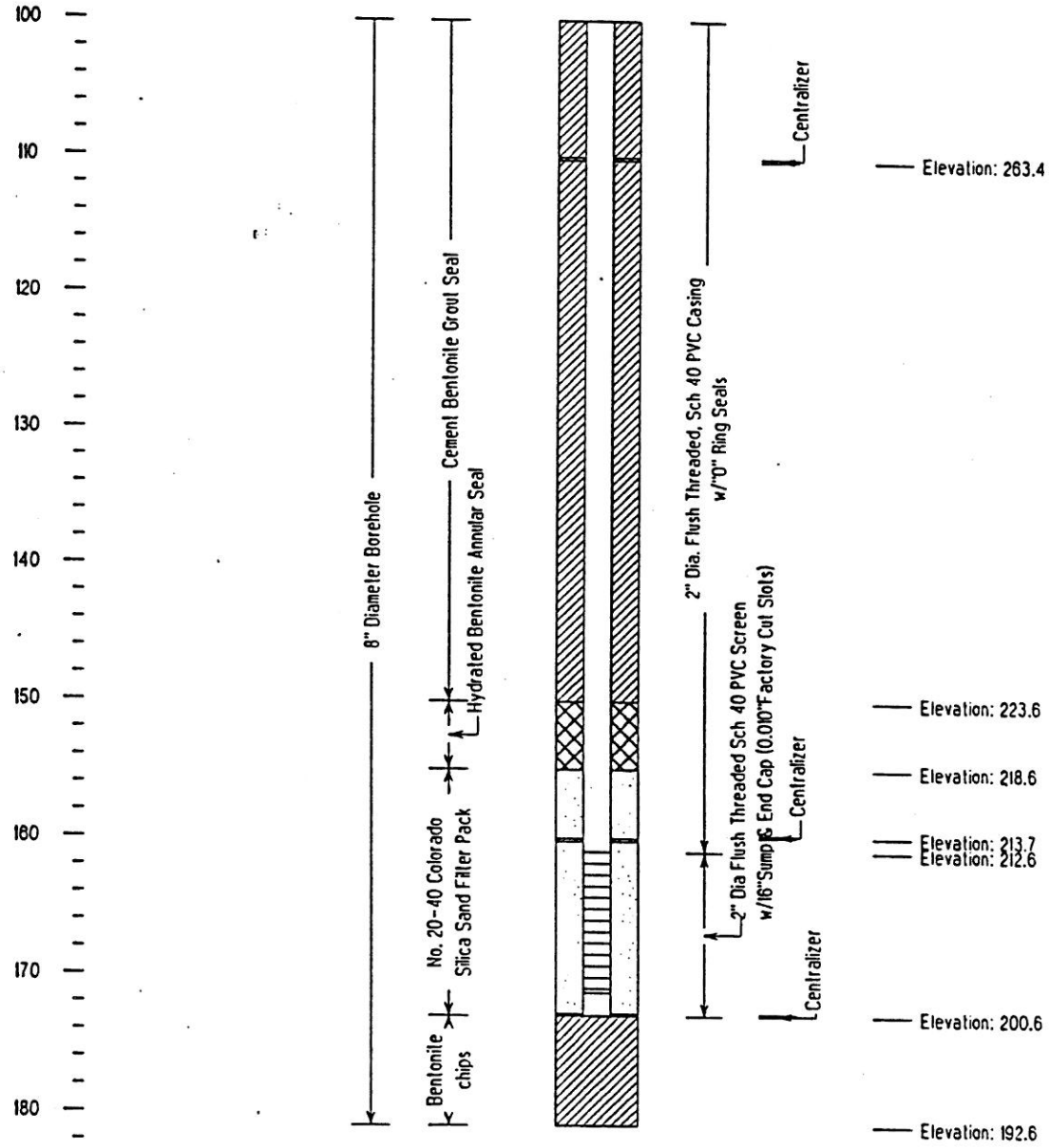
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N713.05, E2126.69

ELEVATION 373.62 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/19/95 FINISH 06/21/95 LOGGER T.O'CONNOR



See Borehole/Well Construction Log For Details

VJHW-4B.LOG
Use VTWELL Template

CHM HILL

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-19
106241.E3.ZZ	MW-9C	SHEET 1 OF 4

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N1283.59, E2268.63

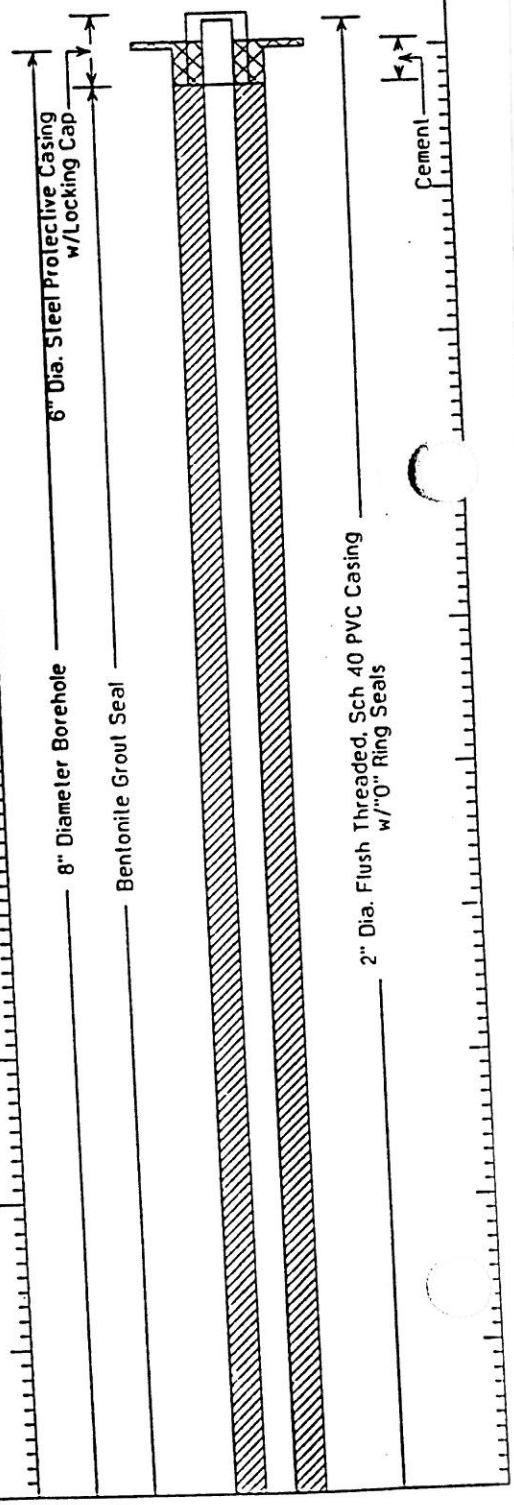
ELEVATION 400.64 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/01/95 FINISH 06/12/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
10.0	20				SILTY SAND, (SM) brown, moist, firm, trace pea gravel
20.0	21	SS	6"	50/4"	Gravel up to 1" diameter
30.0					POORLY GRADED SAND, (SP) brown, moist, firm, trace silt, trace gravel, up to 1" in diameter
40.0	40				
	41	SS	1.2	80/6" 100/1"	SILTY SAND, (SM) brown, moist, firm, trace gravel; OVA=1000; CGI=0
50.0					POORLY GRADED SAND, (SP) gray to light brown, moist, firm
					WELL GRADED SAND, (SW) gray to light brown, moist, firm
60.0	60				
	61	SS	1.0	35-50/6-50/3"	POORLY GRADED SAND WITH SILT AND GRAVEL, (SP-SM) olive, moist, firm; OVA=20; CGI=0
70.0					
80.0	80				
	81	SS	1.0	25-35-50/5"	POORLY GRADED SAND WITH SILT (SP-SM), olive, moist, firm
	100				

WELL COMPLETION DIAGRAM



VHM-9C.LOG Use WELLBORE template

CH2M HILL

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-19
106241.E3.ZZ	MW-9C	SHEET 2 OF 4

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N1283.59, E2268.63

ELEVATION 400.64 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/01/95 FINISH 06/12/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
	100				
	101	SS	1.5	10-25-40	SILT, (ML) olive, moist, brittle Red iron oxide deposit .1" thick with wood/fine sand, no silt
					SILTY SAND, (SM), olive, moist, firm
110.0					
	120				
120.0	121	SS	1.5	3-3-10	
130.0					
	140				SILT, (ML) grayish brown, moist, firm, plastic
140.0	141	SS	1.0	7-25-40	
150.0					
	160				POORLY GRADED SAND WITH GRAVEL, (GP) gray, moist, firm, pea size gravel
160.0	161	SS	8"		
170.0					POORLY GRADED GRAVEL, moist, firm, size gravel
	180				
180.0	181	SS	1'	15-35-35	FAT CLAY, (CL) dark gray, dry, brittle, massive
190.0					
	200				

WELL COMPLETION DIAGRAM: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION

- 8" Diameter Borehole
- Bentonite Grout Seal
- 2" Dia. Flush Threaded, Sch 40 PVC Casing w/"O" Ring Seals

VIMM-9CLUG Use WELLBORE Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-19
106241.E3.ZZ	MW-9C	SHEET 3 OF 4

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N1283.59, E2268.63

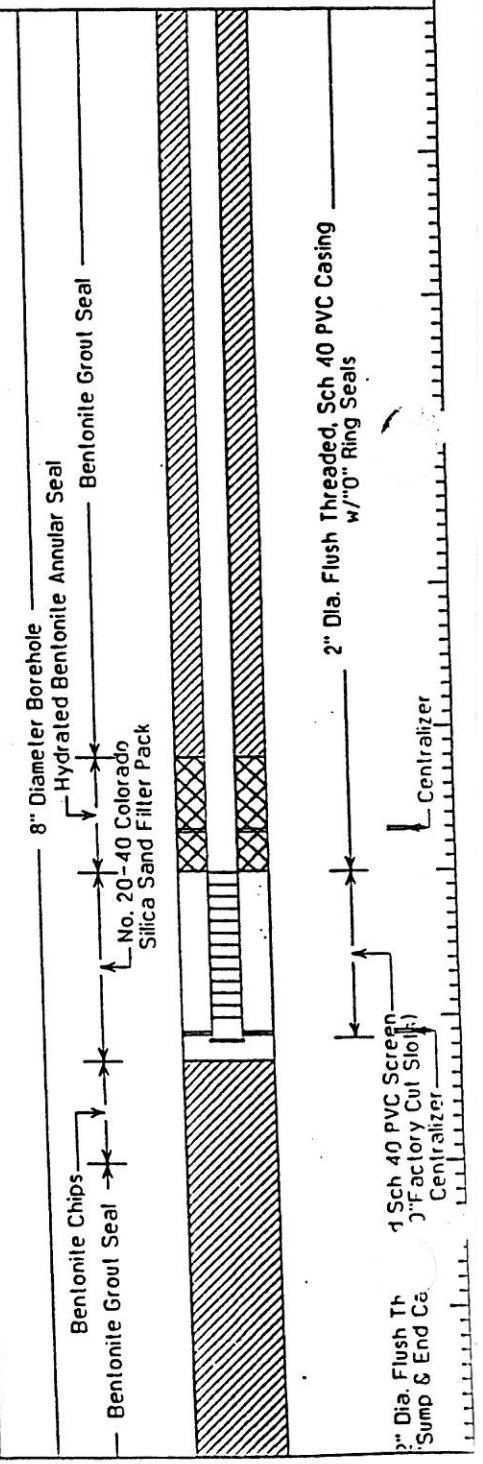
ELEVATION 400.64 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/01/95 FINISH 06/12/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
	200				
	201	SS	1'	5-35-50/5"	SILTY SAND WITH GRAVEL (SM) dark gray, moist, firm
210.0					
	220				
220.0	221	SS	.4"	10-15-50/5"	SILTY GRAVEL WITH SAND (GM) dark gray, moist, firm, dense, gravel up to 1" diameter
230.0					
	240				
240.0	241	SS	.5'	25-75/6"	POORLY GRADED GRAVEL WITH SILT AND SAND (GP-SM) dark grayish brown, moist, firm, large cobbles up to 3" diameter
250.0					POORLY GRADED SAND WITH SILT (SP-SM) dark gray, moist to wet, firm
	260				
260.0	261	SS	.5'	1-1-1	
270.0					
	280				SILT (ML) gray, dense, moist
280.0	281	SS	1.0	1-1-1	SILTY SAND (SM) dark gray, moist, firm
					SILT (ML) dark gray, firm, very dense
290.0					
	300				

WELL COMPLETION DIAGRAM: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION



VIMW-9C.LOG Use WELLBORE template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-19
106241.E3.ZZ	MW-9C	SHEET 4 OF 4

BOREHOLE/WELL CONSTRUCTION LOG

PROJECT VASHON ISLAND LANDFILL LOCATION N1283.59, E2268.63

ELEVATION 400.64 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/01/95 FINISH 06/12/95 LOGGER T.O'CONNOR

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION	WELL COMPLETION DIAGRAM
	300					
	301	SS	1.2	25-90/6"	SILT, (ML) dark gray, firm, dense, brittle, moist, dry, non-plastic	
					SILTY SAND, (SM) gray, moist, firm	
310.0					SILT, (ML) dark gray, firm, dense, moist, semi-plastic	
					SILTY SAND, (SM) wet to moist, firm, very fine grained black, sand with pumice, with interlayers of brown to dark gray SILT (ML)	
	320					
320.0	321	SS	1.5	1-1-5		
					SILTY SAND, (SM) brown, saturated, firm, very fine sand to fine sand, white pumice material	
330.0					WOOD CHIPS, trace white pumice	
					SAND, (SW) well graded, moist to wet, firm, black to black brown, sand medium grained, trace pumice, trace wood fragments, large up 1" long, grading coarser	
	340					
340.0	341	SS	1.0	7-13-19	SILTY SAND, (SM) dark brown, wet, firm	
350.0						
	359				POORLY GRADED SAND WITH SILT, (SP-SM) dark gray, firm, wet	
360.0	360	SS	1.1	8-12-16	TOTAL DEPTH = 360 FEET	
370.0						
380.0						
390.0						

8" Diameter Borehole

Bentonite Grout Seal

VJHW-9C.LOG
Use WELLBORE Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-19
106241.E3.77	MW-9C	SHEET 1 OF 4

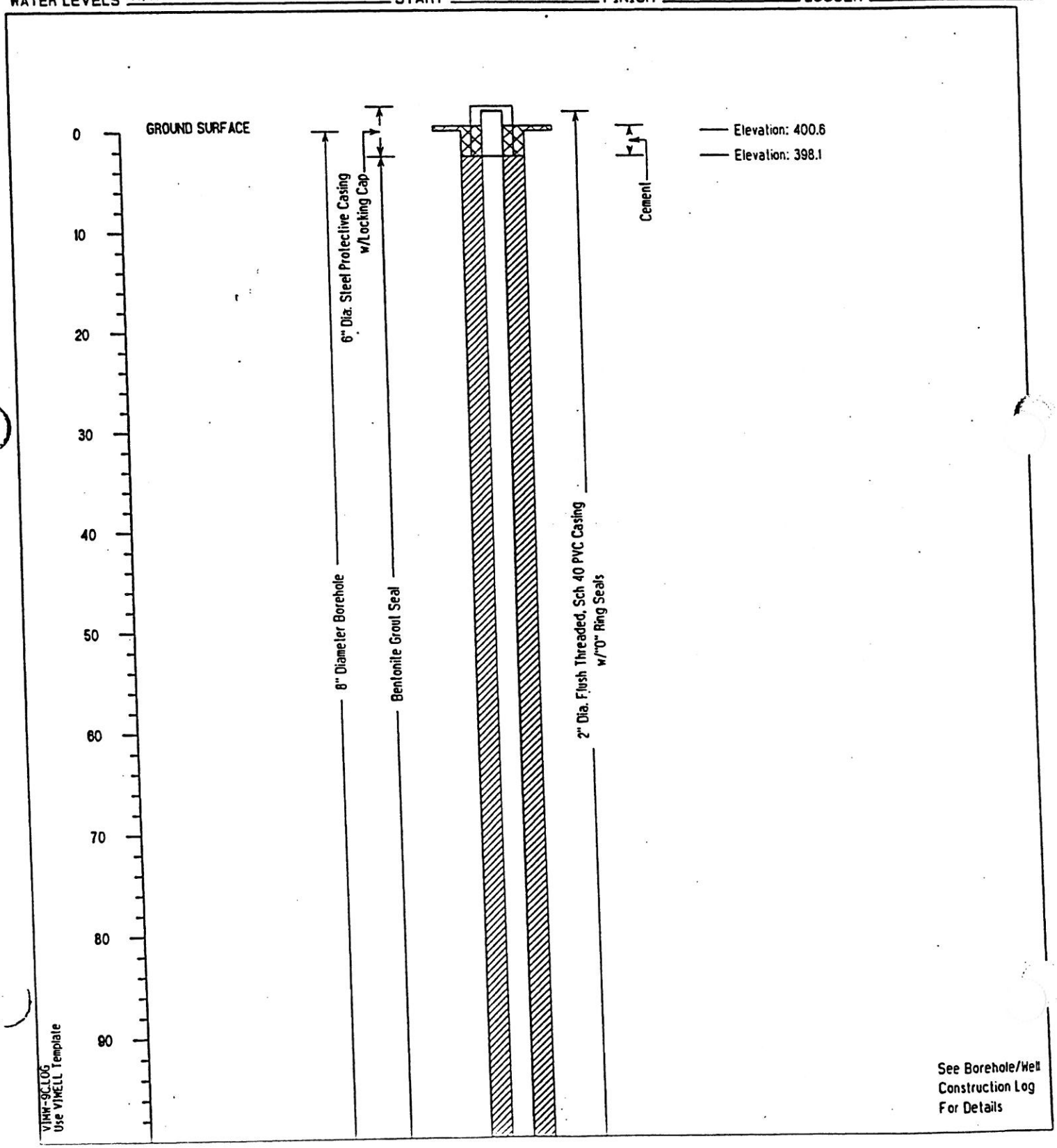
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N1283.59, E2268.63

ELEVATION 400.64 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/01/95 FINISH 06/12/95 LOGGER T.O'CONNOR



See Borehole/Well Construction Log For Details

VIMW-9C.LOG
Use VIWELL Template

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-19
106241.E3.77	MW-9C	SHEET 2 OF 4

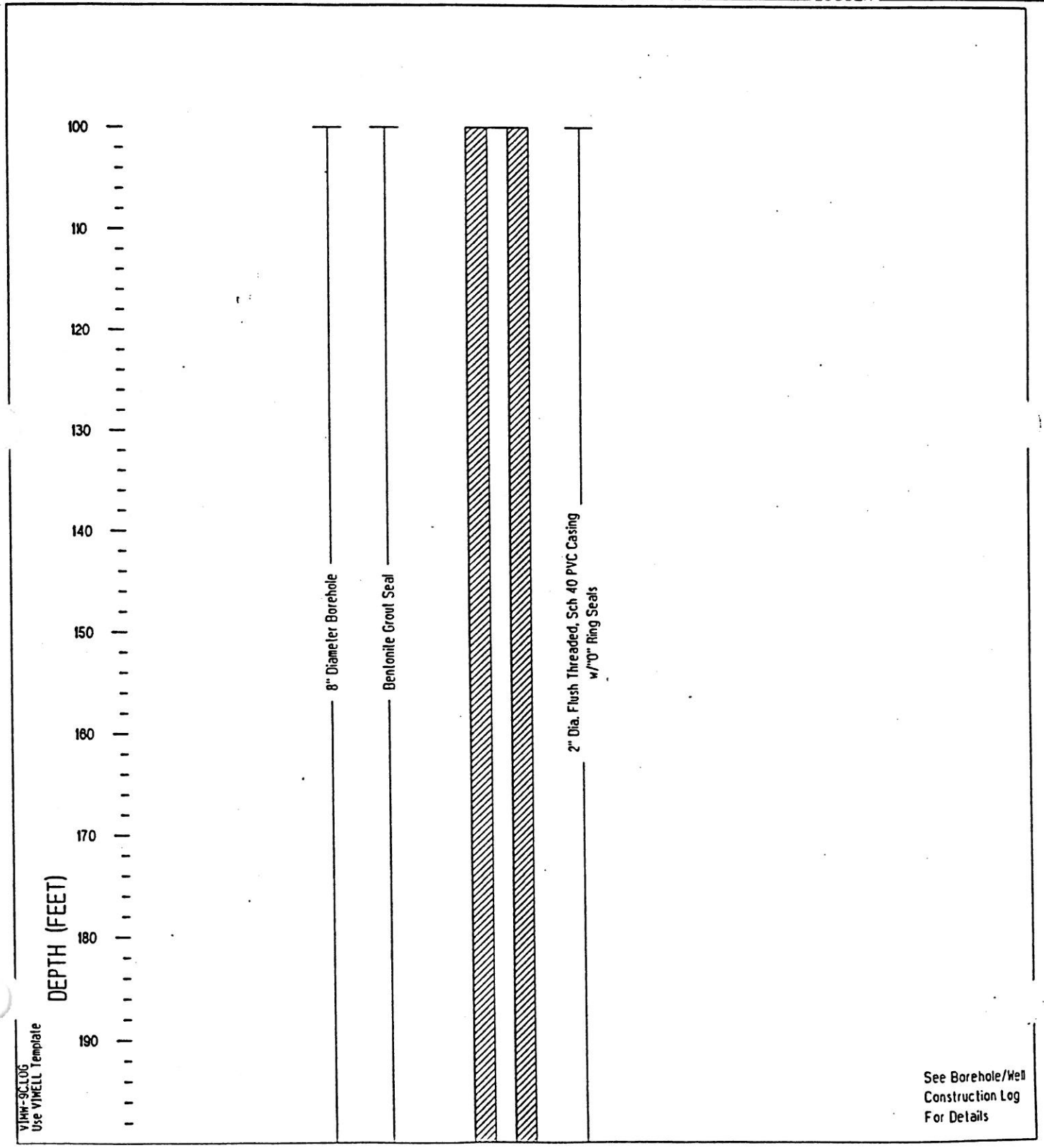
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N1283.59, E2268.63

ELEVATION 400.64 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/01/95 FINISH 06/12/95 LOGGER T.O'CONNOR



See Borehole/Well Construction Log For Details

VIMW-9CLOG
Use VIWELL Template

CH2M HILL

PROJECT NUMBER	BORING NUMBER	Renumbered as MW-19
106241.E3.ZZ	MW-9C	SHEET 3 OF 4

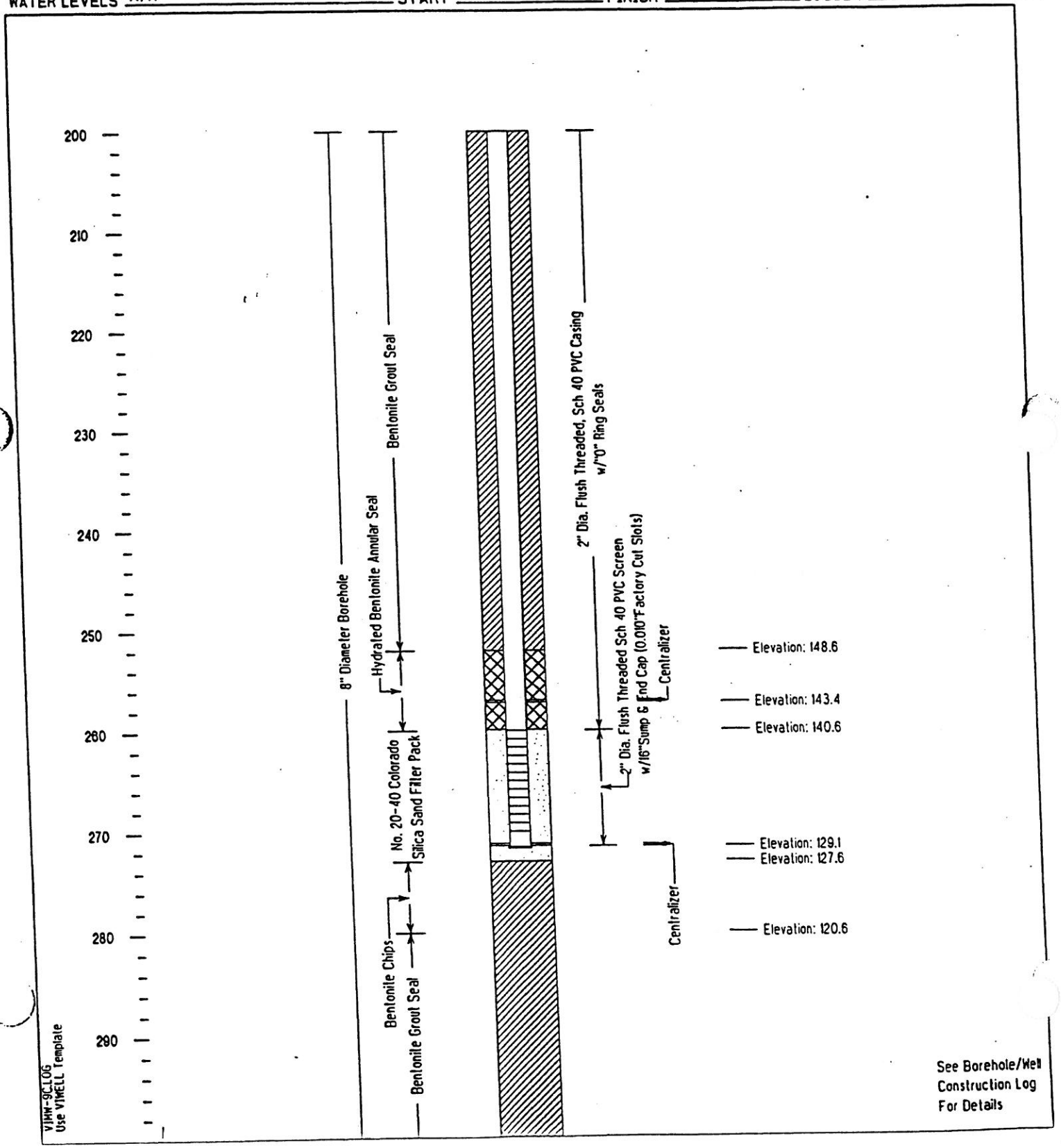
WELL CONSTRUCTIONSUMMARY

PROJECT VASHON ISLAND LANDFILL LOCATION N1283.59, E2268.63

ELEVATION 400.64 DRILLING CONTRACTOR TACOMA PUMP & DRILLING INC.

DRILLING METHOD AND EQUIPMENT AIR ROTARY

WATER LEVELS N/A START 06/01/95 FINISH 06/12/95 LOGGER T.O'CONNOR



See Borehole/Well Construction Log For Details

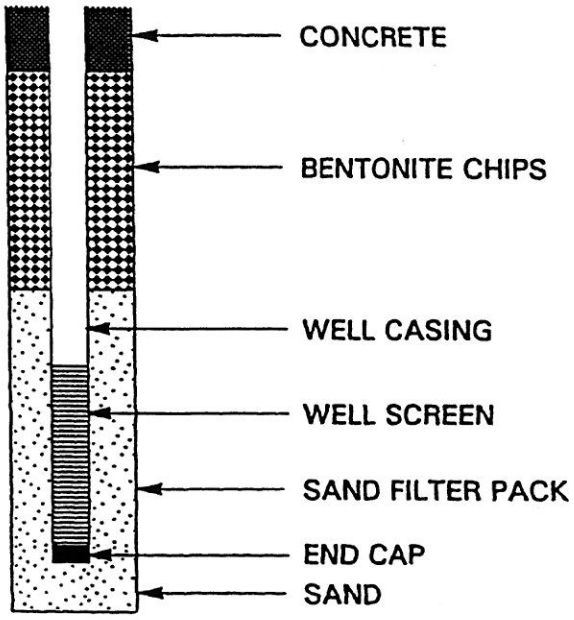
VIHW-9CLOG
Use VIWELL Template

EXPLANATION OF SYMBOLS ON EXPLORATORY BORING LOGS

SAMPLE COLUMN

SAMPLE INTERVAL (Attempted)

WELL DETAILS COLUMN

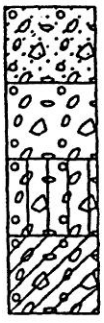


WATER LEVELS

▽ LEVEL AT TIME OF DRILLING

▼ LEVEL AT SPECIFIED DATE

LITHOLOGIC COLUMN

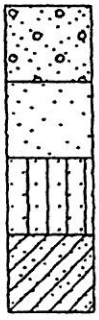


GW

GP

GM or GP-GM

GC

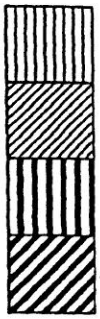


SW

SP

SM or SP-SM

SC



ML

CL

MH

CH

OL

OH

PT

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

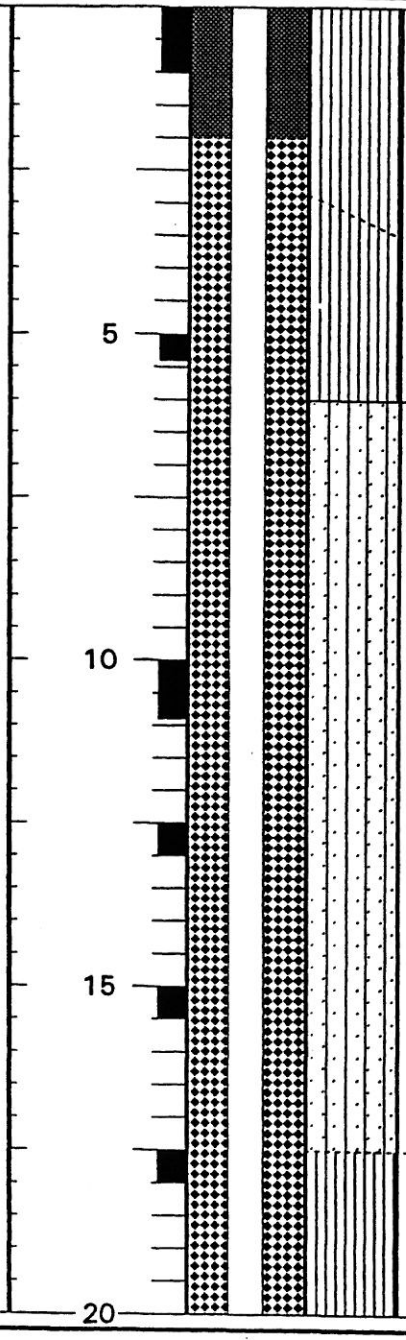
NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS.
HYPHENATED SYMBOLS ARE USED TO INDICATE 5 TO 15 PERCENT FINES BASED ON VISUAL EXAMINATION.

LOG OF EXPLORATORY BORING

PROJECT NAME	Field Investigation Report	BORING NO.	MW-20
LOCATION	Vashon Island Landfill	PAGE	1 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	LITHOLOGIC DESCRIPTION
G	0		**0 to 3.5 feet: SANDY SILT (ML)**, reddish brown, some fine to coarse sand, nonplastic, damp. Predominantly boulders (road subgrade) from 1.0 to 3.5 feet. (TOPSOIL/FILL)
SS	5	50/5"	**3.5 to 6.0 feet: SANDY SILT (ML)**, yellowish gray to gray, little fine sand, trace coarse sand and fine gravel, dry, stiff. (TILL)
SS	10	40-50/5"	**6.0 to 17.5 feet: SILTY SAND (SM)**, yellowish gray with orange-brown mottles, lenses of SILT (ML), trace to few fine to medium subrounded gravel. Boulder from about 7 to 8 feet. Horizontal laminations with one gray silt lens (rip-up clast?) at 15.3 feet. Very slow drilling, very dense. (TILL)
SS	12.5	40	
SS	15	50	
SS	17.5	50/4"	**17.5 to 28.5 feet: SANDY SILT (ML)**, yellowish gray, some fine to medium sand, few coarse sand and fine gravel, very stiff to hard, damp. Common interbeds of SILTY SAND (SM), as above, gradational upper contact. Coarse

GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN



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-20
LOCATION	Vashon Island Landfill	PAGE	2 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	LITHOLOGIC DESCRIPTION
SS	20	9-50	content decreases with depth. Very slow drilling. (TILL)
SS	22.5	50	@ 23.0 feet: trace orange mottles.
SS	25	10-50	@ 25.8 to 26.0 feet: SAND (SP), yellowish gray, fine, wet.
SS	27.5	11-50	**28.5 to 30.5 feet: SANDY SILT (ML)**, yellowish gray, little to some fine sand, few fine to medium subrounded gravel, stiff, wet. Trace thin wet beds of yellowish gray SAND (SP). (ADVANCE OUTWASH)
SS	30	20-50	**30.5 to 49.0 feet: SAND (SP)**, white with brown and black, fine, trace subrounded coarse sand and fine gravel, damp to moist. Occasional thin (<2") SILT (ML) interbeds. Significantly faster drilling. (ADVANCE OUTWASH)
SS	32.5	50/5"	@ 30.5 feet: medium to coarse gravel.
SS	35	20-50	@ 32.5 feet: SANDY SILT (ML), brownish gray, firm to stiff, little fine sand, trace coarse sand and fine gravel, damp. Minimum 0.5-foot thickness.
SS	37.5	12-35	@ 38.0 feet: trace fine gravel.

GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN

25 30 35 40

REMARKS

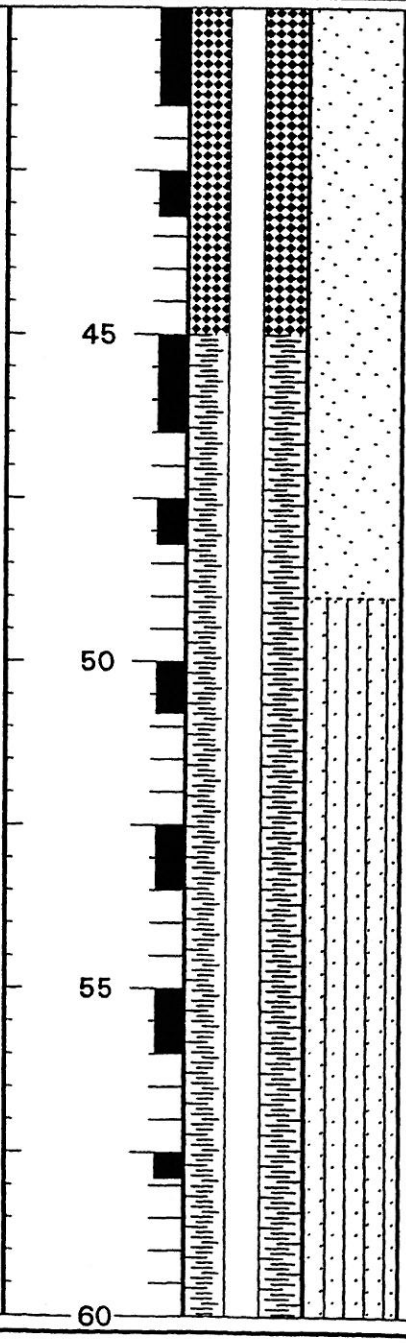
(1) Potable water added during drilling below 131.0 feet. (2) Top of steel casing elevation = 368.18 feet. (3) Northing = 333.12; Easting = 2739.35. (4) Static water elevation after well development = 244.61 feet, measured January 19, 1999. (5) SS = Nominal 2-inch-diameter split-spoon sampler. G = Grab.

LOG OF EXPLORATORY BORING

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

BORING NO. MW-20
PAGE 3 OF 8
GROUND ELEV. 365.20'
TOTAL DEPTH 121.30'
DATE COMPLETED 10/21/98

SAMPLE TYPE	SAMPLE NUMBER	BLOWS PER 6 INCHES	LITHOLOGIC DESCRIPTION
SS	40	12-30-35	**30.5 to 49.0 feet: SAND (SP)**, see description on previous page. @ 40.0 feet: trace medium subrounded gravel.
SS	42.5	20-50/3"	@ 42.5 feet: trace fine to medium gravel.
SS	45	8-8-50	
SS	47.5	30-50/3"	
SS	50	20-50/4"	**49.0 to 72.0 feet: SILTY SAND (SP-SM)**, white with brown and black, fine, few gray silt, trace clay, damp. Common thin (<1 mm) laminations. Gradational upper contact. (ADVANCE OUTWASH)
SS	52.5	30-50	@ 52.5 feet: moist.
SS	55	12-50	
SS	57.5	50/5"	



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-20
LOCATION	Vashon Island Landfill	PAGE	4 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	LITHOLOGIC DESCRIPTION
SS	60	30-50/3"	**49.0 to 72.0 feet: SILTY SAND (SP-SM)**, see description on previous page.
SS	62.5	50	
SS	65	20-50	@ 65.0 to 65.4 feet: SILTY SAND (SM), brown, fine, little fines, trace fine subrounded gravel.
SS	67.5	30-50	@ 67.5 feet: horizontal to subhorizontal laminae. @ 68.0 feet: one light brown SILT (ML) lamina.
SS	70	20-50/5"	@ 70.2 feet: SAND (SP), white with brown, fine, 1-inch thick.
SS	72.5	30-50/2"	**72.0 to 75.0 feet: SILTY SAND (SM)**, grayish brown, fine, some fines, trace subrounded gravel, moist. Gradational upper contact. (ADVANCE OUTWASH)
SS	75	20-50/4"	**75.0 to 75.5 feet: SANDY SILT (ML)**, light olive brown, some fine sand, firm, wet, gradational upper contact. (ADVANCE OUTWASH)
SS	77.5	20-50/5"	**75.5 to 78.1 feet: SILT (ML)**, light olive brown, firm, wet, finely laminated. Abrupt upper contact. Interbeds of SAND (SP) and SILTY SAND (SP-SM) from 77.5 to 78.1 feet. (ADVANCE OUTWASH)
			78.1 to 88.0 feet: SAND (SP), white with brown and black, fine, trace fines, moist above

GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN

65 70 75 80

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-20
LOCATION	Vashon Island Landfill	PAGE	5 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	LITHOLOGIC DESCRIPTION
SS	80	20-50/5"	80.0 feet, damp below 80.0 feet. (ADVANCE OUTWASH) @ 80.0 to 80.5 feet: SILT (ML), grayish brown with common 1- to 5-mm-diameter orange mottles, soft, damp.
SS	82.5	50/3"	
SS	85	50	
SS	87.5	50	**88.0 to 127.5 feet: SILT (ML)**, gray, firm to stiff, moist to about 97.5 feet, wet (capillary saturation) below 97.5 feet. Occasional thin horizontal orange-stained layers below 90.4 feet. (LACUSTRINE PRE-VASHON DEPOSITS) @ 90.0 to 90.4 feet: finely laminated. @ 90.4 to 90.9 feet: SANDY SILT (ML), brown, few to little fine sand, wet, soft, orange staining at 90.4 feet. @ 92.5 to 93.4 feet: mostly beds of wet brownish gray SANDY SILT (ML) with common fine orange-stained laminae.
SS	90	20-50/5"	
SS	92.5	20-50/5"	
SS	95	20-50/5"	@ 95.3 to 95.4 feet: SANDY SILT (ML), orange staining, little fine sand, wet. @ 95.9 feet: brownish gray SANDY SILT (ML), with trace medium to coarse angular to subangular sand in sampler driveshoe.
SS	97.5	25-50	

GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN

85 90 95 100

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-20
LOCATION	Vashon Island Landfill	PAGE	6 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	LITHOLOGIC DESCRIPTION
SS	100	30-50/5"	**88.0 to 127.5 feet: SILT (ML),** see description on previous page.
SS	102.5	30-50	
SS	105	25-50	@ 105.0 to 106.0 feet: SAND (SP), white with brown and black, fine, trace light brown fines, orange staining at 105.0 feet, moist.
SS	107.5	20-30-35	
SS	110	15-30-30	
SS	112.5	10-20-30	@ 113.5 to 114.0 feet: SAND (SP), white with brown and black, fine, moist.
SS	115	10-25-25	@ 115.0 feet: trace fine sand, fine horizontal laminae.
SS	117.5	25-25-45	@ 117.5 to 127.5 feet: varved, trace clay.

GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN

105 110 115 120

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.

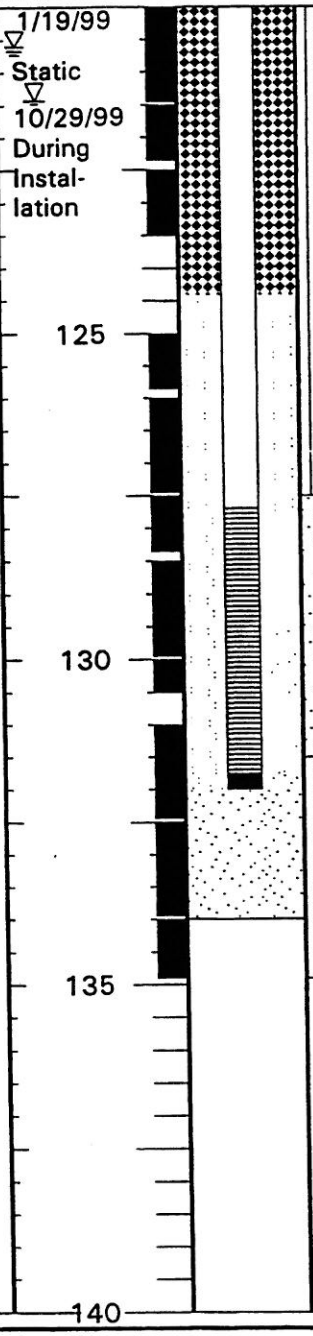
LOG OF EXPLORATORY BORING

PROJECT NAME	Field Investigation Report	BORING NO.	MW-20
LOCATION	Vashon Island Landfill	PAGE	7 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	LITHOLOGIC DESCRIPTION
SS	120	10-15-35	**88.0 to 127.5 feet: SILT (ML)**, see description on previous page.
SS	121.5	25-50/5"	@ 121.1 to 121.5 feet: SAND (SP), gray, fine, wet, with brown and gray silt interbeds.
SS	122.5	25-50	
SS	125	25-50	@ 125.3 to 126.0 feet: SILTY SAND (SM), gray, fine, wet, with soft gray wet silt in sampler drive shoe.
SS	126		
SS	127.5	20-50/5"	**127.5 to 131.5 feet: SAND (SP)**, gray, fine, dense, wet. (PRE-VASHON DEPOSITS)
SS	129		
SS	130	50	
SS	131	20-30-40	**131.5 to 134.9 feet: SILT (ML)**, dark gray, stiff, moist. Varved with trace clay as varves. (LACUSTRINE PRE-VASHON DEPOSITS)
SS	132.5	10-20-50	
SS	134	25-50/5"	
			Total depth drilled = 134.0 feet. Total depth sampled = 134.9 feet.
			See Page 8 for Well Completion Details.

GROUND WATER LEVELS: 1/19/99 Static; 10/29/99 During Instal-lation

DEPTH IN FEET: 125, 130, 135, 140



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.