

APPENDIX F-2 CORE LOGS

Sediment Core Processing Log



Job: LDWG coring
 Job Number: DORS5-18220
 No. of Sections: 1
 Sample Length (from log): 6.0'
 Avg. % Compaction:

Core Location/Sample Number: LDWG-SL-1 R2
 Date/Time: 2/9/06 0825-0930
 Sample Logged by: N. Bacher
 Type/Diameter of Sample: 4" sq. aluminium
 Sample Quality: good fair poor disturbed

Notes: Penet: 6.55' → R=92%
On-deck: 6.05'

Recovered Length (ft)	% Compaction	Color	Size % - C	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		GLE Y 7 S/100		30	45		wet, soft, pale olive green, sandy silt w/ 25% shell fragments. trace twigs and roots	0.15		0900 1-1602	
		GLE Y 1 2.5/N black		15	85	⊙	moist, med. soft, black sl. sandy silt trace roots. very slight H ₂ S odor trace gray clay seam (1/2") @ 0.6' 3'x1.5" piece of bark @ 0.7'		0840	0903 1-1602	
1.6		GLE Y 2 4/N		55	45		wet, med. dense, gray silty sand, sand is fine and grains white and black	1.0		0906 1-1602	
		GLE Y 2 2.5/N black					transition zone to below.		3-1602	0909 1-1602	
				8	92	⊙	moist, med. stiff, black silt, minor sand, 10% wood shreds and mfg. trace scattered shells @ 1.6'		GTE 1.6'	0912 1-1602	
2.6							moderate H ₂ S odor throughout this interval	2.6		0915 1-1602	
		GLE Y 1 3/N V. dark gray		85	15	⊙	moist, med. dense, blackish gray sl. silty sand, sand is fine to medium and grains orange, red, white.		0845	0918 1-1602	
3.6							trace silt below 3.6' other wise SAA.		GTE 3.1'	0921 1-1602	
				95	5	⊙	@ 3.4' 1/2" round clay pocket in matrix.			0924 1-1602	
4.0							below 4.9 SAA but no silt and sand is medium to coarse.			0927 1-1602	
				100	⊙	⊙	core is slightly winnowed below 4.6'. less than 5% lost from one corner edge of core tube.		0850	0930 1-1602	
5.0									2-1602	0933 1-1602	
6.0								6.0			

@ 0.2'
TV = 0.6'
med.

@ 6.9'
TV = 0.5'
med.

@ 3.6'
TV = 3.6'
big

core tube is winnowed

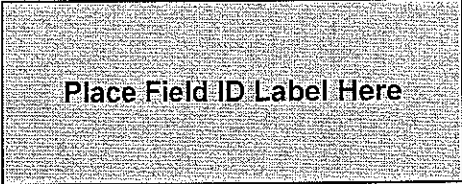
@ 5.1'
TV = 2.5'
big

END OF CORE @ 6.0'

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-8-06 Recorder: GSN



Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 1 R2

Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 25.3

Time: 1206

Northing 211282

Est. Tide Height (ft) 8.1

(MLLW)

Easting 1266316

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 10.0

Comments: 25 ft water depth

diver does not think any material was lost out of core

Penetration Tape Reading

Recovery Tape Reading

Comments

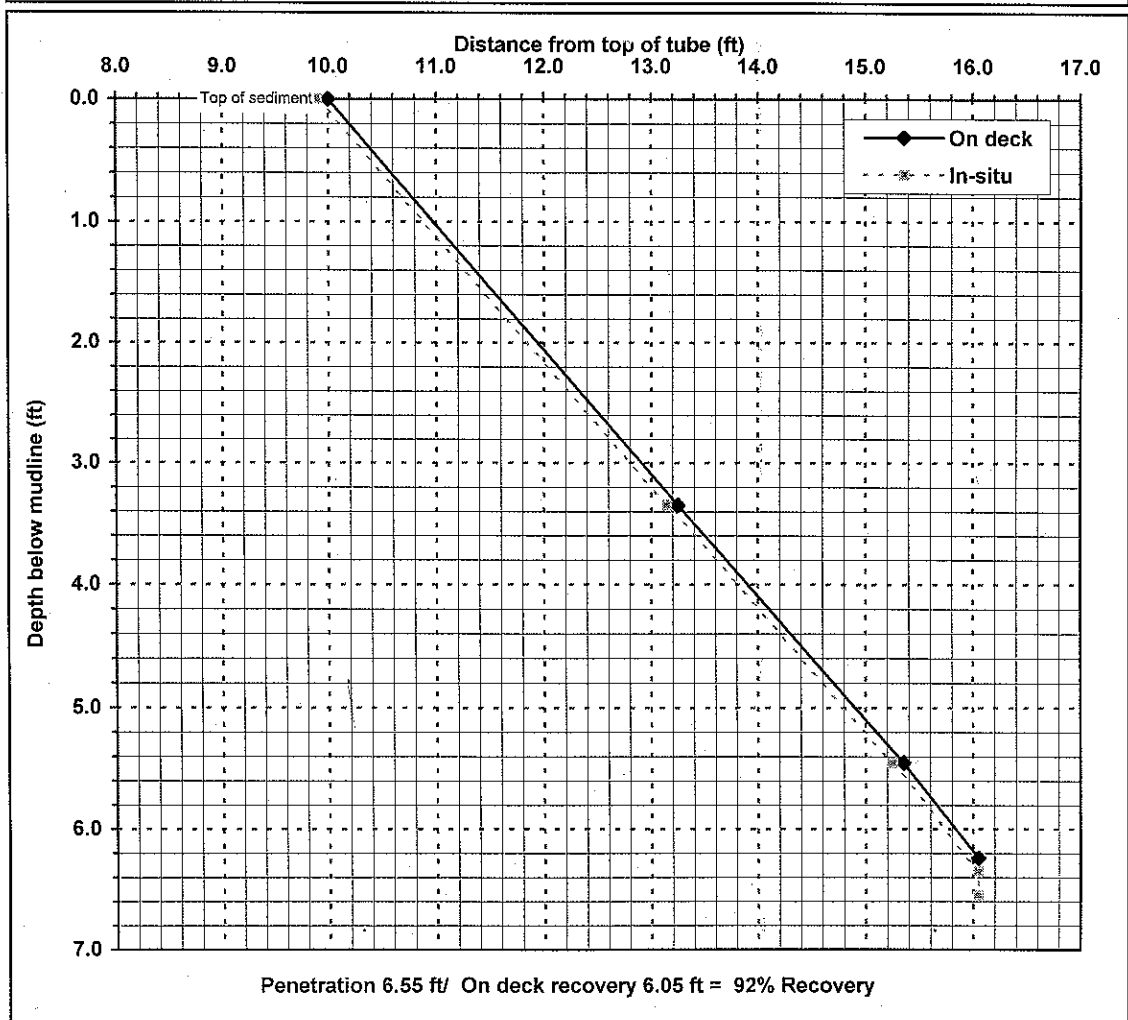
Penetration Tape Reading	Recovery Tape Reading	Comments
<u>12.7</u>	<u>12.8</u>	
<u>10.6</u>	<u>10.7</u>	
<u>9.7</u>	<u>9.9</u>	<u>rate slowed down</u>
<u>9.5</u>	<u>9.9</u>	<u>refusal</u>

Mudmole™ Bore Log

Project: LDWG Duwamish Coring **Station:** 1 R2
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 211282 Northing
Date: 2/8/2006 **Time:** 12:06 1266316 Easting
Water depth: 25.3 ft **Mudline:** -17.2 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A
Driven to refusal



Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

0-3.35	3.25	97%
3.35-5.45	2.1	100%
5.45-6.35	0.799	89%
6.35-6.55	0.001	0%

Depth below mudline (ft)	Distance from top of tube (ft)
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Mudline	10
1	10.97
2	11.94
3	12.91
4	13.90
5	14.90
6	15.84
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 1
 Attempt: R2
 Field Technician: TB/KM
 Contractor: MCS/RSS
 On-site Visitor: JN (SAC)
 Latitude: 21 282
 Longitude: 12 46314

Date: 2/8/04
 Core Tube Length: 16.05
 Lead Line Water Depth: 25.3
 Diver Water Depth: 25
 Tip Probe Depth: —
 Disk Probe Depth: —
 Drive Initiation Time: 1212

(NO)
(EA)

~ 18ft off target, offshore

Shoreline & surrounding area observations: Same as R1a/b
 Sediment surface & slope description: ↓
 Water current: —

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
12.7	12.8	(Drive offset:) easy drive
10.6	10.7	mod. drive
9.7	9.9	rate of penetration slowed difficult drive
9.5	9.9	refusal ↓
6.55	6.15	—

Estimated angle of drive: cannot see - egypt under water
 Reason for ending drive: refusal

Drive Completion Time: 1217 On Boat Recovery: 10

End of Core Tube Observations
Staining: none some (moderate) → residual sed.
Tube Deformation: <u>no</u>
Loss of Sediment: <u>screw plug inserted by diver in situ</u>
Sediment Description: <u>gray sand - catcher full</u>
Water in Tube: <u>yes, siphoned out (~40 pumps)</u>

Keep or Retry: diver does not think any sediment was lost out of the core catcher end.
Core accepted.

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Station Number: 1
 Attempt: 2
 Field Technician: LM
 Contractor: MCS
 On-site Visitor: John M.
 Latitude: -
 Longitude: -

Date: 2/8/16
 Core Tube Length: 16.05
 Lead Line Water Depth: 25.3
 Diver Water Depth: _____
 Tip Probe Depth: _____
 Disk Probe Depth: _____
 Drive Initiation Time: _____

Shoreline & surrounding area observations: _____
 Sediment surface & slope description: _____
 Water current: _____

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
		(Drive offset:)

Estimated angle of drive: _____
 Reason for ending drive: _____

Drive Completion Time: _____ On Boat Recovery: _____

*RETEC
 assisted BSS diver
 a did not take
 notes
 LM*

End of Core Tube Observations
Staining:
Tube Deformation:
Loss of Sediment:
Sediment Description:
Water in Tube:

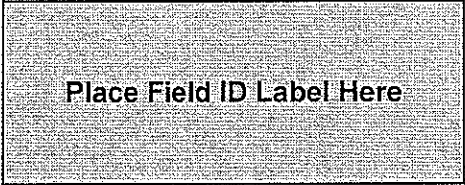
Keep or Retry: _____

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-8-06 Recorder: GSW



Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 1 R1

Position Information

Tube Length (ft): ~~16.25~~ 15.85
 Water Depth (ft): 23.6 (IRIA) Time: 1103
 Est. Tide Height (ft): 9.2 (MLLW)

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 211340
 Easting 1266321

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 10.4

Comments: ebbing tide - silty sand with scattered cobble
22
23 A depth, gentle slope + mild current
5 A visibility - lost some silty sand during plugging of core

Penetration Tape Reading	Recovery Tape Reading	Comments
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14.3	14.7	
14.3	14.6	refusal - hit something hard
16		
12.5	12.9	213' off station
11.0	11.2	
10.0	10.4	
9.6	10.3	refusal
dark medium sand against plug		
water depth R16 23.7 @ 1155		8.2 tide

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 1 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

211310

Northing

Date: 2/8/2006

Time: 11:03

1266321

Easting

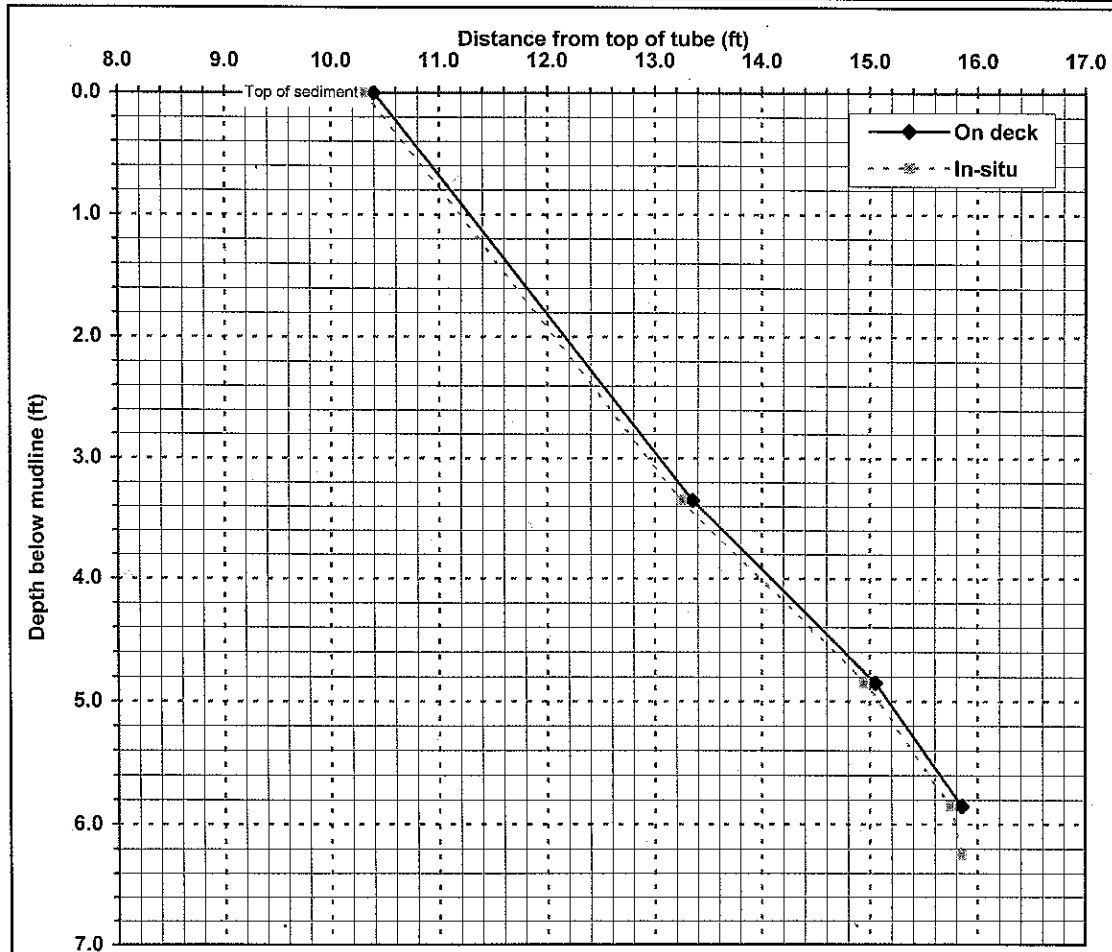
Water depth: 23.6 ft

Mudline: -14.4 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A

Driven to refusal



Penetration 6.25 ft/ On deck recovery 5.45 ft = 87% Recovery

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-3.35	2.95	88%
3.35-4.85	1.7	113%
4.85-5.85	0.8	80%
5.85-6.25	0.1	25%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	10.4
1	11.28
2	12.16
3	13.04
4	14.09
5	15.17
6	No sample
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 1
 Attempt: 1a
 Field Technician: JP/LU
 Contractor: NCS/RS
 On-site Visitor: JN (SAC)

Date: 02/09/04
 Core Tube Length: 16.05
 Lead Line Water Depth: 23.4
 Diver Water Depth: 23
 Tip Probe Depth: —
 Disk Probe Depth: —
 Drive Initiation Time: 1115

(ND) Latitude: 2130Z
 (EN) Longitude: ~ 9 ft off target, offshore

Shoreline & surrounding area observations: rip rap, gravel, ivy and shrubs
 Sediment surface & slope description: silty w/ scattered cobble, gentle slope
 Water current: ebb tide, light winds from north, mild current 5ft visibility.

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
14.3	14.7	(Drive offset:) - difficult drive
14.3	14.6	hit something hard ↓

Core tube guide not used.

Estimated angle of drive: cannot see - eqpt underwater
 Reason for ending drive: refusal - hit something hard

Drive Completion Time: 1119 On Boat Recovery: N/A

End of Core Tube Observations
Staining: <u>—</u>
Tube Deformation: <u>N/A</u>
Loss of Sediment: <u>N/A</u>
Sediment Description: <u> </u>
Water in Tube: <u> </u>

Keep or (Retry) tube empty: will reuse for R2 R16 (reset tube) ~ 14 off

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Station Number: 1
 Attempt: 2 1b
 Field Technician: TD/KM
 Contractor: NCS/RSS
 On-site Visitor: JN (SMC)
 Latitude: 211310
 Longitude: 1266321

Date: 2/8/06 ^{TD}
 Core Tube Length: 1605 15.85
 Lead Line Water Depth: 23.7
 Diver Water Depth: 23
 Tip Probe Depth: —
 Disk Probe Depth: —
 Drive Initiation Time: 1130

(NO)
(KA)

~14 ft. off target.

Shoreline & surrounding area observations: same as R1a
 Sediment surface & slope description: —
 Water current: —

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
12.5	12.9	(Drive offset:) moderate drive
11.0	11.2	
10.0	10.4	
9.6	10.3	difficult drive
6.25	5.55	

core tube
guide not
used

totals:

Estimated angle of drive: cannot see - eqpt under water
 Reason for ending drive: refusal

Drive Completion Time: 1135 On Boat Recovery: 10.4

End of Core Tube Observations
Staining: <u>—</u>
Tube Deformation: <u>no</u>
Loss of Sediment: <u>diver inserted screw plug in situ. lost some silty sand during plugging</u>
Sediment Description: <u>med-coarse sand</u>
Water in Tube: <u>yes, siphoned out (~45 pumps)</u>

Keep or Retry: Will try for R2

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Station Number: 1
 Attempt: 1
 Field Technician: LM
 Contractor: MCS
 On-site Visitor: John M.
 Latitude: -
 Longitude: -

Date: 2/8/06 15.85
 Core Tube Length: 16.25 8.0' of station
 Lead Line Water Depth: 23.6 / (22.0)
 Diver Water Depth: 23.0'
 Tip Probe Depth: -
 Disk Probe Depth: -
 Drive Initiation Time: 1115-1120: mud mole brought out of sediment to check for mud/damage
(1130)

Shoreline & surrounding area observations: marina at REPEC office. RSS boat docked away from MCS boat
 Sediment surface & slope description: sandy bottom w/ scattered cobbles, gentle slope
 Water current: mild current; visibility = 5.0'

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
14.3	14.7	(Drive offset: <u>-</u>) <u>easy</u>
14.3	14.6	<u>hitting something hard below the surface; no bottom penetration</u>
12.5	12.9	<u>moderate-hard diver measurement</u>
11.0	11.2	<u>moderate-hard</u>
10.0	10.1	<u>moderate-hard drive</u>
9.6	10.3	<u>very slow penetration, hard-drive</u>
9.6	10.3	<u>refusal</u>
<u>totals</u>		
6.25	5.55	
6.25	5.55	

end coring @ 1120
 2nd attempt @ 1130
~~totals~~

$$\begin{array}{r} 15.85 \\ 9.60 \\ \hline 6.45 \end{array}$$

$$\begin{array}{r} 10.40 \\ 8.65 \\ \hline 15.85 \end{array}$$

$$\begin{array}{r} 15.85 \\ 9.60 \\ \hline 6.25 \end{array}$$

Estimated angle of drive: below water surface unable to gauge angle;
 Reason for ending drive: refusal - extremely hard drive noted by divers

Drive Completion Time: 135 On Boat Recovery: 10.4

81% recovery

End of Core Tube Observations	
Staining:	<u>None. Some residual black on core tube upon extraction</u>
Tube Deformation:	<u>None</u>
Loss of Sediment:	<u>yes diver noted loss during capping</u>
Sediment Description:	<u>Sand, medium-grained, = Full</u>
Water in Tube:	<u>yes - siphoned ~6 ft.</u>

Keep or Retry: -
 Diver noted some material lost while plugging
 notes: using feedback box on RSS boat
 127 more location toward shoreline (~40ft from shore) for 2nd attempt
 1130 2nd try at drilling
 Core paster used to cap core at sediment-water interface by divers
 Notes: wrapped on deck

Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

1110 Divers in the water - Eric & Don

Sediment Core Processing Log



Job: Dunnemah LDW
 Job Number: PV55-1822D
 No. of Sections: 1
 Sample Length (from log): Drive = 13.1
 Avg. % Compaction: Rec = 13.1
 Notes: %R = 99% 100% sampled in flood
lab mudline matches deck

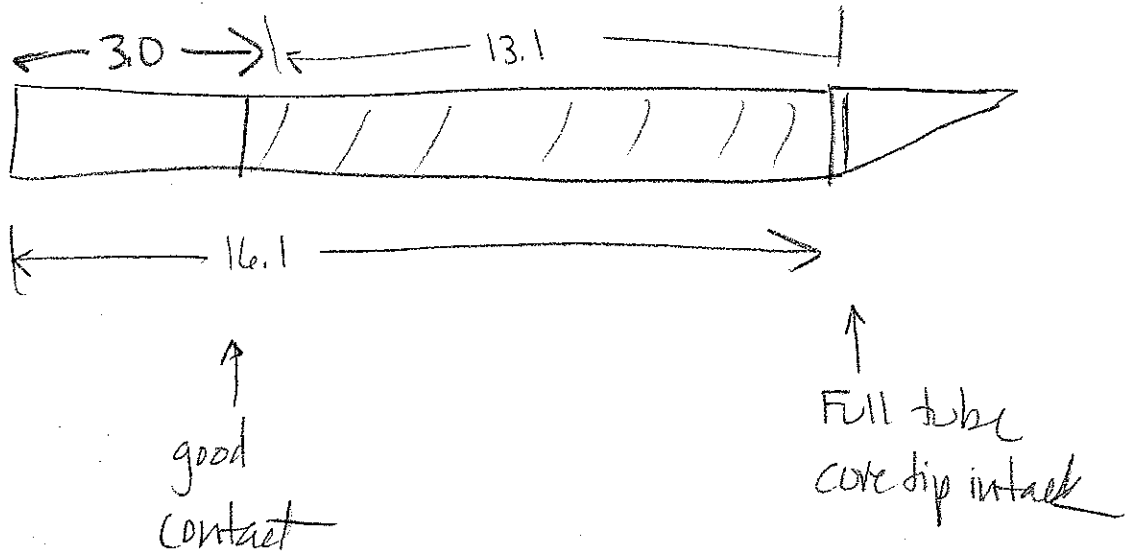
Core Location/Sample Number: LDW-5C-2 (R1)
 Date/Time: 07/09/06 start 1230 end 1400 07/09/06 collected
 Sample Logged by: N. Barber, A. Fitzpatrick
 Type/Diameter of Sample: 4" ID Alum. WCS
 Sample Quality: good fair poor disturbed

Page 1 of 1

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		MUNSEL					little holes in sediment, no bags unless to confirm PID in bleach zone				
		CLAY 1 2.5/N black		75	25		SAND: wet, brownish-black, loose, sl. silty to silty SAND w/ wood frags @ contact (Recent) glacially contact. 4 pc. subrounded deposits gravels up to 1" @ from 0.7 to 0.1 FB.	1245 3-1602 0-2		1325 1-1602 0-0.5	Silty SAND
		2.5 Y 7/1 light gray		15	75		SILT: wet, black, soft to med stiff, sl. sandy, clayey SILT, some plasticity, dark brown clayey lenses, horizontal banding of color + trace sheen. Sheen in seams to scattered silt frags, mod. H ₂ S in 1/2" bands	0.7 1.0		1328 1.5-1 1-1602 1331 1-1.5 1-1602	
					10	90	stiff less H ₂ S w/ depth gradational end of sheen	2.15' TV = 1.5 big		1334 1.5-2 1-1602	W/ Sheen SILT
				tr	98		SILT: wet, black, sl. stiff (holds shapes) sl. clayey SILT, some plasticity (peaks) trace florets, homogenous, no layers slight H ₂ S	2.0 1250 3-1602 2-4		1337 2.2-5 1-1602 1340 1-1612 2.5-3	
								3.0 @ 3.0' TV = 2.0' big GT = 2.9'		1343 1-1602 3-3.5 1347 1-1602 3.5-4	
				tr	98		SILT: wet, shiny, stiff, v. clayey SILT - stark gray	4.0 1255 3-1602		1356 4-4.5 1-1602	
		Same		tr	98		MOTTLED SILT/ROCK FLOUR (anthropogenic): light Ash-like gray/dark gray/med gray bands of SILT, chunky globs of hard SILT, trace wood + minor sand seams, scattered wet, dark gray silt globs w/ trace sheen. Mottled wood frag 3" L, black streaks, silt breaks in chunks.	4.6 4.3 TV = 0.5' med GT = 4.7' @ 5.7' TV =		1353 4.5-5 1-1612 1356 5-5.5 1-1602 1375 med	Mottled GRAY SILT (Flour Ash-like)
					100		At 6.0' = 5" L Wood twig	5.0			

LDW-SC-02

07/09/06



Sediment Core Processing Log



Job: DUNAMISH
 Job Number: POB 55-1822D
 No. of Sections: 1
 Sample Length (from log): see
 Avg. % Compaction: Page 1

Core Location/Sample Number: LDW-SC-2
 Date/ Time: 07/09/06 1230 collected 07/09/06
 Sample Logged by: NPB, ALF
 Type/Diameter of Sample:
 Sample Quality: good fair poor disturbed

Page 2
 of 3

Notes: core
* Samples collected near S Harbor Island / Concrete Plant

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In Situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch	
							Same as above	13.00	6-8'	End of 6" Sampler @ 6'		
		gray + lt gray banded				106	sharp moisture contact	8.7.4'	TV=0.5	med	Mottled Gray SILT (FLOOR)	
							- At 8.4' to 1" layer of black silt + shell frag	13.05	8-10'			
							= wedged catcher					
						106	same as above but damp w/ banding of soft, moist silt and hard chunks SILT, trace sheen in softer layers 1-3" bands, dense	8.9.5'	TV=3.5	med		
10.0							sharp contact	13.10	1-16.02	11-10.7	8.10.5'	TV=2 med
		CLEY 1 3/4 v. dark greenish gray		98	tr	107	SAND: damp, dense, dark brown, M-F SAND w/ trace multicolored grains (red, orange, gray, white). No fines grading to F sand w/ silt bands below	13.15	2-16.07			
							Bottom of core @ 13.9 FX	12.10	10.7 to 12		SAND w/ SILT Inter beds	

Sediment Core Processing Log



Page 3 of 3

Job: DUNAMISH LDW
 Job Number: B155-18206
 No. of Sections: _____
 Sample Length (from log): See
 Avg. % Compaction: Page 1

Core Location/Sample Number: LDW-SC-2
 Date/Time: 07/19/06
 Sample Logged by: AGE, NPB
 Type/Diameter of Sample: 4"
 Sample Quality: good fair poor disturbed

Notes: _____

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Final Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch	
13.1		v. dark greenish gray		98	tr		At 12.0 FT: damp, dark brown F-SAND w/ 1/2" silt (brown) interbeds, distinct horiz. layers. Scattered rootlets, one 1/2" wood shredded frags layer Bottom is 6" of silty v.f. SAND in shoe area	13.0	1320 1-1602 12 to 13		SAND SILT interbeds	
							Bottom of core = 13.1					
							Note: interbedd sand + silt interbeds @ 12.07 just like units observed in core #1 and #4					
							Wet Test @ 5.0 Ft = gray silt matrix finest (& super fine) when wetted. Flow-like or ash-like; no integrity					
							Jar Shear Test @ 1.0 Ft = rainbow sheen 50% covr surface w/ silt 1/2" flocs coming to surface					
							PID baggy headspace @ 0.1 Ft = 0.0					

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-9-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 2 R 1



Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 31.4

Time: 909

Northing 21196

Est. Tide Height (ft) 7.4

(MLLW) predicted

Easting 1267032

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 3.2

Comments: sandy silt - 31 ft - no slope

incoming tide

Penetration Tape

Reading	Recovery Tape Reading	Comments
<u>15.1</u>	<u>15.6</u>	
<u>13.5</u>	<u>13.9</u>	
<u>11.2</u>	<u>11.2</u>	
<u>7.8</u>	<u>7.3</u>	
<u>6.7</u>	<u>6.2</u>	
<u>5.4</u>	<u>5.0</u>	
<u>4.4</u>	<u>4.2</u>	
<u>3.6</u>	<u>3.6</u>	
<u>3.0</u>	<u>3.0</u>	
		<u>lines started coming out of top of tube</u>
		<u>silty clay plug in bottom</u>

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 2 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

211196

Northing

Date: 2/9/2006

Time: 9:09

1267032

Easting

Water depth: 31.4 ft

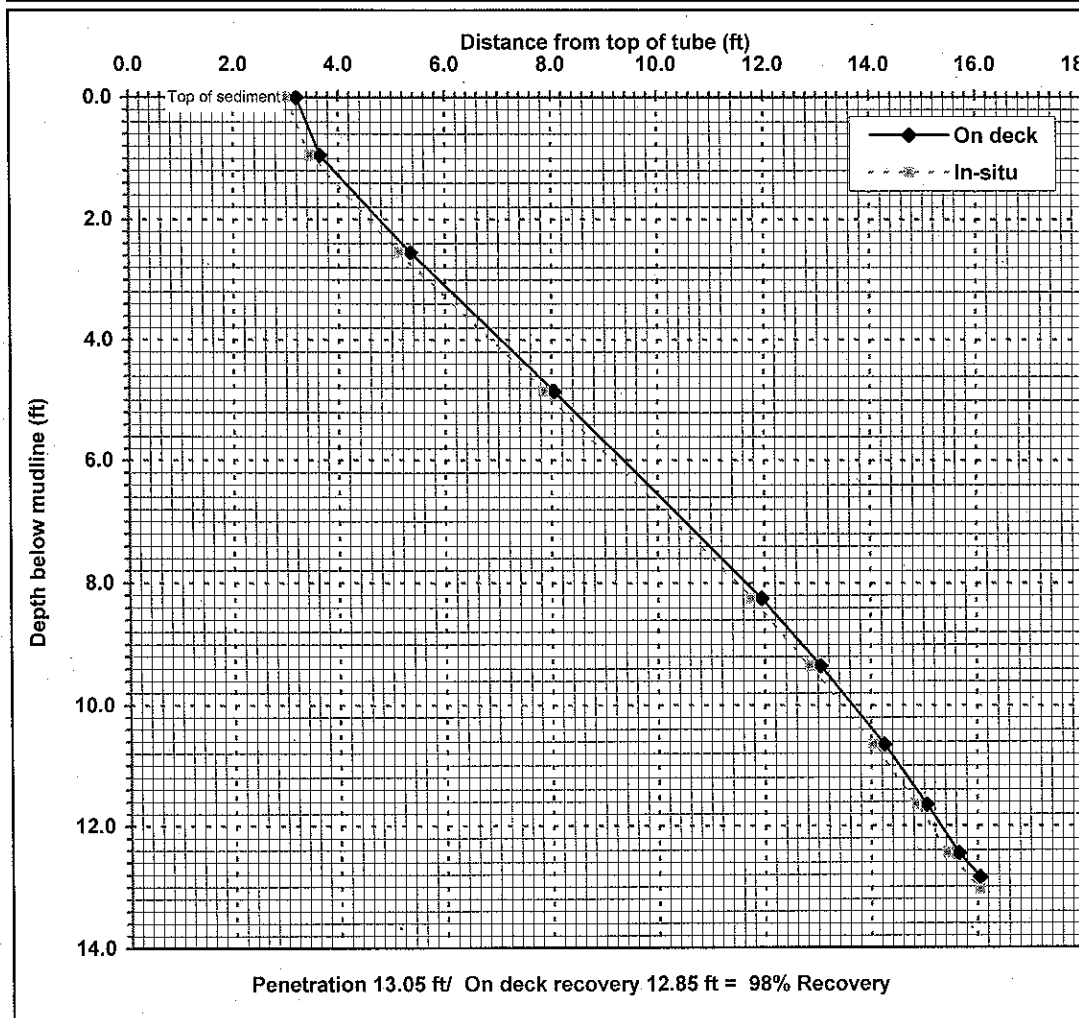
Mudline: -24.0 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Sunny cold

Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
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0-0.950000000000000	0.45	47%
0.950000000000001-2	1.7	106%
2.55-4.85	2.7	117%
4.85-8.25	3.9	115%
8.25-9.35	1.1	100%
9.35-10.65	1.2	92%
10.65-11.65	0.8	80%
11.65-12.45	0.6	75%
12.45-13.05	0.6	100%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	3.2
1	3.70
2	4.77
3	5.88
4	7.05
5	8.22
6	9.37
7	10.52
8	11.66
9	12.70
10	13.65
11	14.53
12	15.31
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 2
 Attempt: 1
 Field Technician: LM
 Contractor: MCS
 On-site Visitor: none
 Latitude: 24196
 Longitude: 1267632

Date: 2/9/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 31.4
 Diver Water Depth: 31.0
 Tip Probe Depth: -
 Disk Probe Depth: -
 Drive Initiation Time: 0915

5' off station

Shoreline & surrounding area observations: 100' from East Wharf, 50' from Marina pier, West Point Tug

Sediment surface & slope description: silty clay

Water current: ebb, no current, 450' visibility
good

freefall
hammer

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
15.1	15.6	(Drive offset: <u>-</u>), free fall
13.5	13.9	easy-moderate
11.2	11.2	easy -moderate - hard drive, punched through something
7.8	7.3	can slow-drive, little movement
6.7	6.2	moderate-hard, slow
5.4	5.0	moderate-hard, slow
4.4	4.2	moderate-hard, slow
3.6	3.6	moderate-hard, slow
3.0	3.0	end of core. - exceeded goal = ^{diver observed} fines started coming out of tube

totals = 13.05 13.05

Estimated angle of drive: mudmole core below mooring, no observation - estimate 10' off vertical

Reason for ending drive: exceeded goal; ended in native silty clay

Drive Completion Time: 0928

On Boat Recovery: 3.2

100%
recovery

End of Core Tube Observations
Staining: <u>black organic silt (residual)</u>
Tube Deformation: <u>none</u>
Loss of Sediment: <u>0.2' fines started coming out of tube = noticed by diver</u>
Sediment Description: <u>black fine silty sand</u>
Water in Tube: <u>clear water siphoned 70'</u>

no on deck observations

Keep or Retry: Keep

Diver caps with core plug - decides core plug is not necessary due to natural plug from natural material

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Sediment Core Processing Log



Job: DUNAMISH LPW
 Job Number: Por 55-18220
 No. of Sections: 1
 Sample Length (from log): Drive = 10.2'
 Avg. % Compaction: Recovered A = 87%
 Notes: on deck R = 85%

Core Location/Sample Number: LDW-SC-3 (R1) Page 10 of 2
 Date/Time: 02/09/06 Start 1430 - 1540
 Sample Logged by: Nik Becker, A. Fitzpatrick
 Type/Diameter of Sample: 4" alum MCS
 Sample Quality: good fair poor disturbed tube is slightly bowed (hard driving)

Notes: collected, lab m 2/1/06 lab mudline matches

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
1.0		10YR 3/1 very dk. gray		45	15		moist, med. dense brownish gray, sl. silt fine sand. Top 0.2' has 30% turfs, wood pieces. Then scattered turfs to base. Sand is multi-colored, orange, red, white, etc. 1" silt lens @ 0.9'	0.0	GTE 0.7'	1525 1-1602	
2.0		2.5Y 3/1 v. dk. gray		85	15		sharp moist to wet, med. dense fine to medium sand w/ silt interbeds. olive gray sand grains are multi-colored interbeds @ 1.6' 1" thick lens 2.4' 1.5" thick lens 3.1' 3" thick lens 4.2' 1/2" thick lens @ 1.2: wood piece 1" long and round @ 2.7' 3"x1" thin wood fragment, platy moderate H ₂ S odor 1.2 to 4.0 slight odor H ₂ S 4.0-4.6. coarsening downward @ 4.8' scattered turfs	1.0	1505 3-1602	1529 1-1602	
4.0								2.0	GTE 1.8'	1531 1-1602	
4.0								3.0		1534 1-1602	
4.0								4.0		1537 1-1602	
5.0		6.5Y 1 4/10Y greenish black		85	15			3.0		1540 1-1602	
6.0								4.0		1543 1-1602	
								5.0		1546 1-1602	
								6.0		1549 1-1602	
										1552 1-1602	
										1555 1-1602	
										1558 1-1602	

@ 0.9'
TV = 0.9
big

@ 3.0'
TV = 2
big

@ 4.9'
TV = 1.1
big

Sediment Core Processing Log



Job: Duwamish
 Job Number: POY55-18200
 No. of Sections: _____
 Sample Length (from log): see
 Avg. % Compaction: page 1
 Notes: _____

Core Location/Sample Number: LDW-SC-3 (R1)
 Date/ Time: 07/09/06
 Sample Logged by: NPB, ALF
 Type/Diameter of Sample: _____
 Sample Quality: good fair poor disturbed

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Thrust Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
							@ 5.6 1/2" thick lens				
							@ 5.8 2" thick lens				
							@ 6.1 2" thick lens		1520		
							@ 6.4 1/2" thick lens	7.0	2-16oz		
							@ 7.0: wood chips, elongate.				
							@ 7.2: 1.5" thick lens	8.0			
							@ 7.9: 1" thick lens				
							@ 8.1: small wood chips				
							End of core = 8.5'				
								9.0			
								10.0			

@ 7.3'
TV = 2.9
6oz

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-9-06 Recorder: GSN

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 3 R1

Tube Length (ft): 16.05

Water Depth (ft): 57.0

Est. Tide Height (ft): 7.9

Est. Mudline: _____ (MLLW)

Time: 1018

(MLLW)

(MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 210648

Easting 1266431

On Deck Top of Sediment 7.4

Comments: incoming tide fine sand & scattered cobble

57 dive depth

wind pushed boat off station ~ 15'

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.6</u>	<u>14.7</u>	
<u>13.6</u>	<u>12.4 13.4 RAG</u>	
<u>10.7</u>	<u>11.0</u>	
<u>9.1</u>	<u>9.7</u>	
<u>8.1</u>	<u>9.0</u>	
<u>7.1</u>	<u>8.2</u>	
<u>5.9</u>	<u>7.2</u>	<u>refusal</u>
<u>hard silty</u>	<u>sand in tip</u>	

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 3 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

210648

Northing

Date: 2/9/2006

Time: 10:18

1266431

Easting

Water depth: 57.0 ft

Mudline: -49.1 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Sunny cold

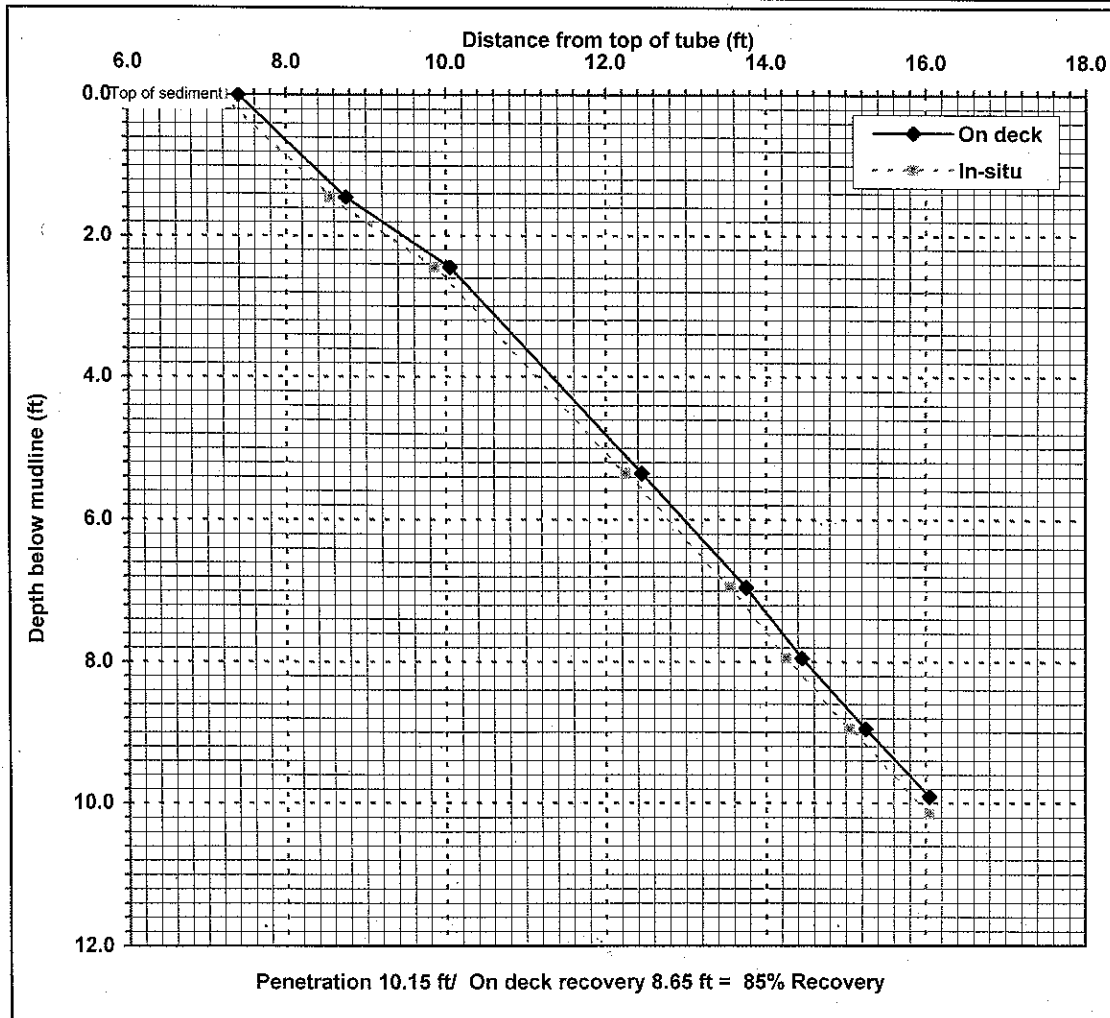
Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------

0-1.45	1.35	93%
1.45-2.45	1.3	130%
2.45-5.35	2.4	83%
5.35-6.95	1.3	81%
6.95-7.95	0.7	70%
7.95-8.95	0.8	80%
8.95-10.15	1	83%

Mudline	7.4
1	8.33
2	9.47
3	10.51
4	11.33
5	12.16
6	12.98
7	13.79
8	14.49
9	15.29
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Station Number: 3
 Attempt: 1
 Field Technician: TD/LN/AF
 Contractor: MCS/RS3
 On-site Visitor: —
 Latitude: 210648
 Longitude: 1266431

Date: 2/9/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 57.0
 Diver Water Depth: 57
 Tip Probe Depth: —
 Disk Probe Depth: —
 Drive Initiation Time: 1036

~7 ft off target, wind pushed boat ~15 ft off station

Shoreline & surrounding area observations: mid channel, rip rap and pilings to west, pier to east

Sediment surface & slope description: fine sand, scattered cobble

Water current: ebb^{al most} tide (slack, from flood tide), unice

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
14.6	14.7	(Drive offset: <u>—</u>) <u>easy-moderate drive; no free falls had to hammer or else core fell over.</u>
13.4	12.4	<u>easy-moderate drive</u>
10.7	11.0	<u>easy-moderate drive</u>
9.1	9.7	<u>moderate-hard drive</u>
8.41	9.0	<u>moderate-hard drive</u>
7.1	8.2	<u>hard drive</u>
5.9	7.2	<u>moderate-hard drive, drive slowed down to refusal; hard silty sand in tip</u>
10.15	8.85	

87.2%

Estimated angle of drive: unable to see, equip. under water; diver estimated 15° off, 5° off during extraction

Reason for ending drive: refusal

Drive Completion Time: 1047

On Boat Recovery: 7.4

End of Core Tube Observations
Staining: <u>resid. sed. on sides - washed off.</u>
Tube Deformation: <u>none</u>
Loss of Sediment: <u>0.2ft, diver inserted screen plug in situ at sed-water interface</u>
Sediment Description: <u>silty sand, hard, grey-brown</u>
Water in Tube: <u>yes, slightly turbid</u>

Keep or Retry: boat listing ~5° to starboard, bow under water
difficult extraction
hard silty sand

Notes:

Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Sediment Core Processing Log



Job: LDWG comms
 Job Number: PORS5-18220
 No. of Sections: 1
 Sample Length (from log): 7.7'
 Avg. % Compaction:

Core Location/Sample Number: LDWG-SC-4 R2
 Date/Time: 2/9/06 0940-
 Sample Logged by: N. Bacher
 Type/Diameter of Sample: 4" sq. aluminium.
 Sample Quality: good fair poor disturbed

Notes: Penet. 9' → R=88%
 On-deck: 7.9'

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		GLE Y1 4/10Y	5	80	15		soupy wet, loose, olive gray silty sand, trace roots and minor gravel rounded up to 1/2". trace shells.				
		GLE Y2 2.5/N	5	45	50	⊗	moist, med. stiff, black sandy silt w/ minor gravel. gravel is angular and up to 1/2". trace roots and twigs.	1.0	0950 3-1602 GT@ 0.4		@ 0.6' TV=0.4 med.
		GLE Y2 4/5G	50	25	25		wet, med: loose, silty sandy gravel. gravel sub angular and up to 2.5". trace HC odor and sheen grayish green		0955 3-1602		Trace HC sheen
		GLE Y2 2.5/N	15	85		⊗	moist, med. soft, black sl. sandy silt. slight to moderate H ₂ S odor. trace HC sheen.	2.0	GT@ 1.9		@ 2.1' TV=1.9 big
		10YR 2/2	80	10		⊗	moist, med. dense, brownish gray fine sand w/ irregular gray silt lenses and 10-15% wood shreds, twigs, roots. no apparent sheen. Wood increases @ base. 1" black clayey silt lens @ 3.0'	3.0	1000 3-1602		
		GLE Y1 3/10GY	95	5		⊗	moist, med: dense, grayish, fine to medium sand w/ trace silt. Scattered wood fragments @ 3.3', 4.0', 5.4'. Multicolored grains are orange, red, white. 1" gray silt lens @ 3.7'	4.0			@ 4.5' TV=2.5 big
							Unit grades to medium sand below 5.5'. clay pocket @ 4.7' 1/4" ⊗ clay pocket @ 5' 1/2" ⊗ 1/2" gray silt lens @ 5.4'	5.0	1005 2-1602		
								6.0			



Sediment Core Processing Log

Job: _____
 Job Number: _____
 No. of Sections: _____
 Sample Length (from log): _____
 Avg. % Compaction: _____
 Notes: _____

Core Location/Sample Number: LDWG-SC-4 RZ
 Date/ Time: _____
 Sample Logged by: _____
 Type/Diameter of Sample: _____
 Sample Quality: good fair poor disturbed

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Initial Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
							clay pocket @ 6.4' 1"Ø		1010		
		GLE 1 4/104		70	30	(8)	Moist, med. dense, gray, fine sand w/ silt interbeds. From 6.9-7.2' interbeds are 1/8" thick and spaced ~ 1/4" apart. Then fine sand to 7.4' where another 1/4" silt lens is found. Another silt lens @ 7.6'	7.0	2-1602		
							End of core: 7.7'	8.0			

@ 7.2
TV=3.0
big

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-8-06 Recorder: GSN

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 4 R2

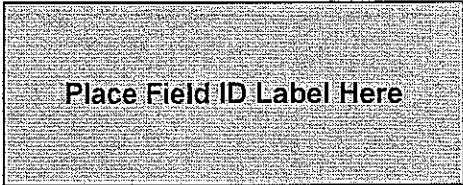
Tube Length (ft): 16.00

Water Depth (ft): 41.9

Est. Tide Height (ft): 5.0

Est. Mudline: _____ (MLLW)

Comments: gravelly silty sand



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 210597

Easting 1266933

On Deck Top of Sediment 8.1

~~42~~ 42 diver depth

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>13.5</u>	<u>13.7</u>	
<u>11.5</u>	<u>11.4</u>	
<u>10.3</u>	<u>10.3</u>	
<u>9.0</u>	<u>9.2</u>	
<u>8.0</u>	<u>8.6</u>	
<u>7.0</u>	<u>8.0</u>	
<u>sediment packed in end of core hard</u>		

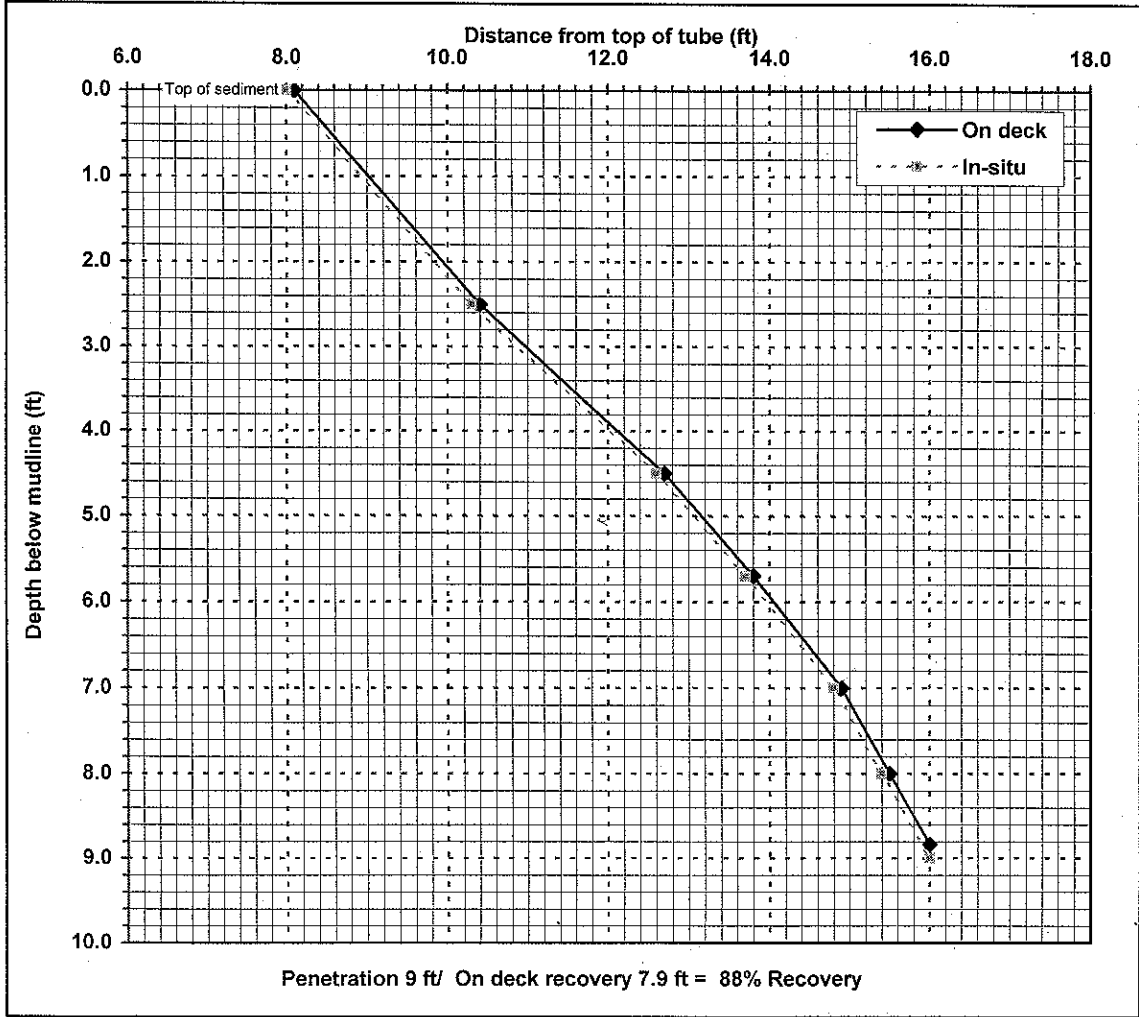
Mudmole™ Bore Log

Project: LDWG Duwamish Coring **Station:** 4 R2
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 210597 Northing
Date: 2/8/2006 **Time:** 14:55 1266933 Easting
Water depth: 41.9 ft **Mudline:** -36.9 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A
 Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
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0-2.5	2.3	92%	Mudline	8.1
2.5-4.5	2.3	115%	1	9.02
4.5-5.7	1.1	92%	2	9.94
5.7-7	1.1	85%	3	10.98
7-8	0.6	60%	4	12.13
8-9	0.6	60%	5	13.16
			6	14.05
			7	14.90
			8	15.50
			9	No sample
			10	No sample
			11	No sample
			12	No sample
			13	No sample
			14	No sample
			15	No sample
			16	No sample
			17	No sample
			18	No sample
			19	No sample
			20	No sample

Station Number: 4
 Attempt: 2
 Field Technician: LM
 Contractor: MCS
 On-site Visitor: John V.
 Latitude: —
 Longitude: —

Date: 2/8/06
 Core Tube Length: 16.00
 Lead Line Water Depth: 41.9'
 Diver Water Depth: 42.0'
 Tip Probe Depth: —
 Disk Probe Depth: —
 Drive Initiation Time: 1502

Shoreline & surrounding area observations: see R1
 Sediment surface & slope description: gravelly, silty sand,
 Water current: see R1

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
13.5	13.7	(Drive offset: <u>—</u>) moderate-hard drive, diver measurements
11.5	11.4	moderate
10.3	10.3	moderate
9.0	9.2	↓
8.0	8.6	↓
7.0	8.0	hard-refusal
Totals		
9.0'	8.0'	

Estimated angle of drive: ~10° off vertical
 Reason for ending drive: Refusal; upon extraction, line under strain; boat heeds to stbd.

Drive Completion Time: 1518 On Boat Recovery: 8.1'

89% recovery

End of Core Tube Observations
Staining: <u>black silty residual as core is extracted</u>
Tube Deformation: <u>None</u>
Loss of Sediment: <u>0.1' on boat vs. 1.00 in situ</u>
Sediment Description:
Water in Tube: <u>water spined ~6 ft.</u>

Keep or Retry: Keep

Diver caps core at sediment-water interface with plug; wrapped on deck

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

1500 Diver in the water.
 1520 Diver out of the water.

Station Number: 4
 Attempt: 2
 Field Technician: TD/LM
 Contractor: MCS/RCS
 On-site Visitor: JN (SAC)
 Latitude: 210597
 Longitude: 1266933

Date: 2/8/06
 Core Tube Length: 16.0
 Lead Line Water Depth: 41.9
 Diver Water Depth: 42
 Tip Probe Depth: —
 Disk Probe Depth: —
 Drive Initiation Time: 1503

(No)
(BA)

~18ft off target

Shoreline & surrounding area observations: same as RJ
 Sediment surface & slope description: gravelly silty sand
 Water current: —

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
13.5	13.7	(Drive offset:) moderate drive
11.5	11.4	
10.3	10.3	
9.0	9.2	
8.0	8.6	difficult drive
7.0	8.0	refusal, hard difficult drive
9.0	8.0	

core tube
guide not
used

88.9%

Estimated angle of drive: cannot see - eqpt underwater ~10° off 90°
 Reason for ending drive: refusal

Drive Completion Time: 1514 On Boat Recovery: 8.1

End of Core Tube Observations
Staining: <u>light amt of sed. streaked on outside, washed off</u>
Tube Deformation: <u>none</u>
Loss of Sediment: <u>screw plug inserted by diver in situ, sed. packed hard on core end.</u>
Sediment Description: <u>fine, gray silty sand - packed in tight at plug</u>
Water in Tube: <u>yes, pumped out (~35 pumps)</u>

Keep or Retry: boat lists to starboard during extraction
sed. packed in end of core - hard

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-8-06 Recorder: GSW

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 4 R1

Tube Length (ft): 16.05

Water Depth (ft): ~~3.3~~ 42.2

Est. Tide Height (ft): ~~7.0~~ 5.9 (MLLW)

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 210583

Easting 1266940

On Deck Top of Sediment 10.4

Comments: pile of gravel at station - moved offshore 26 ft

silty gravel (crushed rock) / diver depth 42. / no slope

7 ft visibility

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>13.7</u>	<u>14.0</u>	
<u>12.2</u>	<u>12.8</u>	
<u>11.2</u>	<u>12.2</u>	
<u>10.5</u>	<u>11.6</u>	
<u>9.8</u>	<u>10.9</u>	
<u>8.7</u>	<u>9.9</u>	<u>refusal</u>
<u>5-10° angle on drive - E</u>		
<u>had to use hammer to break core out of bottom</u>		
<u>silty sand in end of core tube</u>		
<u>no apparent loss of material</u>		

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 4 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

210583

Northing

Date: 2/8/2003

Time: 14:27

1266940

Easting

Water depth: 42.2 ft Mudline: -36.3 ft MLLW (estimated using tide tables)

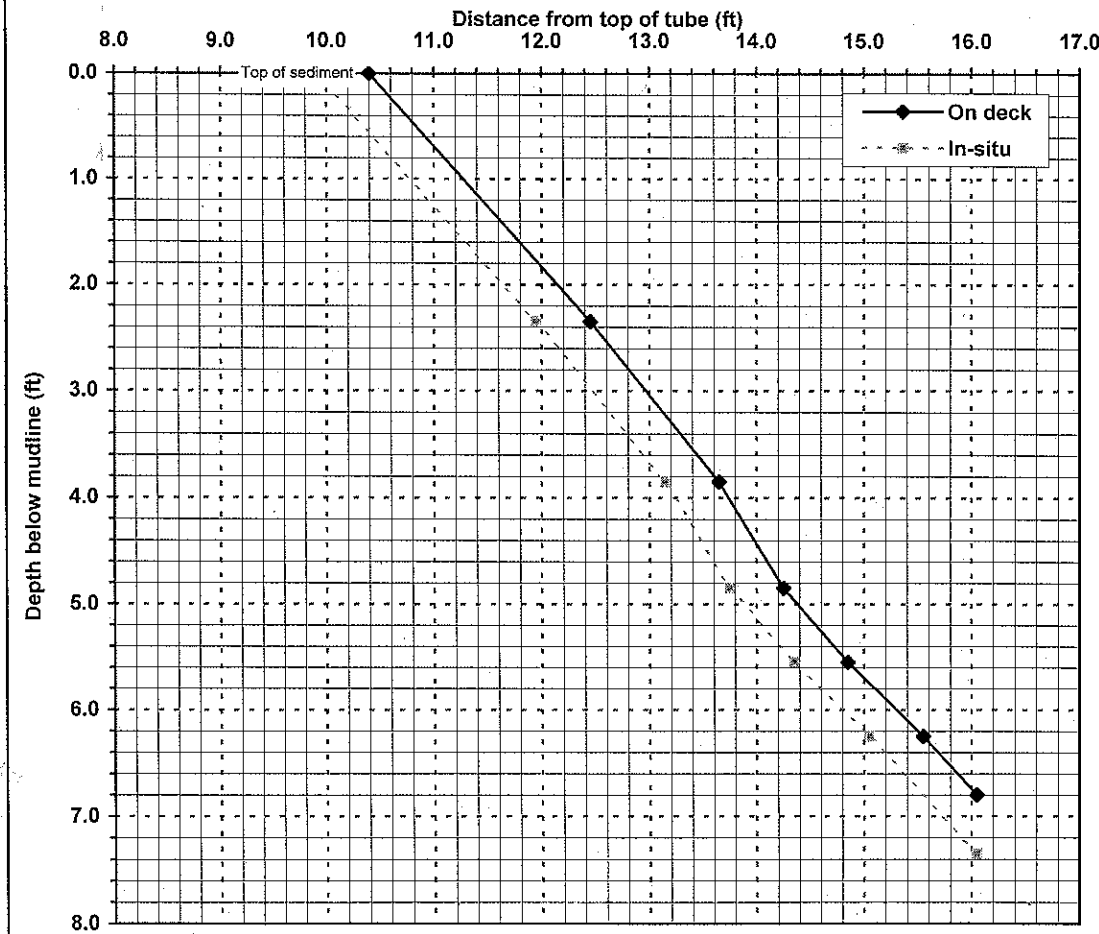
Place Field ID Label Here

Weather/Comments: N/A

Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
---------------------------	------------------------	------------------	--------------------------	--------------------------------

0-2.35	2.05	87%	Mudline	10.4
2.35-3.85	1.2	80%	1	11.27
3.85-4.85	0.6	60%	2	12.14
4.85-5.55	0.6	86%	3	12.97
5.55-6.25	0.7	100%	4	13.74
6.25-7.35	1	91%	5	14.38
			6	15.30
			7	No sample
			8	No sample
			9	No sample
			10	No sample
			11	No sample
			12	No sample
			13	No sample
			14	No sample
			15	No sample
			16	No sample
			17	No sample
			18	No sample
			19	No sample
			20	No sample



Penetration 7.35 ft/ On deck recovery 5.65 ft = 77% Recovery

Station Number: 4
 Attempt: 1
 Field Technician: LJM
 Contractor: MCS
 On-site Visitor: John
 Latitude:
 Longitude:

Date: 2/8/06
 Core Tube Length: 16.05
 Lead Line Water Depth:
 Diver Water Depth: 42
 Tip Probe Depth:
 Disk Probe Depth:
 Drive Initiation Time: 1400/1420

<30' from station

Shoreline & surrounding area observations: 10' from dolphin at gravel-dumping wharf (center wharf)
 Sediment surface & slope description: Silty gravel, crushed rock
 Water current: none, 7 ft. visibility

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
13.7	14.0	(Drive offset: <u> </u>) easy - moderate penetration; diver measurements
13.2	12.8	mod-hard
11.2	12.2	mod-hard
10.5	11.6	↓
9.8	10.9	↓
8.7	9.9	refusal
Totals		
7.35	6.15	

16.05
 9.90
 6.15
 16.05
 8.7
 7.35

Estimated angle of drive: 5-10' off vertical; mudmole core below manpool
 Reason for ending drive: refusal; core deeply embedded in ^{bottom} ~~sediment~~ = boat moved a lot

Drive Completion Time: 1415/1423

On Boat Recovery: 10.4'
~~11.5'~~
~~42.2'~~
 Upon extraction + much strain on line
 Boat lists to port. Continued hammering necessary to remove core for bottom.

84% recovery

End of Core Tube Observations
Staining: <u>none - light amt of residual black sediment</u>
Tube Deformation: <u>none</u>
Loss of Sediment: <u> </u>
Sediment Description: <u>well packed black-gray sand = full at plug</u>
Water in Tube: <u>water exposed = 10 ft.</u>

Keep or Retry: Keep

1352: Gravel around 1st location. Diver is investigating for better coring ground.
 1357: Manuevered 10' toward channel.

Diver capped core with plug at sediment-water interface

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Station Number: 4
 Attempt: 1
 Field Technician: TD/NA
 Contractor: MCS/RSZ
 On-site Visitor: JW (SMCA)
 (ND) Latitude: 21.0583
 (EN) Longitude: 121.0694

Date: 2/2/04
 Core Tube Length: 16.05
 Lead Line Water Depth: 42.2
 Diver Water Depth: 42
 Tip Probe Depth: —
 Disk Probe Depth: —
 Drive Initiation Time: 15⁰⁰ 14:00

Shoreline & surrounding area observations: ^{remaining small} concrete rip rap, wood pilings/dolphins, @ cement/gravel loading site.
 Sediment surface & slope description: 7 ft visibility, silty gravel (crushed rock), no slope
 Water current: mod. winds from north, ebbing tide

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
13.7	14.0	(Drive offset:) moderate dirt
12.2	12.8	
11.2	12.2	
10.5	11.6	
9.8	10.9	difficult drive
8.7	9.9	refusal, hard bottom
7.35	6.15	

Core tube guide not used

83.7%

Estimated angle of drive: cannot see - eqpt under water 5°-10° degree angle off from L
 Reason for ending drive: refusal - hard bottom per diver

Drive Completion Time: ~~14:09~~ ^{14:13} On Boat Recovery: 10.4

End of Core Tube Observations
Staining: <u>—</u>
Tube Deformation: <u>none</u>
Loss of Sediment: <u>screw plug by diver in site.</u>
Sediment Description: <u>silty sand, dk gray packed tight</u>
Water in Tube: <u>yes, siphoned out (~30 pumps)</u>

Keep of Retry: 27 on boat recovery measurements indicate recovery is only 5.65 ft. May need to retry... will determine when core is processed or after consult w/ Benit.
 tube stuck in sediment during retrieval, boat listed to port, used hammer to shake loose.

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Sediment Core Processing Log



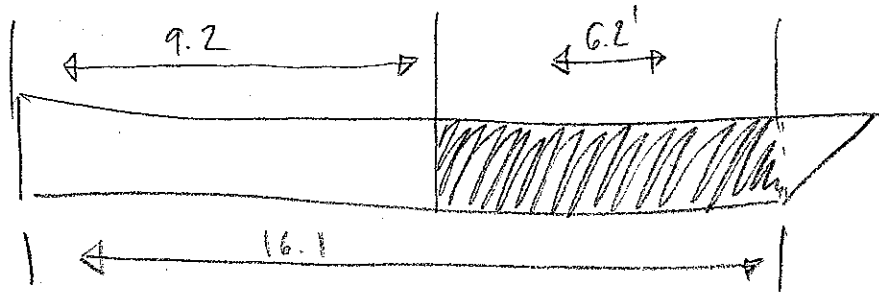
Job: Dunamish
 Job Number: PN55-1822D
 No. of Sections: 1
 Sample Length (from log): Drive = 7.4'
 Avg. % Compaction: On Deck = 1.2'

Core Location/Sample Number: LDN-SC-5 (R2)
 Date/Time: Feb 10, 2006 Start 1101D End 1145
 Sample Logged by: Nik Becker, A. Fitzpatrick
 Type/Diameter of Sample:
 Sample Quality: good fair poor disturbed

Notes: 1/2 R = 84% 1/2
core collected 2/9/06. R1 opened + rejected. Oversight approved this core to be processed as Method A.

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5Y 2.5/1 black		15	85		moist, med. soft, olive gray, sl. sandy silt, scattered roots, twigs. mottled appearance. 1 poly chete worm. 1 worm tube.	0.6	3-16oz		
		2.5Y 4/1 dk. gray		95	5		moist, med. dense, grayish black fine to medium sand, trace silt, trace shell frags. multi colored grains are orange, red, white.	1.0			
			40	10	50		moist, med. loose, grayish, silty sand w/ abundant shell frags. strong H ₂ S odor.	1.125	3-16oz.		
						9.1	moist, soft, greenish gray, slightly sandy, very gravelly, silt, substantial shells, traces of barnacles on gravels, gravels are rounded up to 1.5". strong H ₂ S odor.	2.0			@2.1' TV=2.5 Big
		GREY 3/10Y v. dk. greenish gray.		95	5		moist, medium dense, blackish gray medium sand, scattered very small shells. slight H ₂ S odor to 4.0'	3.0	3-16oz		@3.4' TV=1.9 big
						8	@ 2.4 silt w/ shells @ 2.7 silt clast/pocket. @ 3.6 silt w/ shells and wood.	4.0			@4.7' TV=1.5 big
			100			8	below 3.7' no silt pockets except @ 5.3'. just medium sand. multi colored grains orange, red, white. qtz grains below 5'. moist, dense, blackish gray	5.0	2-16oz		
							piece of black, 1" gravel, subrounded, basalt-like.				
							End of core: 6.2'	6.0			

SL-5 R2



core slightly sloughed
from 5.9-6.2. Material
still present.

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-9-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 5 R 2

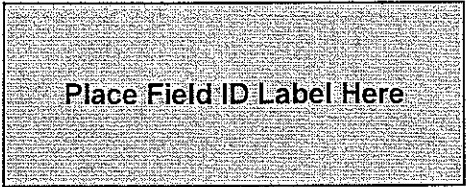
Tube Length (ft): 16.05

Water Depth (ft): 19.7

Est. Tide Height (ft): 7.7

Est. Mudline: _____ (MLLW)

Comments: sandy silt very gentle slope 19 ft diver depth
visibility 5 ft
20 ft from planned station



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 210543

Easting 1266048

On Deck Top of Sediment 9.9

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.5</u>	<u>15.6</u>	
<u>13.1</u>	<u>13.3</u>	
<u>11.0</u>	<u>11.3</u>	
<u>9.7</u>	<u>10.3</u>	
<u>8.7</u>	<u>9.7</u>	<u>penetration slowed</u>
		<u>retusal</u>
		<u>lost some sand out at core tip</u>
		<u>when extracting</u>
		<u>coarse sand in end</u>
		<u>no odor</u>

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 5 R2

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

210543

Northing

Date: 2/9/2006

Time: 14:15

1266048

Easting

Water depth: 19.7 ft

Mudline: -12.0 ft MLLW (estimated using tide tables)

Place Field ID Label Here

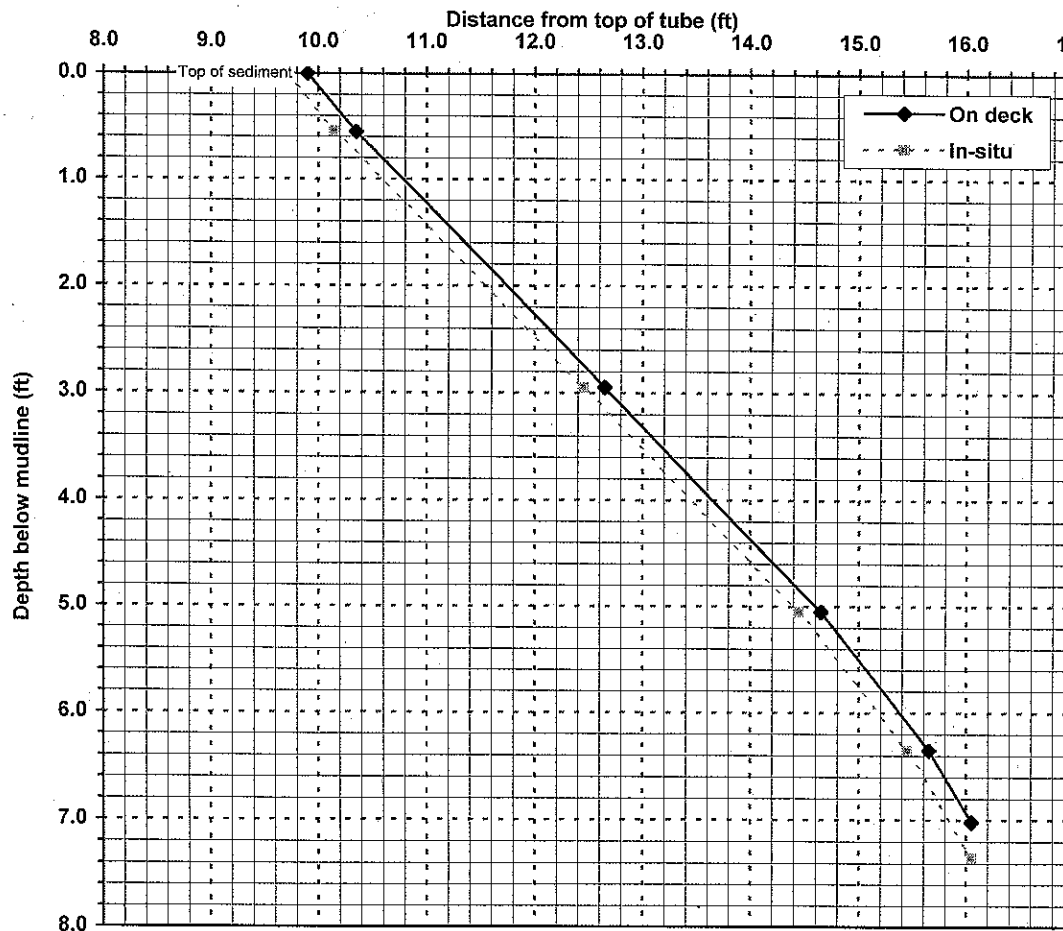
Weather/Comments: Sunny

Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-0.55	0.45	82%
0.55-1.10	2.3	96%
1.10-1.65	2	95%
1.65-2.20	1	77%
2.20-2.75	0.6	60%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	9.9
1	10.78
2	11.74
3	12.70
4	13.65
5	14.60
6	15.38
7	16.04
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

0-0.55	0.45	82%
0.55-1.10	2.3	96%
1.10-1.65	2	95%
1.65-2.20	1	77%
2.20-2.75	0.6	60%



Penetration 7.35 ft/ On deck recovery 6.15 ft = 84% Recovery

Station Number: 5
 Attempt: 2
 Field Technician: TB/LM
 Contractor: MCS/RSS
 On-site Visitor: _____
 Latitude: 210543
 Longitude: 1266098

Date: 2/9/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 19.7
 Diver Water Depth: 19
 Tip Probe Depth: —
 Disk Probe Depth: —
 Drive Initiation Time: 1421

Shoreline & surrounding area observations: Same as R1
 Sediment surface & slope description: gentle slope, sandy silt, visibility 5 ft.
 Water current: Same as R1

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
15.5 13.1	15.6 13.3	free fall (Drive offset:) easy drive
11.0	11.3	equipment under water; easy drive
9.7	10.3	^{TD} easy-moderate drive
8.7	9.7	moderate drive/hard drive, penetration slowed to refusal.
7.35	6.35	

86.4%
 Estimated angle of drive: unable to see - eqpt mostly under water. Est. 10° off
 Reason for ending drive: refusal

Drive Completion Time: 1428

On Boat Recovery: 9.9

End of Core Tube Observations
Staining: <u>black silt on sides, washed off</u>
Tube Deformation: <u>no</u>
Loss of Sediment: <u>0.2</u> , screw plug inserted by diver at sed-water interface
Sediment Description: <u>dark gray coarse sand, no odor no sheen</u>
Water in Tube: <u>yes, clear</u>

Keep or Retry: lost some sand out of tip during extraction
We suspect R1 may have hit a piling b/c no odor/sheen at this one.

Notes:

Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Sediment Core Processing Log



Job: DUNAMISH
 Job Number: POX 55-18220
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:

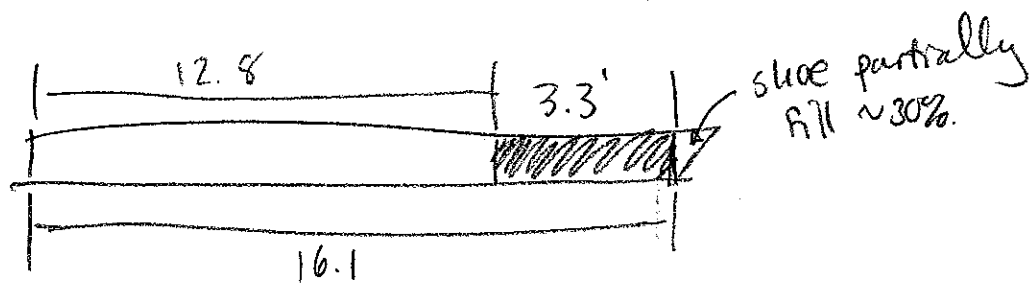
Core Location/Sample Number: LDW-SC-5 (R1)
 Date/Time: Feb 16, 2006 collected 2/16/06 STAT 1830
 Sample Logged by: N. Bacher A. Fitzpatrick
 Type/Diameter of Sample: 4" # alum M/S
 Sample Quality: good fair poor disturbed

Notes: suspect hit piling - refusal, def tube deformation Penet: 6.9' R=47%
On ledge: 3.3'

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Initial Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch	
				15	85	ALL HEAD SPACE READINGS = 0	moist, med. soft, blackish gray sl. sandy SILT, mottled				NO SAMPLE COLLECT	
				95	5		50% wood frags and silty sand, medium sheen, moderate creosote-like odor	1.0				
				5	95		moist, med. dense, black, fine to medium sand, trace silt. multi-colored grains are orange/red, white. trace to moderate HC like sheen and moderate creosote like odor.	2.0				
							moist, med. soft, gray, silt w/trace sand, minor clay. trace creosote like odor, no sheen. 50% winnowed w/above sand	3.0				
							End of core: 3.3'					
							The bottom silt unit appears to be a stand alone stratigraphic unit below the sand. However, it is hard to be certain due to core winnowing.					

core catcher is here in tube

HC like sheen



MCS Environmental MudMole Bore Log

Collection Information

Date: 2-9-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: S R1

Tube Length (ft): 16.05

Water Depth (ft): 18.7

Est. Tide Height (ft) 8.5 (MLLW)

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 210531

Easting 1266043

On Deck Top of Sediment 12.8

Comments: falling tide sandy silt / wood & metal debris

diver depths - gentle slope / 10ft visibility

hit debris under surface - moved offshore slightly

Penetration Tape Reading

Recovery Tape Reading

Comments

15.6

15.6

13.4

13.7

12.9

13.2

penetration slowed

11.3

11.6

9.9 ~~10.0~~

10.4

9.2

9.8

refusal

core stuck in bottom
tapped out with mudmole
very hard to extract core

oily medium sand in tip
core tube tip damaged

many pilings in area -
may have hit end of buried pile

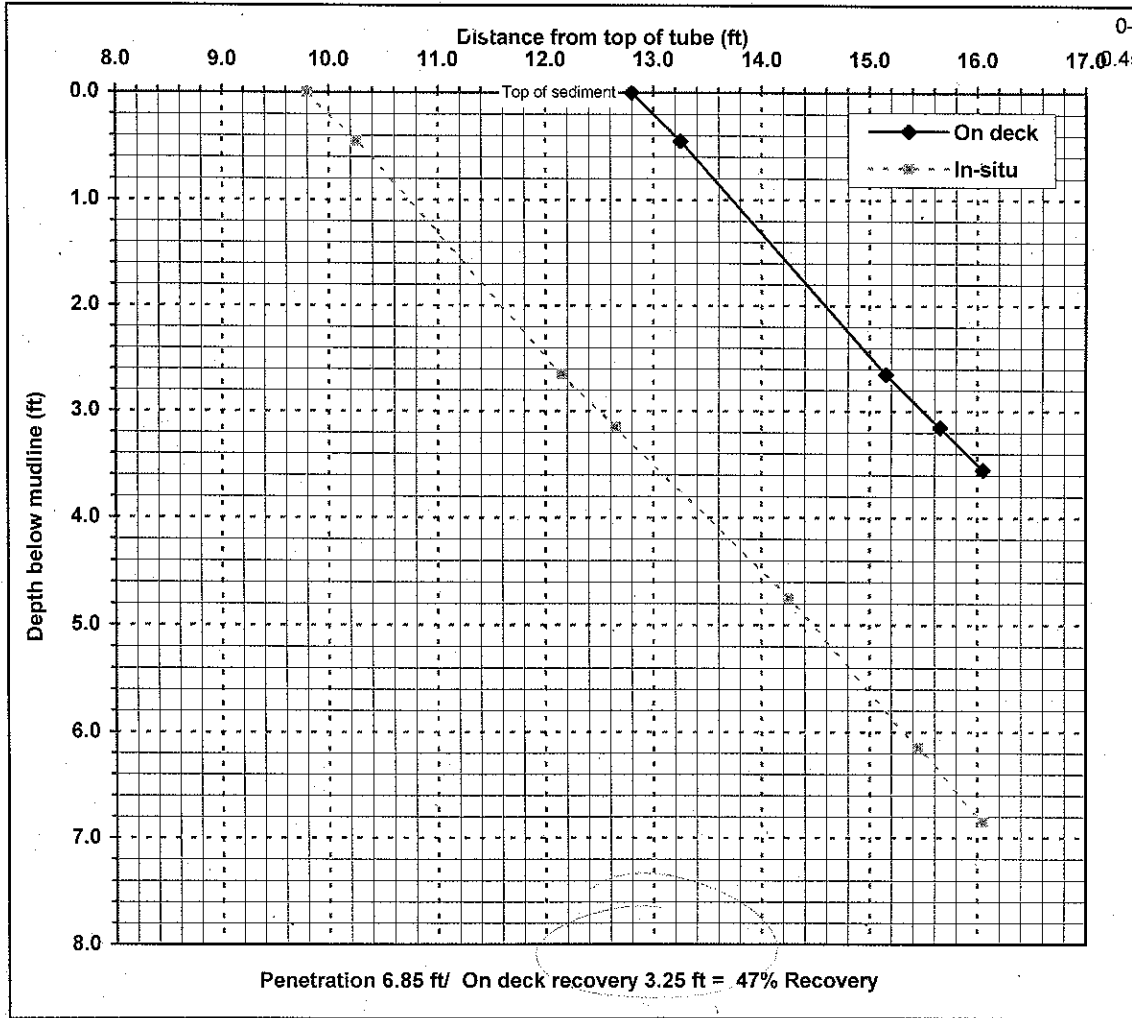
Mudmole™ Bore Log

Project: LDWG Duwamish Coring	Station: 5 R1	
Project No: 341185.001	Position: NAD83	WAN
Collected by: GSM	210531	Northing
Date: 2/9/2006	Time: 13:04	1266043
Water depth: 18.7 ft	Mudline: -10.2 ft MLLW	(estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Sunny
 Driven to refusal, core tapped out with Mudmole

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
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0-0.45	0.45	100%	Mudline	12.8
0.45-0.90	0.45	86%	1	13.73
0.90-1.35	0.45	100%	2	14.59
1.35-1.80	0.45	100%	3	15.50
1.80-2.25	0.45	86%	4	No sample
2.25-2.70	0.45	86%	5	No sample
2.70-3.15	0.45	86%	6	No sample
3.15-3.60	0.45	86%	7	No sample
3.60-4.05	0.45	86%	8	No sample
4.05-4.50	0.45	86%	9	No sample
4.50-4.95	0.45	86%	10	No sample
4.95-5.40	0.45	86%	11	No sample
5.40-5.85	0.45	86%	12	No sample
5.85-6.30	0.45	86%	13	No sample
6.30-6.75	0.45	86%	14	No sample
6.75-7.20	0.45	86%	15	No sample
7.20-7.65	0.45	86%	16	No sample
7.65-8.10	0.45	86%	17	No sample
8.10-8.55	0.45	86%	18	No sample
8.55-9.00	0.45	86%	19	No sample
9.00-9.45	0.45	86%	20	No sample

Station Number: 5
 Attempt: 1
 Field Technician: TD/LN
 Contractor: MCS/RSS
 On-site Visitor: _____
 Latitude: 210531
 Longitude: 1266043

Date: 2/9/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 18.7
 Diver Water Depth: 18
 Tip Probe Depth: _____
 Disk Probe Depth: _____
 Drive Initiation Time: 1318

Shoreline & surrounding area observations: concrete rip rap and sandy beach 100' to west; wood pilings around
 Sediment surface & slope description: sandy silt w/ wood & metal debris, gentle slope, 10ft visibility.
 Water current: light wind from north; ebbing tide

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
15.6	15.6	(Drive offset: _____) freefall
13.4	13.2	easy - mod. drive
12.9	13.2	moderate drive - hard drive - penetration slowed
11.3	11.6	hammer below surface; moderate drive/hard drive
9.9	10.4	moderate - hard drive
9.2	9.8	hard drive, refusal core stuck in bottom, tapped out with mudmole
6.85	6.25	

91.2% (see boat recovery)

Estimated angle of drive: ~10° off upright until underwater's surface - cannot see after that

Reason for ending drive: refusal?

Drive Completion Time: 1326

On Boat Recovery: 12.8 = $\frac{3.25 \text{ ft total recovery}}{6.85 \text{ penetration}}$ = 47.4%

End of Core Tube Observations
Staining: <u>silt on sides; washed off.</u>
Tube Deformation: <u>tip of tube slightly deformed.</u>
Loss of Sediment: <u>3 ft?; screw plug inserted by diver at sed-water interface</u>
Sediment Description: <u>petroleum-like color, silt present; coarse/med. sand.</u>
Water in Tube: <u>yes, clear</u>

Keep or (Retry) slack on port anchor (~6ft) given b/c of debris under surface.
very difficult to extract core, boat bow lists to port (partially submerged),
hammer used to shake core tube free (1328-1330¹³¹⁸ intermittently) Mudmole
line beginning to fray under tension/strain of stuck core tube.

Collecting RZ b/c unsure if debris prevented further penetration and b/c of loss of 3ft. during extraction of stuck core tube (per Barit Bergquist)

Notes: Move station a few feet north b/c pilings prevent moving south.
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Sediment Core Processing Log



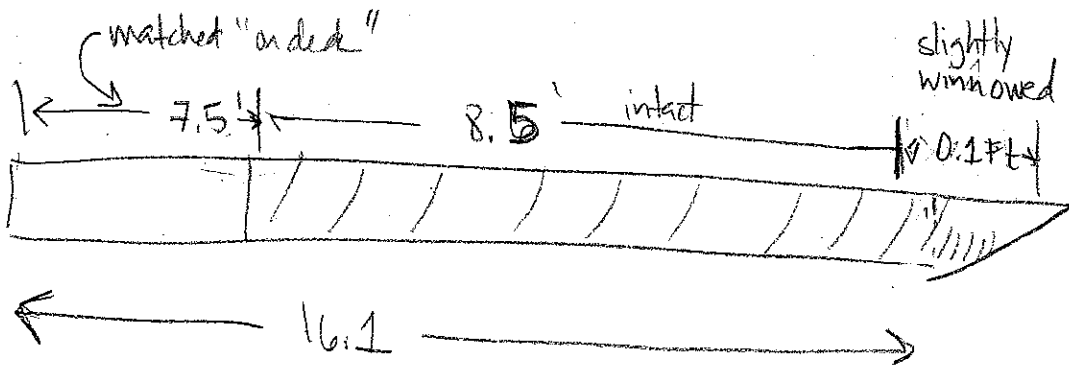
Job: DUNSMITH
 Core Location/Sample Number: LDW-SC-6
 Job Number: POS55-18220-511
 Date/ Time: Feb 10, 2006 STAT 0830
 No. of Sections: 1
 Sample Logged by: N. Becker, A. Fitzpatrick
 Sample Length (from log): Drive = 111'
 Type/Diameter of Sample: 4" ID alum MCK
 Avg. % Compaction: Recd = 8.6' endcap
 Sample Quality: good fair poor disturbed very good
 Notes: % R = 78%

core collected 2/9/06 picked Method B (version #5) for this core w/ oversight approved

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		5Y 4/3 olive		tr	98		Wet, very soft, soupy, olive brown SILT w/ scattered twigs	0.2	1000	1025	soft SILT
		C1EY1 2.5/SG greenish black		15 to 20	85	(0.0)	SILT: wet, soft to mod stiff, blackish brown SILT w/ scattered wood frags slight H ₂ S odor, homogeneous, no layering, mod. plasticity, increasing stiffness w/ depth. Abrupt basal contact, mottled upper contact. About 25% sand in upper 3 FT decreasing w/ depth	3.1602	0-2'	1028	-
1.0								1.0	GTE1A	1031	-
		grading to							C.D.7' TV=2.5 big	1034	SILT
2.0		C1EY4 2.5/IV black				(0.0)		2.0		1037	-
									1005 3-1602 2-4.15'	1040	-
3.0				5	95	(0.0)	- At 3.4' 2" pocket of gray SILT soft, stiff, plastic (not a layer)	3.0	GTE 3.0'	1043	-
										1046	-
4.0						(0.0)	C 3.5' TV = 3.5 big C 4.4' TV = 3.0 big C 4.9' TV = 6.0 big C 6.5' TV = 2.5 big	4.0		1049	-
										1052	-
5.0		10YR 3/1 v. dark gray		90	10	(0.0) F	SAND: moist, dense, d. grayish brown SAND w/ gradational F-m-c sequences, trace small shell frags, and scattered 2" gray silt clasts/chunks (not hard but stiff w/ abrupt edges (sharp contact). silt is not layered. m.c. grains are white, red, orange, generally fining upwards	4.5	1010 3-1602 4.5 to 6.0	1052	SAND
		silt pockets: C1EY4 2.5/IV (black)		98	tr	C-M		5.0		1155	-
								6.0		1058	-

LDW-SC-6 (R1)

02/10/06



Full to tip
but sl. winnowed

* drilled hole in sidewall to remove standing H₂O
started doing this cuz of ~~the~~ suspected fines loss
from previous core. However, does not appear to be
significant, on deck recovery has been matching lab
recovery (as depth to sediment from top of tube)

Sediment Core Processing Log



Job: Dunhamish
 Job Number: PV55-1822D
 No. of Sections: _____
 Sample Length (from log): See
 Avg. % Compaction: Page 1

Core Location/Sample Number: LDW-SC-6
 Date/ Time: Feb 10, 2006 0830
 Sample Logged by: NPB, AEF
 Type/Diameter of Sample: See page 1
 Sample Quality: good fair poor Disturbed

Notes: _____

see page 1

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Height Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
7.0		silt packet: CLEY1 4/50Y d greenish gray		98	tr	M 0.0	same as above. silt clasts look like they were picked up + moved.	1015 2-16.1 6-8'			(SILT) SAND (SILT)
8.0				98	tr	M-F M	larger At 7.7' Qtz gravel more present (transition w/ unit below). From 7.5' to 8.0' scattered brick fragments (1/8") w/ gradual contact	7.0 7.7'			brick frag
8.6				98	tr	M	SAND: same as above but w/o layers + no hard silt chunks/clasts, moist, dense, d grayish brown M-SAND w/ scattered twigs + m. c. grains, one intact 1/2 shell (1") unit has m. c. grain Qtz rounded around.	8.0 1020 1-16.2 8-8.5'			SAND
9.0							Bottom of core 8.6' but last at 1 ft slightly winnowed = not sampled	8.6' 9.0			
Note: Filled 3 debris baggies from sand unit At 5.7' = possible chunk At 7.0 to 8.0" = brick frag 1/2 shell from 8.5' At 6' = sand dust w/ odor.											

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-9-08 Recorder: ESM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 6 R1

Tube Length (ft): 16.1

Water Depth (ft): 8.6

Est. Tide Height (ft): 41.9 (MLLW) ?

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 209837

Easting 126684

On Deck Top of Sediment 7.5

Comments: high slack tide sandy silt gentle slope

41 ft diver depth

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>13.5</u>	<u>13.4</u>	
<u>11.4</u>	<u>11.2</u>	
<u>9.3</u>	8.8 <u>9.7</u>	
<u>7.3</u>	<u>8.4</u>	
<u>6.1</u>	<u>7.6</u>	<u>penetration slowed</u>
<u>5.1</u>	<u>7.3</u>	<u>refusal</u>

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 6 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

209837

Northing

Date: 2/9/2006

Time: 12:20

126684

Easting

Water depth: 41.9 ft

Mudline: -33.3 ft MLLW (estimated using tide tables)

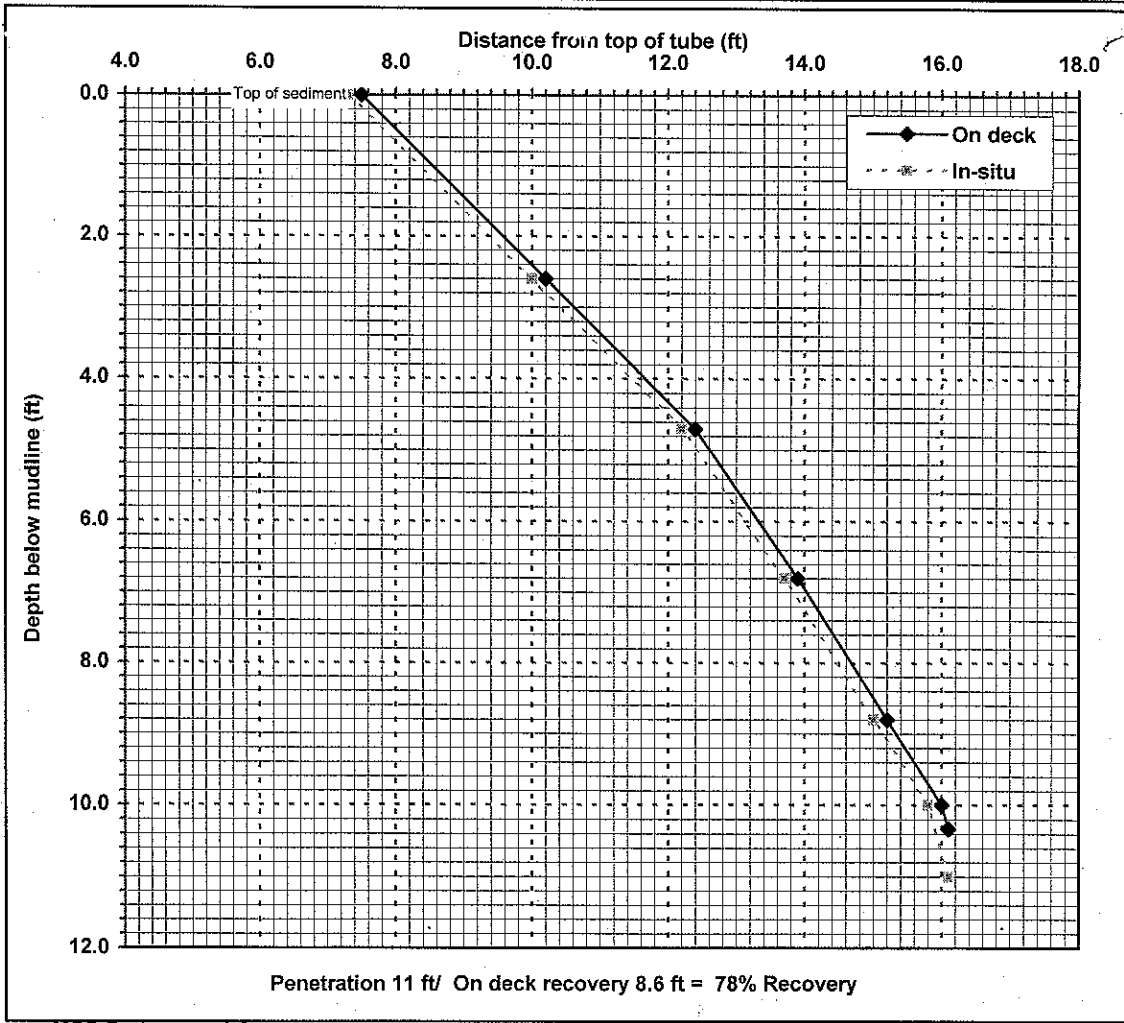
Place Field ID Label Here

Weather/Comments: Sunny

Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------



0-2.6	2.7	104%
2.6-4.7	2.2	105%
4.7-6.8	1.5	71%
6.8-8.8	1.3	65%
8.8-10	0.8	67%
10-11	0.3	30%

Mudline	7.5
1	8.54
2	9.58
3	10.62
4	11.67
5	12.61
6	13.33
7	14.03
8	14.68
9	15.33
10	16.00
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 6
 Attempt: 1
 Field Technician: ID/LM
 Contractor: MIS/RS
 On-site Visitor: _____
 Latitude: 209837
 Longitude: 126684

Date: 2/9/06
 Core Tube Length: 16.1
 Lead Line Water Depth: 41.9
 Diver Water Depth: 41
 Tip Probe Depth: _____
 Disk Probe Depth: _____
 Drive Initiation Time: 1223

189 ft off target

Shoreline & surrounding area observations: rip rap, concrete pier, storm drain ~ 100 ft to west

Sediment surface & slope description: sandy silt, gentle slope

Water current: ebbng tide, winds from north 4 ft visibility
high slack tide

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
13.5	13.4	(Drive offset: _____) <u>easy - moderate drive</u>
11.4	11.2	<u>moderate drive</u>
9.3	9.7	<u>moderate drive</u>
7.3	8.4	<u>moderate - hard drive</u>
6.1	7.6	<u>penetration slowed - hard drive</u>
5.1	7.3	<u>refusal hard drive</u>
11.0	8.8	

80.0%

Estimated angle of drive: unable to see, equip. underwater

Reason for ending drive: refusal

Drive Completion Time: 1229

On Boat Recovery: 7.5

End of Core Tube Observations
Staining: <u>tagged w/silt on sides</u>
Tube Deformation: <u>No</u>
Loss of Sediment: <u>0.2, diver inserted screw cap in situ @ sed-water interface</u>
Sediment Description: <u>sandy silt - med. sand, gray in plug</u>
Water in Tube: <u>yes, slightly turbid</u>

Keep or Retry: screw plug inserted by diver - med. sand in plug end.
acceptable core

Notes:

Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Sediment Core Processing Log



Job: Dunamish
 Job Number: P055-18220
 No. of Sections: 1
 Sample Length (from log): Drive=11 Ft
 Avg. % Compaction: Ind Deck = 8.9
 Notes: Rec % = 81%

Core Location/Sample Number: LDW-SC-07 (R1)
 Date/Time: Feb 10, 2006 start 1400 end 1445
 Sample Logged by: A. Fitzpatrick
 Type/Diameter of Sample: 4" dia dnm MCS
 Sample Quality: good fair poor disturbed

lost 0.2' sand out bottom (50%) but otherwise intact

Core collected today

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		GLEV1 2.5' N black					SILT: olive brown to black, soupy very soft sl. clayey SILT w/ scattered wood frag trace worms, rootlets		1410 0-1.7'		SILT
1.0		GLEV2 3.10y v. dark greenish gray	tr	40	60	(D.D.)	TRANSITION ZONE: very wet, soupy, very soft dark gray very sandy SILT, scattered 1/2" rounded gravel. contact @ 1.4'	0.5 1.0	GT @ 0.1' gashed		SILT
							3' d sharp contact	1.7'			
2.0		GLEV3 4.15y dark greenish gray		98	tr		SAND: moist, med loose to med dense, grayish black VF to F SAND w/ trace silt. grading coarser w/ depth (to bottom of core), no layers, uniform. multicolored grains - red, black, white, orange	2.0	1415 1.7-4.0		SAND
3.0		GLEV4 5.15y greenish gray = SILT CLAST	40	60	tr	(D.D.)	GRAVELLY SAND: moist, dense, dark gray gravelly M SAND, 5 pcs well-rounded gravel from 1 to 4" dia (river rock) w/ scattered small 1/2" dia rounded silt clasts (light gray). Top appears "pebbled". surface	2.7	GT @ 2.6' gashed		SAND w/ SILT CLAST
4.0							End of Gravel	4.0			
5.0				98	tr	(D.D.)	SAND: same as above but no gravel moist, dense, dark gray M-SAND w/ abundant scattered silt clasts / pockets. largest clasts seen yet. H clasts: light gray or green, subrounded, hard 1/2" dia up to 4" dia. red + white multicolored grains, no layering; pockets only surface appears "pebbled".	5.0	1420 4-6.5		
6.0								6.0	2-16oz		

At 0.5'
TV = 1.1
big

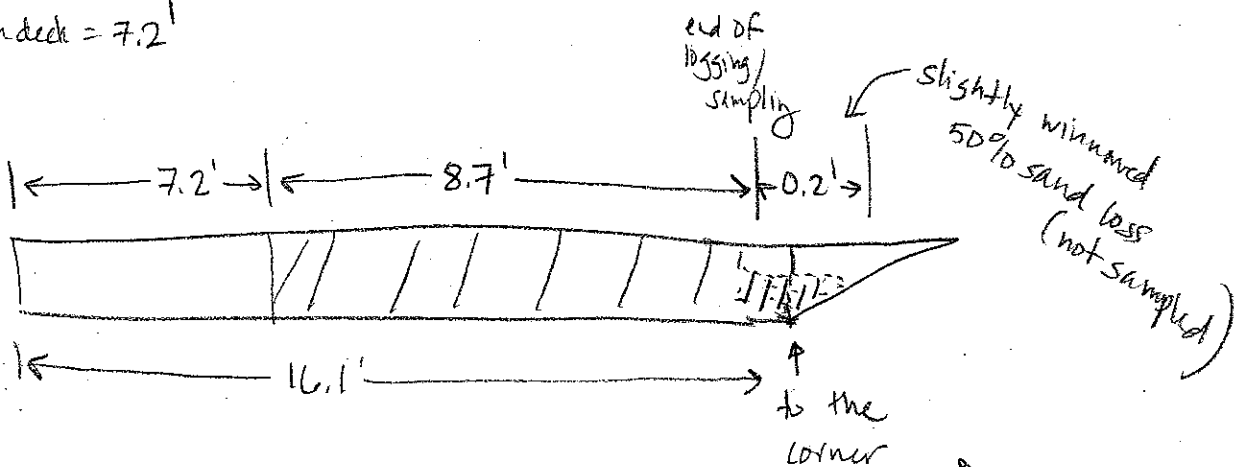
At 3.2'
TV = 1.5
big

At 5.3'
TV = 1.8
big

LDW - SC - 07

Feb 10, 2006
ACF

on deck = 7.2'



empty
shoe
sand
residuals

Sediment Core Processing Log



Page
2 of
2

Job: Duwamish
 Job Number: Pdr 95-18220
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction: see page
 Notes: 1

Core Location/Sample Number: LDW-SC-07-R1
 Date/ Time: Feb 10, 2012
 Sample Logged by: ACF
 Type/Diameter of Sample:
 Sample Quality: good fair poor disturbed

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In Situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
7.0		CLAY 1 4/5 GY dark greenish gray		95	5		<p>↓ Same as above</p> <p>end of silt clasts — transitional</p> <p>SAND: nicely layered/banded moist, dense, dark gray M-SAND w/ dark grayish-brn silty F-SAND interbeds (native-looking)</p>	4.65 6.5 7.2 8.0 8.7	4.65 6.5 7.2 8.0 8.7		SAND w/ CLASTS SAND
8.0								9.0	9.0		
8.7							Bottom of core = 8.7'	8.7	8.7		
9.0							Winnowed from 8.7 to 8.9' = not shut 50% full. same sampled. material as above.	9.0	9.0		
							1 baggie = silt clasts from 4.6'	10.0	10.0		

-At 7.1'
TV= 23
big

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-10-06 Recorder: BSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 7 R1



Position Information

Tube Length (ft): 16.1

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 37.8

Time: 9:07

Northing 209605

Est. Tide Height (ft) 6.7

(MLLW)

Easting 1266850

Est. Mudline: _____

(MLLW)

On Deck Top of Sediment 7.2

Comments: ebbing tide - diver water depth 35 - sandy silt

scattered cobble - gentle slope - 7 A variability

2 4 A off station

Penetration Tape Reading

Recovery Tape Reading

Comments

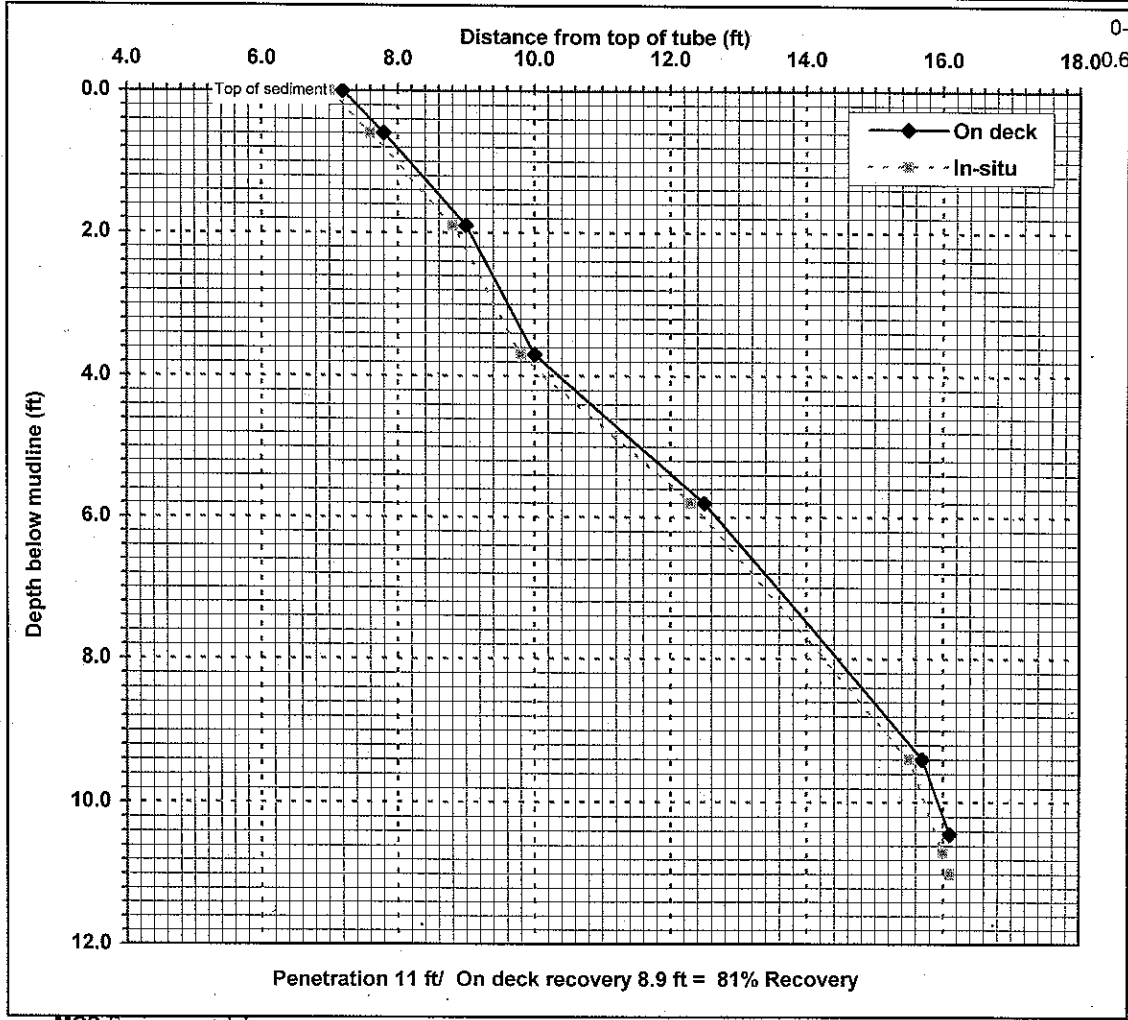
<u>15.5</u>	<u>15.5</u>	
<u>14.2</u>	<u>14.3</u>	
<u>12.9</u>	<u>13.3</u>	
<u>10.3</u>	<u>10.8</u>	
<u>6.7</u>	<u>7.6</u>	
<u>5.4</u>	<u>7.1</u>	
<u>5.1</u>	<u>7.0</u>	<u>retusa</u>
<u>sandy plug in tip of core</u>		

Mudmole™ Bore Log

Project: LDWG Duwamish Coring	Station: 7 R1	
Project No: 341185.001	Position: NAD83	WAN
Collected by: GSM	209605	Northing
Date: 2/10/2006	Time: 9:07	Easting
Water depth: 34.8 ft	Mudline: -28.1 ft MLLW	(estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Sunny
 Driven to refusal



Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-0.6	0.6	100%
0.6-1.2	1.2	92%
1.2-1.9	1	56%
1.9-3.7	2.5	119%
3.7-5.8	3.2	89%
5.8-9.4	0.5	38%
9.4-10.7	0.1	33%
10.7-11		

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	7.2
1	8.17
2	9.06
3	9.61
4	10.36
5	11.55
6	12.68
7	13.57
8	14.46
9	15.34
10	15.93
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 7
 Attempt: 1
 Field Technician: LM
 Contractor: MCS
 On-site Visitor: Kathy, Baritt

Date: 2/10/06
 Core Tube Length: 16.05 & 16.1'
 Lead Line Water Depth: 37.8'
 Latitude: 209605
 Longitude: 1266850

Pre-Dive and Diver Observations:

Shoreline & surrounding area: 40' from eastern shore, cargo containers, 40' off station
 Sediment surface & slope: sandy silt, scattered cobbles, gentle slope
 Water current and visibility: 7' ft visibility, ebbing tide
 Diver Water Depth 35.0' Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 0853 Drive Completion Time: 0900 Drive Offset: _____
 Estimated angle of drive: below moonpool so not visible ~10' off vertical estimate

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.5	15.5	freefall diver measured
14.2	14.3	moderate
12.9	13.3	moderate
10.3	10.8	moderate
6.7	7.6	moderate
5.4	7.1	hard
5.1	7.0	refusal
TOTAL 11.0'	TOTAL 9.1'	Percent Recovered: _____

Reason for ending drive: refusal
 If refusal, reason for refusal: triggered sand - diver observation

Extraction Observations:

Tension on line? Stability of vessel: heel to port, bow above water
 Overlying water in core (quantity and description): potential loss of fines in siphoning, ~200mL of slightly turbid water
 On Boat Recovery: 7.2 Loss of Sediment: _____
 Extraction Observations: _____

On Deck Observations:

Staining: tagged silt layer
 Tube Deformation: none
 Sediment Description (odor or sheen?): sandy plug, none

Keep or Retry: _____

Diver plugged core at water-sediment interface; wrapped on-deck

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)



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Station Number: 7
 Attempt: 1
 Field Technician: TD/LM
 Contractor: MCS, RSS
 On-site Visitor: RGBB (NW)

Date: 02/10/06
 Core Tube Length: 16.1
 Lead Line Water Depth: 34.8
 Latitude: 209605
 Longitude: 126450

4'
 13' of target
 70

Pre-Dive and Diver Observations:

Shoreline & surrounding area: rip rap
 Sediment surface & slope: sand, silt, scattered cobble, gentle slope
 Water current and visibility: ebbing tide, 7 ft vis.
 Diver Water Depth 35 Tip Probe Depth _____ Disk Probe Depth _____

Dive Observations:

Drive Initiation Time: 0853 Drive Completion Time: 0901 Drive Offset: _____
 Estimated angle of drive: equipt. under water (cannot see) e.g. 10° ff

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
19.5	15.5	moderate, freefall - diver measured
14.2	14.3	moderate
13.5/29	13.3	moderate
10.3	10.8	easy-moderate
6.7	7.6	easy-moderate
5.4	7.1	moderate-hard
5.1	7.0	moderate-hard; refusal ✓
TOTAL 11	TOTAL 9.1	Percent Recovered: <u>82.7</u>

Reason for ending drive: refusal
 If refusal, reason for refusal: sand (diver observation)

Extraction Observations:

Tension on line? yes Stability of vessel: port low listing
 Overlying water in core (quantity and description): yes, clear ~ 4ft.
 On Boat Recovery: 7.2 Loss of Sediment: (none) 0.2
 Extraction Observations: _____

On Deck Observations:

Staining: dark silt on sides, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): sandy plug in tip of core; diver inserted screw plug at sed-water interface; mid-course gray sand, no odor, no sheen.

Keep or Retry: Keep good core

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log



Job: DUNHAMISH
 Job Number: POISS-18220
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction: Drive = 14.6'

Core Location/Sample Number: LDW-SC-8 (R1)
 Date/ Time: Feb 10, 2016 start 1230
 Sample Logged by: A. Fitzpatrick, John N. Prescott
 Type/Diameter of Sample: 4" ID alum MPS
 Sample Quality: good fair poor disturbed except catcher blown out, but good recovery

Page 1 of 2

Notes: On Deck R = 9.8'
0.10 R = 1.7' (lost 3' of sediment) core collected 2/10/16

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		5y 4 1/2 olive gray					just above late breath zone (holes)	0.2	1300		SILT
		2.5y					SILT: wet, soft, mottled brown + black SILT w/ mod wood frags (#" L), PC wood 4" L, few shell frags	0.6	0-2'		SILT + WOOD
		2.5 1/4 black					SILT: wet, med stiff, slightly clayey, brownish black SILT, homogenous, no layering	1.0	3-16.02	GT09 geotech	
						tr 98 (0.10)	med. plasticity, scattered rootlets, moderate to strong H ₂ S odor		1305		
							some interbedded F.M. black sand lenses 1/8" thick (from 0.6 to 5.0 ft)	2.0	1-2'		BLACK SILT
							trace hairlets, slightly compressible texture		3-16.02		
						(0.10)	At 1.2' pc. black, hard material (baggie)	3.0	2-4'		
									1306		
									3-16.02		
									2-4'	GT30 geotech	
									4.0		
							gatchional Δ - less water	4.2			
							less water, more stiff, slightly blacker		1315		
									3-16.02		
							At 4.8 to 5.0': 2" layer of wet black SAND w/ 1/4" orange, hard, nugget fused-like	5.0	4-6'		
							At 5.6' 2" layer of black sand w/ moderate wood frags, trace floulets sheen faint TPH-like odor, moderate hairlets possible odor b/w 5.5 and 6.0'	6.0			
							possible TPH-like odor?				

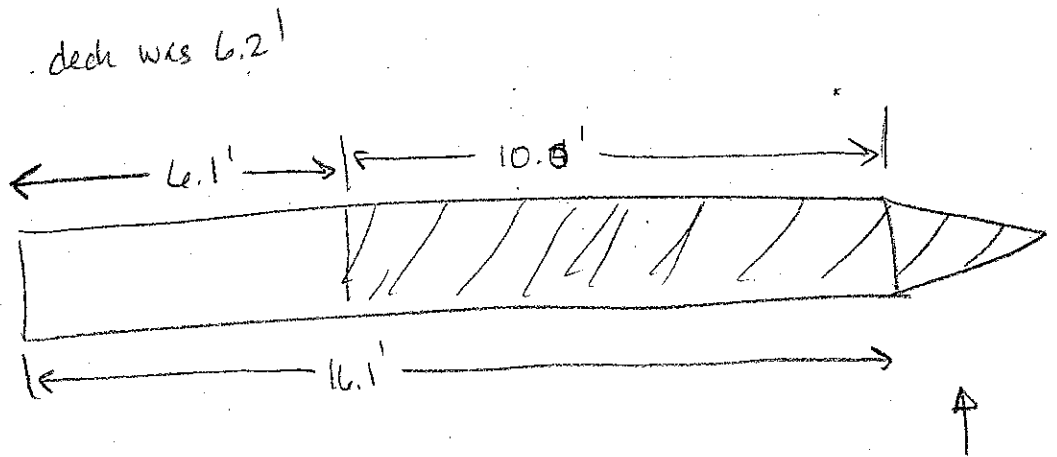
At 1.5' TV = 3.0 big

At 2.5' TV = 1.7 big

At 5' TV = 2.8 big

LDW-SC-08

Feb 10, 2006



shoe is full
w/ silt to very
tip; catcher
inverted

Sediment Core Processing Log



Job: Dunwich
 Job Number: B155-1822D
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: L1W-SC-08 (R1)
 Date/ Time: Feb 10, 2006 start 1230
 Sample Logged by: ACF
 Type/Diameter of Sample: _____
 Sample Quality: good fair poor disturbed

Notes: see pag 1

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		254 25/1 black					same as above, wet black, stiff SILT, no sand interbeds, trace of greenish gray, wet, stiff clay interbeds 1/4" thick, @ moderate H ₂ S odor	6.0	320 2-16oz 6-8'		- - -
			*	tr	98	(AD)	possible TPH-like odor??	7.0			- - - SILT
		CLAY 1 41				100	CLAY: Wet, greenish gray, stiff CLAY	8.0			- - - CLAY
						(AD)	same unit as above, black stiff SILT	8.2	325 2-16oz 8-10'		- - - SILT
							Bottom of core @ 10.0 FT (plus fill shoe 0.4 = 10.4 FT but not sampled).	10.0			- - -
							Baggie: At 4.8' = orange nugget At 1.2' = black chunk				- - -
							PID baggie: At 5.8' = 0.0				- - -

- At 6.6'
TV = 4.2
big

- At 8.4'
TV = 2.0
big

MCS Environmental MudMole Bore Log

[Handwritten signature]

Collection Information

Date: 2-10-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Place Field ID Label Here

Station Name: 8 R1

Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 46.5

Time: 10:45

Northing 209589

Est. Tide Height (ft) 7.2

(MLLW)

Easting 1266614

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 6.3

Comments: flooding tide - 46 ft diver depth - sandy silt -

no debris - no slope - 7 ft vis

~ 4 ft off station

Penetration Tape Reading	Recovery Tape Reading	Comments
15.3	15.5	
13.5	13.4	
11.3	11.0	
9.2	8.9	
6.5	6.7	
4.5	5.2	
2.8	4.0	
1.5	3.2	
core catcher failed		

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 8 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

209589

Northing

Date: 2/10/2006

Time: 10:45

1266614

Easting

Water depth: 46.5 ft

Mudline: -39.2 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Sunny

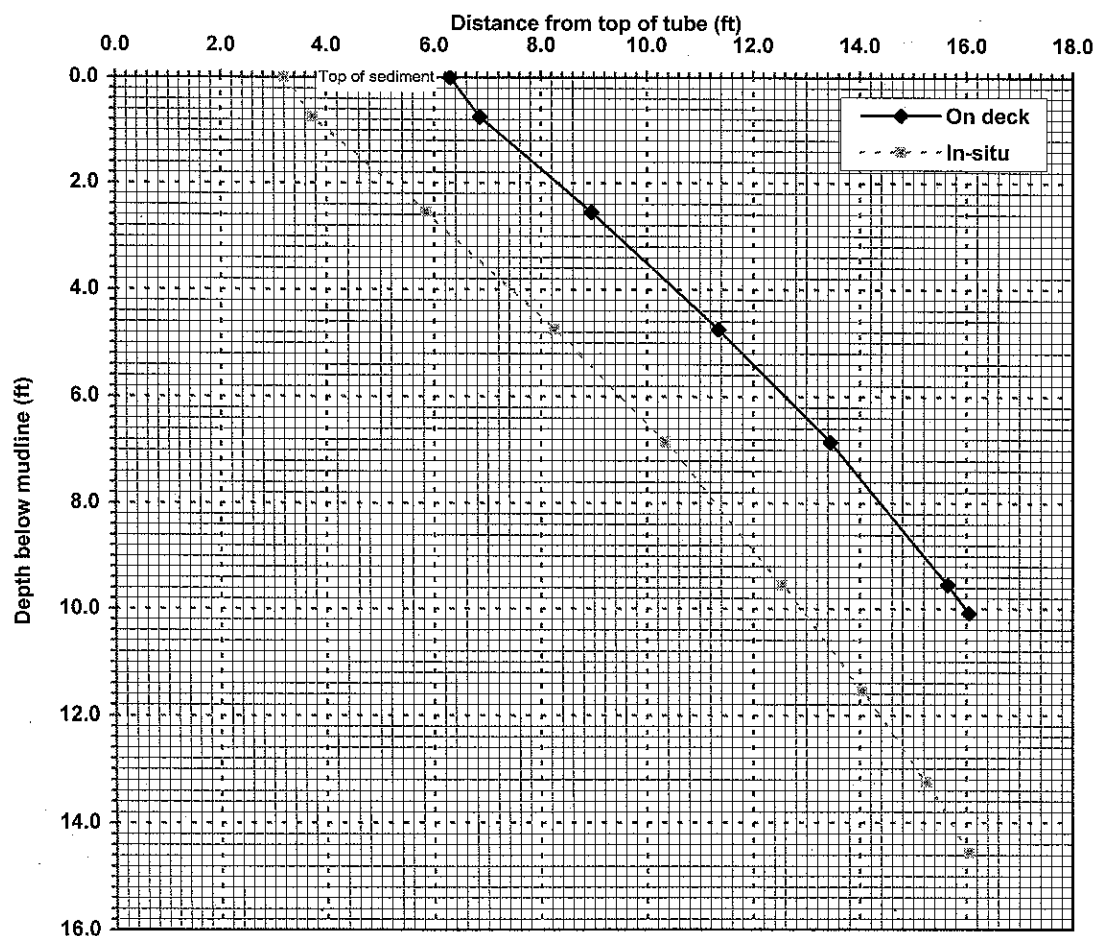
Core catcher failed

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------

0-0.75	0.55	73%
0.75-2.55	2.1	117%
2.55-4.75	2.4	109%
4.75-6.85	2.1	100%
6.85-9.55	2.2	81%
9.55-11.55	1.5	75%
11.55-13.25	1.2	71%
13.25-14.55	0.8	62%

Mudline	6.3
1	7.14
2	8.31
3	9.44
4	10.53
5	11.60
6	12.60
7	13.57
8	14.39
9	15.20
10	15.99
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Penetration 14.55 ft/ On deck recovery 9.75 ft = 67% Recovery

Station Number: 8
 Attempt: 1
 Field Technician: TD/LM
 Contractor: MCS/ESS
 On-site Visitor: _____

Dated: 2/10/08
 Core Tube Length: 16.05
 Lead Line Water Depth: 46.5
 Latitude: 20°58'N
 Longitude: 126°06'W ~4ft off target

Pre-Dive and Dive Observations

Shoreline & surrounding area: Rip rap to east, wood & metal pier (general Reclam) to west, mid nar. channel
 Sediment surface & slope: no debris, no slope, sandy silt
 Water current and visibility: 7ft vis, no current, flood tide
 Diver Water Depth 46 Tip Probe Depth _____ Disk Probe Depth _____

Dive Observations

Drive Initiation Time: 10:54 Drive Completion Time: 11:00 Drive Offset: _____
 Estimated angle of drive: eqpt underwater, cannot see est. 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.3	15.5	diver measured, free fall
13.5	13.4	moderate - easy drive
11.3	11.0	moderate - easy drive
9.2	8.9	easy drive
6.5	6.7	easy drive
4.5	5.2	moderate drive
2.8	4.0	moderate - difficult
1.5	3.2	continue drive to get plug, moderate
TOTAL 14.55	TOTAL 12.85	Percent Recovered: <u>88.3</u>

Reason for ending drive: penetration goal reached, (not much tube length left)
 If refusal, reason for refusal: _____

Extraction Observations

Tension on line? yes Stability of vessel: no problems
 Overlying water in core (quantity and description): yes, clear ~100ml
 On Boat Recovery: 6.3 Loss of Sediment: lost 3.1 ft. b/c core catcher failed. (sed. lost during extraction)
 Extraction Observations: core tipped wrapped in plastic AGF: catcher inverted

On-Deck Observations

Staining: 2 lot of silt on sides, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): not seen, sandy silt w/ clay(?) - diver observation

Keep or Retry: Keep core b/c during the drive, penetration did not slow, no hard (sandy) material reached, and there is still ~10 ft. of sediment recovered. (67%)

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Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Sediment Core Processing Log



Job: Duwamish
 Job Number: Por 55-18220
 No. of Sections: 1
 Sample Length (from log): drive = 12.9'
 Avg. % Compaction: undr = 8.4'

Core Location/Sample Number: LDN-SC-9 (R1)
 Date/Time: Feb 13, 2006 start 1645
 Sample Logged by: N. Bacher, A. Fitzpatrick
 Type/Diameter of Sample: 4" ϕ alum MCS
 Sample Quality: good fair poor disturbed

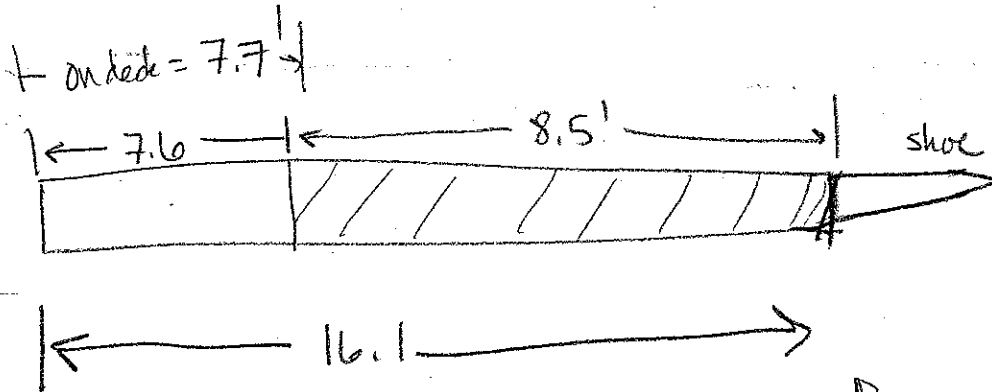
Notes: 0% Rec = 65%

core collected today, kim left - did not observe this core, Amir did.

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, blots, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		GLY 1 2.5 10G greenish black		5	85		in breath zone / TV hole 2" OC SAND: loose, black, wet, sl. silty F-M SAND w/ scattered wood frags + rootlets over black sandy SILT w/ H ₂ S odor (moderate) transition	1710	0-1		SAND
0.5				20	80	(0.0)		5	3-1602		SILT
1.0		GLY 1 2.5 N black		10	90		SILT (ML): black, med stiff, wet, sandy SILT w/ scattered wood frag, strong H ₂ S. transition	GTE 0.9			Recent SILT
							ML/OL: wet, med stiff, black, (organic) SILT w/ moderate scattered sm. wood frags, slight H ₂ S, uniform, no layers, compressible texture, Trace HC-like odor from about moderate plasticity. 1.5 to 2.6 FT	1.0			at 0.4' TV=3.0 big
					98	(0.0)		175	1-2.6		at 1.4' TV=2 big
2.0								2.0	3-1602		DRG? SILT
							transition	2.6	GTE 2.5		
3.0		DYR 3.1 2.2 Very dark brown		70	30		SAND/WOOD: damp, loose to med dense, dark brown WOOD layers, ^{finely/hinted} interbedded w/ dark grayish brown silty F-SAND layers w/ some M-SAND layers. nice, uniform alternating layers ~ 2" thick, low plasticity, scattered soft, very wet "fresh" wood frag up to 1" L, scattered rootlets, slight H ₂ S, wood also moderately scattered throughout.	3.0	1720		WOOD
				40 to 70% WOOD				4.0	2.6 to 4.0		SAND/WOOD
			95	5				4.0	3-1602		at 3.8' TV=1.8 big
4.0						(0.0)		4.0			WOOD
								5.0	1725		at 4.6' TV=2.5 big
5.0						(0.0)		5.0	4-6.4		
								6.0	3-1602		

LDW-SC-09

Feb 13, 2004



Full to beginning
tip of shoe
no winnowing but
hard gray clay at
bottom; slightly broken
off. shoe empty

Sediment Core Processing Log



Job: Duwamish LDW
 Job Number: POISS-18220
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: LDW-SC-9 (R1)
 Date/ Time: Feb 13, 2006
 Sample Logged by: N. Becker, A. Fitzpatrick
 Type/Diameter of Sample: _____
 Sample Quality: good fair poor disturbed

Notes: See page 1

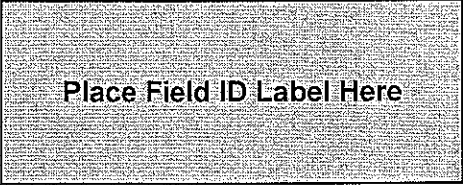
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
							Same as above				SAND
7.0		CLAY 2 6/8B bluish gray		100		(O.D.)	CLAY: moist, stiff, light gray (glacial color) silty CLAY, w/ 1" black-colored bands uniformly spaced (but no textural difference), convex bands, homogenous, highly plastic (native-looking). contact sharp	6.4	1730 2-1602 6.4-8.5		+ / CLAY
8.0								8.0			
9.0							Bottom of core @ 8.5' shoe empty but material is intact	8.5			
							Notes: a) No shell fragments observed in core. b) Unique units observed, inconsistent w/ previous observed cores.	9.0			

At 6.9'
TV = 0.9
big

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-13-06 Recorder: GSM



Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 9 R1

Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): ~~38~~ ^{lead time} 30

Time: 1031

Northing 208919

Est. Tide Height (ft) 4.6 ^{diver} (MLLW)

Easting 1266863

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 7.7

Comments: Slack low tide - strong surface current

Diver depth 30 silty sand - flat bottom - 5 ft vis, moderate current / 1 ft off station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.2</u>	<u>14.6</u>	
<u>12.5</u>	<u>12.1</u>	
<u>10.5</u>	<u>10.7</u>	
<u>8.2</u>	<u>10.0</u>	
<u>6.1</u>	<u>9.4</u>	
<u>4.2</u>	<u>8.3</u>	
<u>3.2</u>	<u>7.5</u>	<u>reached goal</u>
<u>silty clay plug in top of core</u>		

Mudmole™ Bore Log

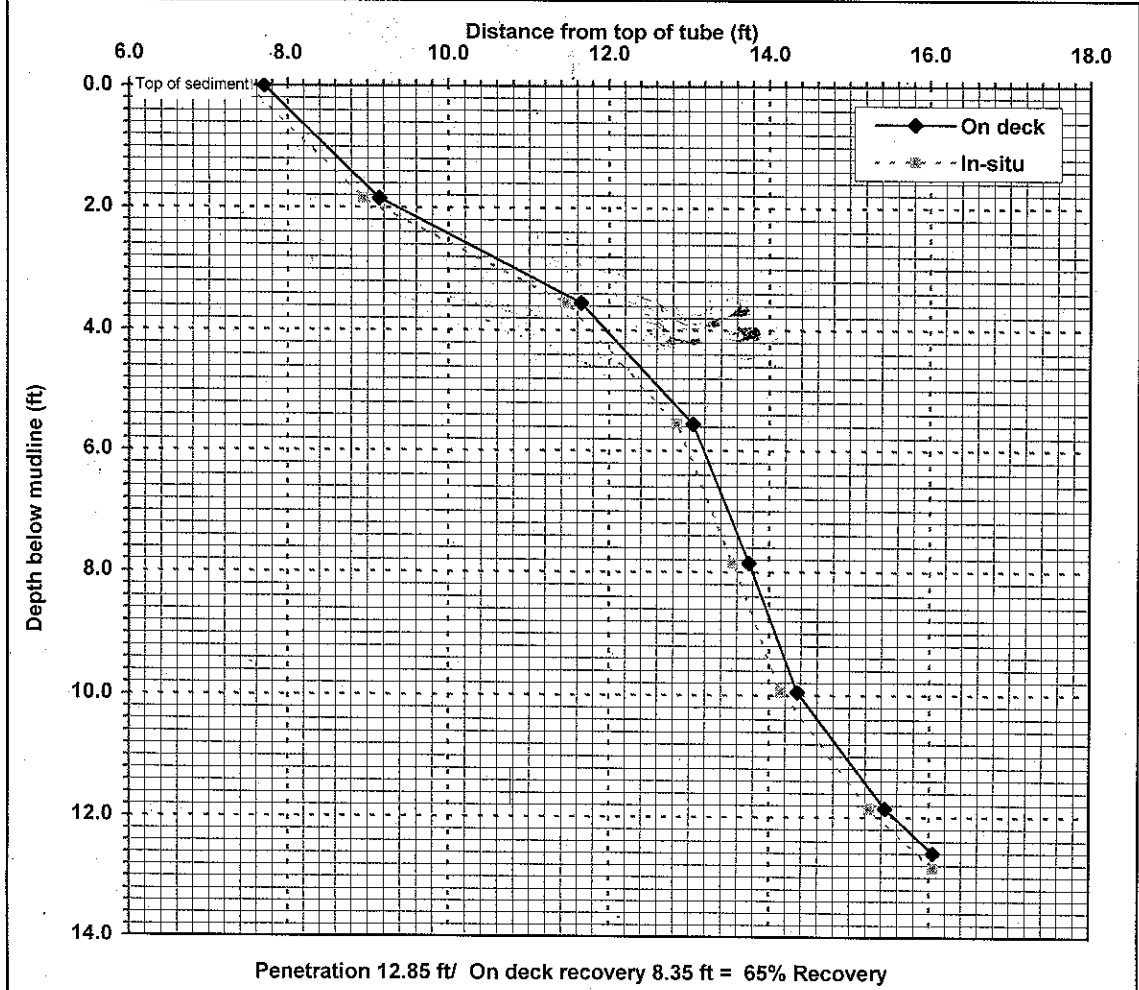
Project: LDWG Duwamish Coring **Station:** 9 R1
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 208919 Northing
Date: 2/13/2006 **Time:** 10:31 1266863 Easting
Water depth: 30.0 ft **Mudline:** -25.4 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Overcast
 Diver depth used, strong surface current

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------



0-1.85	1.45	78%
1.85-3.55	2.5	147%
3.55-5.55	1.4	70%
5.55-7.85	0.7	30%
7.85-9.95	0.6	29%
9.95-11.85	1.1	58%
11.85-12.85	0.8	80%

Mudline	7.7
1	8.48
2	9.37
3	10.84
4	11.97
5	12.67
6	13.19
7	13.49
8	13.79
9	14.08
10	14.38
11	14.96
12	15.57
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 9 Date: 2/12/06 Station Arrival Time: 1015
 Attempt: 1 Core Tube Length: 10.05 Station Departure Time: 1055
 Field Technician: TD Lead Line Water Depth: not done Dist. From Target Station: 1
 Contractor: MIS/RSS Latitude: 208919
 On-site Visitor: _____ Longitude: 12608103

38.0 ft. considered valid compared to bathymetry assessment
 JB
 05.25.06

Pre-Drive and Diver Observations:

Shoreline & surrounding area: mid nar channel, rip rap on on east & west bank
 Sediment surface & slope: silty sand, flat bottom
 Water current and visibility: strong surface moderate current, slack low tide, 5ft vis. mod. current
 Diver Water Depth 30 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1034 Drive Completion Time: 1042 Drive Offset: _____
 Estimated angle of drive: equiv under water cannot see est -10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
14.2	14.6	diver recorded, free fall, easy-moderate drive
12.5	12.1	easy drive
10.5	10.7	easy drive
8.2	10.0	easy-moderate drive
6.1	9.4	moderate drive
4.2	8.3	moderate drive
3.2	7.5	moderate drive
TOTAL 12.85	TOTAL 8.55	Percent Recovered <u>10.5</u>

Reason for ending drive: reached penetration goal, running out of core tube length.
 If refusal, reason for refusal: _____

Extraction Observations:

Tension on line? Y Stability of vessel: bow list to port
 Overlying water in core (quantity and description): yes, clear, ~300mL
 On Boat Recovery: 7.7 Loss of Sediment: 0.2
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: dark silt & sand, sprayed off
 Tube Deformation: no
 Sediment Description (odor or sheen?): dark sand/silt; no odor or sheen, grey clay

Keep or Retry: seal plug inserted by diver at sed/H₂O interface

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log



Page 1 of 2

Job: DUNARMISH
 Job Number: PD155-1822D
 No. of Sections: 1
 Sample Length (from log): Drive = 10.6'
 Avg. % Compaction: on deck = 8.8'

Core Location/Sample Number: LDN-SC-10 (R1)
 Date/Time: Feb 10, 2006 start 1445
 Sample Logged by: A Fitzpatrick
 Type/Diameter of Sample: 4" alum MCS
 Sample Quality: good fair poor disturbed

Notes: old Rec = 83%
core collected = same day John observed processing - DR w/

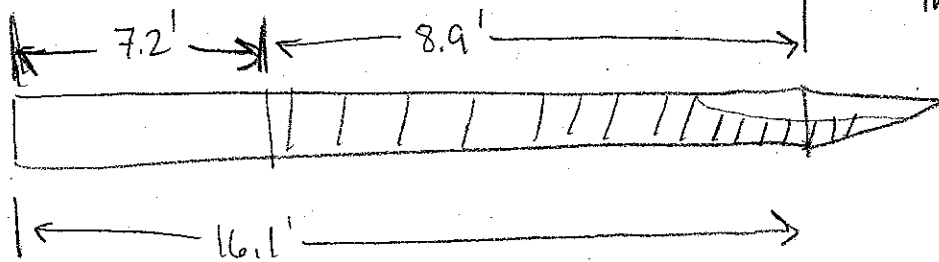
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
							in beach zone clear surface				
		GLEYS 4156Y greenish gray	50	30	10		2" of olive brown scummy silt over wet, loose, dark gray, sl. silty, sl. sandy GRAVEL 1/2" & subgranular "pea gravel", scattered wood w/ mod. shell frags (v. small) gray, white blk frags	1525 0-1' 3-1602			SILT Gravel
6.0		GLEYS 251N black	tr	10	90	(0.0)	SILT: wet, med stiff, black, clayey SILT, highly plastic, moderate H ₂ S odor, trace sand, scattered voidlets, hairlets, shell frags, no layering, uniform w/ depth, less water w/ depth, slightly compressible texture	6TE09' scotch 1530 1-2' 3-1602			- At 1.2' TV = 2.5 big
2.0						(0.0)		1535 2-4' 3-1602			SILT - At 2.3' TV = 1.8 big
3.0				5	95		- At 3.4' mussel shell 1/2 fragment	GT=2.9' scotch			
4.0		CLAY 5156Y greenish gray			100	(0.0)	contact sharp CLAY: wet, stiff, med. greenish gray silty CLAY, highly plastic, uniform texture, no layering, massive dark silty pockets	1540 4-5' 2-1602			# CRAY CLAY - At 4.5' TV = 2.2 big
5.0		LEYS 3104 v. dark greenish gray		45	65	(0.0)	sharp contact SILT: moist to wet, stiff, dense dark brownish gray sl. clayey SILT w/ sand interbeds (1/2" F SAND) + abundant woody frag, plant material, + scattered peat clasts/pockets 1" & decreasing w/ depth. clasts end a 6' then grading to unit below scattered woody material	1545 5-10' 2-1602			SILT w/ Peaty - At 5.4' TV = 2.4 big

LDW-SC-1D

Feb 10, 2006

ACF

on deck = 7.3'



some slumping (from winnowing below)
from 7.7 ft 8.5'
therefore, only sample
8.0'
make sure to tag
sand

↑
shoe 50% Full
evidence of partial
winnowing
50% Full from 8.5 to 8.9''

Sediment Core Processing Log



Job: Duwanish
 Job Number: PWS5-18220
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: LDW-SC-10 (R1)
 Date/ Time: Feb 10, 2006
 Sample Logged by: _____
 Type/Diameter of Sample: _____
 Sample Quality: good fair poor disturbed

Page 2
of 2

Notes: see page 1

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		↓ Same as above		50	50	(O.D.)	SILT: same as above dark gray, moist, stiff SILT w/ sand interbeds, scattered rootlets transitioning to sand w/ silt interbeds - 1" woody layer @ 6.6 FT transition end of wood	7.0	155D 2-1602 6-81		SILT + SAND
		v. dark greenish gray		80	20		SAND: dark gray, moist, dense, M-SAND w/ drab gray silt layers (1/8" thick, horizontal) native-looking no wood frags w/ peaty material. natural transitions/grading 4.8 to bottom coarser w/ depth (native-looking)	8.0	Not Sampled slightly winnowed		SAND
							Bottom of core 8.9 FT (but only sample to 8.0' partly winnowed below 50% loss) no sheen/odor observed throughout core	8.9			
								9.0			
								10.0			

At 6.3' TV = 4.0 big

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-10-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: ~~10 R~~ 10 R1

Tube Length (ft): 16.05

Water Depth (ft): 24.6

Est. Tide Height (ft): 6.8 (MLLW)

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 208776

Easting 1267167

On Deck Top of Sediment 7.3

Comments: Flooding tide

24 ft diver depth - sandy silt - no slope - vis 5'
5' off station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.5</u>	<u>15.6</u>	
<u>14.4</u>	<u>14.4</u>	
<u>12.3</u>	<u>12.2</u>	
<u>10.3</u>	<u>10.1</u>	
<u>8.3</u>	<u>8.5</u>	
<u>6.3</u>	<u>7.6</u>	<u>penetration rate slowed</u>
<u>5.5</u>	<u>7.2</u>	<u>refusal</u>
<u>lost some silty sand out of tip during extraction</u>		

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 10 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

208776

Northing

Date: 2/10/2006

Time: 9:46

1267167

Easting

Water depth: 24.6 ft

Mudline: -17.8 ft MLLW (estimated using tide tables)

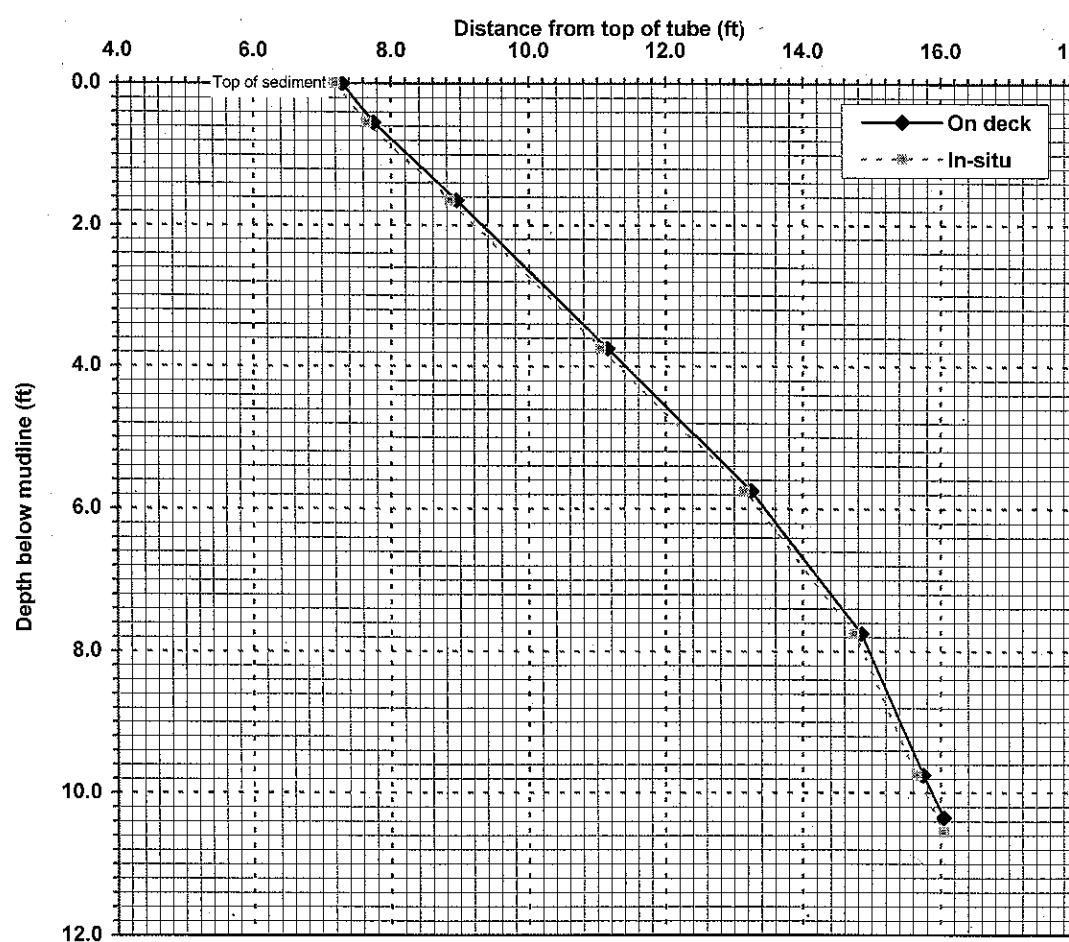
Place Field ID Label Here

Weather/Comments: Sunny

Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-0.55	0.45	82%
0.55-1.10	1.2	109%
1.10-1.65	2.2	105%
1.65-3.75	2.1	105%
3.75-5.75	1.6	80%
5.75-7.75	0.9	45%
7.75-9.75	0.4	50%
9.75-10.55		

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	7.3
1	8.24
2	9.32
3	10.36
4	11.41
5	12.46
6	13.45
7	14.25
8	14.96
9	15.41
10	15.88
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Penetration 10.55 ft/ On deck recovery 8.75 ft = 83% Recovery

Station Number: 10

Date: 2/10/06

Attempt: 1

Core Tube Length: 16.05

Field Technician: TD/LM

Lead Line Water Depth: 24.6

Contractor: MCG/BSS

Latitude: 208776

On-site Visitor: —

Longitude: 1267167

5' off target

Drive and Diver Observations

Shoreline & surrounding area: wood pier, rip rap

Sediment surface & slope: sandy silt, no slope

Water current and visibility: visibility 5ft: flood tide

Diver Water Depth 24' Tip Probe Depth — Disk Probe Depth —

Drive Observations

Drive Initiation Time: 0954 Drive Completion Time: 1000 Drive Offset: —

Estimated angle of drive: equip under water, cannot see est. 10°

Penetration'	Recovery'	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.5	15.6	diver measured, free fall
14.4	14.4	easy drive
12.3	12.2	easy
10.3	10.1	easy-moderate
8.9 ^{no}	8.5	easy
6.3	7.6	easy-moderate, penetration slowing
5.5	7.2	wake is listing boat side to side; moderate-difficult
TOTAL 10.55	TOTAL 8.95	Percent Recovered: <u>83.9</u>

Reason for ending drive: refuse

If refusal, reason for refusal: sand, diver observed

Extraction Observations

Tension on line? yes Stability of vessel: no listing

Overlying water in core (quantity and description): clear

On Boat Recovery: 7.3 Loss of Sediment: some silty sand loss upon extraction

Extraction Observations: —

On Deck Observations

Staining: residual silt on core, sprayed off

Tube Deformation: no

Sediment Description (odor or sheen?): no sheen, no odor, med. dk gray sand

Keep or Retry: screw plug inserted by diver at sed/water interface

Notes:
Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log



Page 1 of 2

Job: DUNAMISH
 Job Number: POF55-1822D
 No. of Sections: 1
 Sample Length (from log): drive = 5.95'
 Avg. % Compaction: no data = 4.95'

Core Location/Sample Number: LDW-SC-11
 Date/ Time: Feb 13, 2006 start 1430 ship 1510
 Sample Logged by: N. Backus, A. Fitzpatrick
 Type/Diameter of Sample: 4" alum MCS
 Sample Quality: good fair poor disturbed collected 02/12/06

Notes: R = 83%

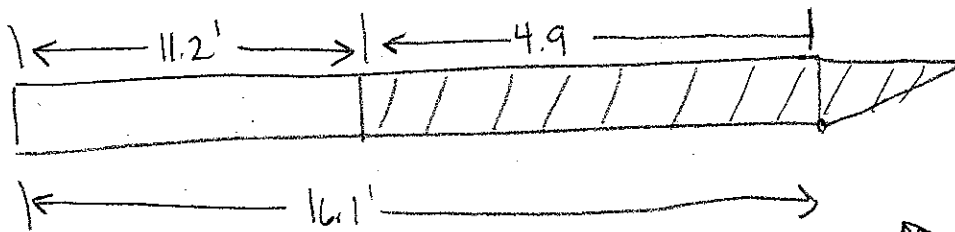
Kim observed core and approved core for processing (1) all units represented (2) hard clay in situ (3) location is unaltered.

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		25YR 2.5/N black		20 80 (4% WOOD FRAGS) HWSS			WDOPX SILT: wet, soft, silty, sandy SILT jumbled looking w/ wood. wood frags, black subst. cedar chips and scat 2 pc. red chips (possibly paint) pc plastic + leather, strong H2S odor, 2 pc. glass shards	0.0	1440 3-16.2 0-0.8		SOFT SILT
		10YR 3/1 v. dark gray		75 25 (O.D.)			SAND: med dense, moist to wet, brownish gray silty F-SAND, no layers, homogeneous, no odor/sheen ↓ decreasing silt w/ depth * core catcher lodged in sidewall at 0.8 FT	0.8 4.0	1445 3-16.2 0.8 to 2 GT COA jookeh		SAND At 1.2' TV=4.2 big (inclined surface)
		10YR 4/1 dark gray	60	20 20 100			GRAVEL: wet, loose, gray, silty, sandy GRAVEL w/ subrounded, up to 2" & moderate small shell frags, decreasing gravel w/ depth transition	2.0 4.0 4.1	1450 3-16.2 2-3.4 1455 3.4 to 4.1 2-16.2		
		5Y 6/4 olive yellow		100 (O.D.)			CLAY: damp, mottled greenish gray, very dense & silty CLAY (gleeclay) massive, no layering, low plasticity.	5.0	1460 2-16.2 4.1 to 5		CLAY At 4.5' TV=6 small
							Bottom of core @ 5.0 FT				
							1 baggie @ 0.7 FT = red chips, pc. debris.	4.1			

LDW-SC-11

Feb 13, 2006

on deck = 11.1'



Shot is Full
V. stiff stay clear
Sample to 5 FT.

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 11 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

208291

Northing

Date: 2/13/2006

Time: 9:34

1265908

Easting

Water depth: 2.6 ft

Mudline: 2.7 ft MLLW (estimated using tide tables)

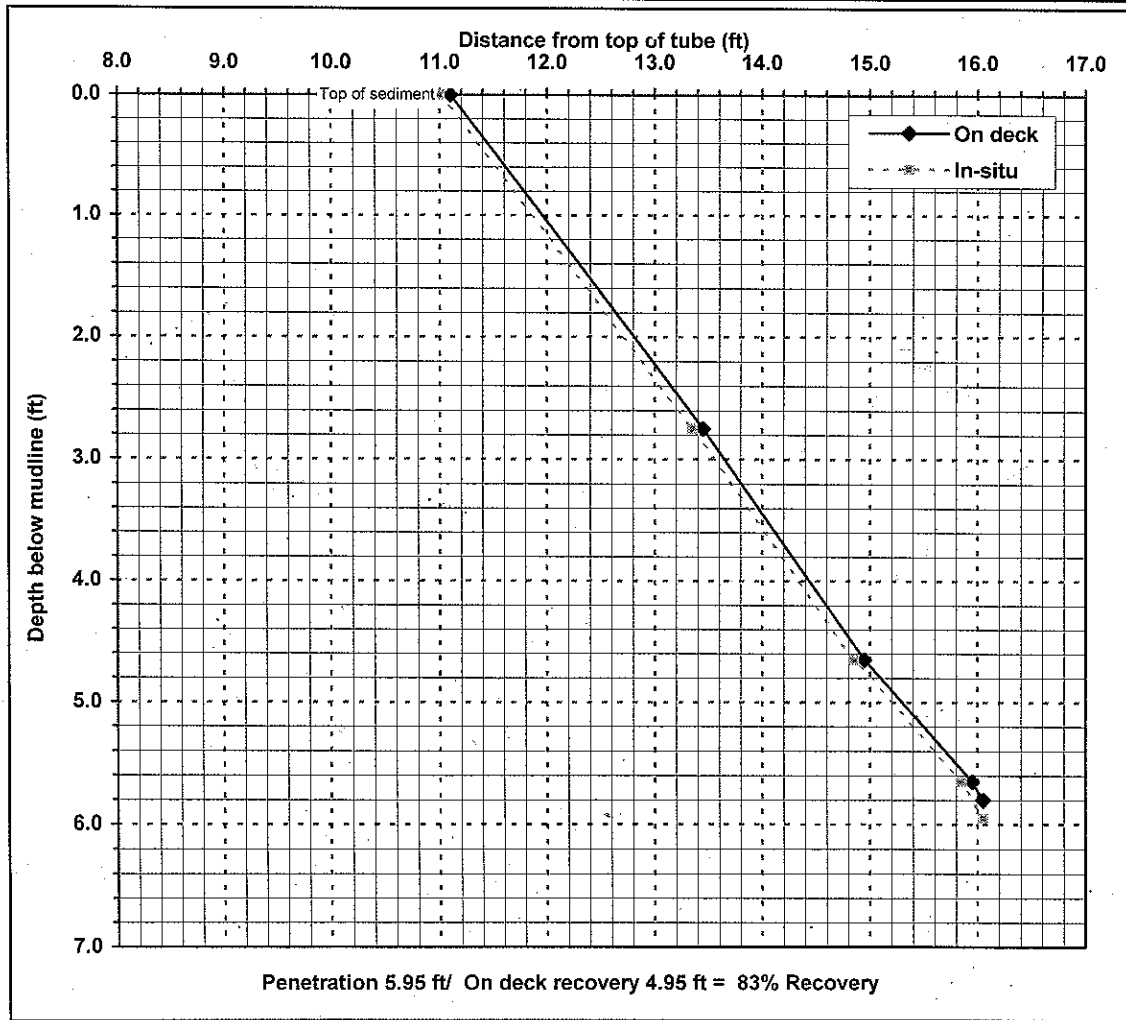
Place Field ID Label Here

Weather/Comments: Overcast

Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-2.75	2.35	85%
2.75-4.65	1.5	79%
4.65-5.65	1	100%
5.65-5.95	0.2	67%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	11.1
1	11.95
2	12.81
3	13.65
4	14.44
5	15.30
6	No sample
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



MCS Environmental MudMole Bore Log

Collection Information

Date: 2-13-08 Recorder: GSV

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 11 R1

Tube Length (ft): 16.95

Water Depth (ft): 2.6

Est. Tide Height (ft): 5.3

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 208291

Easting 126598

On Deck Top of Sediment 11.1

Comments: scattered rip rap & bricks at site - moved 17 A off station

to find soft area - no diver used

very hard to extract core from bottom

Penetration Tape Reading

Recovery Tape Reading

Comments

13.3

13.7

11.4

12.2

10.4

11.2

10.1

11.0

return

hard gray clay in tip of core tube

Station Number: 11 Date: 2/13/08 Station Arrival Time: 0915
 Attempt: 1 Core Tube Length: 16.05 Station Departure Time: 1007
 Field Technician: TD Lead Line Water Depth: 7.6 Dist. From Target Station: 17
 Contractor: MCS/RSB Latitude: 20B291
 On-site Visitor: — Longitude: 1265408

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, bricks, wood debris
 Sediment surface & slope: silt, sand, shallow to flat slope (deck observed, no diver used)
 Water current and visibility: mod. surface current, shallow intertidal station
 Diver Water Depth N/A Tip Probe Depth — Disk Probe Depth —

Drive Observations:

Drive Initiation Time: 0931 Drive Completion Time: 0943 Drive Offset: —
 Estimated angle of drive: core tube guide used, est. 10°-15°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
13.3	13.7	deck measured, moderate drive
11.4	12.2	moderate drive
10.4	11.2	moderate-hard drive
10.1	11.0	off core tube guide, hard drive, refusal
TOTAL 5.95	TOTAL 5.05	Percent Recovered: 84.9

Reason for ending drive: refusal
 If refusal, reason for refusal: hard material

Extraction Observations:

Tension on line? Y Stability of vessel: difficult, bow dipped forward
 Overlying water in core (quantity and description): just a little, clear
 On Boat Recovery: 11.1 Loss of Sediment: none
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, difficult

On Deck Observations:

Staining: silt and sand, moderate, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): gray hard clay plug, no odor, no sheen

Keep or Retry: keep, hit hard clay

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log

Job: LDN 6 Core processing
 Job Number: PURS 18220-511
 No. of Sections: 1
 Sample Length (from log): 8.7
 Avg. % Compaction:

Core Location/Sample Number: SC-12-R1
 Date/Time: 2/16/06
 Sample Logged by: LMcke
 Type/Diameter of Sample: 4" Sq. aluminum
 Sample Quality: good fair poor disturbed

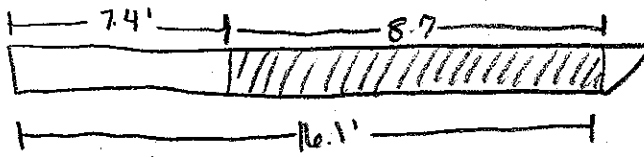
Notes: Pen = 90' } 91% Rec
on Deck Rec = 8.7'

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.57 4/3 - ol. brown					0.0-0.1 olive brown SILT			0-0.5 1515	- SILT -
		2.54 2.511 black	-	10	90	8	0.1-2.6 (ona) SILT. wet, med stiff, black, low plasticity sl. sandy SILT (org). shell fragments abundant rootlets + wood fragments massive, blocky, uniform sl. compressibility, low plasticity organic matter (leaf litter) @ 1.0: woody fragments to 0.5' L	0-2 1450 GT 0.9		0.5-1 1518	- wood
1							mod. H ₂ S-like odor + metallic color to the SILT. @ 2.0 strong H ₂ S-like odor			1-1.5 1521	@ 1.3 TV = 25 B16
2							@ 2.5 0.1" shell piece (1/2 shell) transition	2		1.5-2 1524	SILT (ORG)
		unit = 2.54 511 gray Red = 2.54 2.511 black	-	10	98	8	2.6 (SILT w/ clay) most dense, high stiffness gray clayey SILT interbedded with moist, med. dense black sl sandy SILT wood fragments			2-2.5 1527	
3							strong H ₂ S-like odor	3		2.5-3 1530	
										3-3.5 1533	@ 3.4 TV = 1 B16
4								4		3.5-4 1536	SILT
										4-4.5 1539	
5								5		4-6 1500	
							@ 5.0: 3" pieces wood (fragment) stiffening - composition with depth (no color) (or test. A)			4.5-5 1542	
							transition			5-5.5 1545	@ 5.4 TV = 3.0 B16
6							OVER NEXT PAGE	6		5.5-6 1548	

SC-12-R1

2/16/06

LM



Mudline = 7.4'

5.1
16.1
7.4
8.7

core shoe is $\frac{5}{6}$ full of ^{fine} multicolored grained bl sand

Sediment Core Processing Log



Job: LDWG Core Processing
 Job Number: POLS 8200-S11
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:

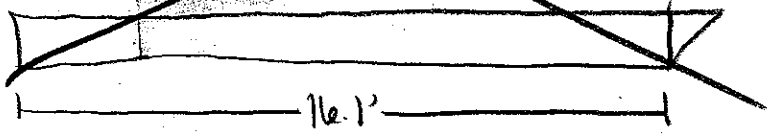
Core Location/Sample Number: SG-12-R1
 Date/ Time: 2/16/06
 Sample Logged by: LM
 Type/Diameter of Sample: 4" eq. aluminum
 Sample Quality: good fair poor disturbed

Notes: CONTINUED CONTINUED

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch	
		unit GREY 4/10y d. greenish grey Bed:	-	10	90	Ø	5.9-6.6 SILT w/ SAND interbeds unit - moist, med stiff, dk greenish black, SILT from above with BEDS = sl. sandy SILT up to 3" layers, woody debris to 0.2' L milky H ₂ S-like odor					SILT w/ SAND
7		GREY 2.5-9/10y greenish black					6.6-8.7 SAND moist, dk greenish-black grey SAND with clasts + layers of SILT (olive grey) moist, sl compressible, play-do like) up to 0.05' L interspersed to end of core. no odor	7	6-8.7 6.05 2.1602		SAND @ 7' TV=3.5 B16	
8		GREY 3/1 v.d.k. greenish grey	-	95	5	Ø	Ø 8.0 peat pockets/clasts to 8.7'	8			← Peat Ø 8.2 TV=4 B16	
9							End of Core @ 8.7'	9				
10								10				
11								11				

SC-12-R1

2/16/06
LM

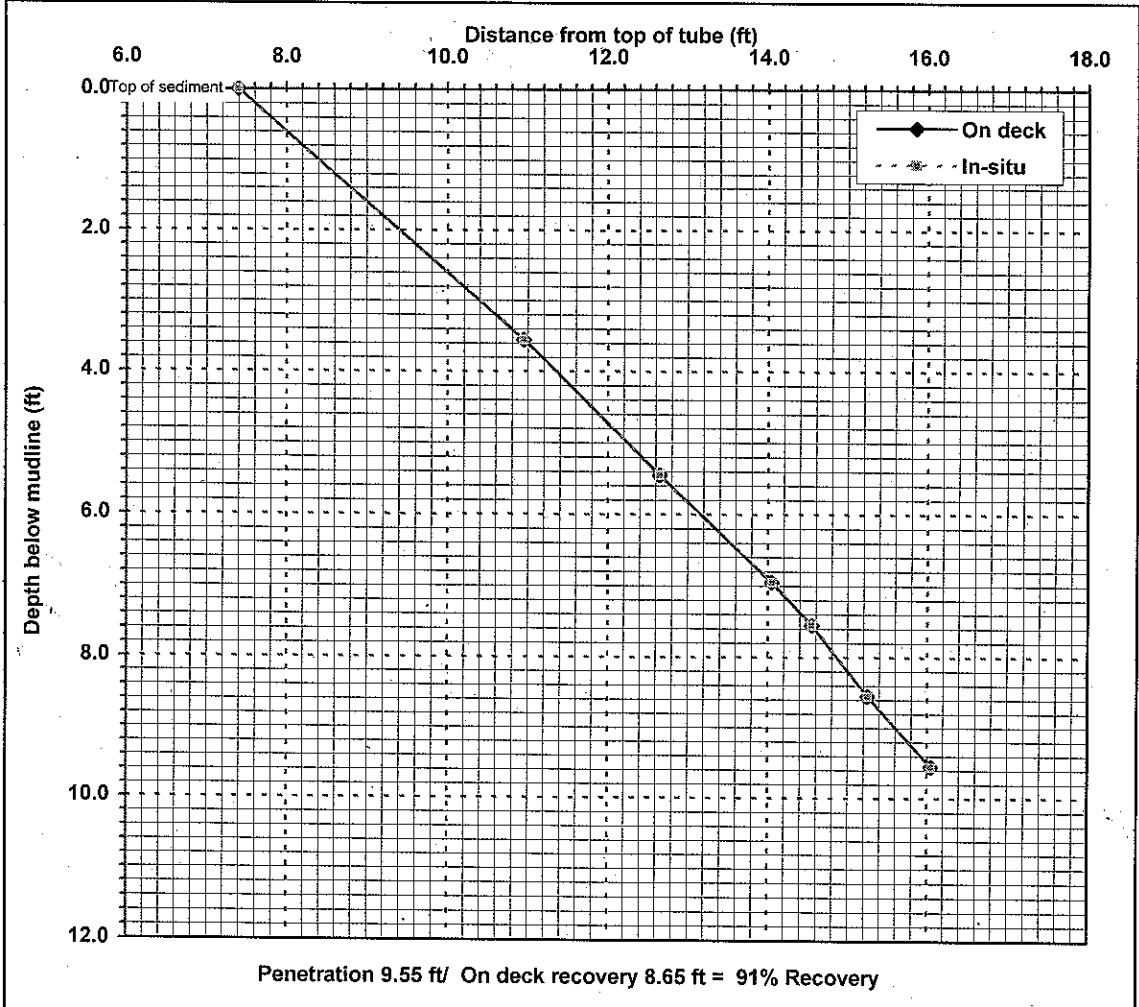


Mudmole™ Bore Log

Project: LDWG Duwamish Coring	Station: 12 R1	Place Field ID Label Here
Project No: 341185.001	Position: NAD83	
Collected by: GSM	208217	
Date: 2/16/2006	Time: 10:55	
Water depth: 13.7 ft	Mudline: ft MLLW (estimated using tide tables)	

Weather/Comments: N/A
 Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
---------------------------	------------------------	------------------	--------------------------	--------------------------------



0-3.55	3.55	100%	Mudline	7.4
3.55-5.45	1.7	89%	1	8.40
5.45-6.95	1.4	93%	2	9.40
6.95-7.55	0.5	83%	3	10.40
7.55-8.55	0.7	70%	4	11.35
8.55-9.55	0.8	80%	5	12.25
			6	13.16
			7	14.09
			8	14.87
			9	15.61
			10	No sample
			11	No sample
			12	No sample
			13	No sample
			14	No sample
			15	No sample
			16	No sample
			17	No sample
			18	No sample
			19	No sample
			20	No sample

Station Number: 12
 Attempt: P1
 Field Technician: T.OO, JMF
 Contractor: MCS, RSS
 On-site Visitor: ---

Date: 2/16/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 13.7
 Latitude: 20° 21' 7"
 Longitude: 126° 05' 77"

Station Arrival Time: 1040
 Station Departure Time: 1120
 Dist. From Target Station: ~2

Pre-Drive and Diver Observations:

Shoreline & surrounding area: Kellogg Island, wood pilings & dolphins, logs, gravel, peat/clay shelf
 Sediment surface & slope: gentle slope, grainy silt, no debris
 Water current and visibility: ebbing tide
 Diver Water Depth: 13 Tip Probe Depth: --- Disk Probe Depth: ---

Drive Observations:

Drive Initiation Time: 1100 Drive Completion Time: 1105 Drive Offset: ---
 Estimated angle of drive: under water est to be 10° JMF

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
		<u>deck measured</u>
<u>12.5</u>	<u>12.5</u>	<u>easy drive - diver measured</u>
<u>10.6</u>	<u>10.8</u>	<u>easy drive - diver measured</u>
<u>9.1</u>	<u>9.4</u>	<u>easy drive - diver measured</u>
<u>8.5</u>	<u>8.9</u>	<u>moderate drive, penetration slowed</u>
<u>7.5</u>	<u>8.2</u>	<u>moderate to difficult, penetration very slow</u>
<u>6.5</u>	<u>7.4</u>	<u>difficult drive, refusal</u>
TOTAL <u>9.55</u>	TOTAL <u>8.65</u>	Percent Recovered: <u>90.5%</u>

JMF

Reason for ending drive: refusal
 If refusal, reason for refusal: hard substrate

Extraction Observations:

Tension on line? Y Stability of vessel: no problem
 Overlying water in core (quantity and description): slightly turbid ~ 2.5L
 On Boat Recovery: 7.4 Loss of Sediment: 0
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: silty, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): no odor, no sheen, dark brown md to fine sand

Keep or Retry: diver instead inserted screw plug at sed/H2O interface

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Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-16-06 Recorder: BSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 12 R1

Tube Length (ft): 16.05

Water Depth (ft): 13.7

Est. Tide Height (ft): 2.8

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 208217

Easting 1266577

On Deck Top of Sediment 7.4

Comments: falling tide - grainy silt - 13A depth - gentle

slope - no debris

22A off station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>12.5</u>	<u>12.5</u>	
<u>10.6</u>	<u>10.8</u>	
<u>9.1</u>	<u>9.4</u>	
<u>8.5</u>	<u>8.9</u>	<u>penetration rate slowed</u>
<u>7.5</u>	<u>8.2</u>	
<u>6.5</u>	<u>7.4</u>	<u>refusal</u>

Sediment Core Processing Log



Job: DUNAMESH
 Job Number: POVS5-18220
 No. of Sections: 1
 Sample Length (from log): drive = 12.5'
 Avg. % Compaction: on deck = 9.9'
 Notes: pld Rec = 79%

Core Location/Sample Number: LDW-SC-13 (P1)
 Date/Time: Feb 13, 2006 start 1630 end 1630
 Sample Logged by: N. Bacher, A. Fitzpatrick
 Type/Diameter of Sample: 4" alum MCS
 Sample Quality: good fair poor disturbed

CDP collected today Kim observed core + processing

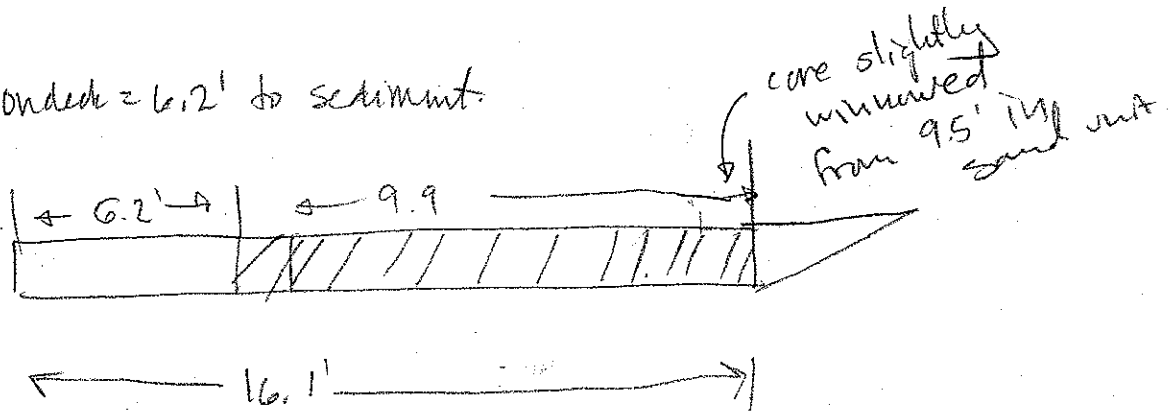
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		GLEV2 2 5/16" greenish black		100			wet, loose, gray medium to coarse sand w/ minor shell fragments trace silt, trace small gravel			1610 1-1602	
1.0		GLEV1 3/1 v. dk. greenish gray		60	40	⊙	moist, med. soft, olive gray silty sand w/ 25% wood, frags, roots. moderate to strong H ₂ S odor.	1.0	1545 3-1602	1610 16-02	 @1.0 N=1.5 big
2.0				10	90		transitional moist, medium stiff, olive gray silt w/ minor sand. 25-30% wood, like above. H ₂ S odor diminishes.	2.0		1616 1602	
3.0						⊙	very trace HC-like odor b/w 2.5-3.0'		1550	1619 1602	
4.0		GLEV1 3/1 v. dk. greenish gray		95	5		sharp moist, med. dense, brownish gray fine to medium sand w/ minor silt. HMB of silty layers/pockets, scattered rootlets. multicolored grams red, orange, white.	3.0	3-1602	1622 1602	
5.0		10YR 3/2 v. dk. grayish brown				⊙	4.1-4.5 SAA but silty sand w/ 30% wood fragments & shreds. slight to moderate H ₂ S odor.	4.0	6TE 2.1'	1625 1602	
				95	5		transitional moist, med. dense, brownish gray fine silt interbedded w/ moist med. stiff, grayish brown sl. sandy silt.	5.0	1555	1628 1602	
				15	85			6.0	2-1602	1631 1602	
										1634 1602	
										1637 1602	
										1640 1602	
										1643 1602	

30% wood from 5.5-6.0. shredded slight H₂S odor in this layer ~ peaty, fibrous

LDW-SC-13

Feb 13, 2006

on deck = 6.2' to sediment.



Sediment Core Processing Log



Page 2 of 2

Job: Dunwich
 Job Number: PO55-18220
 No. of Sections: _____
 Sample Length (from log): 8.0
 Avg. % Compaction: Page 1

Core Location/Sample Number: LDW-SC-13
 Date/ Time: FEB 13, 2006
 Sample Logged by: N. Bahr, A. Fitz
 Type/Diameter of Sample: _____
 Sample Quality: good fair poor disturbed

Notes: _____

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5Y 4/1 dk gray	95	5		Ø	minor wood shreds @ 6.6' Interbeds from 1-2" thick and distinct, slightly convex from coring motion. (uniform thickness, banded) trace-scattered roots throughout sand is multicolored red, orange, white. no H ₂ S below about 6.0 ft. (native-looking)		1600		
7.0			15	85		Ø		7.0	2-1602		
8.0						Ø		8.0			
9.0								9.0	2-1602		
10.0							END OF CORE: 9.9'	10.0			
							Cone slightly winnowed from 9.5 to end.	11.0			

@ 6.4'
TV=3.0
big

@ 8.5'
TV=3.5
big

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-13-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring



Station Name: 13 R1

Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 16.5

Time: 1121

Northing 207 096

Est. Tide Height (ft) 4.8

(MLLW)

Easting 12675 85

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 6.2

Comments: flooding tide - diver depth 16 - silty ^{course} sand -

gentle slope - gentle current 5 A visibility
26 ft off station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.7</u>	<u>14.5</u>	
<u>12.9</u>	<u>12.8</u>	
<u>10.8</u>	<u>11.3</u>	
<u>8.7</u>	<u>9.9</u>	
<u>6.7</u>	<u>8.4</u>	
<u>5.6</u>	<u>7.5</u>	<u>penetration rate slowed</u>
<u>4.6</u>	<u>6.7</u>	
<u>3.6</u>	<u>6.0</u>	<u>reached goal</u>
<u>clay plug in tip of core</u>		<u>slow penetration</u>
<u>fine silty sand above</u>		

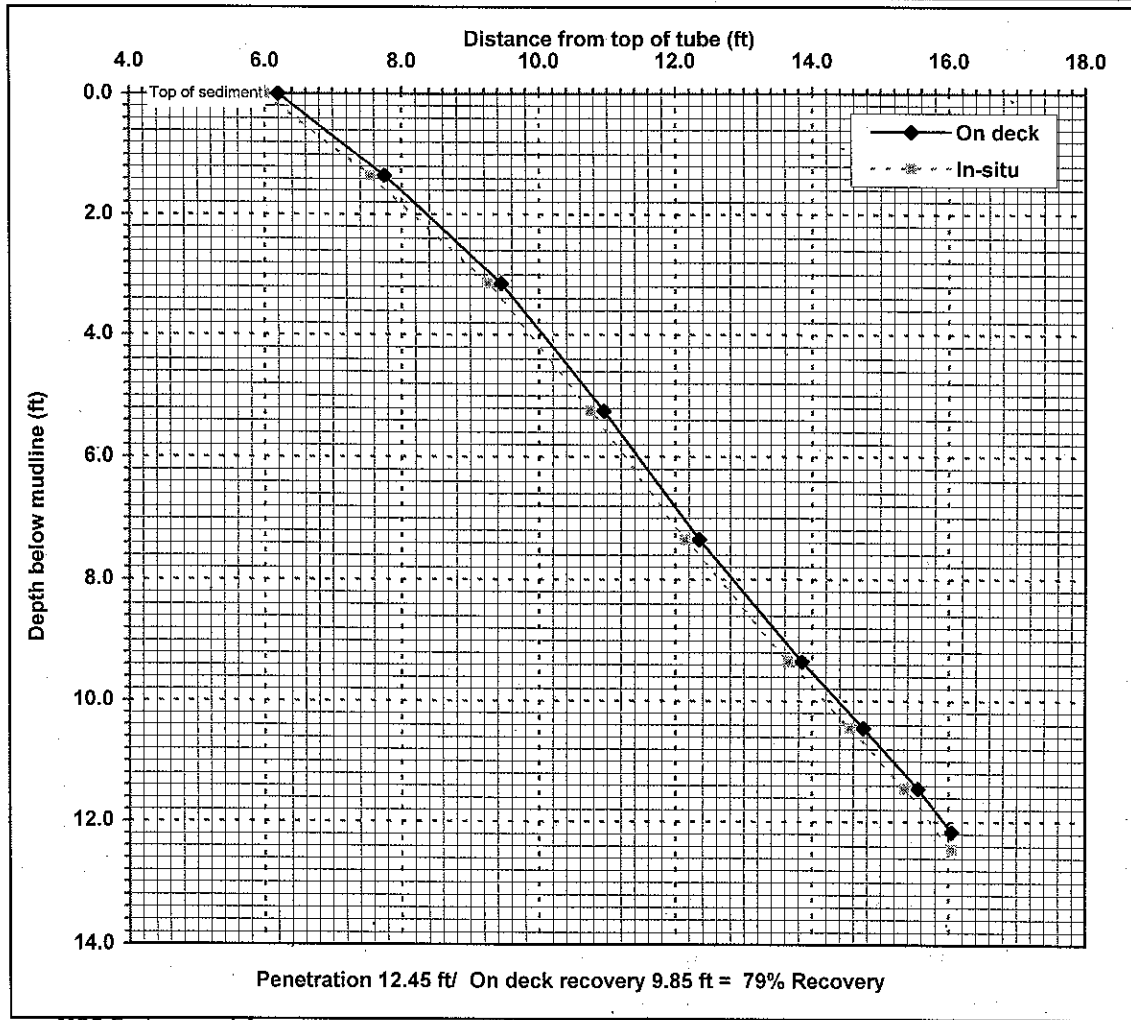
Mudmole™ Bore Log

Project: LDWG Duwamish Coring **Station:** 13 R1
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 207096 Northing
Date: 2/13/2006 **Time:** 11:21 1267585 Easting
Water depth: 16.5 ft **Mudline:** -11.7 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Overcast

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
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0-1.35	1.55	115%	Mudline	6.2
1.35-3.15	1.7	94%	1	7.35
3.15-5.25	1.5	71%	2	8.36
5.25-7.35	1.4	67%	3	9.31
7.35-9.35	1.5	75%	4	10.06
9.35-10.45	0.9	82%	5	10.77
10.45-11.45	0.8	80%	6	11.45
11.45-12.45	0.7	70%	7	12.12
			8	12.84
			9	13.59
			10	14.38
			11	15.19
			12	15.94
			13	No sample
			14	No sample
			15	No sample
			16	No sample
			17	No sample
			18	No sample
			19	No sample
			20	No sample

Station Number: 13 Date: 2/13/04 Station Arrival Time: 1108
 Attempt: 1 Core Tube Length: 16.05 Station Departure Time: 1145
 Field Technician: TD Lead Line Water Depth: 16.5 Dist. From Target Station: 6
 Contractor: MCS/RS Latitude: 207096
 On-site Visitor: — Longitude: 1267585

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, wood dolphins
 Sediment surface & slope: silty coarse sand, gentle slope
 Water current and visibility: gentle current, 5ft vis., flooding tide
 Diver Water Depth 16 Tip Probe Depth — Disk Probe Depth —

Drive Observations:

Drive Initiation Time: 1124 Drive Completion Time: 1131 Drive Offset: —
 Estimated angle of drive: started out of water, ~10° est.

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
14.7	14.5 ⁰⁰	diver measured, easy-moderate drive
12.9	12.8	easy drive
10.8	11.3	easy-mod. drive
8.7	9.9	moderate drive, eqtpt. under water, cannot see
6.7	8.4	easy-mod. drive
5.6	7.5	moderate-diff. drive, penetration rate slowed
4.6	6.7	moderate-diff. drive
3.6	6.0	difficult drive, reached penetration goal
TOTAL 12.45	TOTAL 10.05	Percent Recovered: <u>80.7</u>

Reason for ending drive: penetration goal reached, running out of tube length
 If refusal, reason for refusal: —

Extraction Observations:

Tension on line? Y Stability of vessel: no problem
 Overlying water in core (quantity and description): yes, slightly turbid to clear, ~500ml
 On Boat Recovery: 6.2 Loss of Sediment: 0.2 ft.
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: very light, silty, sprayed off.
 Tube Deformation: none
 Sediment Description (odor or sheen?): gray, fine med. sand w/ silt, no odor, no sheen.

Keep or Retry: screw plug inserted at sed/H₂O interface by diver.
clay plug in tip of core, diver dug out

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log

Job: LDWG SC coring
 Job Number: P0855-18220
 No. of Sections: 1
 Sample Length (from log): 11.6'
 Avg. % Compaction:

Core Location/Sample Number: LDWG-SC-14 R1
 Date/Time: 2/13/06 start 1250-1400
 Sample Logged by: N. Bucher
 Type/Diameter of Sample: 4" sq. aluminum
 Sample Quality: good fair poor disturbed

Notes: Penet: 12.65 → R=91%
 On deck: 11.55

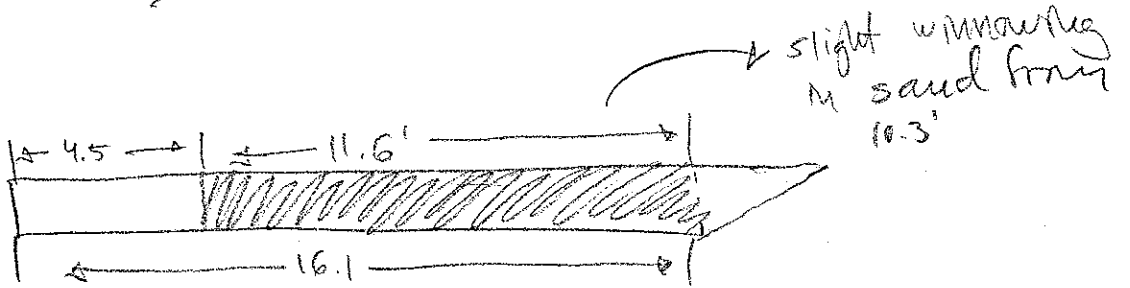
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		CLAY 1 1/104		85	15		wet, loose, olive gray sl. silty sand, shell fragments and intact shells.				
		GLE 7 2.5/N black		10	90	⊗	wet, med. soft, black silt. trace clay minor organics, twigs, roots wood shreds. moist, med. dense, brown, fine sand lens @ 0.5' 1" thick	1.0	1300 3-16oz		
							SAA but moist, more competent. slightly mottled ↓ to grayish below here to base	1.0 1.0	1305 3-16oz		
							blocky texture, trace clay content. trace 1/16" sheen florets. v. trace HC-like odor.	2.0	1310 3-16oz		
		2.5Y 4/1			100	⊗	moist, soft, dk. gray, sil. clayey to clayey silt. trace black streaks, horizontal.	3.0	1315 6oz 3.0'		
		GLE 7 2.5/N black		10	90		moist, med. stiff, black silt. minor organics, twigs, roots, wood fibers. minor scattered 1/2" & brown, sand pockets. mottled, scattered gray sl. clayey silt pockets/lenses? db continuous blocky texture. trace 1/16" sheen florets. v. trace HC-like odor. to 6'	4.0	1315 2-16oz		
								6.0			

@0.6
TV=0.7
5oz

@3.4
TV=1.5
5oz

Very trace HC-like odor and trace 1/16" sheen florets.

SC-14 R1



Sediment Core Processing Log



Job: LDWG SC cone
 Job Number: PORSS-18820
 No. of Sections: 1
 Sample Length (from log): 11.6'
 Avg. % Compaction: _____

Core Location/Sample Number: LDWG-SC-14 R2
 Date/ Time: _____
 Sample Logged by: N. Bacher
 Type/Diameter of Sample: 4" sq. aluminum
 Sample Quality: good fair poor disturbed

Notes: _____

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
							Continue from previous page.				
						⊙	1.5" sl. sandy silt lenses grayish brown @ 7.0'	7.0	2-1602		
							@ 7.7' 1" thick brown, fine sand lens.				
							below 8' no brown sand patches just black silt.	8.0			
							transition zone. Interbeds of fine brown sand & grayish olive sl. clayey silt. very mottled appearance. trace to minor organic material, roots. @ 9' 4 1/2" piece of wood	9.0	1325		
		2.54 3/8 v. dk. grayish brown		50	50		moist, med. dunge brown fine sand w/ trace silt. scattered organic twigs, roots. multicolored grains red, orange, white.	10.0	2-1602		
				95	5		slight continuity from 10.5' to end of core.		1330		
						⊙	grades medium @ 11.1' and med. coarse. could be from continuity.		2-1602		
							End of core: 11.6'	11.6			
								12.0			

@ 7.0'
TV = 3.6
sq

@ 11.0'
TV = 2.0
sq

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 14 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

207055

Northing

Date: 2/13/2006

Time: 8:34

1267397

Easting

Water depth: 46.0 ft

Mudline: -39.3 ft MLLW (estimated using tide tables)

Place Field ID Label Here

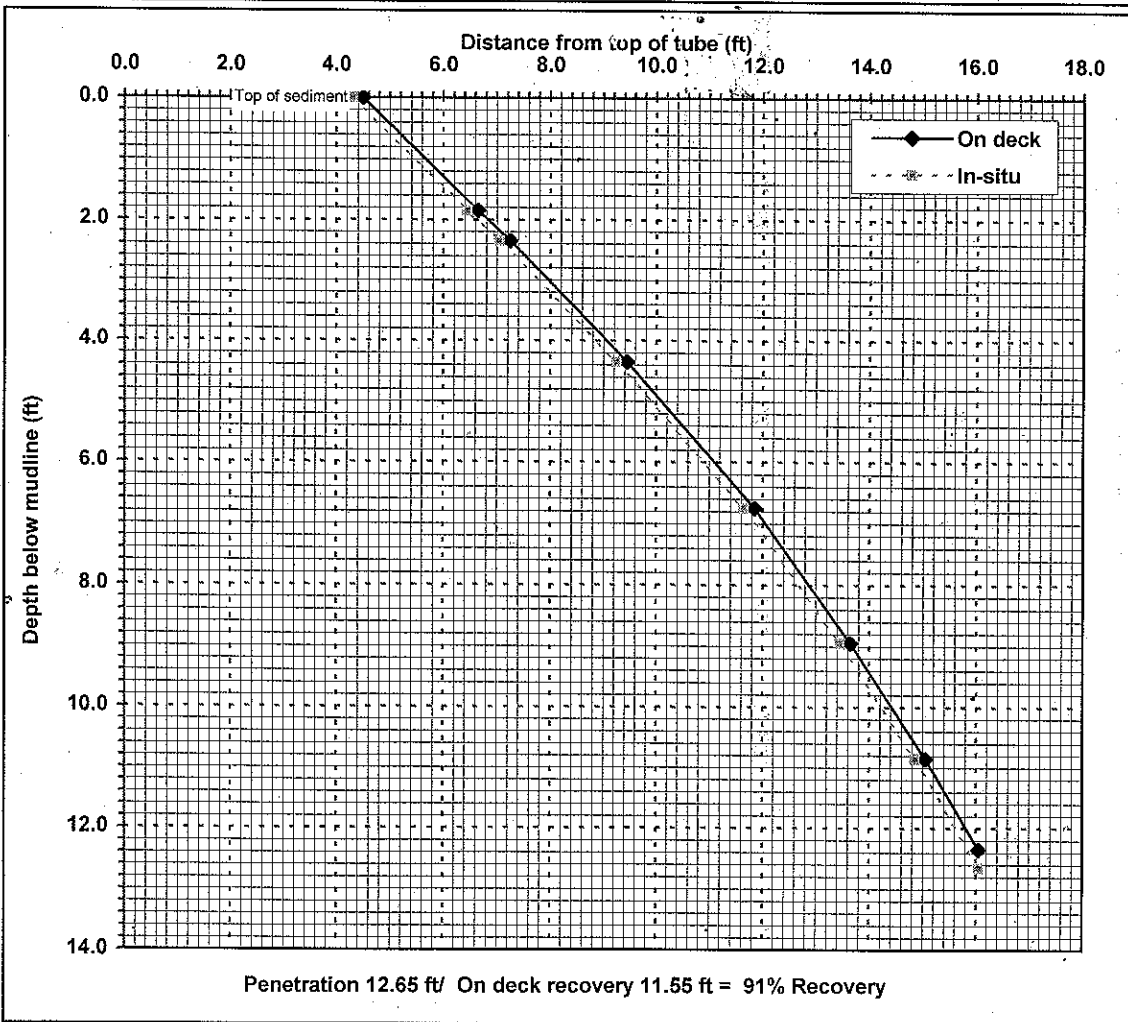
Weather/Comments: Overcast

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------

0-1.85	2.15	116%
1.85-2.35	0.6	120%
2.35-4.35	2.2	110%
4.35-6.75	2.4	100%
6.75-8.95	1.8	82%
8.95-10.85	1.4	74%
10.85-12.65	1.2	67%

Mudline	4.5
1	5.66
2	6.83
3	7.97
4	9.06
5	10.10
6	11.10
7	12.05
8	12.87
9	13.69
10	14.42
11	15.15
12	15.82
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Station Number: 1A
 Attempt: 1
 Field Technician: TD
 Contractor: MCS/RSS
 On-site Visitor: —

Date: 2/13/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 46.0
 Latitude: 207055
 Longitude: 1267397

Station Arrival Time: 0805
 Station Departure Time: 0905
 Dist. From Target Station: 85

Pre-Drive and Diver Observations:

Shoreline & surrounding area: mid way channel
 Sediment surface & slope: flat bottom, silty sand, firm bottom
 Water current and visibility: strong surface current, ebbing tide, 5ft vis, moderate current
 Diver Water Depth 45 Tip Probe Depth — Disk Probe Depth —

Drive Observations:

Drive Initiation Time: 0840 Drive Completion Time: 0846 Drive Offset: —
 Estimated angle of drive: upset under water - cannot see est. 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
14.2	14.9	diver measured, free fall
13.7	13.3	easy drive
11.7	11.1	easy drive
9.3	8.7	easy drive
7.1	6.9	easy drive
5.2	5.5	easy-moderate drive
3.4	4.3	moderate drive
TOTAL 12.05	TOTAL 11.75	Percent Recovered: <u>92.9</u>

Reason for ending drive: reached penetration goal
 If refusal, reason for refusal: —

Extraction Observations:

Tension on line? ✓ Stability of vessel: no problem
 Overlying water in core (quantity and description): yes, clear, ~ 200mL
 On Boat Recovery: 4.5 Loss of Sediment: 0.2 ft.
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: light silt, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): no odor, no sheen, silty sand, brown-grey

Keep or Retry: screw plug inserted by diver at sed/lead interface
sand silt plug (natural) in tip of core

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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MCS Environmental MudMole Bore Log

Collection Information

Date: 2-13-06 Recorder: SM

Project: 341185.001 Windward Lower Duwamish Coring

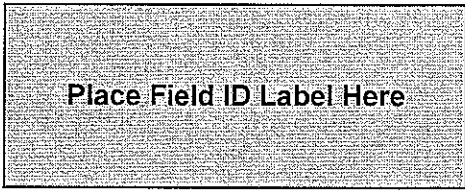
Station Name: 14 R1

Tube Length (ft): 16.05

Water Depth (ft): 46 *leading*

Est. Tide Height (ft) 6.7 (MLLW)

Est. Mudline: _____ (MLLW)



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 207055

Easting 1267397

On Deck Top of Sediment 4.5

Comments: strong surface current - ebbing tide

bottom silty sand - flat bottom - 4.5 ft depth -

SA visibility - moderate current - firm bottom

SA off station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.2</u>	<u>14.9 13.9246</u>	
<u>13.7</u>	<u>13.3</u>	
<u>11.7</u>	<u>11.1</u>	
<u>9.3</u>	<u>8.7</u>	
<u>7.1</u>	<u>6.9</u>	
<u>5.2</u>	<u>5.5</u>	
<u>3.4</u>	<u>4.3</u>	<u>goal reached</u>

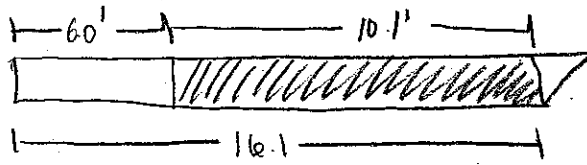
Sediment Core Processing Log

Job: LDWG Core Proc.
 Job Number: PORS-1822D-511
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:
 Notes: Pen = 12.7' } 80%
 On Deck Rec = 10.1' }

Core Location/Sample Number: SC15-21
 Date/ Time: 2/17/06
 Sample Logged by: LMckee KID
 Type/Diameter of Sample: 4" eq. al.
 Sample Quality: good fair poor disturbed ~ 30' F

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5Y 4/3 d. brown	-	10	90	8	SILT (0-3) Wet, loose, dk. olive brown sl. sandy SILT no odor	0-3	0-1 1025		SILT
		2.5Y 2.5/1 Black	-	10	90	8	SILT (ORG) w/ clay layers Wet-matt, blocky, massive black SILT (org) with rootlets + wood fragments up to 0.4' L (wood)	GT 0.9 3-16oz 0	1		SILT (ORG) + clay layers
		(grey) 6.5Y 4/10Y d. greenish gray	-	tr	98	8	1.0-1.4 layer of dk grey clayey SILT [worm (polychaete) in worm tube ~ 0.2'] scattered in top 0.8' Pillworm-like pellets + bits from tube very sporadic < 1" L 2-6" mottled olive-grey clayey silt pockets + layers w/in the black SILT unit. Layers are up to 0.5" thick Pockets are up to 0.1" & moist, soft, clay do-like low compressibility, uniform texture	1-2 1030 3-16oz	2		01.5 TV=1.5 B16
								3	2-4 1035 GT 2.9 3-16oz		02.5 TV=2.5 B16
							@ 3.7-4.2 ' smear zone to 5.0 clayey silt layer (olive-gray) described above	4			
							@ 5.1 0.5' wood fragment	5	4-6 1040 3-16oz		04.7 TV=0.5 B16
								6			

SC 15-R1



Midline = 6.0

Core shoe is $\frac{1}{3}$ full due to winnowing.
Bl. fine-med. grained sand (multicolored grains)

Sediment Core Processing Log



Job: LDW6 Core Proc.
 Job Number: POS-18220-511
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: SC-15-R1
 Date/ Time: 2/17/06
 Sample Logged by: LM
 Type/Diameter of Sample: _____
 Sample Quality: good fair poor disturbed

Notes: Pen = 12.7'
 On Deck Rec = 10.1'

CONT'D

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Insitu Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		SAA					Petrology like floccs etc. up to 6.7' up to 1/2" L (very sporadic)	7	6-8 1046 3lbaz		SILT
		CLAY 1 3/1 v. d. green sh gray	- 90	10	0		layers of v. fine sand 1" thick layers of clay & silt 1" thick SAND moist, dark g. gray sand w/ some convex markings + multicolored grains (orange, red, white)	8			SAND
							@ 9.7 green gray silt pockets up to 0.1" subrounded. (rip up clasts?) } worsening downward (medium sand)	9	8-10 1050 3lbaz		SILT
							End of Core @ 10.1'	10			SAND
							<u>sheen test</u> : 1-2' = no sheen 4-6' = no sheen				

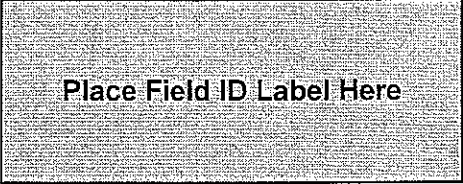
@ 7.0
TV=41
B16

@ 8.8
TV=45
B16

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-16-06 Recorder: GSM



Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 15 A1

Position Information

Tube Length (ft): 16.1

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 37.8

Time: 0851

Northing 206 821

Est. Tide Height (ft) 6.6

(MLLW)

Easting 1267 821

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 6.0

Comments: ebbing tide - diver depth 37 A flat bottom

5 A vis no debris silty

→ A off station

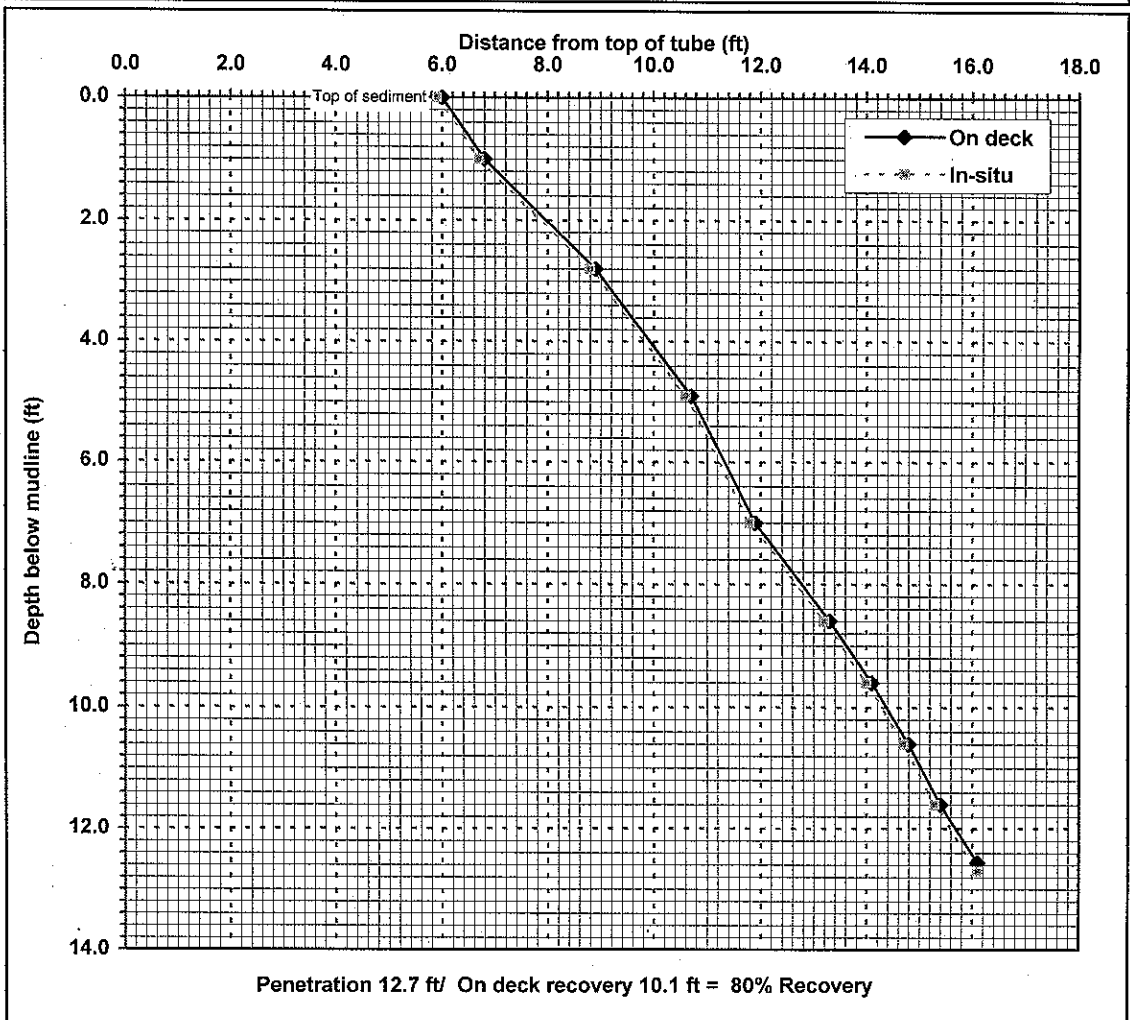
Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.1</u>	<u>15.3</u>	
<u>13.3</u>	<u>13.2</u>	
<u>11.2</u>	<u>11.4</u>	
<u>9.1</u>	<u>10.2</u>	
<u>7.5</u>	<u>8.8</u>	<u>penetration rate slowed</u>
<u>6.5</u>	<u>8.0</u>	
<u>5.5</u>	<u>7.3</u>	
<u>4.5</u> <u>5.5</u>	<u>6.7</u>	
<u>3.4</u>	<u>5.9</u>	<u>goal reached</u>

Mudmole™ Bore Log

Project: LDWG Duwamish Coring **Station:** 15 R1
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 206821 Northing
Date: 2/16/2006 **Time:** 8:51 1267821 Easting
Water depth: 37.8 ft **Mudline:** NA ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A



Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-1	0.8	80%
1-2.8	2.1	117%
2.8-4.9	1.8	86%
4.9-7	1.2	57%
7-8.6	1.4	87%
8.6-9.6	0.8	80%
9.6-10.6	0.7	70%
10.6-11.6	0.6	60%
11.6-12.7	0.8	73%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	6
1	6.80
2	7.97
3	9.07
4	9.93
5	10.76
6	11.33
7	11.90
8	12.78
9	13.62
10	14.38
11	15.04
12	15.69
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 15 Date: 02/16/06 Station Arrival Time: 0843
 Attempt: 1 Core Tube Length: 16.1 Station Departure Time: 0937
 Field Technician: TD, JF Lead Line Water Depth: 37.8 Dist. From Target Station: 7
 Contractor: M/S/RSS Latitude: 206821
 On-site Visitor: _____ Longitude: 1267821

Pre-Drive and Diver Observations:

Shoreline & surrounding area: wood pier and piling
 Sediment surface & slope: silty, no debris, flat bottom
 Water current and visibility: 5 ft vis., ebbing tide
 Diver Water Depth 37 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 0912 Drive Completion Time: 0922 Drive Offset: _____
 Estimated angle of drive: est 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.1	15.3	diver recorded, free fall
13.3	13.2	moderate drive
11.2	11.4	moderate drive
9.1	10.2	moderate drive
7.5	8.8	difficult drive, penetration rate
6.5	8.0	difficult drive
5.5	7.3	difficult drive
10.5 4.5	6.7	difficult drive
3.4	5.9	difficult drive, refusal, penetration goal reached
TOTAL 12.7	TOTAL 10.2	Percent Recovered: <u>80.3%</u>

Reason for ending drive: refusal and penetration goal reached
 If refusal, reason for refusal: hard material

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): clear, slightly turbid ~ 1/2L
 On Boat Recovery: 6.0 Loss of Sediment: 0.1 ft.
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, moderately easy


On Deck Observations:

Staining: slight, silt, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): med. brown sand, no odor, no sheen

Keep or Retry: diver inserted screw plug at sed/H₂O interface

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log



Job: LDWG Sr. cutting
 Job Number: PORS-18220-511
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____

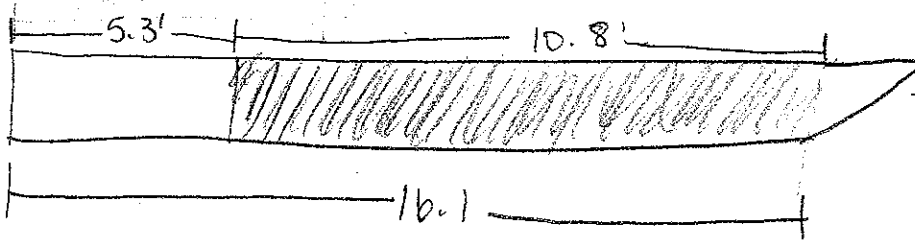
Core Location/Sample Number: LDWG-SC-16 (R1)
 Date/Time: 2/17/06 0950 - 1120
 Sample Logged by: N. Bachan, J. Mehel
 Type/Diameter of Sample: 4" square aluminum
 Sample Quality: good fair poor disturbed

Notes: Pen = 13.55 (R) = 79%
on Roc = 10.75

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		GLE Y1 2.5/N black	15	85	5	95	sump, olive gray, sl. sandy silt. trace shell fragments. moist to wet, med soft, blackish SILT w/ trace sand. Scattered organics twigs, roots. worm tube @ 0.8' ~ 2" long, segmented. 1.3-2.0' trace 1/16" sheen florets. no odor. @ 0.5' 3/4" piece of garbage bag, white, thin	1.0	1010	1040 1602 1043 1602 1046 1602 1049 1602	
		GLE Y2 4/10G dk greenish gray		100			sharp moist, soft, gray sl. clayey to clayey silt. minor thin black horizontal streaks. no odor	2.0	1015	1052 1602 1055 1602	
		GLE Y1 2.5/N black	10	90			sharp moist, med. stiff, black silt. minor sand to 4.0', then trace sand below, scattered organics throughout. twigs, roots. trace #2, odor 3.0-4.0. blocky texture. trace gravel @ 3.3-3.4' only trace sand below 4'. 4-7.4 trace HC-like odor trace HC-like sheen 4-7	3.0	1020	1058 1602 1101 1602 1104 1602 1107 1602	@ 3.0 TV = 0.75 big
			2	98			slightly mottled 5-7.0 w/ trace 1/2"-1/4" clayey silt inclusions, irregular not pebbles or clasts.	4.0	1020	1110 1602 1113 1602	@ 5.0' TV = 40 big

SC-116 (R)

2/11/02
N. Becker
L. McKee



Sediment Core Processing Log



Job: LDWG SC Coring
 Job Number: PORS 18220-311
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:

Core Location/Sample Number:
 Date/ Time: 2/14/06
 Sample Logged by: N Bacher, LMckee
 Type/Diameter of Sample:
 Sample Quality: good fair poor disturbed

Notes: Pg. 2

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
							@ 6.1' 2 1"-pieces of wood.		1025		
				80	20	⊕	transitional moist, medium dense, brownish gray fine sand mottled w/ gray sl. sandy silt pockets/inclusions.	7.0	2-16oz		@ 7.0'
		10YR 3/1 v. dk. gray					8-8.4 localize med. sand lens w/ 25% wood. @ 8.4' wood chunks	8.0			
						⊕	below 9.5 more defined interbeds 1/8-1/4" thickness of fine brownish gray sand and gray silt.	9.0	2-16oz		@ 9.0' IV-4.25 big
			50	50			sand is multicolored, red, orange, white below 9.5', hard to tell above in unit.	10.0	1035 2-16oz		
							End of core: 10.8'	11.0			

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-13-06 Recorder: GSM



Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 16 R1

Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 32.3

Time: 1431

Northing 206669

Est. Tide Height (ft) 8.3

(MLLW)

Easting 1267959

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 5.3

Comments: incoming tide - soft silt 32A vis 1A

gentle slope mild current

2 10A off station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.8</u>	<u>15.1</u>	
<u>12.3</u>	<u>12.4</u>	
<u>10.0</u>	<u>10.1</u>	
<u>8.0</u>	<u>8.5</u>	
<u>6.0</u>	<u>6.8</u>	
<u>3.9</u>	<u>5.5</u>	
<u>2.5</u>	<u>5.0</u>	
		<u>goal reached - still penetrating fast</u>

silty clay plug in tip of core

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 16 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

206669

Northing

Date: 2/13/2006

Time: 14:31

1267959

Easting

Water depth: 32.3 ft

Mudline: -24.0 ft MLLW (estimated using tide tables)

Place Field ID Label Here

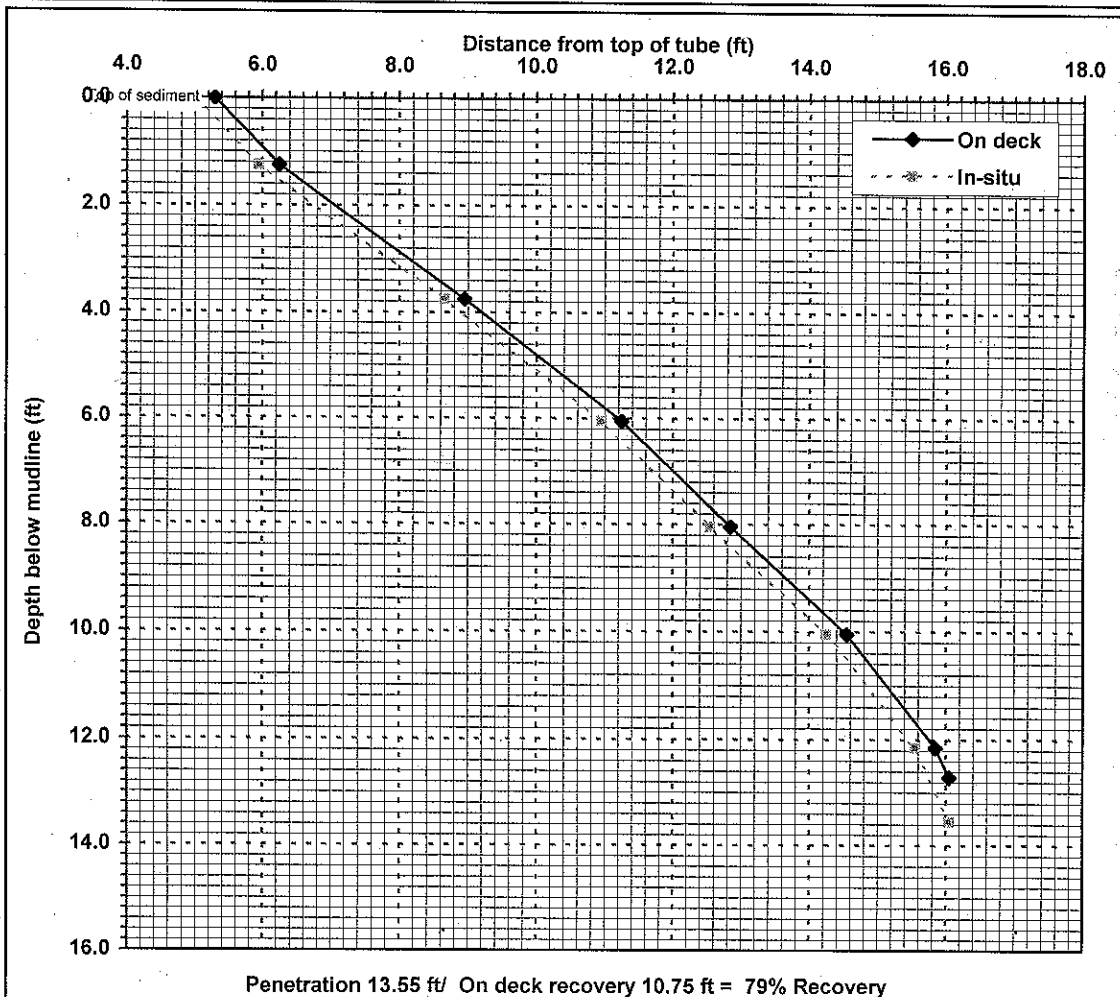
Weather/Comments: Overcast and cold

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------

0-1.25	0.95	76%
1.25-3.75	2.7	108%
3.75-6.05	2.3	100%
6.05-8.05	1.6	80%
8.05-10.05	1.7	85%
10.05-12.15	1.3	62%
12.15-13.55	0.5	36%

Mudline	5.3
1	6.06
2	7.06
3	8.14
4	9.20
5	10.20
6	11.20
7	12.01
8	12.81
9	13.66
10	14.51
11	15.14
12	15.76
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Station Number: 16 Date: 02/13/06 Station Arrival Time: 1418
 Attempt: 1 Core Tube Length: 16.05 Station Departure Time: 1452
 Field Technician: TD Lead Line Water Depth: 32.3 Dist. From Target Station: 10
 Contractor: MCS/RSS Latitude: 206669
 On-site Visitor: _____ Longitude: 1267959

Pre-Drive and Diver Observations:

Shoreline & surrounding area: wood pilings/pier to north and south, surrounded by barges
 Sediment surface & slope: soft silt
 Water current and visibility: Flooding tide
 Diver Water Depth 32 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1434 Drive Completion Time: 14:37 Drive Offset: _____
 Estimated angle of drive: equiv underwater, cannot see est 10° off

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
<u>12.3</u>	<u>12.4</u>	<u>CNR recorded; free fall; mod-diff drive.</u>
<u>10.0</u>	<u>10.1</u>	<u>easy drive/moderate drive.</u>
<u>8.0</u>	<u>8.95</u>	<u>easy drive</u>
<u>6.0</u>	<u>6.8</u>	<u>easy-moderate drive</u>
<u>3.9</u>	<u>5.</u>	<u>easy-moderate drive</u>
<u>2.5</u>	<u>5.0</u>	<u>easy-moderate drive; penetration goal reached.</u>
		<u>still penetrating fast</u>
TOTAL <u>13.55</u>	TOTAL <u>11.05</u>	Percent Recovered: <u>81.5</u>

Reason for ending drive: penetration goal reached; running out of tube length
 If refusal, reason for refusal: _____

Extraction Observations:

Tension on line? Yes Stability of vessel: no problem
 Overlying water in core (quantity and description): yes, clear - slightly turbid, ~ 500ml
 On Boat Recovery: 5.3 Loss of Sediment: silty clay plug in core tip
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: silty on sides, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): gray/brown - silty fine sand, some clay (?)

Keep or Retry: diver inserted screw plug at sed/H₂O interface

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log

Job: LDW6 Core Processing
 Job Number: POS-18220-5110
 No. of Sections: 1
 Sample Length (from log): 8.6'
 Avg. % Compaction: _____

Core Location/Sample Number: 30-17-(R5)
 Date/Time: 2/24/06 0945
 Sample Logged by: LM, CB
 Type/Diameter of Sample: 3" round
 Sample Quality: good fair poor disturbed

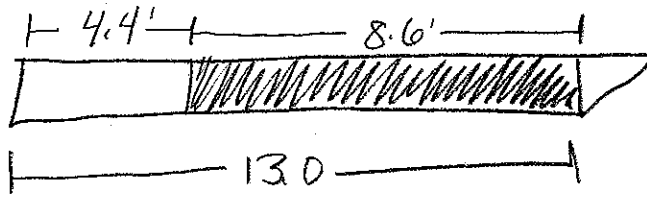
Notes: Pen = 13.0' } 66% Rec
On Deck Rec = 8.6' }

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch	
		2.54 4/3 olive brown		15	85	0	olive brown, soupy, soft sandy SILT 0-0.6' transitioning to black w/ odor @ 0.3'		0-1 1025 3-1002		SILT	
		2.54 2.51 black		10	90	0 (20% wood)	wet-damp, black, med-dense sl. sandy (org) SILT w/ shell fragments & rootlets 0.9-1.0" layer of wood fragments up to 0.2" L and subrounded gravel 0.1" L SILT is sl. compressible, low plasticity, blocky, massive, & uniform shell fragments & rootlets & wood fragments up to 1/4" L mild H ₂ S odor; 1" subangular gravel-sized material (rock?) @ 1.4 2" piece of red crumbly - sandy gravel (non-ratite) @ 1.7 petroleum-like odor + wetness → sheen, rainbow (1/4" x 1/8") @ 2.4 - rootlets + gravel/asphalt + wood fragments (1 1/2") strong pet-like odor & sheen w/ wood & gravel. 0.6" piece of plastic (tape?) @ 2.6 piece of subrounded multi-colored red glass 1/2" Ø @ 3.0 wood fragment 3x1" @ 3.2 2" piece of foliated red paint chip-like material	1	1-2 1030 GT 1.2 3-1002		00.9' TV=0.1 BIG SILT (org) @ 1.8 TV=0.5 BIG Retroleum-like Sheen + odor	
3		2.54 4/2 olive grey			98	0	@ 3.4 3" olive-grey clayey SILT layer no odor	2	2-4 1035 GT 2.3 3-1002			
4		2.54 2.51 black					@ 3.8 wood fragments 50.5% x 0.2' w/ mild pet-like odor with rainbow streaks & florets up to 1/4" @ 4.0' 0.3' L x 2" wood fragment, strong petroleum-like odor, sheen florets up to 1/4" @ 4.5 0.6' piece of plastic (tape) w/ strong HC-like odor	3	4-6 1040 2-1002		Sheen + odor plastic @ 4.6' TV=0.1 BIG	
							4.9-5.0 2" layer of clayey SILT (olive grey) no odor 5.0 wood layer of 0.1' L w/ med HC-like odor 5.2 0.2 x 0.1' pieces of canvas w/ med HC-like odor 5.3 wood fragments w/ mild HC-like odor	4				
							5.7 2" peat pocket + wood fragments w/ med. HC-like odor	5				
							5.9 olive grey clayey SILT layer (seam) about 2" thick	6			← peat	

5.9 olive grey clayey SILT layer (seam) about 2" thick
 Baggie @ 2.4'
 Baggie @ 2.6'
 Baggie @ 3.2'

SC-17-R5

2/24/06
LM



$\frac{12}{9.8}$
 $\frac{8.6}{1.4}$

based on
 Thair's field
 notes

Core catcher fullness was not noted in field.
 Sediment in core catcher included sandy silt, gravel, and wood fragments

Core catcher is 1/10 full of black silty sands w/ olive-grey SILT layers

Notes:

upon opening top of core, water w/ rainbow sheen & strong petroleum-like odor. (~100ML)

-LM

upon opening bottom of core rainbow sheen in smear zone & petroleum-like odor appears from 2-6'

-LM

winnowing

top 0.2' of core are winnowed ~70%


Sediment Core Processing Log

Job: LDWG Core Processing
 Job Number: POS-18220-SW
 No. of Sections: 1
 Sample Length (from log): 8.6'
 Avg. % Compaction:

Core Location/Sample Number: SC17-R5
 Date/ Time: 2/24/06 0945
 Sample Logged by: LM, CB
 Type/Diameter of Sample: 3" round
 Sample Quality: good fair poor disturbed

Notes: _____

CONT'D

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5' black					med HC-like odor, sl. metallic sheen @ 6.2 leaf stem pockets of olive-grey clayey silt about 2' & no odor @ 6.6 0.1" wood fragments + med HC-like odor @ 7.0 red paint-chip like material 0.05' L @ 7.3 1 wood fragment 0.1' L mild HC-like odor @ 7.7 submerged gravel @ 0.1' L 1 piece mild HC-like odor @ 7.8 0.1 x 0.1' wood fragment, med HC-like odor @ 7.9 1" x 1" peat pocket, wood fragments 1" L to 8.1' @ 8.2 red paint-chip like material, few ^{minimal} _{fragments} damp med dense, grey fine sand w/ multi-colored grains w/ layer of black silt from above, silt has HC-like odor	6-8.6 045 21602			
				90	10	8	End of core @ 8.6'	9			

HC like odor + sand - 1



SEDIMENT CORE DRIVE LOG

Project: LDW subsurface sed.
 Project #: 05-DB-D6-32
 Field Crew: TD
 Contractor: MSS

Core Location: LDW-5C17
 Date: 02-23-06 Time: ~~1430~~ 1530
 Attempt #: 5 Accept/Reject
 Sample Method: Vibracore

Proposed Coordinates		Actual Coordinates	
N: 206550	E: 1268449	N: 47 33.3761N	E: 122 20.3911W
Mudline:		Mudline:	
Core Drive:		Core Drive:	Core Recovery:



DTS Boat:

DTS Lead Line:

20.0 ft.

Mudline Elevation:

Tide Measurements (Datum:)

Time/Height:

Time/Height:

Description:

(free fall, fingers inverted, vibration needed to drive/extract, estimation of density, debris encountered, slopes, refusal, mudline conditions, drive action, etc.)

0-7 ft free fall
 7-10 ft moderate drive
 10-13 ft. moderately easy drive

shear on core tube
 core tip was empty (washed out)
 top of sed: brown surface, black silt w/ lots of shear.

Total Drive: 13 ft.

Length Recovered: 8.6 ft.

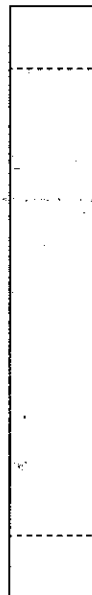
(66.1%)

Notes: ~6 ft off target

Measurement (to nearest 0.1 foot):

Avg. % Recovery:

Avg. % Compaction:



Core Tube Length:

- Section: Length: Description at Cuts:
- A =
- B =
- C =
- D =

discarded core from RA on site.

cut at catcher revealed blank sandy silt, gravel, wood debris.




SEDIMENT CORE DRIVE LOG

Project: LDW Subsurface Sed.
 Project #: 05-08-06-32
 Field Crew: TD
 Contractor: MSS

Core Location: LDW-SC17
 Date: 02.23.06 Time: 1510
 Attempt #: 4 Accept/Reject *pending one more try*
 Sample Method: Vibracore

Proposed Coordinates		Actual Coordinates	
N: <u>206550</u>	E: <u>1268449</u>	N: <u>47 33.3755N</u>	E: <u>122 20.3900W</u>
Mudline:		Mudline:	
Core Drive:		Core Drive:	Core Recovery:



DTS Boat: 
 DTS Lead Line: 20.0 ft.
 Mudline Elevation:

Tide Measurements (Datum:)
 Time/Height:
 Time/Height:

Description:
 (free fall, fingers inverted, vibration needed to drive/extract, estimation of density, debris encountered, slopes, refusal, mudline conditions, drive action, etc.)

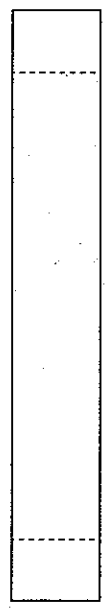
*0-2 - did not record
 2-4 - moderate drive
 4-5.5 - difficult drive, refusal*

*core tip had gravel, wood debris
 black silty sand.*

Core Tube Length:

Measurement (to nearest 0.1 foot):

Avg. % Recovery:
 Avg. % Compaction:



Section:	Length:	Description at Cuts:
<input type="checkbox"/> A =		
<input type="checkbox"/> B =		
<input type="checkbox"/> C =		
<input type="checkbox"/> D =		

Total Drive: 5.5 ft. Length Recovered: 5.2 ft.
98.1%

Notes: *~ 1/2 ft. off target.*

Sediment Core Processing Log



Job: LDWG SL processing
 Job Number: PARS-18220-SH
 No. of Sections: 1
 Sample Length (from log): 2.1'
 Avg. % Compaction:

Core Location/Sample Number: LDWG SC-17 R2
 Date/ Time: 2/14/06 1120-
 Sample Logged by: LMcke, NBacher
 Type/Diameter of Sample: 4" square aluminum
 Sample Quality: good fair poor disturbed

Notes: Pen = 3.3' 70% Rec
in Arch/Rec = 2.3'

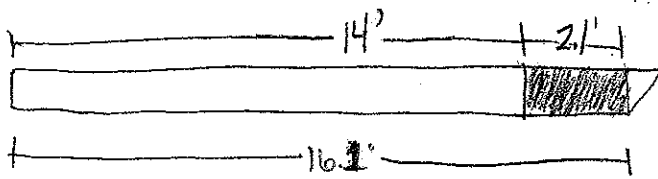
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Initial Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch	
1		GREY / 2S/N black 	10	10	80	Ø	moist, black, medium stiff, sil. sandy silt thin 1/8" olive-green fine sand lenses MIDD gravel. 0-0.2' trace twigs & shell fragments 0.9' woody debris ~1" length no odor	1	1125	3V 16oz.		@ 0.4' TV = 1.0 Big
			0	0	100	Ø	moist, med. stiff greyish black sil. clayey silt trace HC-like odor, trace hor. thin bl. streaks transition zone to below		1130	3 16oz.		@ 1.2' TV = 2.5 Big
2			60	20	20		moist, loose, black silty sandy gravel. Gravel is rounded to subrounded, few gravel size. 10% wood. trace HC-like odor 3" pc. clear plastic tap	2	GT-14			
							END of Core 2.1'					

SC-17-R2

2/11/06

LM

NB



New top of core to mudline length = 14.2'
New MCS mudmole Bore Log generated.

- LM

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-13-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 17 R1

Tube Length (ft): ~~16.3~~ 16.3
 Water Depth (ft): ~~25.6~~ 19.2 Time: 1332
 Est. Tide Height (ft) 7.1 (MLLW)

Est. Mudline: _____ (MLLW)



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

	<u>R1</u>	<u>R2</u>
Northing	<u>206552</u>	<u>206546</u>
Easting	<u>1268461</u>	<u>1268465</u>

On Deck Top of Sediment 14.0

Comments: Incoming tide - 19A silt, bottom scattered wood
metal debris - gentle slope 2 ft visibility

Penetration Tape Reading	Recovery Tape Reading	Comments
15.1	15.5	
13.8	14.3	
13.7		<u>hit something</u>
<u>R2 water depth 18.1</u>		<u>time 1352 tide 7.7</u>
<u>silt bottom w/ scattered gravel</u>		<u>incoming</u>
<u>diver depth 17A level bottom</u>		
<u>14.2</u>	<u>14.3</u>	
<u>13.3</u>	<u>13.4</u>	
<u>13.0</u>	<u>13.3</u>	<u>hit something</u>
<u>2 20A attestation</u>		<u>Mudmole bouncing</u>

Mudmole™ Bore Log

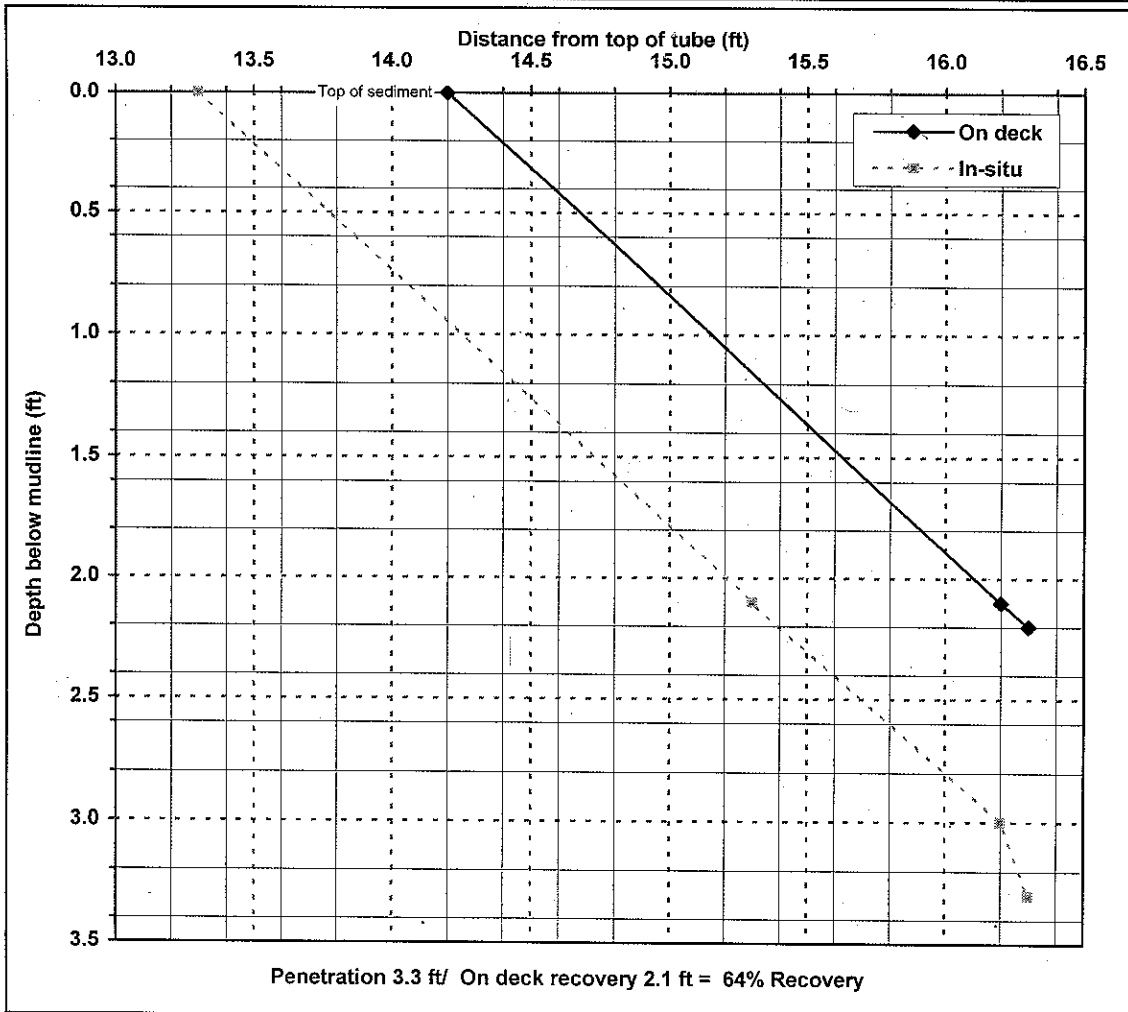
Project: LDWG Duwamish Coring	Station: 17 R2	
Project No: 341185.001	Position: NAD83	WAN
Collected by: GSM	206546	Northing
Date: 2/13/2006	Time: 13:52	Easting
Water depth: 18.1 ft	Mudline: -10.4 ft MLLW (estimated using tide tables)	

Place Field ID Label Here

Weather/Comments: Rain

Rep 1 hit debris, tube rinsed clean and reused, Rep 2 hit debris

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
---------------------------	------------------------	------------------	--------------------------	--------------------------------



0-2.1	2	95%	Mudline	14.2
2.1-3	0.9	100%	1	15.15
3-3.3	0.1	33%	2	16.10
			3	No sample
			4	No sample
			5	No sample
			6	No sample
			7	No sample
			8	No sample
			9	No sample
			10	No sample
			11	No sample
			12	No sample
			13	No sample
			14	No sample
			15	No sample
			16	No sample
			17	No sample
			18	No sample
			19	No sample
			20	No sample

Mudmole™ Bore Log

Project: LDWG Duwamish Coring **Station:** 17 R2
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 206546 Northing
Date: 2/13/2006 **Time:** 13:52 1268465 Easting
Water depth: 18.1 ft **Mudline:** -10.4 ft MLLW (estimated using tide tables)

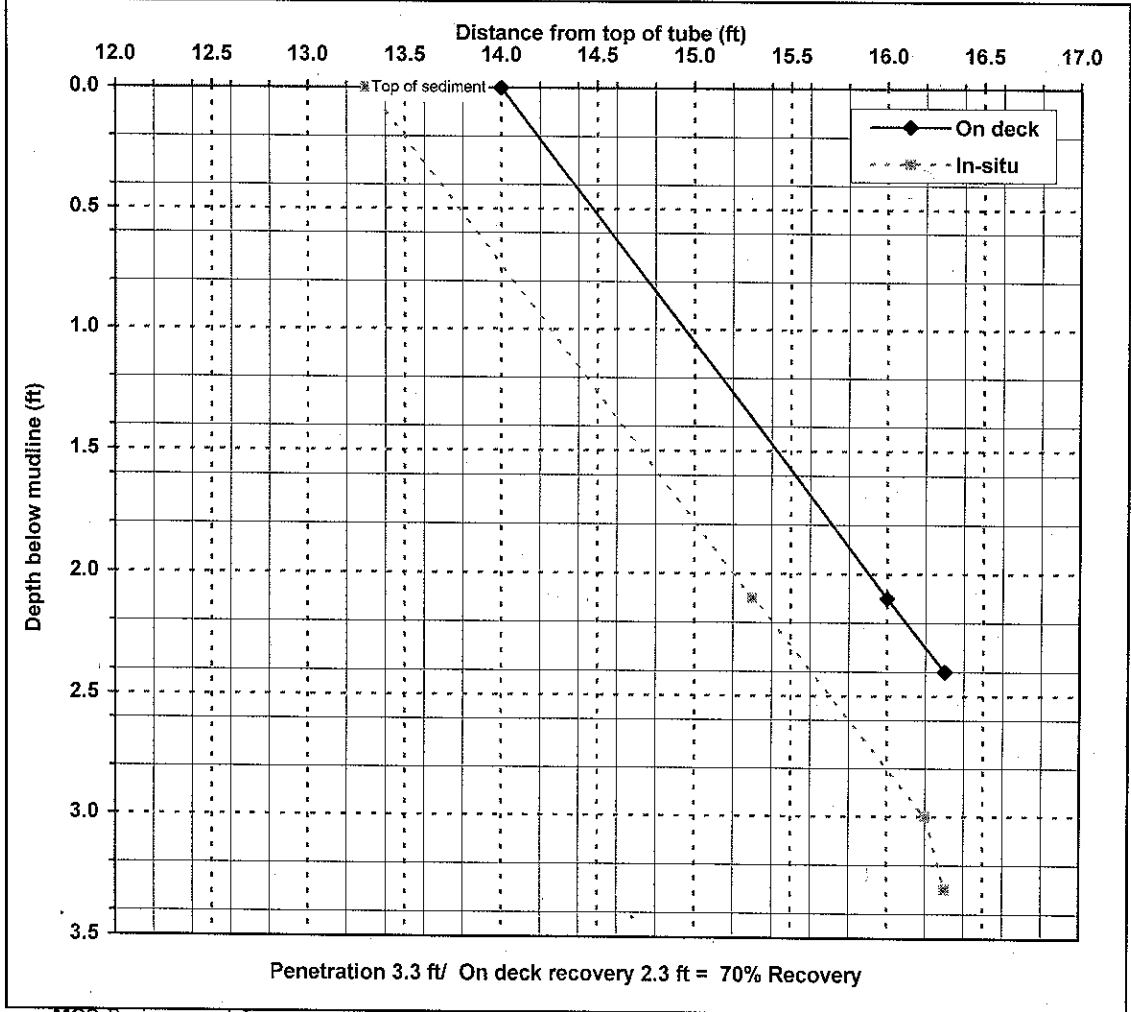
Place Field ID Label Here

Weather/Comments: Rain

Rep 1 hit debris, tube rinsed clean and reused, Rep 2 hit debris

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-2.1	2	95%
2.1-3	0.9	100%
3-3.3	0.1	33%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	14
1	14.95
2	15.90
3	No sample
4	No sample
5	No sample
6	No sample
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Station Number: 17 Date: 07/17/06 Station Arrival Time: 1355
 Attempt: 2 Core Tube Length: 16.3 Station Departure Time: 1410
 Field Technician: TD Lead Line Water Depth: 18.1 Dist. From Target Station: 20
 Contractor: MCS/RS Latitude: 206546
 On-site Visitor: _____ Longitude: 1268465

Pre-Drive and Diver Observations:

Shoreline & surrounding area: same as R1
 Sediment surface & slope: silty bottom, scattered wood/metal debris, gentle slope, scattered gravel level bottom
 Water current and visibility: incoming tide, 2ft vis.
 Diver Water Depth: 17 Tip Probe Depth: _____ Disk Probe Depth: _____

Drive Observations:

Drive Initiation Time: 1352 Drive Completion Time: 1355 Drive Offset: _____
 Estimated angle of drive: eqpt mostly under water @ 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
14.2	14.3	diver recorded, free fall; moderate drive
13.3	13.4	easy moderate drive - hard drive
13.0	13.3	hard drive - refusal
TOTAL 3.3	TOTAL 3.0	Percent Recovered: <u>90.1</u>

Reason for ending drive: refusal
 If refusal, reason for refusal: eqpt bouncing around, hit something hard.

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): yes, clear, a lot (>5L)
 On Boat Recovery: 14 Loss of Sediment: 0.7 (?)
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: black silty sand - sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): black silt/sand, no odor/sheen.

Keep or Retry: eqpt. bouncing around;
diver inserted screw plug at sed/H₂O interface

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Station Number: 17 Date: 07/13/04 Station Arrival Time: 1253
 Attempt: 1 Core Tube Length: 16.3 Station Departure Time: 1352
 Field Technician: TD Lead Line Water Depth: 19.2 Dist. From Target Station: 12
 Contractor: MCS/RYS Latitude: 206552
 On-site Visitor: _____ Longitude: 1268461

Pre-Drive and Diver Observations:

Shoreline & surrounding area: wood pilings and debris, snag pile, rip rap; pier to north and south.
 Sediment surface & slope: scattered wood/metal debris, silty, gentle slope
 Water current and visibility: 2 ft vis.
 Diver Water Depth 19 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1341 Drive Completion Time: 1343 Drive Offset: _____
 Estimated angle of drive: ~10° off, equiv underwater

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
<u>15.1</u>	<u>15.5</u>	<u>diver recorded, free fall</u>
<u>13.8</u>	<u>14.3</u>	<u>easy drive - moderate drive</u>
		<u>hit something hard drive, refusal</u>
<u>sample aborted</u>		
TOTAL	TOTAL	Percent Recovered:

Reason for ending drive: refusal
 If refusal, reason for refusal: hit something hard

Extraction Observations

Tension on line? yes Stability of vessel: no prob
 Overlying water in core (quantity and description): yes - all water
 On Boat Recovery: 0 Loss of Sediment: no sed.
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy.

On Deck Observations:

Staining: silt, sprayed off
 Tube Deformation: no
 Sediment Description (odor or sheen?): no sed.

Keep or Retry: reset station, core tube inside clean (empty)
→ sample aborted ←

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log

Job: LDGW Core Processing
 Job Number: PORS-18200-511
 No. of Sections:
 Sample Length (from log):
 Avg. % Compaction:

Core Location/Sample Number: LDGW-SC-11 R3
 Date/ Time: 2/15/06 Start 0845
 Sample Logged by: IMckee A Fitzpatrick
 Type/Diameter of Sample: 4" sq aluminum
 Sample Quality: good fair poor disturbed

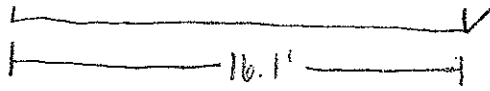
Analyze R3 samples instead of R2

Notes: Pen = 7.45' ?
On Deck Rec = 4.75' ?
Rec = 64%

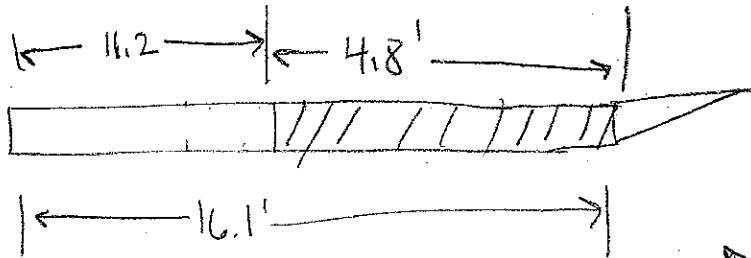
core core collected 2/14/05

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Dist Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		CLAY 1 2.5 N v. dark		15	85		SILT: wet, soupy, runny, olive brown to black sl. sandy SILT 0-0.25	0.2	0920		SILT
1.0		CLAY 1 2.5 N black	20	70	10		SAND: wet, black, loose, sl. silty, gravelly F-SAND w/ sub wood frag up to 3" L Gravel - subrounded, 1" & max, trace H/S poorly sorted to 4" max, moderate sheen, increasing gravel size 2" & w/ depth moderate H/S adv w/ depth	0.3	7-1602 0-1		SAND
			60	20	20		increasing silt below 1.5' (transition to unit below)	0.25	3-1602		
2.0		CLAY 1 3 10X v. d. greenish sw		10	90		SILT: moist, wet, stiff, dark grayish brown, sl. clayey SILT, transitional (possible slope) & sharp contact	1.8	1-2		SILT
3.0		102 2.5 1 reddish black	70	20	10		GRAVEL: wet, dense, black, poorly sorted (jumbled) sl. silty, sandy, GRAVEL (poorly sorted, subrounded, up to 3" &) w/ moderate large wood frag, rootlets, moderate sheen + rainbow florets throughout, trace TPA-like adv throughout	2.6	0930 2-4 3-1602		GRAVEL
3.4							woody debris - natural, unlumbered, flat, head, up to 3" L	3.0			
4.0		CLAY 1 3 10Y v. dark greenish gray	80	15	5		Below 3.4 FT = color change + less sheen and C-SAND + increasing gravel w/ depth, more rounded w/ depth (river-rock-looking), slight TPA-like	4.0	0935 2-1602 4-4.8'		
5.0							Bottom of Core 4.8' Catcher in ket	5.0			
6.0							Sand grains = Qtz, gray, white	6.0			





on deck = 11.3'



↑
shoe is
empty
otherwise intact

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-14-06 Recorder: GSN

Project: 341185.001 Windward-Lower Duwamish Coring

Station Name: 17 R3

Tube Length (ft): 16.05

Water Depth (ft): 21.4

Est. Tide Height (ft): 4.5

Est. Mudline: _____ (MLLW)

Time: 1237

(MLLW)

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 206538

Easting 1268436

On Deck Top of Sediment 11.3

Comments: incoming tide - diver depth 21 ft - vis 1 ft

silty sand - large holes from burrows - no debris - gentle slope

~ 17 ft offshore of station

Penetration Tape Reading

Recovery Tape Reading

Comments

<u>15.3</u>	<u>15.6</u>	
<u>13.3</u>	<u>13.8</u>	
<u>11.5</u>	<u>12.1</u>	
<u>9.4</u>	<u>11.3</u>	
<u>8.6</u>	<u>11.2</u>	<u>no recovery</u>
		<u>slow driving</u>

Mudmole™ Bore Log

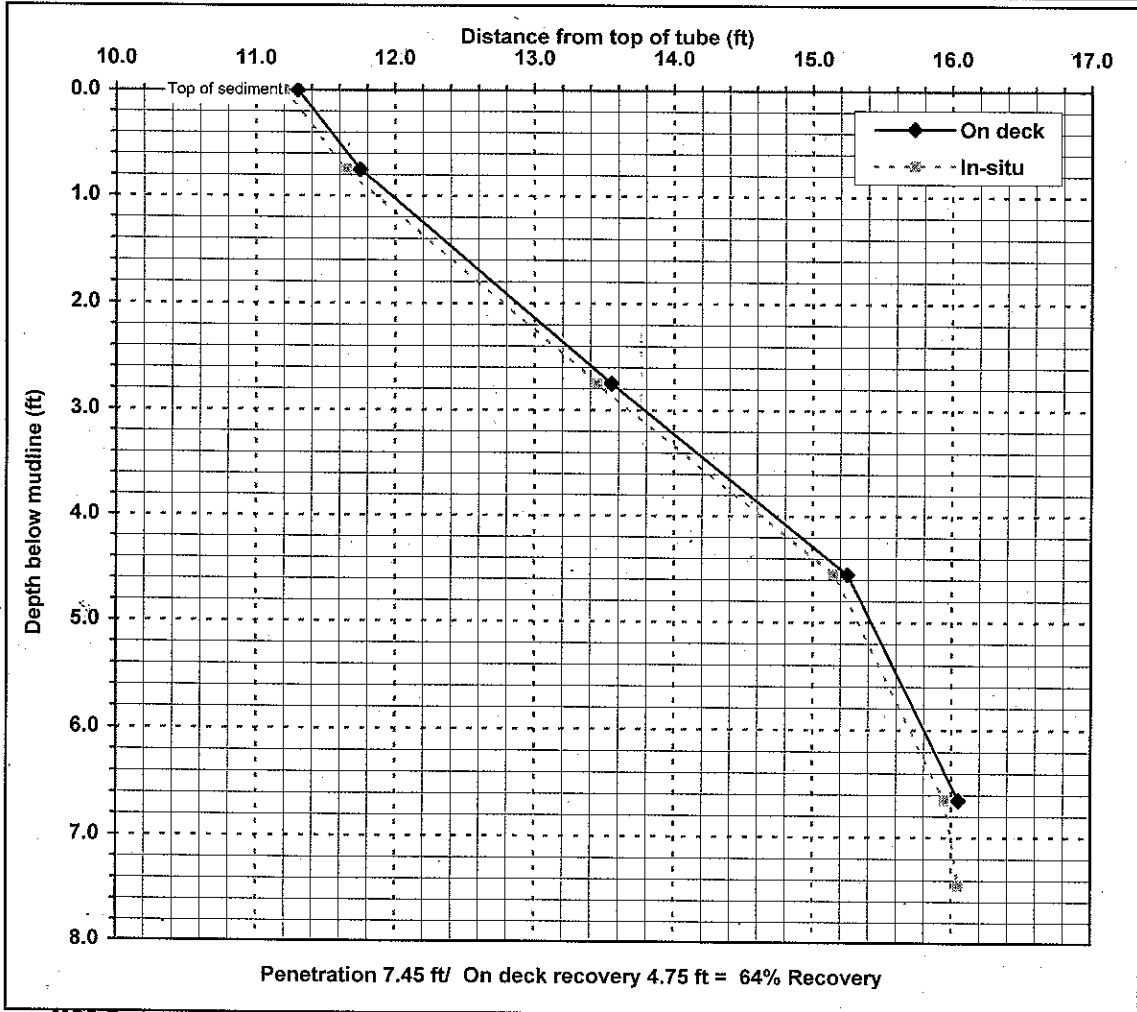
Project: LDWG Duwamish Coring
Station: 17 R3
Project No: 341185.001
Position: NAD83
Collected by: GSM
Date: 2/14/2006
Time: 12:37
Water depth: 21.4 ft
Mudline: -16.9 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-0.75	0.45	60%
0.75-2.75	1.8	90%
2.75-4.55	1.7	94%
4.55-6.65	0.8	38%
6.65-7.45	0.1	13%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	11.3
1	11.98
2	12.88
3	13.79
4	14.73
5	15.42
6	15.80
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-0.75	0.45	60%
0.75-2.75	1.8	90%
2.75-4.55	1.7	94%
4.55-6.65	0.8	38%
6.65-7.45	0.1	13%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	11.3
1	11.98
2	12.88
3	13.79
4	14.73
5	15.42
6	15.80
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 17

Date: 02/14/06

Station Arrival Time: 1219

Attempt: 3

Core Tube Length: 16.05

Station Departure Time: ~~1307~~ 1307

Field Technician: TD

Lead Line Water Depth: 21.4

Dist. From Target Station: 17

Contractor: MCS, PSS

Latitude: 206538

On-site Visitor:

Longitude: 1260436

Pre-Drive and Diver Observations:

Shoreline & surrounding area: same as R1 & R2 (02/13/06)
 Sediment surface & slope: silty sand, gentle slope, no debris, large holes from barge spuds
 Water current and visibility: ift. vis.
 Diver Water Depth 21 Tip Probe Depth Disk Probe Depth

Drive Observations:

Drive Initiation Time: 1243 Drive Completion Time: 1249 Drive Offset:
 Estimated angle of drive: unable to see - eqpt under water est 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.3	15.6	diver recorded, free fall
13.3	13.8	moderate drive
11.5	12.1	moderate drive
9.4	11.3	moderate drive/penetration slowing
8.6	11.2	moderate → difficult drive, refusal (slow driving) no recovery
TOTAL 7.45	TOTAL 4.85	Percent Recovered: <u>65.1%</u>

Reason for ending drive: refusal, penetration slowed
 If refusal, reason for refusal: hard material, no recovery

Extraction Observations:

Tension on line? yes Stability of vessel: boat list to starboard
 Overlying water in core (quantity and description): yes, clear
 On Boat Recovery: 11.3 Loss of Sediment: 0.1, branch stuck in tip, silty sediment
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, mildly difficult

On Deck Observations:

Staining: dk. silt, sprayed off.
 Tube Deformation: none, core tip battered up.
 Sediment Description (odor or sheen?): gravel (crushed rock) & black silty sand. no odor, no sheen.

Keep or Retry: diver inserted screw plug at sed/H₂O interface

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log



Job: PDWG Core Proc.
 Job Number: PORS-18220-S11
 No. of Sections: 1
 Sample Length (from log): 10.7'
 Avg. % Compaction:

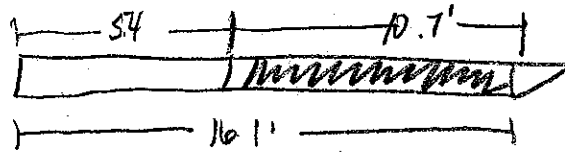
Core Location/Sample Number: SC-18-R1
 Date/ Time: 2/17/06
 Sample Logged by: LMchee 1120
 Type/Diameter of Sample: 4" sq aluminum
 Sample Quality: good fair poor disturbed T=30°F

Notes: Pen = 11.8' } 91%
in Deck Rec = 10.7' }

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
	2.54	black black		10	90	0	SILT wet, loose, ol. brown sl. sandy SILT	0-1	0-1		SILT
1		black 2.54 2.511		90	10	0	0.1-5.7 sharp damp-moist, well sorted fine black SAND with multicolored grains and distinct SILT units up to 0.2' thick (see below) 0-8 0.2' L piece of glass	1	0-1 1145 3-16oz		SAND
2		OLEY 1 4/104 d. greenish gray	tr 98		98		1.1-1.2 olive-grey, moist, soft, SILT w/ tr. fine sand 0.1-5 0.3' L piece of subangular rock	2	1-2 1150 3-16oz		
3		2.54 2.511 black	tr 98		98		1.9-2.1 moist, silty, black SILT w/ trace fine sand no odor or sheen	3	2-4 1155 3-16oz		
4		OLEY 2 4/104 d. greenish gray	unit beds	90	10	0	3.0-3.5 damp, sl. stiff, sl. sandy SILT olive-grey mod. H ₂ S like odor 3.5-5.7 (INTERBEDS) [more black in color] damp, sl. stiff olive-grey sl. sandy SILT with layers of 0.05' thick alternating with v. fine - fine black SAND	4	4-6 1200 2-16oz		SAND SILT LAYERS
5		OLEY 1 4/104 d. greenish gray + 2.54 2.511 black					• Sand has multicolored grains as in above unit • SILT is low compressibility/plasticity no odor or sheen	5			
6			tr 90		90		5.5 shell fragments 5.7-9.0 massive, blocky, wet, banded layers of v. fine sand & clayey SILT (grey) [more grey + wet] transitional	6			SAND + CLAYEY SILT

2/16/06
UM

SC-18-R1



midline = 5.4'

Core Catcher is 100% full
no deformation to show v. fine-fine bl. sand
w/ multicolored grains

Sediment Core Processing Log



Job: LDWG Core Proc.
 Job Number: FORS-18220-511
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:

Core Location/Sample Number: SC-18-R1
 Date/ Time: LAP 2/17/66
 Sample Logged by: LM
 Type/Diameter of Sample: 4" sq aluminum
 Sample Quality: good fair poor disturbed

Notes: CONT'D CONT'D

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		SAB					SAA		6-8 1205 2.1602		SAND + SILT
							no odor/sheen	8			
							8.6' woody layer of 1" thick woody fragments up to ~ 2cm				
		2.5Y black + GLEY 4/10Y d. greenish gray		90 10			[more black + sl. silty moist] SANDS interbedded w/ v. fine SANDS + SILT moist, dense, fine black SANDS with layers of olive-grey SILT that alternate @ 9.5 olive grey SILT layer (sl. sandy SILT)	9	1210 2.1602		SAND w/ SILT LAYERS
			10 90				alternating SILT + SAND layers from 9.9-10.7' alternate every 1cm (rightly spaced) (See previous descriptions above)	10			
							no odor/sheen				
							End of Core at 10.7'	11			
							baggie - 0.8 M'L glass				

Mudmole™ Bore Log

Project: LDWG Duwamish Coring
Station: 18 R1
Project No: 341185.001
Position: NAD83
Collected by: GSM
206336
Date: 2/16/2006
Time: 9:53
1267929
Water depth: 27.6 ft
Mudline: ft MLLW (estimated using tide tables)

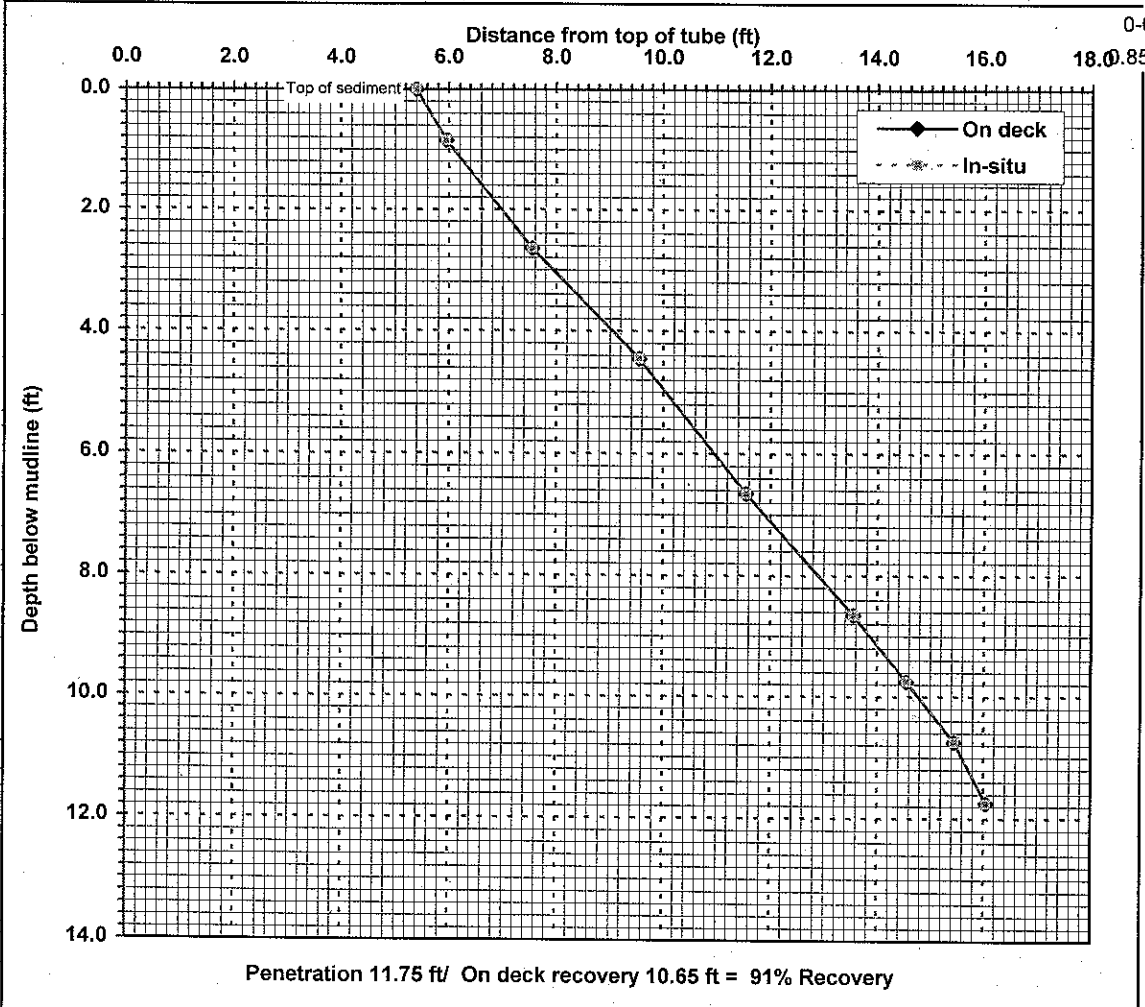
WAN
Northing
Easting

Place Field ID Label Here

Weather/Comments: N/A

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-0.85	0.55	65%
0.85-1.70	1.6	89%
1.70-2.55	2	111%
2.55-3.40	2	91%
3.40-4.25	2	100%
4.25-5.10	1	91%
5.10-5.95	0.9	90%
5.95-6.80	0.6	60%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	5.4
1	6.08
2	6.97
3	7.94
4	9.05
5	10.05
6	10.96
7	11.90
8	12.90
9	13.87
10	14.78
11	15.60
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



0-0.85	0.55	65%
0.85-1.70	1.6	89%
1.70-2.55	2	111%
2.55-3.40	2	91%
3.40-4.25	2	100%
4.25-5.10	1	91%
5.10-5.95	0.9	90%
5.95-6.80	0.6	60%

Mudline	5.4
1	6.08
2	6.97
3	7.94
4	9.05
5	10.05
6	10.96
7	11.90
8	12.90
9	13.87
10	14.78
11	15.60
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-16-06 Recorder: GSN

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 18 R1

Tube Length (ft): 16.05

Water Depth (ft): 27.6

Est. Tide Height (ft): 4.6

Est. Mudline: _____ (MLLW)

Comments: ebbing tide 27 A - sandy silt - 5A visibility

no debris - flat bottom

~ 8A off station

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 206336

Easting 1267929

On Deck Top of Sediment 5.4

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.2</u>	<u>15.5</u>	
<u>13.4</u>	<u>13.9</u>	
<u>11.6</u>	<u>11.9</u>	
<u>9.4</u>	<u>9.9</u>	
<u>7.4</u>	<u>7.9</u>	
<u>6.3</u>	<u>6.9</u>	<u>penetration suddenly slowed</u>
<u>5.3</u>	<u>6.0</u>	
<u>4.3</u>	<u>5.4</u>	<u>goal reached</u>
<u>hard clay</u>	<u>plug in tip of core</u>	

Station Number: 10 Date: 2/10/06 Station Arrival Time: 0945
 Attempt: 1 Core Tube Length: 16.05 Station Departure Time: 1022
 Field Technician: TD SF Lead Line Water Depth: 27.6 Dist. From Target Station: ~8ft
 Contractor: MGS/RSS Latitude: 200336
 On-site Visitor: _____ Longitude: 1207929

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip-rap, trees, wood dolphin, concrete pier, gravel barge
 Sediment surface & slope: sandy silt, no debris, level slope
 Water current and visibility: 5ft vis, ebbing tide
 Diver Water Depth 27 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1003 Drive Completion Time: 1009 Drive Offset: _____
 Estimated angle of drive: underwater, est 10° S 10° E

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.2	15.5	diver recorded free fall
13.4	13.9	moderate drive
11.6	11.9	moderate drive
9.4	9.9 ^{JMF}	moderate drive
7.4	7.9	moderate drive
6.3	6.9	moderate drive - penetration slowed
5.3	6.0	moderate - difficult drive
4.3	5.4	difficult drive, penetration goal reached
TOTAL 11.75	TOTAL 10.65	Percent Recovered: <u>90.6%</u>

Reason for ending drive: penetration goal reached
 If refusal, reason for refusal: _____

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): clear, ~2L
 On Boat Recovery: 5.4 Loss of Sediment: 0
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, moderately easy

On Deck Observations:

Staining: slight silt, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): did not observe

Keep or Retry: diver inserted screw plug at sed/H₂O interface JMF
diver observed; hand clay plug in tip of core

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths).

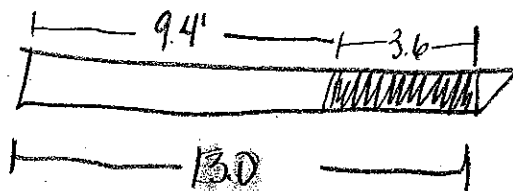
The RETEC Group, Inc.
 1011 SW Klickitat Way, Suite 207
 Seattle, WA 98134-1162



206.624.9349 Phone
 206.624.2839 Fax
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SC-19-R4

LM
2/25/06



12.1
18.0
3.6
9.4

Core catcher = silty sand } note: this is from
Thai's log. I did not
see the core catcher

-LM

★ Note: This core was stored vertically for
3 hours prior to processing (top-down).
may have caused soft sed. to shift.

2) ~ 50 mL of ^{silty} water came out of top of core when opened.
Water had 1mm florets of rainbow sheen.

→ No sheen observed in smear zone ^{from} 3.6 core was opened.

3.5-3.6 fell out of core while being cut open.

• Smear zone from 0.0-0.5 had 1mm rainbow florets



SEDIMENT CORE DRIVE LOG

Project: LDW Subsurface Sediment

Core Location: LDW-SC19

Project #: 05-08-06-32

Date: 02-24-06

Time: 1340

Field Crew: TD

Attempt #: 4

Accept/Reject *pending*

Contractor: MSS

Sample Method: *Vibracore*

Proposed Coordinates		Actual Coordinates	
N: 2061091	E: 1267011	N: 47 33.3135N	E: 122 20.7481W
Mudline:		Mudline:	
Core Drive: 5 ft		Core Drive: 5 ft	Core Recovery: 36 ft (72%)



DTS Boat:

DTS Lead Line:

29.8 ft.

Mudline Elevation:

Tide Measurements (Datum:)

Time/Height:

Time/Height:

Description:

(free fall, fingers inverted, vibration needed to drive/extract, estimation of density, debris encountered, slopes, refusal, mudline conditions, drive action, etc.)

0-3.5 ft - free fall

3.5-5 ft - diff. drive refusal

core catcher: ^{RS} scoop silty sand. mostly

core cutter - empty - washed out.

Core Tube Length:

Total Drive: 5 ft.

Length Recovered: 3.6 ft

72% ~~26%~~ ~~66%~~

Measurement (to nearest 0.1 foot):

Avg. % Recovery:

Avg. % Compaction:

Section:

Length:

Description at Cuts:



A =



B =



C =



D =

Notes: ~ 43 ft. off target, will try for RS

Sediment Core Processing Log

1062

Job: RDWG Core Processing

Core Location/Sample Number: SG 19-R 5

Job Number: PORS-18200-5/1

Date/Time: 2/24/06 1500

No. of Sections: 1

Sample Logged by: LM, CB

Sample Length (from log): _____

Type/Diameter of Sample: 3" round

Avg. % Compaction: _____

Sample Quality: good fair poor disturbed

Notes: Pen = 13.0'

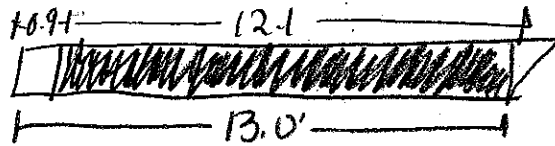
On beach rec. = 12.1' } 93%

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Insitu Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
1		2.5y 2.5s/1 black	-	10 tr	90 98	8	moist-damp, med-dense black (org) sl. sandy SILT with mottling of olive-grey-brown & clayey SILT @ 0.7 poly chete worm tubes • rotlets, shell fragments up to 2" L • low plasticity, sl compressible	0-1 1515 2-1602			SILT @ 0.4' TV = 0.3 BIG
2							@ 1.9 woody fragments up to 1/4" L " floret of rainbow sheen 1/4" &	1-2 1520 GT 2.2 3-1602			sheen
3								2-4 1525 GT 3.1 3-1602			@ 2.6' TV = 1.0' BIG
4							mild H ₂ S-odor	4-6 1530 2-1602			@ 3.7' TV = 0.8 BIG
5							@ 5.3' pocket of woody fragments 2 1/2" L				
6							@ 5.9 3" L piece of wood				

f:\fieldforms\coreprocess

SC-19-R5

LM, CB
2/24/06



Thai's notes { Core catcher is empty
due to being washed
out

~~Core catcher is full of
black sandy silt~~

0.8 - 7.0' sheen on smear zone

Sediment Core Processing Log

282

Job: LDWG Core Proc

Core Location/Sample Number: SC-19-R5

Job Number: PRS-18220-511

Date/Time: 2/24/06 500

No. of Sections: _____

Sample Logged by: IM, CB

Sample Length (from log): _____

Type/Diameter of Sample: 3" round

Avg. % Compaction: _____

Sample Quality: good fair poor disturbed

Notes: Pen = 13.0'

DN Deck Rec = 121'

CONT'D

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
							mod H ₂ S odor		6-7 1535 2/1602	291	SILT
7		2.5y 2.5/1 black	25	75	-		7.0-7.5 transitional layer of gravelly SAND subrounded up to 1/2" and subangular up to 0.1" L, H ₂ S odor	7	7-9 1540 2/1602		GRAVEL SAND
8			-	40	60		7.5-8.6 mix of very fine SAND (grey-brown) and black SILT	8			SILT SAND
9		SIET 11 v. dk. grey		tr	98		8.6-9.0 layer of olive-grey clayey SILT. sl. compressible, low plast. red pocket up to 1/2" sharp	9			
10			20	90	-		SAND moist, med-dense, gravelly SAND with multicolored gravels (red, white, orange). Gravel is subrounded and up to 1/4" Ø	10	9-11.9 1545 2/1602		SAND
11								11			
12		SIET 11 3/11 v. dk. grey					11.7-11.9 layer of blue-grey SAND w/ 2" L rootlets	12			
							End of core @ 11.9'				

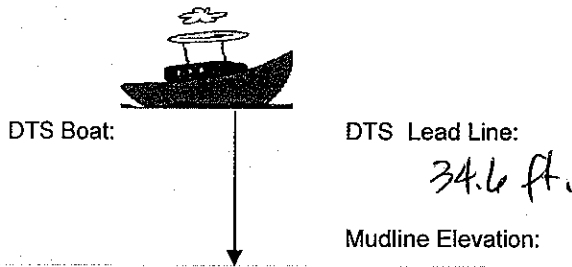


SEDIMENT CORE DRIVE LOG

Project: LDW Subsurface Sed.
 Project #: 05-08-06-32
 Field Crew: TD
 Contractor: MSS

Core Location: LDW-5C19
 Date: 02.24.06 Time: 1355
 Attempt #: 5 Accept/Reject pending
 Sample Method: Vibra corer

Proposed Coordinates		Actual Coordinates	
N: <u>206189</u>	E: <u>1267011</u>	N: <u>47 33.3172W</u>	E: <u>122 20.7486W</u>
Mudline:		Mudline:	
Core Drive: <u>13ft</u>		Core Drive: <u>13ft</u>	Core Recovery: <u>12.1 ft (93.1%)</u>



Tide Measurements (Datum:)

Time/Height:

Time/Height:

Description:

(free fall, fingers inverted, vibration needed to drive/extract, estimation of density, debris encountered, slopes, refusal, mudline conditions, drive action, etc.)

0-5.75 ft - freefall
5.75 - 6.5 ft moderate drive.
6.5 - 13 ft easy drive
 surf sed - soft brown silt
 core catcher - brown sand/silt
 core cutter - sandy silt, washed out.

Core Tube Length:

Total Drive: 13ft. Length Recovered: 12.1
93.1%

Notes: 5.6 ft off target.

Measurement (to nearest 0.1 foot):

Avg. % Recovery:

Avg. % Compaction:

Section:	Length:	Description at Cuts:
<input type="checkbox"/> A =		
<input type="checkbox"/> B =		
<input type="checkbox"/> C =		
<input type="checkbox"/> D =		



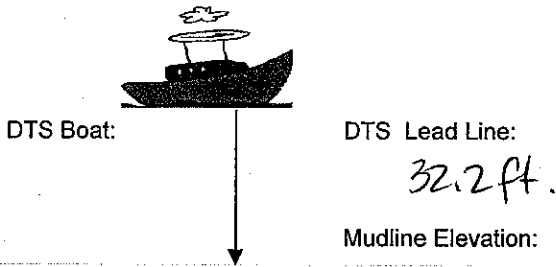


SEDIMENT CORE DRIVE LOG

Project: LDW Subsurface Sediment
 Project #: 05-08-06-32
 Field Crew: TD
 Contractor: MSS

Core Location: LDW-SC19
 Date: ~~02-21-06~~ 02-24-06 Time: 1245
 Attempt #: 3 Accept/Reject: Reject
 Sample Method: Vibracore

Proposed Coordinates		Actual Coordinates	
N: <u>206189</u>	E: <u>1267011</u>	N: <u>47 33.3153N</u>	E: <u>122 20.7443W</u>
Mudline:		Mudline:	
Core Drive: <u>8 ft.</u>		Core Drive: <u>8 ft.</u>	Core Recovery: <u>2.9 ft. (36.3%)</u>



Tide Measurements (Datum:)

Time/Height:

Time/Height:

Description:

(free fall, fingers inverted, vibration needed to drive/extract, estimation of density, debris encountered, slopes, refusal, mudline conditions, drive action, etc.)

0-4 ft freefall
4 ft. - 8 ft. extremely difficult drive
w/ 5 minute total core
time

3 1/2 in rock in core cutter end.

Core Tube Length:

Measurement (to nearest 0.1 foot):

Avg. % Recovery:

Avg. % Compaction:



Section:	Length:	Description at Cuts:
<input type="checkbox"/> A =		
<input type="checkbox"/> B =		
<input type="checkbox"/> C =		
<input type="checkbox"/> D =		

Total Drive: 8 ft. Length Recovered: 2.9 ft.
36.3%

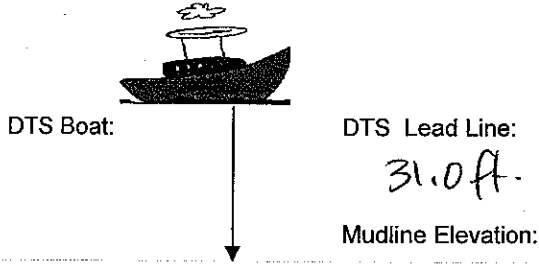
Notes: TD
Notes: ~ 3 1/2 ft. off target, core discarded, will try R4



SEDIMENT CORE DRIVE LOG

Project: LDW Subsurface Sediment	Core Location: LDW-SC19
Project #: 05-08-06-32	Date: 02.24.06
Field Crew: TD	Time: 12:5
Contractor: MSS	Attempt #: 2
	Accept/Reject: <u>Accept</u>
	Sample Method: Vibracore

Proposed Coordinates N: 206189 E: 1267011 Mudline: Core Drive: 6 ft	Actual Coordinates N: 47 33.3150N E: 122 20.7420W Mudline: Core Drive: 6 ft. Core Recovery: 4.5 ft (75%)
-------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------



Tide Measurements (Datum:)
Time/Height:
Time/Height:

Description:

(free fall, fingers inverted, vibration needed to drive/extract, estimation of density, debris encountered, slopes, refusal, mudline conditions, drive action, etc.)

- 0-3.5 free fall
- 3.5-4 difficult drive
- 4-5 - free fall
- 5-6 ft. - difficult drive - refusal

core cutter end had gray silt w/ fine sand.

Core Tube Length:

Measurement (to nearest 0.1 foot):

Avg. % Recovery:

Avg. % Compaction:

Section:	Length:	Description at Cuts:
A =		
B =		
C =		
D =		

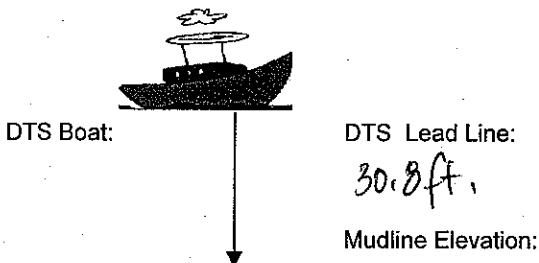
Total Drive: 6 ft. Length Recovered: 4.5

Notes: ~27 ft. off target, will discard, try for R3

SEDIMENT CORE DRIVE LOG

Project: LDW subsurface sediment	Core Location: LDW-SC19
Project #: 05-08-06-32	Date: 02-24-06 Time: 1155
Field Crew: TD,	Attempt #: 1 <i>Accept/Reject pending R2</i>
Contractor: MSS	Sample Method: Vibracores

Proposed Coordinates N: 206189 E: 1267011 Mudline: Core Drive: 10ft.	Actual Coordinates N: 47 33, 3144W E: 122 20.7444W Mudline: Core Drive: 6ft. Core Recovery:
--------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------



Tide Measurements (Datum:)
 Time/Height:
 Time/Height:

Description:
 (free fall, fingers inverted, vibration needed to drive/extract, estimation of density, debris encountered, slopes, refusal, mudline conditions, drive action, etc.)
 0-4 ft. free fall
 4-6 ft. difficult drive, hit refusal
 soupy sandy silt.

Measurement (to nearest 0.1 foot):

Avg. % Recovery:
 Avg. % Compaction:

Section:	Length:	Description at Cuts:
<input type="checkbox"/> A =		
<input type="checkbox"/> B =		
<input type="checkbox"/> C =		
<input type="checkbox"/> D =		

Total Drive: 6ft. Length Recovered: 2.7ft
 45%

Notes: ~ 30ft off target; will discard, try for R2

Sediment Core Processing Log



Job: LDWG Core Processing
 Job Number: PORS-18120-SIT
 No. of Sections: 1
 Sample Length (from log): 10.0
 Avg. % Compaction: _____

Core Location/Sample Number: LDWG-20-21
 Date/ Time: 2/15/06 1410
 Sample Logged by: LMhee, C Brackett
 Type/Diameter of Sample: 4" sq aluminum
 Sample Quality: good fair poor disturbed

Notes: Pen = 12.6 2
on deck Dec = 9.9 5
Rec = 78%

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
1		2.5Y 4/3 olive brown	0	10	90	0	0.0 - 0.1 moist, loose, olive brown, sl. sandy silt		1935	0-0.5	SILT
		2.5Y 2.5/1 Black	2	10	90	0	0.1 - 2.1 moist, blocky, black silt with trace subrounded gravel to 0.05 Rootlets & woody fragments, ranging from 0.05 - 2.1 leaf fragments Slight sheen moderate HC-like odor (organic silt).	1	4-1602	0.5-1	SILT
2		unit = 2.5Y 2.5/1 black bed = 2.5Y 5/1 grey	10	75	85	0	2.1 - 3.7 transitional moist, blocky, slightly sandy silt with fine sand unit with interbeds of moist, stiff, grey clayey silt layers (~0.05" thick) moderate sheen moderately oriented	2	1940	1.5-2	SILT
							2.1 - 3.5 moderate sheen mild HC-like odor	3	4-1602	2.5-3	SILT w/ sand
3		2.5Y 2.5/1 black	0	2	98	0	2.5 - 2.6 layer of fine, black, moist dense sand	3	GT 2.9	3-3.5	SILT
							3.7 - 4.1	4	1531	3.5-4	SILT w/ clay
4		3/1 v. dk grey	0	0	100	0	4.1 - 10.0 moist, blocky, bl. sl. sand y silt with fine sand & H ₂ S-like odor uniform texture block, low plasticity play-do like texture sl. compressible - no wood fragments or rootlets	4	1945	4.4-5	SILT
		2.5Y 2.5/1 black	0	10	90	0		5	2-1602	5.5-5	SILT
5		2.5Y 2.5/1 black	0	10	90	0		5	1540	5.5-6	SILT
								6	1543	5.5-6	SILT

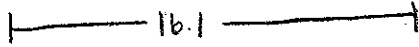
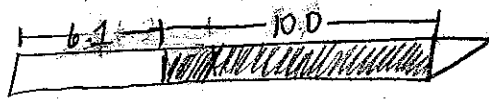
HC-like odor
 Sheen
 indurated sheen
 @3.9 TV=1.0 Big

SC-20-R1

2/15/06

LM

CB



16.1

6.1

10.0

shoe $\frac{1}{2}$ full of bl. sl. sandy silt
C.C. 10.0



Sediment Core Processing Log

Job: LDWG Core Processing
 Job Number: PORS-18200-511
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:
 Notes: CONTINUED

Core Location/Sample Number: LDWG-SC-20 (21)
 Date/ Time: 2/15/06
 Sample Logged by: LM, CB
 Type/Diameter of Sample: 4" Sq q/l.
 Sample Quality: good fair poor disturbed

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
7		SAA	-	SAA	SAA		7.4-10.0 small shell fragments - trace up to 0.05' ø	7	6-8 1455 2.1602		
8							8-10 shell fragment	8			
9								8-10 1505 2.1602			
10							End of core at 10.0' core catcher shoe 1/2 full.	10			
NOTES:							Sed units include: sl. sandy silt black silt (org.)				
RI examined No. 1-2.14							Sediment is coming out of core shoe				
Core shoe K deformation in 13' interval											

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-15-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 20 R1

Tube Length (ft): 16.05

Water Depth (ft): 43.5

Est. Tide Height (ft) 7.4 (MLLW)

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 206177

Easting 1267735

On Deck Top of Sediment 62

Comments: Falling tide - strong surface current

1 ft vis - mild current - flat bottom - sandy silt -

43 ft diver depth

Penetration Tape Reading

Recovery Tape Reading

Comments

15.9

15.6

12.1

11.8

8.3

8.2

5.8

6.4

3.5

5.1

goal reached

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 20 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

206177

Northing

Date: 2/15/2006

Time: 8:49

1267735

Easting

Water depth: 43.5 ft

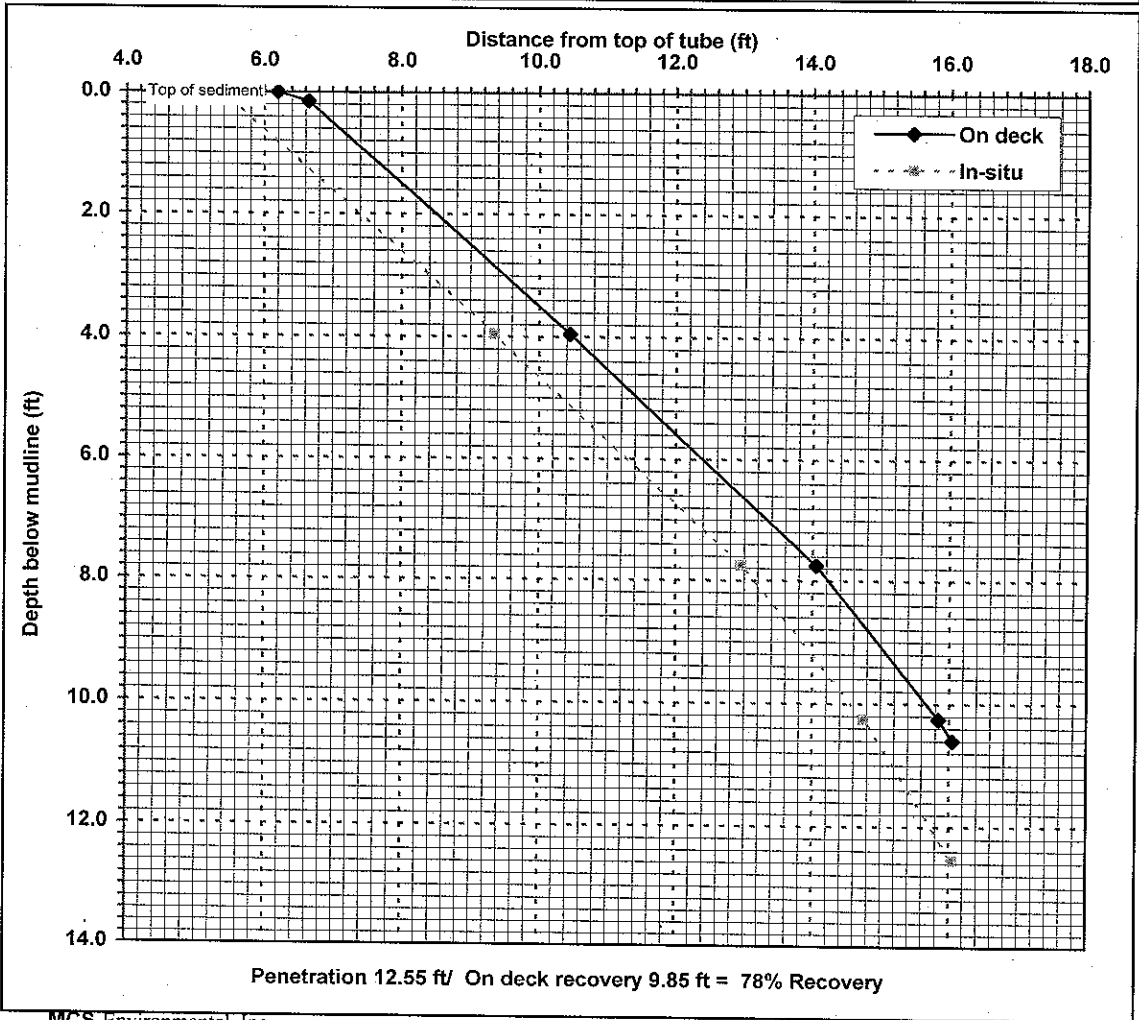
Mudline: -36.1 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Sunny

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------



0-0.15	0.45	300%
0.15-3.95	3.8	100%
3.95-7.75	3.6	95%
7.75-10.25	1.8	72%
10.25-12.55	1.3	57%

Mudline	6.2
1	7.50
2	8.50
3	9.50
4	10.50
5	11.44
6	12.39
7	13.34
8	14.23
9	14.95
10	15.67
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 20

Date: 02/15/06

Station Arrival Time: 0820

Attempt: 1

Core Tube Length: 16.05

Station Departure Time: 0920

Field Technician: TD

Lead Line Water Depth: 43.5

Dist. From Target Station: 6

Contractor: MCS/RSS

Latitude: 206177

On-site Visitor: _____

Longitude: 1267735

Pre-Drive and Diver Observations:

Shoreline & surrounding area: mid navigation channel, wood & concrete piers to east and west

Sediment surface & slope: sandy silt, flat bottom

Water current and visibility: strong ebbing current at surface, mild current

Diver Water Depth 43 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 0901 Drive Completion Time: 0906 Drive Offset: _____

Estimated angle of drive: equiv. under water, cannot see. est 10-15° (strong current)

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.9	15.	diver recorded, free fall
12.1	11.8	moderate drive
8.3	8.2	moderate drive
5.8	6.4	moderate drive
3.5	5.1 5.1	moderate drive.
TOTAL 12.55	TOTAL 10.95	Percent Recovered: <u>87.3</u>

Reason for ending drive: penetration goal reached

If refusal, reason for refusal: _____

Extraction Observations:

Tension on line? yes Stability of vessel: no problem

Overlying water in-core (quantity and description): clear, ~ 400 ml

On Boat Recovery: 6.2 lbs Loss of Sediment: 1.1 ft.

Extraction Notes: (i.e. winch or hammer, easy, hard) winch, moderately easy

On-Deck Observations:

Staining: silt washed off by diver under water bk of current and sprayhose frozen

Tube Deformation: none

Sediment Description (odor or sheen?): dark silty sand, no odor, no sheen

Keep or Retry: diver inserted screw plug at sed/H₂O interface

Notes: Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)



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www.retec.com

Sediment Core Processing Log



Page 1 of 2

Job: Dunwich
 Job Number: P0155-18220
 No. of Sections: 1
 Sample Length (from log): drive = 12.7'
 Avg. % Compaction: undist = 11.1'

Core Location/Sample Number: LDW-SC-21 (R)
 Date/Time: Feb 15, 2006 start 0445
 Sample Logged by: A. Fitzpatrick, Leslie Melke
 Type/Diameter of Sample: 4" ID alum MCS
 Sample Quality: good fair poor disturbed

Notes: 0% Recovery = 87%
CWC collected D2-14-01

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, blots, wood, other debris)	Grain Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
0.5		2.5/4/3 olive brown		40	60	Ø	0-0.5: Moist, med. dense, dk. olive sandy silt with fine sand no odor, no sheen		0-1		SILT
1.0		2.5/1 black		2	98	D	0.5-1.5: Moist, med. stiff, black silt with trace fine sand light H ₂ S-like odor low plasticity, massive, appears like soft play do - has organic matter, uniform texture, st. compressible scattered wood fragments (15%)	0.5	3-1602		
2.0							2-4: mild H ₂ S-like odor (organic silt)	1.0	GT 1.1		
3.0								2.0	1030		
4.0			0	100	0		3.6-3.8 Layer fine sand	2.0	GT 1.1		
5.0							Silt (SAA)	3.0	3-1602		
6.0							4-6: moderate H ₂ S-like odor	4.0	2-4		
7.0		2.5/1 black						5.0	1035		
8.0		2.5/1 grey	0	0	100	Ø	5-6.2 transitional transition zone to unit below Moist, medium dense, black silty sandy silt w/ olive grey med. dense clayey silt casts layers with high stiffness	3.0	GT 2.2		
9.0							5.4-5.6 convex layer of moist, bl. fine sand	4.0	5-1602		

0.08
TV=2
Big

mild H₂S-like odor

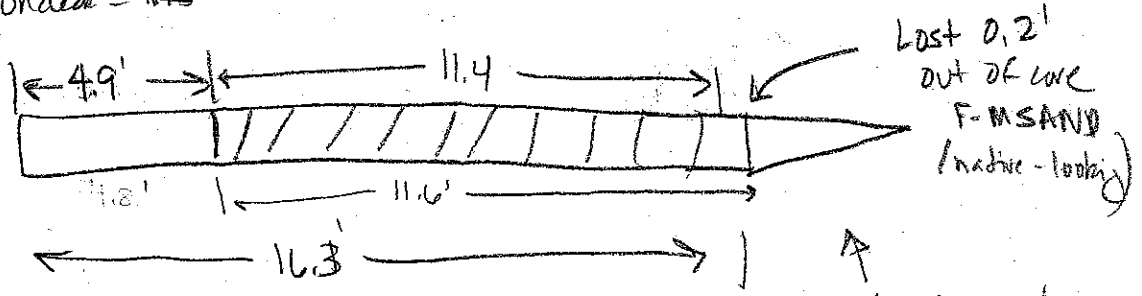
mod. H₂S-like odor

0.5.6
TV=3.25
Big

LDW-SC-21

Feb 15, 2006

on deck = ~~15~~ 5.0'



↗
water settled
over night.

no refusal
soil reached

5 1
16.3
11.4

4.9

Sediment Core Processing Log



Job: Dunamisb
 Job Number: POS55-1822D
 No. of Sections: _____
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: LDW-SC-21 (R1)
 Date/ Time: Feb 15, 2006
 Sample Logged by: L. Miller, A. Fitzpatrick
 Type/Diameter of Sample: _____
 Sample Quality: good fair poor disturbed

Notes: see page 1

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
7.0		2.5Y 5/2.9 greyish brown	10	100	0	Ø	6.1 - 6.1' mottled in a black fine sand layer at 6.2 silt (S17A) sharp				SILT
8.0		2.5Y 4/2 dk greyish brown	Ø	75	25	Ø	6.2 - 9.8 Moist, black med-fine sand with interbedded silty sand (black) 2-4" Wood fragments (10%) 0.1" (max) Scatter woody layers ~ 2" thick and interbedded silt layers ~ 2"	6.2-8	1045	2-1602	SAND w/ SILT INT. BEDS
9.0		2.5Y 4/2 dk greyish brown	unit: Ø 10	90	Ø	Ø	8.2 - 8.6 orange-br. woody layer (shredded) < 0.05'	8.0			
10.0		(gradational)	interbed: Ø 20	80	Ø	Ø	grading coarser with depth (less silt) LESS wood with depth	9.0	1050	2-1602	
11.0		4.0E/1 3/1 very dark greenish grey	unit: 98	2			9.8 - 11.4 transitional to unit below Moist, dense, black med sand with multicolored grains (white, red, orange) 9.8 - 9.9 woody layer: orange br. shredded pieces, well-sorted	10.0			
12.0			bed: 75	25			11.0 Non-lumbered 0.1" wood piece (native-looking)	10-11.4	1055	2-1602	SAND
12.0							END of core 11.4' core catcher/shoe - empty	12.0			

@ 9.5 TV=4.5 Big

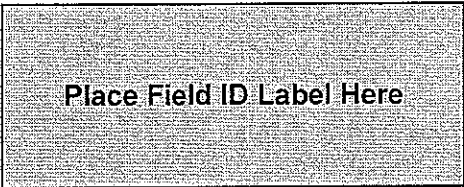
MCS Environmental MudMole Bore Log

Collection Information

Date: 2-14-06 Recorder: GSV

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 21 R1



Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 34.1

Time: 1330

Northing 206167

Est. Tide Height (ft) 5.9

(MLLW) predicted tide

Easting 1267486

Est. Mudline: _____

(MLLW)

On Deck Top of Sediment 5.0

Comments: incoming tide - 33ft - 4ft at bottom - 4ft variability

silty sand - no debris

23ft off station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.6</u>	<u>15.6</u>	
<u>12.5</u>	<u>12.4</u>	
<u>10.2</u>	<u>10.1</u>	
<u>7.8</u>	<u>7.8</u>	
<u>5.7</u>	<u>6.1</u>	
<u>3.9</u>	<u>4.8</u>	<u>goal reached</u>

Mudmole™ Bore Log

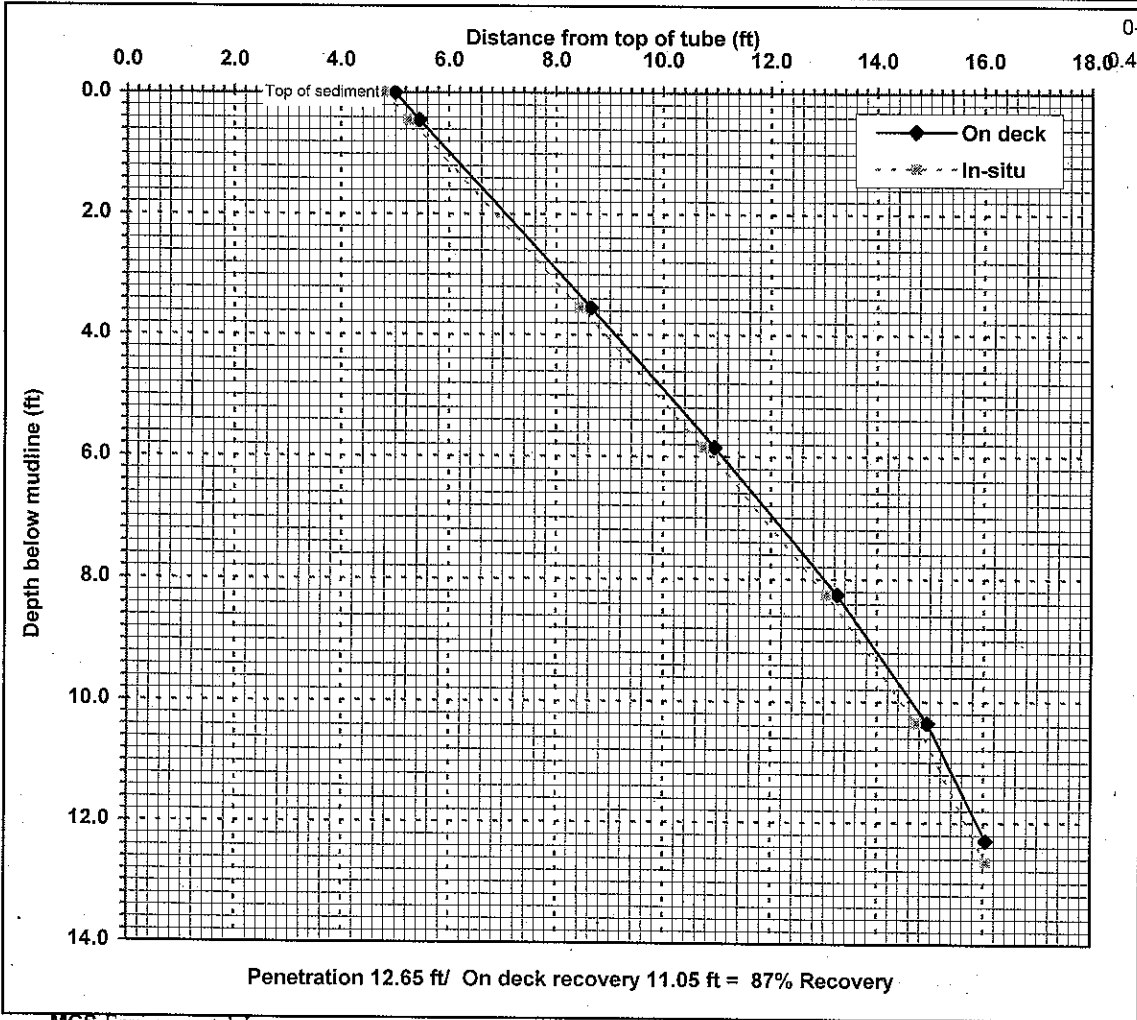
Project: LDWG Duwamish Coring	Station: 21 R1	
Project No: 341185.001	Position: NAD83	WAN
Collected by: GSM	206167	Northing
Date: 2/14/2006	Time: 13:30	1267486
Water depth: 34.1 ft	Mudline: -28.2 ft MLLW	(estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------



0-0.45	0.45	100%
0.45-0.90	3.2	103%
0.90-1.35	2.3	100%
1.35-1.80	2.3	96%
1.80-2.25	1.7	81%
2.25-2.70	1.3	57%

Mudline	5
1	6.02
2	7.05
3	8.08
4	9.10
5	10.10
6	11.09
7	12.05
8	13.01
9	13.86
10	14.67
11	15.32
12	15.88
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 21 Date: 02/14/06 ^{TPD} Station Arrival Time: 1321
 Attempt: 1 Core Tube Length: 39.16.05 Station Departure Time: 1358
 Field Technician: TD Lead Line Water Depth: 34.1 Dist. From Target Station: 3
 Contractor: MCS/RSS Latitude: 206167
 On-site Visitor: --- Longitude: 1267486

Pre-Drive and Diver Observations:

Shoreline & surrounding area: concrete pier with wood pilings.
 Sediment surface & slope: silty sand, no debris, flat bottom
 Water current and visibility: 4 ft. vis; flooding (incoming) tide
 Diver Water Depth 33 Tip Probe Depth --- Disk Probe Depth ---

Drive Observations:

Drive Initiation Time: 1339 Drive Completion Time: 1345 Drive Offset: ---
 Estimated angle of drive: unable to see - eqpt under water (est 10°)

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.6	15.6	Diver measured; free fall
12.5	12.4	easy - moderate drive
10.2	10.1	easy - moderate drive
7.8	7.8	easy - moderate drive
5.7	6.1	^{DO} easy moderate drive
3.9	4.8	moderate - difficult drive.
TOTAL 12.15	TOTAL 11.25	Percent Recovered: <u>92.6%</u>

Reason for ending drive: penetration goal reached
 If refusal, reason for refusal: ---

Extraction Observations:

Tension on line? YES Stability of vessel: no problem
 Overlying water in core (quantity and description): yes, clear -> slightly turbid.
 On Boat Recovery: 5.0 Loss of Sediment: 0.2
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: some silt, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): brown, med. sand, no odor no sheen (in plug)

Keep or Retry: diver inserted screw plug at sed/THO interface

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

The RETEC Group, Inc.
 1011 SW Kirkland Way, Suite 207
 Seattle, WA 98134-1162



206.624.9349 Phone
 206.624.2839 Fax
 www.retec.com



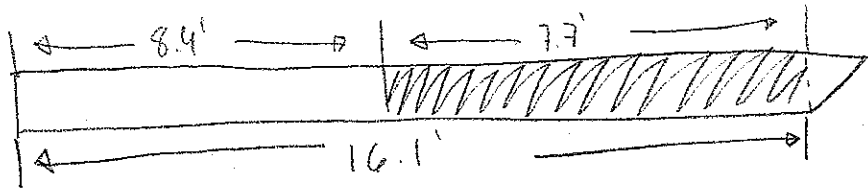
Sediment Core Processing Log

Job: LDWG SC core
 Job Number: PORS5-18220
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:
 Notes: Percent 9.3 → R=83%
 On-deck: 7.7'

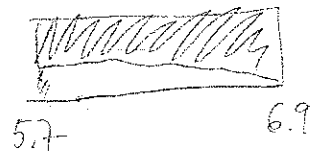
Core Location/Sample Number: LDWG-SC-22 (RI)
 Date/Time: 2/14/06 0830-0920
 Sample Logged by: N. Bacher, L. McKee
 Type/Diameter of Sample: 4" sq. aluminium
 Sample Quality: (good) fair poor disturbed

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		10YR 4/4		90	10		brownish trace gravel wet, loose, dark gray medium sand w/ minor silt. multi-colored grains red, orange 1" Ø brown woody silt pocket/peat		0850		
		GLE1 2.5/10Y greenish black		90	10		moist, med. dense, black, medium sand w/ minor silt. 25% wood debris. Multi-colored grains are orange, red, white. 0.9-1.1 moderate creosote-like odor and mod. sheen. 1.5" wood piece @ 1.0 w/ staining and odor.	1.0	1.0 1.7		sheen odor creosote-like
		1/2" Ø brown silty clay pocket @ 1.4'		90	10		moist, med. dense, grayish brown, fine sand w/ scattered grayish sl. sandy silt lenses or hints of lenses. multi-colored grains are red, orange, white. no creosote-like odor or sheen below 1.6'	2.0	1.6 1.9		
		GLE1 2.5/N					@ 3.6 1x3" red brick fragment. 3.5-4.0 scattered 1/4" gray silty pockets.	3.0			@ 3.0 TV=30 612
							@ 4.2-4.4 silty woody sand layer. wood B elongate splinters ~ 1/2" Ø and 1-2" long.	4.0			
							@ 5.1" trace 1/4" Ø peaty brown pockets.	5.0			@ 5' TV=35 612
							core B slightly to moderately unground from 5.7-6.9' good seal below.	6.0			

SC-22 R1



core B winnowed
from 5.7-6.9



Sediment Core Processing Log



Job: _____
 Job Number: _____
 No. of Sections: _____
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: LDWG-SC-22 R1
 Date/ Time: 2/11/06
 Sample Logged by: _____
 Type/Diameter of Sample: _____
 Sample Quality: good fair poor disturbed

Notes: _____

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
							@ 6.5 unit grades to medium sand	0910			<p>@ 7.0' TV=2.0 big</p>
							@ 6.9' 1/2" silty clayey peat pocket, brown.	7.0			
							END OF CORE: 7.71	8.0			

winnowed

@ 7.0'
TV=2.0
big

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-13-06 Recorder: ESM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 22 R1

Tube Length (ft): 16.1

Water Depth (ft): 12.0

Est. Tide Height (ft): 9.1 (MLLW)

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 205908

Easting 1258174

On Deck Top of Sediment 8.4

Comments: conc. rubble at station - moved offshore 15' from

station diver 11 ft silty sandy with scattered gravel

& debris gentle slope & visibility,

Penetration Tape Reading

Recovery Tape Reading

Comments

13.5 13.4 _____

9.6 9.7 _____

7.9 8.4 rate slowed

6.8 8.2 refusal

fine sand in tip - some loss of material

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 22 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

205908

Northing

Date: 2/13/2006

Time: 15:20

1268174

Easting

Water depth: 12.0 ft

Mudline: -2.9 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Overcast

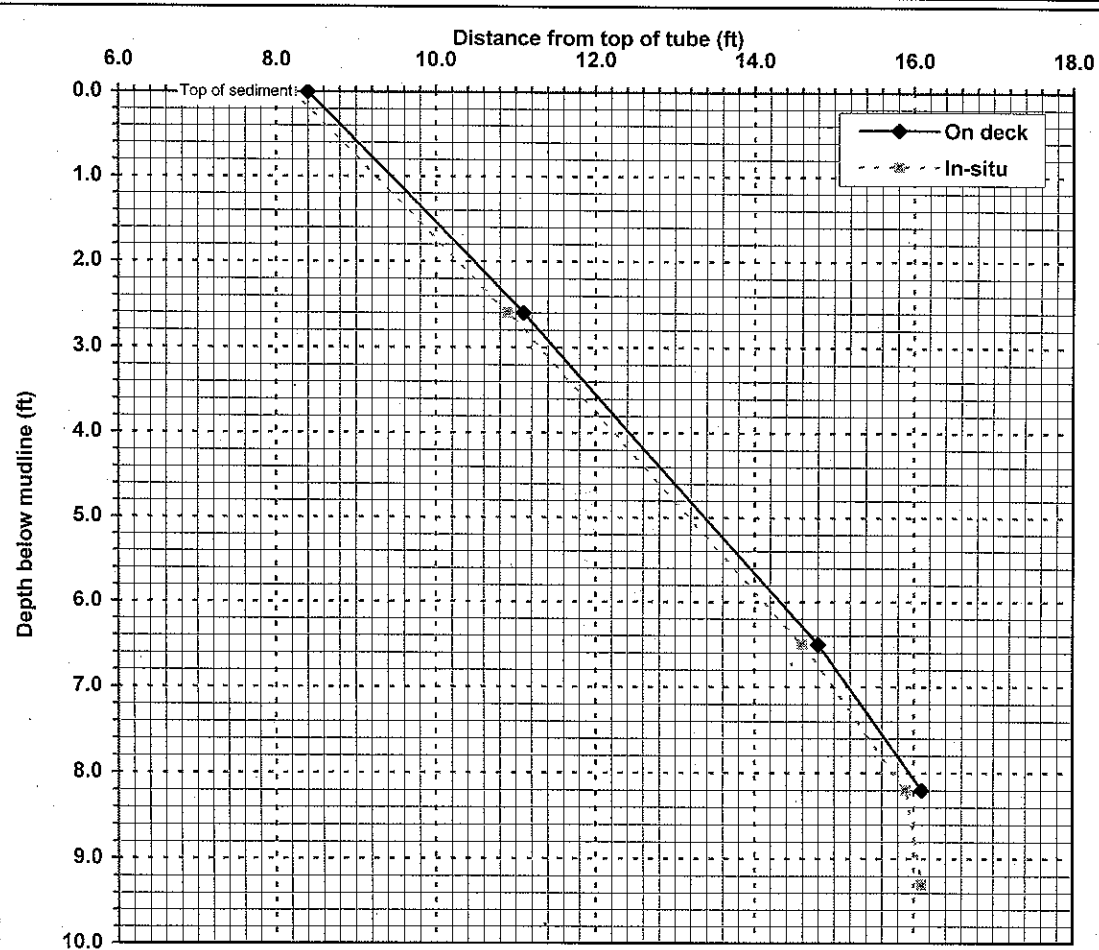
Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------

0-2.6	2.7	104%
2.6-6.5	3.7	95%
6.5-8.2	1.3	76%
8.2-9.3	0.2	18%

Mudline	8.4
1	9.44
2	10.48
3	11.48
4	12.43
5	13.38
6	14.33
7	15.18
8	15.95
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Penetration 9.3 ft/ On deck recovery 7.7 ft = 83% Recovery

Sediment Core Processing Log



Job: LDWG Sed. Core Proc.
 Job Number: PORS 18220-511
 No. of Sections: 1
 Sample Length (from log): 10.7
 Avg. % Compaction: _____

Core Location/Sample Number: SC-23-R1
 Date/ Time: 2/17/06 0830
 Sample Logged by: LMcCle
 Type/Diameter of Sample: 4" sq al.
 Sample Quality: good fair poor disturbed

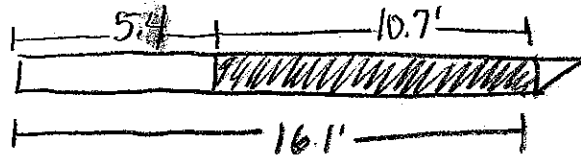
Notes: Pen = 12.4' }
 On Deck Rec = 10.7' } 80% Rec. note: temp is 27 F

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch	
1		2.5Y 4/3 olive brown	-	10	90	✓	0.0-0.5 SILT Wet, loose, olive brown @ 0.1 0.3' concrete piece			0-0.5 0915 11602	← concrete SILT	
		2.5Y 2.5/1 Black		10	90	✓	0.5-2.3 SILT (ORG) moist, blocky, black PP black SILT (org.) Shell fragments & scattered woody fragments up to 0.2' • massive, uniform • low plasticity, sl. compressibility • metallic sheen test	1	0-2 0850 GT 0.9 31002	11602 0.5-1 0918 11602 SILT (ORG) @ 0.9 TV = 3.0 RIG		
		6.5Y 3/1 v. dk. greenish grey	10	15	95	✓	@ 1.8-2.1 thick layer of med. black sandy SILT with multicolored grains & gravel up to 0.05' & moist, dense SILT (ORG)	2	1-1.5 0921 11602 1.5-2 0924 11602	11602 SILT w/ SAND & gravel		
		Black (see above)		tr	98	✓	2.3-2.6 SILT w/ clay (dk. green grey) layer of sl. clayey silt, dk greenish grey, moist, sl. compressible, low plasticity	3	2-2.5 0927 11602 2.5-3 0930 11602	11602 SILT w/ clay		
				10	90	✓	SILT (ORG) as above unit 0.5-2.3' @ 3.0 mild H ₂ S-like odor.	4	3-3.5 0933 11602 3.5-4 0936 11602	11602 SILT (ORG)		
				tr	98		layer of 4.8-6 SILT w/ clay (dk. green grey) layer of moist, dk greenish grey sl. clayey SILT • like play do • sl. compressible mild H ₂ S-like odor	5	4-4.5 0939 11602 4.5-5 0942 11602 5-5.5 0945 11602 5.5-6 0948 11602	11602 SILT w/ clay		
								6				04.4 TV = 1.6 RIG

SG 23- R1

2/17/06

LM



Mudline = 5.4

core catcher is 1/5 full
grey-black SILT, trace fine sand

12.1

5.4

16.7

Sediment Core Processing Log

Job: LDWG Sed Core Proc.
 Job Number: PORS 18220-511
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____
 Notes: CONT'D

Core Location/Sample Number: SC-23-RA
 Date/ Time: 2/17/16
 Sample Logged by: L McKee
 Type/Diameter of Sample: 4" Sq al.
 Sample Quality: good fair poor disturbed
 Notes: CONT'D CONT'D

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		Black					6-9.5 ORG SILT				
		SAA					SAA @ 7.2' lg. woody fragment ~ 1" L	7			
							H ₂ S-like odor	8			
							transitional				
		2.5Y S11 grey	- 10	90	0		9.5-10.7 grey SILT Moist, med. dense, grey clayey SILT clumpy clay balls wood fragments up to 0.2' L shell fragments up to 0.1' L H ₂ S-like odor	10			
							End of core @ 10.7'				
							* Torvane is frozen. After thawing had sl. restricted maneuverability note: water at top end of core tube is frozen Sheen test - 0-1 = No Sheen 1-2 = No Sheen				

@ 9.0'
 4V ~ 4.1
 BIG

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-16-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 23 R1

Tube Length (ft): 16.05

Water Depth (ft): 23.2

Est. Tide Height (ft) 2.1 (MLLW)

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 205418

Easting 1268229

On Deck Top of Sediment 5.4

Comments: Falling tide - strong surface current - Diver depth 23

visibility < 1 ft silty bottoms - slope unknown

23A at station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.5</u>	<u>14.6</u>	
<u>13.0</u>	<u>13.1</u>	
<u>10.0 11.0</u>	<u>11.0 10.8</u>	
<u>9.0</u>	<u>8.6</u>	
<u>7.0</u>	<u>6.9</u>	
<u>5.7</u>	<u>5.8</u>	<u>penetration slowed</u>
<u>3.7</u>	<u>4.5</u>	<u>goal reached</u>

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 23 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

205418

Northing

Date: 2/16/2006

Time: 11:56

1268229

Easting

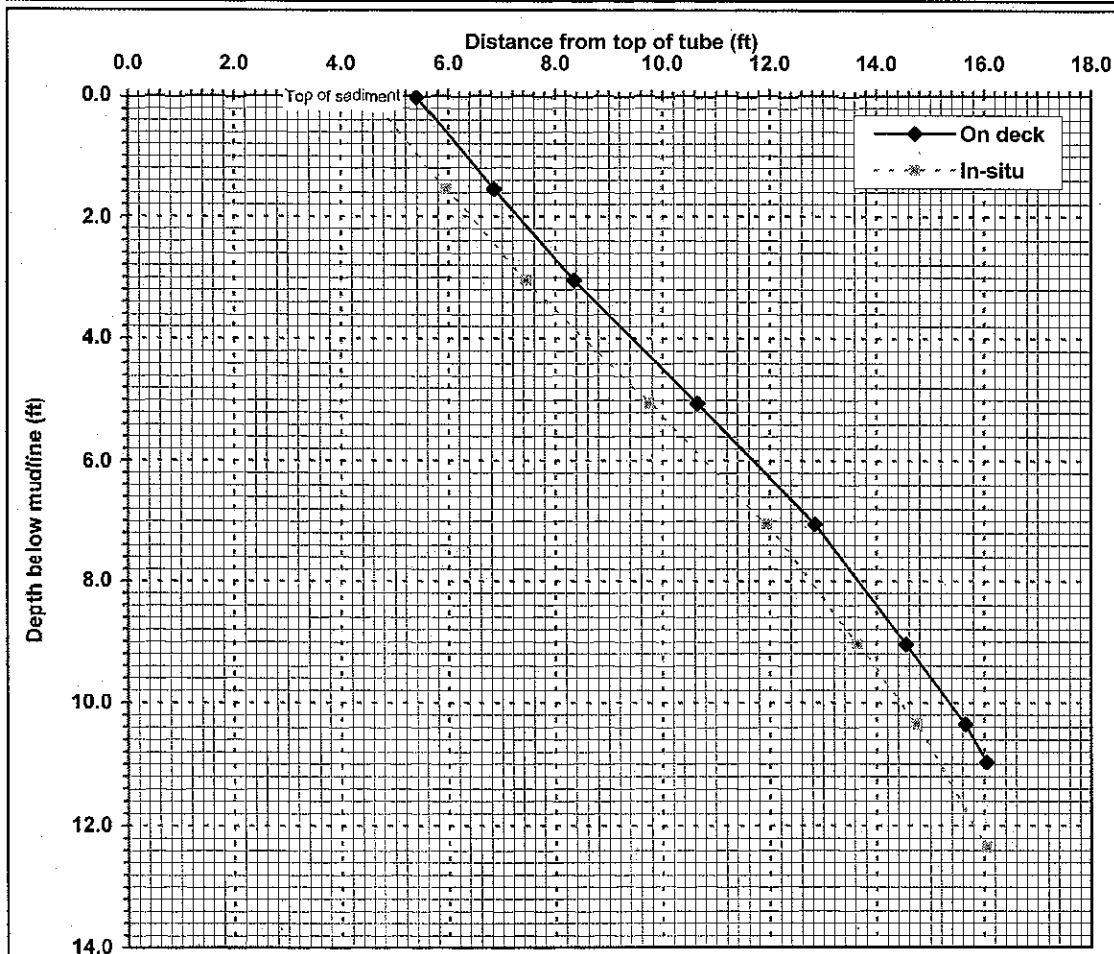
Water depth: 23.2 ft

Mudline:

ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A



Penetration 12.35 ft/ On deck recovery 10.65 ft = 86% Recovery

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
0-1.55	1.45	94%	Mudline	5.4
1.55-3.05	1.5	100%	1	6.34
3.05-5.05	2.3	115%	2	7.30
5.05-7.05	2.2	110%	3	8.30
7.05-9.05	1.7	85%	4	9.44
9.05-10.35	1.1	85%	5	10.59
10.35-12.35	1.3	65%	6	11.70
			7	12.80
			8	13.66
			9	14.51
			10	15.35
			11	No sample
			12	No sample
			13	No sample
			14	No sample
			15	No sample
			16	No sample
			17	No sample
			18	No sample
			19	No sample
			20	No sample

Station Number: 23 Date: 2/16/06 Station Arrival Time: 1142
 Attempt: R1 Core Tube Length: 16.05 Station Departure Time: 1230
 Field Technician: TND, JMF Lead Line Water Depth: 23.2 Dist. From Target Station: 3
 Contractor: MCS, RSS Latitude: 205418
 On-site Visitor: _____ Longitude: 1268229

Pre-Drive and Diver Observations:

Shoreline & surrounding area: Gypsum factory, riprap, concrete blocks, gypsum, steel pilings + dolphin
 Sediment surface & slope: Silty, slope unknown
 Water current and visibility: VIS < 1ft, ebbing tide, strong current
 Diver Water Depth 23 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1205 Drive Completion Time: 1211 Drive Offset: _____
 Estimated angle of drive: underwater est 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
		diver measured free fall
14.5	14.6	easy drive
13.0	13.1	easy drive
10.0	10.8	easy drive
9.0	8.6	easy drive
7.0	6.9	easy drive
5.7	5.8	easy drive, penetration slowed
3.7	4.5	moderate drive, penetration goal reached
TOTAL 12.35	TOTAL 11.55	Percent Recovered: <u>93.5%</u>

Reason for ending drive: penetration goal reached
 If refusal, reason for refusal: _____

Extraction Observations:

Tension on line? Y Stability of vessel: no problem
 Overlying water in core (quantity and description): slightly turbid, ~1L
 On Boat Recovery: 5.4 Loss of Sediment: 0.9ft
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: Silty, rinsed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): fine silt w/ trace gravel

Keep or Retry: diver inserted screw plug at sed/H₂O interface

The RETEC Group, Inc.
 1011 SW Klickitat Way, Suite 207
 Seattle, WA 98134-1162



Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

206.624.9349 Phone
 206.624.2839 Fax
 www.retec.com

Sediment Core Processing Log



Job: LDWG Core Process.
 Job Number: PORS-18220-SH
 No. of Sections: 1
 Sample Length (from log): 11.8'
 Avg. % Compaction:
 Notes: Pen = 12.2' { 97%
 On Deck Dec = 11.8' }

Core Location/Sample Number: SC-24-R1
 Date/Time: 2/17/06 1400
 Sample Logged by: LM
 Type/Diameter of Sample: 4" sq aluminum
 Sample Quality: good fair poor disturbed

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5Y 2.5/1 black					0.0 - 1.0 wet, soft, black sl. sandy SILT (org) shredded woody fragments < 1cm abundant polychaetes		D-1 1440 6T0.9 3' 16oz		SILT
		SAA		80	20		transitional SAND interbedded w/ SILT sand is fine-grained, damp, black w/ multicolored grains of white, red, orange		A-2 1445 3' 16oz		SAND + SILT
		GLEY 1 4/10 Y d. greenish gray		10	90		SILT is in layers & pockets from up to 1" thick, wet, stiff and is wet, soft-molense, olive-grey and sl. sandy	2			
			unit	90	10		SAND med. dense, damp, black (SAND unit (w/ multicolored grains) with thin beds of olive-grey sl. clayey silt ~ 0.01" thick frequently spaced & decreasing with depth. unit		2-4 1450 3 6T28 3' 16oz		
			bed	tr	98			sharp			
									4		
									4-6 1455 5 2 16oz		
							@ 5.6 unit of SILT (see des. above) - 5.7		6		

@ 1.3'
TV = 1.25
BIG

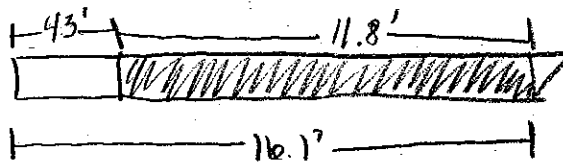
@ 3.6'
TV = 2
BIG

@ 5.4'
TV = 3.8
BIG

SC-24-R1

2/17/06

LM



Mudline = 4.3'

core catcher is full with 0.1' of
winnowing from tip upward.
fine sand & silt interbeds.

Sediment Core Processing Log

Job: LDWG Core Processing
 Job Number: PORS-18220-SIT
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:
 Notes: CONT'D

Core Location/Sample Number: SC-24-R1
 Date/ Time: 2/17/06
 Sample Logged by: LM
 Type/Diameter of Sample: 4" sq. aluminum
 Sample Quality: good fair poor disturbed
 Notes: CONT'D

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Initial Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
							6.0 mild H ₂ S-like odor trace wood uniformly throughout		6-8		
							6.7 0.2" piece of wood		1600		
								7	2/16oz		
							7.6-8.0 layer olive-grey SILT (see desc. above)				
							7.7 end of H ₂ S-like odor	8			SAND w/ SILT beds
									8-10		
								9	1505		
									2/16oz		
							9.2-11.8 convexly-shaped olive-grey silt layers <0.05' thick & distanced ~0.1' apart to end of core.	10			
								11			
							End of core @ 11.8'	12			

@ 7.0'
TV=25
BIG

BIG
@ 9.0
TV=25
← SILT

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 24 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

205130

Northing

Date: 2/17/2006

Time: 11:19

1267860

Easting

Water depth: 26.3 ft

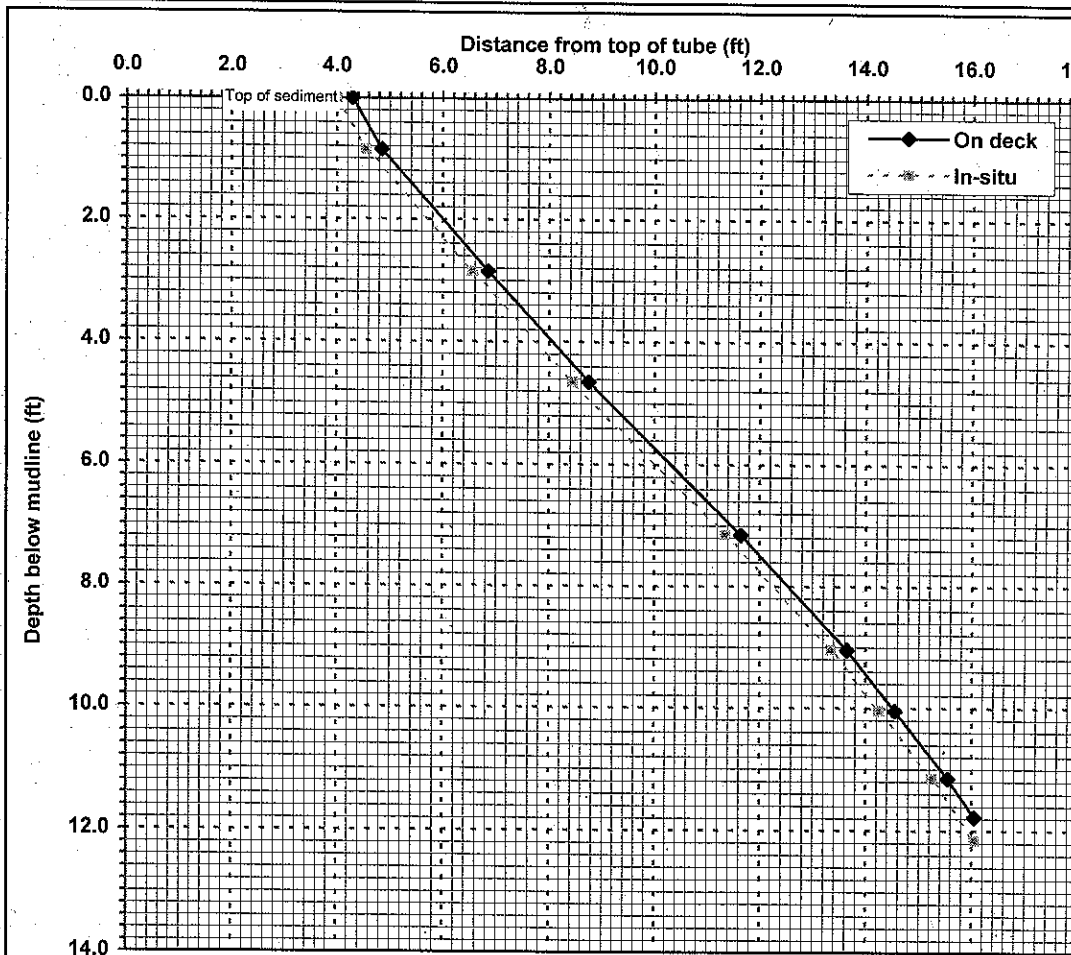
Mudline: -20.2 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
---------------------------	------------------------	------------------	--------------------------	--------------------------------

0-0.8500000000000000	0.55	65%	Mudline	4.3
0.8500000000000001-2	2	100%	1	5.00
2.85-4.65	1.9	106%	2	6.00
4.65-7.15	2.9	116%	3	7.01
7.15-9.05	2	105%	4	8.06
9.05-10.05	0.9	90%	5	9.16
10.05-11.15	1	91%	6	10.32
11.15-12.15	0.8	80%	7	11.48
			8	12.54
			9	13.60
			10	14.51
			11	15.41
			12	No sample
			13	No sample
			14	No sample
			15	No sample
			16	No sample
			17	No sample
			18	No sample
			19	No sample
			20	No sample



Penetration 12.15 ft/ On deck recovery 11.75 ft = 97% Recovery

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-17-06 Recorder: BSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 24 R1

Tube Length (ft): 16.05

Water Depth (ft): 26.3

Est. Tide Height (ft): 6.1

Est. Mudline: _____ (MLLW)

Comments: falling tide - diver depth 26 visibility 4

silt bottom - scattered metal debris

Barge over station - sampled 26 ft downriver



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 205130

Easting 1267860

On Deck Top of Sediment 4.3

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.2</u>	<u>15.5</u>	
<u>13.2</u>	<u>13.5</u>	
<u>11.4</u>	<u>11.6</u>	
<u>8.9</u>	<u>8.7</u>	
<u>7.0</u>	<u>6.7</u>	
<u>6.0</u>	<u>5.8</u>	
<u>4.9</u>	<u>4.8</u>	
<u>3.9</u>	<u>4.0</u>	<u>goal reached</u>
<u>hard clay plug in tip of core</u>		

Station Number: 24
 Attempt: 1
 Field Technician: TD
 Contractor: M/S/RSS
 On-site Visitor:

Date: 02/17/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 26.3
 Latitude: 205130
 Longitude: 1267860

Station Arrival Time: 1105
 Station Departure Time: 1144
 Dist. From Target Station: TRD ~~26~~

barge on target level.

Pre-Drive and Diver Observations:

Shoreline & surrounding area: concrete pier, under barge "Talen Provider"
 Sediment surface & slope: moderate slope, scattered metal debris, silt bottom
 Water current and visibility: vis. 4 ft., falling tide
 Diver Water Depth: 26 Tip Probe Depth: Disk Probe Depth:

Drive Observations:

Drive Initiation Time: 1127 Drive Completion Time: 1132 Drive Offset:
 Estimated angle of drive: eqpt under water, est 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.2	15.5	diver measured, free fall
13.2	13.5	easy drive
11.4	11.6	easy drive
8.9	8.7	easy drive
7.0	6.7	moderate drive
6.0	5.8	moderate drive
4.9	4.8	mod-difficult drive
3.9	4.0	mod-difficult drive, penetration goal reached
TOTAL 12.15	TOTAL 12.05	Percent Recovered: <u>99.2%</u> (<u>96.7% on deck</u>)

Reason for ending drive: penetration goal reached
 If refusal, reason for refusal:

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): slightly turbid, ~ 300ml
 On Boat Recovery: 4.3 Loss of Sediment: 0.3
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, moderate

On Deck Observations:

Staining: silty clayey, gray, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): silty clay, gray, no odor no sheen

Keep or Retry: hard clay plug in tip, no screw plug needed.

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Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log



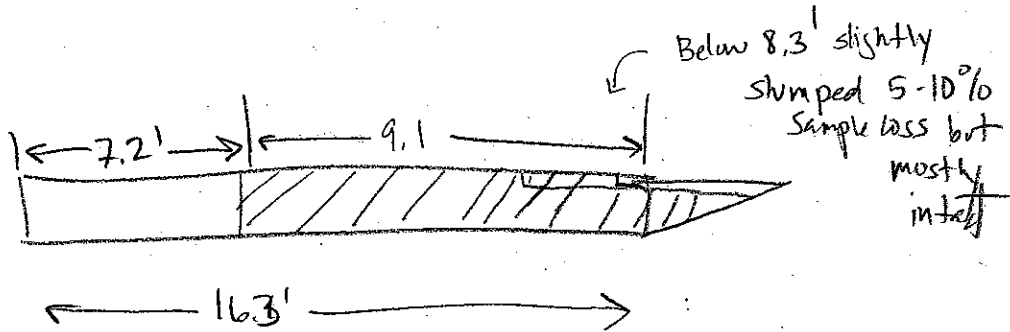
Job: Dunamish LDW
 Job Number: POYS5-18220
 No. of Sections: 1
 Sample Length (from log): Drive = 10.3'
 Avg. % Compaction: ondck = 8.9'
 Notes: 0% Rec = 86%
core collected 2/17/06

Core Location/Sample Number: LDW-SC-25 (22)
 Date/Time: Feb 18, 2006 start 1400
 Sample Logged by: A. Fitzpatrick, C. Blackett
 Type/Diameter of Sample: 4" # alum MCS
 Sample Quality: good fair poor disturbed

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description <small>(grain size, color, moisture, sheen/odor, biota, wood, other debris)</small>	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5 x 1/4 black		15	85		SILT: very soft, soupy, olive to black SILT scattered 4" wood frags No H ₂ S. polychaete worm @ 0.4' twigs, leaf stems <i>dk gray</i>	0.0	1420		SILT
		2.5 x 2.5/1 black		5	95		SILT: black, soft to med stiff, wet, organic - SILT w/ substantial wood frags (0.3 to 1.2 Ft) low plasticity, compressible texture, uniform/homogenous, no layering, moderate to substantial layers of 4" L shredded wood frags. slight H ₂ S b/w 2 ft, #	0.3	0-1' 3-16.02		
							At 1.8' 1" black clast, pc of clear glass shard (does not roll but holds shape in ball)	1.0	1425 1-2'		SILT (ORG) to SILT
							At 2.6' sub. wood frag 4" L		6TE14 3-16.2		At 1.8' TV=1 big
				5	95			2.0	1430 2-4' 3-16.2		
							At 3.6' large wood chunk 3" d	3.0			
							increasing woody matter below 4 Ft and have 1" # SAWD pockets. At 5.0' and below; scattered small, hard dk gray silt clasts 1/2" d w/ scattered rootlets, hairs, twigs (15%) From 5 to 6'	4.0			
		black to grayish black	unit	10	90				1435 4-6' 2-16.2		SILT w/ woody matter
			sand pockets (20% wood)	98	88						
			unit:	90	10			5.0			
			clast:		100			6.0			

LDW-SC-25 (R2)

Feb 18, 2006



on deck to mudline = 7.2'

A
Shoe
mostly fill w/
M-SAND



Sediment Core Processing Log

Job: Dunamish
 Job Number: POISS-18220
 No. of Sections: _____
 Sample Length (from log): (CONT'D)
 Avg. % Compaction: _____

Core Location/Sample Number: LDW-SC-25 (R2)
 Date/Time: Feb 18, 2006
 Sample Logged by: A. Fitzpatrick, C. Brackett
 Type/Diameter of Sample: _____
 Sample Quality: good fair poor disturbed
 Notes: (CONT'D)

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
7.0		same clst	Unit: 75 98	25 to trace	100		SAND w/ silt CLASTS: black, moist/wet, med dense M-SAND w/ scattered gray, soft SILTY CLAY pockets upto 2" Ø (same as above but larger + softer) (not natural looking) silt balls; well sorted, no layers, just pockets clasts: lt gray clay 1" Ø soft clasts: black, silt, 2" Ø soft	6.0 7.0	1440 6-8' 2-163		SAND At 6.6' TV=1.15 big silt pockets
8.0		CLAY 2.5/2 greenish black	98	tr			SAND: black gradig to d. greenish gray, moist/wet, med. dense M-SAND w/ multicolored grains (red, white, orange) no layers, no silt, no silt pockets below 7.5 FT, well sorted, native-looking	7.5 8.0	1445 8-8' 2-1612		M SAND At 7.9' TV=1.0 big
9.0							Bottom of Core @ 9.1 FT	9.0			
10.0							* no sand blast grit observed in core - SAND IS SAME AS OBSERVED IN OTHER ALLUVIAL UNITS. Baggie: At 1.8' black clst.	10.0			

Mudmole™ Bore Log

Project: LDWG Duwamish Coring	Station: 25 R2	
Project No: 341185.001	Position: NAD83	WAN
Collected by: GSM	204751	Northing
Date: 2/17/2006	Time: 12:45	1267980
Water depth: 18.7 ft	Mudline: -15.2 ft MLLW	(estimated using tide tables)

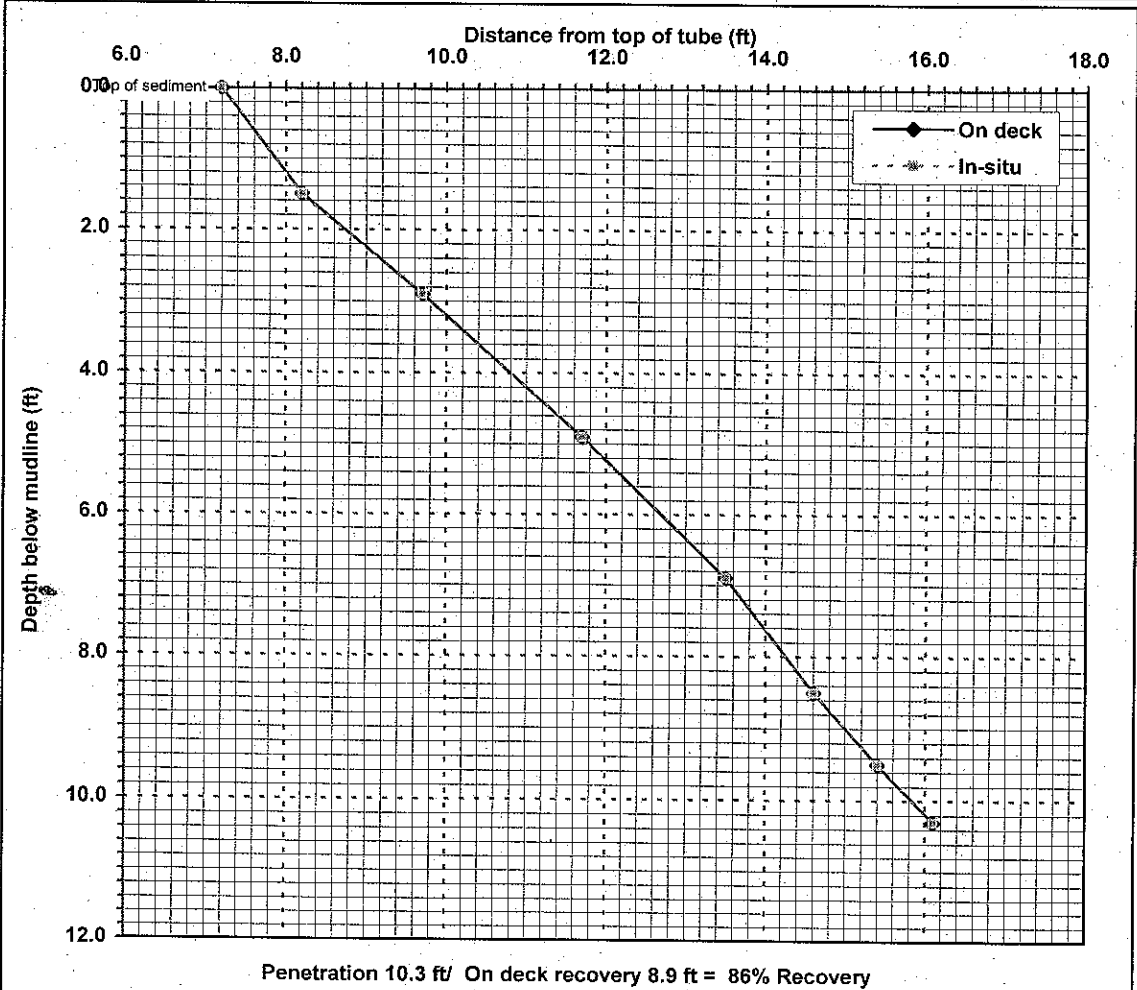
Place Field ID Label Here

Weather/Comments: N/A

Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------



0-1.5	1	67%
1.5-2.9	1.5	107%
2.9-4.9	2	100%
4.9-6.9	1.8	90%
6.9-8.5	1.1	69%
8.5-9.5	0.8	80%
9.5-10.3	0.7	88%

Mudline	7.2
1	7.87
2	8.74
3	9.80
4	10.80
5	11.79
6	12.69
7	13.57
8	14.26
9	15.00
10	15.84
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-27-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 25 B2



Position Information

Tube Length (ft): 16.1

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft.

Water Depth (ft): 18.7

Time: 1245

Northing 204751

Est. Tide Height (ft) 3.5

(MLLW) Feb tide tables

Easting 1267980

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 7.2

Comments: falling tide Diver depth 18ft visibility 4ft

gentle slope - no debris - silty bottom

22ft off shore of station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.6</u>	<u>15.1</u>	
<u>13.2</u>	<u>13.6</u>	
<u>11.2</u>	<u>11.6</u>	
<u>9.2</u>	<u>9.8</u>	
<u>7.6</u>	<u>8.7</u>	<u>penetration slowed</u>
<u>6.5</u>	<u>7.9</u>	
<u>5.8</u>	<u>7.2</u>	<u>refusal</u>

Station Number: 25 Date: 02/12/06 Station Arrival Time: 1155
 Attempt: 2 Core Tube Length: 16.1 Station Departure Time: 1310
 Field Technician: TD Lead Line Water Depth: 18.7 Dist. From Target Station: 22
 Contractor: MCS/RSS Latitude: 204751
 On-site Visitor: _____ Longitude: 1267980

Pre-Drive and Diver Observations:

Shoreline & surrounding area: same as R1
 Sediment surface & slope: no debris, silty bottom, gentle slope
 Water current and visibility: 4 ft. vis; falling tide
 Diver Water Depth: 18 Tip Probe Depth: _____ Disk Probe Depth: _____

Drive Observations:

Drive Initiation Time: 1251 Drive Completion Time: 1256 Drive Offset: —
 Estimated angle of drive: Eqpt under water, est 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
14.6	15.1	diver measured, free fall
13.2	13.6	easy drive
11.2	11.6	easy-moderate drive
9.2	9.8	easy-moderate drive
7.6	8.7	moderate drive, penetration slowed.
6.6	7.9	moderate-difficult drive
5.8	7.2	difficult drive, refusal
TOTAL 10.3	TOTAL 8.9	Percent Recovered: <u>86.5%</u> (<u>86.5% on deck</u>)

Reason for ending drive: refusal
 If refusal, reason for refusal: hard substrate

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): clear-slightly turbid, ~ 1L
 On Boat Recovery: 7.2 Loss of Sediment: 0
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: dark silty sand, spilled off
 Tube Deformation: none
 Sediment Description (odor or sheen?): dark med. sand, no odor, no sheen

Keep or Retry: diver inserted screw plug at sed/H₂O interface

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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MCS Environmental MudMole Bore Log

Collection Information

Date: 2-17-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 25 R1

Tube Length (ft): 15.6

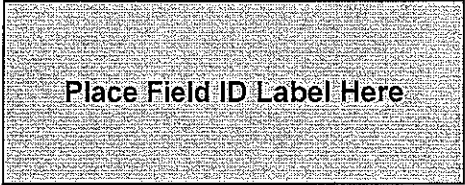
Water Depth (ft): 14.8

Est. Tide Height (ft): 4.3

Est. Mudline: _____ (MLLW)

Comments: 13 ft depth - silty bottom gentle slope - no debris
visibility 5 ft

~6 ft off station



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 204752

Easting 1267953

On Deck Top of Sediment 11.9

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>13.2</u>	<u>13.4</u>	
<u>12.3</u>	<u>12.7</u>	<u>slow penetration</u>
<u>11.3</u>	<u>12.3</u>	
<u>10.5</u>	<u>11.8</u>	<u>refusal</u>

NOT PROCESSED

Mudmole™ Bore Log

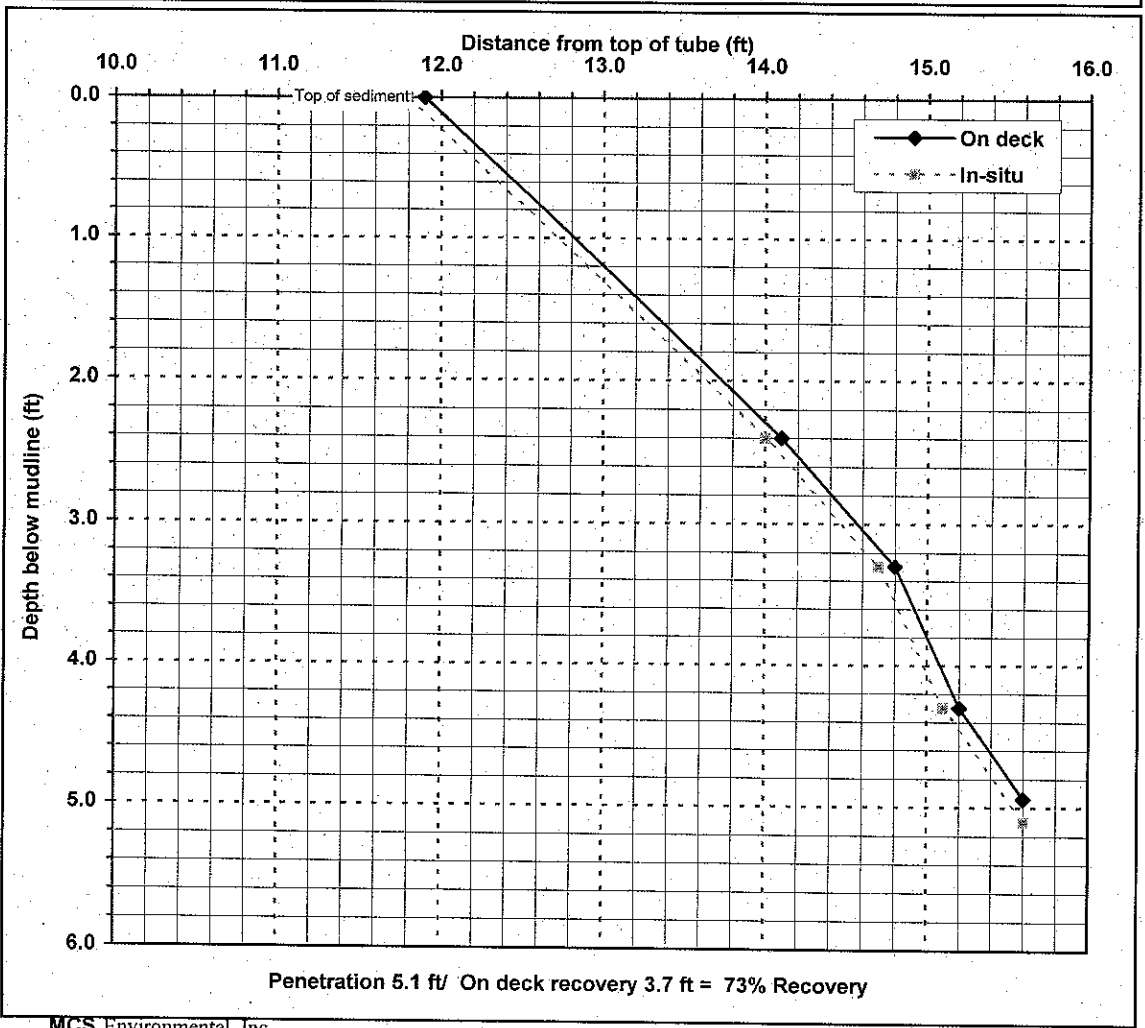
Project: LDWG Duwamish Coring **Station:** 25 R1
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 204752 Northing
Date: 2/17/2006 **Time:** 12:10 1267953 Easting
Water depth: 14.8 ft **Mudline:** -10.5 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A
 Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-2.4	2.2	92%
2.4-3.3	0.7	78%
3.3-4.3	0.4	40%
4.3-5.1	0.5	62%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	11.9
1	12.82
2	13.73
3	14.57
4	15.08
5	No sample
6	No sample
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Station Number: 25 Date: 02/17/06 Station Arrival Time: 1155
 Attempt: 1 Core Tube Length: 15.6 Station Departure Time: 1310
 Field Technician: TD Lead Line Water Depth: 14.0 Dist. From Target Station: 6
 Contractor: MS/RSS Latitude: 204752
 On-site Visitor: _____ Longitude: 1267953

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, wood pilings, concrete pilings/pier
 Sediment surface & slope: gentle slope, silty bottom no debris
 Water current and visibility: 5 ft. vis., falling tide
 Diver Water Depth 13 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1215 Drive Completion Time: 1221 Drive Offset: _____
 Estimated angle of drive: Est. 10°-15°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
13.2	13.4	free fall, easy drive, diver measured
12.3	12.7	difficult drive, slow penetration
11.3	12.3	difficult drive
10.5	11.8	difficult drive, refusal
TOTAL 5.1	TOTAL 3.8	Percent Recovered: <u>74.5%</u> (<u>72.5% on deck</u>)

Reason for ending drive: refusal
 If refusal, reason for refusal: hard substrate

Extraction Observations:

Tension on line? yes Stability of vessel: boat bow listing
 Overlying water in core (quantity and description): clear, ~3L
 On Boat Recovery: 11.9 Loss of Sediment: 0.1 ft.
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, difficult(very)

On Deck Observations:

Staining: dk silty sand, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): dark med. sand, silty no odor, no sheen

? Keep or (Retry): diver inserted screw plug at sed/H₂O interface
diver observed silty sand in core tip.
will retry for better penetration/recovery

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Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Sediment Core Processing Log



Job: LDWB Core Processing
 Job Number: PORS-18220-511
 No. of Sections: 1
 Sample Length (from log): 12.3'
 Avg. % Compaction: _____

Core Location/Sample Number: SC-26-R1
 Date/Time: 2/22/10
 Sample Logged by: LM
 Type/Diameter of Sample: 4" sq. alum.
 Sample Quality: good fair poor disturbed

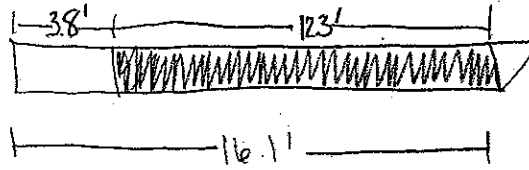
Notes: Pen = 14.6' ? 84% Rec
On Deck Rec = 12.3'

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.54 4/3 Olive Brown		10	90	0	wet, soft, olive-brown silty sandy SILT poly chaetes		0-1 1600		1 SILT
		2.51R 2.511 black	-	10	90	0	SILT wet, soft, black silty sandy SILT (org) with olive-grey mottling of clayey SILT frequent to occasionally spread throughout unit trace shell debris silt has low plasticity sl. compressibility	1	1-2 1605 GT 1.5		1 SILT (org)
							@ 3.0 unit becomes drier, more blocky	2			@ 0.91 TV=0.4 B16 skels
							@ 3.6 wood fragments + rootlets, wood is up to 0.1' L	3	2-4 1607 GT 3.9		@ 1.91 TV=1.4 B16
							@ 4.2 0.2' wood fragment (branch)	4			@ 3.0' TV=1.9 B16 wood
							@ 4.5 woody fragment ~ 0.1' w/ ^{rainbow} 1mm sheen flake @ 4.6 rainbow sheen on smear zone	5	4.6 1615		@ 5.01 TV=1.2 B16
			-	90	10		5.0-5.5 wet, medium-grained, med. dense, black silty SAND (M)	6			SAND

2/22/06

LM

SC-26-R1



Mudline = 3.8

16.1
3.8
12.3

Core shoe is 1/2 full (50%) at last 0.3'
Core catcher did not trigger
Sediment silty sand (black + brown)

Smear zone seen from

3-12' with florets ~1" to 2" occasional

Sediment Core Processing Log



Job: DWG Core Processing
 Job Number: POIS-18220-511
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:

Core Location/Sample Number: SC-26-RP
 Date/ Time: 2/22/06
 Sample Logged by: IM
 Type/Diameter of Sample: 4" sq. alum.
 Sample Quality: good fair poor disturbed

Notes: _____

CONTINUED

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No	Summary Sketch	
		2.5" R 2.5" I black	10	80	10	8	6.0-6.3 - sl. gravelly SAND. Gravel is subangular and 1/4" or. Black SILT seam is interbedded on either side of SAND layer wood fragments + rootlets in SILT layer. • Strong pet-like odor + sheen on grains in porewater	6-8 1620				<p style="position: absolute; top: 30%; left: 5%; font-size: 0.8em;">@6.5' TV=0.6 BIG</p> <p style="position: absolute; top: 60%; left: 5%; font-size: 0.8em;">@9.0' TV=3.5 BIG</p> <p style="position: absolute; top: 85%; left: 5%; font-size: 0.8em;">@11.6' TV=7.0816</p> <p style="position: absolute; top: 30%; left: 95%; font-size: 0.8em; transform: rotate(-90deg);">rainbow sheen + strong odor</p> <p style="position: absolute; top: 75%; left: 95%; font-size: 0.8em; transform: rotate(-90deg);">rainbow sheen + strong odor</p>
			70	30		8	7.0-8.2 gravel layer metallic color, moist, dense, very sandy gravel • most gravel is a conglomerate of sand, wood, other gravel is subangular + larger pieces have sheen coming out of pore spaces, 1/2mm bright orange specs on some gravel pieces (non-reflective specs) @7.6 Baggie scraps of 1" (paint chips?) @7.8 amber glass 1" L	7				
							Interbedded layers of med. black SAND and black SILT with occasional pockets of olive grey clayey SILT 8.4-8.8 Black SILT seam running longitudinally ~2" thick in	8	8-10 1625			
							@9.4 brass/bronze nut 3/8"	9				
							10.1 Black silt layer pocket 0.1" thick	10				
							@10.6 Baggie: 6" L of 1" plastic strips + netl clamp Slight odor + 1/4" rainbow sheen florets	11	10-12 1630			
							sharp					
							11.2-12.3: SAND w/ pockets of clayey silt moist, med. dense, fine black SAND w/ multicolored grains 11.2-11.5: 2" black and olive-grey silt pockets 11.6-11.9 very coarse black SAND w/ multi-colored grains; H ₂ S-like odor (strong)					
			90	10			12.0-12.3 clayey sandy SILT pocket ~4" or olive-grey w/ wood debris + silt fragments	12				
		GLY 1 3 1/1 water	95	5								
			11	98								

Baggie @ 7.6'
Baggie @ 10.6'

End of Core @ 12.0' (0.3' winnowed)

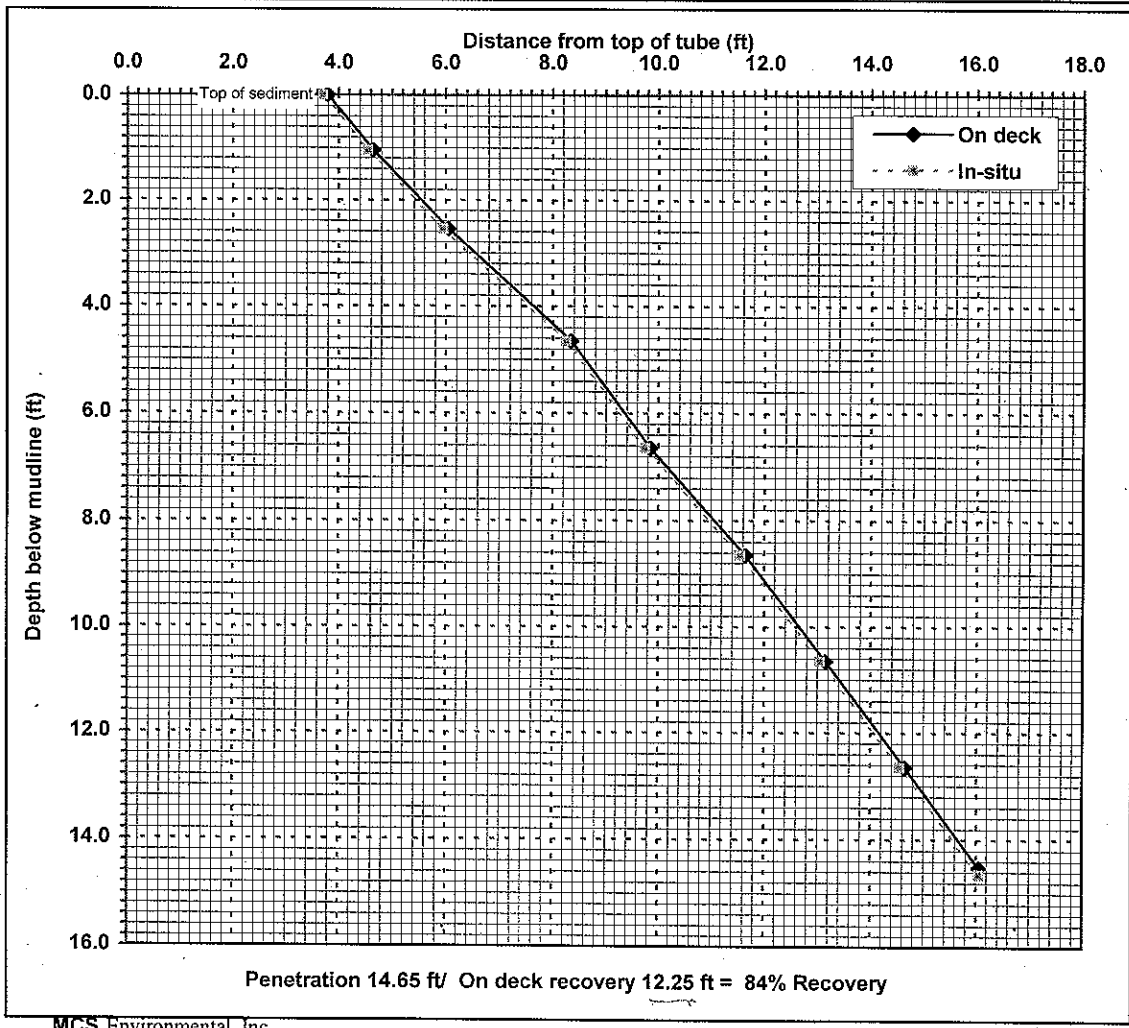
Mudmole™ Bore Log

Project: LDWG Duwamish Coring **Station:** 26 R1
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 204479 Northing
Date: 2/22/2006 **Time:** 11:26 1268157 Easting
Water depth: 35.4 ft **Mudline:** -26.1 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
0-1.05	0.85	81%	Mudline	3.8
1.05-2.55	1.4	93%	1	4.61
2.55-4.65	2.3	110%	2	5.54
4.65-6.65	1.5	75%	3	6.54
6.65-8.65	1.8	90%	4	7.64
8.65-10.65	1.5	75%	5	8.61
10.65-12.65	1.5	75%	6	9.36
12.65-14.65	1.5	75%	7	10.17
			8	11.07
			9	11.91
			10	12.66
			11	13.41
			12	14.16
			13	14.91
			14	15.66
			15	No sample
			16	No sample
			17	No sample
			18	No sample
			19	No sample
			20	No sample



Station Number: 26 Date: 02/21/06 Station Arrival Time: 1120
 Attempt: 1 Core Tube Length: 16.05 Station Departure Time: 1208
 Field Technician: TD Lead Line Water Depth: 35.4 Dist. From Target Station: 58 ← Okeyed by Allison Hiltner on 02.21.06
 Contractor: MCS/RSS Latitude: 204479
 On-site Visitor: Scotty Emmons Longitude: 1268157

Pre-Drive and Diver Observations:

Shoreline & surrounding area: tid up adjacent to barge "Screw 6" to mid-channel
 Sediment surface & slope: gentle slope, silt bottom, no debris
 Water current and visibility: vis. 4ft. gentle current
 Diver Water Depth 34 Tip Probe Depth — Disk Probe Depth —

Drive Observations:

Drive Initiation Time: 1144 Drive Completion Time: 1151 Drive Offset: —
 Estimated angle of drive: egpt under water, est 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.0	15.2	diver measured, free fall
13.5	13.8	easy drive
11.4	11.5	easy drive
9.4	10.0	moderate - easy drive
7.4	8.2	moderate - easy drive
5.4	6.7	moderate drive
3.4	5.2	moderate drive
1.4	3.7	moderate drive, penetration goal reached
TOTAL 14.65	TOTAL 12.35	Percent Recovered: <u>84.3%</u> (<u>83.6% on-deck</u>)

Reason for ending drive: penetration goal reached
 If refusal, reason for refusal: —

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): slightly turbid, ~ 1/2L.
 On Boat Recovery: 3.8 Loss of Sediment: 0.1ft.
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch,

On Deck Observations:

Staining: brown silty sand streaks, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): gray/brown silty sand, no odor/sheen.

Keep or Retry: (diver inserted screw plug at sed/H₂O interface)
silty sand plug (diver observed)

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 1011 SW Midland Way, Suite 207
 Seattle, WA 98134-1162



Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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MCS Environmental MudMole Bore Log

Collection Information

Date: 2-22-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 26 R1

Tube Length (ft): 16.05

Water Depth (ft): 35.4

Est. Tide Height (ft): 9.3

Est. Mudline: _____ (MLLW)



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 204479

Easting 1268157

On Deck Top of Sediment 3.8

Comments: diver depth 34 ft - 4 visibility
gentle slope - no debris - silty bottom - gentle current
~ 58 ft off station (barge on station)

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.0</u>	<u>15.2</u>	
<u>13.5</u>	<u>13.8</u>	
<u>11.4</u>	<u>11.5</u>	
<u>9.4</u>	<u>10.0</u>	
<u>7.4</u>	<u>8.2</u>	
<u>5.4</u>	<u>6.7</u>	
<u>3.4</u>	<u>5.2</u>	
<u>1.4</u>	<u>3.7</u>	<u>goal reached</u>



Sediment Core Processing Log

Job: LDWG Sed. coring
 Job Number: PORS-18220-511
 No. of Sections: 1
 Sample Length (from log): 9.5'
 Avg. % Compaction:
 Notes: Pen = 11.5' ?
 on Deck Rec. = 9.45' 85% Rec

Core Location/Sample Number: LDWG SC-27 R1
 Date/Time: 2/14/06 1245
 Sample Logged by: 1 McLe, N Bacher
 Type/Diameter of Sample: 4" sq aluminum
 Sample Quality: good fair poor disturbed

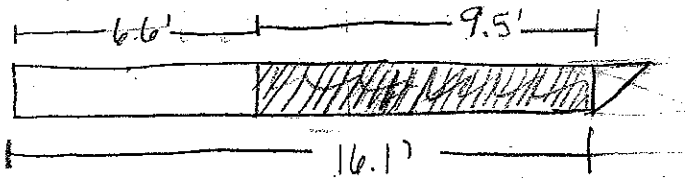
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
1		GLE11 2.5/N black	0	15	85	0	0-0.4' wet, soft, black sl. sandy silt H ₂ S-like odor			0-0.5 1325 11602	
			0	10	90	0	0.4-1.8' wet, med-firm, black, sl. sandy silt slight to moderate H ₂ S-like odor. 1.6-1.7' - wet loose woody horizon with moderate H ₂ S-like odor. 3" piece of to strong Scattered organics and rootlets from 0.4-0.8	1	0-2 1300 3x16oz GT 0.9	0.5-1 1328 11602 1-0.5 1334 11602	@1.0' TV=1.5 Big
2		GLE11 3/5G4 very dk greenish gray	0	10	90	0	1.9-2.0 wet, med-firm grey, sl. sandy silt			1.5-2 1334 11602	
			0	10	90	0	2.0-4.5' moist, dense, blocky grey-black silt with minor sand trace clay 10% wood chunks, mottled 3.2-3.6 shredded wood layer 3D. and 70% silt, wood layer has areddish tint 4.5-7.8 moist, med. dense, brownish grey	2	2-2.5 1337 11602 GT 2.5 2.5-3 1340 11602	2-2.5 1337 11602	@3.0' TV=2.75 Big
3		101R 3/1 very dark grey	0	10	90	0	4.5-7.8 moist, med. dense, brownish grey fine sand with minor silt Sand has red, yellow, orange multi-colored grains No odor			3-3.5 1343 11602 3-4 1346 11602	
			0	10	90	0	4.5-7.8 moist, med. dense, brownish grey fine sand with minor silt Sand has red, yellow, orange multi-colored grains No odor	3	2-4.5 1305 3x16oz	2.5-3 1340 11602 3-3.5 1343 11602 3-4 1346 11602	@3.0' TV=2.75 Big
4		101R 3/1 very dark grey	0	10	90	0	4.5-7.8 moist, med. dense, brownish grey fine sand with minor silt Sand has red, yellow, orange multi-colored grains No odor			4-4.5 1349 11602	
			0	10	90	0	4.5-7.8 moist, med. dense, brownish grey fine sand with minor silt Sand has red, yellow, orange multi-colored grains No odor	4	2-4.5 1305 3x16oz	4-4.5 1349 11602	@3.0' TV=2.75 Big
5		101R 3/1 very dark grey	0	10	90	0	4.5-7.8 moist, med. dense, brownish grey fine sand with minor silt Sand has red, yellow, orange multi-colored grains No odor			4.5-5 1352 11602	
			0	10	90	0	4.5-7.8 moist, med. dense, brownish grey fine sand with minor silt Sand has red, yellow, orange multi-colored grains No odor	5	4.5-6 1310 3x16oz	4.5-5 1352 11602 5-5.5 1355 11602	@5.5' TV=3.5 Big
6		101R 3/1 very dark grey	0	10	90	0	5.8 1 1/2" grey silt clast			5.5-6 1358 11602	
			0	10	90	0	6.0 2" subrounded gravel	6		5.5-6 1358 11602	@5.5' TV=3.5 Big

5C-27 R1

2/14/06

LM

WB



Sediment Core Processing Log



Job: LDWG Sed Coring
 Job Number: PORS-18220-511
 No. of Sections: 1
 Sample Length (from log): 9.5'
 Avg. % Compaction:

Core Location/Sample Number: LDWG SC-27R1
 Date/ Time: 2/14/16 1245
 Sample Logged by: LMckee N/Bacher
 Type/Diameter of Sample: 4" sq aluminum
 Sample Quality: good fair poor disturbed

Notes: PEN = 11.15' ? 85%
 On Deck Dec 9.45' 85%
 85%
 85%

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
7		10YR 3/1 very dk grey (continued)	0	50	50	Ø	6.5' corecatcher 6.6-7.8: 1/4-1/2" interbeds of brownish-grey fine sand + grey silty sandy silt w/ scattered wood shreds. Interbeds are convex in shape	7	6-7.8 B15		
8		2.5Y 3/2 very dk grayish brown	0	15	85	Ø	7.5' 1" wood zone w/ 50% wood + 50% silty sand 7.6-7.8' slightly sandy silt 2" lens	8	7.8-9.5 B20 B20		
9							7.8-9.5' moist, dense, brownish grey med sand with wood debris (trace) multicolored med sand red, orange, white grains	9			
End of Core @ 9.5'											

@6.5'
TV=2.75
B1g

@8.5'
TV=2.75
B1g

@9.0'
TV=4.25
B1g

Station Number: 2027 Date: 02/14/06 Station Arrival Time: 0824
 Attempt: 1 Core Tube Length: 16.05 Station Departure Time: 0910
 Field Technician: TD Lead Line Water Depth: 20.0 Dist. From Target Station: 8
 Contractor: MCS/RS Latitude: 204441
 On-site Visitor: — Longitude: 1268518

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, metal dolphins
 Sediment surface & slope: gentle slope, sandy silt
 Water current and visibility: moderate-mild current, 8ft vis., falling tide
 Diver Water Depth 19 Tip Probe Depth — Disk Probe Depth —

Drive Observations:

Drive Initiation Time: 0845 Drive Completion Time: 0853 Drive Offset: —
 Estimated angle of drive: right under water, cannot see (est 10°)

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.4	15.5	diver recorded, free fall
13.6	13.6	moderate drive
10.9	11.0	moderate drive
8.8	9.6	moderate-difficult drive
5.8	7.4	difficult drive, penetration rate slowed
4.9	6.4	difficult drive, refusal
TOTAL 11.15	TOTAL 9.65	Percent Recovered: <u>86.5%</u>

Reason for ending drive: refusal
 If refusal, reason for refusal: hard material

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): yes, clear, ~ 400mL
 On Boat Recovery: 6.6 Loss of Sediment: 0.7
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: a little bit of dark silt, sprayed off
 Tube Deformation: no
 Sediment Description (odor or sheen?): brown fine-grained sand, silt, no sheen no odor

Keep or Retry: Keep - diver inserted scoring plug at sea/H₂O interface

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 27 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

204441

Northing

Date: 2/14/2006

Time: 8:37

1268518

Easting

Water depth: 20.0 ft

Mudline: -13.2 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Sunny

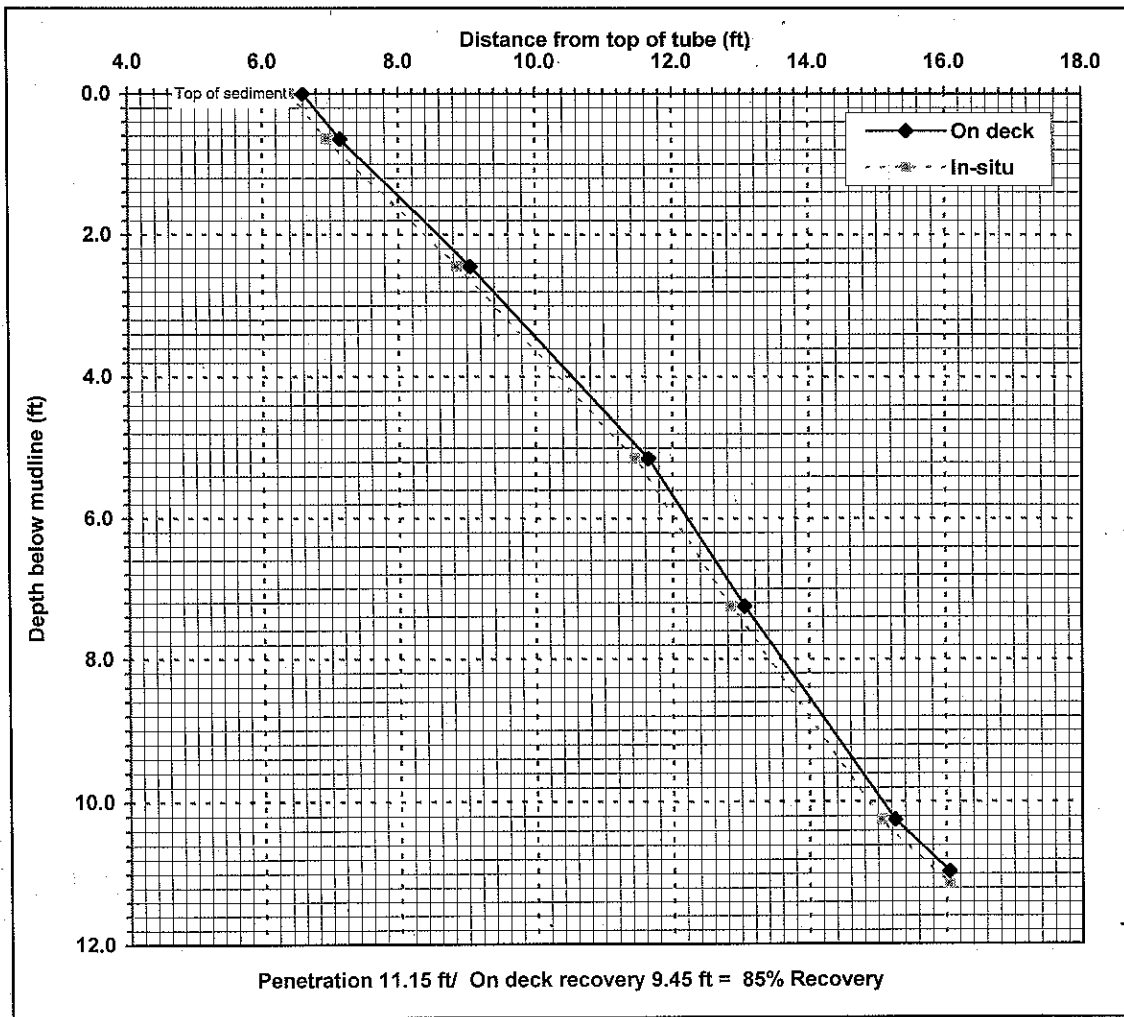
Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------

0-0.65	0.55	85%
0.65-2.45	1.9	106%
2.45-5.15	2.6	96%
5.15-7.25	1.4	67%
7.25-10.25	2.2	73%
10.25-11.15	1	111%

Mudline	6.6
1	7.52
2	8.58
3	9.58
4	10.54
5	11.51
6	12.22
7	12.88
8	13.60
9	14.33
10	15.07
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



MCS Environmental MudMole Bore Log

Collection Information

Date: 2-14-06 Recorder: GSW

Project: 341185.001 Windward Lower Duwamish Coring

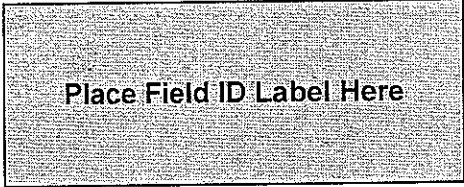
Station Name: 27 R1

Tube Length (ft): 16.05

Water Depth (ft): 20.0

Est. Tide Height (ft): 6.8

Est. Mudline: _____ (MLLW)



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 204441

Easting 1268518

On Deck Top of Sediment 6.6

Comments: falling tide - sandy silt - 19ft - visibility 8ft

mild current - gentle slope

~ 8ft off station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.4</u>	<u>15.5</u>	
<u>13.6</u>	<u>13.6</u>	
<u>10.9</u>	<u>11.0</u>	
<u>8.8</u>	<u>9.6</u>	
<u>5.8</u> 4	<u>7.4</u>	
<u>4.9</u>	<u>6.4</u>	<u>refusal</u>

1063



Sediment Core Processing Log

Job: LDW6 Core Processing
 Job Number: PORS-18220-511
 No. of Sections: 1
 Sample Length (from log): 12.4'
 Avg. % Compaction:

Core Location/Sample Number: SC-28-R5
 Date/Time: 2/25/06 0930
 Sample Logged by: LM, CB
 Type/Diameter of Sample: 3" round
 Sample Quality: good fair poor disturbed

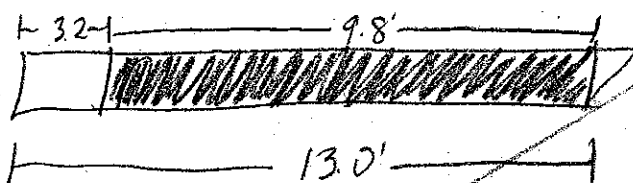
Notes: Pen 13.0' 79.4% 48' off station
On Deck Rec = 12.4'

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		7.5YR 4/3 brown	-	70	90	✗	wet soft, brown sl. sandy SILT		0-1 1000		SILT
		2.5Y 2.5Y black + blkt 3/1 v. dk. greenish grey		10	90	✗	mottled black + olive grey, moist, med. stiff, sl. sandy SILT w/ trace clay; occasional rootlets; near form massive blocky • occasional rootlets, polychaetes • increasing stiffness w/ depth • sl. compressible, low plasticity	1	1-2 GT 2 10DS		SILT (org)
							@ 2.1' 0.3' L piece of wood	2	2-4 GT 3.9 10D		
							@ 2.9' Full clam shell of 1/2"	3			
							@ occasional rootlets < 1"				@ 1.0' TV=0.5 B16
							3.3-3.5 rootlets	4			@ 1.6' TV=1.6' B16
							4.2-4.5 rootlets		4-5.5 1015		
							@ 4.6 occasional wood pockets w/ fibrous wood < 1cm (shreds)	5			@ 3.1' TV=2.0' B16
							@ 4.7 occasional rootlets < 1"				
							@ 5.1' 1.5' L subrounded gravel	6	5.5-7.5 1020		@ 5.0' TV=6.0 B16
		2.5Y 2.5Y black		90	10	✗	5.5-5.6 0.1' layer of damp med. dense fine SAND (grey) transitional 5.6-7.5 med. coarse, metallic black SAND w/ multi-colored grains w/ occasional black SILT pockets (orig. from above) 1" ✗				SAND SAND BLAST GRIT

⑤56
LOW
STRAIN
FRUIT
CHIPS

SC-28-R4

2/24/06
LM



21
13.0
9.8
3.2

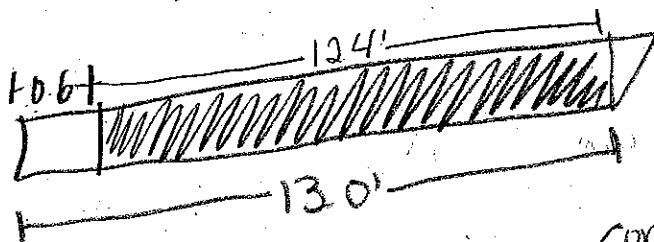
note: not
accepted b/c
we tagged the
gravel cap layer

core catcher was 1/2 full (50%)
of wet, silty sand, fine, grey
(200ml water overlying sediment on top of core catcher)

* Note: core was bowed, ~510% from vertical

SC-28-R5

2/24/06
LM



core catcher is full
of med gray SAND

4.0-11.3: smear zone sheen
upon opening core

@6.5 shear test:















- immediate florets + streaks up to 2" L
- mod. HC-like odor

Sediment Core Processing Log

Job: LDW's Core Processing
 Job Number: PD8-18720-511
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:

Core Location/Sample Number: SC-28-R4
 Date/ Time: 2/24/06
 Sample Logged by: LM
 Type/Diameter of Sample: 3" round
 Sample Quality: good fair poor disturbed

Notes: CONT'D

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
2.54		black				SAND BLAST GRIT	0.6-2.5 asphalt pieces up to 0.3" L ^{well sorted} ^{intermixed w/ SAND} (60% by volume) strong HC-like odor	5.6-7.5	1020		
2.51		black				SAND BLAST GRIT	0.6-3. black SILT pocket				
2.54		black				SAND BLAST GRIT	0.6-5-2" paint chip-like material, red-green mod. HC-like odor - sheen test				
2.54		black	10	90		SAND BLAST GRIT	@ 2" layer of black SILT (org)	7			
						SAND BLAST GRIT	@ 2.2-2" layer of SILT (org) I.S. - mild HC-like odor				
						SAND BLAST GRIT	2.8-8.1 layer of olive-grey, damp, med. stiff, clayey SILT no odor / sheen	7.5-9.1	1025		
						SAND BLAST GRIT	Alternating layers/bands of 1" ^{well sorted} coarse SAND w/ multi-colored grains and black + green-grey mottled clayey SILT. S.I.H.S. 0.1"	8			
						SAND BLAST GRIT	@ 8.3' 1" piece of red paint-chip-like material mottled, moist, clayey SILT	9			
						SAND BLAST GRIT	Wet, med dense, coarse, metallic-colored dk grey SAND w/ strong HC-like odor, well sorted	9.1-12	1030		
						SAND BLAST GRIT	9.4-9.6 black SILT - no odor				
						SAND BLAST GRIT	9.6-10.8 SAND, coarse, metallic-colored (sable) w/ metallic-colored dk grey grains, strong HC-like odor	10			
						SAND BLAST GRIT	10.8-11.0 layer of mottled grey-green clayey SILT	11			
						SAND BLAST GRIT	well sorted, damp, metallic-dk grey, coarse SAND (blast-grit) strong HC-like odor				
2.54		black	10	90		SAND BLAST GRIT	11.7-12: layer of black SILT	12			

aspha #
 → metallic sheen + HC-like odor
 @ 6.9' TV=2.0 B16
 @ 8.0' TV=0.5 B16
 metallic-odor strong odor

Baggie @ 6.5'

Sediment Core Processing Log

3 of 3

Job: _____

Core Location/Sample Number: SC 28-25

Job Number: _____

Date/ Time: _____

No. of Sections: _____

Sample Logged by: _____

Sample Length (from log): _____

Type/Diameter of Sample: _____

Avg. % Compaction: _____

Sample Quality: good fair poor disturbed

Notes: CONT'D

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
							end of odor + sheen at 12.2' — transitional	12.1	12-126		SAND BLAST GRIT
							damp, med stiff, grey, fine SAND w/ multicolored grains and	.2	1035		
				90	10		regions of black sandy SILT (moist, med. stiff) about 3" thick	.3			SAND
							no odor, no sheen	.4			
								.5			
								.6			
							End of core at 12.6'	.7			
								.8			
								.9			
								1.3			

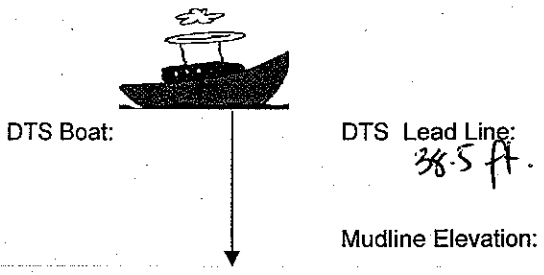


SEDIMENT CORE DRIVE LOG

Project: LDW Subsurface Sed.
 Project #: DS.08.06.32
 Field Crew: TD
 Contractor: MSS

Core Location: LDW-5C28
 Date: 02.24.06 Time: 1500
 Attempt #: 5 Accept/Reject
 Sample Method: Vibracore

Proposed Coordinates N: <u>204704</u> E: <u>1268204</u> Mudline: Core Drive: <u>13 ft.</u>	Actual Coordinates ^{TD 2.1.06} N: <u>47 32.930N</u> E: <u>122 20,4270N</u> Mudline: <u>32.9930N</u> Core Drive: <u>13 ft.</u> Core Recovery:
------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------



Tide Measurements (Datum:)
 Time/Height:
 Time/Height:

Description:
 (free fall, fingers inverted, vibration needed to drive/extract, estimation of density, debris encountered, slopes, refusal, mudline conditions, drive action, etc.)

0-5 ft' free fall
5-6 ft easy drive
6-9 ft very easy drive
9-11 ft difficult (moderately)
11-13 ft easy drive
 slight bow list during extraction.
 cutter end: empty
 catcher: med-fine sand/silt, dk gray.

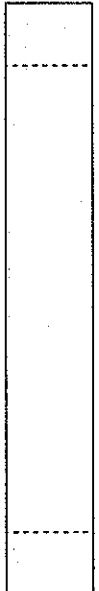
Total Drive: 13 ft. Length Recovered: 12.4 ft
95.4%

Notes: ~48 ft off target

Measurement (to nearest 0.1 foot):

Avg. % Recovery:
 Avg. % Compaction:

Section:	Length:	Description at Cuts:
<input type="checkbox"/> A =		
<input type="checkbox"/> B =		
<input type="checkbox"/> C =		
<input type="checkbox"/> D =		

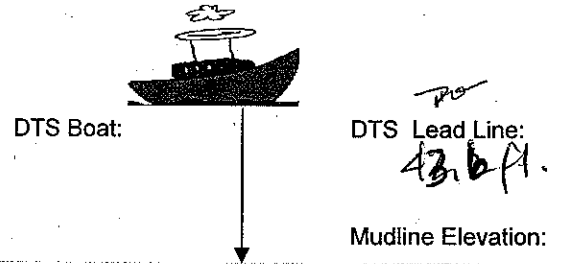
Core Tube Length: 



SEDIMENT CORE DRIVE LOG

Project: <u>LDW Subsurface Sed.</u>	Core Location: <u>LDW-5C28</u>
Project #: <u>05-08-06-32</u>	Date: <u>02-23-06</u> Time: <u>1415</u>
Field Crew: <u>TD</u>	Attempt #: <u>A</u> <u>Accept/Reject</u>
Contractor: <u>MSS</u>	Sample Method: <u>Vibracore</u>

Proposed Coordinates N: <u>204204</u> E: <u>1268204</u> Mudline: Core Drive:	Actual Coordinates N: <u>47 32.9863 N</u> E: <u>122 20.4302W</u> Mudline: Core Drive: Core Recovery:
----------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------



Tide Measurements (Datum:)

Time/Height:

Time/Height:

Description:
(free fall, fingers inverted, vibration needed to drive/extract, estimation of density, debris encountered, slopes, refusal, mudline conditions, drive action, etc.)

- 0-1 ft free fall
- 1-3.5 ft - easy-moderate drive
- 3.5 - 6 - difficult drive
- 6 - 7 - moderate drive
- 7 - 13 - moderately easy drive

Core ~~tube~~ tube slightly bowed, difficult drive.
tube also scraped up from ~3ft. on down.

Total Drive: 13 ft. Length Recovered: 9.8ft

Notes: ~30 ft off target. (recovery 75.4%)

Measurement (to nearest 0.1 foot):

Avg. % Recovery:

Avg. % Compaction:

Section:	Length:	Description at Cuts:
<input type="checkbox"/> A =		
<input type="checkbox"/> B =		
<input type="checkbox"/> C =		
<input type="checkbox"/> D =		

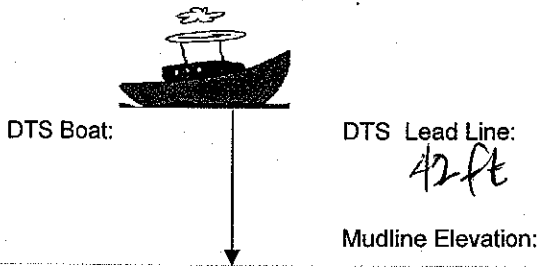
Call Bill Jaworsky about contents.
core tip contained gray fine sand w/some silt., sheer



SEDIMENT CORE DRIVE LOG

Project: <u>LDW Subsurface Sediment</u>	Core Location: <u>LDW-5L28</u>
Project #: <u>05-08-06-32</u>	Date: <u>02-23-06</u> Time: <u>1335</u>
Field Crew: <u>TD</u>	Attempt #: <u>3</u> Accept/Reject: <u>Reject</u>
Contractor: <u>MSS</u>	Sample Method: <u>Vibracore</u>

Proposed Coordinates N: <u>204204</u> E: <u>1268204</u> Mudline: Core Drive:	Actual Coordinates N: <u>47 328841 N</u> E: <u>122 20.4411 W</u> Mudline: Core Drive: Core Recovery:
----------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------



Tide Measurements (Datum:)
Time/Height:
Time/Height:

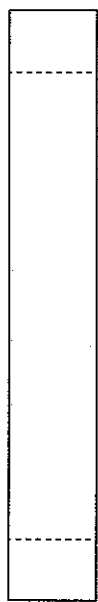
Description:
(free fall, fingers inverted, vibration needed to drive/extract, estimation of density, debris encountered, slopes, refusal, mudline conditions, drive action, etc.)

0-1 freefall
1ft - refusal. difficult drive

Measurement (to nearest 0.1 foot):

Avg. % Recovery:

Avg. % Compaction:



Core Tube Length:

Section:	Length:	Description at Cuts:
<input type="checkbox"/> A =		
<input type="checkbox"/> B =		
<input type="checkbox"/> C =		
<input type="checkbox"/> D =		

Total Drive: 1ft Length Recovered: 0 (0%)

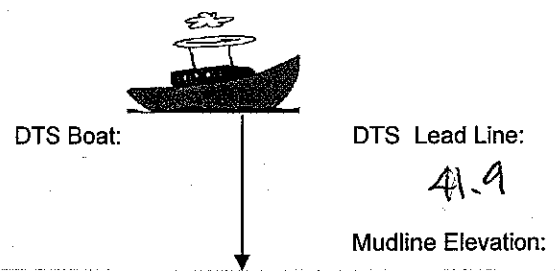
Notes: 258 ft off target, no recovery, hit something hard, core cutter twisted up.



SEDIMENT CORE DRIVE LOG

Project: <u>LDW Subsurface Sediment</u>	Core Location: <u>LDW-5C2B</u>
Project #: <u>05-DB-06-32</u>	Date: <u>07.23.06</u> Time: <u>1320</u>
Field Crew: <u>TP</u>	Attempt #: <u>2</u> Accept/Reject: <u>(circled)</u>
Contractor: <u>MSS</u>	Sample Method: <u>Vibracore</u>

Proposed Coordinates N: <u>204204</u> E: <u>1268204</u> Mudline: Core Drive:	Actual Coordinates N: <u>4732.9854</u> NE: <u>12220.4408W</u> Mudline: Core Drive: Core Recovery:
----------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------



Tide Measurements (Datum:)
Time/Height:
Time/Height:

Description:
(free fall, fingers inverted, vibration needed to drive/extract, estimation of density, debris encountered, slopes, refusal, mudline conditions, drive action, etc.)

free fall ~ 1-2 ft.
difficult drive 2-3 refusal

Measurement (to nearest 0.1 foot):

Avg. % Recovery:
Avg. % Compaction:

Section:	Length:	Description at Cuts:
<input type="checkbox"/> A =		
<input type="checkbox"/> B =		
<input type="checkbox"/> C =		
<input type="checkbox"/> D =		

Total Drive: 3ft. Length Recovered: 0 (0%)

Notes: ~27ft off target, hit refusal at ~3 ft of penetration
core tube was empty (washed out) will retry for R3

Sediment Core Processing Log



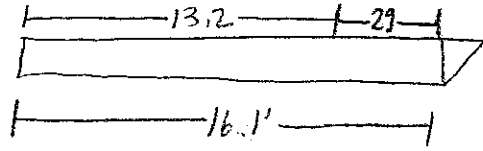
Job: 1 DWG Core Processing
 Job Number: PORS-18220-SIN
 No. of Sections: 1
 Sample Length (from log): 2.9'
 Avg. % Compaction: _____

Core Location/Sample Number: SC-28 R1
 Date/ Time: 2/14/16 1555
 Sample Logged by: LM/ee
 Type/Diameter of Sample: 4" sq. diameter
 Sample Quality: good fair poor disturbed

Notes: Pen = 7.25'
on Deck Rec = 2.85' } 39% Rec

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch	
1		6LEY1 2.5/10Y greenish black	0	90	10	90	X	0-1.1' wet, soft sl sandy silt olive brown slight sheen and petroleum-like odor 0.5-0.6' large woody debris (0.2')	1	1620 0-1 3 x 16oz 1 x 8oz GT 0.9		TV=
2		6LEY1 2.5/N black	0	80	20	90	X	1.1-2.3' wet, soft, medium stiff sl. sandy clayey silt, black organic slight sheen petroleum like odor 1.5-1.2' roots, sm woody debris frags	2	1625 1-2 3 x 16oz 1 x 8oz GT 1.9		@1.5 TV=2.25
3		6LEY1 10YR 3/1	0	100	0	X	2.7-2.9' moist, firm, medium grained multi-colored sand (orange, red, white) no odor, no sheen 2.4' 0.1' diameter subangular gravel well sorted	3	1630 2-3 3 x 16oz 1 x 8oz		@2.4 TV=2.5	
							End of Core at 2.9' no deformation on core tip	3				

SG 28



2/14/06

LM

16.1

13.2

2.9

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-14-08 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 28 R1

Tube Length (ft): 16.05

Water Depth (ft): 40.0

Est. Tide Height (ft) 5.1 (MLLW)

Est. Mudline: _____ (MLLW)



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 204181

Easting 1268195

On Deck Top of Sediment 13.2

Comments: falling tide - diver depth 40 - vis 3 ft

silty bottom no debris, gentle slope

dry back over station - 22 off station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.7</u>	<u>15.7</u>	
<u>12.6</u>	12.6 <u>14.2</u>	
<u>10.3</u>	<u>13.3</u>	
<u>8.8</u>	<u>12.7</u>	
<u>8.0</u>	<u>12.8</u>	<u>no recovery</u>
		<u>slow penetration</u>

Mudmole™ Bore Log

Project: LDWG Duwamish Coring	Station: 28 R1	
Project No: 341185.001	Position: NAD83	WAN
Collected by: GSM	204181	Northing
Date: 2/14/2006	Time: 9:32	Easting
Water depth: 40.0 ft	Mudline: -34.9 ft MLLW	(estimated using tide tables)

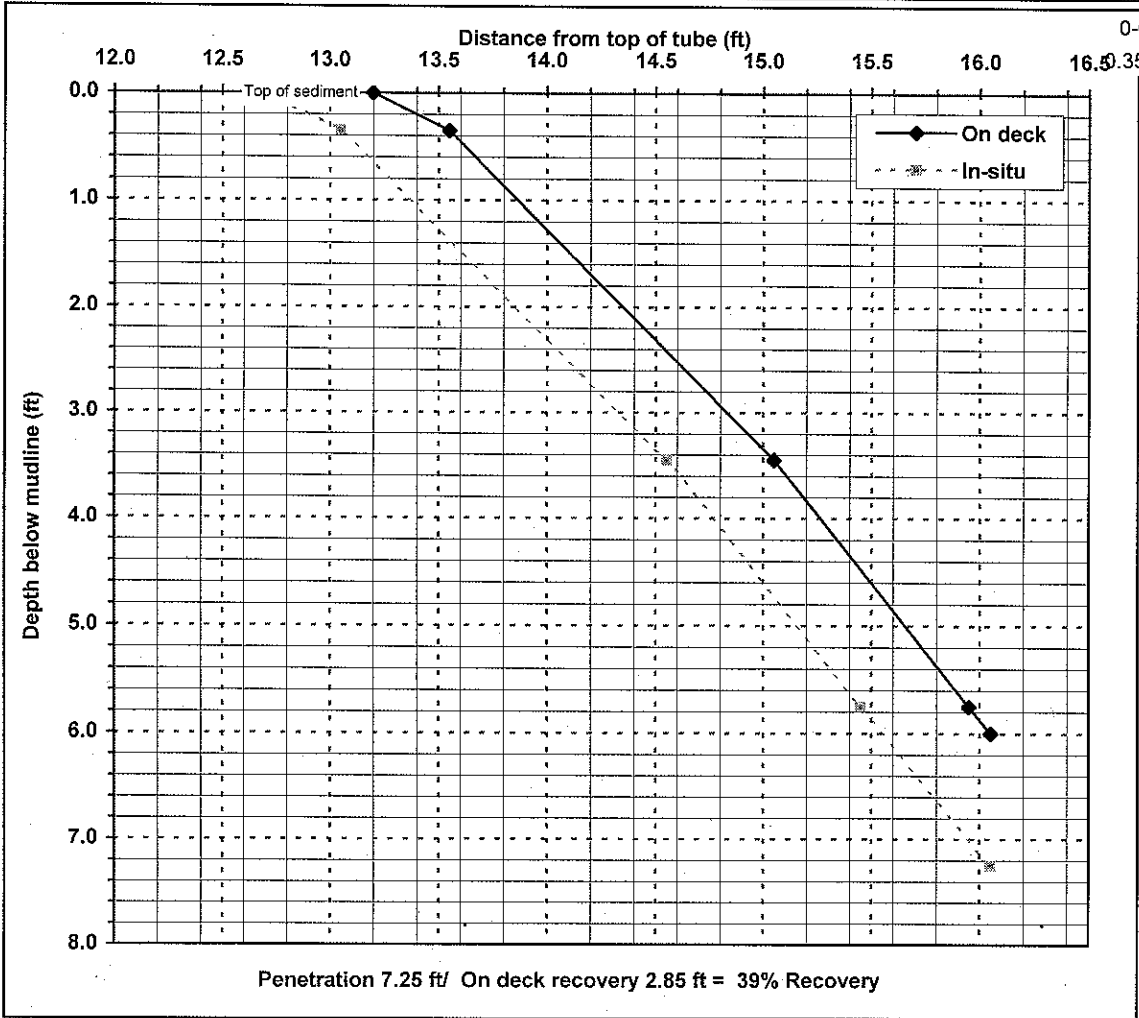
Place Field ID Label Here

Weather/Comments: Sunny

No recovery final interval

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-0.35	0.35	100%
3.45-5.75	0.9	39%
5.75-7.25	0.6	40%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	13.2
1	13.86
2	14.35
3	14.83
4	15.27
5	15.66
6	16.05
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



0-0.35	0.35	100%
3.45-5.75	0.9	39%
5.75-7.25	0.6	40%

Mudline	13.2
1	13.86
2	14.35
3	14.83
4	15.27
5	15.66
6	16.05
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 28

Date: 02/14/04

Station Arrival Time: 0918

Attempt: 1

Core Tube Length: 16.05

Station Departure Time: 1003

Field Technician: TD

Lead Line Water Depth: 40.0

Dist. From Target Station: 2522 ^{TOO}

Contractor: MLSRSS

Latitude: 204181

target station is under dry dock at
Dunlapish Shipyard. Cannot move closer.

On-site Visitor: ---

Longitude: 1260195

Pre-Drive and Diver Observations:

Shoreline & surrounding area: concrete pier, wood pilings and dolphin

Sediment surface & slope: silty, gentle slope, hard base below surface, no visible debris

Water current and visibility: 3 ft vis, falling tide

Diver Water Depth 40 Tip Probe Depth --- Disk Probe Depth ---

Drive Observations:

Drive Initiation Time: 0937 Drive Completion Time: 0944 Drive Offset: ---

Estimated angle of drive: eqpt under water, cannot see, (est 10°)

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.7	15.7	Diver measured, free fall
12.6	^{TP} 12.2	easy moderate drive
10.3	13.3	moderate drive
8.8	12.7	moderate to difficult drive
8.0	12.8	difficult drive, refusal, no recovery, slow penetration
TOTAL 6.05	TOTAL 3.25	Percent Recovered: <u>40.1%</u>

Reason for ending drive: refusal

If refusal, reason for refusal: hard material - no recovery.

Extraction Observations:

Tension on line? yes Stability of vessel: vessel listing side to side

Overlying water in core (quantity and description): yes, clear, ~ 300 ml

On Boat Recovery: 13.2 Loss of Sediment: 0.4, some gravel

Extraction Notes: (i.e. winch or hammer, easy, hard) winch, hard to extract

On Deck Observations:

Staining: some silt, sprayed off

Tube Deformation: none, tip slightly scraped up.

Sediment Description (odor or sheen?): coarse sand, no odor no sheen

Keep or Retry: diver inserted screw plug at sed/H₂O interface
diver observed gravel that fell out of core tip

Notes:
Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134-1162



206.624.9349 Phone
206.624.2839 Fax
www.retec.com

Sediment Core Processing Log

Job: ADWG Core Processing
 Job Number: PORS-18220-5H
 No. of Sections: 1
 Sample Length (from log): 3.6'
 Avg. % Compaction:

Core Location/Sample Number: SC-29-R2
 Date/ Time: 2/21/06 1540
 Sample Logged by: LM
 Type/Diameter of Sample: 4" sq alum.
 Sample Quality: good fair poor disturbed

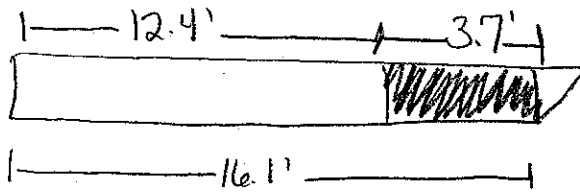
Notes: Pen = 6.1 ?
on Deck Rec = 3.7 60% Rec

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5Y 2.5/1 black + 6.5Y 1 3/1 r. dk greenish gray	-	10	90	✓	0-1.0 wet-moist, soft mottled olive-brown sl. sandy SILT intermixed w/ black moist, soft black SILT @0.6-0.7: moist, dense, med SAND @0.9 1" layer of moist, sl. med SAND		0-1 1555 GT 0.7 GT 0.9 4.16oz		SILT
			-	90			1.2-1.7 transitional * mix of black SILT from above with 2" thick layers of SAND from below		1-2 1600 4.16oz		
		2.5Y 2.5/1 black	-	90	10	✓	@1.8' pocket of olive-grey clayey SILT ~0.5" @ moist, dense, black SAND w/ Multicolored grains (red, orange, white)	2			SAND
		6.5Y 1 3/1 r. dk. greenish gray					@2.6 pocket of olive-grey clayey SILT ~0.5" @	3	2-3.6' 1605 4.16oz		
							End of core at 3.6'	4			
							* largely winnowed, see description on opposite side	5			
								6			

SC-29-R2

2/21/06

LM



$$\begin{array}{r} 5.1 \\ 12.4 \\ \hline 3.7 \end{array}$$

mudline = 12.4'

core catcher is full
of med black SAND
w/ multicolored grains

winnowing occurred from

1.15 - 2.00' at 70% winnowing
2.00 - 2.80 at 30% "
2.80 - 3.30 at 10% "

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-21-06 Recorder: GSW

Project: 341185.001 Windward Lower Duwamish Coring

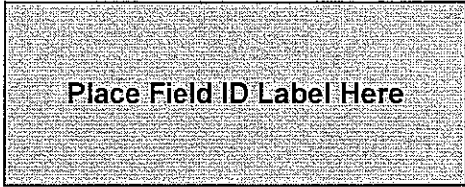
Station Name: 29 R2

Tube Length (ft): 16.05

Water Depth (ft): 14.1

Est. Tide Height (ft): 9.9

Est. Mudline: _____ (MLLW)



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 204054

Easting 1268061

On Deck Top of Sediment 12.4

Comments: incoming tide - diver depth 14 - visibility 4 ft

gentle slope - sandy silt - no debris

29 ft offshore of station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>13.1</u>	<u>13.2</u>	
<u>11.2</u>	<u>12.6</u>	
<u>10.0</u>	<u>12.2</u>	<u>refusal</u>
	<u>16</u>	
	<u>12.4</u>	
<u>GA</u>	<u>3.6</u>	

Mudmole™ Bore Log

Project: LDWG Duwamish Coring **Station:** 29 R2
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 204054 Northing
Date: 2/21/2006 **Time:** 8:18 1268061 Easting
Water depth: 14.1 ft **Mudline:** -4.2 ft MLLW (estimated using tide tables)

Place Field ID Label Here

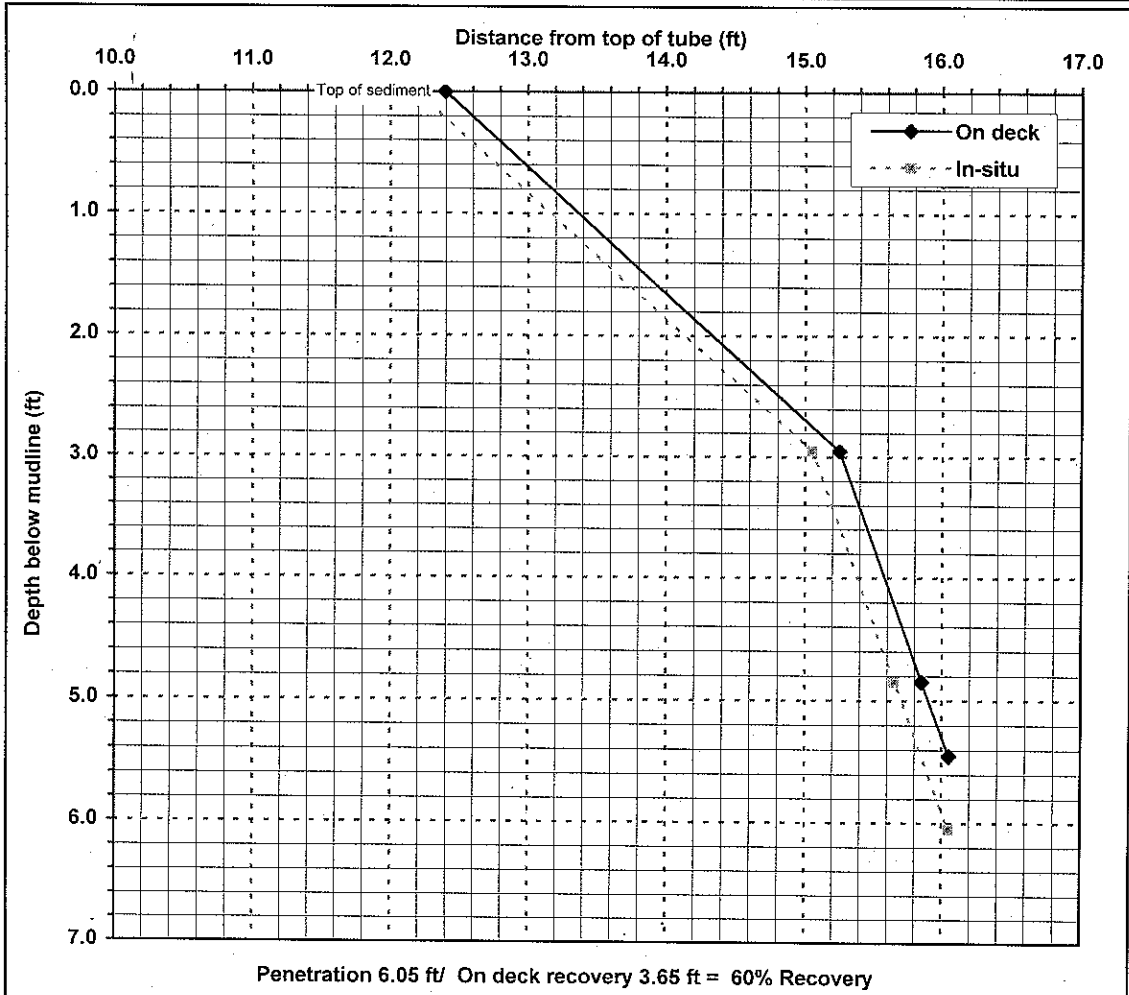
Weather/Comments: N/A
 Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------

0-2.95	2.85	97%
2.95-4.85	0.6	32%
4.85-6.05	0.4	33%

Mudline	12.4
1	13.37
2	14.33
3	15.27
4	15.58
5	15.90
6	No sample
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Station Number: 29

Date: 02/1/04

Station Arrival Time: 0805

Attempt: 2

Core Tube Length: 16.05

Station Departure Time: 0855

Field Technician: ID

Lead Line Water Depth: 14.1

Dist. From Target Station: 29

Contractor: MLP/RESS

Latitude: 204054

On-site Visitor: _____

Longitude: 1268061

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, concrete debris, concrete pier, "Glacier triangle"
 Sediment surface & slope: gentle slope, sandy silt, no obstructions
 Water current and visibility: vis 4 ft., flooding tide
 Diver Water Depth 14 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 0836 Drive Completion Time: 0842 Drive Offset: _____
 Estimated angle of drive: Est 10-15°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
13.1	13.2	difficult drive, diver recorded, free fall
11.2	12.6	difficult drive
10.0	12.2	difficult drive, refusal
TOTAL 6.05	TOTAL 3.85	Percent Recovered: <u>63.7%</u> (<u>60.3% on deck</u>)

Reason for ending drive: refusal
 If refusal, reason for refusal: hard substrate

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): yes, clear, ~ 3 L
 On Boat Recovery: 12.4 Loss of Sediment: 0.2
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: some sand/silt, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): no odor, no sheen, med sand, brown, clean

Keep or Retry diver inserted screw plug at sed/H₂O interface

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

The RETEC Group, Inc.
 1011 SW Klickitat Way, Suite 207
 Seattle, WA 98134-1162



206.624.9349 Phone
 206.624.2839 Fax
 www.retec.com

11/15

2-17-06
We will resample
next week. R1
was not
processed.

Environmental MudMole Bore Log

Place Field ID Label Here

Coll: _____
Date: _____
Operator: SSM

Project: _____
Location: Duwamish Coring

Station Name: _____

Position Information

Tube Length (ft): _____
Water Depth (ft): _____ Time: 10 06
Est. Tide Height (ft): 4.0 (MLLW)
Coordinate Datum: WA State Plane N, NAD 83, Survey Ft
Northing: 204058
Easting: 1268033
Est. Mudline: _____ (MLLW) On Deck Top of Sediment: 13.7

Comments: Falling tide - diver depth 7' vis 1A - flat bottom
- sandy silt - no debris
~ 2 ft off station

Penetration Tape Reading Recovery Tape Reading Comments

<u>13.9</u>	<u>14.3</u>	
<u>12.9</u>	<u>13.6</u>	
<u>10.9</u>	<u>12.3</u>	
<u>9.6</u>	<u>11.6</u>	<u>refusal</u>

water leakage out of bottom of core tube

<u>10.6</u>	<u>10.2</u>	
<u>6.4</u>	<u>4.8</u>	

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 29 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

204058

Northing

Date: 2/15/2006

Time: 10:06

1268033

Easting

Water depth: 8.0 ft **Mudline:** -4.0 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Sunny

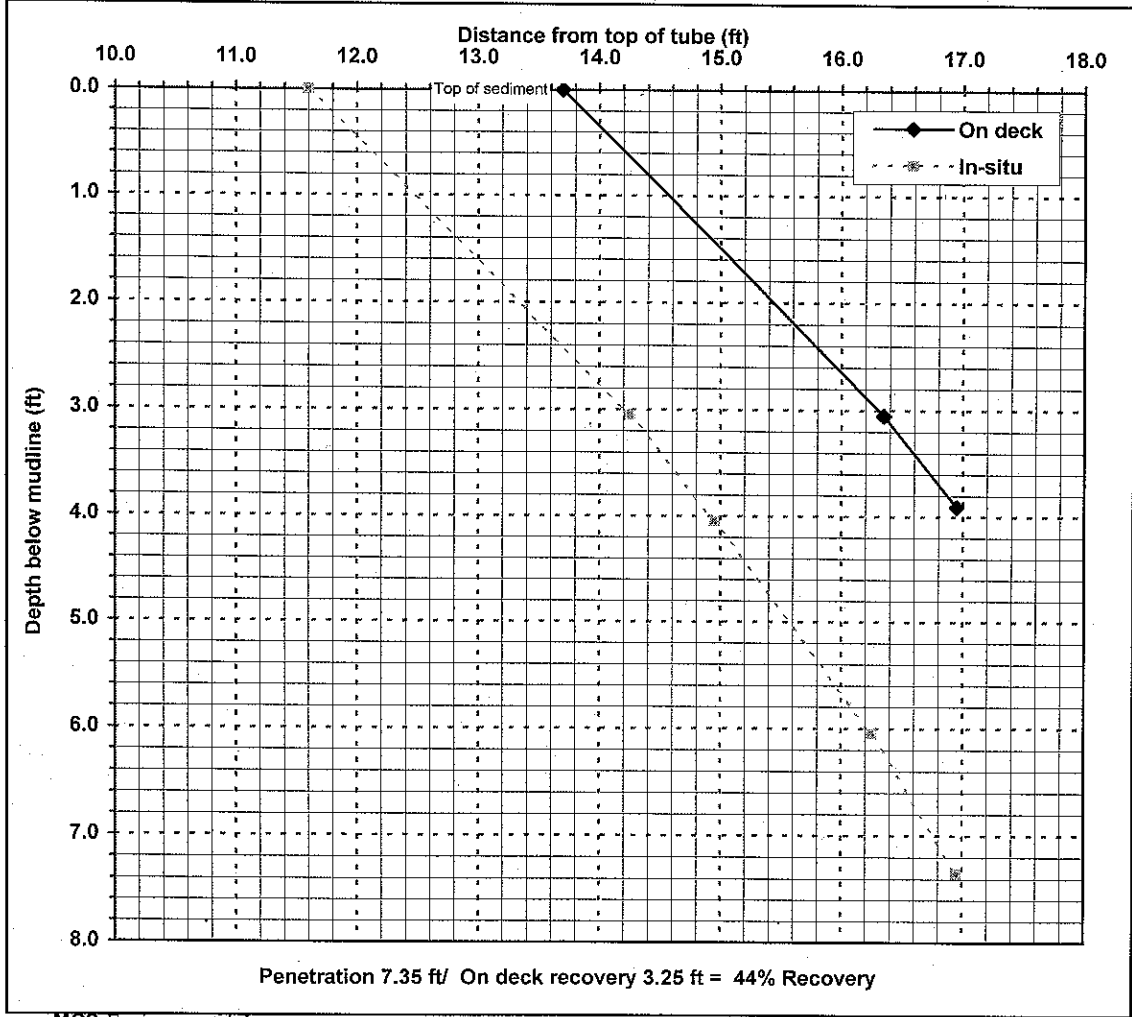
Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------

0-3.05	2.65	87%
3.05-4.05	0.7	70%
4.05-6.05	1.3	65%
6.05-7.35	0.7	54%

Mudline	13.7
1	14.57
2	15.44
3	16.31
4	No sample
5	No sample
6	No sample
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Station Number: 29

Date: 02/15/06

Station Arrival Time: 0935

Attempt: 1

Core Tube Length: 16.05

Station Departure Time: 1105

Field Technician: TD

Lead Line Water Depth: 8.0

Dist. From Target Station: 2

Contractor: MCS/RSS

Latitude: 204058

On-site Visitor: ---

Longitude: 1268033

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, concrete pier
 Sediment surface & slope: flat bottom, sandy silt, no debris
 Water current and visibility: 1 ft vis; mild current, ebbing tide
 Diver Water Depth 7 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 10:32 Drive Completion Time: 10: Drive Offset: ---
 Estimated angle of drive: Est 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
13.9	14.3	deck measured, free fall
12.9	13.6	easy-moderate drive
10.9	12.3	moderate drive
9.6	11.6	moderate drive
TOTAL 6.45	TOTAL 4.45	Percent Recovered: <u>69.0%</u>

Reason for ending drive: refusal
 If refusal, reason for refusal: hard material - coarse sand

Extraction Observations

Tension on line? KS Stability of vessel: no problem
 Overlying water in core (quantity and description): yes, clear, ~ 1L
 On Boat Recovery: 13.7 Loss of Sediment: some leakage during extraction. 2.1 ft?
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations

Staining: trace silty sand, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): course dark sand

Keep or Retry: diver inserted screw plug at H₂O/sed interface, keep, pending decision to resample station.

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log



Job: LDW6 Core Processing
 Job Number: FORS-18220-311
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:

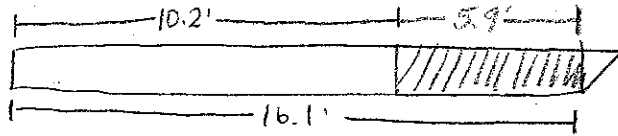
Core Location/Sample Number: LDWA-SG-30 (R2)
 Date/Time: 2/14/02 1420
 Sample Logged by: LMcLee, N Barber
 Type/Diameter of Sample: 4" diameter square
 Sample Quality: good fair poor disturbed

Notes: Pen = 6.9' 2 80% POC
On Deck POC = 5.9'

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		6LEY11 4/10y v. dk grey dk grey grey 25y 2/1 Black	0 90	10	10	2	0-0.2 wet, dense green-grey sl. silty sand no odor			0-0.5 1505 11602	
			10 80	2		2	0.2-1.2 moist dense grey-black fine to medium sand with minor gravel - subround 1/4" - 0.3" some with barnacles no odor 1-2 1" wood ~ 0.2" in length 2.5 SAA but no gravel	0-2.5 1450	3x/6oz	1.5-1 1508 11602 1.5-1 1511 11602 1.5-2 1514 11602 2-2.5 1517 11602	
		2.5y 4/1 dk grey	0 100	0	0	3	2.5-3.2' transitional zone fine to med. sand greenish to grey, in a matrix of multicolored fine-med. sand. 3.2-5.9' interbeds of dark grey-black very fine sand (moist, firm) and dk. grey slightly sandy silt (moist, stiff) no odor. well sorted	2.5-4.0 1455	3x/6oz	2.5-3 1520 11602 3-3.5 1523 11602 3.5-4 1526 11602	Q1.5' 2.25' Big
						4	4.7' Core catcher 5.1 woody debris, trace, small < 1" L	4-5.9 1500	3x/6oz	4-4.5 1529 11602 4.5-5.0 1532 11602 5-5.5 1535 11602 5.5-5.9 1538 11602	Q3.0' TV=5.5' Big
						6	End of core at 5.9'				Q5.0' TV=4.5' Big

50-30-R2

2/14/DLe
LM
NB



MCS Environmental MudMole Bore Log

Collection Information

Date: 2-14-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 30 R2

Tube Length (ft): 16.1

Water Depth (ft): ~~3.5~~ 18

Est. Tide Height (ft): 3.5 (MLLW)

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 203576

Easting 1268785

On Deck Top of Sediment 10.2

Comments: low slack tide - diver depth 16

bottom gentle slope - silty sand - no debris vis 4 ft
224' off shore of station

Penetration Tape Reading

Recovery Tape Reading

Comments

<u>15.4</u>	<u>15.5</u>	
<u>12.5</u>	<u>12.7</u>	
<u>10.7</u>	<u>10.9</u>	
<u>9.6</u>	<u>10.3</u>	
<u>9.2</u>	<u>9.9</u>	<u>refusal</u>
<u>silty clay in tip of core</u>		

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 30 R2

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

203576

Northing

Date: 2/14/2006

Time: 10:59

1268785

Easting

Water depth: 18.0 ft

Mudline: -14.5 ft MLLW (estimated using tide tables)

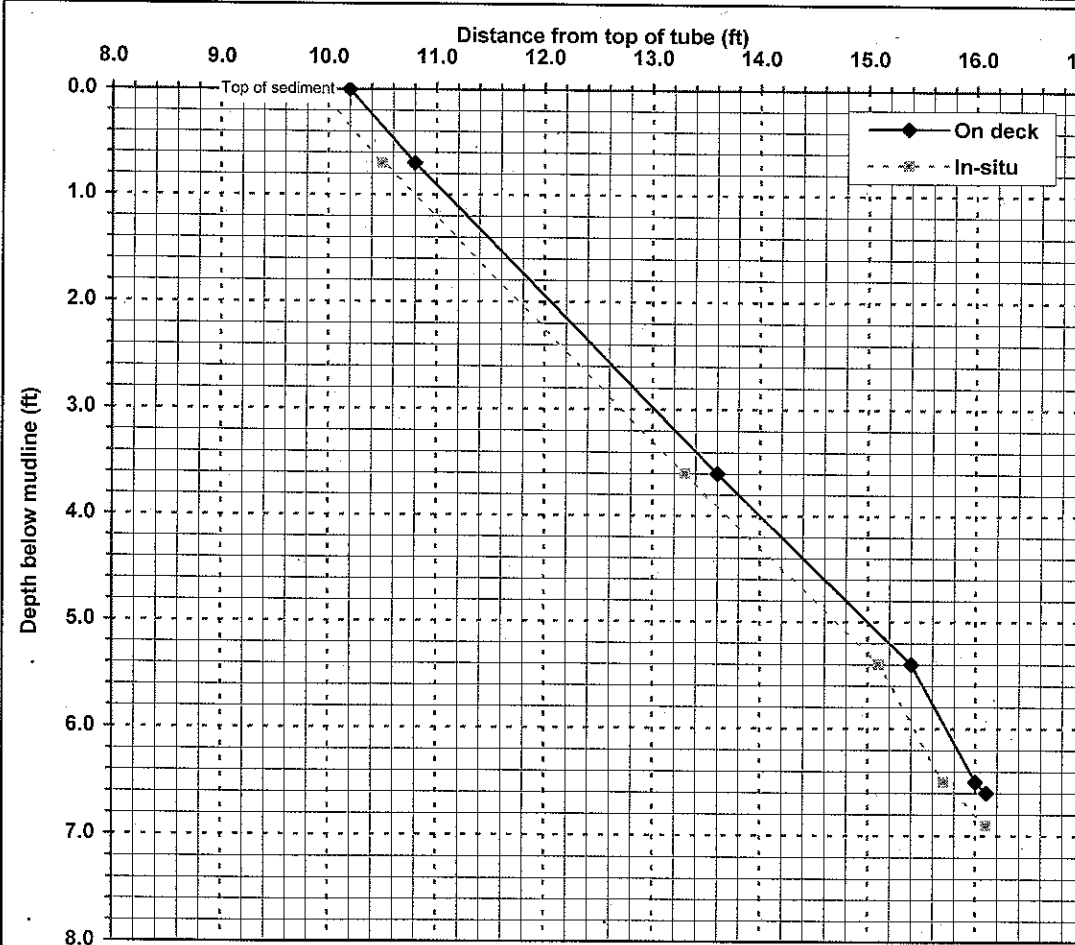
Place Field ID Label Here

Weather/Comments: Sunny

Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-0.700000000000000	0.6	86%
0.700000000000000-1.3	2.8	97%
1.3-3.6	1.8	100%
3.6-5.4	0.6	55%
5.4-6.5	0.4	100%
6.5-6.9		

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	10.2
1	11.09
2	12.06
3	13.02
4	14.00
5	15.00
6	15.73
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Penetration 6.9 ft/ On deck recovery 5.9 ft = 86% Recovery

Station Number: 30 Date: 02/14/04 Station Arrival Time: 1012
 Attempt: 2 Core Tube Length: 16.1 Station Departure Time: 1123
 Field Technician: TD Lead Line Water Depth: 18.0 Dist. From Target Station: 2A
 Contractor: MCS/RSS Latitude: 203576
 On-site Visitor: _____ Longitude: 1260785

Pre-Drive and Diver Observations:

Shoreline & surrounding area: same as R1
 Sediment surface & slope: silty sand, ^{no} metal debris, gentle slope
 Water current and visibility: falling tide 4ft vis. low slack tide
 Diver Water Depth 16 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1104 Drive Completion Time: 11 Drive Offset: _____
 Estimated angle of drive: EA-10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.4	15.5	diver measured, free fall
12.5	12.7	easy to moderate drive
10.7	10.9	easy to moderate drive
9.6	10.3	moderate to difficult drive
9.2	9.9	difficult drive, refusal, penetration very slow
TOTAL 6.9	TOTAL 6.2	Percent Recovered: <u>89.9%</u>

Reason for ending drive: refusal
 If refusal, reason for refusal: hard material

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): yes
 On Boat Recovery: 10.2 Loss of Sediment: 0.3
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, moderately difficult, a lot of tension on cable.

On Deck Observations:

Staining: dk silt, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): gray silty, fine sand no odor no sheen.

Keep or Retry: diver inserted screw plug at sed/HO interface
diver observed silty/clayey in tip.

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log



Job: LDWS Core Processing
 Job Number: PRS-18220-311
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: LDWS-SC-30(RI)
 Date/Time: 2/14/06 1420
 Sample Logged by: LMcku NBarker
 Type/Diameter of Sample: 4" diameter square
 Sample Quality: good fair poor disturbed

Notes: Pen = 4.4' 268% Rec.
moist = 30

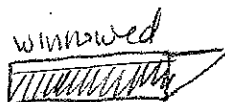
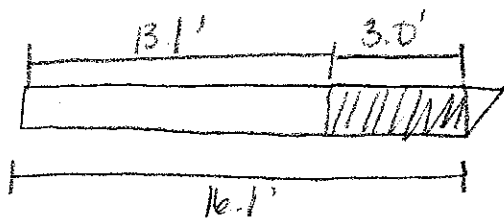
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
			0	100	0		Entire core is winnowed moist, firm black sand with orange, red, white multi colored grains ~30-35% winnowed		NO SAMPLES COLLECTED		

SC 30 R1

2/14/06

UM

NB



MCS Environmental MudMole Bore Log

Collection Information

Date: 2-14-06 Recorder: GSW

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 30 R 1

Tube Length (ft): 16.1

Water Depth (ft): 11.4

Est. Tide Height (ft): 4.1

(MLLW)

Est. Mudline: _____

(MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 203593

Easting 1268797

On Deck Top of Sediment 13.1

Comments: Falling tide - diver depth 11 ft - slope ~ 30°

sandy silt - rocks + wood debris in area

26 ft off station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>13.6</u>	<u>13.6</u>	
<u>11.9</u>	<u>12.9</u>	
<u>11.7</u>	<u>12.9</u>	<u>refusal</u>

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 30 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

203593

Northing

Date: 2/14/2006

Time: 10:20

1268797

Easting

Water depth: 11.4 ft

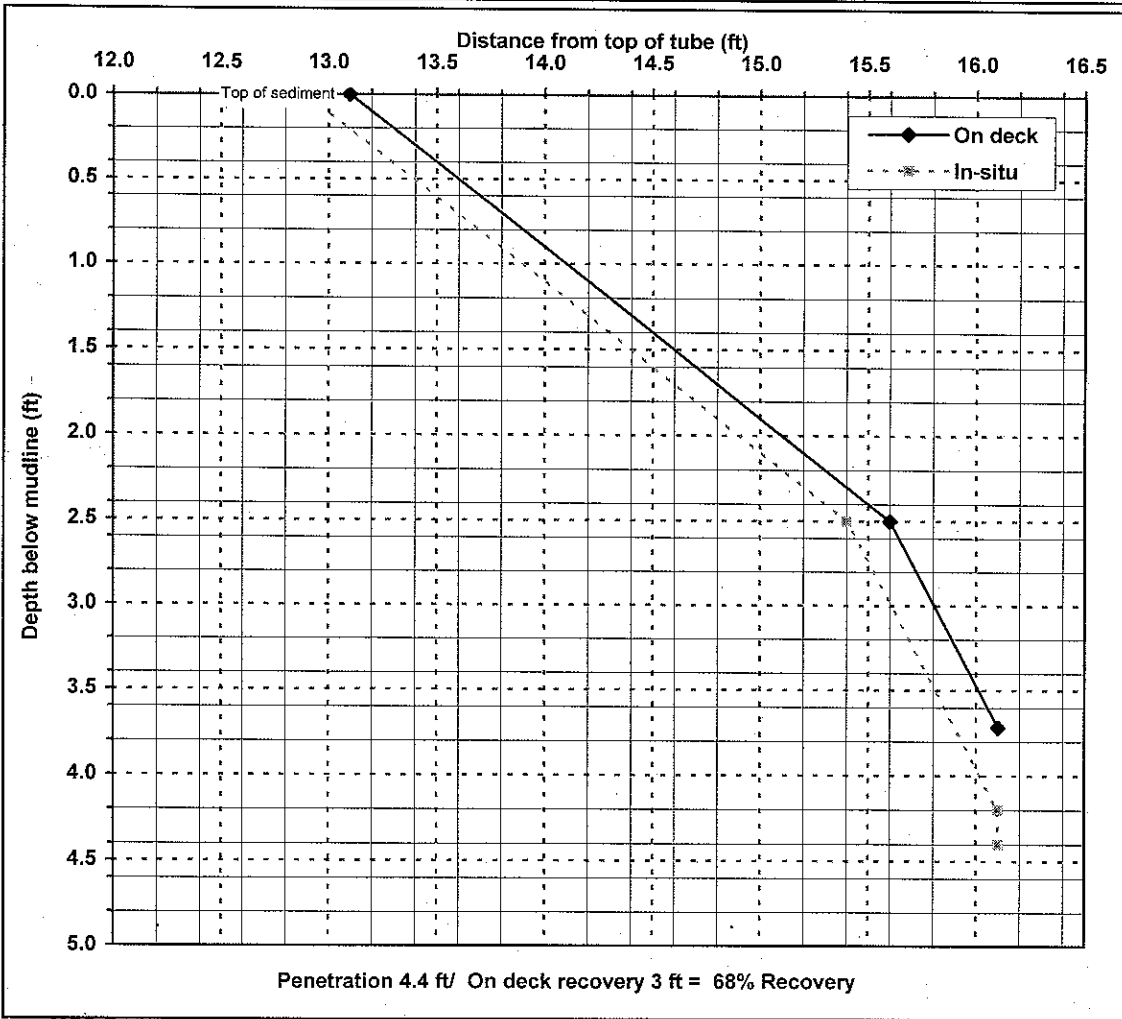
Mudline: -7.3 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Sunny

Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
---------------------------	------------------------	------------------	--------------------------	--------------------------------



0-2.5	2.5	100%	Mudline	13.1
2.5-4.2	0.699	41%	1	14.10
4.2-4.4	0.001	0%	2	15.10
			3	15.81
			4	No sample
			5	No sample
			6	No sample
			7	No sample
			8	No sample
			9	No sample
			10	No sample
			11	No sample
			12	No sample
			13	No sample
			14	No sample
			15	No sample
			16	No sample
			17	No sample
			18	No sample
			19	No sample
			20	No sample

Station Number: 30 Date: 02/14/00 Station Arrival Time: 1012
 Attempt: 1 Core Tube Length: 16.1 Station Departure Time: _____
 Field Technician: TD Lead Line Water Depth: 11.4 Dist. From Target Station: 6
 Contractor: MCS/RSS Latitude: 203593
 On-site Visitor: _____ Longitude: 1268797

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, reed canary grass
 Sediment surface & slope: sandy silt, wood debris, rock debris, moderate slope to channel
 Water current and visibility: falling tide, 5 ft vis.
 Diver Water Depth 11 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1027 Drive Completion Time: 1033 Drive Offset: _____
 Estimated angle of drive: EA 10-15° off

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
<u>13.6</u>	<u>13.6</u>	<u>easy drive, deck measured</u>
<u>11.9</u>	<u>12.9</u>	<u>moderate to difficult drive, deck measured</u>
<u>11.7</u>	<u>12.9</u>	<u>difficult drive, refusal</u>
TOTAL <u>4.4</u>	TOTAL <u>3.2</u>	Percent Recovered: <u>72.7</u>

Reason for ending drive: refusal
 If refusal, reason for refusal: hard material

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): yes, clear, ~500 mL
 On Boat Recovery: 13.1 Loss of Sediment: 0.2
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: a little bit of silt, sprayed off
 Tube Deformation: none, tip is battered
 Sediment Description (odor or sheen?): brown, med. silty sand, no odor no sheen

Keep or **Retry**: diver inserted screw plug at sed/H₂O interface
diver felt rip rap/rocks in hole where core tube was

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)



Sediment Core Processing Log



Job: LDWG Core Processing
 Job Number: PDPS-18220-511
 No. of Sections: 1
 Sample Length (from log): 8.9'
 Avg. % Compaction:

Core Location/Sample Number: SC-31-R1
 Date/Time: 2/17/06 1300
 Sample Logged by: LM Chee
 Type/Diameter of Sample: 4" sq aluminum
 Sample Quality: good fair poor disturbed

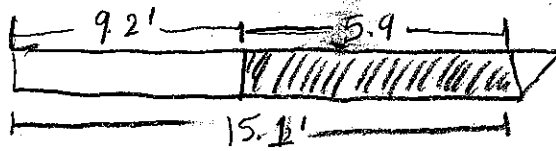
Notes: Pen = 7.5' } 85%
on Deck Rec = 6.4' } * note: core is 15.1' in length

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No	Summary Sketch
		2.54 4/3 olive brown	-	10	90	Ø	SILT 0-0.5 wet, loose, olive brown sl. sandy SILT segmented worm		0-1 1325		SILT
		2.54 2.5/1 black		10	90	Ø	SILT 0.5-2.8 moist, soft, black sl. sandy SILT (org) with woody fragments	1	GT 0.8		SILT (ORG)
							0.2-3:0.2' wood fragments, subangular 0.05' gravel	2	GT 2.7		
							Silt pockets near sand from below sharp				
			-	90	10	Ø	SAND 2.8-5.0 moist, dense, black SAND with multicolored grains (orange, white, red) medium- graded	3	2.8-4		SAND
							transitional	4			
		6LE11 4/104 a greenish grey	SAND-90	10		Ø	layer of moist damp, stiff grey clayey silty sl sand + 0.5-4' 0.05' subround gravel	5	4-5.9'		SAND SILT
			SILT-10	98			all SILT + SAND in 1" thick convex warts - SILT is same as above, sand is earthing downward - multicolored grains	6			
							5.9' End of Core.				

SC-31-R1

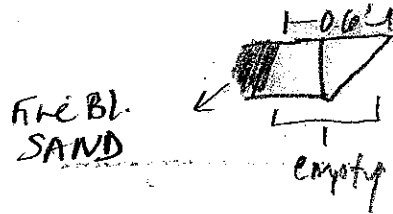
2/17/06

ZM



modline = 9.2'

show
core catcher is empty from
tip of core tube to 0.6' toward surface



core catcher did not close

9.2
5.9

15.1

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-16-06 Recorder: GSM



Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 3) R)

Position Information

Tube Length (ft): 15-6

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 35.3

Time: 1345

Northing 203092

Est. Tide Height (ft) _____

(MLLW)

Easting 1268934

Est. Mudline: _____

(MLLW)

On Deck Top of Sediment 9.2

Comments: Diver depth 35 visibility 3A no debris

flat silty bottom - mild current

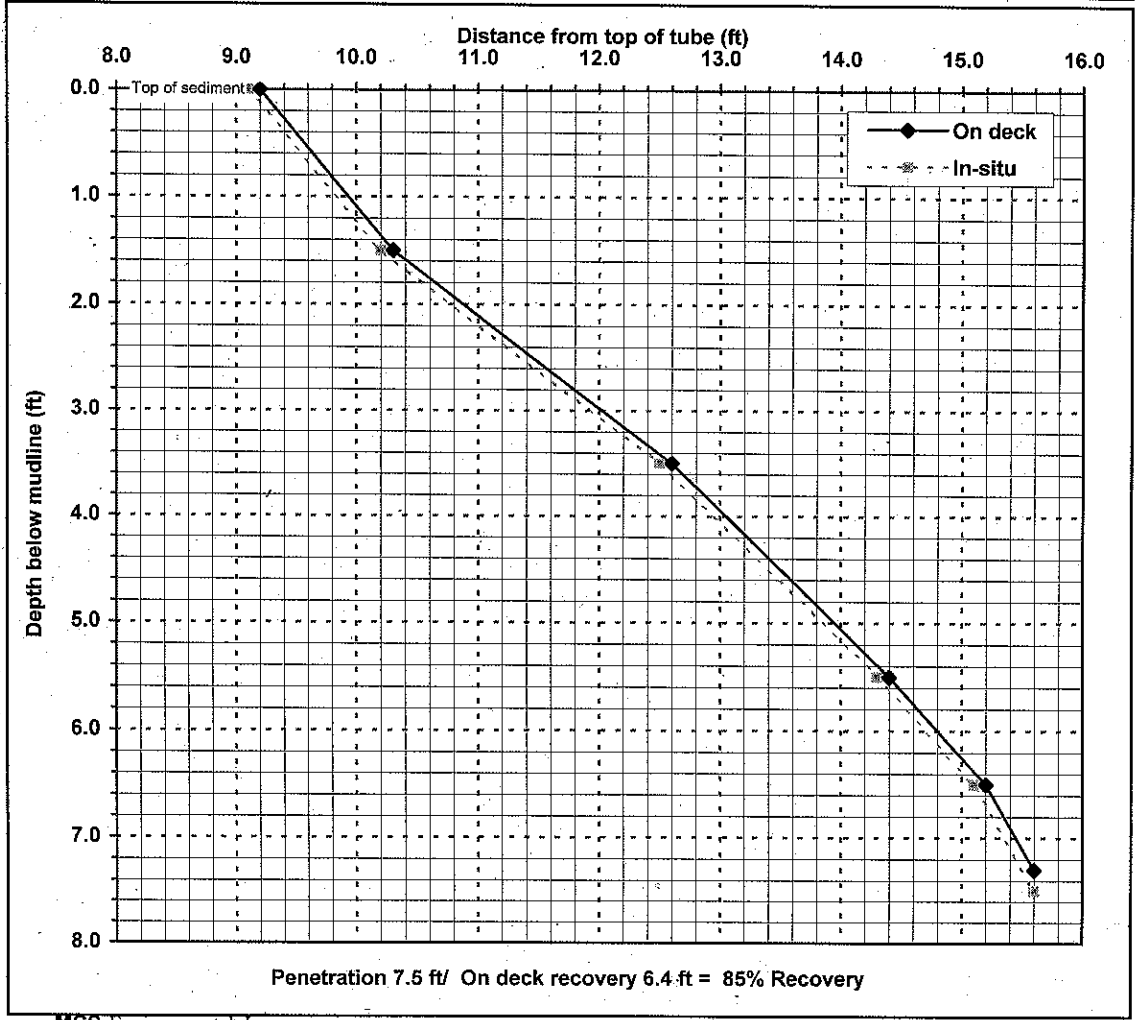
24A from station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.1</u>	<u>14.5</u>	
<u>12.1</u>	<u>12.2</u>	
<u>10.1</u>	<u>10.4</u>	
<u>9.1</u>	<u>9.6</u>	
<u>8.1</u>	<u>9.1</u>	<u>refusal</u>
		<u>hard to extract core</u>
		<u>from bottom</u>

Mudmole™ Bore Log

Project: LDWG Duwamish Coring	Station: 31 R1	<div style="border: 1px solid black; padding: 5px; background-color: #e0e0e0;">Place Field ID Label Here</div>
Project No: 341185.001	Position: NAD83	
Collected by: GSM	203092	
Date: 2/16/2006	Time: 13:45	
Water depth: 35.3 ft	Mudline: #VALUE! ft MLLW (estimated using tide tables)	

Weather/Comments: N/A
 Driven to refusal



Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
0-1.5	1.1	73%	Mudline	9.2
1.5-3.5	2.3	115%	1	9.93
3.5-5.5	1.8	90%	2	10.88
5.5-6.5	0.8	80%	3	12.03
6.5-7.5	0.5	50%	4	13.05
			5	13.95
			6	14.80
			7	15.45
			8	No sample
			9	No sample
			10	No sample
			11	No sample
			12	No sample
			13	No sample
			14	No sample
			15	No sample
			16	No sample
			17	No sample
			18	No sample
			19	No sample
			20	No sample

Station Number: 31

Date: 2/16/06

Station Arrival Time: 1333

Attempt: 1

Core Tube Length: 15.6

Station Departure Time: 14

Field Technician: TND, IMF

Lead Line Water Depth: 15.6

Dist. From Target Station: 4

Contractor: MCS, R33

Latitude: 203092 3513

On-site Visitor: —

Longitude: 176 8934

Pre-Drive and Diver Observations

Shoreline & surrounding area: wood pier, cement, sand + gravel
 Sediment surface & slope: no debris, flat bottom, silty
 Water current and visibility: 3ft vis, mild current
 Diver Water Depth 35 Tip Probe Depth — Disk Probe Depth —

Drive Observations

Drive Initiation Time: 1353 Drive Completion Time: 1358 Drive Offset: —
 Estimated angle of drive: under water est 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
14.1	14.5	free fall measured by diver
12.1	12.2	easy drive
10.1	10.4	easy drive, penetration slowed
9.1	9.6	moderate drive, penetration slowed
8.1	9.1	difficult drive, refusal
TOTAL 7.5	TOTAL 6.5	Percent Recovered: <u>86.7%</u>

Reason for ending drive: refusal
 If refusal, reason for refusal: hard substrate

Extraction Observations

Tension on line? Y Stability of vessel: list to starboard + dip of bow
 Overlying water in core (quantity and description): clear, ~ 3L
 On Boat Recovery: 9.2 Loss of Sediment: 0.1 ft
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, moderate to hard

On-Deck Observations

Staining: some silty, was rinsed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): grey, silty, sand

Keep or Retry: diver inserted screw plug at H₂O/sed interface

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log

Job: LDWG SC coring
 Job Number: POR55-16220
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:

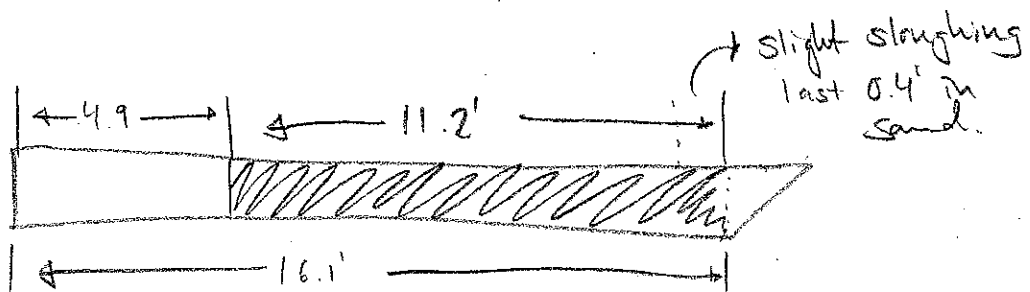
Core Location/Sample Number: LDWG-SC-32 R1
 Date/ Time: 2/11/06 start 1445-
 Sample Logged by: N. Bacher, A. Fitzpatrick
 Type/Diameter of Sample: 4" sq. aluminum
 Sample Quality: good fair poor disturbed

Notes: Penetr: 12.65 7 → R=95%
 On-deck rec: 12.05

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5Y 3/3 dark olive brown		10	90		wet, loose, olive gray, sl. sandy silt. trace twigs, rootlets 2-3 worms		1510		
		2.5Y 2.5/1 black		15	85	⊙	moist, med. soft, black sl. sandy silt, mottled black & gray. trace twigs, rootlets flat worm @ 0.6'	6.8	GT @ 1.1'		@ 0.4 TV=1.75 613
		2.5Y 4/4 dark gray		10	90		wet, loose, black silty sandy gravel, trace HC-like odor. wet, med. soft, olive gray silt trace twigs, rootlets, clayey to trace 1/8" sand pockets & slightly mottled throughout to base w/ thin black streaks very low plasticity.	1.0	1515		
		2.5Y 2.5/1 black		80	20	⊙	trace to minor sheen florets 1/8" ⌀, moderate HC-like odor throughout. @ 2.5' piece of gravel, 1"	2.0	1520		@ 2.5' TV=0.75 614
		2.5Y 2.5/1 black				⊙	wet, med. soft, black medium sand w/ olive gray silt interbeds, moderate HC-like odor. minor sheen florets 1/8" ⌀ sand is multicolored red, orange, white. @ 4.3' piece of wood. @ 4.7' 4" piece of wood.	3.0	GT @ 3.3'		
						⊙		4.0	1525		@ 4.5 TV=1.75 615
								5.0			
		OLEY1 3/50Y v. dk greenish gray		50	50	⊙	moist, med. dense, greenish gray 2" silty sand, silt, and sand interbeds. Scattered rootlets, no sheen. @ 5.9': 2" wood layer.	6.0	1530		@ 5.7 TV=5.5 616

SC-32

R1



MCS Environmental MudMole Bore Log

Collection Information

Date: 2-10-06 Recorder: GSM



Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 32 R1

Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 25.6

Time: 1243

Northing 202959

Est. Tide Height (ft) 8.6

(MLLW)

Easting 1269344

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 4.9

Comments: high slack tide - 25' diver depth - silt bottom

no debris - no slope - flat bottom - 1-2 ft visibility
9 ft off station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.4</u>	<u>14.8</u>	
<u>12.3</u>	<u>12.6</u>	
<u>10.1</u>	<u>10.2</u>	
<u>8.1</u>	<u>8.0</u>	
<u>6.3</u>	<u>6.4</u>	
<u>4.8</u>	<u>5.1</u>	<u>penetration rate slowed</u> <u>refusal</u>
<u>4.3</u>	<u>4.8</u>	

Mudmole™ Bore Log

NOT COLLECTED

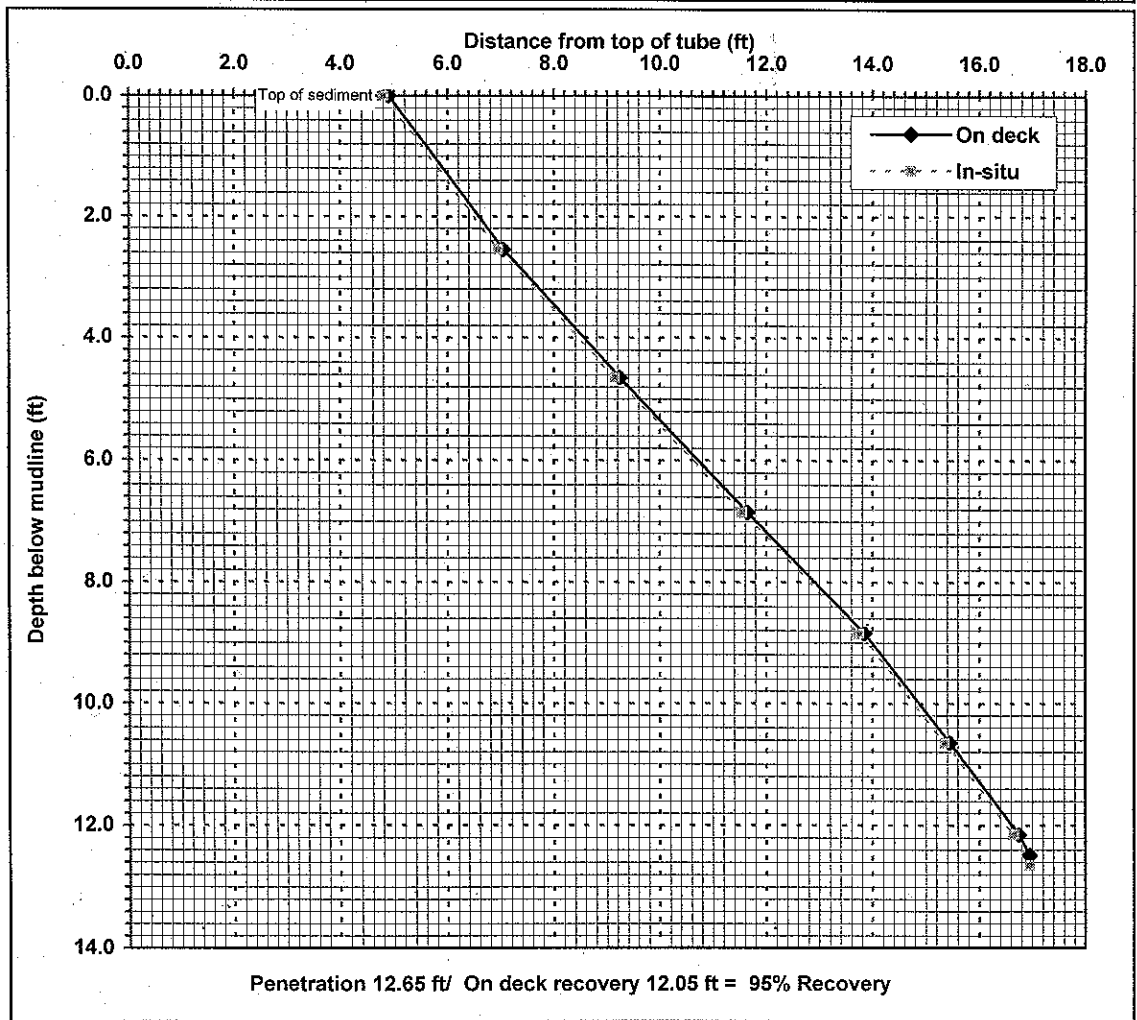
Project: LDWG Duwamish Coring **Station:** 32 R1
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 202959 Northing
Date: 2/10/2006 **Time:** 12:43 1269344 Easting
Water depth: 25.6 ft **Mudline:** -17.0 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Sunny
 Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------



0-2.55	2.15	84%
2.55-4.65	2.2	105%
4.65-6.85	2.4	109%
6.85-8.85	2.2	110%
8.85-10.65	1.6	89%
10.65-12.15	1.3	87%
12.15-12.65	0.3	60%

Mudline	4.9
1	5.74
2	6.59
3	7.52
4	8.57
5	9.63
6	10.72
7	11.82
8	12.92
9	13.98
10	14.87
11	15.75
12	16.62
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 32
 Attempt: 1
 Field Technician: TD/LM
 Contractor: MCS/RS
 On-site Visitor: _____

Date: 2/10/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 25.6
 Latitude: 202959
 Longitude: 1269344

9 ft off station

Pre-Drive and Diver Observations:

Shoreline & surrounding area: Slip 2, no rap, barge nearby (west)
 Sediment surface & slope: no slope, silt, no debris, flat bottom
 Water current and visibility: 1-2ft vis., high slack tide
 Diver Water Depth 25 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1251 Drive Completion Time: 1256 Drive Offset: _____
 Estimated angle of drive: equiv underwater, cannot see

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
14.4	14.8	diver measured free fall
12.3	12.6	easy drive
10.1	10.4	easy drive
8.1	8.0	easy drive
6.3	6.4	easy-moderate drive
4.8	5.1	difficult, penetration slow
4.3	4.8	refusal, difficult drive
TOTAL 11.75	TOTAL 11.25	Percent Recovered: <u>95.7</u>

Reason for ending drive: refusal
 If refusal, reason for refusal: sand layer - diver observation

Extraction Observations:

Tension on line? yes Stability of vessel: no problems
 Overlying water in core (quantity and description): yes, clear, ~ 200 ft, slightly turbid
 On Boat Recovery: 4.9 Loss of Sediment: 0.1
 Extraction Observations: no hammer used

On Deck Observations:

Staining: light colored (gray) clay, silty, sprayed off, ~
 Tube Deformation: none
 Sediment Description (odor or sheen?): med-sand, light petroleum-like odor, no sheen

Keep or Retry: diver inserted screw plug at sed/tbD interface

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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 1011 SW Klickitat Way, Suite 207
 Seattle, WA 98134-1162



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 www.retec.com

Sediment Core Processing Log



Job: LDWG SC coring
 Job Number: PORS5-18220
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:

Core Location/Sample Number: LDWG-SC-33 **R2**
 Date/Time: 2/11/06 start 1015 end 1200
 Sample Logged by: N. Bacher, A. Fitzpatrick
 Type/Diameter of Sample: 4" sq. aluminum
 Sample Quality: good fair poor disturbed

Notes: Penet: 13.05' → R=77%

On-deck rec: 10.05' core collected 2/10/06 lab = 10.2' sediment

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Sample Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		GLE Y 2 4/1 gray dk. greenish		15	85		wet, med. soft, olive gray sl. sandy silt. trace clay. trace roots.			1125 1-1602	
		GLE Y 1 25/w black		15	85	⊘	moist, med. soft to med. firm black silt. minor sand. polychaete worms @ 0.5'. trace H ₂ S odor, increasing to moderate @ base of layer.	1.0	1100	1128 1-1602	
							@ 1.3 grades to wet, med. loose, black silty coarse sand w/ trace gravel. trace black sheen & moderate H ₂ S odor.	1.4	3-1602	1131 1-1602	
		GLE Y 1 3/1 v. dk. greenish gray		15	95		moist, med. firm, greenish gray to black sl. clayey silt. minor to trace roots, moderate H ₂ S odor			1134 1-1602	
					100		1.4-1.9" 1.5" pale yellow, fibrous silty clay, strong H ₂ S odor, disintegrates when rolled b/w fingers. becomes clayey silt @ 2.0 to base.	2.0		1137 1-1602	
		2.54 2.5/1 black				⊘	moist, med. firm, black silt, trace clay and sand, w/ scattered wood frags, frags, shell frags, slight H ₂ S trace gravel	2.6	1105	1140 1-1602	
				5	95		less water w/ depth @ 3.3 light weight, black, unknown fragments probably organic in nature trace gravel @ this location as well	3.0	3-1602	1143 1-1602	
				15	85					1146 1-1602	
				15			⊘			1149 1-1602	
							E 3.6 to 4 ft = a gray sl. sandy silt layer E 5.8 to 6 ft = a gray sl. sandy silt layer				
							4.4-5.0, sandy wood layer w/ 1/2" angular debris, slight creosote like odor, 1/4" metal nugget silver color, shiny, shell fragments abundant	5.0	1110	1152 1-1602	
										1155 1-1602	
							@ 5.7' glass piece, top of soda bottle.			1156 1-1602	
								6.0			

@ 0.9
TV = 28
b13

@ 2.5
TV = 2.5
b13

potentially impacted area

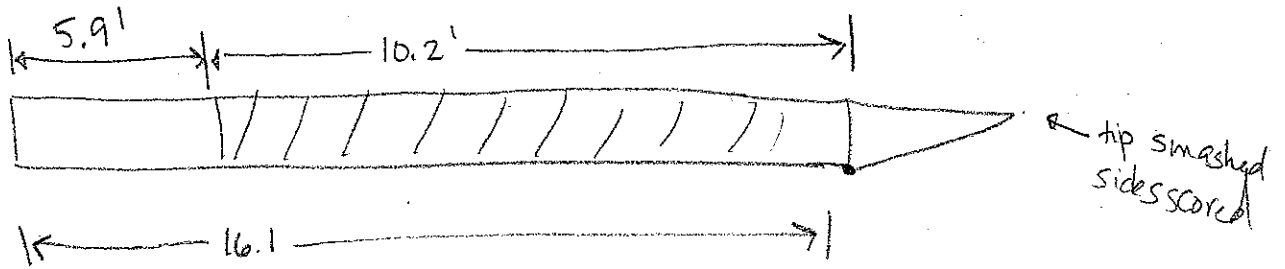
@ 5.0
TV = 3
b13

4.6' silver shiny layer.

LDW-SC-33

02/11/06

on deck = 6.0'



Water poured out
~~clean~~ settled overnight
non-turbid

shoe empty
but sediment
fill down to
core catcher +
measuring corner.

Sediment Core Processing Log

Job: LDWG SC Coring
 Job Number: PORS5-18220
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: LDWG-SC-33 R2
 Date/ Time: 2/11/06
 Sample Logged by: N. Bacher, A. Fitzpatrick
 Type/Diameter of Sample: 4" sq. aluminum
 Sample Quality: good fair poor disturbed

Notes: _____

See page 1

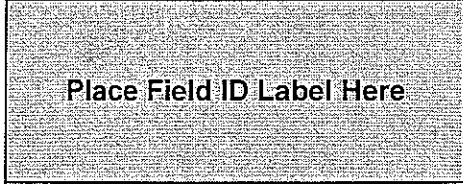
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Initial Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch	
				10	90		↓ same as above damp, med stiff, black organic? SILT w/ H2S, med scattered wood frag, druse (2%), TPH-like odor from 4.4-7.7	7.0	2-1602			
		2.5Y 4/2 dk. grayish brown					moist, med. dense, silty sand blackish gray grains to silty @ 9.5' well sorted. fine sand grains are multicolored, orange, red, no odor white. scattered rattlebs.	9.0	2-1602			
							Bottom of Core = 10.2'	10.0				
							<u>Show & Tell</u> 1.9' yellow twine 3.2' shell frag? 5.5' unknown frags? 5.6' silver nugget 5.7' glass bottle frag	10.2'				
								11.0				
								12.0				

1200 1-1602
 @ 7.0'
 TV-5
 @ 9.0'
 TV-5
 big

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-10-06 Recorder: GSM



Project: 341185.001 Windward Lower Duwamish Coring

Station Name: ~~33 R1~~ 33 R2

Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 20.3

Time: 1333

Northing ~~202054~~ 202056

Est. Tide Height (ft) 8.6

(MLLW)

Easting ~~1269295~~ 1269267

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 6.0

Comments: Rep 1, 9' off station - falling tide - wood debris & logs on

19 ft, moderate slope - grainy silt, scattered metal debris - 4 ft visibility

Penetration Tape Reading

Recovery Tape Reading

Comments

15.7

15.5

refusal - hit something just below surface

<u>Rep 2</u>	<u>water depth</u>	<u>time</u>	<u>tide</u>
	<u>24.1</u>	<u>1415</u>	<u>8.4</u>
<u>moved 26 ft off shore of station</u>			
<u>falling tide - log debris just under surface</u>			
<u>moderately sloping bottom</u>			
<u>15.5</u>	<u>15.3</u>		
<u>13.0</u>	<u>12.4</u>		
<u>10.7</u>	<u>10.4</u>		
<u>8.6</u>	<u>8.8</u>		
<u>7.0</u>	<u>7.5</u>		
<u>5.0</u>	<u>6.1</u>		
<u>3.0</u>	<u>5.2</u>		

clay silt plug in end of core

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 33 R2

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

202056

Northing

Date: 2/10/2006

Time: 14:15

1269267

Easting

Water depth: 24.1 ft

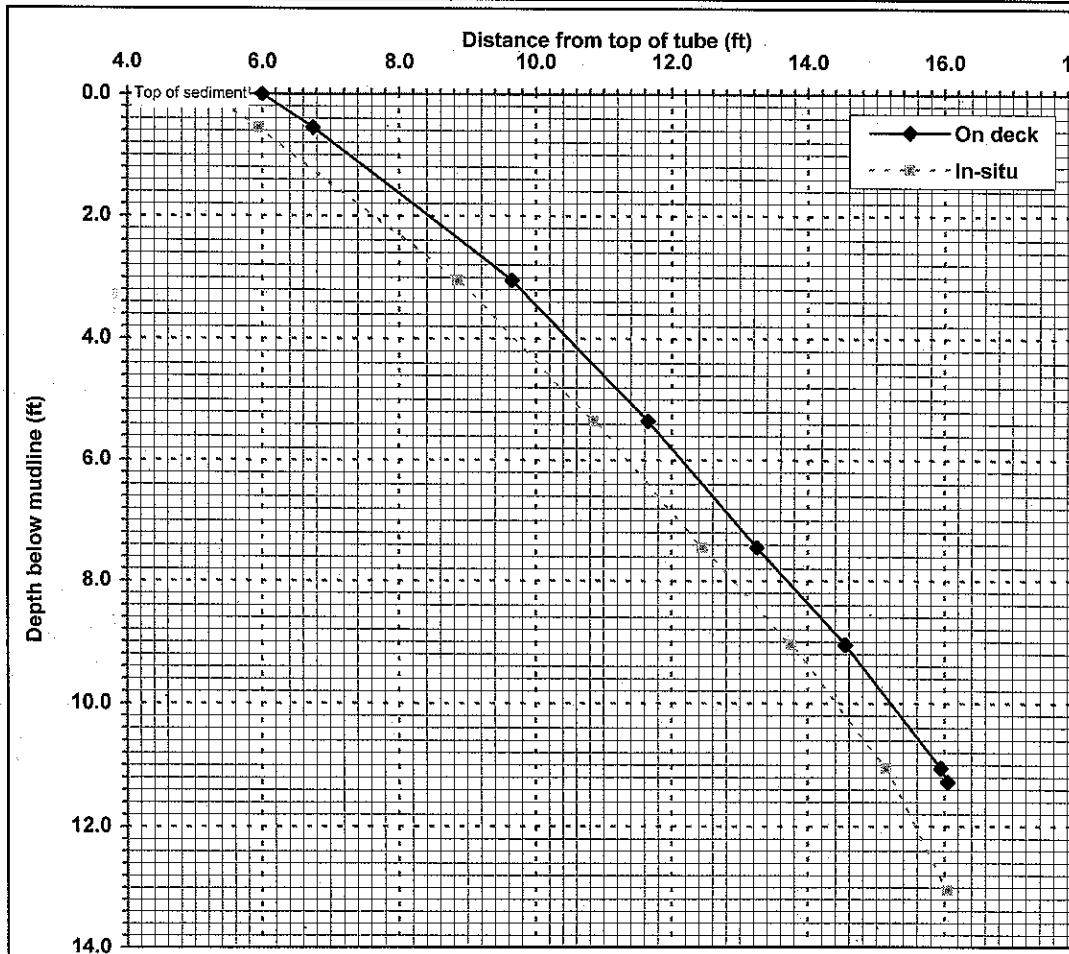
Mudline: -15.7 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Sunny

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-0.550000000000000	0.75	136%
0.550000000000000-1.3	2.9	116%
1.3-2.9	2	87%
2.9-5.35	1.6	76%
5.35-7.45	1.3	81%
7.45-9.05	1.4	70%
9.05-11.05	0.9	45%
11.05-13.05		

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	6
1	7.27
2	8.43
3	9.59
4	10.48
5	11.35
6	12.15
7	12.91
8	13.70
9	14.51
10	15.22
11	15.92
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Penetration 13.05 ft/ On deck recovery 10.05 ft = 77% Recovery

Station Number: 83

Date: 2/10/06

Attempt: 2

Core Tube Length: 16.05

Field Technician: TD/LM

Lead Line Water Depth: 24.1

Contractor: MCS/RSS

Latitude: 202056

On-site Visitor: _____

Longitude: 126 9267 26ft. off target (offshore)

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, log pilings, pier, barges

Sediment surface & slope: mod- gentle slope, grainy silt, scattered debris (metal & wood), logs debris just under surface

Water current and visibility: 4 ft visibility

Diver Water Depth 17.0 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 13:40 ^{14:23} Drive Completion Time: 14:29 Drive Offset: _____

Estimated angle of drive: mostly east under water, cannot see much, 15° off (est)

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.7	15.5	diver recorded, free fall (station reset)
15.5	15.3	diver recorded, free fall
13.0	12.4	easy drive
10.7	10.4	easy drive
8.6	8.8 ^{8.8}	easy drive
7.0	7.5	easy-mod. drive
5.0	6.1	easy-mod. drive
3.0	5.2	moderate
TOTAL 13.05	TOTAL 10.85	Percent Recovered: 83.1

Reason for ending drive: goal reached

If refusal, reason for refusal: _____

Extraction Observations:

Tension on line? yes Stability of vessel: no problems

Overlying water in core (quantity and description): yes, clear, 1 L.

On Boat Recovery: 6.0 Loss of Sediment: 0.8 ft.

Extraction Observations: no hammer used

On Deck Observations:

Staining: silt, moderately spread off.

Tube Deformation: none

Sediment Description (odor or sheen?): silt, dark.

Keep or Retry: core did not penetrate. Mudmole evidently trying to penetrate to no success. Will reset. moved off shore to try again. Core screw plug inserted by diver at sed/H₂O interface.

Notes: Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log

Job: LDWG Scoring
 Job Number: PORSS-18220
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: LDWG-SL-201 R1
 Date/Time: 2/11/06
 Sample Logged by: N. Bacher, A. Fitzpatrick
 Type/Diameter of Sample: 4" sq. aluminium
 Sample Quality: (good) fair poor disturbed intact

field rep of 33

Notes: Penet: 13.65' → R=85%

On-deck R: 11.55' (one collected 2/10/06)

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Insitu Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		5Y 3/2 dark olive gray		15	85		in breath zone 2" of very soupy, runny SILT over wet, med stiff, dark olive brown, sl. sandy SILT w/ mod. wood frags. No H ₂ S odor, w/ worms, trace gravel transition	1245 3-1602 1-15	1310 1-162		Recent SILT
1.0		6EY 4 2.5/10y greenish black		10	90	(O.D.)	ML: black, wet, soft, sl. sandy, organic? SILT w/ trace small shell frags + rootlets No H ₂ S odor, 2" of gravelst, scattered orange streaks bounded w/ barbed marks, 1 pc brick frag	0.5 1.0	0.5-3 1-162		SILT
2.0		dark olive gray			100		ML: wet, stiff, dark gray very clayey SILT transition	1.5 2.0	1-115' 1-162 1.5-2 1-162		CLAY SILT f
3.0		dark		5	95	(O.D.)	ML (transition zone w/ unit below) alternating layers of gray clayey SILT (stiff, wet) and black organic SILT diffuse concretions, trace H ₂ S odor w/ scattered small wood + shell frags trace sand seams. low plasticity, grades to black unit below.	2.0 3.0	2-215' 1-162 2.5-3 1-162		SILT
4.0		6EY 1 2.5/1 N black					OL/ML: wet/moist, med stiff, black slightly CLAYEY SILT. sharp	4.0	3-335' 1-162		
5.0		w/ dark greenish gray layers					At 4.0 to 4.2: distinct layer of wet, black, loose, w/ up to 4" L wood + shell fragments, (1/2 shell) strong H ₂ S, x'd fragments, crunchy	1255 3-1602 4-6'	4-4.5 1-162 4.5-5 1-162		(organic) SILT
							w/ scattered sheen/florets, mod. H ₂ S odor, trace TPH-like odor, uniform, no layers mod. plasticity, blocky texture	5.0	5-5.5 1-162		
							At 5.6" = 2" layer of mod. sheen/florets in parting seam	6.0	5.5-6 1-162		

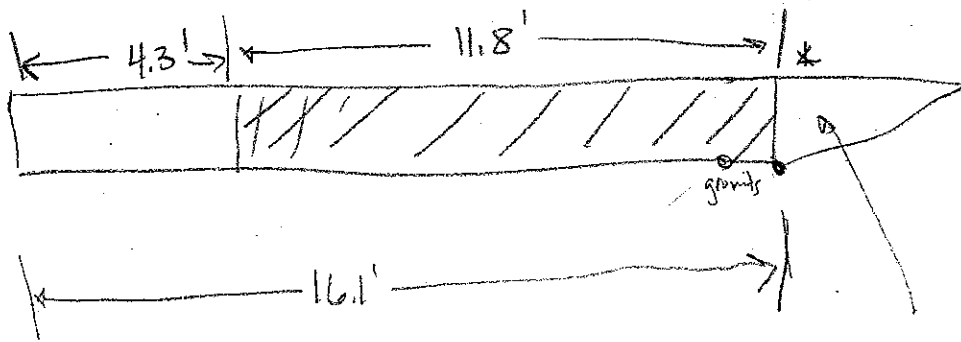
At 1.2'
TV=2.5
big

At 3.5'
TV=2.5
big

At 5.3'
TV=1.75
big

LDW-SC-~~33~~ 201 (Field rep of 33)

on deck = 4.5'



Water powered out
non-turbid
settled overnight

Fill down to
catcher; shoe empty

*in shoe = funky shiny
orange/silver film
has settled over residual
sediment; possibly migrated
down core along sidewalls
(anthropogenic-looking)



Sediment Core Processing Log

Job: LDWG SC core
 Job Number: DORS5-18220
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: LDWG-SC-201 R2R1
 Date/ Time: 2/11/06
 Sample Logged by: N. Bucher, A. Fitzpatrick
 Type/Diameter of Sample: 4" Sq. aluminum
 Sample Quality: good fair poor disturbed

Notes: _____

See page 1

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
							ML/OL: same unit as above but no scattered sheen/ floccs below 6.0', trace odor	1300 2-1602 6-8'			(ORG) SILT
			tr	98		(D.D)		7.0			
8.0		CLAY 3/564 v.d. greenish gray	unit: 10	90	beds: 85	25	grad. do horizontal bands (native-looking) ML: moist, med stiff, med dark gray, sl. clayey SILT w/ trace ^{small} shell frags, trace rootlets and interbeds of v.f silty SAND - # med grayish brown, 2" thick → transition zone w/ unit below	8.0	1305 2-1602 8-10'		SILT w/ silty sand interbeds
9.0						(D.D)		9.0			At 9.0' TV=5.5 big
10.0						(D.D)	At 10.5' 1/2" layer of ^{small} fibrous roots	10.0			
		254 10YR 4/2 dark grayish brown	unit: 60	40	85	25	SAND: moist, med dense, med grayish brown silty F-SAND w/ dark silt interbeds 1/4" - At 11.5 1" layer of light brown wood frag wet w/ rootlets, scattered wood frags, NO shell frags well-sorted	10.8 11.0 10-11.8	1308 2-1602 10-11.8		SILTY SAND
			10	40		(D.D)		11.8			At 10.6' TV=5 big
							shoe = pink/orange resin-like residue	12.0			

1 baggie: brick frag @ 0.5'

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-10-06 Recorder: GJM



Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 32013 Reg 1

Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 24

Time: 1753

Northing 202052

Est. Tide Height (ft) 8

(MLLW)

Easting 1269266

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 7.5

Comments: falling tide - diver depth 23 ft - moderate slope - grainy

silt bottom - visibility 1 ft
26 ft offshore of station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.0</u>	<u>15.3</u>	
<u>13.1</u>	<u>13.2</u>	
<u>10.6</u>	<u>10.5</u>	
<u>8.0</u>	<u>8.0</u>	
<u>6.0</u>	<u>6.4</u>	
<u>4.0</u>	<u>4.6</u>	
<u>2.4</u>	<u>3.3</u>	
		<u>silty clay plug in end</u>

Mudmole™ Bore Log

CORRECTED

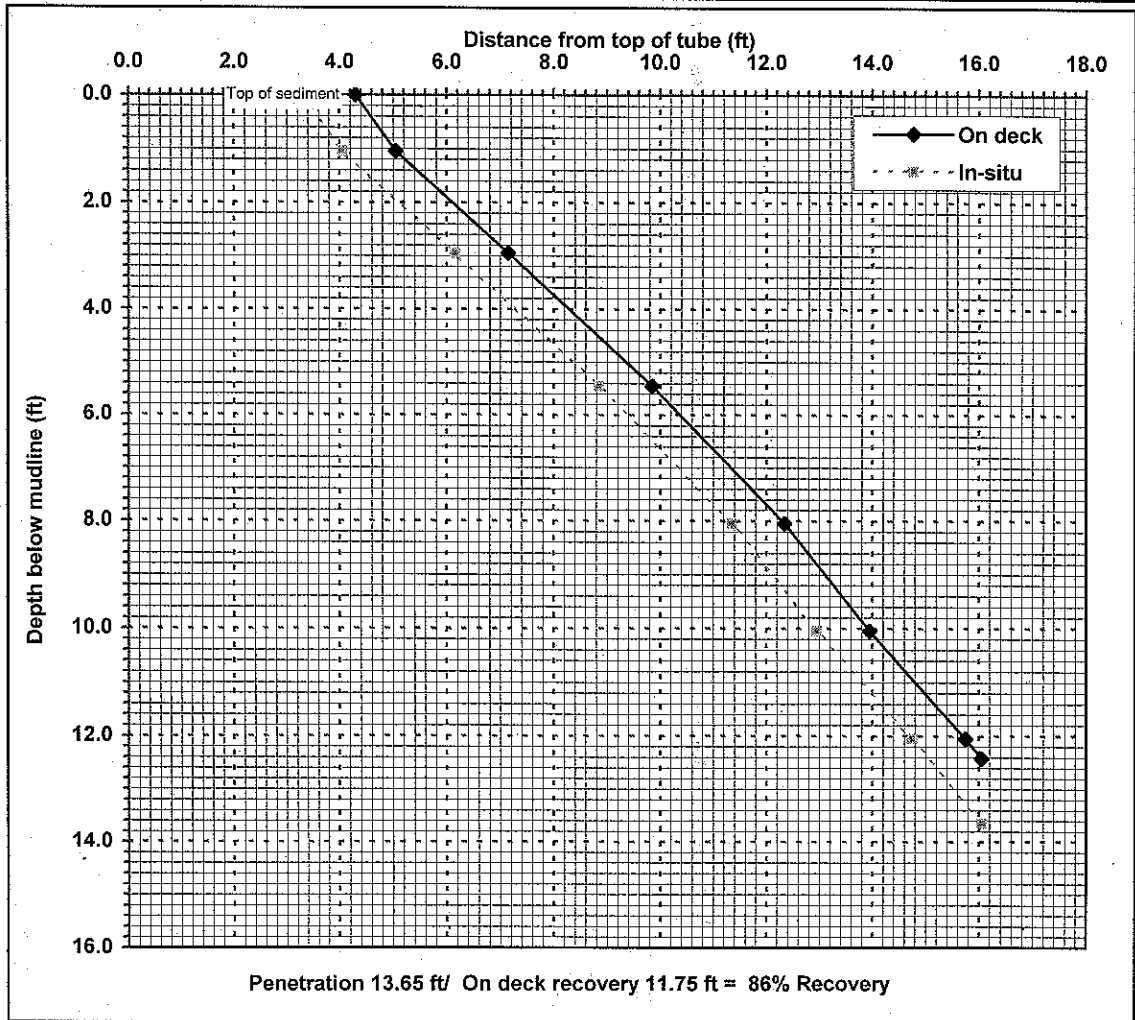
Project: LDWG Duwamish Coring **Station:** 201 R1
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 202052 Northing
Date: 2/10/2006 **Time:** 14:53 1269266 Easting
Water depth: 24.0 ft **Mudline:** -16.0 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Sunny
 Mudline corrected to 4.3 ft from top of tube in field lab

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-1.05	0.75	71%
1.05-2.95	2.1	111%
2.95-5.45	2.7	108%
5.45-8.05	2.5	96%
8.05-10.05	1.6	80%
10.05-12.05	1.8	90%
12.05-13.65	1.3	81%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	4.3
1	5.01
2	6.10
3	7.20
4	8.28
5	9.36
6	10.38
7	11.34
8	12.30
9	13.11
10	13.91
11	14.81
12	15.71
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-1.05	0.75	71%
1.05-2.95	2.1	111%
2.95-5.45	2.7	108%
5.45-8.05	2.5	96%
8.05-10.05	1.6	80%
10.05-12.05	1.8	90%
12.05-13.65	1.3	81%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	4.3
1	5.01
2	6.10
3	7.20
4	8.28
5	9.36
6	10.38
7	11.34
8	12.30
9	13.11
10	13.91
11	14.81
12	15.71
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

201 (Field Rep. of 33)

Station Number: ~~33 (201) Field Rep. of 33~~
Attempt: 1
Field Technician: TD/LM
Contractor: MCS/RSS
On-site Visitor: _____

Date: 2/10/06
Core Tube Length: 16.05
Lead Line Water Depth: 24
Latitude: 202052
Longitude: 1269266

2 ft. from 33 R2, still ~26 ft. off target.

Drive and Diver Observations

Shoreline & surrounding area: same as 33 R1
Sediment surface & slope: silt bottom, sand, moderate slope
Water current and visibility: mild current, 1 ft. vis., falling tide
Diver Water Depth 23 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations

Drive Initiation Time: 1456 Drive Completion Time: 1500 Drive Offset: _____
Estimated angle of drive: unable to see, eqpt. under water Est ~10° off

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.0	15.3	diver measured, free fall
13.1	13.2	moderate, mud/mole bouncing a lot.
10.6	10.5	moderate, mud/mole bouncing a lot.
8.0	8.0	moderate - easy drive, punch through something?
6.0	6.4	moderate, penetration slowing
4.0	4.6	easy drive
2.4	3.3	easy drive
TOTAL 13.65	TOTAL 12.75	Percent Recovered: 93.4

Reason for ending drive: reached goal
If refusal, reason for refusal: _____

Extraction Observations

Tension on line? yes Stability of vessel: port bow slightly listing
Overlying water in core (quantity and description): yes, clear, ~ 1/2
On Boat Recovery: 4.5 Loss of Sediment: ~1.2 ft. - New recovery = 11.55 ft (84.6%)
Extraction Observations: no hammer used.

On Deck Observations

Staining: light silt
Tube Deformation: none
Sediment Description (odor or sheen?): not seen, end of core wrapped under water.

Keep or Retry: diver wrapping end of core in plastic at sed/tub interface.
silt clay plug in core tip.

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Notes:
Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log



Job: Dunamish LDW
 Job Number: Porss - 18220
 No. of Sections: 1
 Sample Length (from log): drive = 12.2'
 Avg. % Compaction: on-site = 9.3'
 Notes: % Rec = 76%

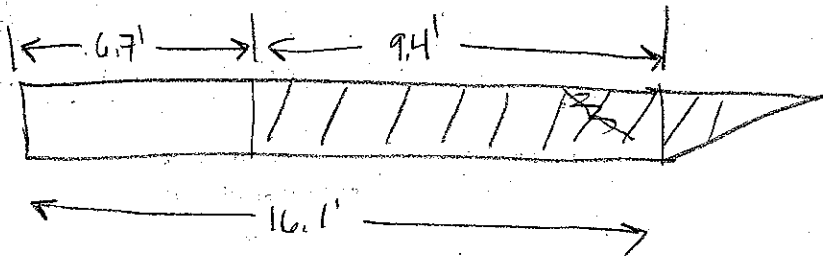
Core Location/Sample Number: LDW - SC - 34 (22) Field Dep is 203
 Date/ Time: Feb 16 2006 start 1000 stop 1130
 Sample Logged by: A. Fitzpatrick Chip Brackett
 Type/Diameter of Sample: 4" ~~Ø~~ abm MCS
 Sample Quality: good fair poor disturbed

Notes: Sediment is frozen → no forvanes down; no geotech
core collected 2/17/06

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Initial Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5 y 3/3 dark olive brown	10	5	85	0.0	SILT: wet, med stiff, olive-brown, gravelly, sl. sandy SILT w/ sub. wood frags + twigs, no H ₂ S	0-4 0-11	1040 3-1602		SILT
		2.5 y 2.5/1 black	10	15	85	0.0	- At 0.5' water transitional SILT: med stiff, dark brown, moist, SILT w/ sub. organic matter - twigs, leaves, shredded wood frags, pine needles, shredded wood - all small, slight throughout, fibers no H ₂ S, uniform, no layers, sl. compressible to slight mat - low plastic	1.0 2.0	No Geo Techs = 1045 3-1602 1-2'		SILT w/ orgs
			10	90			- At 1.3' plastic zip-tie slightly gummy	3.0	1050 3-1602 2-4'		
							↙ sand present below 3.2 w/ shell + wood frags.	3.0 3.2			
			SILT: 10	90		0.0	transitional SILT (transition unit): 8" interbedded layers of dark brown SILT w/ org. matter and	4.0			SILT + SAND
			Sand 90	10			- At 3.4' pc of glass shard dark gray F-SAND w/ small moderate shell frags	6.0	1055 3-1602 4-0'		
		2.5 y 3/2 v. dark grayish brown				0	↓ SAND interbeds start at 5'; sand gets coarser w/ depth; Below 3.2' SILT is not compressible nor elastic B	6.0 6.2			

LDW-SC-34 (R2)

Feb 18, 2006



Outside to sediment = 6.8'

↑
Shoe is full
packed.



Sediment Core Processing Log

Job: DUNAMISH
 Job Number: PDS 5-1822D
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: LDW-SC-34 (R2)
 Date/ Time: Feb 18, 2006
 Sample Logged by: A
 Type/Diameter of Sample: See page 1
 Sample Quality: good fair poor disturbed

Notes: See page 1

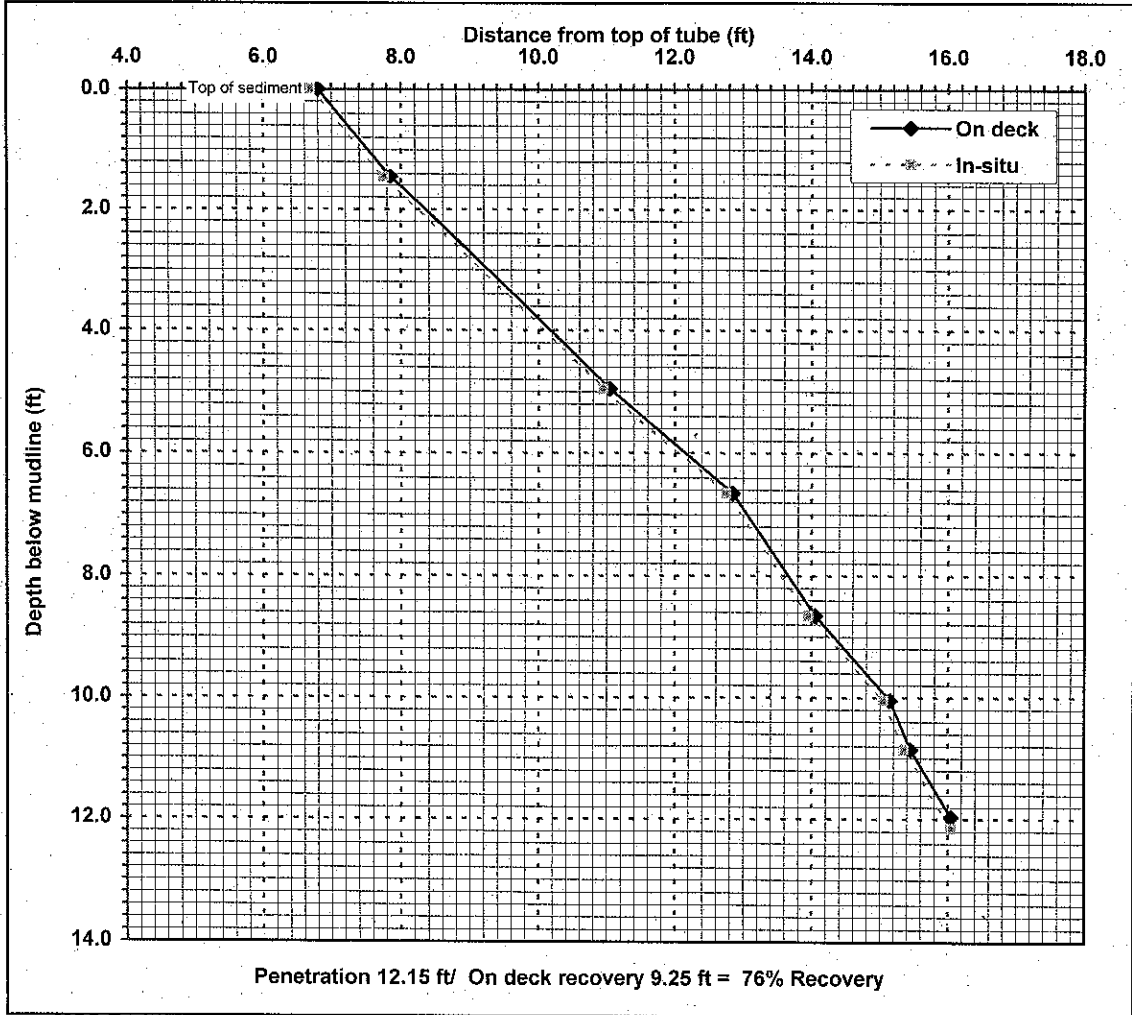
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		Silt interbeds = black		98	tr.	D.O	S grades to M-SAND w/ silt interbeds below 6.4' transition	6.4'	1100 6-8' 2-162		
7.0		CLAY 311 v. dark greenish gray		98	tr		SAND: damp, dense, dark gray, sl. silty, sl. gravelly (below 8 FE) M SAND w/ some dk brown silt interbeds (1") to 2" long sand is multi-colored red, white, gray grains w/ 1/2" & hard gray CLAY clasts At 7.9' small 1/2" orange brick fragment (pebbled-looking surface, slightly jumbled)	6.9 7.0	1105 8-9H 2-162		SAND
8.0						D.O	GRAVEL: damp, dense, dark gray, sandy GRAVEL (up to 2" & angular) w/ lt gray, hard, 2" & silt clasts, no layering, hard to sample.	8.0			
9.0			60	30	10	D.O		9.0			GRAVEL
								9.41			
10.0							Bottom of 9.4' Full size, sand/gravel. Suspect it is not native (x gravel, no layering not alluvium - debris) looking	10.0			
							Two baggies: At 3.4' - glass shard At 7.9' - sm. brick frag 8.7' - amber glass shard	11.0			
								12.0			

Mudmole™ Bore Log

Project: LDWG Duwamish Coring	Station: 34 R2	
Project No: 341185.001	Position: NAD83	WAN
Collected by: GSM	202014	Northing
Date: 2/17/2006	Time: 9:36	Easting
Water depth: 23.7 ft	Mudline: -14.6 ft MLLW (estimated using tide tables)	

Place Field ID Label Here

Weather/Comments: N/A



Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-1.45	1.05	72%
1.45-4.95	3.2	91%
4.95-6.65	1.8	106%
6.65-8.65	1.2	60%
8.65-10.05	1.1	79%
10.05-10.85	0.3	37%
10.85-12.15	0.7	54%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	6.8
1	7.52
2	8.35
3	9.27
4	10.18
5	11.10
6	12.16
7	13.06
8	13.66
9	14.33
10	15.11
11	15.53
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-17-06 Recorder: GSW

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 34 R2

Tube Length (ft): 16.05

Water Depth (ft): 23.7

Est. Tide Height (ft): 9.1

Est. Mudline: _____ (MLLW)

Time: 0936

(MLLW) Feb Tide Table

(MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 202014

Easting 1268831

On Deck Top of Sediment 6.8

Comments: falling tide - Diver depth 42 visibility 5

silty sand 10% cobble cover - 10% slope

228 A off station

Penetration Tape Reading

Recovery Tape Reading

Comments

14.6

15.0

11.1

11.8

9.4

10.0

7.4

8.8

6.0

7.7

5.2

7.4

3.9

6.7

goal reached

Station Number: 34
 Attempt: 2
 Field Technician: TD
 Contractor: MCS/RS5
 On-site Visitor:

Date: 02/12/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 23.7
 Latitude: 202014
 Longitude: 1268831

Station Arrival Time: 0830
 Station Departure Time: 1050
 Dist. From Target Station: 20^{TD0} 28 ft.

moved offshore to avoid debris and gravel

Pre-Drive and Diver Observations:

Shoreline & surrounding area: same as pt 1
 Sediment surface & slope: silty sand 10% cobble, 10% slope
 Water current and visibility: ebbing tide, vis 5 ft.
 Diver Water Depth 22 Tip Probe Depth Disk Probe Depth

Drive Observations:

Drive Initiation Time: 0953 Drive Completion Time: 0957 Drive Offset:
 Estimated angle of drive: est under water, est 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
14.6	15.0	diver recorded. free fall
11.1	11.8	easy drive
9.4	10.	easy drive
7.4	8.8	easy drive
6.0	7.7	easy drive
5.2	7.4	easy drive
3.9	6.7	easy drive, penetration goal reached, no core tube length
TOTAL 12.15	TOTAL 9.35	Percent Recovered: <u>77.0%</u> (<u>76.1% on deck</u>)

Reason for ending drive: penetration goal reached.
 If refusal, reason for refusal: no core tube length left.

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): yes, clear, ~ 1.5L
 On Boat Recovery: 6.8 Loss of Sediment: 50.1% 0.1 ft.
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: at silt, trace, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): silty sand (dark), no odor, no sheen

Keep or Retry: diver inserted screw plug at sed / HD into face

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Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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MCS Environmental MudMole Bore Log

Collection Information

Date: 2-17-08 Recorder: BSM

Project: 341185.001 Windward Lower Duwamish Coring

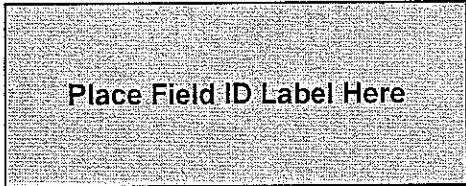
Station Name: 34 R1

Tube Length (ft): 16.1

Water Depth (ft): 22.7

Est. Tide Height (ft): 10.4

Est. Mudline: _____ (MLLW)



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 201 999

Easting 1268808

On Deck Top of Sediment 12.8

Comments: falling tide - diver depth 22 - visibility 5

fine silt - no slope -

a 2A off station

Penetration Tape Reading

Recovery Tape Reading

Comments

15.6

15.5

~~14.5~~ 13.8

14.5

13.4

14.1

~~13.1~~ ~~12.6~~ 12.9

13.2

12.3

12.1

tool bouncing - hit something

end of core tube crushed

NOT PROCESSED

Mudmole™ Bore Log

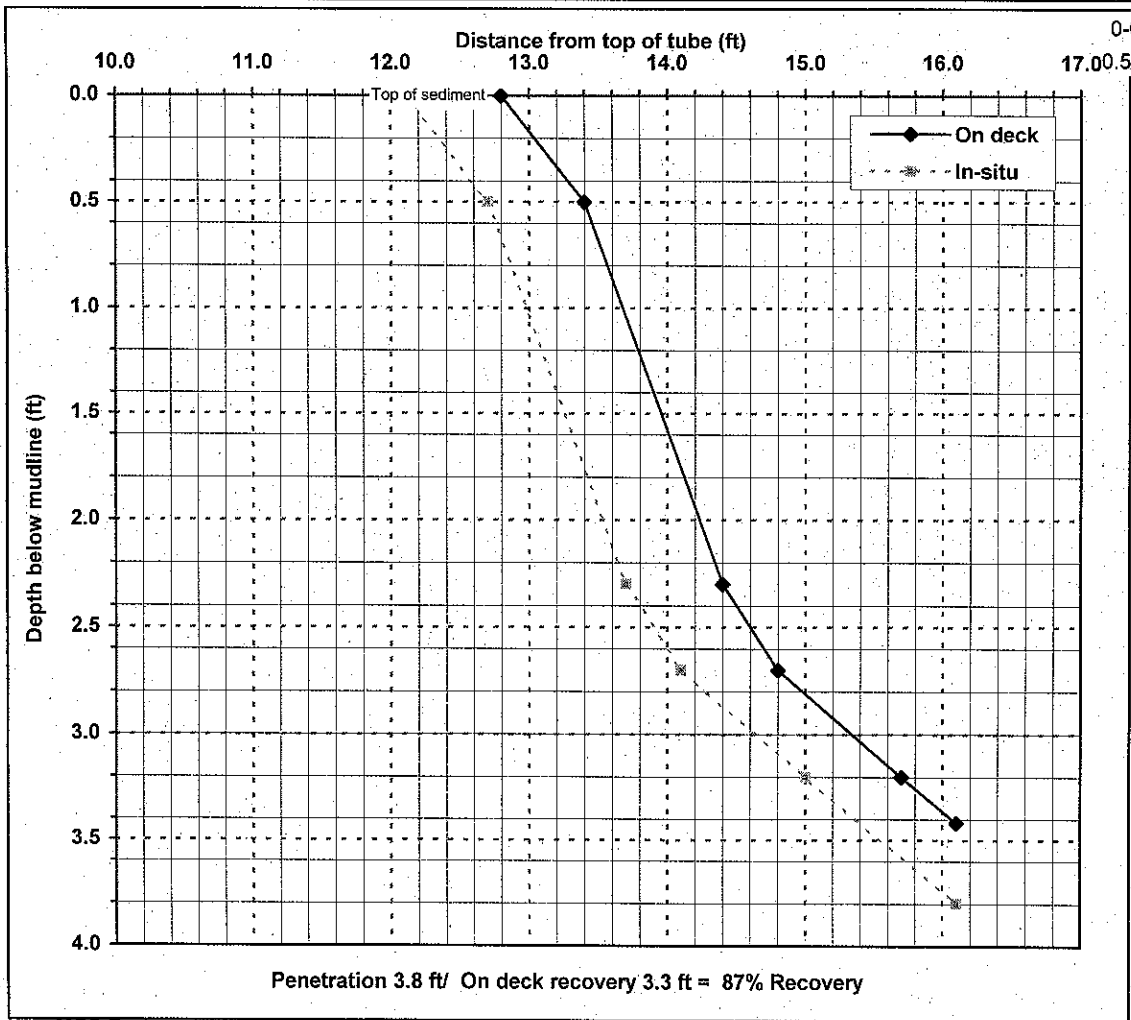
Project: LDWG Duwamish Coring **Station:** 34 R1
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 201999 Northing
Date: 2/17/2006 **Time:** 8:41 11268808 Easting
Water depth: 22.7 ft **Mudline:** -12.3 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A
 Driven to refusal, hit debris

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------



0-0.5	0.6	120%
0.5-1.0	1	56%
1.0-1.5	0.4	100%
1.5-2.0	0.9	180%
2.0-2.5	1.1	183%

Mudline	12.8
1	13.68
2	14.23
3	15.34
4	No sample
5	No sample
6	No sample
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 34 Date: 02/17/06 Station Arrival Time: 0830
 Attempt: 1 Core Tube Length: 16.1 Station Departure Time: 1050
 Field Technician: TD Lead Line Water Depth: 22.7 Dist. From Target Station: <2
 Contractor: MCS/RSS Latitude: 201999
 On-site Visitor: — Longitude: 1268808

Pre-Drive and Diver Observations:

Shoreline & surrounding area: wrap/concrete debris, wood planks/pier, steel dolphins.
 Sediment surface & slope: fine silt, no slope
 Water current and visibility: ebbing tide vis 5 ft.
 Diver Water Depth 18 Tip Probe Depth — Disk Probe Depth —

Drive Observations:

Drive Initiation Time: 0857 Drive Completion Time: 0902 Drive Offset: —
 Estimated angle of drive: eqpt under water, est. 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.6	15.5	diver recorded, free fall
13.8	14.5	moderate drive
13.4	14.1	difficult drive
70 13.129	13.2	difficult
12.3	12.1	hit wood? rock?, refusal, Maximize bouncing
TOTAL 3.0	TOTAL 4.0	Percent Recovered: <u>105%</u> <i>(56.8% after recalculated using on boat recovery)</i>

Reason for ending drive: refusal
 If refusal, reason for refusal: hit rock or wood

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): clear - 3L
 On Boat Recovery: 12.8 Loss of Sediment: 0.7 ft.
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: some silt, sprayed off.
 Tube Deformation: tube tip warped/crushed.
 Sediment Description (odor or sheen?): did not observe, core tip wrapped under water, diver observed silty sand.

Keep or Retry: diver wrapped tip of core under water. could not insert screw plug b/c tip was warped. diver suspects concrete. will retry after moving further offshore.

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log



Job: DUNAMISH LDW
 Job Number: POS5-18220
 No. of Sections: 1
 Sample Length (from log): drive = 12.1'
 Avg. % Compaction: On deck = 8.9'
 Notes: 90 Rec = 73%

Core Location/Sample Number: LDW-SC-203 (2) Field rep of (34 R2)
 Date/Time: Feb 18, 2006 start 1000 stop 1200
 Sample Logged by: A. Fitzpatrick, N. Barber
 Type/Diameter of Sample: 4" glum MCS
 Sample Quality: good fair poor disturbed

Frozen sediment -> Towards skewed high.

Core collected 2/17/06 No oversight today.

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
1.0		2.5y 2.5/1 black		10 (15% wood)	90		dusting of olive brwn soupy SILT acc. SILT: wet, med stiff, black grading to dark brwn, organic? SILT w/ moderate small wood + plant frags, uniform, no layers, sl. compressible texture strong H ₂ S below 2 FT, scattered small shell fragments, pc. plastic ~ 0.5 FT. non-plastic - Blw 1-2' 2 pcs plastic	1115 0-1' 3-16oz			Very soft SILT
2.0				10	90		- At 2.1' intact 1/2 mussel shell (two halves)	1120 1-2' 3-16oz GT 1.1'			ORC? SILT
3.0							↓ No H ₂ S below 3 FT				
4.0							↓ sand layers start below 4.0' interbedded				
5.0		black + v.d. greenish gray interbeds.	SAND: 45 unit	5	90		<u>transitional</u> SAND: (interbedded w/ SILT): d. brwnish gray, moist, dense F-SAND w/ scattered grayed (below 5 FT) ~ interbedded w/ 6" thick dark brwn SILT w/ mod. to subst. scattered sm. shell frags, shredded wood 2" L, rootlets, twigs, leaves, slightly jumbled-looking layers, well sorted. SAND has multi-colored red, white, gray grains. trace small grave/	1130 4-6' 9-16oz			SAND + SILT

- At 0.7' TV = 0.4 med

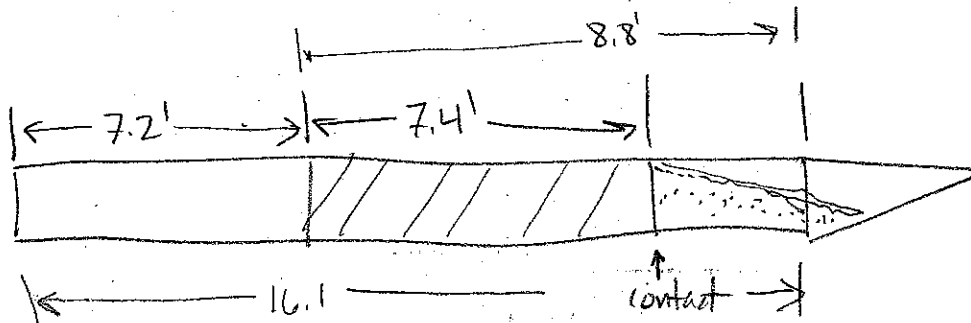
- At 1.7' TV = 2 med wheel

- At 2.7' TV = 1.5 med

- At 4.0 TV = 1.9 med

LDW-SC-203 (121)

2/18/06



Under to sediment = 7.2'

↑
30% winnowed
in sand

sharp contact (pulled
away from) silt + sand
blw 7.4 to 8.8'

but OK to sample
appears relatively intact
(no sliding
downward)

Sediment Core Processing Log



Job: Duwamish LDW
 Job Number: Por 55-18820
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____
 Notes: see page 1

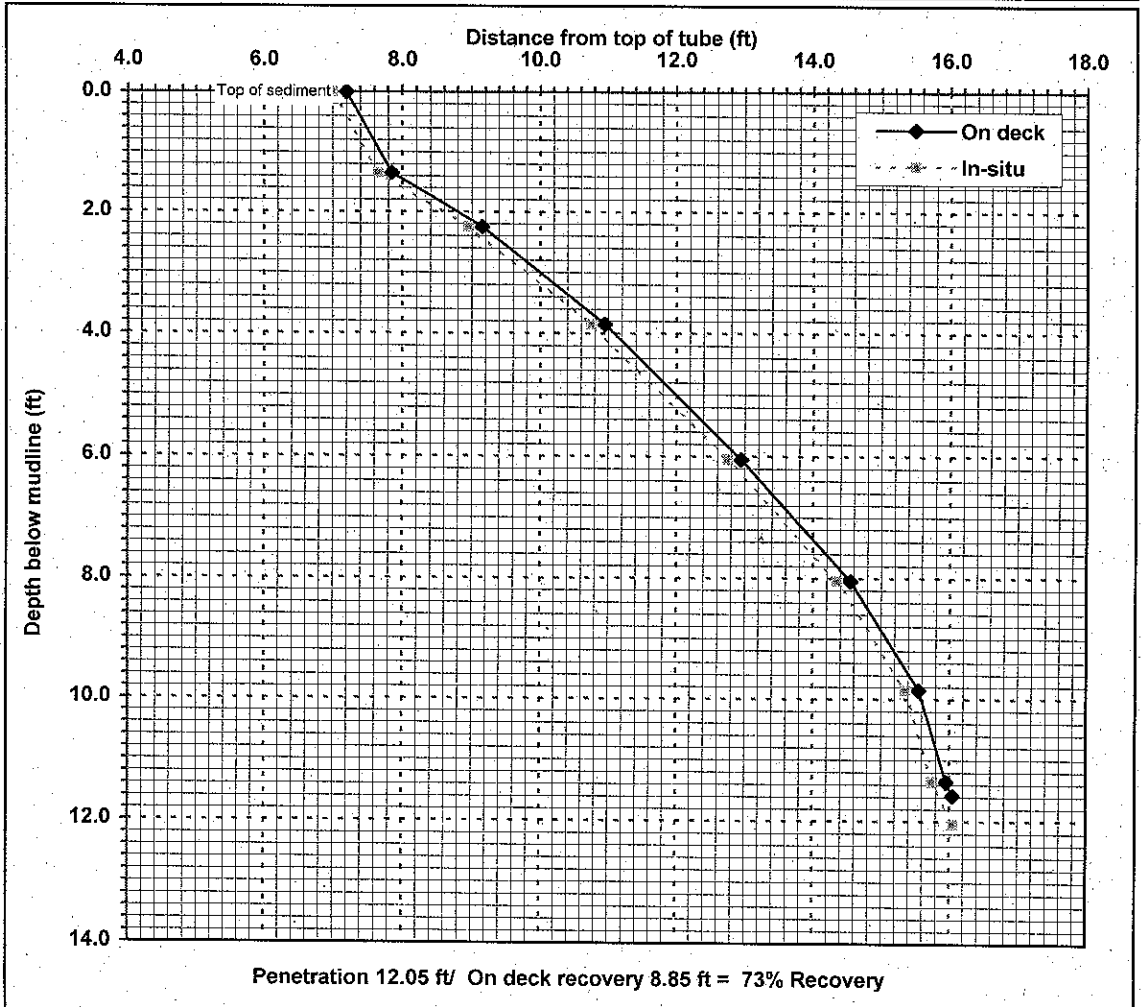
Core Location/Sample Number: LDW-SC-203 (21) Field rep of 3422
 Date/ Time: Feb 18, 2006
 Sample Logged by: A. Fitzpatrick
 Type/Diameter of Sample: _____
 Sample Quality: good fair poor disturbed

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
				98	tr		grading C-M SAND w/ depth in interbeds N/SIT				
				10	10		- At 6.6' sm brick frag.		1135 2-16-02 6-8'		SAND + SILT
7.0								7.0			
7.4							M-SAND tr sharp	7.4			
		6EEY1 311 v.d. greenish gray	30	70	10		SAND: damp, dark gray, sl. gravelly grading to gravelly M-SAND, dense, no layers sand is angular up to 2", w/ small H gray, hard, rounded 1/2" & clay clasts	8.0			SAND
8.0								8.0	1140 8-88 2-16-02		
								8.8			
							Bottom of Core = 8.8'	7.0			
							winnowed 30% below 7.4' = not sampled				
								10.0			
								11.0			
								12.0			

Mudmole™ Bore Log

Project: LDWG Duwamish Coring	Station: 203 R1	Place Field ID Label Here
Project No: 341185.001	Position: NAD83	
Collected by: GSM	202013	
Date: 2/17/2006	Time: 10:23	
Water depth: 24.4 ft	Mudline: -16.6 ft MLLW (estimated using tide tables)	

Weather/Comments: N/A



Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
0-1.35	0.65	48%	Mudline	7.2
1.35-2.25	1.3	144%	1	7.68
2.25-3.85	1.8	113%	2	8.79
3.85-6.05	2	91%	3	9.99
6.05-8.05	1.6	80%	4	11.09
8.05-9.85	1	56%	5	12.00
9.85-11.35	0.4	27%	6	12.90
11.35-12.05	0.3	43%	7	13.71
			8	14.51
			9	15.08
			10	15.59
			11	15.86
			12	No sample
			13	No sample
			14	No sample
			15	No sample
			16	No sample
			17	No sample
			18	No sample
			19	No sample
			20	No sample

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-17-06 Recorder: GSV



Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 203 R1

Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 24.4

Time: 1023

Northing 202013

Est. Tide Height (ft) 7.8

(MLLW) Feb tide tables

Easting 1268832

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 7.2

Comments: 24ft depth - gentle slope - sandy silt - 2ft visibility

2.28ft off station

Penetration Tape Reading

Recovery Tape Reading

Comments

<u>14.7</u>	<u>15.4</u>	
<u>13.8</u>	<u>14.1</u>	
<u>12.2</u>	<u>12.3</u>	
<u>10.0</u>	<u>10.3</u>	
<u>8.0</u>	<u>8.7</u>	
<u>6.2</u>	<u>7.7</u>	<u>penetration slowed</u>
<u>4.7</u>	<u>7.3</u>	
<u>4.0</u>	<u>7.0</u>	<u>goal reached</u>
<u>sand + crushed rock in tip of core</u>		

Station Number: 203 Date: 02/17/06 Station Arrival Time: 0830
 Attempt: 1 Core Tube Length: 16.05 Station Departure Time: 1050
 Field Technician: TD Lead Line Water Depth: 2AA Dist. From Target Station: 188
 Contractor: MCS/RSS Latitude: _____
 On-site Visitor: _____ Longitude: _____

Field replicate
 of LDW-5234 (R2)
 (w/ft off)
 ↑
 diver observed

Pre-Drive and Diver Observations:

Shoreline & surrounding area: same as station 34 (R2)
 Sediment surface & slope: gentle slope, sandy silt, organic debris
 Water current and visibility: no current, 2 ft. vis.
 Diver Water Depth 28 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1032 Drive Completion Time: 1037 Drive Offset: _____
 Estimated angle of drive: eqpt under water, est 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
14.7	15.4	diver recorded, free fall
13.8	14.1	easy drive
12.2	12.3	easy drive
10.0	10.3	easy drive
8.0	8.7	easy drive
6.2	7.7	moderate drive, penetration slowed
4.7	7.3	difficult drive
4.0	7.0	difficult drive, penetration goal reached.
TOTAL 12.05	TOTAL 9.05	Percent Recovered: <u>75.1%</u> (<u>73.4% on deck</u>)

Reason for ending drive: penetration goal reached
 If refusal, reason for refusal: _____

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): clear, slightly turbid ~ 2L
 On Boat Recovery: 7.2 Loss of Sediment: 0.2
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: dark silty sand
 Tube Deformation: none
 Sediment Description (odor or sheen?): med-course sand and silt, no odor, no sheen

Keep or Retry: diver inserted screw plug at sed/ldr interface
diver observed sand and crushed rock in core tip.

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Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log



Job: LDWG Core Processing
 Job Number: PORS-18200-34
 No. of Sections: 1
 Sample Length (from log): 8.3
 Avg. % Compaction:

Core Location/Sample Number: LDWG-SC-35 (R2) + notes from R1
 Date/Time: 2/15/06 1150
 Sample Logged by: Mikel A Fitzpatrick, C. Brackett
 Type/Diameter of Sample: 4" Sq Aluminum
 Sample Quality: good fair poor disturbed

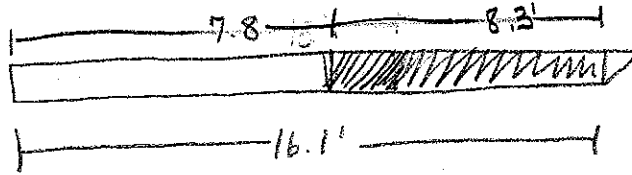
Notes: Pen = 10.2 2% Dec = 81%
DN Back Dec = 8.3 1% Dec = 81%

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
1		2.5/4 4/3 olive brown		10	90	8	0-10.7 sweet, loose, blk. olive-black, sl. sandy silt no odor			0-0.5 1245	
		2.5/4 2.5/1 Black		10	90	8	transitional 0.7-4.2 moist, blocky (organic) Black silt with silt pebbles and woody fragments max 0.2' L scattered throughout (organic silt) @ 1.2 0.1' worm (polychaete)	1220 0-2 GT 0.9	0.5-1 1248	SILT w/ SAND	
2							1.5-1.9 moist, black clayey silt pocket • low plasticity, blocky • appears like soft play do • uniform texture, sl. compressible • scattered wood fragments • has organic matter	2		1-1.5 1251	
							2.0-2.5 - 1.5' fine sand, med. dense,	2	1.5-2 1254		
3							3.0-4.2 Mild H ₂ S-like odor	3		2-2.5 1257	SILT Logt.
								3	2-2.4 1300 GT 2.9		
4							- plasticity, compressibility	4		2.5-3 1303	
								4	3.5-4 1306		
5		2.5/4 5/1 grey	bed =	2	98	8	4.2- Grey clayey silt clasts • layers of 0.05', 4.9 moist, med. dense, high stiffness	1230 4.4.9		4.4.5 1309	
		2.5/4 2.5/1 black	cont =	15	85	8	in a unit of moist, med. dense black sl. sandy silt light H ₂ S-like odor	5		4.5.5 1312	SILT w/ SAND
6		GLE 1 3/1 v. dk. greenish gray		98	2	8	5.1-8.3 fine sand, black multi-colored grains (red, white, orange) @ 5.4-5.9 0.5' piece of concrete/rock 5.5-7.0 subrounded to subangular gravel up to 0.15' L trace. no odor.	1235 4.9.6		5.5.5 1315	SAND
			5							5.5.6 1318	← concrete

baggie @ 5.3 - 0.3' L piece of concrete/rock

SC 35 R2

LM
~~AF~~
CB



13.4
~~8.0 R10~~

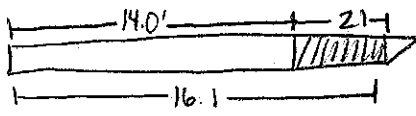
Sediment Core Processing Log



Job: LDWG Core Processing
 Job Number: PORS-18220-5110
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: _____
 Date/ Time: _____
 Sample Logged by: _____
 Type/Diameter of Sample: _____
 Sample Quality: good fair poor disturbed

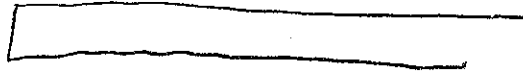
Notes: _____

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		SAA		SAA			SAA		6-8 1240		
7							16.75 convex ^{0.05'} thick layer of olive grey med. coarse silt	7			SAND
8							SAA	8			
9							End of Core 8.3' Core catcher full				
4							NOTES: R1 Examined  <ul style="list-style-type: none"> Sed. is coming out of core shoe core shoe is deformed (rock?) core is intact core catcher is full 				
5							Sed. tagged: <ul style="list-style-type: none"> si. sandy silt - olive brown black silt (org) 				
10											

SC-35-R2

2/13/06

78



MCS Environmental MudMole Bore Log

Collection Information

Date: 2-14-06 Recorder: ESM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 35 R2

Tube Length (ft): 16.05

Water Depth (ft): 21.2

Est. Tide Height (ft): 6.7

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 201602

Easting 1269260

On Deck Top of Sediment 8.0

Comments: incoming tide - diver depth 20ft silty sand

gentle slope - no debris

29 ft off station

Penetration Tape Reading

Recovery Tape Reading

Comments

15.3

15.3

12.4

12.3

10.3

10.7

8.1

9.1

6.0 6.1

8.1

5.9

7.9

slowing
retusal

Mudmole™ Bore Log

Project: LDWG Duwamish Coring
Project No: 341185.001
Collected by: GSM
Date: 2/14/2006
Water depth: 21.2 ft

Station: 35 R2
Position: NAD83
 201602
 1269260

Time: 15:05
Mudline: -14.5 ft MLLW (estimated using tide tables)

WAN
 Northing
 Easting

Place Field ID Label Here

Weather/Comments: N/A

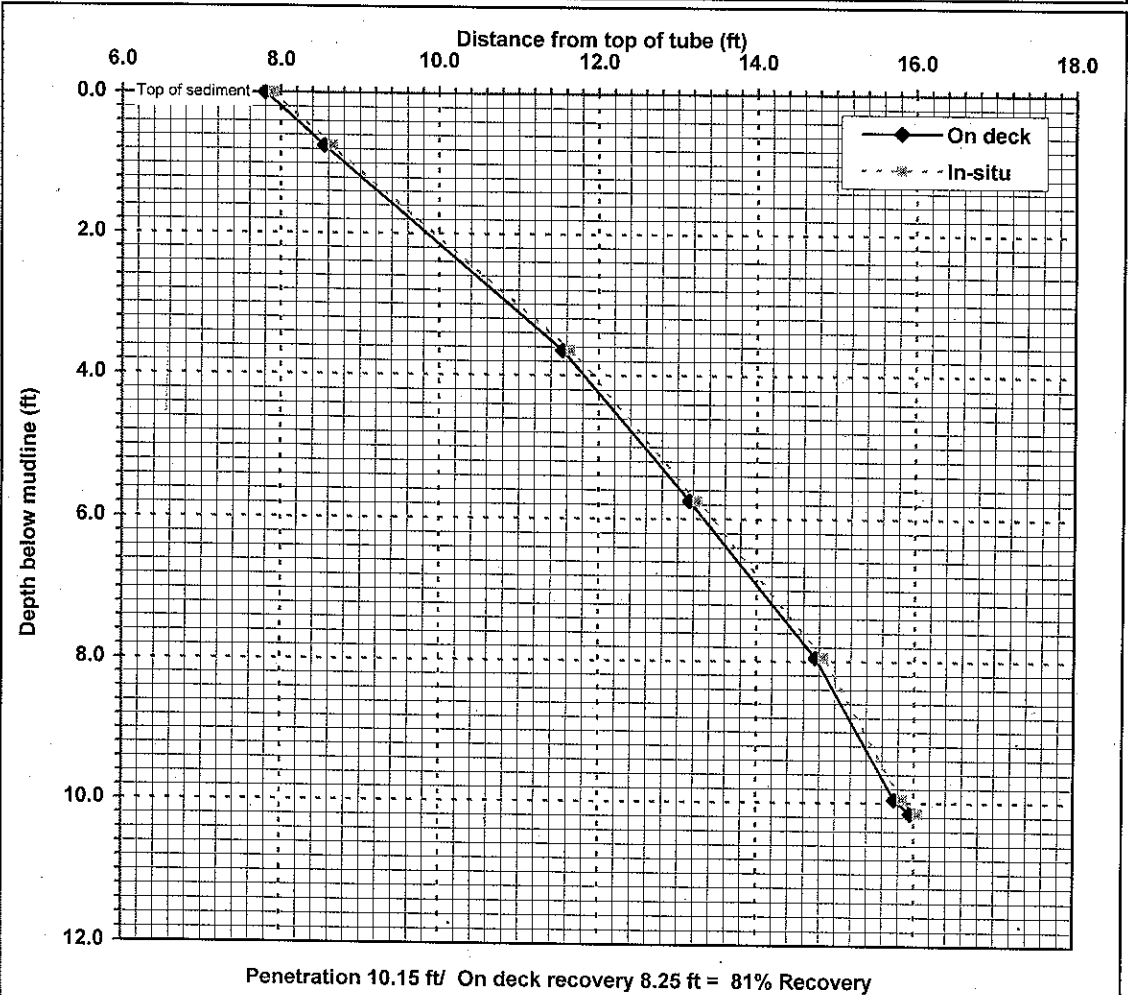
Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------

0-0.75	0.75	100%
0.75-3.65	3	103%
3.65-5.75	1.6	76%
5.75-7.95	1.6	73%
7.95-9.95	1	50%
9.95-10.15	0.2	100%

Mudline	7.8
1	8.81
2	9.84
3	10.88
4	11.82
5	12.58
6	13.33
7	14.06
8	14.78
9	15.28
10	15.80
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Station Number: 35

Date: 02/14/00

Station Arrival Time: 1414

Attempt: 2

Core Tube Length: 16.05

Station Departure Time: 1535

Field Technician: TD

Lead Line Water Depth: 21.2

Dist. From Target Station: 29

Contractor: WCS/RSB

Latitude: 201602

ward north of phone cable crossing

On-site Visitor: _____

Longitude: 1269260

Pre-Drive and Diver Observations:

Shoreline & surrounding area: same as R1

Sediment surface & slope: gentle slope, no debris, silt, sand

Water current and visibility: fluct (incoming) tide; ft. vis., strong wind from north

Diver Water Depth 20 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1511 Drive Completion Time: 15 Drive Offset: _____

Estimated angle of drive: unable to see, eq. pt. under water, est. 10° off.

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.3	15.3	diver measured; free fall
12.4	12.3	easy - moderate drive
10.3	10.7	moderate drive
8.1	9.1	moderate drive
^{TD} 6.0-1	8.1	moderate - difficult drive, recovery slowing
5.9	7.9	difficult drive, refusal
TOTAL 10.15	TOTAL 8.15	Percent Recovered: <u>80.3%</u>

Reason for ending drive: refusal

If refusal, reason for refusal: no penetration/recovery

Extraction Observations:

Tension on line? yes Stability of vessel: no problem

Overlying water in core (quantity and description): yes, slightly turbid, ~500ml

On Boat Recovery: 8.0 Loss of Sediment: 0.1 ft.

Extraction Notes: (i.e. winch or hammer, easy, hard) winch, moderately easy

On Deck Observations:

Staining: dk. silty sand, sprayed off

Tube Deformation: none

Sediment Description (odor or sheen?): gray med. sand, no odor, no sheen

Keep or Retry: diver inserted screw plug at sed/H₂O interface

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1011 SW Klickitat Way, Suite 207
Seattle, WA 98134-1162



Notes:
Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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MCS Environmental MudMole Bore Log

Collection Information

Date: 2-14-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 35 R1

Tube Length (ft): 15-85

Water Depth (ft): 16.8

Est. Tide Height (ft): 7.5

Est. Mudline: _____ (MLLW)

Time: 1429

(MLLW)

(MLLW)

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 201591

Easting 1269253

On Deck Top of Sediment 13.9

Comments: moved 21A along shore to avoid cable crossing area

incoming tide - diver depth 16 - gentle slope - silty sand - no debris

2A visibility

Penetration Tape Reading

Recovery Tape Reading

Comments

15.6

15.1

14.1

13.9

~~13.4~~ 13.0

13.4

12.8

13.2

refusal

tip of core crushed
- hit rocks
(beach is very rag)

Mudmole™ Bore Log

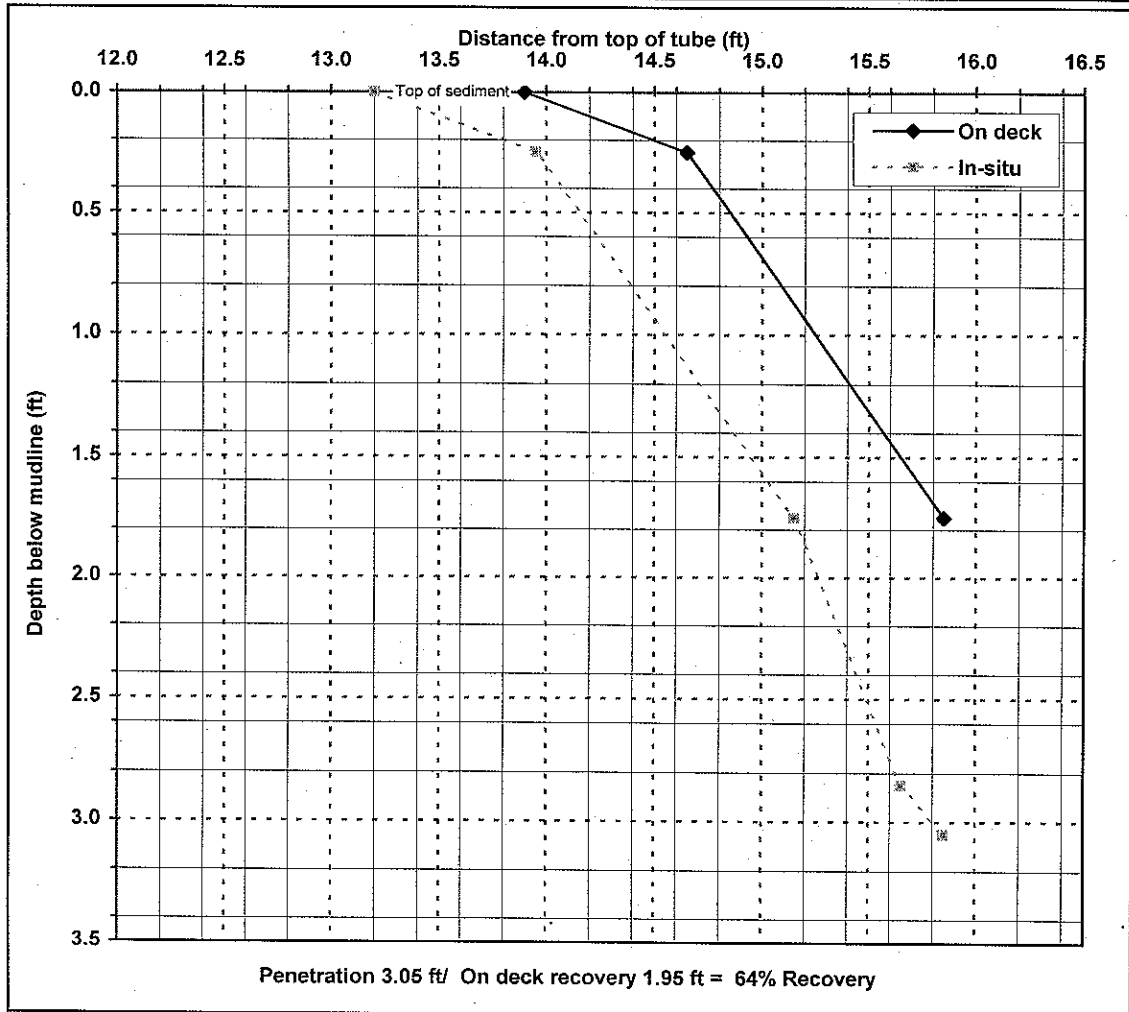
Project: LDWG Duwamish Coring **Station:** 35 R1
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 201591 Northing
Date: 2/14/2006 **Time:** 14:29 1269253 Easting
Water depth: 16.8 ft **Mudline:** -9.3 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A
 Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-0.25	0.75	300%
0.25-1.75	1.2	80%
1.75-2.85	0.5	45%
2.85-3.05	0.2	100%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	13.9
1	15.25
2	No sample
3	No sample
4	No sample
5	No sample
6	No sample
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Station Number: 35
Attempt: 1
Field Technician: TD
Contractor: M/S/RSS
On-site Visitor: _____

Date: 02/14/06
Core Tube Length: 15.85
Lead Line Water Depth: 14.8
Latitude: 201591
Longitude: 1269253

Station Arrival Time: 1414
Station Departure Time: 1535
Dist. From Target Station: 21
had to move off target to avoid phone cable crossing

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, wood debris, wood pilings and dolphins (fish offloading pier at sea freeze)
Sediment surface & slope: gentle slope, silty sand, no debris
Water current and visibility: 2 ft. vis, incoming tide
Diver Water Depth 16 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1435 Drive Completion Time: 1441 Drive Offset: _____
Estimated angle of drive: 10-15° off, est 15° off

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.6	15.1	diver measured; free fall
14.1	13.9	easy drive → moderate
13.0	13.4	moderate to difficult drive, mud hole slightly angled
12.8	13.2	difficult drive, refusal, hit something
TOTAL 3.05	TOTAL 2.65	Percent Recovered: <u>88.9%</u>

Reason for ending drive: refusal
If refusal, reason for refusal: hit something hard

Extraction Observations:

Tension on line? YES Stability of vessel: no problem
Overlying water in core (quantity and description): YES, clear, ~1L
On Boat Recovery: 13.9 Loss of Sediment: 0.7
Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: dark silty sand, sprayed off
Tube Deformation: tip of tube very deformed
Sediment Description (odor or sheen?): dark silty sand, no odor, no sheen

Keep or Retry: diver inserted screw plug at sed/H₂O interface
core hit something hard.

Notes:
Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log

Job: LDWG Processing
 Job Number: PORS-18220-511
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:

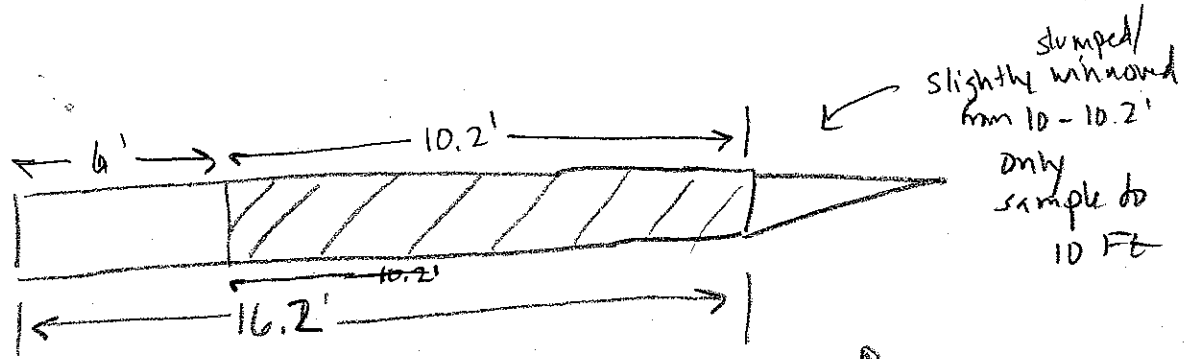
Core Location/Sample Number: SC-36 (R1) (field rep 202)
 Date/Time: 11/10/06 start 0900 end 1000
 Sample Logged by: Z. McKee, A. Fitzpatrick
 Type/Diameter of Sample: 4" sq aluminum MCS
 Sample Quality: good fair poor disturbed

Notes: Pen = 12.3 } 82% Rec
 On Deck Rec = 10.1 }

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Spill/Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5y 417 olive brn		10	90		in breath zone SILT; olive brown, wet, soft, sl. sandy SILT w/ 1 worm	0.0	0940 3-16r2		SILT
		2.5y 2.5/4 black		10	90		transition SILT MUD; black, wet, med stiff organic SILT w/ scattered rootlets, blocky texture, massive/ no layering, low plasticity, sl. compressible. Trace H ₂ S odor, shell	0.4	0.2		
				10	98	0	At 0.6 Ft: small wood frags, scattered shell frags, max 2" L	1.0	0945 3-16r2 1-2'		ORG SILT
							At 2.0 Ft = 1/2" M SAND layer	2.0	0950 3-16r2 2-4'		
							↓ less organics w/ depth	3.0	6TE 2.1'		
		bed 1 6.5y 2.5y greenish black unit 2.0y 417y d. greenish gray		10	90	0	transition sl. sandy SILT interbeds (transition): wet, unit is wet, med stiff, dark greenish gray sl. sandy SILT interbedded w/ greenish organic silt from above, banded 3" layers scattered rootlets, twigs. No H ₂ S odor below 3.2 Ft	3.2	4.0		SILT w/ org- SILT
				10	98			4.0	0955 3-16r2 4-6'		At 3.1' TV = 5.5 big
							At 4.9' = whole clam shell 3" x	5.0			
							transition	5.4			
					100		SILT: moist to wet, med stiff, dark greenish gray SILT w/ scattered rootlets no distinct layers	6.0			At 5.1' TV = 5. big F-2

LDW-SC-36

Feb 16, 2006



ended to sediment = 6.0'

↑
shoe 50%
empty
C-M-SAWD
to winnowed.

Sediment Core Processing Log



Job: LDW6 Processing
 Job Number: PDRS-18000-511
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:

Core Location/Sample Number: SC-36-21 (field rep 202)
 Date/ Time: 02/16/05
 Sample Logged by: LMcke, A Fitzpatrick
 Type/Diameter of Sample:
 Sample Quality: good fair poor disturbed

Notes: CONTINUED

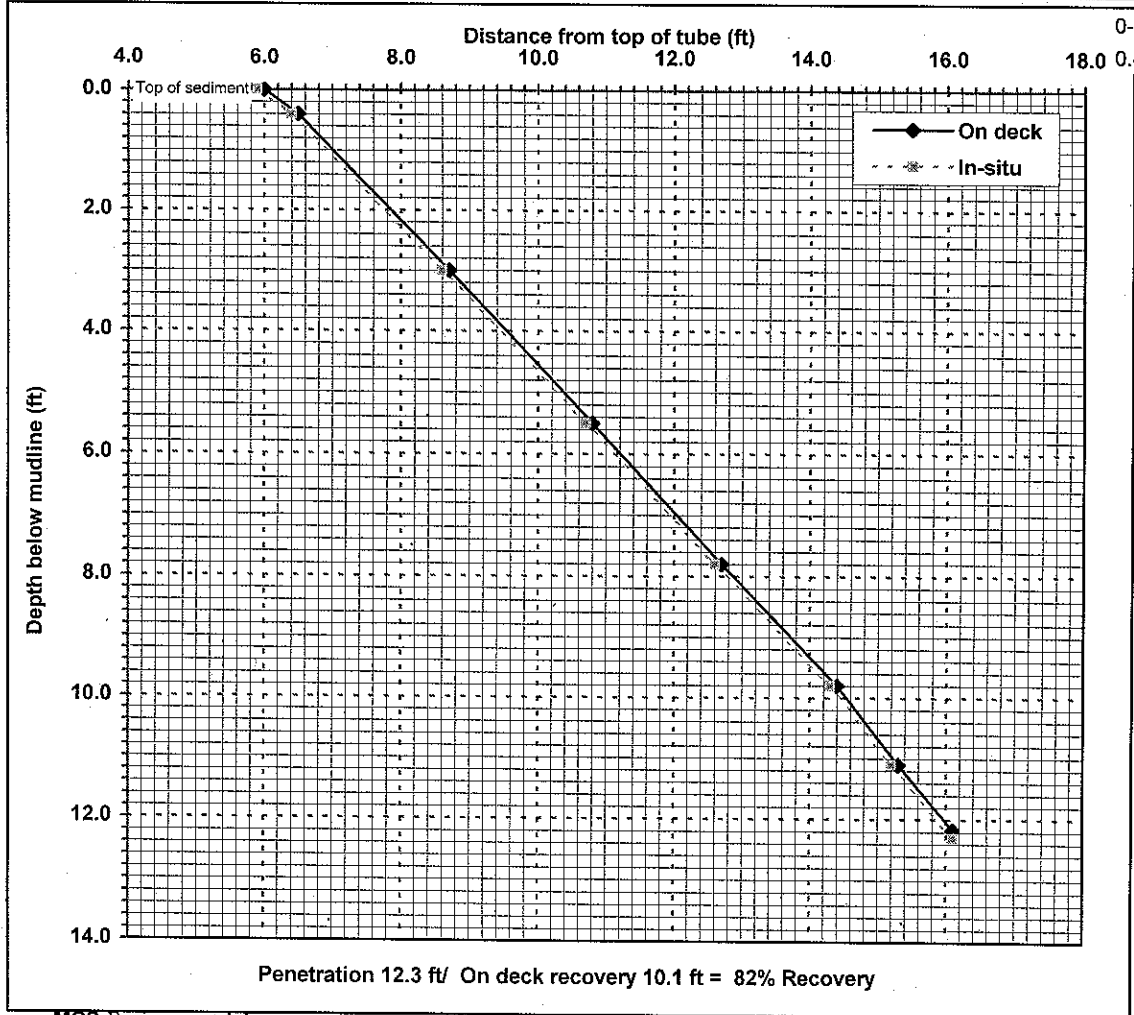
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Just Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch	
							Same as above, less water w/ depth.	1000	2-1602			
								70	6-8'		SILT	
						(R)	From 7.4 to 7.8 ft layer of sl. clayey black SILT shiny surface.	80			At 7.8 TV=4.5 big	
							Transition	8.4	1005			
		CLAY 1 311 v. cl. greenish gray	unit 90	10		(D)	SAND: moist to damp, dark greenish gray M SAND w/ uniform bands/layers of alternating v. fine silty SAND and SILT (native-looking) bands = 1" thick and slightly convex. No silt below 9.5'	9.0	2-1602		SAND	At 9' TV=4.5 big
		beds	80	20					8-10'			
			10	90			At 9.5 ft. large wood frag 3" x					
10.0							coarser M SAND w/ depth below 9.6' x	10.0				
							Bottom of core = 10.2	10.2				
							* SAND has multicolored grains = white, red, orange	11.0				

Mudmole™ Bore Log

Project: LDWG Duwamish Coring **Station:** 36 R1
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 201490 Northing
Date: 2/15/2006 **Time:** 11:31 1269988 Easting
Water depth: 17.4 ft **Mudline:** -14.5 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Sunny
 Driven to refusal



Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-0.400000000000000	0.5	125%
0.4000000000000002-	2.2	85%
3-5.5	2.1	84%
5.5-7.8	1.9	83%
7.8-9.8	1.7	85%
9.8-11.1	0.9	69%
11.1-12.3	0.9	75%

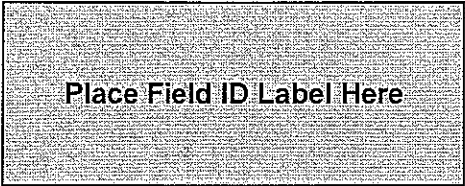
Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	6
1	7.01
2	7.85
3	8.70
4	9.54
5	10.38
6	11.21
7	12.04
8	12.87
9	13.72
10	14.54
11	15.23
12	15.97
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-15-06 Recorder: CSM

Project: 341185.001 Windward Lower Duwamish Coring



Station Name: 36 R1

Position Information

Tube Length (ft): 16.1

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 17.4

Time: 1131

Northing 201490

Est. Tide Height (ft) 2.9

(MLLW)

Easting 1269988

Est. Mudline: _____

(MLLW)

On Deck Top of Sediment 6.0

Comments: slack low tide - diver depth 17-A ~~at~~ ~~bottom~~

sandy silt - no debris - flat bottom - vis 2 ft

~ 3 ft from station

Penetration Tape Reading

Recovery Tape Reading

Comments

15.7

15.6

13.1

13.4

10.6

11.3

8.3

9.4

6.3

7.7

5.0

6.8

3.8

5.9

penetration slowed
refusal

Station Number: 36 Date: 02/15/06 Station Arrival Time: 1115
 Attempt: 1 Core Tube Length: 16.1 Station Departure Time: 1200
 Field Technician: TD Lead Line Water Depth: _____ Dist. From Target Station: 3
 Contractor: MCS/RSS Latitude: 201490
 On-site Visitor: _____ Longitude: 1269988

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, 1st Ave S. boat ramp.
 Sediment surface & slope: sand, silt, flat bottom, no debris
 Water current and visibility: ebbing tide slack tide vis 2 ft.
 Diver Water Depth 17 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1135 Drive Completion Time: 1144 Drive Offset: _____
 Estimated angle of drive: _____

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.7	15.6	diver recorded, free fall
13.1	13.4	easy drive
10.6	11.3	easy-moderate drive
8.3	9.4	moderate drive
6.3	7.7	moderate drive
5.0	6.8	moderate-difficult drive, penetration slowed
3.8	5.9	difficult drive, refusal
TOTAL 12.3	TOTAL 10.2	Percent Recovered: <u>82.9%</u>

Reason for ending drive: penetration goal reached
 If refusal, reason for refusal: _____

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): yes, clear
 On Boat Recovery: 6.0 Loss of Sediment: 0.1 ft.
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: slightly silty, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): gray med. sand, no odor, no sheen

Keep or Retry: diver inserted screw plug @ sed/H₂O interface

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log



Job: LAW6 Processing
 Job Number: FORS-18222-511
 No. of Sections: 1
 Sample Length (from log): 10.1
 Avg. % Compaction: _____

Core Location/Sample Number: SG 202 ER1 (field report of station 36)
 Date/ Time: 02/16/06 1020
 Sample Logged by: LMyer, AFitzpatrick
 Type/Diameter of Sample: 4" sq aluminum
 Sample Quality: good fair poor disturbed

Notes: Pen = 12.5' } 81% Rec
On Deck Rec = 10.1' }

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.54 4/3 olive brown	0	10	90	Ø	0 - 0.4 SILT: dk. brown, wet, soft sl sandy SILT	0.4	1030 0-1 3/16oz		SILT
		2.54 2.5/1 black	0	10	90	Ø	0.4 - 3.0 SILT: wet stiff, massive, blocky, black SILT (org), with scattered wood fragments ~ 0.2% Low plasticity Sl compressible	4.0	1035 1-2 3/16oz		SILT (ORG)
							transition	2.0			
									1040 2-4 3/16oz		
							3.0 - SL SANDY SILT wet-moist, med stiff, dk gr. gray, sl. sandy SILT interbedded with SILT (org) from above [greenish black] layers ~ 0.3-0.4" scattered rootlets & wood fragments ~ 0.1" L	3.0	3-16oz GT 2.1		SILT (ORG) + SILT WITH SAND
							transition	4.0			
							4.1 - 8.0 SILT moist, med stiff, dk gr. gray SILT, with scattered rootlets blocky, massive rocky layers	5.0	1045 4-6 3/16oz		SILT

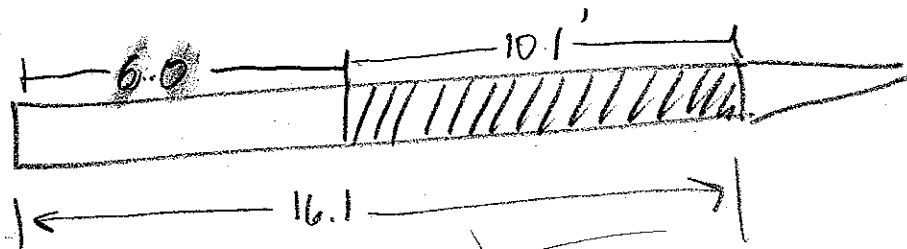
0.1' TV=3
3/16oz

0.3' TV=3
3/16oz

0.5' TV=7
3/16oz

LDW-SC-202 (field rep of station 36)

Feb 16, 2006



On deck to sediment = 6.0'

Shore is 3/4 full

Winnowing from 10.0-10.1'



Sediment Core Processing Log

Job: LDW6 Processing
 Job Number: PRS-15250-511
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____
 Notes: _____

Core Location/Sample Number: SC-202-R1
 Date/ Time: 2/16/06 1020
 Sample Logged by: LMK
 Type/Diameter of Sample: _____
 Sample Quality: good fair poor disturbed

CONTINUED

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch	
							SAA		1050 6-8 3.16oz		SILT	
								70			① 7' TV = 7 B/G	
								80				
		GLY 1 3/1 v. dk. greenish gray	SAND 100	10	10	8	80 - SAND moist, dk. gr. gray fine sand with multi-colored grains (white, red, orange). uniform layers 0.2' thick of alt. fine sand and SILT ① woody fragments up to 1/0.192 SAND coarsens downward	90	1055 8-10.1 3.16oz		SAND	wood fragments ① 9' TV = 5 B/G
								10.0				
							Bottom of core @ 10.1'	11.0				

Mudmole™ Bore Log

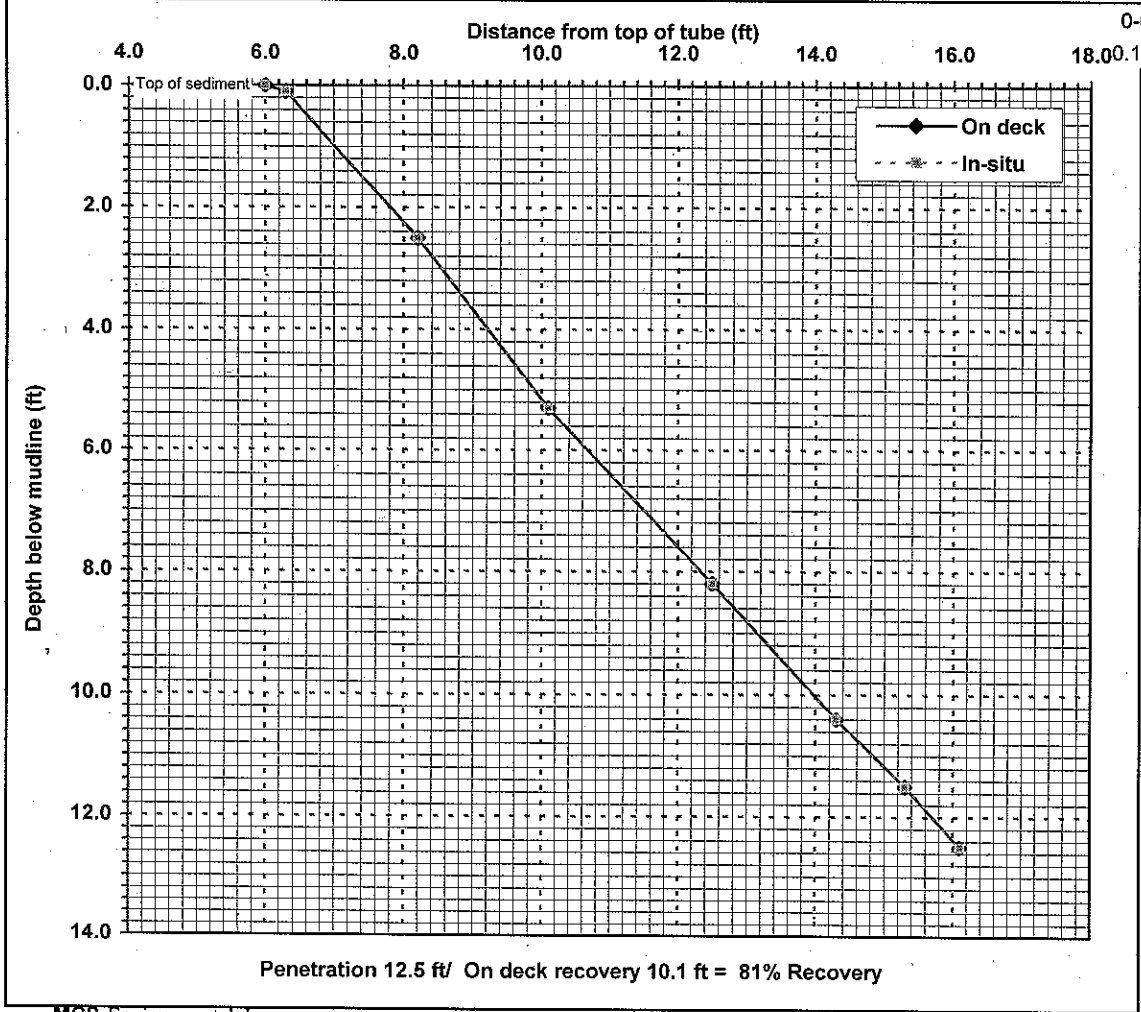
Project: LDWG Duwamish Coring **Station:** 202 R1
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 201491 Northing
Date: 2/15/2006 **Time:** 12:55 1269986 Easting
Water depth: 16.5 ft **Mudline:** -12.7 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------



0-0.1000000000000000	0.3	300%
0.1000000000000000-2	1.9	79%
2.5-5.3	1.9	68%
5.3-8.2	2.4	83%
8.2-10.4	1.8	82%
10.4-11.5	1	91%
11.5-12.5	0.8	80%

Mudline	6
1	7.01
2	7.80
3	8.54
4	9.22
5	9.90
6	10.68
7	11.51
8	12.33
9	13.15
10	13.97
11	14.85
12	15.70
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-15-06 Recorder: GSW

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 202 R1

Tube Length (ft): 16.15

Water Depth (ft): 16.5

Est. Tide Height (ft): 3-8

Est. Mudline: _____ (MLLW)

Comments: SEA diver - vis 2 ft - sandy silt - flat bottom
depth

- no debris

2 SA off station

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 201491

Easting 1269986

On Deck Top of Sediment 6.0

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>16.0</u>	<u>15.8</u>	
<u>13.6</u>	<u>13.9</u>	
<u>10.8</u>	<u>12.0</u>	
<u>7.9</u>	<u>9.6</u>	
<u>5.7</u>	<u>7.8</u>	
<u>4.6</u>	<u>6.8</u>	
<u>3.6</u>	<u>6.0</u>	<u>goal reached</u>
		<u>refusal</u>

Station Number: 202 Date: 02/15/06 Station Arrival Time: 1240
 Attempt: 1 Core Tube Length: 16.1 Station Departure Time: 1320
 Field Technician: TD Lead Line Water Depth: 16.5 Dist. From Target Station: 5th 5
 Contractor: M/S/RSS Latitude: 201491 (63 ft. from station to core R-1)
 On-site Visitor: _____ Longitude: 1269986

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, 1st Ave. boat launch, marina docks
 Sediment surface & slope: sandy silt, flat bottom, no debris
 Water current and visibility: 2 ft. vis. slack tide, flooding
 Diver Water Depth 15 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1300 Drive Completion Time: 1307 Drive Offset: _____
 Estimated angle of drive: Est 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
16.0	15.8	diver recorded, fu fail
13.6	13.9	easy-mod. drive
10.8	12.0	easy-moderate drive
7.9	9.6	moderate drive
5.7	7.8	moderate drive
4.6	6.8	moderate-difficult drive, penetration slow
3.6	6.0	difficult drive, penetration refusal
TOTAL 12.5	TOTAL 10.1	Percent Recovered: <u>80.8%</u>

Reason for ending drive: penetration goal reached, refusal
 If refusal, reason for refusal: sand layer

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): yes, clear ~500ml
 On Boat Recovery: 6.0 Loss of Sediment: 0
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy to moderate

On Deck Observations:

Staining: slight amount of silty sand, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): med. sand, brown, no odor, no sheen

Keep or Retry: diver inserted screw plug at H₂O/sed interface

FIELD REPLICATE OF CDW-SC36

Notes: Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)



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Sediment Core Processing Log



Job: LSW G Core Processing
 Job Number: PORS-18220-511
 No. of Sections: 1
 Sample Length (from log): 6.9'
 Avg. % Compaction: _____

Core Location/Sample Number: 5C-37-R1
 Date/Time: 2/22/06
 Sample Logged by: LM 1425
 Type/Diameter of Sample: 4" sq alum.
 Sample Quality: good fair poor disturbed

Notes: Pen = 8.6' } 80% Rec
DN Deck Rec = 6.9'

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.54 4.13 olive brown		10	90	Ø	wet, soft, soupy, olive-brown sl sandy SILT (transitional)	0-1 1445			SILT
		2.54 2.511 black		10	90	Ø	SILT moist, med. stiff, black sl. sandy SILT low plasticity, sl compressibility woody fragments, occasional mottled w/ olive-grey clayey SILT from 0.9-1.0	6T 0.9 3.1602	1		SILT
				85	15	Ø	@ 1.5, piece of copper wire @ 1.6 layer of silty SAND, black, wet, to fine-med grained	1.2 1450 GT 2.2 4.1602	2		SILT
							SILT @ 2.6 layer med. grained, black SAND				SILT
				90	10	Ø	@ 3.0 black SILT layer of 1" thickness @ 3.05 black, dense, moist SAND w/ 35% asphalt slender sheen floret pooling on core water about 1" - asphalt is subrounded up to 0.10' L and metallic grey in color, sheeny in shiny bowl, mod. pet-like odor. Gravel may be asphalt 0.2' wood fragment w/ strong pet-like odor	2-4 1455 4.1602	3		SILT
							@ 3.9 large piece of asphalt ~ 0.1' L 3.6-3.9 = piece of wood 0.3' L		4		SILT
				5	95	Ø	4.7: 2% silt pockets as described below embedded in black fine SAND 4.9-5.3: pocket of grey-green sandy SILT low plasticity, sl. compressible	4-5.3 1500 2.1602	5		SILT
							@ 5.3 piece of subrounded asphalt 2" (sharp)				SILT
		2.54 2.511 black		90	10	Ø	SAND moist, med. dense, black SAND w/ multicolor grains @ 5.7 silt pocket of 1" green-grey well sorted	5.2-6.9 1505 2.1602	6		SAND

Note: this unit is potentially impacted at the gravel/ asphalt layers

metallic color black

35% asphalt
10% wood

sheen of odor
@ 3.6 TV=3.7816
sheen + odor strongest when asphalt
@ 5.0' TV=1.3 Med

Baggie @ 1.5'
Baggie @ 3.9'

Sediment Core Processing Log



Job: LDWG Core Processing
 Job Number: PRS-18220-501
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:

Core Location/Sample Number: SC-37-R1
 Date/ Time: 2/22/02 1425
 Sample Logged by: LM
 Type/Diameter of Sample: 4" sq alum.
 Sample Quality: good fair poor disturbed

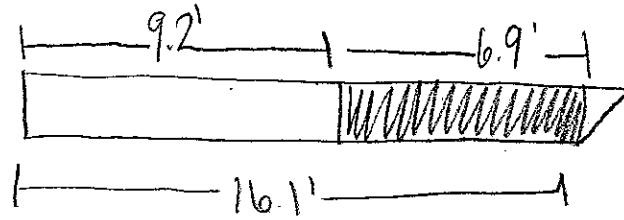
Notes: Pen = 8.6'
on back Rec = 8.9' 50% Rec

← CONTINUED →

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		SAA					SAA				SAND
							End of core @ 6.9'	7			
								8			
								9			

SC-37-R1

LM
2/22/06



mudline = 9.2'

$$\begin{array}{r} 16.1 \\ - 9.2 \\ \hline 6.9 \end{array}$$

Core catcher is full w/ void space in top 1/6"

Black fine sand

sheen florets: 0.5 - 3.5 = occasional, 1/2" ø

@ 3.5 floret 0.1" ø

@ 4.0 sheen streak 0.3' L

} all in smear zone

Mudmole™ Bore Log

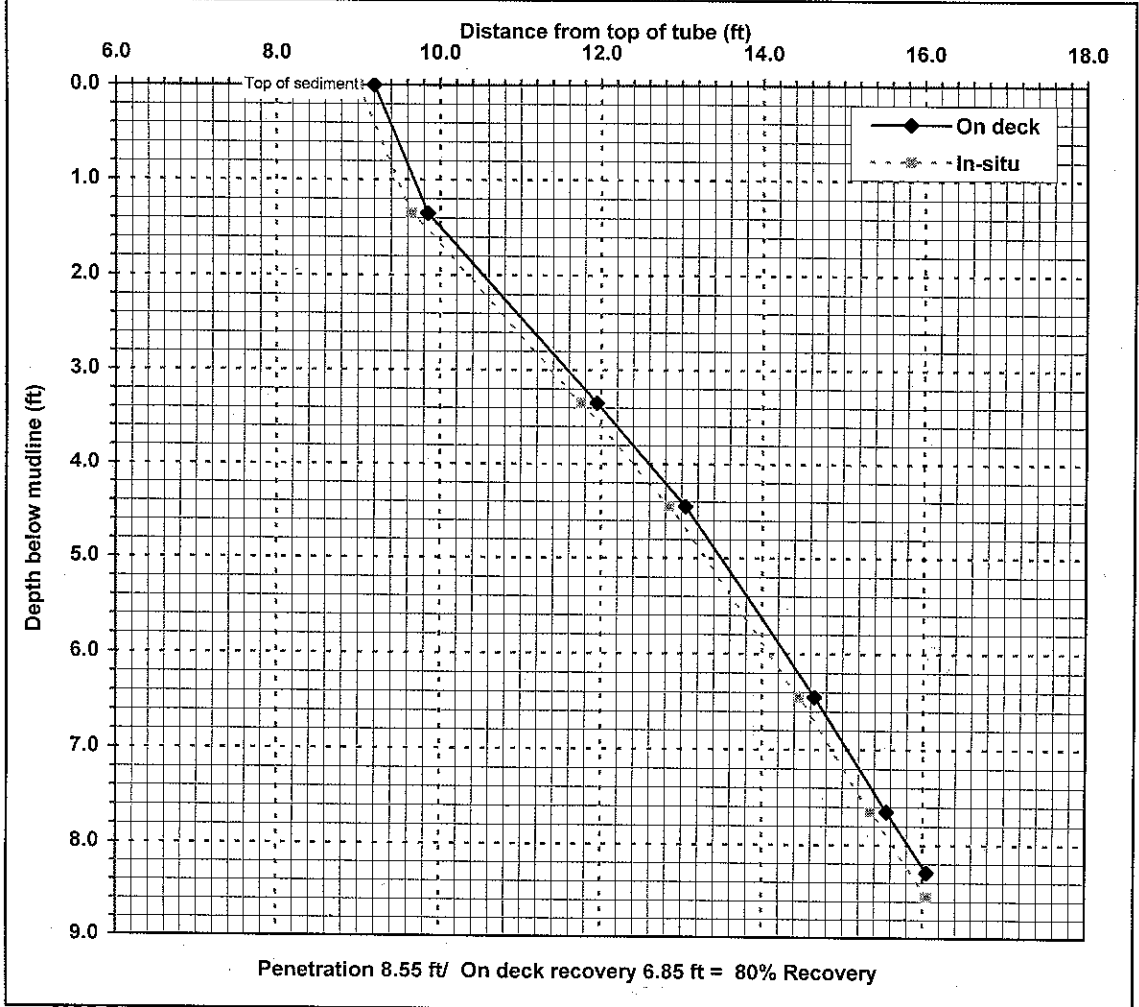
Project: LDWG Duwamish Coring **Station:** 37 R1
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 201435 Northing
Date: 2/22/2006 **Time:** 12:28 1270690 Easting
Water depth: 19.8 ft **Mudline:** -11.6 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A
 Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-1.35	0.65	48%
1.35-3.35	2.1	105%
3.35-4.45	1.1	100%
4.45-6.45	1.6	80%
6.45-7.65	0.9	75%
7.65-8.55	0.7	78%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	9.2
1	9.68
2	10.53
3	11.58
4	12.60
5	13.49
6	14.29
7	15.06
8	15.82
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Station Number: 37

Date: 02/22/06

Station Arrival Time: 1230 (boat already anchored)

Attempt: 1

Core Tube Length: 16.05

Station Departure Time: 1300

Field Technician: TD

Lead Line Water Depth: 19.8

Dist. From Target Station: 16

Contractor: MCS/RSS

Latitude: 201435

Station VI

On-site Visitor: _____

Longitude: 1270690

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap & concrete debris, wood pier (rock), wood pilings, barges around us.

Sediment surface & slope: steep slope, silt bottom, pilings in area

Water current and visibility: 4ft vis., mild current,

Diver Water Depth 19.2 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1243 Drive Completion Time: 1249 Drive Offset: _____

Estimated angle of drive: est. 10° east under water

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
14.7	15.4	diver recorded, free fall
12.7	13.3	easy drive
11.6	12.2	moderate drive
9.6	10.1	moderate drive
8.4	9.7	moderate difficult drive, penetration slowed
7.5	9.0	difficult drive, refusal
TOTAL 0.55	TOTAL 7.05	Percent Recovered: <u>82.4%</u> (80.1% on deck)

Reason for ending drive: refusal

If refusal, reason for refusal: hard substrate

Extraction Observations:

Tension on line? yes Stability of vessel: no problem

Overlying water in core (quantity and description): yes, clear, ~1L

On Boat Recovery: 9.2 Loss of Sediment: 0.2

Extraction Notes: (i.e. winch or hammer, easy, hard) winch, moderate

On Deck Observations:

Staining: did not observe ^{IMO} dk. streaks of silty sand.

Tube Deformation: none

Sediment Description (odor or sheen?): did not observe med sand, no odor, no sheen
_{IMO}

Keep or Retry: diver inserted screw plug at sed/H₂O interface
fine sand on core tip (diver observed)

Notes: Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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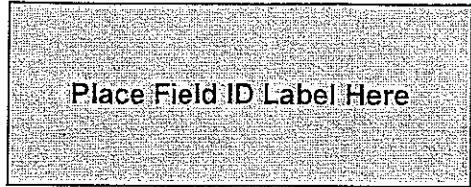


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MCS Environmental MudMole Bore Log

Collection Information

Date: 2-22-06 Recorder: GJM



Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 37 R1

Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 19.8

Time: 1228

Northing 201435

Est. Tide Height (ft) 8.2

(MLLW)

Easting 1270690

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 9.2

Comments: station is ~~is~~ under pier - sampled close as possible ~

16 ft off station - diver depth 18 ft - 4 ft visibility steep slope

silt bottom - old pilings in area - mild current

Penetration Tape Reading

Recovery Tape Reading

Comments

<u>14.7</u>	<u>15.4</u>	
<u>12.7</u>	<u>13.3</u>	
<u>11.6</u>	<u>12.2</u>	<u>penetration slowed</u>
<u>9.6</u>	<u>10.6</u>	
<u>8.4</u>	<u>9.7</u>	
<u>7.5</u>	<u>9.0</u>	<u>refusal</u>

Sediment Core Processing Log



Job: LDW6 Core Processing
 Job Number: DUNAMICH
 No. of Sections: 1
 Sample Length (from log): drive = 5.6'
 Avg. % Compaction: on deck = 3.8'
 Notes: 2% Ret = 68%

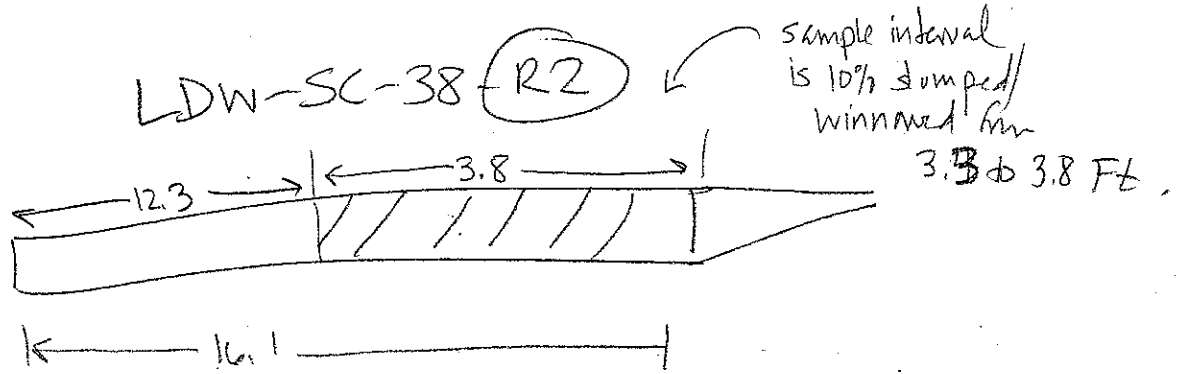
Core Location/Sample Number: SC-38 (R2)
 Date/ Time: Feb 21, 2006 start 1630 stop 1730
 Sample Logged by: AGF
 Type/Diameter of Sample: 4" ID alum
 Sample Quality: good fair poor disturbed

COR collected 2/20/2006

Recovered Length (ft)	% Compaction	Color	Size % - C	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5y 3/2 v.d. sluish brwn	55	30	15		GRAVEL: loose, wet, dark brwn, sl. silty M-SANDY GRAVEL (subx upto 1.5" Ø) W. mod. large wood frags, shredded wood, rootlets, fibers, (jumbled looking) poorly sorted				
		6LEY1 3/1 v. dark grayish gray	5	90	5		SAND: wet, loose, dark grayish brwn M-SAND w/ trace silt pockets (1/2" Ø) From 1 to 2 FT, scattered wood frag 1" L From 1 to 2 FT, well sorted, no layering (native-looking). scattered rounded 1/16" grains from 1-2.2 FT	2.0	upper interval sampled in <u>(R1)</u>		
				98	tr		<p>✓ No wood below 2.5 FT</p> <p>- At 2.9 FT - 3" Ø "fresh" wood chunk</p> <p>- At 3.2 FT - one brwn 1/2" silt lens</p>	3.0	1705 3-3.3' 2-16oz		
							<p>Bottom of core @ 3.8 FT but 20% winnowed below 3.3 FT (not sampled below 3.3')</p> <p>• No sheen/odor observed in core. • Sampled @ 3 to 3.3' to tag "clean" sand at bottom of R1 core, which only had silt</p>	4.0			

22e

35-42



End of mudline = 12.3'

↑
shor is
winnowed
by 60%
all M-SAND

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-20-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 38 R2



Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): ~~9.8~~ 6.6

Time: 955

Northing 200959

Est. Tide Height (ft) 9.8

(MLLW)

Easting 1269745

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 12.3

Comments: Get depth - scattered ballast rock - silty sand -

flat bottom - falling tide - 3A visibility

Penetration Tape Reading

Recovery Tape Reading

Comments

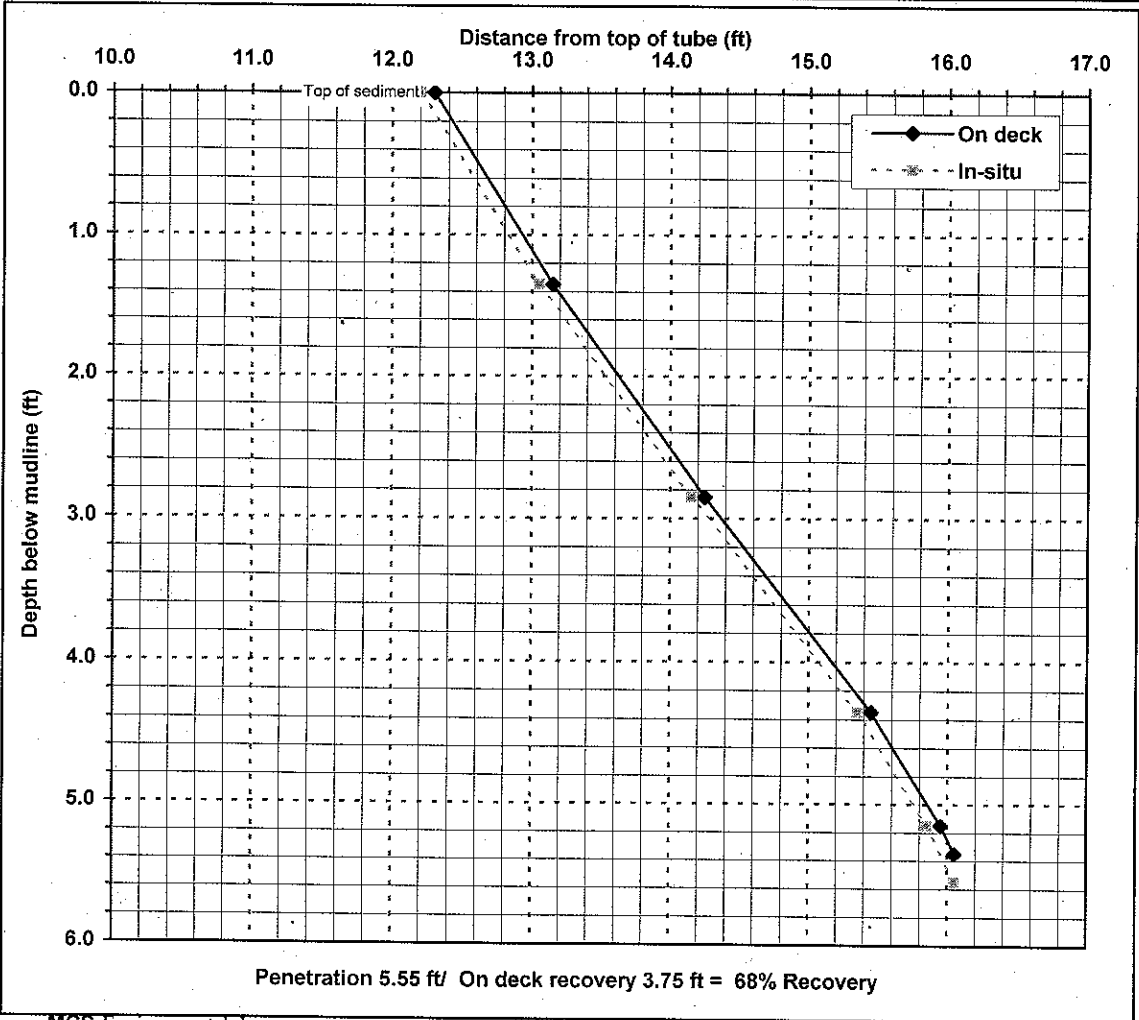
<u>14.7</u>	<u>15.2</u>	
<u>13.2</u>	<u>14.1</u>	
<u>11.7</u>	<u>12.9</u>	
<u>10.9</u>	<u>12.4</u>	
<u>10.5</u>	<u>12.2</u>	<u>refusal</u>
	<u>native sand in tip of core</u>	

Mudmole™ Bore Log

Project: LDWG Duwamish Coring **Station:** 38 R2
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 200959 Northing
Date: 2/20/2006 **Time:** 9:55 1269745 Easting
Water depth: 6.6 ft **Mudline:** 3.2 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A
 Driven to refusal



Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-1.35	0.85	63%
1.35-2.85	1.1	73%
2.85-4.35	1.2	80%
4.35-5.15	0.5	63%
5.15-5.55	0.2	50%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	12.3
1	12.93
2	13.63
3	14.37
4	15.17
5	15.86
6	No sample
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

NOT PROCESSED

Station Number: 38 Date: 2/20/06 Station Arrival Time: 0850
 Attempt: 2 Core Tube Length: 16.05 Station Departure Time: 0720
 Field Technician: JMF Lead Line Water Depth: 6.6 Dist. From Target Station: 30
 Contractor: MCS/RSS Latitude: 200959
 On-site Visitor: — Longitude: 1269745

Pre-Drive and Diver Observations:

Shoreline & surrounding area: riprap, concrete columns
 Sediment surface & slope: scattered rock, silty sand, flat bottom
 Water current and visibility: 3ft vis
 Diver Water Depth: 6ft Tip Probe Depth: — Disk Probe Depth: —

Drive Observations:

Drive Initiation Time: 0955 Drive Completion Time: 1007 Drive Offset: —
 Estimated angle of drive: —

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
14.7	15.2	
13.2	14.1	
11.7	12.9	
10.9	12.4	
10.5	12.2	refusal, hit something
TOTAL 5.55	TOTAL 3.85	Percent Recovered: <u>69.4%</u> (<u>67.6%</u> on deck)

Reason for ending drive: refusal
 If refusal, reason for refusal: hit something

Extraction Observations:

Tension on line? Y Stability of vessel: no problem
 Overlying water in core (quantity and description): no
 On Boat Recovery: 12.3 Loss of Sediment: 0.1
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: some silt, rinsed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): native md-fn sand, dark brown

Keep or Retry: pending. Diver could not insert screen plug due to top of core tube crushed

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log

Job: LDWG Sed Core Proc.
 Job Number: POCS-18220-511
 No. of Sections: 1
 Sample Length (from log): 16.1'
 Avg. % Compaction: _____

Core Location/Sample Number: SC-38-R1
 Date/Time: Feb 21, 2006 start 1630 stop 1730
 Sample Logged by: LM Anne Fitzpatrick
 Type/Diameter of Sample: St 4" sy. ALUM.
 Sample Quality: good fair poor disturbed tip is crushed

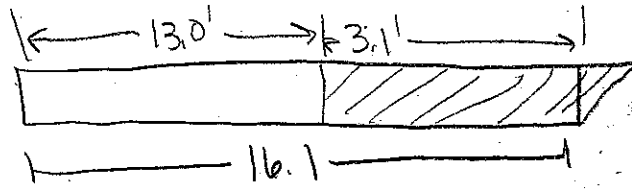
Notes: Pen = 4.5'

on Deck Dec = 3.4' 76% Recovery saw core collected 2/20/2006

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5y 2.5/1 black		5	15	φ	SILT: med stiff dusting of olive-brown silt over wet, med stiff, mottled brown-black SILT w/ 3" dia an 4" L pc wood frag. Slight H2S odor. Slightly compressible texture, low plasticity.	1650 0-1 3-16.2 GTCD3'			At 0.5' TV=6 big
		7.5y 3/2 dark brown		20	80	φ	transitional SILT: med stiff, wet, brown to black SILT w/ 1" sand lenses (brown, F-SAND). Slightly mottled gradly black w/ depth. No odor. Slightly jumbled. At 1.1 FT npx wood 1.5" L. Thick wood frags, rootlets.	1655 1-2' 3-16.2			At 1.5' TV=5.5 big
		2.5y 2.5/1 black	limited interbed	30 tr 90	70 10	φ interbed	transitional SILT: med stiff, wet, black SILT w/ trace sand, moderate TPH-like odor and greasy texture w/ scattered sand seams (1/8" to 1/2") TPH sheen concentrated in sand but unit is 100% impacted. (From 2.6 to 3.1) sheen also concentrated in parting seam @ 2.4'	1700 2-3' 3-16.2			At 2.5' TV=3.5 big
							Bottom of core @ 3.1'				
							Shore: med silt w/ sand lenses did not tag sand in this core but R2 collected 20 Ft offshore of this station was sand from 1 to 3.3. Sampled bottom sand from R1. - no sheen/odor.				
							Shore Test @ 2-3 Ft: 100% of surface has sheen (mod to heavy) w/ long rainbow streaks.				

SC-38-R1

2/21/06
LM



mudline = 12.7'
on boat

↑
intact sediment
to bottom of core

~~and possibly slipped~~
slight scoring on dip
sidewalls = hard
material

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-20-06 Recorder: GSW

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 38 R1

Tube Length (ft): 16.1

Water Depth (ft): 6.1

Est. Tide Height (ft): 10.3

Est. Mudline: _____ (MLLW)



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 200938

Easting 1269746

On Deck Top of Sediment 12.7

Comments: silty sand bottom - broken concrete in vicinity

<12ft off station - depth 5ft flat bottom 3ft vis
scattered wood debris

Penetration Tape Reading

Recovery Tape Reading

Comments

13.5

14.0

12.3

13.1

11.6

12.5

refused

tip of core crushed

Mudmole™ Bore Log

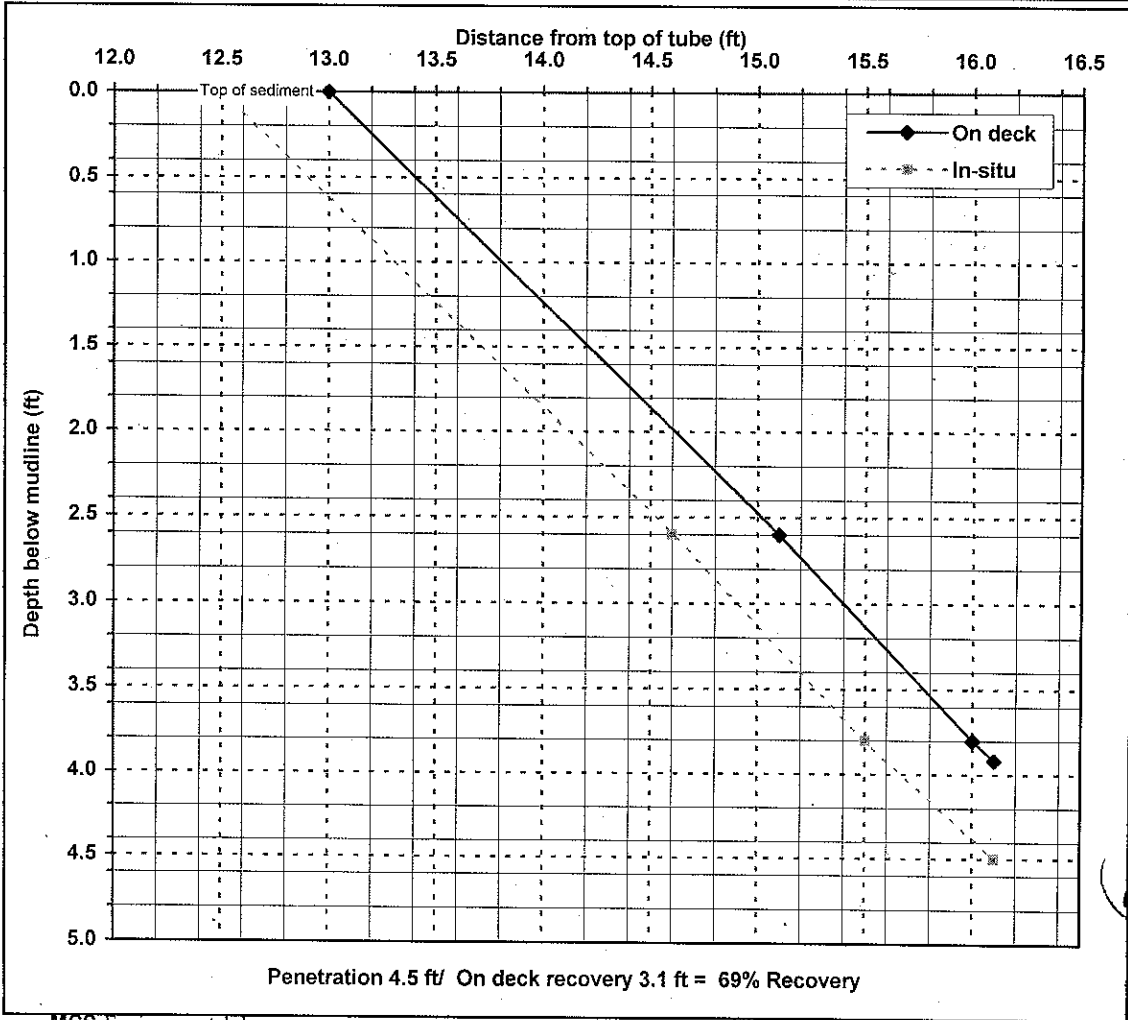
Project: LDWG Duwamish Coring **Station:** 38 R1
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 200938 Northing
Date: 2/20/2006 **Time:** 9:19 1269746 Easting
Water depth: 6.1 ft **Mudline:** 4.2 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A
 Driven to refusal, on-deck top of sediment measurement is 13 ft from top of tube at field lab

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-2.6	2.1	81%
2.6-3.8	0.9	75%
3.8-4.5	0.6	86%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	13
1	13.81
2	14.62
3	15.40
4	No sample
5	No sample
6	No sample
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Adjusted in the lab
 depth to mudline is
 different during processing

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 38 R1

Project No: 341185.001

Position: NAD83

Collected by: GSM

200938

WAN

Date: 2/20/2006

Time: 9:19

1269746

Northing

Easting

Water depth: 6.1 ft

Mudline: 4.2 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A

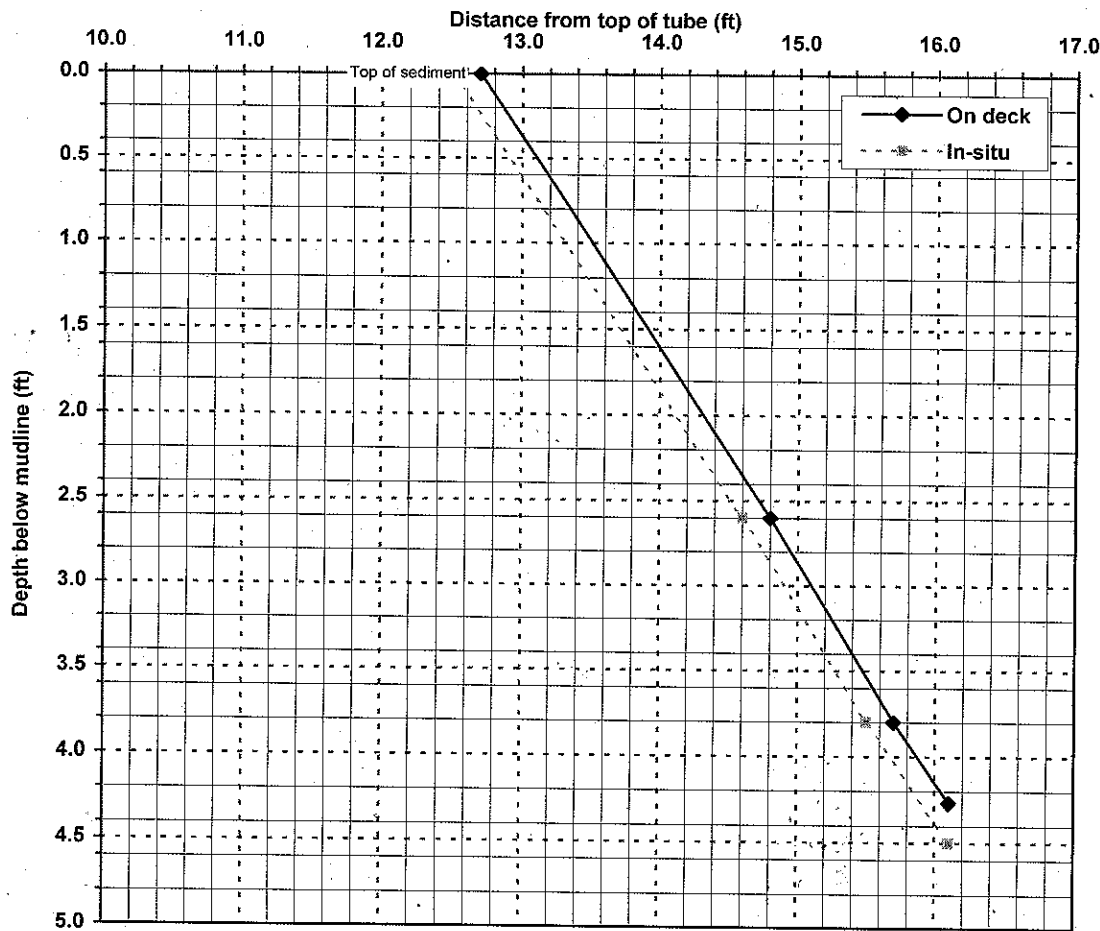
Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------

0-2.6	2.1	81%
2.6-3.8	0.9	75%
3.8-4.5	0.6	86%

Mudline	12.7
1	13.51
2	14.32
3	15.10
4	15.87
5	No sample
6	No sample
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Penetration 4.5 ft/ On deck recovery 3.4 ft = 76% Recovery

Station Number: 1A 38
 Attempt: 1
 Field Technician: JMF
 Contractor: MCS/RSS
 On-site Visitor: —

Date: 7/20/00
 Core Tube Length: 16.1
 Lead Line Water Depth: 6.1
 Latitude: 200938
 Longitude: 1249746

Station Arrival Time: 0850
 Station Departure Time: 1020
 Dist. From Target Station: 12

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, concrete columns
 Sediment surface & slope: flat bottom, silty, broken concrete, scattered wood debris
 Water current and visibility: 3ft vis
 Diver Water Depth: 6.0 Tip Probe Depth: — Disk Probe Depth: —

Drive Observations:

Drive Initiation Time: 0919 Drive Completion Time: 0925 Drive Offset: —
 Estimated angle of drive: —

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
13.5	14.0	easy drive
12.3	13.1	moderate drive, penetration slowed
11.6	12.5	refusal - hit something
TOTAL 4.5	TOTAL 3.6	Percent Recovered: <u>80%</u> (75.6% on deck)

Reason for ending drive: refusal
 If refusal, reason for refusal: hit something, end of core tube crushed

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): no
 On Boat Recovery: 12.7 Loss of Sediment: 0.2
 Extraction Notes: (i.e. winch or hammer, easy, hard) easy, winch

On Deck Observations:

Staining: some silt sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): silt + sand, black, slight hydrocarbon odor

Keep or Retry: diver inserted screw plug, tip of core crushed, suspect concrete

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 Seattle, WA 98134-1162



Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log

Job: LDWG Core Processing
 Job Number: PORS-18220-511
 No. of Sections: 1
 Sample Length (from log): 9.2
 Avg. % Compaction: _____

Core Location/Sample Number: SC-39-R1
 Date/Time: 2/16/06 1120
 Sample Logged by: LMcKee
 Type/Diameter of Sample: 4" Sq aluminum
 Sample Quality: good fair poor disturbed

Notes: Pen = 12.9 }
 on Deck Rec = 9.2 } 74% Rec

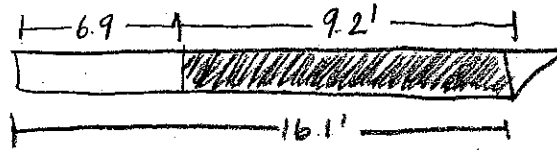
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5V 4/3 olive br.	-	10	90	0	0-0.4 SILT wet, soupy, loose olive brown sl. sandy SILT no odor transitional	0-1	1145		SILT
1		GREY 3/1 v. dk. greenish gray	15	85	-	2	0.4-2.5 SAND + GRAVEL moist, hard, black gravelly SAND gravel is subrounded and up to 0.15" Sand is medium & multi colored (orange, red, white) no odor	1			gravelly SAND
2							@ 1.3 Brick fragment ~ 0.1" L scattered brick pieces interbedded with gravel to 3.0'	1-2	1150		
							no odor transitional	2-4	1155		
3		UNIT = SAA BEDS 2.5V 2.5/1 black	15	85	-	0	2.5-3.6 SAND + GRAVEL w/ SILT interbeds	3	GT 4.0		SILT
							Sand is SAA with interbeds of: Moist, firm, black, blocky + massive textured SILT. SILT is low plasticity, sl. compressibility • has shell fragments no odor, sl. shiny transitional				
4		SA BED Above			100	0	3.6-6.4 SILT: moist, firm, massive, blocky SILT rootlets up to 0.3" L, woody fragments up to 0.4" L • sl. compressible • low plasticity • uniform • rootlets	4			
5								4-6	1200		SILT
6								6			

* unable to get GT < 2.0 due to gravel.

2/16/06

LM

SC-39-R1



Mudline = 6.9'

$$\begin{array}{r} 16.1 \\ - 6.9 \\ \hline 9.2 \end{array}$$

core catcher is full
winnowing from 9.2-9.3 (30%)

Sediment Core Processing Log



Job: LDWG Core Processing
 Job Number: PURS-18220-511
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: SC-39-R1
 Date/ Time: 2/16/06
 Sample Logged by: L. McKee
 Type/Diameter of Sample: 4" sq. aluminum
 Sample Quality: good fair poor disturbed

Notes: CONTINUED CONTINUED

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
6							SAA				SILT
7		OLEY 1 4/10 dk greenish gray	-	2	98	8	transition SILT w/ SAND interbeds 1" thick moist, stiff, gray black SILT with fr. sand unit with interbeds of fine-med. black sand	6-85 1205	7		SILT w/ SAND INTERBEDS
8							@ 8.0 wood fragment 0.6' L		8		▲ ▲
9		OLEY 1 3/11 v.d. greenish gray	unit = - Beeds =	90	10	8	transition SAND moist, firm, fine-med. gray SAND with bands of alt. v. fine silty SAND and SILT. no odor, no wood fragments	85-92 1210	9		SAND
10							End of core @ 9.2' Baggie - Brick fragment @ 1.3 in 1-2 interval		10		

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-15-06 Recorder: GSN

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 39 R1

Tube Length (ft): 16.05

Water Depth (ft): 9.8

Est. Tide Height (ft): 5.3 (MLLW)

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 290657

Easting 1270056

On Deck Top of Sediment 6.9

Comments: incoming tide - broken cone on beach - moved offshore

Diver depth 9 - visibility 1 - silty sand with small

gravel - no debris - gentle slope - concrete nearby

2 24A off station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.0</u>	<u>14.9</u>	
<u>13.3</u>	<u>13.5</u>	
<u>10.6</u>	<u>11.0</u>	
<u>7.4</u>	<u>8.7</u>	
<u>6.0</u>	<u>7.7</u>	
<u>3.7</u>	<u>6.0</u>	<u>goal reached</u>
		<u>slow penetration</u>
		<u>very hard extraction from bottom</u>

Station Number: 39 Date: 02 Station Arrival Time: 1335
 Attempt: 1 Core Tube Length: 16.05 Station Departure Time: 1440
 Field Technician: TD Lead Line Water Depth: 9.8 Dist. From Target Station: _____
 Contractor: MCS/RSS Latitude: 200657
 On-site Visitor: _____ Longitude: 1270056

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, concrete debris, asphalt, gravel, wood dolphin, barges to north and south
 Sediment surface & slope: silty sand w/ gravel, gentle slope to channel, no debris, concrete nearby
 Water current and visibility: floodng tide, 1 ft vis.
 Diver Water Depth 9 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1356 Drive Completion Time: 1407 Drive Offset: _____
 Estimated angle of drive: Est 10° off

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.0	14.9	deck measured; easy drive & ^{TD} (hammer used to secure mudmole to core tube)
13.3	13.5	moderate drive
10.6	11.0	moderate drive, diver measured
7.4	8.7	moderate drive
6.0	7.7	moderate - difficult drive
3.7	6.0	difficult drive, penetration slow, penetration goal reached
TOTAL 12.35	TOTAL 10.05	Percent Recovered: <u>81.4%</u> (74.1% from on-deck recovery)

Reason for ending drive: penetration goal reached
 If refusal, reason for refusal: _____

Extraction Observations:

Tension on line? yes Stability of vessel: list to starboard and port bow during extraction
 Overlying water in core (quantity and description): yes, clear, ~750mL
 On Boat Recovery: 6.9 Loss of Sediment: TD 0.9ft. lost? during extraction.
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, difficult (very)

On-Deck Observations:

Staining: dark silty sand, sprayed off.
 Tube Deformation: none
 Sediment Description (odor or sheen?): small gravel, silty gray, some clay no odor no sheen.

Keep or Retry: diver inserted screw plug at sed/1/2 O interface
diver observed "pasty clay" in core tip

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Mudmole™ Bore Log

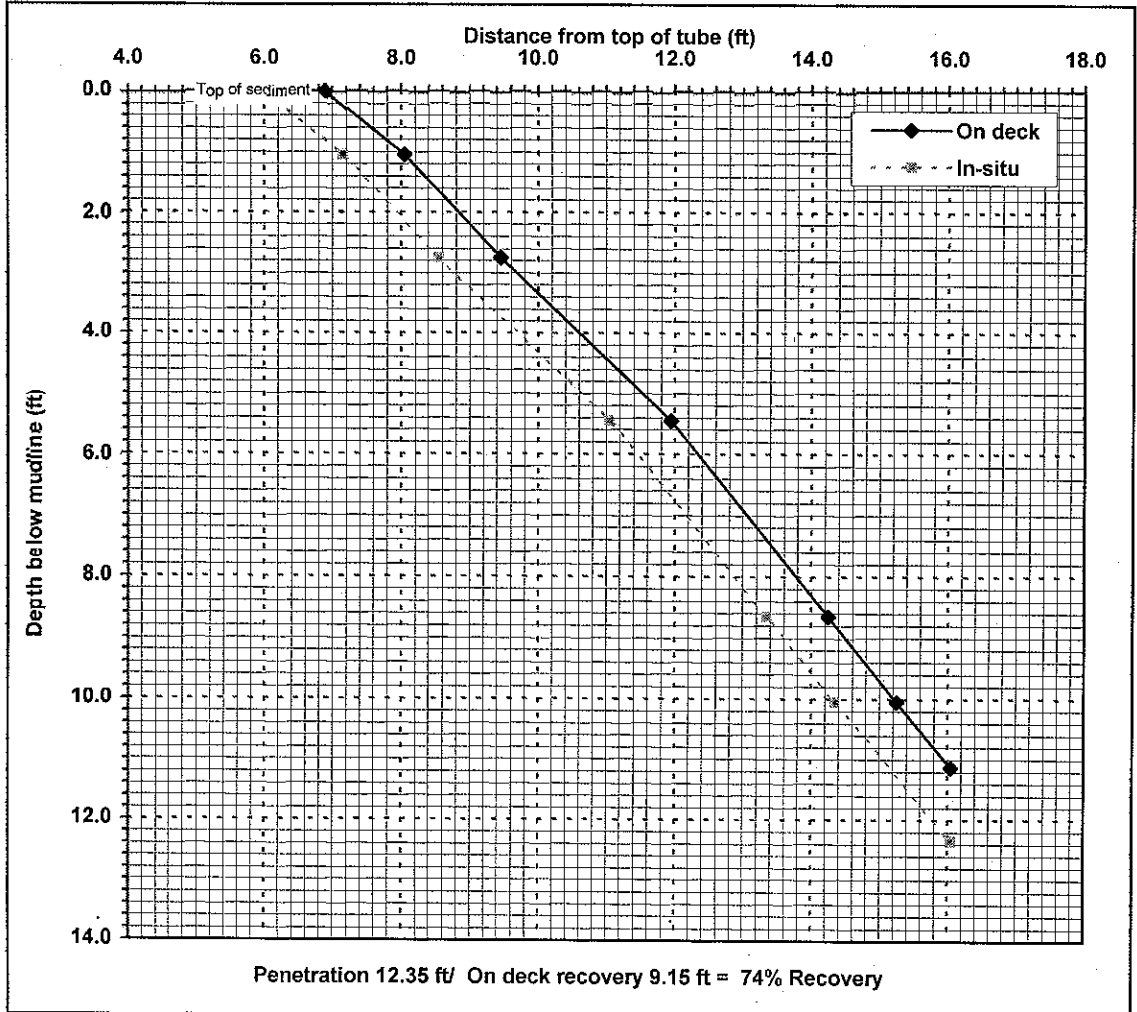
Project: LDWG Duwamish Coring **Station:** 39 R1
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 200657 Northing
Date: 2/15/2006 **Time:** 13:53 1270056 Easting
Water depth: 9.8 ft **Mudline:** -4.5 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------



0-1.05	1.15	110%
1.05-2.75	1.4	82%
2.75-5.45	2.5	93%
5.45-8.65	2.3	72%
8.65-10.05	1	71%
10.05-12.35	1.7	74%

Mudline	6.9
1	8.00
2	8.83
3	9.68
4	10.61
5	11.53
6	12.35
7	13.06
8	13.78
9	14.50
10	15.21
11	15.95
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Sediment Core Processing Log



Job: LNW7 Core Processing

Core Location/Sample Number: SC-40-R1

Job Number: PORS-18220-511

Date/Time: 2/16/06 1350

No. of Sections: 1

Sample Logged by: LMcKee

Sample Length (from log): 2.7

Type/Diameter of Sample: 4" sq. 9/16" I.D.

Avg. % Compaction:

Sample Quality: good fair poor disturbed

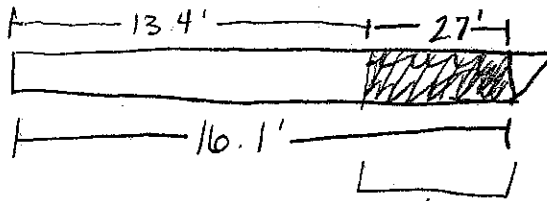
Notes: Rein = 5.4' 2.1' Rec = 50%
On Deck Rec. = 2.7' 5

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch	
1		(sand) GLEY 1 311 v.d. greenish gray (Silt) GLEY 1 251104 greenish d.	-	90	10	X	0.0-1.4 SAND with SILT (org.) clasts and layers of med. coarse sand Sand = very fine - fine, bl. brown (unit) Silt = sl. sandy, black, moist, stiff, low compressibility, mottled sand = layer - coarse, multicolored grains up to 1" thick	1	*			SAND
2		GLEY 1 311 v.d. greenish gray	-	90	10	X	1.4- 2.7 SAND black moist, stiff, med. SAND with multi-colored grains (red, orange, white)	2				SAND
3							End of core @ 2.7' * No physical/chemical collected for analysis	3				

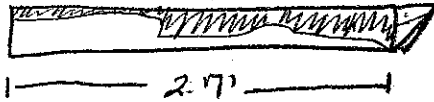
2/16/06

LM

5C-40-R1



mudline = 13.4



> 80% winnowing

core shoe is 3/4 full due to winnowing

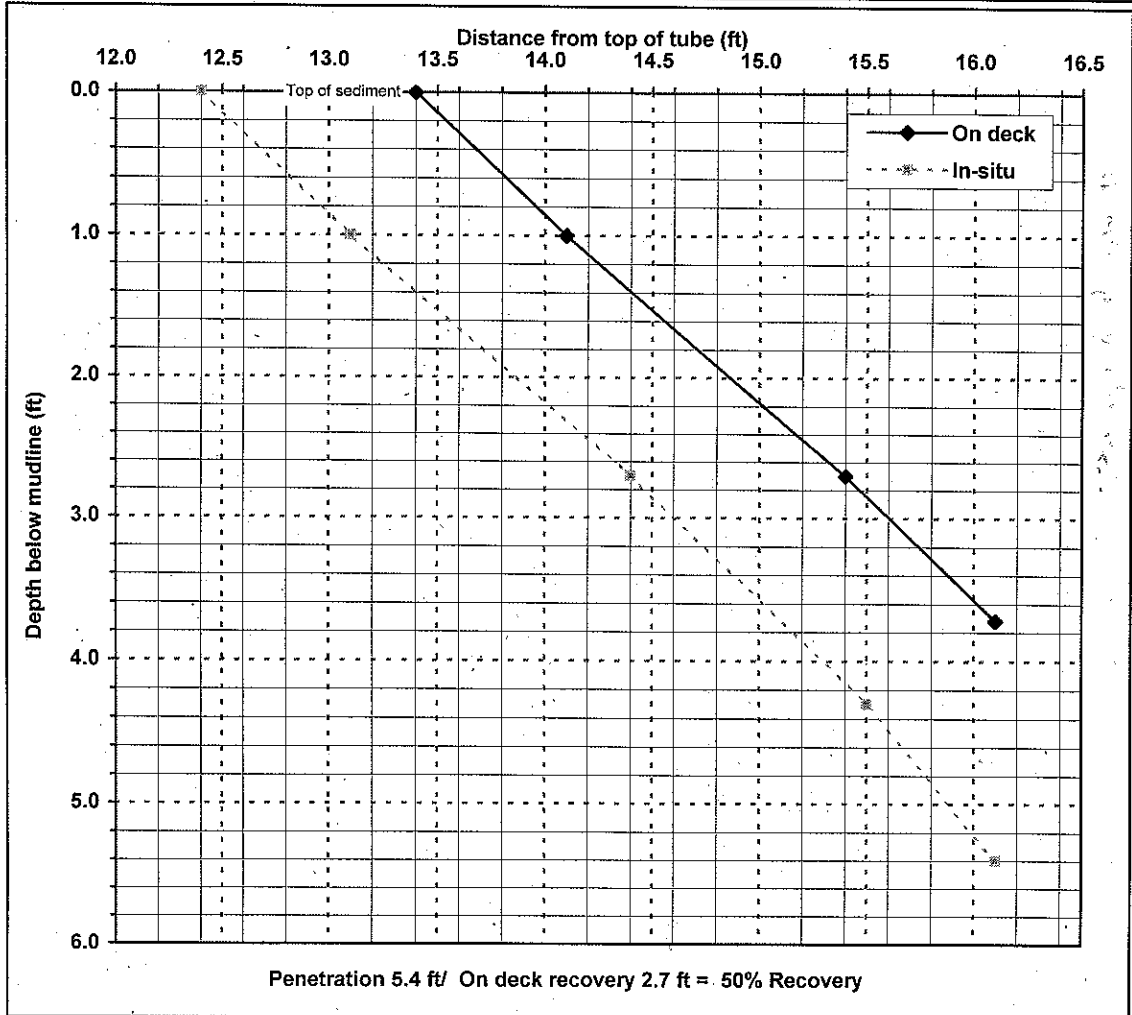
Mudmole™ Bore Log

Project: LDWG Duwamish Coring	Station: 40 R1	
Project No: 341185.001	Position: NAD83	WAN
Collected by: GSM	200341	Northing
Date: 2/15/2006	Time: 15:00	Easting
Water depth: 8.0 ft	Mudline: -0.9 ft MLLW	(estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A

Driven to refusal



Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-1	0.7	70%
1-2.7	1.3	76%
2.7-4.3	1.1	69%
4.3-5.4	0.6	55%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	13.4
1	14.10
2	14.86
3	15.61
4	No sample
5	No sample
6	No sample
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-15-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 40 R1

Tube Length (ft): 16.1

Water Depth (ft): 8.0

Est. Tide Height (ft): 7.1

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 200341

Easting 1270307

On Deck Top of Sediment 13.4

Comments: incoming tide - diver depth 8A - visibility 1A

flat bottom - no visible debris - silty clay

20A off station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.1</u>	<u>15.4</u>	
<u>13.4</u>	<u>14.1</u>	
<u>11.8</u>	<u>13.0</u>	
<u>10.7</u>	<u>12.4</u>	
		<u>refusal</u>
		<u>penetration suddenly</u>
		<u>stopped</u>

Station Number: 40

Date: 02/15/06

Station Arrival Time: 1445

Attempt: 1

Core Tube Length: 16.1

Station Departure Time: 1607

Field Technician: TD

Lead Line Water Depth: 8.0

Dist. From Target Station: 10

"Trotsky" site

Contractor: MCS/RSS

Latitude: 200341

On-site Visitor: _____

Longitude: 1270307

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, wood pilings and dolphins, barge to southeast, tires, barges to northeast

Sediment surface & slope: flat bottom, silty-grey, no visible debris

Water current and visibility: 1 ft vis., flood tide

Diver Water Depth 8 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1503 Drive Completion Time: 1507 Drive Offset: _____

Estimated angle of drive: Est 10° off

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.1	15.4	deck measured, free fall
13.4	14.1	moderately easy drive
11.8	13.0	moderate drive
10.7	12.4	moderate → difficult drive, hit something hard, refusal penetration suddenly stopped
TOTAL 5.4	TOTAL 3.7	Percent Recovered: <u>68.5%</u>

Reason for ending drive: refusal

If refusal, reason for refusal: hit something hard

Extraction Observations:

Tension on line? yes Stability of vessel: no problem

Overlying water in core (quantity and description): yes, clear, ~1.5L

On Boat Recovery: 13.4 Loss of Sediment: 1 ft.

Extraction Notes: (i.e. winch or hammer, easy, hard) winch, moderately easy

On Deck Observations:

Staining: trace dark silty sand, sprayed off.

Tube Deformation: none

Sediment Description (odor or sheen?): gray, med. sand, no odor, no sheen

Keep or Retry: diver inserted screen plug at sed/H₂O interface
will probably retry tomorrow or today.

Notes:
Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log



Job: LDWG Core Processing

Core Location/Sample Number: SC-40-R2

Job Number: PERD-18220-SIT

Date/ Time: 2/16/16 1355

No. of Sections: 1

Sample Logged by: LM'Lee

Sample Length (from log): 2.1

Type/Diameter of Sample: 4" sq. aluminum

Avg. % Compaction:

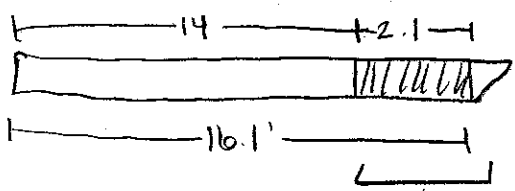
Sample Quality: good fair poor disturbed

Notes: Pen = 6.0' 2 Rec = 34'
DA Deck Rec. = 2.0'S

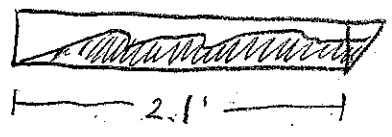
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
1		UNIT OLEYI 3/1 v.d. greenish grey	UNIT: -	90	10		D.O-2.1 SAND with SILT clasts (up to 3") and layers of fine-course sand up to 1" thick SAND = very fine-fine, moist, ol. brown SILT = sl. sandy, black, moist, stiff, low compressibility, rootlets	1	*		SAND
2		+ BESS OLEYI 2.5/10 greenish black	interbed:	2	98		SAND interbeds = coarse-med. multicolored grains up to 1" thick @ 1.9' piece of glass ~ 0.1' L	2			
3							End of Core 2.1 * No chemistry No Physical	3			

2/16/06
LM

SC-40-R2



Mudline = 14



40% winnowing

core shoe is 2/3 full due to winnowing

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 40 R2

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

200337

Northing

Date: 2/15/2006

Time: 15:38

1270321

Easting

Water depth: 9.1 ft

Mudline: -1.6 ft MLLW (estimated using tide tables)

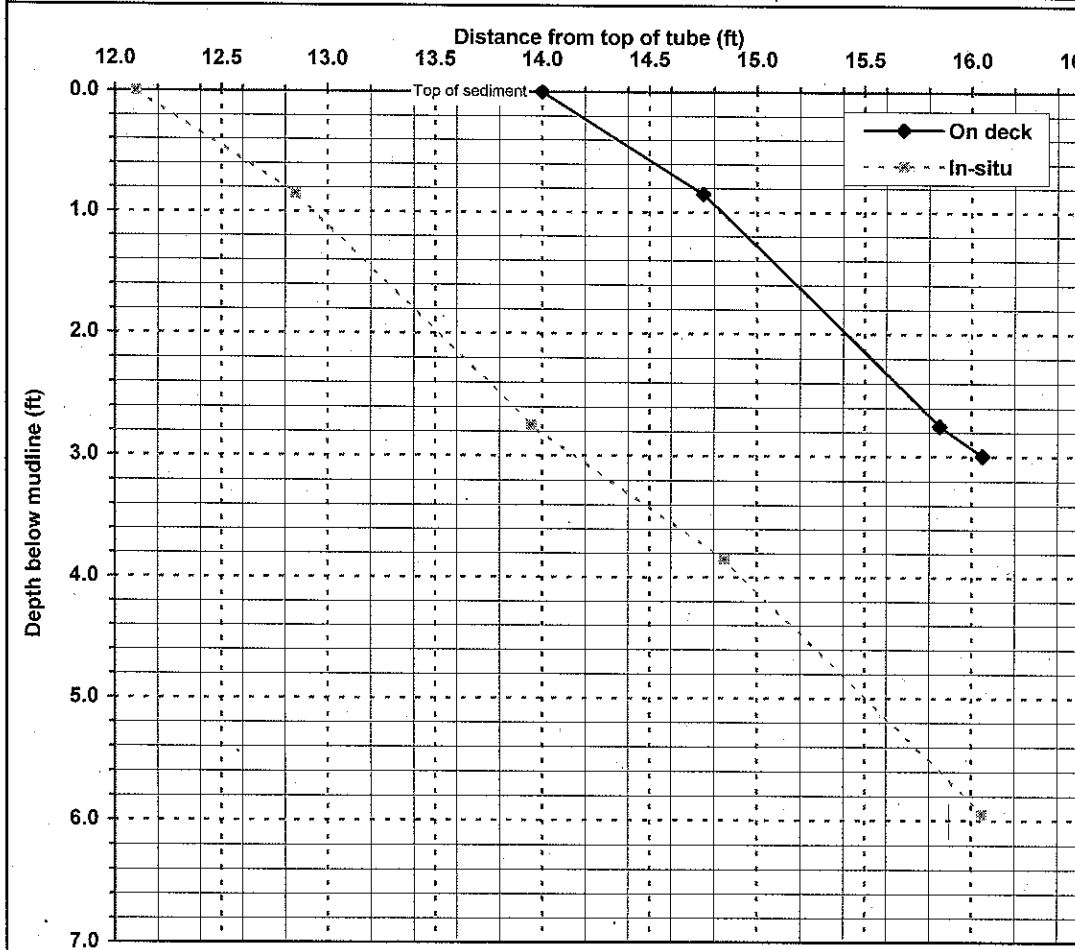
Place Field ID Label Here

Weather/Comments: N/A

Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-0.85	0.75	88%
0.85-1.1	1.1	58%
1.1-1.2	0.9	82%
1.2-1.6	1.2	57%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	14
1	14.84
2	15.42
3	No sample
4	No sample
5	No sample
6	No sample
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Penetration 5.95 ft/ On deck recovery 2.05 ft = 34% Recovery

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-15-06 Recorder: GSN

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 40 R2

Tube Length (ft): 16.05

Water Depth (ft): 9.1

Est. Tide Height (ft) _____ (MLLW)

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 200337

Easting 1270321

On Deck Top of Sediment 14.0

Comments: 24 ft off station (moved offshore) diver depth 9 ft

visibility 2 ft - silty sand -

Penetration Tape Reading

Recovery Tape Reading

Comments

15.2

15.3

13.3

14.2

12.2

13.3

10.1 ~~9.7~~

12.1

penetration suddenly slowed
refusal

Station Number: 40 Date: 02/15/06 Station Arrival Time: 1445
 Attempt: 2 Core Tube Length: 16.05 Station Departure Time: 1607
 Field Technician: TP Lead Line Water Depth: 9.1 Dist. From Target Station: 24
 Contractor: W/S/P/S Latitude: 200337 *near offshore*
 On-site Visitor: _____ Longitude: 1270321

Trotter site

Pre-Drive and Diver Observations:

Shoreline & surrounding area: same as R1
 Sediment surface & slope: flat bottom, silty-clay, no visible debris
 Water current and visibility: 1 ft. vs. flood tide
 Diver Water Depth 9 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1537 Drive Completion Time: 1546 Drive Offset: _____
 Estimated angle of drive: Est 10° off to 20° off

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.2	15.3	deck measured, free fall
13.3	14.2	easy-moderate drive
12.2	13.3	moderate drive
10.1	12.1	moderate drive - difficult, diver measured
		moderate - difficult drive, refusal
TOTAL 5.95	TOTAL 3.95	Percent Recovered: <u>66.4</u>

Reason for ending drive: refusal
 If refusal, reason for refusal: hit hard material

Extraction Observations:

Tension on line? Yes Stability of vessel: list to port
 Overlying water in core (quantity and description): yes, clear, ~ 2L
 On Boat Recovery: 14.0 Loss of Sediment: ~ 2 ft.
 Extraction Notes: (i.e. winch or hammer, easy, hard) moderate, winch

On Deck Observations:

Staining: trail of silt/sand, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): wet gray sand no odor no sheen.

Keep or Retry: Diver inserted screw plug at sd/lb.O interface
core kept, pending decision to resample

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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This may be a Bill station

Tip not deformed.

med-sand - lost out bottom.



Sediment Core Processing Log

Job: LAWG Core Processing
 Job Number: POBS 18220-511
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____

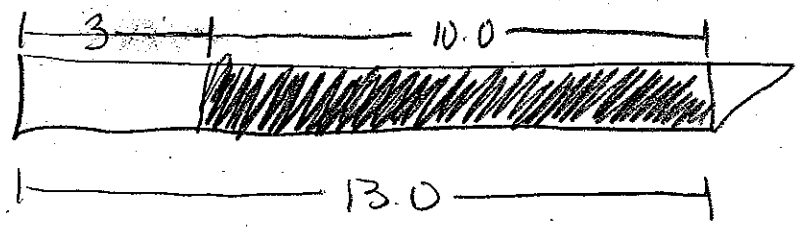
Core Location/Sample Number: SC-40 AR3
 Date/ Time: 2/24/06 0839
 Sample Logged by: LM, CB
 Type/Diameter of Sample: 3" round
 Sample Quality: good fair poor disturbed

Notes: Pen = 13.0'
On Deck Rec. = 10.0' 77% Rec

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch	
1		1.5-1.2 4/2 Brown	-	90	10	0	0-0.4 damp, med-dense med SAND w/ multicolored grains (red, orange, white)		0-1.3 0915		SAND	@0.2 TV=0.0 BIG
		2.5-1.1 black + grey 4/1 dark grey	-	10	90	0	0.5-1.3 alternating layers of moist, sl. stiff sl sandy black (brg) SILT (2") and moist, med-dense grey sl. sandy SILT (3") 0.0-0.9 shell fragments in black SILT ~ 1/2" & and barnacle, wood fragment 1/2" L x 1/4" thick ↓ increasing sand layers (grey) transitional		GT 1.2 3.1602 1.802		SILT (brg) SAND	@0.7 TV=1.6 BIG
2		1.5-1.2 4/2 Brown	20	90	10	0	SAND: moist, med-dense, brown SANDS w/ multi-colored grains (orange, white, red) w/ med-course grains 1.9-1.9 layer of gravelly sand w/ subrounded gravel up to 1" & piece of brick 0.1' L		1.3-2 0920		SAND	← gravel
3									2-4 0925 GT 2.5			@2.2 TV=0.1 BIG
4												@3.0 TV=0.7 BIG
5		grey 3/1 v. dk grey					@ 4.4 color change to grey SAND from 4 8' slight H ₂ S like odor		4-6 0930			
6												

2/24/06
LM
(CB)

SC-40-R3



core catcher was 0% full (empty)
0.5' sediment loss

Thai's field notes indicate that → end of core was full of med. brown sand w/ multicolored grains & SILT

Note: top 1.5' of core tube was erroneously cut off.
This section was opened with the rest of the core tube and logged as the top of the core.
(brown med. SANDS) -LM



Sediment Core Processing Log

Job: LSWB Core Processing
 Job Number: PDS-18220-511
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: SC-40 (R3)
 Date/ Time: 2/24/06
 Sample Logged by: LM, CB
 Type/Diameter of Sample: 3" Round
 Sample Quality: good fair poor disturbed

Notes: CONT'D

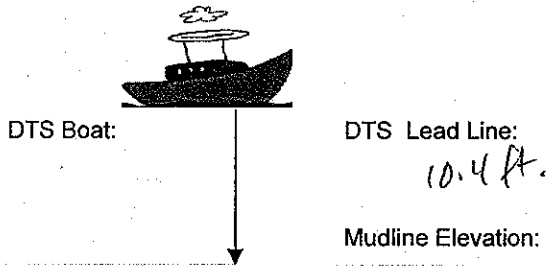
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
							From 6.0-10.0' SAND largely coarsens downward w/ some residual regions of medium-grained sand spread occasionally throughout	7			
							↓ coarsening downward	8			SAND
								9			
								10			
							End of core @ 10.0'				



SEDIMENT CORE DRIVE LOG

Project: <i>LDW Subsurface Sed.</i>	Core Location: <i>LDW-SC4D</i>	
Project #: <i>05-09-06-32</i>	Date: <i>02-23-06</i>	Time: <i>1030</i>
Field Crew: <i>TD</i>	Attempt #: <i>3</i>	Accept/Reject
Contractor: <i>MSS</i>	Sample Method: <i>Vibracore</i>	

Proposed Coordinates		Actual Coordinates	
N: <i>200339</i>	E: <i>1270298</i>	N:	E:
Mudline:		Mudline:	
Core Drive:		Core Drive:	Core Recovery:



Tide Measurements (Datum:)

Time/Height:

Time/Height:

Description:

(free fall, fingers inverted, vibration needed to drive/extract, estimation of density, debris encountered, slopes, refusal, mudline conditions, drive action, etc.)

*easy down all the way.
no obstructions
no free fall*

Measurement (to nearest 0.1 foot):





Avg. % Recovery:

Avg. % Compaction:

Description at Cuts:

Core Tube Length:



Section:	Length:
A = 	<i>~ 0.3</i>
B = 	<i>10 ft.</i>
C = 	
D = 	

*med. brown multicolored sand - some silt.
med. brown multicolored sand*

Total Drive: *13 ft.* Length Recovered: *10 ft.*

Notes: *v 7.5 ft off target. may have lost ~1 ft out of end during extraction -> soupy sand silt.*

13 ft penetration, 10 ft recovery = 76.9%

core catcher end: nothing b/c washed out.

med. brown & multicolored sand w/silt.

catcher end cut off 0.5 ft - not retained, b/c clean of sediment.

Sediment Core Processing Log

Job: LDWG Core Processing
 Job Number: PORS-18220-511
 No. of Sections: 1
 Sample Length (from log): 7.91
 Avg. % Compaction: _____

Core Location/Sample Number: XC-41 (R1)
 Date/Time: 2/21/06 1020
 Sample Logged by: LM 1020e
 Type/Diameter of Sample: 4" sq AUM.
 Sample Quality: good fair poor disturbed

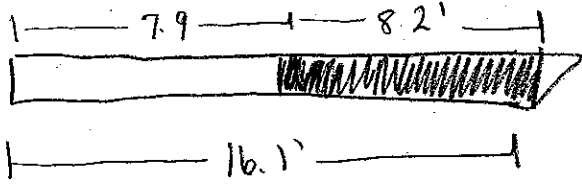
Notes: Pen = 11.6 (66) Rec
on Deck Rec = 7.7

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.54 4/3 olive brown		10	90	✓	0-0.5 SILT soupy, wet, brown sl sandy SILT @ 0.3 sheen floret ~ 0.05' L low competency, low plast. transition		0-1 1030 4.1602		SILT
		2.54 2.54 black		10	90	✓	0.5-6.4 ORG SILT moist, soft-med. dense, black (org) sl sandy SILT w/ woody fragments + occasional rootlets spread throughout	1			
		0.45 sl grey	tr		98	✓	1.2-1.3 layer of soft, moist, olive-grey clayey SILT interbedded in ORG SILT SILT is low plasticity, sl. compressible @ 1.5' woody fragments ~ 0.2" L	1-2 1035 6T1.2 4.1602			@ 1.2 TV = 0.2 BIG ← wood
		2.54 2.54 black		10	90	✓	SILT is blocky, uniform, massive @ 2.5' woody fragments of 0.1' L @ 2.8' shell fragments of 0.1' L @ 3.0' woody fragment of 0.3' L	2 3	2-4 1040 6T3.2 4.1602		SILT (6026) ← shells
							@ 4.1 sheen floret in smear zone ~ 0.05' L	4			@ 3.5' TV = 11 BIG
							@ 4.9' sheen floret in smear zone ~ 0.05' L	5	4-6 1045 2.1602		@ 5.3 TV = 1.8 BK
							@ 5.4' sheen floret ~ 0.05' L in smear zone 5.6-5.8 woody fragments, small ~ 0.05' L	6			

SG 41- R1

2/21/06

LM



midline = 7.9

$$\begin{array}{r} 16.1 \\ - 7.9 \\ \hline 8.2 \end{array}$$

core catcher folded around
 Sediment. Grey-bl. sl. sandy SILT
 No sediment in last 0.2' of core shoe.

winnowing from 3.9 - 4.2'



Sediment Core Processing Log

Job: LDNG Core Processing
 Job Number: PORS-18220-511
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:

Core Location/Sample Number: SC-41 (R1)
 Date/ Time: 2/21/10
 Sample Logged by: LM
 Type/Diameter of Sample: 4" Sq ALUM.
 Sample Quality: good fair poor disturbed

Notes: Pen = 3
on Deck Rec = 3

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		SAA	- SAA -				SILT (cont'd)		6-7.9' 10SD 2/16/02		1 1 SILT (ORG) TV=2.3 BIG
		GLEY 1 3/11 v. dk greyish grey		98		6.9-7.3	transitional moist, soft, olive-grey clayey SILT	7			SILT
		GLEY 2 5/10/05 bluish grey		90			transitional damp fine grey sandy silt layers grading to fine grey sand layers interbedded w/ org SILT sharp				SILT SAND
				90			damp moist, med dense med grey SANDS well sorted				SAND
							End of core @ 7.9'	8			
							Sheen test: 0-0.5: No sheen				
								9			

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-20-06 Recorder: GSW

Project: 341185.001 Windward Lower Duwamish Coring



Station Name: 41 R1

Position Information

Tube Length (ft): 15.6

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 15.6

Time: 1044

Northing 200294

Est. Tide Height (ft) 8.9

(MLLW)

Easting 1271170

Est. Mudline: _____

(MLLW)

On Deck Top of Sediment 7.9

Comments: Falling tide - diver depth 15' - silty bottom - 5 ft variability

no slope -

0.7 ft off station

Penetration Tape Reading

Recovery Tape Reading

Comments

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.4</u>	<u>14.6</u>	
<u>12.4</u>	<u>12.5</u>	
<u>10.5</u>	<u>10.3</u>	
<u>8.0</u>	<u>8.6</u>	
<u>6.0</u>	<u>7.2</u>	
<u>4.0</u>	<u>6.0</u>	<u>goal reached</u>

Mudmole™ Bore Log

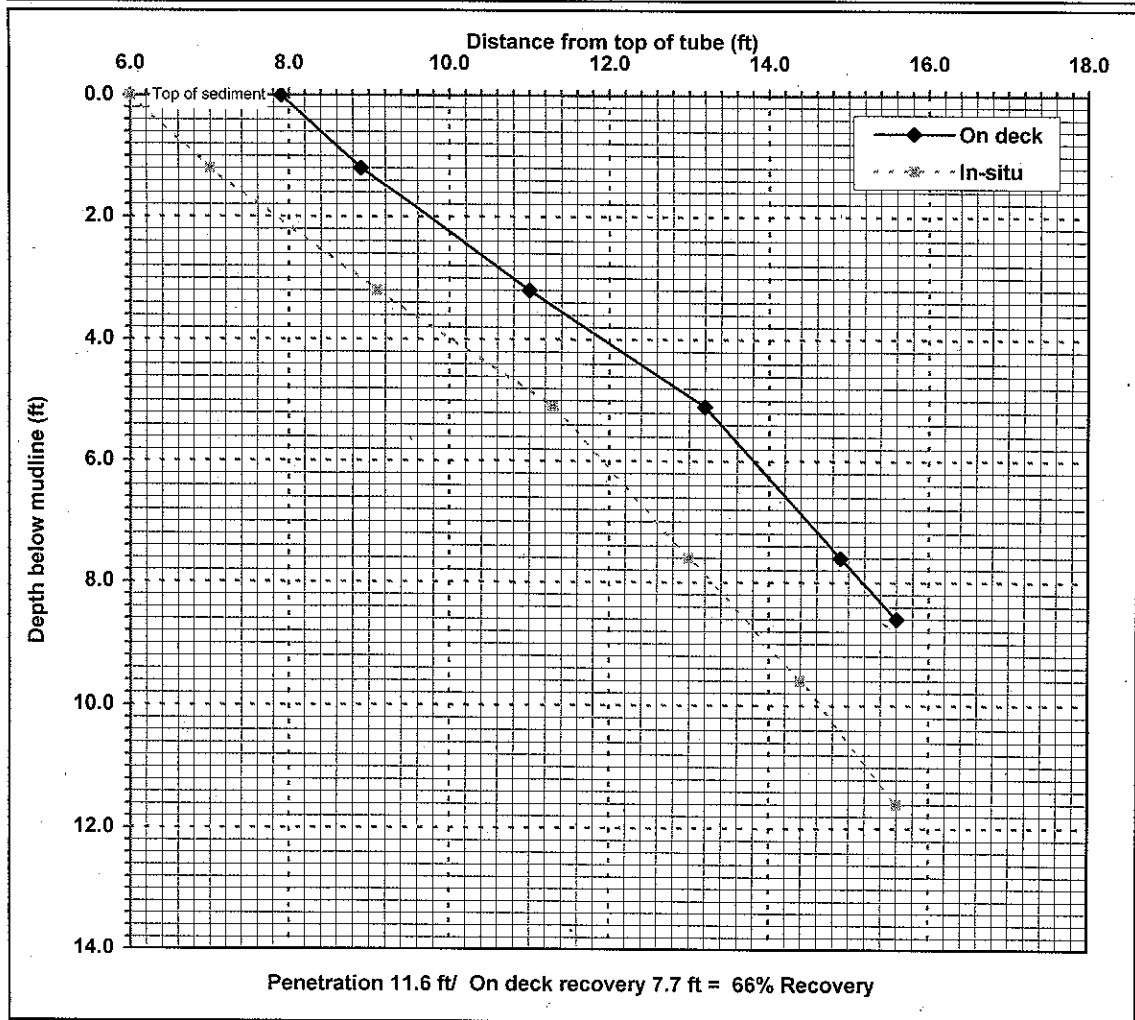
Project: LDWG Duwamish Coring **Station:** 41 R1
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 200294 Northing
Date: 2/20/2006 **Time:** 10:44 1271170 Easting
Water depth: 15.6 ft **Mudline:** -6.7 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-1.2	1	83%
1.2-3.2	2.1	105%
3.2-5.1	2.2	116%
5.1-7.6	1.7	68%
7.6-9.6	1.4	70%
9.6-11.6	1.2	60%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	7.9
1	8.73
2	9.74
3	10.79
4	11.93
5	13.08
6	13.81
7	14.49
8	15.18
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-1.2	1	83%
1.2-3.2	2.1	105%
3.2-5.1	2.2	116%
5.1-7.6	1.7	68%
7.6-9.6	1.4	70%
9.6-11.6	1.2	60%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	7.9
1	8.73
2	9.74
3	10.79
4	11.93
5	13.08
6	13.81
7	14.49
8	15.18
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 41
 Attempt: 1
 Field Technician: JMF
 Contractor: MCS/RSS
 On-site Visitor: —

Date: 2/20/06
 Core Tube Length: 15.6
 Lead Line Water Depth: 15.6
 Latitude: 200 294
 Longitude: 127 1170

Station Arrival Time: 1030
 Station Departure Time: 1110
 Dist. From Target Station: 0.7

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, wood pier, dock + pilings
 Sediment surface & slope: Silty bottom, no slope
 Water current and visibility: 5 ft vis
 Diver Water Depth 15 Tip Probe Depth — Disk Probe Depth —

Drive Observations:

Drive Initiation Time: 1048 Drive Completion Time: 1054 Drive Offset: —
 Estimated angle of drive: under water, est +10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
14.4	14.6	diver recorded free fall
12.4	12.5	easy drive
10.5	10.3	easy drive
8.0	8.6	easy drive
6.0	7.2	easy drive
4.0	6.0	easy drive, reached penetration goal
TOTAL 11.6	TOTAL 9.6	Percent Recovered: <u>82.8%</u> (do. 4% on deck)

Reason for ending drive: reached penetration goal
 If refusal, reason for refusal: —

Extraction Observations:

Tension on line? 7 Stability of vessel: no problem
 Overlying water in core (quantity and description): slightly turbid, ~1.5 L
 On Boat Recovery: 7.9 Loss of Sediment: 1.9 26.1% recovery - on boat
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: some silt, rinsed off
 Tube Deformation: no
 Sediment Description (odor or sheen?): dark grey, silt w/ trace fines and

Keep or Retry: could not insert JF
diver inserted screw plug at sed/H₂O interface
since core catcher was bulging out

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

The RETEC Group, Inc.
 1011 SW Nikolai Way, Suite 207
 Seattle, WA 98134-1162



206.624.9349 Phone
 206.624.2839 Fax
 www.retec.com

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-21-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 41 R2

Tube Length (ft): 15.6

Water Depth (ft): 9.7

Est. Tide Height (ft) 3.0

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Time: 1445

Northing 200286

Easting 127165

On Deck Top of Sediment 7.4

Comments: Falling tide - diver depth 8' - visibility 1 ft -

silty bottom - no current - no slope

~ 9 A off station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>12.9</u>	<u>13.4</u>	
<u>9.3</u>	<u>10.8</u>	
<u>11 7.5</u>	<u>9.5</u>	
<u>5.6</u>	<u>8.0</u>	
<u>3.5</u>	<u>6.5</u>	
<u>1.8</u>	<u>5.3</u>	
<u>0.2</u>	<u>4.3</u>	<u>full penetration</u>

Mudmole™ Bore Log

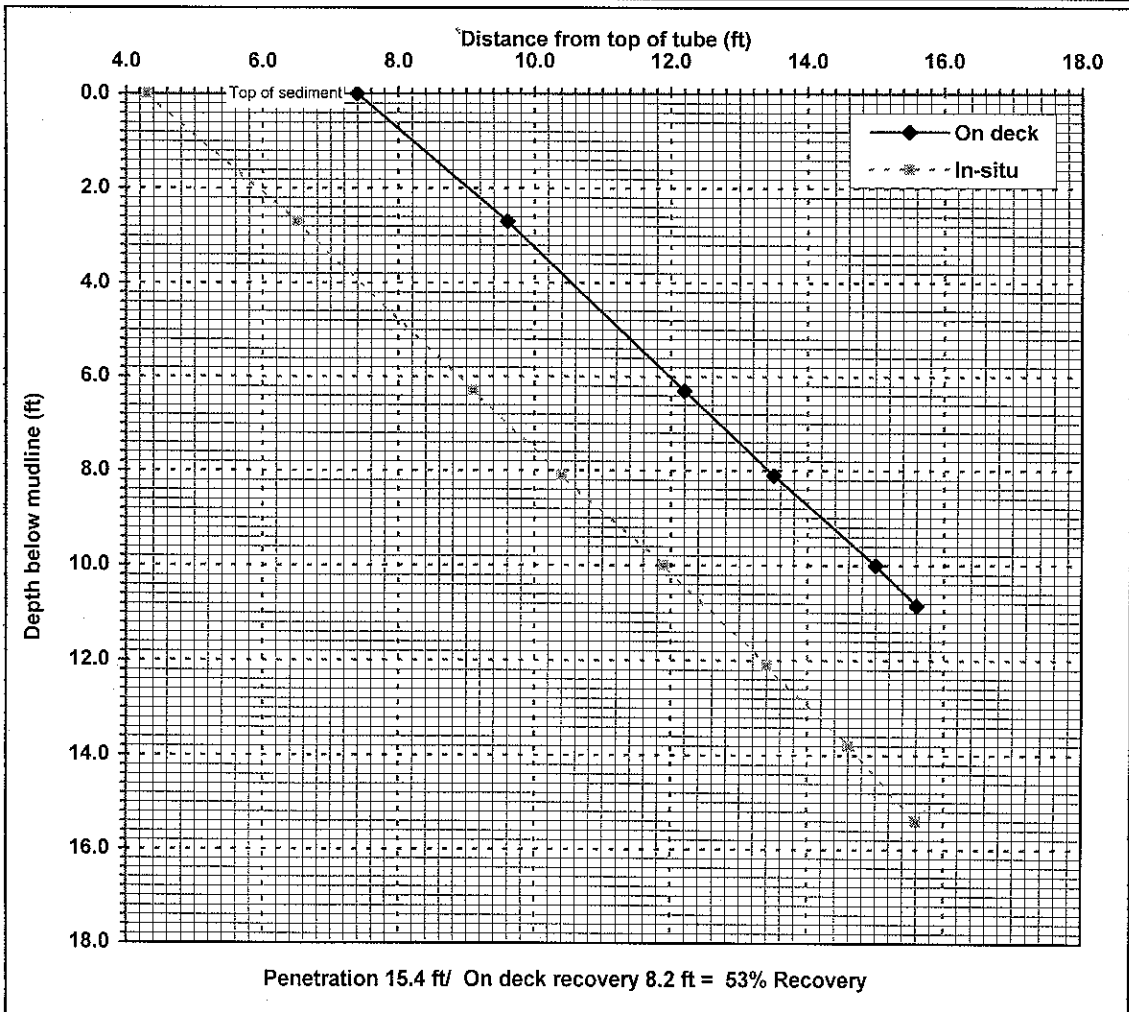
Project: LDWG Duwamish Coring **Station:** 41 R2
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 200286 Northing
Date: 2/21/2006 **Time:** 14:45 1271165 Easting
Water depth: 9.7 ft **Mudline:** -6.7 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A
 Full penetration

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------



0-2.7	2.2	81%
2.7-6.3	2.6	72%
6.3-8.1	1.3	72%
8.1-10	1.5	79%
10-12.1	1.5	71%
12.1-13.8	1.2	71%
13.8-15.4	1	62%

Mudline	7.4
1	8.21
2	9.03
3	9.82
4	10.54
5	11.26
6	11.98
7	12.71
8	13.43
9	14.21
10	15.00
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: A1
 Attempt: 2
 Field Technician: TD
 Contractor: MS/RSS
 On-site Visitor: —

Date: 02/21/06
 Core Tube Length: 15.6
 Lead Line Water Depth: 9.9
 Latitude: 206206
 Longitude: 1271165

Station Arrival Time: 1430 ^{TD}
 Station Departure Time: 1515
 Dist. From Target Station: 9

Pre-Drive and Diver Observations:

Shoreline & surrounding area: concrete rip rap, wood dolphins, cables, wood pier, barge "Rockport" in Myrtle St. embayment
 Sediment surface & slope: Silty bottom, no slope
 Water current and visibility: falling tide, no current, vis. 1 ft
 Diver Water Depth: 8 Tip Probe Depth: — Disk Probe Depth: —

Drive Observations:

Drive Initiation Time: 1451 Drive Completion Time: 1455 Drive Offset: —
 Estimated angle of drive: est 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
12.9	13.4	free fall, deck measured
9.3	10.8	easy drive, diver measured
7.5	9.5	easy drive
5.6	8.0	easy drive
3.5	6.5	easy-moderate drive
1.8	5.3	easy-moderate drive
0.2	4.3	moderate drive
TOTAL 15.4	TOTAL 11.3	Percent Recovered: <u>73.4%</u> (<u>53.2% on deck</u>)

Reason for ending drive: full penetration, no tube length left.
 If refusal, reason for refusal: —

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): clear
 On Boat Recovery: 7 ft Loss of Sediment: 3.1 ft.
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: dk silty streaks, sprayed off.
 Tube Deformation: none
 Sediment Description (odor or sheen?): black silt, fine sand, no sheen, slight petrol odor

Keep or Retry: diver inserted screw plug @ sed/H₂O interface, wrapped w/plastic by diver soft sed. slips down tube during extraction, even though the Mudstone is lifted slowly.

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)



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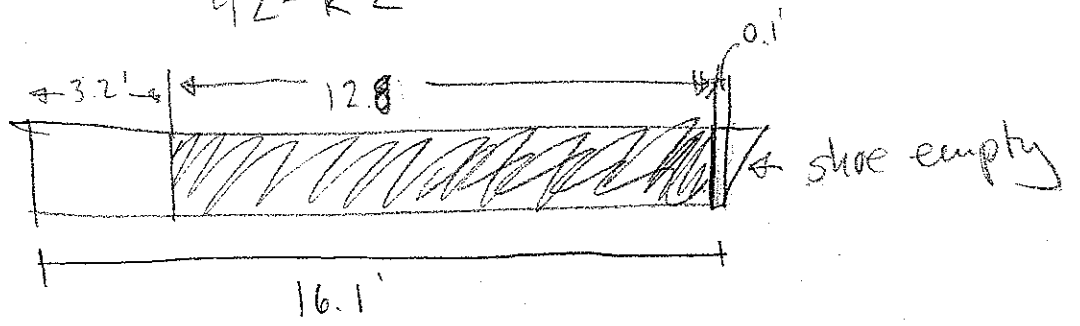
Sediment Core Processing Log

Job: LDWG Coring
 Job Number: PORS5-18220
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:
 Notes: Penet: 15.85 → R=79%
 On deck: 12.55

Core Location/Sample Number: LDWG-SC-42 R2
 Date/ Time: 2/8/06 1100 - 1220
 Sample Logged by: N. Bacher
 Type/Diameter of Sample: 4" sq. aluminium
 Sample Quality: good fair poor disturbed

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		GLEYS 3/10Y		12	88		loose, olive gray sl sandy silt, very trace twigs.				
1.0		GLEYS 2.5/N		5	95	⊕	moist, med. soft, black silt w/ trace to minor sand. sand decreases downward. trace H ₂ S odor. trace organic material scattered throughout (fibers, roots, wood shreds). slight to minor clay content, sediment B sticky.	1130	3-1602		
2.0						⊕		1135	3-1602		@ 0.7' TV=1.5 big
3.0								1140	3-1602		@ 1.3 TV=2.5 big
4.0		GLEYS 4/10Y		15	85		moist, med. soft, gray sl. sandy silt. minor roots, fibers. trace to minor black trace very small shells. sheen, no odor.				
5.0		GLEYS 2.5/N				⊕	moist, med. stiff, black sl. clayey silt, trace roots & fibers	1145	2-1602		@ 4.3' TV=2.25 big
6.0		GLEYS 4/10G	25	50	25	⊕	trace sand @ base, multicolored gran. orange red, w/ etc. moist to wet, med dense, gravelly silty sand, gravel B rounded and up to 2"				@ 5.7' TV=2.5 big

42-R2



Sediment Core Processing Log



Job: _____
 Job Number: _____
 No. of Sections: _____
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: LDWG-SC-42 R2
 Date/ Time: _____
 Sample Logged by: _____
 Type/Diameter of Sample: _____
 Sample Quality: good fair poor disturbed

Notes: _____

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, blots, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
7.0		GREY 1 2.5/N			100	Ø	trace sand @ base, medium multicolored granules (orange, red, white) moist, medium stiff, blackish gray clayey silt	1150	2-16oz		Sketches of sediment layers
9.0			5		75	Ø	SAA but only slightly clayey and scattered granules. apparent black sheen on matrix, no odor.	1155	2-16oz		Sketches of sediment layers with note: black sheen
10.0		GREY 1 4/104			100	Ø	black sheen ends. moist, med. stiff, grayish black silt w/ trace clay.	1200			Sketches of sediment layers with note: @ 9.5' TV=4.25 big
11.0							thin interbeds of pale olive gray clay ~ 1/8" ⇒ 1/4" thick @ 10, 10.6, 11, 11.3, and 11.5' @ 11.0' thin, plastic film piece.	1200			Sketches of sediment layers
12.0							no interbeds below 11.6 just grayish black silt w/ trace clay.	1200	2-16oz		Sketches of sediment layers

Sediment Core Processing Log



Job: _____
 Job Number: _____
 No. of Sections: _____
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: LDWG-SC-42 R2
 Date/ Time: _____
 Sample Logged by: _____
 Type/Diameter of Sample: _____
 Sample Quality: good fair poor disturbed

Notes: _____

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
13.0		GLEY 2 4/564		85	15		damp, med. dense, brownish gray silty fine sand. trace fine black streaks in matrix, horizontal End of core: 12.8'	13.0	13.0		

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-8-06 Recorder: GSW

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 42 R2



Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): ~~19.7~~ 20.2

Time: 942

Northing 199898

Est. Tide Height (ft) 8.8 (MLLW)

Easting 127 1361

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 3.5

Comments: Rising tide - ~~flat bottom~~ gentle slope toward channel

scattered debris - silty river depth 20ft

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.9</u>	15.6 <u>15.7</u>	<u>on core catcher</u>
<u>13.7</u>	<u>13.6</u>	
<u>10.6</u>	<u>10.7</u>	
<u>8.0</u>	<u>8.5</u>	
<u>6.7</u>	<u>7.6</u>	
<u>4.7</u>	<u>6.2</u>	
<u>2.7</u>	<u>4.8</u>	
<u>1.7</u>	<u>4.2</u>	
<u>0.2</u>	<u>3.2</u>	

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 42 R2

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

199898

Northing

Date: 2/8/2006

Time: 9:42

1271361

Easting

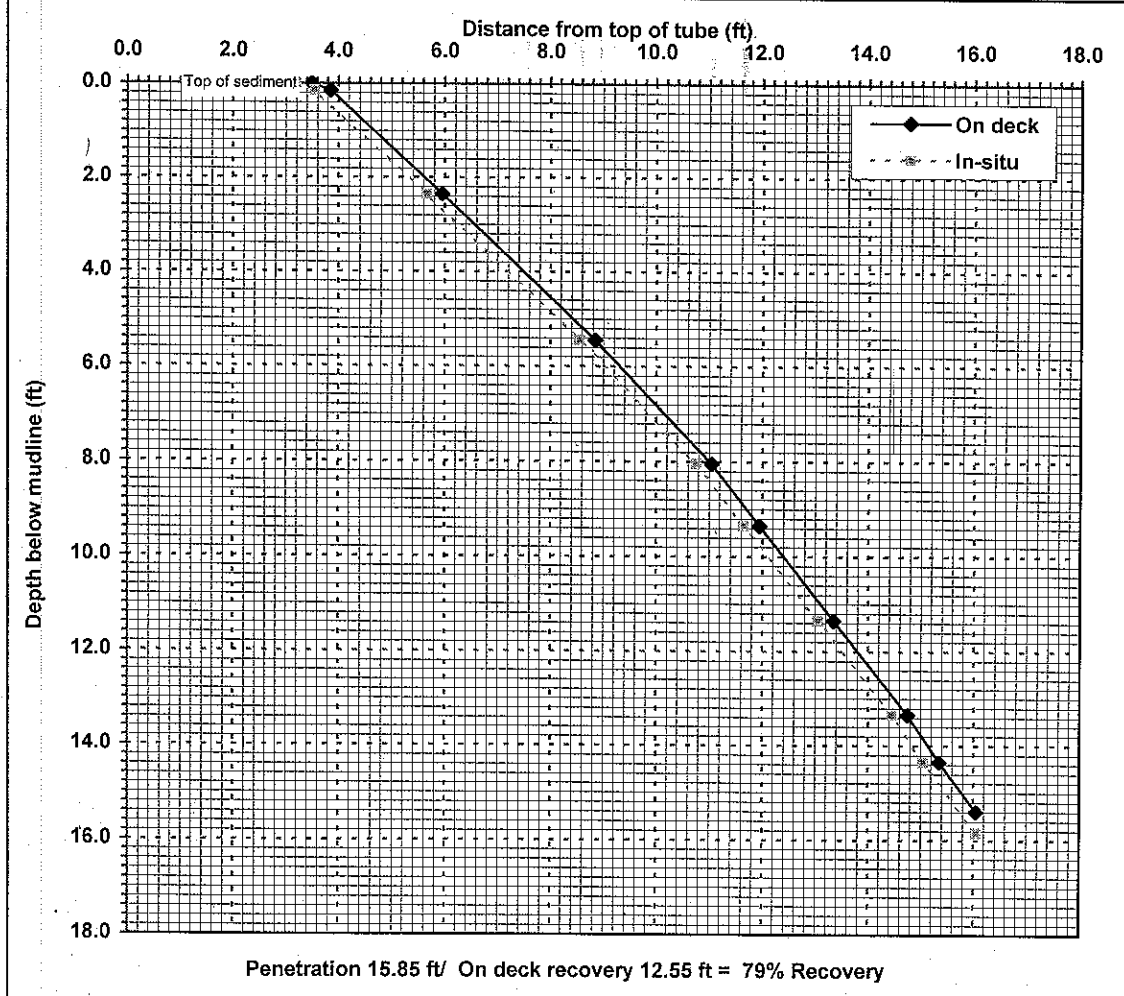
Water depth: 20.2 ft **Mudline:** -11.4 ft MLLW (estimated using tide tables)

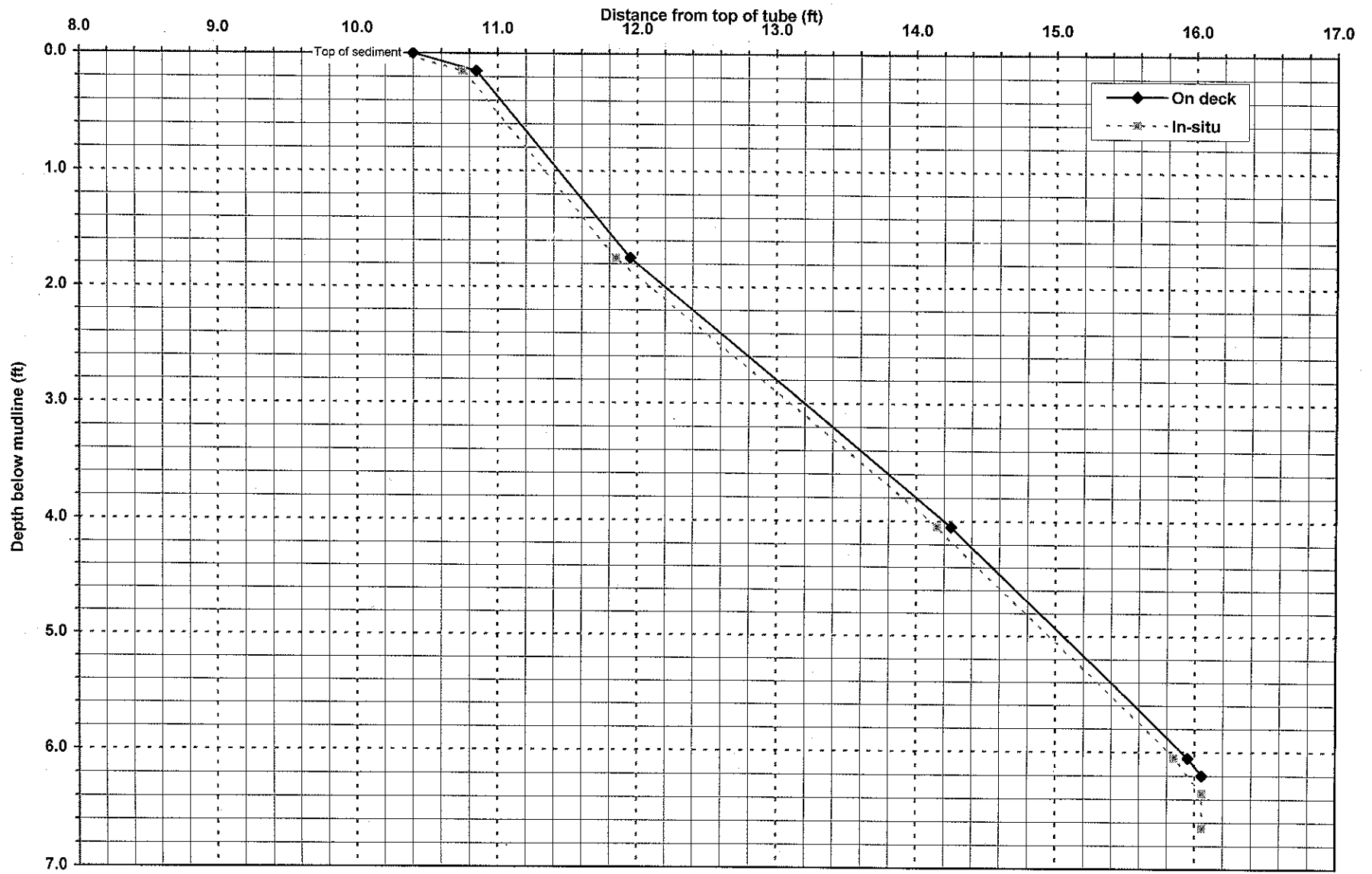
Place Field ID Label Here

Weather/Comments: Overcast

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
---------------------------	------------------------	------------------	--------------------------	--------------------------------

0-0.15	0.35	233%	Mudline	3.5
0.15-2.35	2.1	95%	1	4.66
2.35-5.45	2.9	94%	2	5.62
5.45-8.05	2.2	85%	3	6.56
8.05-9.35	0.9	69%	4	7.49
9.35-11.35	1.4	70%	5	8.43
11.35-13.35	1.4	70%	6	9.32
13.35-14.35	0.6	60%	7	10.16
14.35-15.85	1	67%	8	11.01
			9	11.71
			10	12.41
			11	13.11
			12	13.81
			13	14.51
			14	15.14
			15	15.78
			16	No sample
			17	No sample
			18	No sample
			19	No sample
			20	No sample





Penetration 6.65 ft/ On deck recovery 5.65 ft = 85% Recovery

Station Number: 42
 Attempt: 2
 Field Technician: TD, LM, AF
 Contractor: MLS, RGS
 On-site Visitor: ---
 Latitude: 199 898
 Longitude: 127 1361
5-6 ft off target

Date: 2/8/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 19.17^m 20.2 ft.
 Diver Water Depth: 20 ft.
 Tip Probe Depth: ---
 Disk Probe Depth: ---
 Drive Initiation Time: 0943^m 0946

Shoreline & surrounding area observations: barge nearby (just north of us); wood debris floating in water; rip rap along shore; board dolphins and pilings; blackberry bushes
 Sediment surface & slope description: gentle slope toward channel, scattered debris, silty
 Water current: flooding tide

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
15.9	15.7	(Drive offset:) cannot see, relayed by diver - easy
13.7	13.6	
10.6	10.7	
8.0	8.5	
6.7	7.6	
4.7	6.2	
2.7	4.8	
1.7	4.2	
0.2	3.2	

Estimated angle of drive: 90° ± 10° cannot see eqpt. - in water
 Reason for ending drive: out of tube length

Drive Completion Time: 0952

On Boat Recovery: 3.5 ON DECK TOP OF SEDIMENT

End of Core Tube Observations
Staining: <u>---</u>
Tube Deformation: <u>no</u>
Loss of Sediment: <u>screw plug inserted by diver at bottom (sed. surface)</u>
Sediment Description: <u>fin sand, gray-black</u>
Water in Tube: <u>yes, pumped out (9 pumps)</u>

(Keep) or Retry: good core. good natural plug - diver had to dig some out to insert screw plug

Notes:

Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Station Number: 42
 Attempt: 2
 Field Technician: LM
 Contractor: MCS
 On-site Visitor: None
 Latitude: —
 Longitude: —

Date: 2/8/06
 Core Tube Length: 16.05
 Lead Line Water Depth: ~~16.05~~ 19.50'; 20.2'
 Diver Water Depth: —
 Tip Probe Depth: —
 Disk Probe Depth: —
 Drive Initiation Time: 0946

Shoreline & surrounding area observations: See attempt 1 (R1) *100' from shore rip rap. Station in line with abandoned dolphin a kilometer out on shore*
 Sediment surface & slope description: scattered concrete debris, silty bottom,
 Water current: mild; visibility 1-2'

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
15.9	15.6	(Drive offset: —) easy drive diver measurement
13.7	13.6	easy drive -
10.6	10.7	moderate - drive
8.0	8.5	moderate - drive
6.7	7.6	↓
4.7	6.2	
2.7	4.8	
1.7	4.2	
14.35	11.85	

16.05
 1.70
 14.35

Totals

Estimated angle of drive: unknown - core tube not visible; extraction angle = 85-90°
 Reason for ending drive: —

Drive Completion Time: 0956 On Boat Recovery: 3.5

81%

End of Core Tube Observations
Staining: <u>none</u>
Tube Deformation: <u>none</u>
Loss of Sediment: <u>more on deck than in drive</u>
Sediment Description: <u>light - fine sand, gray-black = fill</u>
Water in Tube: <u>> 6 ft water</u>

Keep or Retry: Keep
sampled on the flood
NO trouble holding position w/ Y-anchor + stern anchor
Diver used screw plug at water-sed. surface; wrapped + foiled on deck (thermos plug)

Notes: Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

0933 - setting stern anchor for broad side wind
 Engine being left in gear due to wind in shallow area
 0940 Diver in water
 0959 Diver out of water

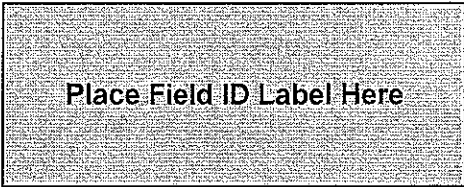
MCS Environmental MudMole Bore Log

Collection Information

Date: 2-7-06 Recorder: SM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 42 RA



Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 15.0

Time: 1554

Northing 199908

Est. Tide Height (ft) 1.5

(MLLW)

Easting 1271361

Est. Mudline: _____

(MLLW)

On Deck Top of Sediment 9.9

Comments: 0.4 penetration tape buried in bottom - offset data - core catcher tested

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.0</u>	<u>15.1</u>	
15.0		
<u>12.8</u>	<u>13.1</u>	
<u>10.5</u>	<u>11.1</u>	
<u>9.1</u>	<u>10.1</u>	
<u>7.3</u>	<u>8.5</u>	
5.7 <u>5.2</u>	<u>6.8</u>	
<u>4.0</u>	<u>5.9</u>	<u>penetration showed</u>
<u>4.0</u>	<u>5.8</u>	<u>refusal</u>

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 42 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

199908

Northing

Date: 2/7/2006

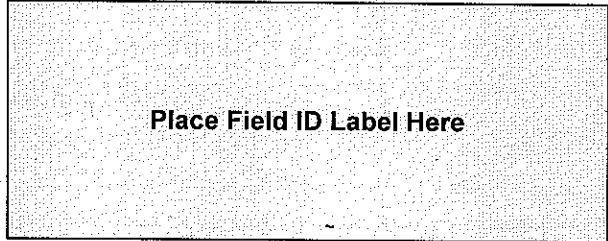
Time: 15:54

1271361

Easting

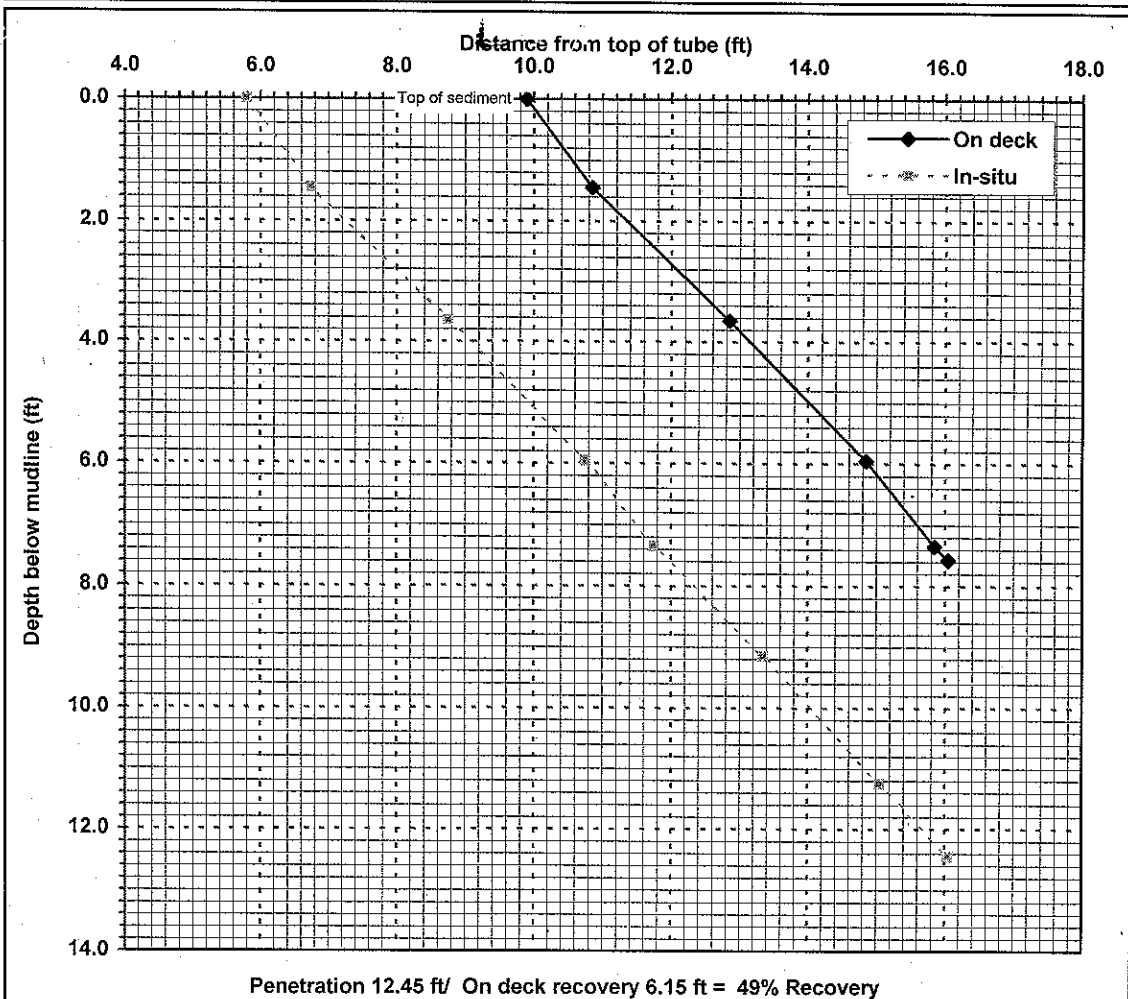
Water depth: 15.0 ft

Mudline: -13.5 ft MLLW (estimated using tide tables)



Weather/Comments: N/A

Penetration tape buried 0.4 ft field measurements offset, core catcher failed



Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-1.45	0.95	66%
1.45-3.65	2	91%
3.65-5.95	2	87%
5.95-7.35	1	71%
7.35-9.15	1.6	89%
9.15-11.25	1.7	81%
11.25-12.45	1	83%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	9.9
1	10.56
2	11.35
3	12.26
4	13.15
5	14.02
6	14.89
7	15.60
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 42
 Attempt: 1
 Field Technician: TD/CB/LM
 Contractor: MCS/RSS
 On-site Visitor:

Date: 02/07/05
 Core Tube Length: 16.05
 Lead Line Water Depth: 15.0
 Diver Water Depth:
 Tip Probe Depth:
 Disk Probe Depth:
 Drive Initiation Time: 1606

(NO) Latitude: 199900
 (EA) Longitude: 1271361

Shoreline & surrounding area observations: rip rap, barge tied up nearby
 Sediment surface & slope description: cannot see
 Water current: med strong ebb tide, light wind

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
15.0	15.1	(Drive offset:) 0.4 pen. tape buried in bottom
12.8	13.1	- core catcher failed
10.5	11.1	
9.1	10.1	
7.3	8.5	
5.2	6.8	
4.0	5.9	penetration slowed
4.0	5.8	

Estimated angle of drive: ~ 90° ± 10°
 Reason for ending drive: Refusal

Drive Completion Time: 1613

On Boat Recovery: 9.9 ON DECK TOP OF SEDIMENT

End of Core Tube Observations
Staining: <u> </u>
Tube Deformation: <u>no</u>
Loss of Sediment: <u>core catcher end</u>
Sediment Description: <u>cannot see</u>
Water in Tube: <u>yes, siphoned off</u>

Keep or Retry: lost ~ 4ft 1/2 of core catcher failure.

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Station Number: 42
 Attempt: 1
 Field Technician: LM, CB
 Contractor: MCS
 On-site Visitor: None
 Latitude: _____
 Longitude: _____

Date: 2/7/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 15.0'
 Diver Water Depth: 15.0'
 Tip Probe Depth: _____
 Disk Probe Depth: _____
 Drive Initiation Time: 11007

(9.0' off station)

Note: location is between two piers of the scrap yard near a set of dolphins unattached to the shoreline

Shoreline & surrounding area observations: rip rap, concrete, plastic, wiring/cable, unattached scrap yard refuse
 Sediment surface & slope description: clayey silt, flat
 Water current: moderate

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
		(Drive offset:) Diver measurements
15.0	15.1	super easy, very fast drive
12.8	13.1	super easy, very fast drive
10.5	11.1	
9.1	10.1	
7.3	8.5	
5.2	6.8	
4.0	5.8	and 4.0/5.9
12.05	10.25	

no guide used

Total

Estimated angle of drive: 80° from initial push, 80-85° later
 Reason for ending drive: refusal (11.0) Penetration

Drive Completion Time: 1105 On Boat Recovery: 9.9 core catcher failed

End of Core Tube Observations
Staining: <u>none</u>
Tube Deformation: <u>None</u>
Loss of Sediment: <u>none at bottom, much at sed-water surface</u>
Sediment Description:
Water in Tube: <u>water siphoned off tube</u>

Keep or Retry: Retry due to sediment loss

* Diver wrapped sed core in water and estimated that core-catcher may be missing; confirmed that sediment is being held in

Notes: Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

MOOD - Diver in the water

Sediment Core Processing Log

Job: LNAG Core Processing
 Job Number: POPS-18220-511
 No. of Sections: 1
 Sample Length (from log): 7
 Avg. % Compaction: 9.9%
 Notes: Pen = 15.9'
On Deck Rec - 9.9% } 62%

Core Location/Sample Number: SC-43 (R2)
 Date/Time: 2/23/06 0900
 Sample Logged by: LM
 Type/Diameter of Sample: 4" sq diam.
 Sample Quality: good fair poor disturbed

Torrane was not taken at this station
 (See R2 Core Log)

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		5YR 4/6 reddish red	-	10	90	0	low comp. sl sandy SILT moist, med stiff, sl sandy SILT	0-0.1 0.1-0.7	0-2 0.910	0-0.5 0.935 1.16oz	SILT SILT (org)
		2.5Y 2.5/1 black	-	10	90	0	blocky, massive, uniform, sl compress, low plast.		GT 0.9 3.16oz	0.5-1 0.938 1.16oz	
		2.5Y 5/1 grey + 2.5Y 2.5/1 black	-	10	90	0	alternating beds of: 1) moist, soft med stiff olive-grey clayey SILT (low plast., sl comp tills like play-doh) and 2) moist, med-dense black fine-med SAND w/ multicolored gravels (red, white, orange) SAND ranges in size from 1" layer to 0.1' layer AND SILT is dominant unit	transitional 0.7-	1	1.1-1.5 0.949 1.16oz	
		7.5YR 5/1 grey	-	90	10	0	@ 2.5-0.5" pocket of grey-brown clayey SILT		2	1.5-2 0.944 1.16oz	SILT + SAND
		7.5YR 5/1 grey	-	98	10	0	@ 3.0 SAND becomes dominant unit and SILT ranges in size 1" to 0.1' layers		3	2-2.5 0.947 1.16oz	
		7.5YR 4/1 dark grey	-	98	10	0	@ 3.8-4.0 layer of moist, dense, dark grey-brown fine sand, well sorted 4-9 silt has mottling w/ olive-grey clayey SILT		4	2.5-3 0.950 1.16oz	
			-	98	10	0			5	3-3.5 0.953 1.16oz	SAND + SILT
			-	98	10	0			6	3.5-4 0.958 1.16oz	
			-	98	10	0			7	4-4.5 0.959 1.16oz	
			-	98	10	0			8	4.5-5 1.002 1.16oz	
			-	98	10	0			9	5-5.6 1.008 1.16oz	
			-	98	10	0	@ 5.9 organic litter (leaves)		10	6-5.6 1.008 1.16oz	leaf

Sediment Core Processing Log



Job: LDWG Core Processing
 Job Number: POKS-18220-311
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: SC-43-R3
 Date/ Time: 2/23/06
 Sample Logged by: LM
 Type/Diameter of Sample: 4" S9 @ 1.5m
 Sample Quality: good fair poor disturbed

Notes: Pen =
On Deck Acc = CONT'D

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
							SAA		6.9		
			SAA				@ 7.1' 1" seams of SILT alternating with SANDS	7	0925		SAND + SILT
							@ 8.0 SAND is coarse & in a 0.1' layer returning to med. grained sand from 8.1-9.0	8			
							SAND Sharp damp, stiff, med-coarse black multi-colored grained SANDS ↓ coarsening downward	9	0930		SAND
							End of core @ 9.8'	10	21002		

Mudmole™ Bore Log

REDONE - KEEP

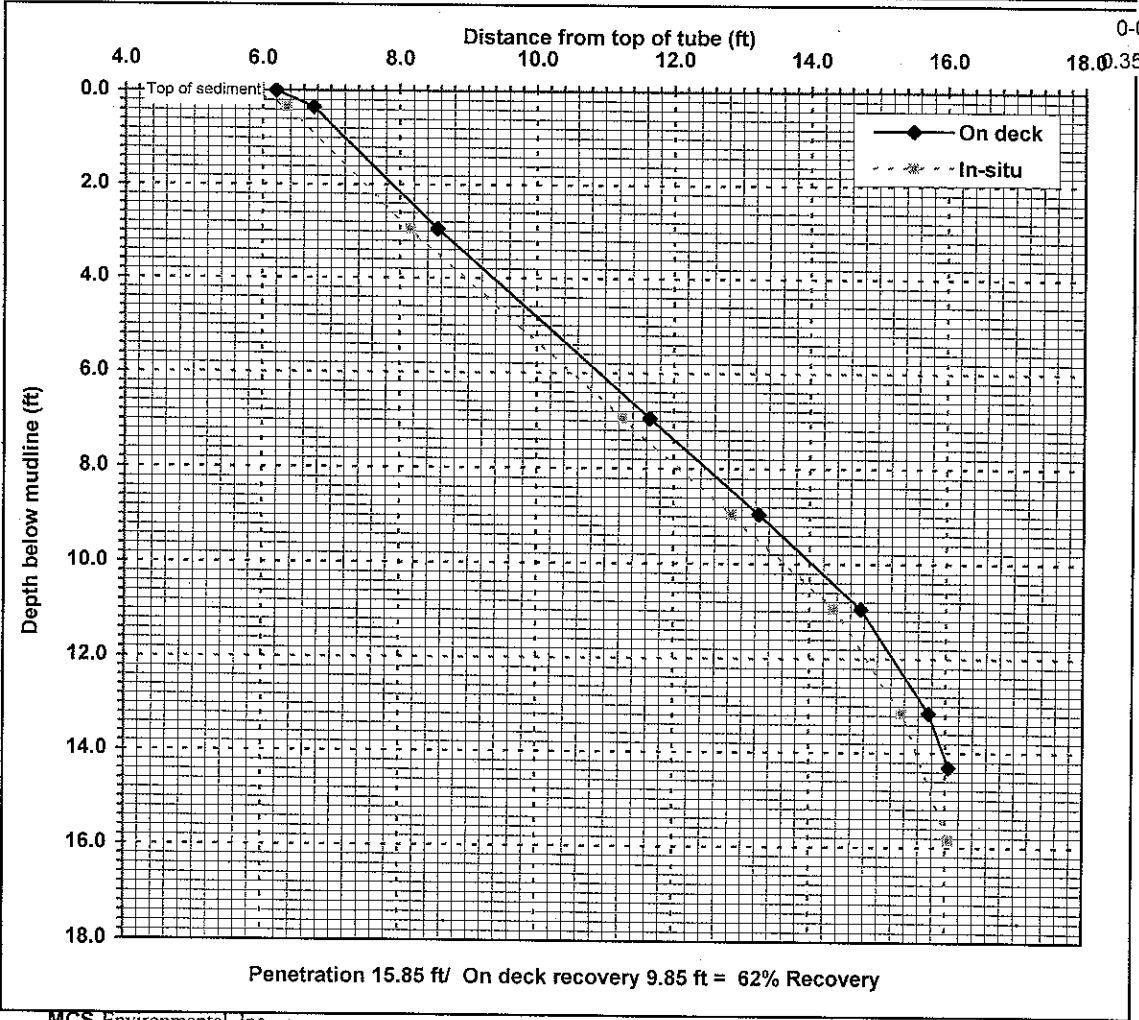
Project: LDWG Duwamish Coring
Project No: 341185.001
Collected by: GSM
Date: 2/22/16
Water depth: 11.1 ft
Station: 43 R3
Position: NAD83
Time: 14:50
Mudline: -7.2 ft MLLW (estimated using tide tables)

WAN
Northing
Easting
Place Field ID Label Here

Weather/Comments: N/A
 Full penetration, top of mud adjusted in field lab

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------



0-0.3500000000000000	0.55	157%
0.3500000000000001-2	1.8	69%
2.95-6.95	3.1	78%
6.95-8.95	1.6	80%
8.95-10.95	1.5	75%
10.95-13.15	1	45%
13.15-15.85	0.7	26%

Mudline	6.2
1	7.20
2	7.89
3	8.59
4	9.36
5	10.14
6	10.91
7	11.69
8	12.49
9	13.29
10	14.04
11	14.77
12	15.23
13	15.68
14	15.97
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Mudmole™ Bore Log

Project: LDWG Duwamish Coring
Project No: 341185.001
Collected by: GSM
Date: 2/22/16
Water depth: 11.1 ft
Station: 43 R3
Position: NAD83
Time: 14:50
Mudline: -7.2 ft MLLW (estimated using tide tables)
WAN
199287
1271846
Northing
Easting

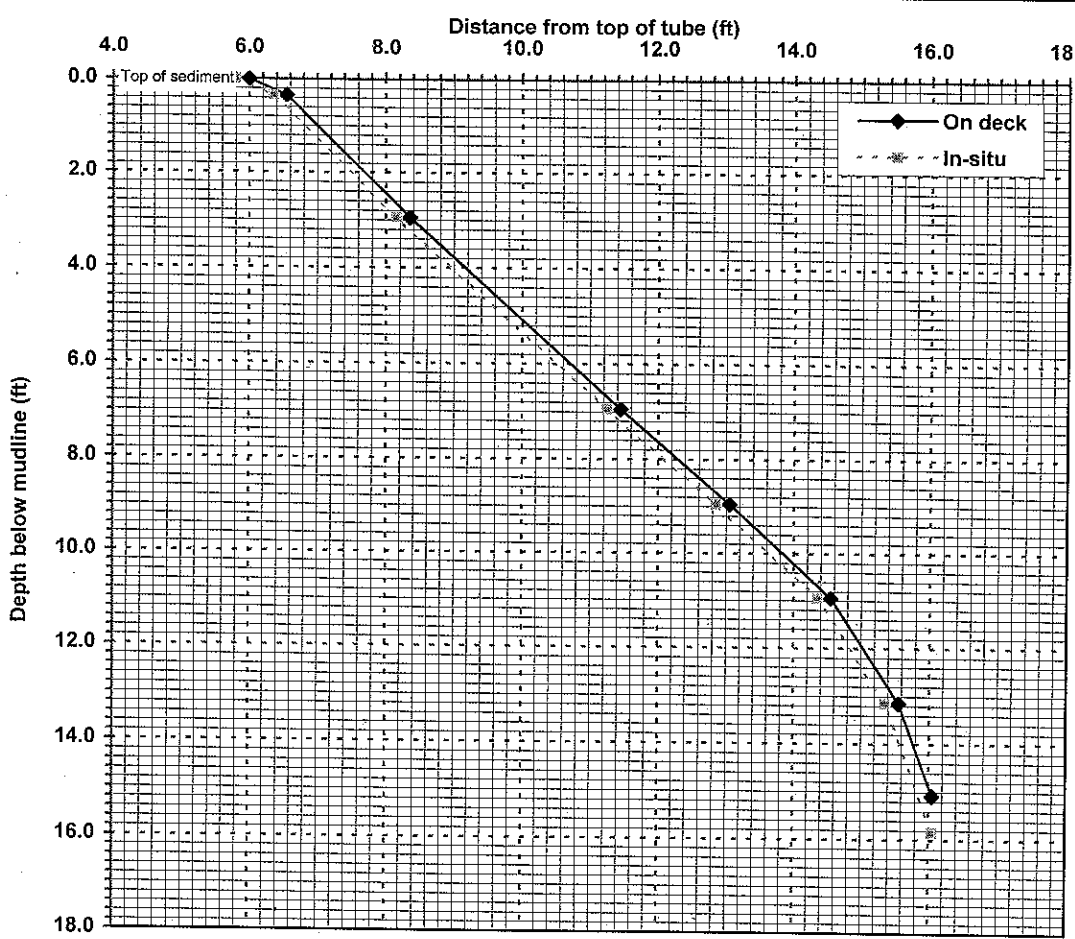
Place Field ID Label Here

Weather/Comments: N/A

Full penetration

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-0.350000000000000	0.55	157%
0.350000000000000-1-2	1.8	69%
2.95-6.95	3.1	78%
6.95-8.95	1.6	80%
8.95-10.95	1.5	75%
10.95-13.15	1	45%
13.15-15.85	0.7	26%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	6
1	7.00
2	7.69
3	8.39
4	9.16
5	9.94
6	10.71
7	11.49
8	12.29
9	13.09
10	13.84
11	14.57
12	15.03
13	15.48
14	15.77
15	16.03
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Penetration 15.85 ft/ On deck recovery 10.05 ft = 63% Recovery

Station Number: 43
 Attempt: 3
 Field Technician: TD
 Contractor: MCS/ESS
 On-site Visitor: _____

Date: 02/22/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 11.1
 Latitude: 199287
 Longitude: 1271846

Station Arrival Time: 1439
 Station Departure Time: 1520
 Dist. From Target Station: 26

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, steel, concrete, asphalt, wood debris
 Sediment surface & slope: fine silty sand, no visible debris
 Water current and visibility: 1 ft. vis., moderate current, falling tide (comp'd)
 Diver Water Depth: 9 Tip Probe Depth: _____ Disk Probe Depth: _____

Drive Observations:

Drive Initiation Time: 1456 Drive Completion Time: 1508 Drive Offset: _____
 Estimated angle of drive: Est 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.7	15.5	deck measured, free fall
13.1	13.7	easy drive.
9.1	10.6	easy drive, diver measured.
7.1	9.0	moderate drive.
5.1	7.5	moderate drive
2.9	6.5	moderate-difficult drive, penetration at 100
0.2	5.8	difficult drive, penetration goal reached.
TOTAL 15.85	TOTAL 10.25	Percent Recovered: <u>64.7%</u> (<u>63.4%</u> on deck)

Reason for ending drive: reached penetration goal
 If refusal, reason for refusal: _____

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): slightly turbid, ~ 1/2L
 On Boat Recovery: 6.0 Loss of Sediment: 0.2 ft.
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: med sand & silt streaks, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): med-coarse sand w/ gravel, no odor/sheen

Keep or Retry: diver inserted screw plug at sed/H₂O interface

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

The RETEC Group, Inc.
 1011 SW Kirkland Way, Suite 207
 Seattle, WA 98134-1162



206.624.9349 Phone
 206.624.2839 Fax
 www.retec.com

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-22-06 Recorder: GSN

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 43 R3

Tube Length (ft): 16.05

Water Depth (ft): 11.1

Est. Tide Height (ft): 3.9 (MLLW)

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 199287

Easting 1271846

On Deck Top of Sediment 6.0

Comments: rapidly falling tide diver depth 9 ft - flat bottom

firm silty sand - visibility 1 ft - no debris - medium current

26 ft offshore of station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.7</u>	<u>15.5</u>	
<u>13.1</u>	<u>13.7</u>	
<u>9.1</u>	<u>10.6</u>	
<u>7.1</u>	<u>9.0</u>	
<u>5.1</u>	<u>7.5</u>	
<u>2.9</u>	<u>6.5</u>	
<u>0.2</u>	<u>5.8</u>	<u>full penetration</u>

Sediment Core Processing Log



Job: DDWG Core Processing
 Job Number: PO2S-1R220-511
 No. of Sections: 1
 Sample Length (from log): 6.3'
 Avg. % Compaction: _____

Core Location/Sample Number: SC-43-(P2)
 Date/ Time: 2/21/06 0900
 Sample Logged by: LM
 Type/Diameter of Sample: 4" sq alum
 Sample Quality: good fair poor disturbed

Notes: Pen = 11.7' } 64% Rec
 On Deck Rec = 6.3'

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Initial Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		SYR yellow 4/6 red	-	10	90	⊕	red brown, wet, sl. sandy SILT transitional			0-0.5 0930 1.16oz	SILT
		2.5 2.5/1 BLACK	-	10	90	⊕	Moist, med. stiff, black, low plast. sl sandy SILT (org) sl. compressibility no odor/sheen	1	0-2 0915 GT 0.6 3.16oz	0.5-1 0933 1.16oz 1-1.5 0936 1.16oz	SILT (org) L
		Sand = 2.5 2.5/1 black	-	90	10	⊕	1.5-2.1 Alternating beds of 1) moist, med dense, black fine SAND about 1" wide w/ multi-colored grains and 2) moist, silt-med. stiff olive-grey clayey silt about 1" to 2" wide 3.0-4.0 D layer of #2	2		1.5-2 0939 1.16oz 2-2.5 0942 1.16oz	SAND + SILT
		Silt = 2.5 5/1 grey	-	2	98	⊕		3	0920 GT 2.6 3.16oz	2.5-3 0945 1.16oz 3-3.5 0948 1.16oz	
								4		3.5-4 0951 1.16oz	
										4-4.5 0954 1.16oz 4.5-5 0957 1.16oz	
								5	4-6.3 0925 2.16oz		
		2.5 2.5/1 black	-	90	10	⊕	5.1-6.3 increasing SAND (dom. unit) @5.7 core catcher begins @5.8 wood fragment 0.1' L SAND is coarsening downward	6		5-5.5 1000 1.16oz 5.5-6 1003 1.16oz	SAND

@0.9'
TV=5.2
B/G

@3.4'
TV=5.5
B/G

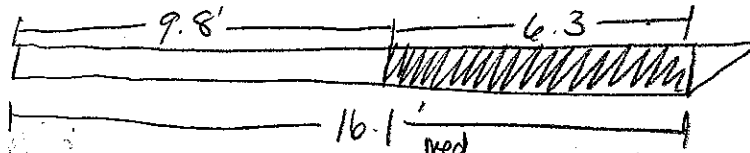
@4.8'
TV=5.6
B/G

End of core @ 6.3'

SG 43 - R2

2/21/06

LM



Observed mud line = 8.6'
 actual " = 9.8'


red fine black sand
 w/ silt interbeds
 occasional

X-sectional view



core catcher is $\frac{5}{16}$ - $\frac{2}{3}$ full
 of last 1.3' from bottom

winnowing

- 0.8 - 1.0  ~10%
- 1.5 - 2.0 SAA ~10%
- 2.3 - 2.8 SAA ~20%
- 4.0 - 5.0 SAA ~15%
- 5.0 - 6.0 top $\frac{1}{6}$ - $\frac{2}{3}$ of core is missing (see X-sec. above)

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-20-06 Recorder: GSW

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 43 R2

Place Field ID Label Here

Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 7.5

Time: 1243

Northing 199291

Est. Tide Height (ft) 5.4

(MLLW)

Easting 1271871

Est. Mudline: _____

(MLLW)

On Deck Top of Sediment 8.6

Comments: rapidly falling tide - strong surface current

SA visibility - silty sand - gentle slope

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>12.9</u>	<u>14.0</u>	
<u>11.6</u>	<u>12.9</u>	
<u>10.3</u>	<u>11.8</u>	
<u>7.2</u>	<u>9.4</u>	
<u>6.4</u>	<u>9.0</u>	
<u>5.4</u>	<u>8.7</u>	
<u>4.4</u>	<u>8.5</u>	<u>refusal</u>

Mudmole™ Bore Log

Project: LDWG Duwamish Coring **Station:** 43 R2
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 199291 Northing
Date: 2/20/2006 **Time:** 12:43 1271871 Easting
Water depth: 7.5 ft **Mudline:** -2.1 ft MLLW (estimated using tide tables)

Place Field ID Label Here

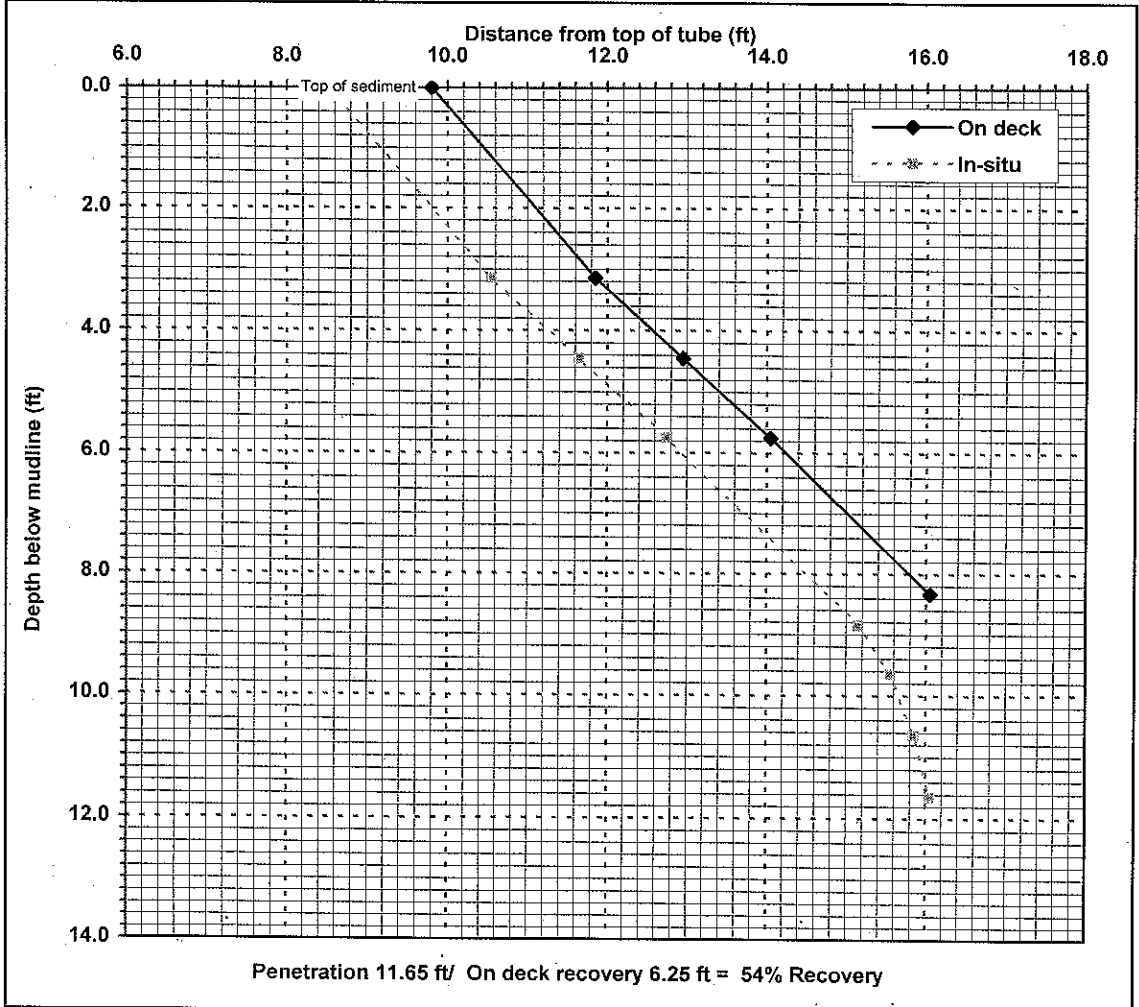
Weather/Comments: N/A
 Driven to refusal, top of core measured as 9.8 ft from top of tube in field lab.

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------

0-3.15	2.05	65%
3.15-4.45	1.1	85%
4.45-5.75	1.1	85%
5.75-8.85	2.4	77%
8.85-9.65	0.4	50%
9.65-10.65	0.3	30%
10.65-11.65	0.2	20%

Mudline	9.8
1	10.45
2	11.10
3	11.75
4	12.57
5	13.42
6	14.24
7	15.02
8	15.79
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Station Number: 43
 Attempt: 2
 Field Technician: JMF
 Contractor: MCS/RSS
 On-site Visitor: —

Date: 2/20/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 7.5
 Latitude: 199291
 Longitude: 1271871

Station Arrival Time: 1130
 Station Departure Time: 1330
 Dist. From Target Station: 14

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, concrete slabs, wood pilings + dolphins
 Sediment surface & slope: silty sand, gentle slope, wood debris
 Water current and visibility: strong surface current
 Diver Water Depth: 8.0 Tip Probe Depth: — Disk Probe Depth: —

Drive Observations:

Drive Initiation Time: 1240 Drive Completion Time: 1305 Drive Offset: —
 Estimated angle of drive: ~10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
12.9	14.0	easy drive
11.6	12.9	easy drive, but penetration slowed
10.3	11.8	moderate drive
6.4	9.0	moderate drive
5.4	8.7	moderate drive
4.4	8.5	difficult drive - refusal
TOTAL 11.65	TOTAL 7.55	Percent Recovered: <u>64.8%</u>

Reason for ending drive: refusal
 If refusal, reason for refusal: hard substrate

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): clear ~1.5L
 On Boat Recovery: 8.5 Loss of Sediment: 0.0
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: some silt, rinsed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): dark grey to black, silt w/ finesand

Keep or Retry: diver inserted screw plug at sed/H₂O interface

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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MCS Environmental MudMole Bore Log

Collection Information

Date: 2-20-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring



Station Name: 43 R1

Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 8.4

Time: 1146

Northing 199298

Est. Tide Height (ft) 5.1

(MLLW)

Easting 1271875

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 11.3

Comments: strong surface current - falling tide

diver depth 8 ft visibility - 5 ft silty - sand - gentle slope
no debris

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>13.7</u>	<u>14.4</u>	
<u>12.1</u>	<u>13.6</u>	
<u>10.0</u>	<u>12.4</u>	
		<u>current may have distorted data</u>
<u>7.0</u>	<u>10.7</u>	
<u>5.9</u>	<u>10.2</u>	
<u>4.8</u>	<u>9.8</u>	
		<u>more weight added to penetration tape</u>
		<u>retusal</u>

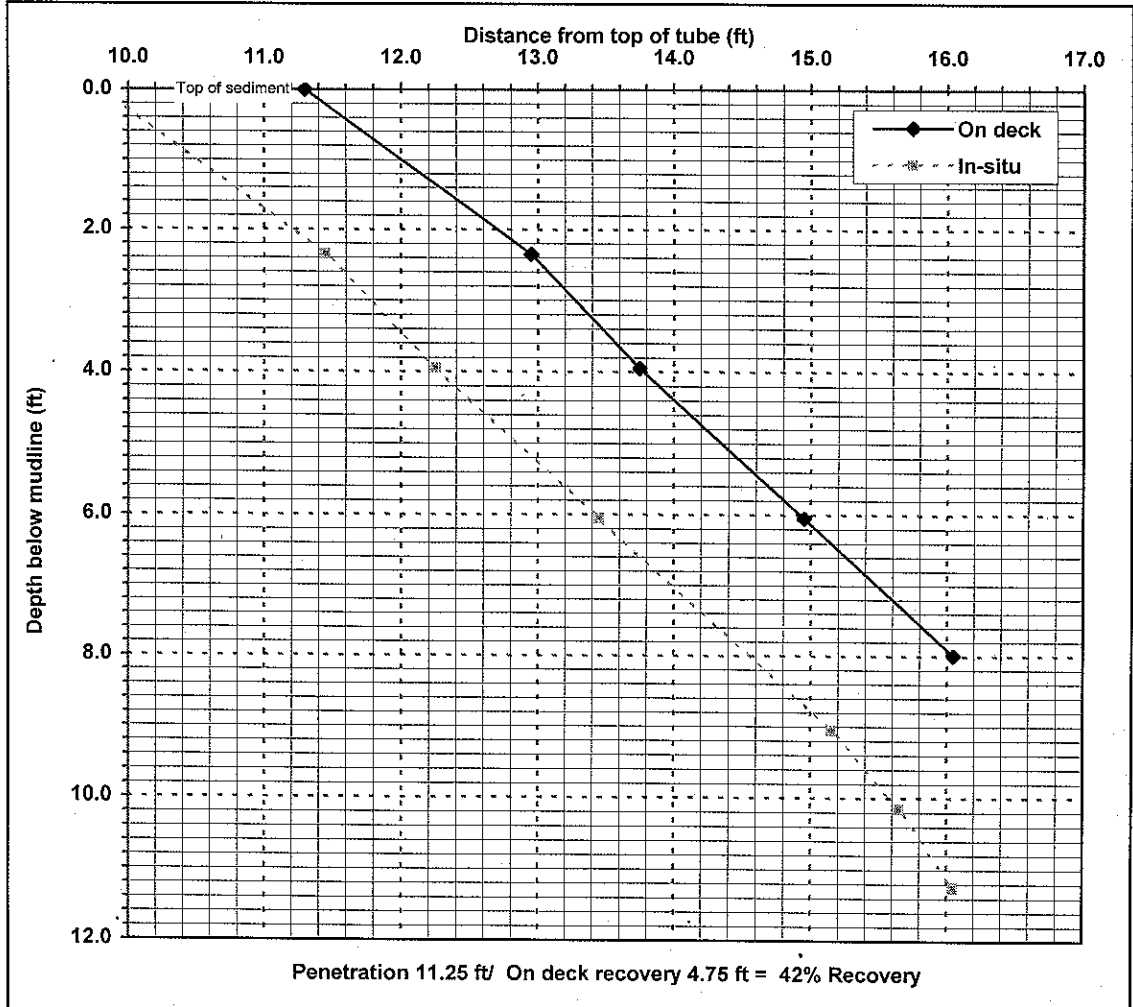
Mudmole™ Bore Log

Project: LDWG Duwamish Coring Project No: 341185.001 Collected by: GSM Date: 2/20/2006 Water depth: 8.4 ft	Station: 43 R1 Position: NAD83 199298 1271875 Mudline: -3.3 ft MLLW (estimated using tide tables)	WAN Northing Easting
-----------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------	----------------------------

Place Field ID Label Here

Weather/Comments: N/A
 Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
---------------------------	------------------------	------------------	--------------------------	--------------------------------



0-2.35	1.65	70%	Mudline	11.3
2.35-3.95	0.8	50%	1	12.00
3.95-6.05	1.2	57%	2	12.70
6.05-9.05	1.7	57%	3	13.28
9.05-10.15	0.5	45%	4	13.78
10.15-11.25	0.4	36%	5	14.35
			6	14.92
			7	15.49
			8	No sample
			9	No sample
			10	No sample
			11	No sample
			12	No sample
			13	No sample
			14	No sample
			15	No sample
			16	No sample
			17	No sample
			18	No sample
			19	No sample
			20	No sample

Station Number: 43
 Attempt: 1
 Field Technician: JMF
 Contractor: MCS/PSS
 On-site Visitor: —

Date: 2/20/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 8.4
 Latitude: 199298
 Longitude: 1271875

Station Arrival Time: 1130
 Station Departure Time: 1330
 Dist. From Target Station: 12

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, concrete slabs, wood dolphins
 Sediment surface & slope: silty sand, gentle slope, no debris
 Water current and visibility: 5ct + vis, strong surface current
 Diver Water Depth: 8.0 Tip Probe Depth: — Disk Probe Depth: —

Drive Observations:

Drive Initiation Time: 1155 Drive Completion Time: 1220 Drive Offset: —
 Estimated angle of drive: ~10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
13.7	14.4	easy drive
12.1	13.6	easy drive
10.0	12.4	easy drive, current may have distorted data
7.0	10.7	moderate
5.9	10.2	moderate to difficult
4.8	9.8	difficult - refusal
TOTAL 11.25	TOTAL 6.25	Percent Recovered: 55.6%

Reason for ending drive: refusal
 If refusal, reason for refusal: hard substrate

Extraction Observations:

Tension on line? Y Stability of vessel: No problem
 Overlying water in core (quantity and description): slightly turbid ~ 1.5L
 On Boat Recovery: 11.3 Loss of Sediment: 1.5ft, On boat recovery 42.2%
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: some silt, rinsed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): fine silt sand + silt grey to dark grey

Keep or Retry: diver inserted screw plug at H₂O/sed interface
Will retry due to low recovery

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log



Job: DUNAMISH
 Job Number: PO55-18220
 No. of Sections: 1
 Sample Length (from log): Drive = 11.7'
 Avg. % Compaction: Dredge = 5.8'
 Notes: 0% Rec = 50%

Core Location/Sample Number: LDN-44-R2
 Date/Time: Feb 21, 2006 1430
 Sample Logged by: L. McKee, A. Fitzpatrick
 Type/Diameter of Sample: 4" ID 5/8 alum MCS
 Sample Quality: good fair poor disturbed

Notes: Core collected 2/21/06

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
1.0		2.54 2.511 Black		10	90	Ø	0.0- Wet to moist, soft, silty sandy SILT (black, org.) 0.3-0.4 1" fine sand layer ~ 1" clayey SILT layer SILT - blocky, massive, will form for majority of core scanned, mottled occasionally @ 0.6' thick matting w/ olive grey clayey SILT	1.0	0-2 1500 GT 0.9	0-0.5 1520 1-1602 0.5-1 1523 1-1602	1 1 SILT
2.0		2.54 4/2 Brown		90	10		@ 1.4 shell fragments, wood fragments < 1" @ 1.6 1" thick med. grained SAND layer w/ multicolored grains @ 1.8 1" thick olive grey clayey SILT	2.0	3-1602	1-1.5 1526 1-1602 1.5-2 1529 1-1602	1 1 1
3.0		2.54 2.511 Black					@ 2.4 0.05" glass shreds, wood fragments 0.2' rootlets, trace shell frags. @ 3.3 concrete conglomerate ~ 0.5' L @ 3.0 layers of moist, med black SANDS w/ multicolored grains sharp	3.0	2-3.2 1505 3-1602	2-2.5 1532 1-1602 2.5-3 1535 1-1602	1 1 1
4.0		7.51R 4/2 Brown	90	10		Ø	@ 3.2-3.3' gravelly SAND interbedded w/ org. SILT from above. transitional	4.0	3.2-4 1510 GT 3.9 3-1602	3-3.5 1538 1-1602 3.5-4 1541 1-1602	1 1 SAND
5.0		2.54 5/11 grey		90	10	Ø	damp, dense medium-coarse SAND with multicolored grains. color banded from brown to grey changing to grey at 4.8' grains are red, white, orange & are well sorted up to 5.6'	5.0	4-5.8 1515 2-1602	4-4.5 1544 1-1602 4.5-5 1547 1-1602	1 1
		2.54 5/11 grey	10	85	5		From 5.6-5.8 medium-coarse grained coarsening gravelly subangular downward @ 5.8	6.0		5-5.5 1550 1-1602 5.8-5.8 1553 1-1602	1 1
End of core at 5.8'								6.0			

@ 1.2'
TV = 4.5
B16

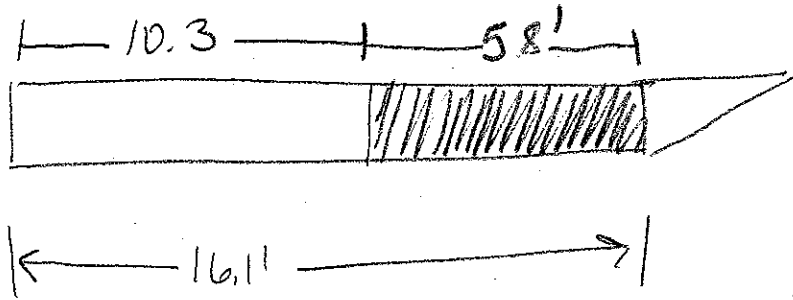
@ 2.6'
TV = 3.0
B16

@ 3.2'
TV = 3.816
← gravel

Baggie @ 3.3' subangular concrete conglomerate

LDW-SC-44 (R2)

Feb 21, 2006



Ordeck Madene = 10.3

core catcher is $\frac{2}{3}$ full
of bl. med-course SAND
w/ multicolored grains

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-21-06 Recorder: ESM



Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 44 R2

Position Information

Tube Length (ft): 16.1

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 12.0

Time: 1004

Northing 198925

Est. Tide Height (ft) 10.0

(MLLW)

Easting 1272230

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 10.3

Comments: moved offshore to avoid concrete debris ~ 28 ft offset

diver depth 13 - visibility 4 ft - mild current - silty sand
with rolling mounds ~ 1 1/2 ft high - sloping bottom

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>13.4</u>	<u>14.2</u>	
<u>11.1</u>	<u>12.8</u>	
<u>9.4</u>	<u>12.1</u>	
<u>7.6</u>	<u>11.1</u>	
<u>5.4</u>	<u>10.6</u>	
<u>4.4</u>	<u>10.2</u>	<u>refusal</u>
<u>core penetrated at 10° angle</u>		

Mudmole™ Bore Log

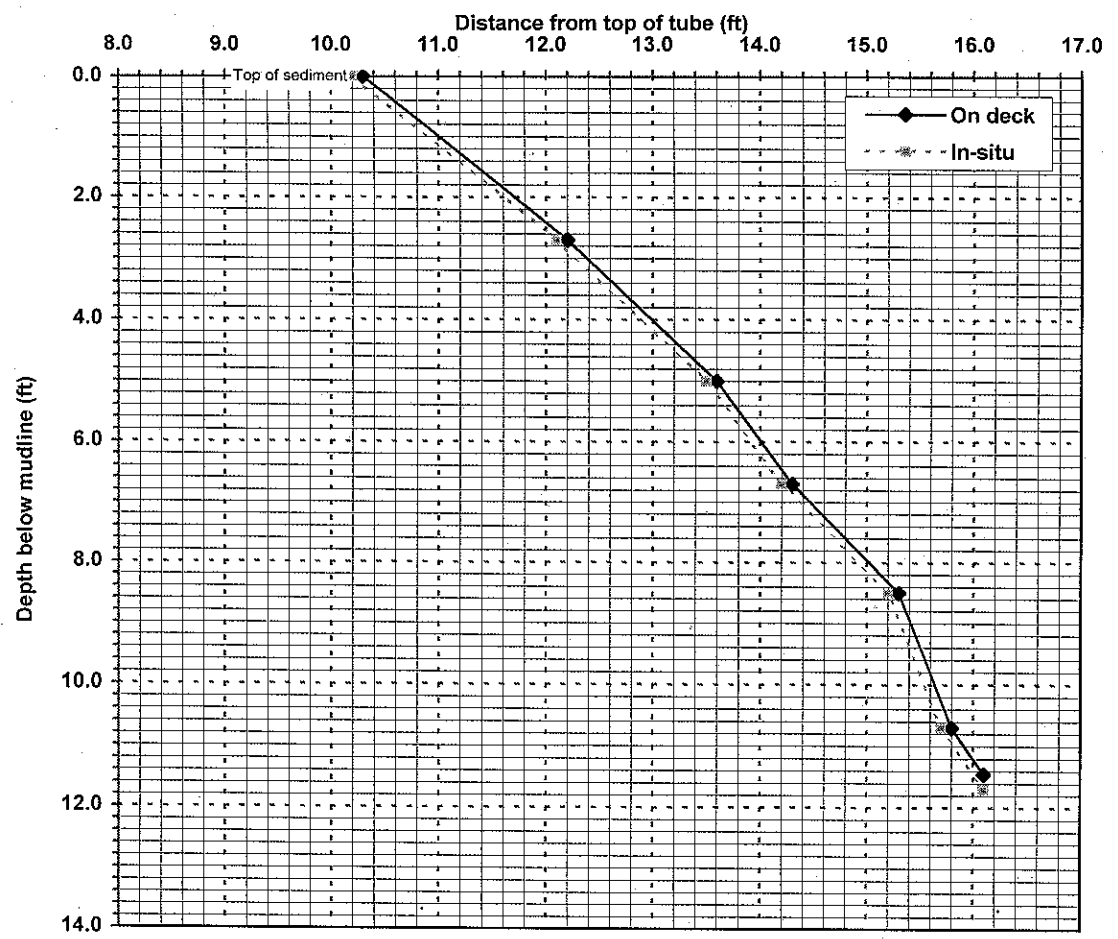
Project: LDWG Duwamish Coring **Station:** 44 R2
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 198925 Northing
Date: 2/21/2006 **Time:** 10:04 1272230 Easting
Water depth: 12.0 ft **Mudline:** -2.0 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A
Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-2.7	1.9	70%
2.7-5	1.4	61%
5-6.7	0.7	41%
6.7-8.5	1	56%
8.5-10.7	0.5	23%
10.7-11.7	0.4	40%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	10.3
1	11.00
2	11.71
3	12.38
4	12.99
5	13.60
6	14.01
7	14.47
8	15.02
9	15.41
10	15.64
11	15.92
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Penetration 11.7 ft/ On deck recovery 5.8 ft = 50% Recovery

Station Number: 44
 Attempt: 2
 Field Technician: TD
 Contractor: MCS/RSS
 On-site Visitor: _____

Date: 6/22/04
 Core Tube Length: 16.1
 Lead Line Water Depth: 12.0
 Latitude: 198925
 Longitude: 1272230

Station Arrival Time: 0922
 Station Departure Time: _____
 Dist. From Target Station: 28

Pre-Drive and Diver Observations

Shoreline & surrounding area: same as R1
 Sediment surface & slope: gentle slope down, silty sand, no visible debris, sediment mounds on bottom
 Water current and visibility: 4 ft vis., mild current
 Diver Water Depth 13 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations

Drive Initiation Time: 1018 Drive Completion Time: 1025 Drive Offset: _____
 Estimated angle of drive: BT. 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
13.4	14.2	deck measured, free fall
11.1	12.8	diver measured, moderate drive
9.4	12.1	moderate - difficult drive
7.6	11.1	difficult drive
5.4	10.6	difficult drive
4.4	10.2	difficult drive.
TOTAL 11.7	TOTAL 5.9	Percent Recovered: 50.4% (49.6% on-deck)

Reason for ending drive: refusal
 If refusal, reason for refusal: hard substrate

Extraction Observations

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): clear - slightly turbid
 On Boat Recovery: 10.3 Loss of Sediment: 0.1 ft
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations

Staining: slightly sand silt, sprayed off
 Tube Deformation: none, tube scratched up.
 Sediment Description (odor or sheen?): course sand, no odor, no sheen.

Keep or Retry: diver inserted screw plug at sed/H₂O interface
- may come back with vibracore.

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Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log



Job: LNG Core Processing
 Job Number: POPS-18220-517
 No. of Sections: 1
 Sample Length (from log): 6.5'
 Avg. % Compaction:

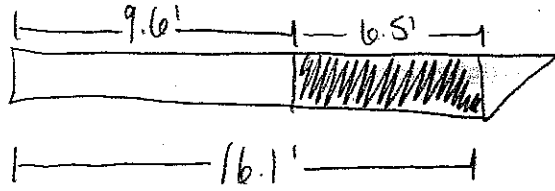
Core Location/Sample Number: SC-44-(R3)
 Date/ Time: 2/23/06
 Sample Logged by: LM, CB
 Type/Diameter of Sample: 4" sq. cym.
 Sample Quality: good fair poor disturbed

Notes: Pen = 10.62
on Deck Rec = 6.5' 61% Rec

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
				10	90		0-0.2 Wet, soft, brown sl. sandy SILT OR SILT (sl. sandy) + mottling		0-2.3 1600		SILT
		black					@0.9 0.1' layer of s	1			SILT
							1.2-1.6 OR SILT + clayey s				
							<div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: fit-content; margin: 10px auto;"> This core was not processed b/c R2 was determined to be better recovery w/ less winnowing & bottom sed. was confirmed as SAME ZM </div>	2			
								sharp		2-3-4 1605	
							SAND + gravel	3			SAND + GRAVEL
								4			
									4-6 1610		
								5			
								6			gravel ←

SC 43-R3

LM
2/23/06

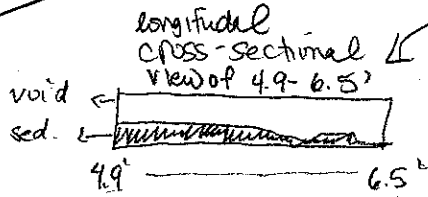


Mudline = 9.6'

$$\begin{array}{r} 9.6' \\ 9.6 \\ \hline 6.5 \end{array}$$

(50%)
 Core catcher is $\frac{1}{2}$ full from 4.9 - 6.5' (end of core)
 black gravelly sand w/ wood debris
 gravel is sub angular & up to 1" ϕ

winnowing



Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 44 R3

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

198940

Northing

Date: 2/22/2006

Time: 15:39

1272209

Easting

Water depth: 5.6 ft

Mudline: -2.7 ft MLLW (estimated using tide tables)

Place Field ID Label Here

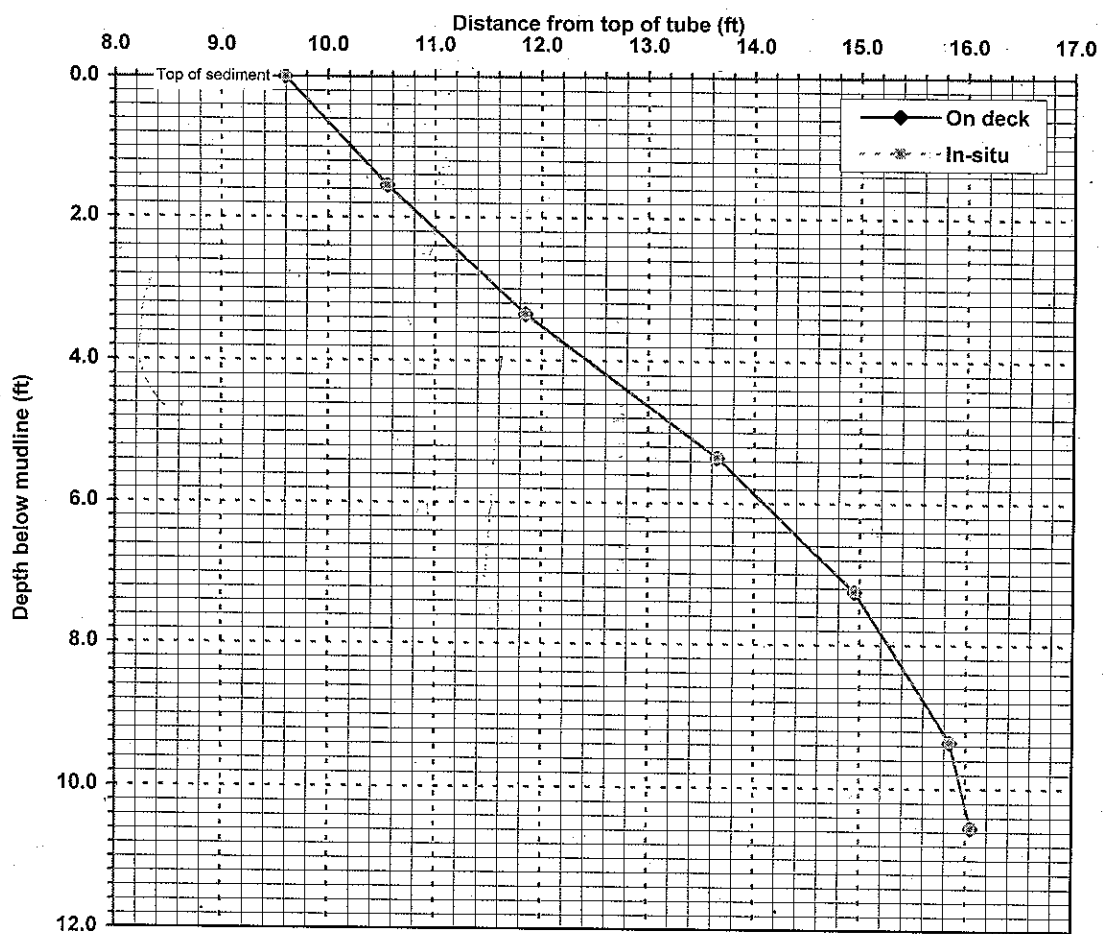
Weather/Comments: N/A

Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
---------------------------	------------------------	------------------	--------------------------	--------------------------------

0-1.55	0.95	61%	Mudline	9.6
1.55-3.35	1.3	72%	1	10.21
3.35-5.35	1.8	90%	2	10.88
5.35-7.25	1.3	68%	3	11.60
7.25-9.35	0.9	43%	4	12.44
9.35-10.55	0.2	17%	5	13.34

6	14.09
7	14.78
8	15.27
9	15.70
10	15.96
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Penetration 10.55 ft/ On deck recovery 6.45 ft = 61% Recovery

Station Number: 44 Date: 04/22/06 Station Arrival Time: 1530
 Attempt: 3 Core Tube Length: 16.05 Station Departure Time: 1605
 Field Technician: TD Lead Line Water Depth: 5.6 Dist. From Target Station: 27
 Contractor: MCS/ESS Latitude: 198940
 On-site Visitor: _____ Longitude: 1272209

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, concrete debris, wood & metal debris, wood pilings
 Sediment surface & slope: sandy silt, flat bottom, no debris
 Water current and visibility: vis 3ft. moderate current, falling tide (rapidly)
 Diver Water Depth: 5 Tip Probe Depth: _____ Disk Probe Depth: _____

Drive Observations:

Drive Initiation Time: 1544 Drive Completion Time: 1553 Drive Offset: _____
 Estimated angle of drive: est. 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
14.5	15.1	deck measured, free fall
12.7	13.8	moderately easy ^{TD} drive
10.7	12.0	moderate drive
8.8	10.7	moderate drive
6.7	9.8	difficult drive, penetration slowed
5.5	9.6	difficult drive
TOTAL 10.65	TOTAL 6.45	Percent Recovered: <u>61.1%</u> (61.1% on deck)

Reason for ending drive: refusal
 If refusal, reason for refusal: hard substrate

Extraction Observations:

Tension on line? yes Stability of vessel: no problems
 Overlying water in core (quantity and description): did not observe
 On Boat Recovery: 9.6 Loss of Sediment: 0
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, moderate

On Deck Observations:

Staining: light streaking of sandy silt, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): coarse sand, brown, no odor/sheen

Keep or Retry: diver inserted screen plug at sed/H₂O interface
core accepted

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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MCS Environmental MudMole Bore Log

Collection Information

Date: 2-22-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 44 R2

Tube Length (ft): 16.05

Water Depth (ft): 5.6

Est. Tide Height (ft): 2.9

Est. Mudline: _____ (MLLW)



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 198140

Easting 1272209

On Deck Top of Sediment 9.6

Comments: rapidly falling tide - 27 ft off shore of station

diver depth 5A - visibility 3 ft - medium current - flat bottom - sandy silt - no debris

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.5</u>	<u>15.1</u>	
<u>12.7</u>	<u>13.8</u>	
<u>10.7</u>	<u>12.0</u>	
<u>8.8</u>	<u>10.7</u>	
<u>6.7</u>	<u>9.8</u>	
<u>5.5</u>	<u>9.6</u>	<u>penetration slowed refusal</u>

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-21-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 44 Q1

Tube Length (ft): 16.1

Water Depth (ft): 10.4

Est. Tide Height (ft): 10.1

(MLLW)

Est. Mudline: _____ (MLLW)



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 198960

Easting 1272242

On Deck Top of Sediment 16.1

Comments: Diver depth 10 - visibility 4 A - flat bottom scattered debris - silty sand concrete debris

~ 12 A off station - falling tide - broken off piling near station moved away from A 25 A

Penetration Tape Reading

Recovery Tape Reading

Comments

16.0

15.6

15.1

15.3

refusal

no recovery - tip of core tube crushed

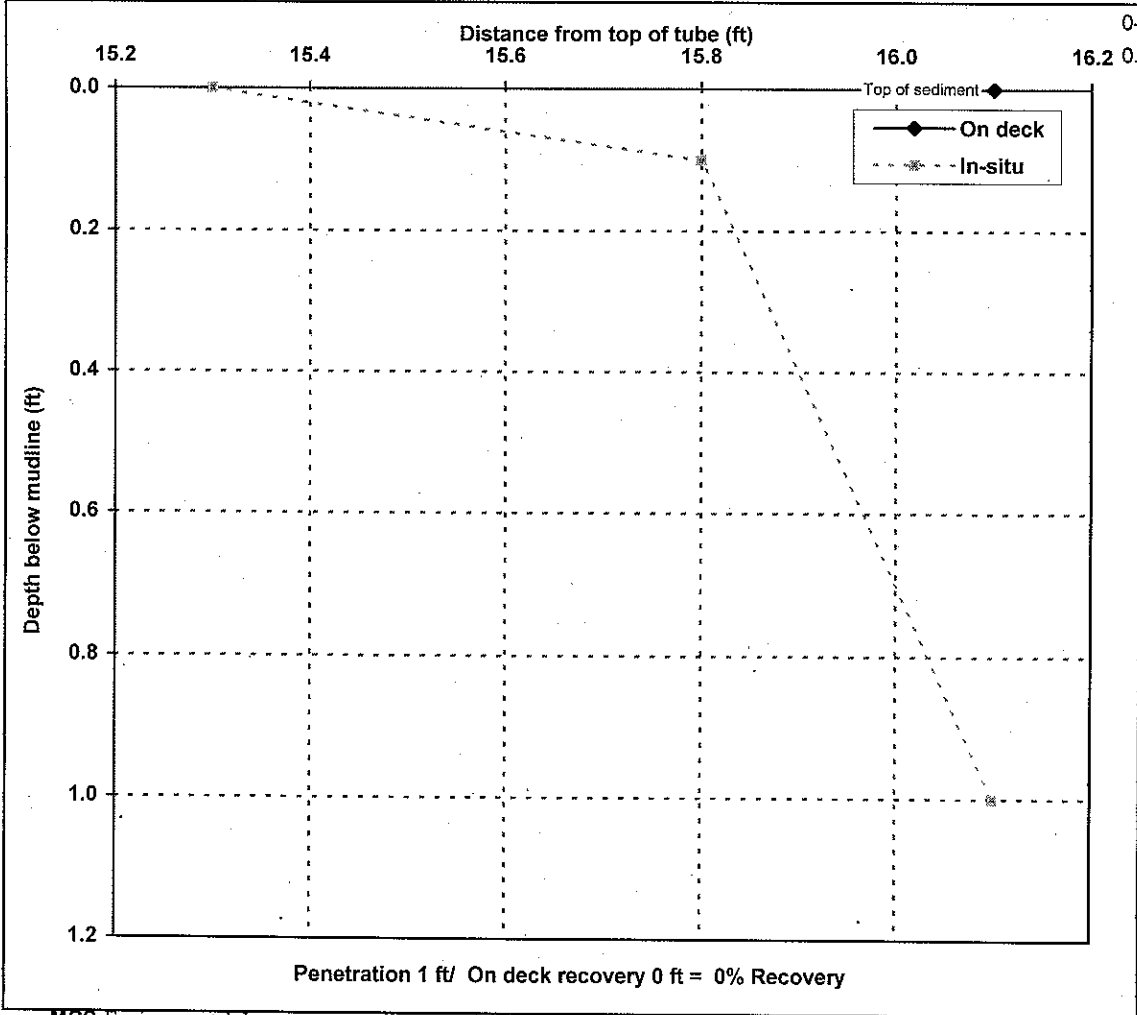
Mudmole™ Bore Log

Project: LDWG Duwamish Coring	Station: 44 R1	Place Field ID Label Here
Project No: 341185.001	Position: NAD83	
Collected by: GSM	198960	
Date: 2/21/2006	Time: 9:35	
Water depth: 10.4 ft	Mudline: -0.3 ft MLLW (estimated using tide tables)	

Weather/Comments: N/A
 Driven to refusal, no recovery, tip of core tube crushed

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-0.1000000000000000	0.5	500%
0.1000000000000001-	0.3	33%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	16.1



1	No sample
2	No sample
3	No sample
4	No sample
5	No sample
6	No sample
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: AA
 Attempt: 1
 Field Technician: TD
 Contractor: NLS/ESS
 On-site Visitor: _____

Date: 02/21/06
 Core Tube Length: 16-1
 Lead Line Water Depth: 10.4
 Latitude: 198960
 Longitude: 1272242

Station Arrival Time: 0922
 Station Departure Time: _____
 Dist. From Target Station: 12

Pre-Drive and Diver Observations:

Shoreline & surrounding area: concrete debris, rip rap, wood + metal cable debris
 Sediment surface & slope: scattered debris, flat bottom, silty sand, broken pilings
 Water current and visibility: vis 4ft.
 Diver Water Depth 10 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 0946 Drive Completion Time: 0949 Drive Offset: _____
 Estimated angle of drive: est 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
16.0	15.6	deck measured, free fall
15.1	15.3	difficult drive, refusal
		difficult drive - caused tube tip to warp.
TOTAL 1.0	TOTAL 0.8	Percent Recovered: <u>80%</u> (<u>10% on-deck</u>)

Reason for ending drive: refusal
 If refusal, reason for refusal: hard debris/substrate

Extraction Observations:

Tension on line? yes Stability of vessel: no prob.
 Overlying water in core (quantity and description): yes
 On Boat Recovery: 16-1 Loss of Sediment: _____
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: none
 Tube Deformation: tube warped.
 Sediment Description (odor or sheen?): none

Keep or Retry hit something hard (concrete?) - core tip warped.
sediment washed out.

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log

Job: LNW6 Core Processing
 Job Number: RORS-18220-511
 No. of Sections: 1
 Sample Length (from log): 5.3'
 Avg. % Compaction:

Core Location/Sample Number: SC-45-R1
 Date/Time: 2/21/06 1125
 Sample Logged by: LM, ACF
 Type/Diameter of Sample: 4" sq ALUM.
 Sample Quality: good fair poor disturbed

Notes: Pen = 9.5' } 71% Rec
on Deck Rec = 6.8'
 note: closer to shore

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5Y 4/3 olive brown		10	90	✓	brown sandy SILT 6-0.3				SILT
		2.5Y 2.5/1 black		10	90	∅	transitional moist, med. dense ^{black} silty sandy SILT (long) • rootlets, occasional • wood fragments occasional	1			SILT
			90	10	∅		@2.4 layers of black multicolored grains of fine-med. SANDS of 0.05' thick layers interbedded with black SILT	2	see R3 for chem sample		
			10	80	10	∅	transitional wet damp, med dense - dense black silty SAND with gravel (subrounded to subang.) @3.3 sheen (rainbow) + strong petroleum-like odor on top surface of sed. Does not extend below a span-scope depth (0.02')	3			SAND
			80	15	5	∅	@4.6 subrounded to subang. gravel with material is completely saturated, sheen test 0.1' ∅ shows free phase pet-like odor but is strong - last 6" is the most impacted around area where gravel begins	4			
							Note: AF is present for sheen test = 15 of 100. matches unit	5	0.50' discrete	1310	GRAVEL
							End of Core @ 5.3' sheen test @4.0' = none, @5.0' = yes No Chem. No GeoTech R3 will be used for the above	6			

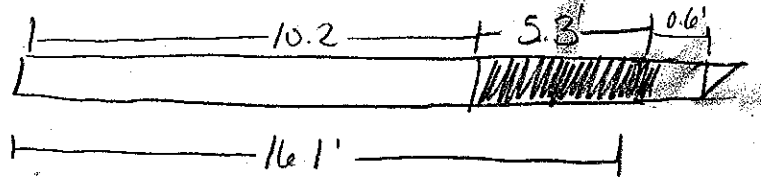
Rainbow sheen + pet-like odor

Archive from 5.0' @ 1310
 potentially impacted area

→ over

SC-45 - (R1)

2/20
2/21/06
LM



Mudline = 10.2

$$\begin{array}{r} 18' \\ 10.2 \\ \hline 5.9 \end{array}$$

core shoe & tip are deformed due to driving impact

core shoe is 1/6 full

rainbow sheen on sediment & water in core tube from 3.3' to bottom of core

Petroleum-like odor

Sheen test @ 5.0'

- ~~many~~ sheen, iridescent streaks, ^{staining &} blebs on jar sides, metallic/rainbow in color
- no thickness observed, dissipates v. slowly - none
- 100% spatial coverage

Mudmole™ Bore Log

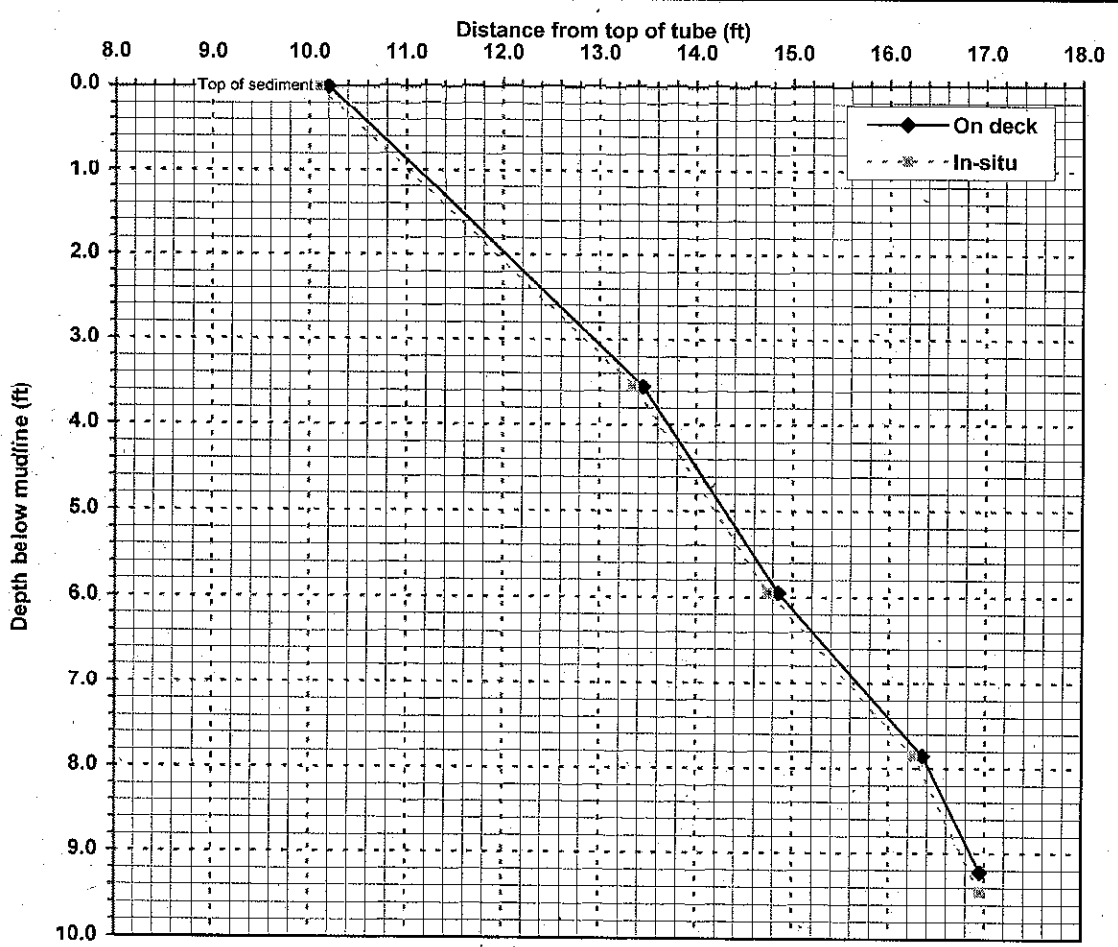
Project: LDWG Duwamish Coring **Station:** 45 R1
Project No: 341185.001 **Position:** NAD83 **WAN**
Collected by: GSM 198628 **Northing**
Date: 2/20/2006 **Time:** 14:56 1272645 **Easting**
Water depth: 9.0 ft **Mudline:** -7.2 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A
 Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-3.55	3.25	92%
3.55-5.95	1.4	58%
5.95-7.85	1.5	79%
7.85-9.45	0.7	44%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	10.2
1	11.12
2	12.03
3	12.95
4	13.71
5	14.30
6	14.89
7	15.68
8	16.42
9	16.85
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Penetration 9.45 ft/ On deck recovery 6.75 ft = 71% Recovery

Station Number: 45
 Attempt: 1
 Field Technician: JMF
 Contractor: MCS/RSS
 On-site Visitor:

Date: 2/20/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 9
 Latitude: 19° 8' 62.8"
 Longitude: 127° 26' 45"

Station Arrival Time: 1450
 Station Departure Time: 1600
 Dist. From Target Station: 10

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, steel wood dolphins, concrete pier
 Sediment surface & slope: sandy, no slope, no debris
 Water current and visibility: ~2ft vs
 Diver Water Depth: 8 Tip Probe Depth: Disk Probe Depth:

Drive Observations:

Drive Initiation Time: 1503 Drive Completion Time: 1540 Drive Offset:
 Estimated angle of drive: est 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
13.4	13.7	drive moderate
11.0	13.3	drive moderate
9.1	10.8	drive moderate
7.8	10.0	drive moderate to difficult, penetration slow
7.5	10.1	drive difficult
TOTAL 8.55	TOTAL 8.95	Percent Recovered: <u>69.6%</u> (<u>68.4% on deck</u>)

Reason for ending drive: refusal
 If refusal, reason for refusal: hard substrate

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): clear ~ 2L
 On Boat Recovery: 10.2 Loss of Sediment: 0.1A
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On-Deck Observations:

Staining: some silt, rinsed off
 Tube Deformation: none, tip bent
 Sediment Description (odor or sheen?): sheen, silts, with fine to med sand, petroleum odor

Keep or Retry: diver could not insert screw plug since one catheter was inverted tip was bent
retry due to low recovery

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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MCS Environmental MudMole Bore Log

Collection Information

Date: 2-20-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 45 R1

Tube Length (ft): 16.05

Water Depth (ft): 9.0

Est. Tide Height (ft): 1.8 (MLLW)

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 198628

Easting 1272645

On Deck Top of Sediment 10.2

Comments: falling tide - pilings on station - 13 ft north of station - diver depth 8 - visibility 2 ft - mud bottom - silty sand - no debris - no current - no slope

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>13.4</u>	<u>13.7</u>	
<u>11.0</u>	<u>12.3</u>	
<u>9.1</u>	<u>10.8</u>	
<u>7.8</u>	7.8 <u>10.0</u>	<u>penetration slowed</u>
<u>7.5</u>	<u>10.1</u>	<u>refusal</u>
<u>end of core tube crushed</u>		
<u>silty silty sand in tip</u>		

Mudmole™ Bore Log

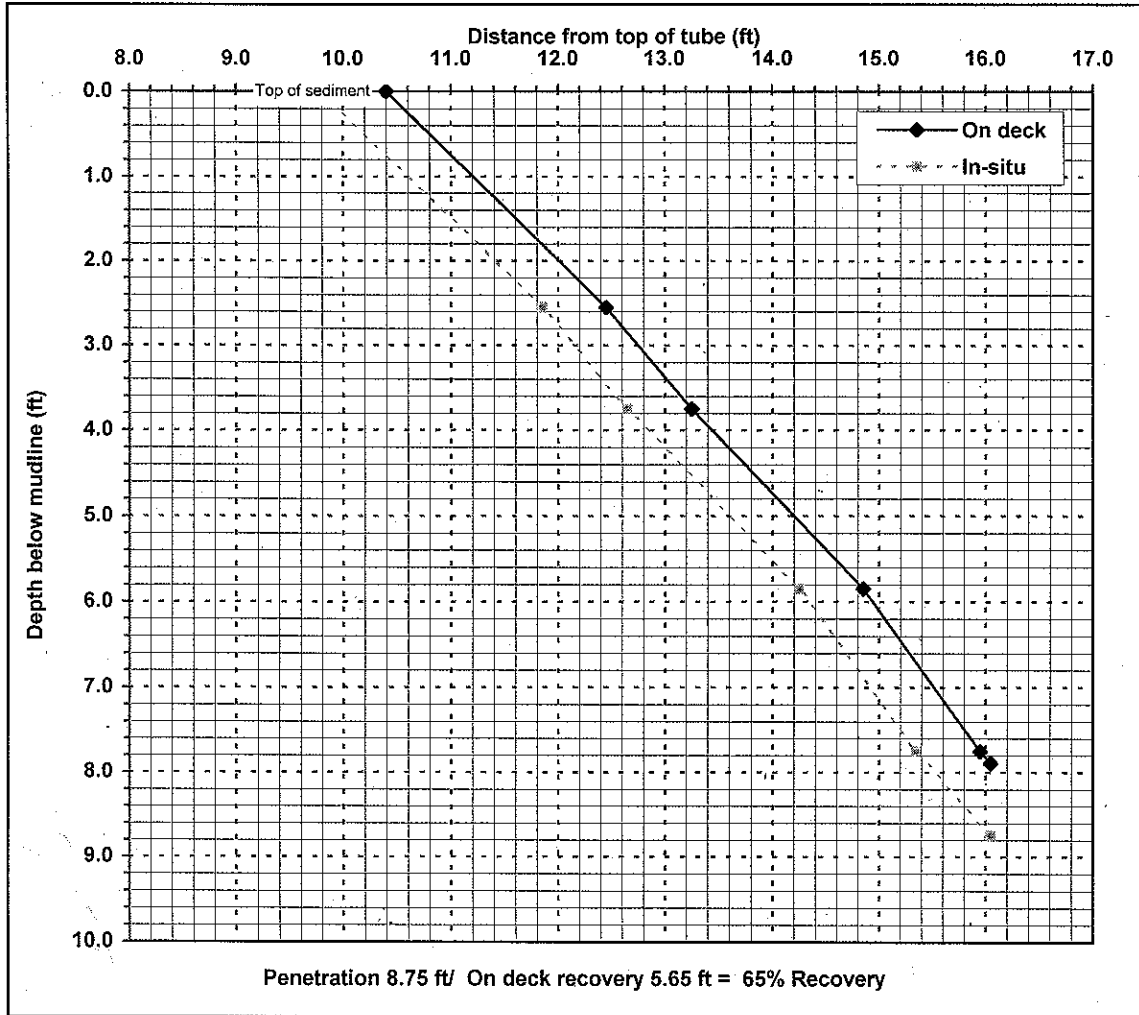
Project: LDWG Duwamish Coring **Station:** 45 R2
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 198622 Northing
Date: 2/20/2006 **Time:** 15:35 1272635 Easting
Water depth: 9.5 ft **Mudline:** -8.2 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A
 Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-2.55	2.05	80%
2.55-3.75	0.8	67%
3.75-5.85	1.6	76%
5.85-7.75	1.1	58%
7.75-8.75	0.7	70%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	10.4
1	11.20
2	12.01
3	12.75
4	13.44
5	14.20
6	14.94
7	15.52
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Station Number: 45 Date: 2/20/06 Station Arrival Time: 1450
 Attempt: 2 Core Tube Length: 16.05 Station Departure Time: 1600
 Field Technician: JMF Lead Line Water Depth: 9.5 Dist. From Target Station: 9
 Contractor: MCS/RSS Latitude: 198622
 On-site Visitor: — Longitude: 1272635

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, steel + wood dolphins, concrete pier
 Sediment surface & slope: Sandy, no slope, no debris
 Water current and visibility: ~2ft vis
 Diver Water Depth: 9.0 Tip Probe Depth: — Disk Probe Depth: —

Drive Observations:

Drive Initiation Time: 1520 Drive Completion Time: 1545 Drive Offset: —
 Estimated angle of drive: —

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
13.5	14.0	easy drive
12.3	13.2	easy drive
10.2	11.6	easy drive
8.3	10.5	moderate drive, penetration slowed
7.3	9.8	difficult drive, refusal
		med size cobble fell out of core tip
		+ coarse gravel
TOTAL 8.75	TOTAL 6.25	Percent Recovered: <u>71.4%</u>

Reason for ending drive: refusal
 If refusal, reason for refusal: hard substrate

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): slightly turbid ~1.5L
 On Boat Recovery: 10.4 Loss of Sediment: 0.6 ft 64.6% on boat recovery
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: some silt, rinsed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): med to fine sand (native) dark brown

Keep or Retry: diver inserted screw plug at sed/H₂O interface
2nd attempt, acceptability pending

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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MCS Environmental MudMole Bore Log

Collection Information

Date: 2-20-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 45 R2

Tube Length (ft): 16.05

Water Depth (ft): 9.5

Est. Tide Height (ft): 1.3

Est. Mudline: _____ (MLLW)

Comments: falling tide diver depth visibility

29 ft off station

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 198622

Easting 1272635

On Deck Top of Sediment 10.4

Penetration Tape Reading

Recovery Tape Reading

Comments

13.5

14.0

12.3

13.2

10.2

11.6

8.3

10.5

7.3

9.8

refusal

medium size cobble fell out of tip of core tube

Sediment Core Processing Log



Job: DNV Core Processing
 Job Number: PORS-18220-511
 No. of Sections: 1
 Sample Length (from log): 6.5'
 Avg. % Compaction: _____

Core Location/Sample Number: SC-45-R3
 Date/ Time: 2/21/06 1230
 Sample Logged by: IM AGR
 Type/Diameter of Sample: 4" Sq. ALUM
 Sample Quality: (good) fair poor disturbed

Notes: Pen = 7.72 84% Rec
in Deck Rec = 6.5

Note: further from shore

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5Y 4/3 olive brown	-	10	90	Ø	0-0.3 soupy, wet, brown sl. sandy SILT transitional				SILT
		2.5Y 2.5/1 black	-	10	90	Ø	0.3- moist, med stiff, black, sl. sandy SILT (org) occasional woody fragments occasional rootlets		0-1 1245		
							1.8 sheen floret and smear zone in parting seam		1-2 1250 GT 1.1		SILT (OR 6)
							2.2 rainbow sheen floret w/ 1" & w/ smear zone in parting seam 2.3 woody fragments, small rootlets < 1" L 2.7 shell fragments, small < 1" L		2-4 1255 GT 3.8		
			-	90	10	Ø	3.0 1" thick layer of damp, black, SAND w/ multi-colored grains runs transversely from 3-3.1'				
		2.5Y 5/1 grey	-	45	98	Ø	3.5-4.2 rainbow sheen florets spaced few occasional max 1" & w/ smear zone in parting seam transitional 3.8-4.2 moist, med stiff, grey clayey SILT				SILT CLAY
		2.5Y 2.5/1 black	-	10	90	Ø	BLACK ORG SILT w/ rootlets - sharp moist, sl. stiff med-black sl. gravelly silty SAND w/ multi-colored grains. Gravel is subrounded at 0.1" L [from 5.8-6.5']		4-5 1300		
			10	80	10	Ø	4.8' piece of concrete 0.15' L gravel med. subrounded		5		gravel
							SAND coarsening downward		5-6 1305		
									See RI for disturb	e50	

@ 1.9'
TV = 3.0 BIG

@ 3.8'
TV = 3.0
BIG

@ 5.6
TV = 3.5
BIG

NOTE: Archive sample of
SC-45R1 taken

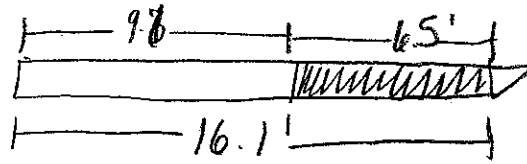
Core catcher begins at 6.0'
End of core @ 6.5'

Baggie @ 4.8'
Baggie @ 4.8'

SG-45-(R3)

2/21/06

LM



mudline = 9.6'

6.5

core catcher is 1/2 full of
black med. grained sand

Mudmole™ Bore Log

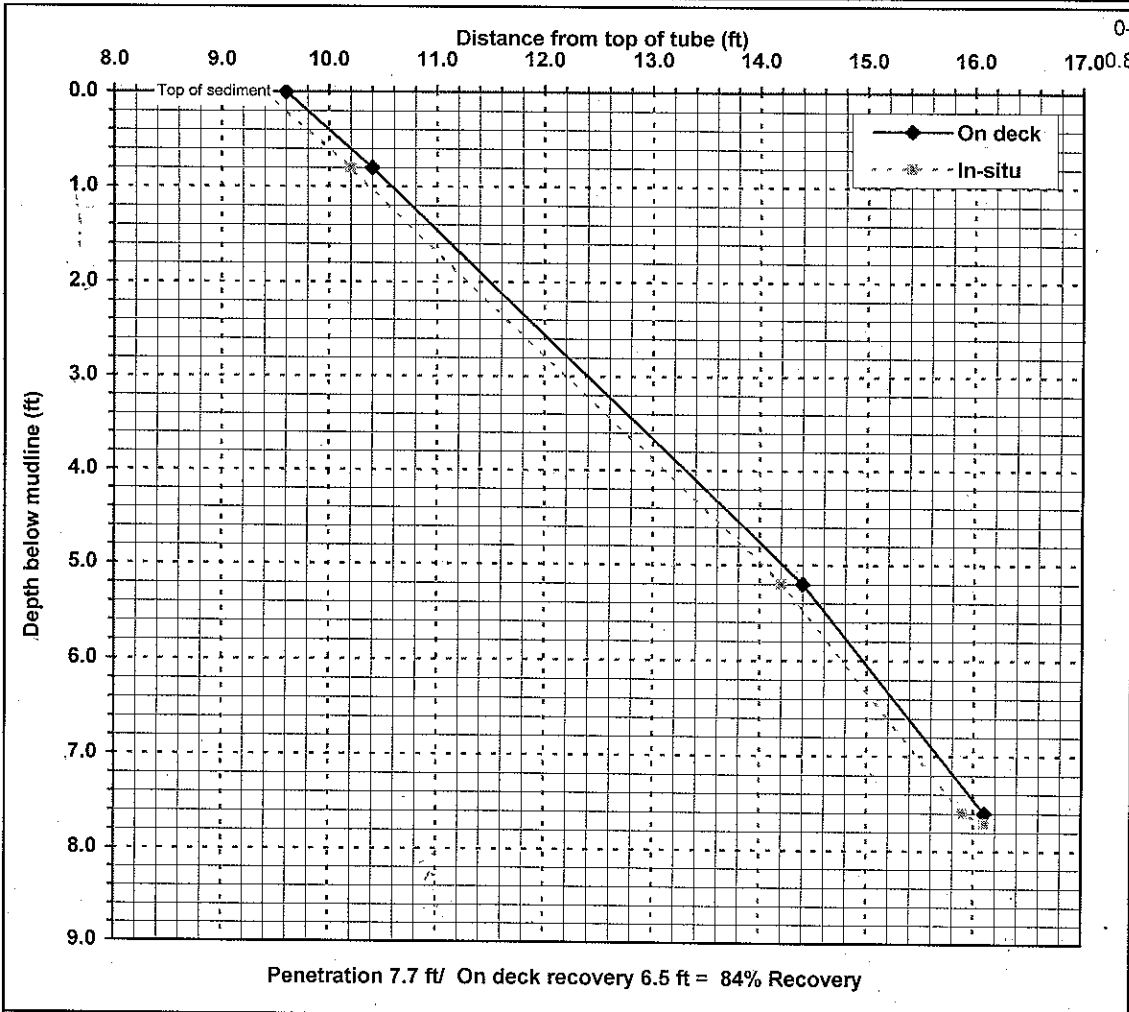
Project: LDWG Duwamish Coring **Station:** 45 R3
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 198588 Northing
Date: 2/21/2006 **Time:** 11:05 1272647 Easting
Water depth: 22.7 ft **Mudline:** -13.5 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A
 Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------



0-0.8000000000000000	0.8	100%
0.8000000000000001-5.2	4	91%
5.2-7.6	1.7	71%
7.6-7.7	0.2	200%

Mudline	9.6
1	10.58
2	11.49
3	12.40
4	13.31
5	14.22
6	14.97
7	15.68
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 45 Date: 02/21/06 Station Arrival Time: 1052
 Attempt: 3 Core Tube Length: 16.1 Station Departure Time: 1130
 Field Technician: TP Lead Line Water Depth: 22.7 Dist. From Target Station: 29
 Contractor: M/S/RSS Latitude: 198588
 On-site Visitor: _____ Longitude: 1272617

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, steel ^{deck} dolphins, pilings, concrete piers at Slip 4
 Sediment surface & slope: gentle slope, no vis. debris, sandy silt bottom
 Water current and visibility: mild current, 4 ft vis, falling tide
 Diver Water Depth: 22 Tip Probe Depth: _____ Disk Probe Depth: _____

Drive Observations:

Drive Initiation Time: 1113 Drive Completion Time: 111 Drive Offset: _____
 Estimated angle of drive: equpt under water, est 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.3	15.3	diver measured, free fall
10.9	11.3	easy drive
8.5	9.6	moderate-difficult drive, penetration slowed considerably
8.4	9.4	difficult drive, refusal
TOTAL 7.7	TOTAL 6.7	Percent Recovered: <u>87.0%</u> (<u>94.4%</u> on deck)

Reason for ending drive: refusal
 If refusal, reason for refusal: hard substrate

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): yes
 On Boat Recovery: 9.6 Loss of Sediment: 0.2 ft.
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy-moderate


On Deck Observations:

Staining: slightly sandy silt, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): medium sand, clean, no odor, no sheen.

Keep or Retry: diver inserted screw plug at sea/H₂O interface

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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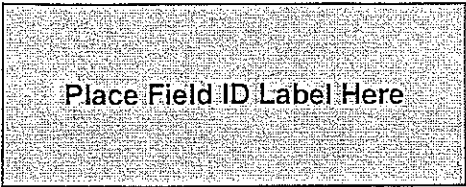
MCS Environmental MudMole Bore Log

Collection Information

Date: 2-21-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 45 R3



Position Information

Tube Length (ft): 16.1

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 22.7

Time: 1105

Northing 198588

Est. Tide Height (ft) 9.2

(MLLW)

Easting 1272647

Est. Mudline: _____

(MLLW)

On Deck Top of Sediment 9.6

Comments: Falling tide ~ 28A south of station -

22 ft depth - 4A vis - sandy silt bottom - no debris

gentle slope

Penetration Tape Reading

Recovery Tape Reading

Comments

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.3</u>	<u>15.3</u>	
<u>10.9</u>	<u>11.3</u>	
<u>8.5</u>	<u>9.6</u>	<u>penetration slowed</u>
<u>8.4</u>	<u>9.4</u>	<u>retusal</u>

Sediment Core Processing Log

Job: LIDW6 Core Processing

Core Location/Sample Number: SG-40-R1

Job Number: POS-18220-511

Date/ Time: 2/24/06 1014

No. of Sections: 1

Sample Logged by: LM, CB

Sample Length (from log): _____

Type/Diameter of Sample: 3" round

Avg. % Compaction: _____

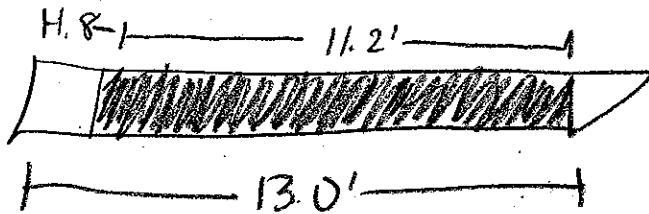
Sample Quality: good fair poor disturbed

Notes: Pen = 13.0' } 86.2%
 On Deck Pec = 11.2' }

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.54 2.5/1 black + grey 3/1 v. dk greenish grey	-	10	90	0	0.0-2.0 SILT wet moist, med stiff, black (org) St. Sandy SILT (mottled) olive-grey damp med stiff clayey SILT 00.6 occasional subrounded gravel (tr) and poly chert 00.9 shell fragments 1/2" L occasional rootlets, barnacles sl. compressibility hard plasticity increasing competency w/ depth	0-1 1620 2-1602			SILT (mottled) 0-0 gravel 0-0 shells
							(10x wood) @ 1.7 woody fragments up to 2" x 1/8" transitional	1-2 1625 GT 1.1 3-1602			
		2.54 2.5/1 black		TT	98	0	2.0-2.8 moist, med stiff, black clayey SILT transverse seam of fine med SAND w/ multicolored grains ~1" thick from 2.3-2.2' @ 2.8 1" shell layer w/ shells up to 1/2" L mild H ₂ O-like odor, metallic sheen when wetted	2-4 1630 GT 2.1 3-1602			SILT (org) @ 1.8' TV=1.5 BIG
							@ 3.6 wood fragment up to 0.05' L @ 3.9 no frequent shells up to 2" L 1/2" muschel shell mild H ₂ O-like odor, rainbow sheen when wetted	3-4 1635 2-1602			@ 3.2' TV=1.6 BIG @ 3.9' TV=0.82 BIG color + sheen when wetted
				90	10		0.1" thick layer of black fine SAND	4-6.8 1635 2-1602			
							@ 5.2 2" shell (1/2-shell)				
				90	10		0.1" thick layer of black fine SAND w/ multicolored grains	6			

3046-R1

2/24/06
LM



13.0
11.2
1.8

core catcher = empty
bottom end of core = med. SAND
grey, multi-colored grains

Sediment Core Processing Log

Job: LNWG Core Processing
 Job Number: POES-18200 501
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: SC-46-R1
 Date/ Time: 2/24/06
 Sample Logged by: LM, CB
 Type/Diameter of Sample: 3" round
 Sample Quality: good fair poor disturbed

Notes: CONT'D

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
			SAA				SAA				SILT
				90	10	0	@6.9 2" piece of plastic & wood fragment 0.2' L x 0.2' W				SAND
		7.5VR silty clay (S1)	-	tr	95	0	SAND damp, med-dense, brown w/ dark colored grains SAND light grey	7	6.8-8		
						0	@7.0 2" pocket of olive-grey clayey SILT		11.40		
							occasional gravel, subrounded @ 2" Ø, equally spaced		2-1602		
		grey silty v. dk. greenish grey		tr	98	0	@7.9 pocket of olive grey clayey SILT 0.1' L	8	8-10		
									16.45		
									2-1602		
								9			
								10			
									10-11.2		
									16.50		
									2-1602		
								11			
							End of core @ 11.2'				
								17			

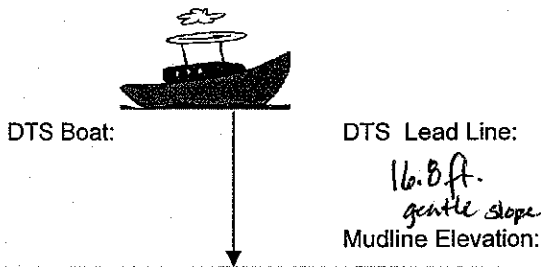


SEDIMENT CORE DRIVE LOG

Project: LDW Subsurface Sediment
 Project #: 05-08-06-32
 Field Crew: TD
 Contractor: MSS

Core Location: LDW-SCAD 46
 Date: 02-24-06 Time: 1100
 Attempt #: 1 Accept/Reject
 Sample Method: Vibracorer

Proposed Coordinates		Actual Coordinates	
N: <u>198577</u>	E: <u>127217</u>	N: <u>47 32.0768N</u>	E: <u>122 19.4609W</u>
Mudline:		Mudline:	
Core Drive: <u>13ft</u>		Core Drive: <u>13ft</u>	Core Recovery: <u>10.2ft (86%)</u>



Tide Measurements (Datum:)

Time/Height:

Time/Height:

Description:

(free fall, fingers inverted, vibration needed to drive/extract, estimation of density, debris encountered, slopes, refusal, mudline conditions, drive action, etc.)

0-3.5 ft free fall
3.5-7 ft easy drive
7-13 ft easy drive to

ok. surface silt w/ trace silt
catcher end had washed out med. gray sand.
bottom end of core had 6" void where
catcher was - had some med. sand.

Measurement (to nearest 0.1 foot):

Avg. % Recovery:

Avg. % Compaction:



Section:	Length:	Description at Cuts:
<input type="checkbox"/> A =		
<input type="checkbox"/> B =		
<input type="checkbox"/> C =		
<input type="checkbox"/> D =		

Total Drive: 13ft.

Length Recovered: 10.2ft

Notes: 10ft. off target.

Sediment Core Processing Log



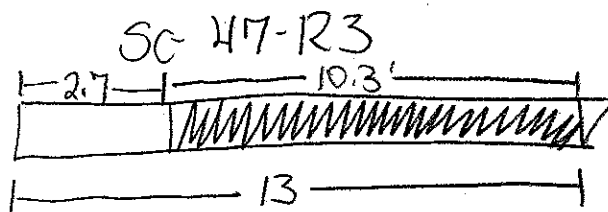
Job: LDWS Core Processing
 Job Number: POPS-18270-511
 No. of Sections: 1
 Sample Length (from log): 10.3'
 Avg. % Compaction:

Core Location/Sample Number: SC-47-R3
 Date/Time: 2/23/06 1415
 Sample Logged by: LM, CB
 Type/Diameter of Sample: 3" round elem.
 Sample Quality: good fair poor disturbed

Notes: Pen = 13 79.2%
DN Deck Rec = 10.3'

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		7.54R 4/2 Brown	10	90			SILT w/lt soupy brown SL sandy SILT transitional SAND: moist, med-stiff, dark brown w/ multi-colored grains poorly sorted SAND w/ medium-coarse grains occasional rootlets	0-2 1445			SILT SAND
		2.54 2.51 black	20	80			Sandy SILT: moist, med-stiff black SAND w/ wood (1.5) coarse sand grains @ 10' 0.2' L con. laminate / concrete rock (non-native) and shell fragments @ 2-2.5' w/ slightly sandy SILT, black (org)	1 2-2 1450 GT 1.4			wood shells SILT (org)
			80	20			@ 1.6 coarse grained SAND w/ multi colored grains about 2" thick @ 1.6 wood 0.2' L w/ strong H ₂ S odor strong H ₂ S-like odor is mild in surrounding area	2			@ 1.8' TV=0.8' B16
			10	90			@ 2.3 layer of brown, damp, med. dense SAND w/ multi colored grains SAND + SILT intermixed in transition zone	2-3 1455 AT 2.8			@ 2.6' TV=0.91 B16
		7.54R 4/2 Brown	90	10			@ 2.8 layer of black SILT (sl. sandy + moist) SAND: 3.0-10.3 moist-damp, dense brown SAND w/ multi colored grains (white, red, orange) well sorted uniform no color variation	3 4 3-4 1500			
								5	4-6 1505		
								6			@ 5.5' TV=0.4 B16

2/23/06
LM



$$\begin{array}{r} \text{mudline} = 13.0 \\ - 10.3 \\ \hline 2.7 \end{array}$$

core catcher is 50% full of
med brown/gray sand

→ 26-40'
opened R2: has 50% winnowing and 1/2 full core catcher
total recovered length = 5.3'

Sediment Core Processing Log

Job: LW6 Core Processing
 Job Number: POS-18220-SH
 No. of Sections: _____
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: SC-47-R3
 Date/Time: 2/23/06
 Sample Logged by: JM, CB
 Type/Diameter of Sample: 3" round
 Sample Quality: good fair poor disturbed

Notes: CONT'D

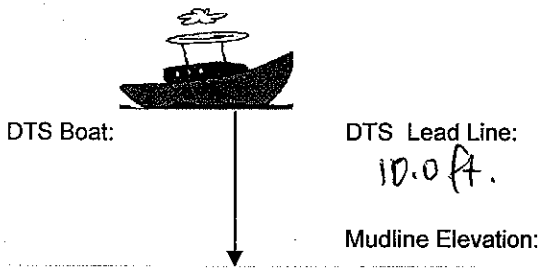
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		7.5 YR 4/2 (SAA) brown					(SAA) @ 6.5' coarse sand, angular fr	7	6-8 151B		SAND
		2.5 YR 5/1 grey					TOP - 100	8	8-10 151B		
		GREY 3/1 v. dk. greenish grey				98	@ 8.9' 2" pocket of green grey very clayey conch. shape SILT @ 9.2' fine, grey SAND w/ <1/2" L wood fragments fining downward @ 9.9 wood fragments, round 1/2" & 2" thick layer	9			SILT wood
							end of core @ 10.3'	10			wood



SEDIMENT CORE DRIVE LOG

Project: <u>UDW Subsurface Sid.</u>	Core Location: <u>UDW SC47</u>
Project #: <u>05-08-0632</u>	Date: <u>02-23-06</u> Time: <u>1130</u>
Field Crew: <u>TD</u>	Attempt #: <u>3</u> <u>Accept/Reject</u>
Contractor: <u>MSS</u>	Sample Method: <u>Vibracore</u>

Proposed Coordinates N: <u>19 7422</u> E: <u>1273340</u> Mudline: Core Drive:	Actual Coordinates N: <u>19 731 8145N</u> E: <u>122 19.1578W</u> Mudline: Core Drive: Core Recovery:
-----------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------



Tide Measurements (Datum:)
Time/Height:
Time/Height:

Description:
(free fall, fingers inverted, vibration needed to drive/extract, estimation of density, debris encountered, slopes, refusal, mudline conditions, drive action, etc.)
*instrument not ready correctly during early part of drive.
5-10 ft - moderate-difficult drive
10 ft on - difficult drive.
a lot of rip rap and debris in area.*

Measurement (to nearest 0.1 foot):

Avg. % Recovery:
Avg. % Compaction:

Section:	Length:	Description at Cuts:
A =		
B =		
C =		
D =		

Total Drive: 13 ft. Length Recovered: 10.3 ft.
79.20%

Notes: 25 ft off target.

core catches end = 50% medium brown/gray sand.

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 47 R2

Project No: 341185.001

Position: NAD83

Collected by: GSM

197448

WAN

Date: 2/22/2006

Time: 13:59

1273341

Northing

Water depth: 5.1 ft

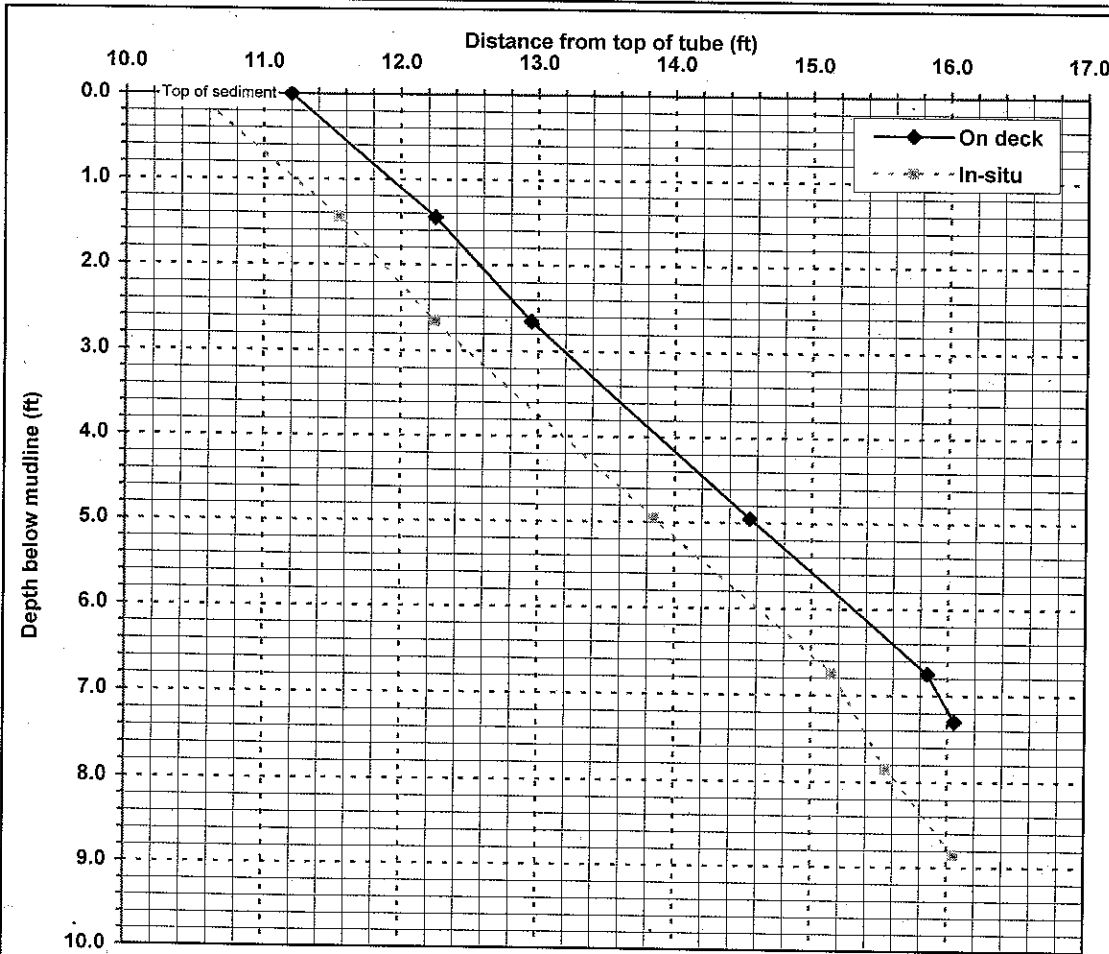
Mudline: 0.6 ft MLLW (estimated using tide tables)

Easting

Place Field ID Label Here

Weather/Comments: N/A

Driven to refusal



Penetration 8.85 ft/ On deck recovery 4.85 ft = 55% Recovery

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
---------------------------	------------------------	------------------	--------------------------	--------------------------------

0-1.45	1.05	72%	Mudline	11.2
1.45-2.65	0.7	58%	1	11.92
2.65-4.95	1.6	70%	2	12.57
4.95-6.75	1.3	72%	3	13.19
6.75-7.85	0.4	36%	4	13.89
7.85-8.85	0.5	50%	5	14.59

6	15.31
7	15.94
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 47
 Attempt: 2
 Field Technician: TD
 Contractor: MCS/RSS
 On-site Visitor: —

Date: 02/22/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 5.1
 Latitude: 197448
 Longitude: 1273341

Station Arrival Time: 1350
 Station Departure Time: 1430
 Dist. From Target Station: 28

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, concrete debris, sandy beach, Duwamish Park
 Sediment surface & slope: silty bottom, flat bottom, no visible obstructions
 Water current and visibility: falling tide, 0 vis.
 Diver Water Depth: 8.4 Tip Probe Depth: — Disk Probe Depth: —

Drive Observations:

Drive Initiation Time: 1405 Drive Completion Time: 1415 Drive Offset: —
 Estimated angle of drive: est. 10°-15°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
14.6	15.0	deck measured, free fall
13.4	14.3	moderate drive
11.1	12.7	moderate drive
9.3	11.4	difficult drive
8.2	11.0	difficult drive
7.2	10.5	difficult drive, refusal
TOTAL 9.85	TOTAL 5.55	Percent Recovered: <u>62.7%</u> (<u>54.8% on deck</u>)

Reason for ending drive: refusal
 If refusal, reason for refusal: hard substrate

Extraction Observations:

Tension on line? yes Stability of vessel: no problems
 Overlying water in core (quantity and description): clear - slightly turbid, ~ 1.5L
 On Boat Recovery: 11.2 Loss of Sediment: 0.7 ft.
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On-Deck Observations:

Staining: dark silty sand, sprayed off.
 Tube Deformation: none.
 Sediment Description (odor or sheen?): brown med-coarse sand, no odor/sheen

Keep or Retry: diver inserted screw plug at sed/H₂O interface
submit to processing team pending analyses and decision to resample

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

The RETEC Group, Inc.
 1011 SW Klickitat Way, Suite 207
 Seattle, WA 98134-1162



206.624.9349 Phone
 206.624.2839 Fax
 www.retec.com

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-22-06 Recorder: SSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 47 R2

Tube Length (ft): 16.05

Water Depth (ft): 5.1

Est. Tide Height (ft): 5.7

Est. Mudline: _____ (MLLW)



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 197448

Easting 1273341

On Deck Top of Sediment 11.2

Comments: falling tide - silty bottom - visibility 0 ft

no debris felt

~ 28A off station

Penetration Tape Reading

Recovery Tape Reading

Comments

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.6</u>	<u>15.0</u>	
<u>13.4</u>	<u>14.3</u>	
<u>11.1</u>	<u>12.7</u>	
<u>9.3</u>	<u>11.4</u>	
<u>8.2</u>	<u>11.0</u>	
<u>7.2</u>	<u>10.5</u>	<u>refusal</u>

Sediment Core Processing Log



Job: Duwamish
 Job Number: POISS-1822D
 No. of Sections: 1
 Sample Length (from log): drive = 7.3'
 Avg. % Compaction: includ = 4.6'
 Notes: 10 Rec = 6390

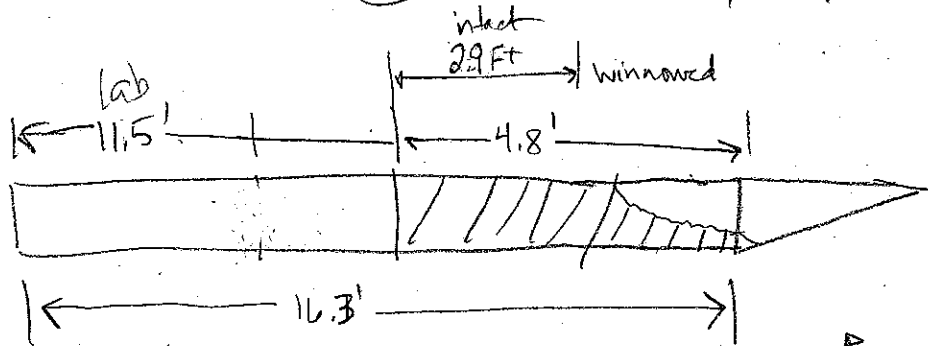
Core Location/Sample Number: LDW-SC-47 (R4)
 Date/Time: Feb 18, 2016 start 0900 stop 1400
 Sample Logged by: A. Fitzpatrick, C. Buckett
 Type/Diameter of Sample: 4" # alum MCS
 Sample Quality: good fair poor disturbed

Notes: Frozen water core is frozen solid, take photos +
core collected 07-16-DL6 near south park sit aside in sun, temp. = high 30's
processed 3 hours later

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, bits, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
0.0							Several pieces 1" diameter Surface had abundant concrete gravel	0.0			000
1.0		V.D. 25y 3/2 D. grayish brown	#0	60	tr		SAND: dark brown, wet, loose, poorly sorted sand w/ F-M-C, poorly sorted	1325 0-1.2'			SAND
2.0		25y 4/2 D. grayish brown	-	TR	98		SILT: dark brown, med. stiff, silt w/ 1" fine sand layer, no layering, uniform, low plasticity, no organics - 0.9' → 1" fine sand layer - 1' → 1/4" med. sand pocket; 2" glass shards (under glass)	1335 13-16.2' 67607'			SILT
3.0		7.5 YR 4/2 Brown	-	98	TR		SAND: Brown, moist, med dense, med sand, well sorted, sand is multicolored grains (red, white, green, orange), no layering, uniform - 2.0' → color change from brown to v.d. greenish gray	1330 1.2-2 3-16.2 67617'			At 1.4' TV=0.7 med wheel
4.0		Gray 3/1 V.D. greenish gray					- 2.9' → 1" dark gray silt layer same w/ depth, winnowed below 2.9 ft not sampled below 2.9 except for discrete sample in shor.	1335 2-2.1' 3-16.2 2.1			M-SAND
5.0							Bottom of Core = 4.8' but 50% winnowed/slumped below 3ft	1340 0.48' Grab 2-16.2			

LDW-SC-47 (21)

Feb 18, 2006



on deck to sediment = 11.5'

shoe empty

50% winnowed from 2.9 FT to 4.8'

not sampled

sharp mudline contact.
rods on top

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-16-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 47 R1

Tube Length (ft): 16.05

Water Depth (ft): 5.2

Est. Tide Height (ft) _____ (MLLW)

Est. Mudline: _____ (MLLW)

Comments: _____



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 197443

Easting 1273361

On Deck Top of Sediment 11.5

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.8</u>	<u>15.1</u>	
<u>13.2</u>	<u>13.6</u>	
<u>11.1</u>	<u>12.1</u>	
<u>9.7</u>	<u>11.6</u>	
<u>8.8</u>	<u>11.3</u>	<u>refusal</u>

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 47 R1

Project No: 341185.001

Position: NAD83

Collected by: GSM

197443

WAN

Date: 2/16/2006

Time: 14:54

1273361

Northing

Easting

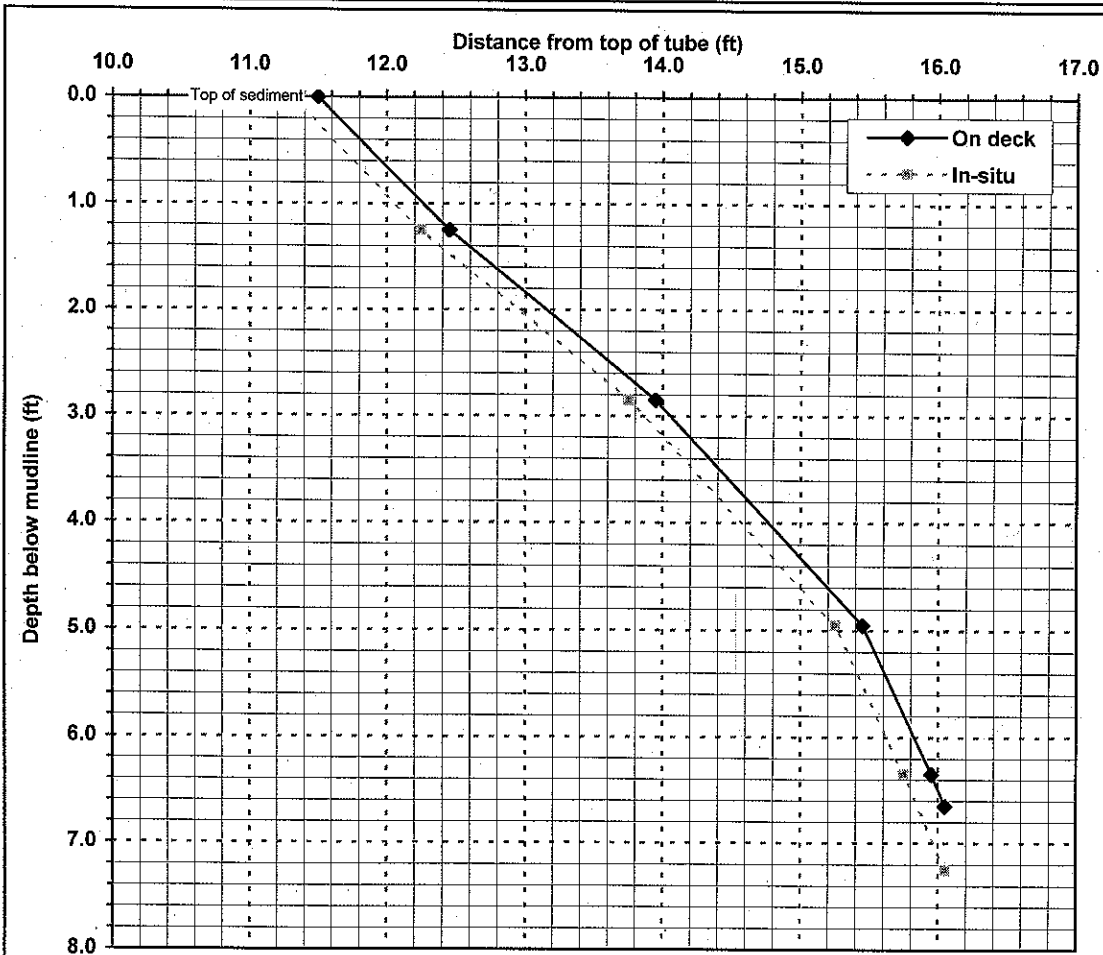
Water depth: 5.2 ft

Mudline: #VALUE! ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A

Driven to refusal



Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

0-1.25	0.95	76%
1.25-2.85	1.5	94%
2.85-4.95	1.5	71%
4.95-6.35	0.5	36%
6.35-7.25	0.3	33%

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------

Mudline	11.5
1	12.26
2	13.15
3	14.06
4	14.77
5	15.47
6	15.83
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 47 Date: 2/14/06 Station Arrival Time: 1435 1525
 Attempt: 1 Core Tube Length: 16.05 Station Departure Time: 24ft due to riprap JMF
 Field Technician: TND, JMF Lead Line Water Depth: 5.2ft Dist. From Target Station: 24ft due to riprap
 Contractor: MCS/RSS Latitude: 197743
 On-site Visitor: _____ Longitude: 1273341

Pre-Drive and Diver Observations:

Shoreline & surrounding area: rip rap, sand
 Sediment surface & slope: unknown
 Water current and visibility: unknown
 Diver Water Depth: _____ Tip Probe Depth: _____ Disk Probe Depth: _____

Drive Observations:

Drive Initiation Time: 1459 Drive Completion Time: 1510 Drive Offset: _____
 Estimated angle of drive: on deck est 10°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
14.8	15.1	easy drive on deck
13.2	13.6	easy drive on deck
11.1	12.1	easy drive on deck
9.7	11.6	moderate drive on deck, penetration slowed
8.8	11.3	difficult drive, refusal
TOTAL 72.5	TOTAL 47.5	Percent Recovered: <u>65.5%</u>

Reason for ending drive: refusal
 If refusal, reason for refusal: hard substrate

Extraction Observations:

Tension on line? Y Stability of vessel: no problem
 Overlying water in core (quantity and description): yes, but unsiphonable
 On Boat Recovery: 11.5 Loss of Sediment: 0.2ft
 Extraction Notes: (i.e. winch or hammer, easy, hard) easy, winch

On Deck Observations:

Staining: none
 Tube Deformation: none
 Sediment Description (odor or sheen?): dark brown fine to med sand

Keep or Retry: diver inserted screw plug at sed/H₂O interface

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

The RETEC Group, Inc.
 1011 SW Klickitat Way, Suite 207
 Seattle, WA 98134-1162



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Sediment Core Processing Log



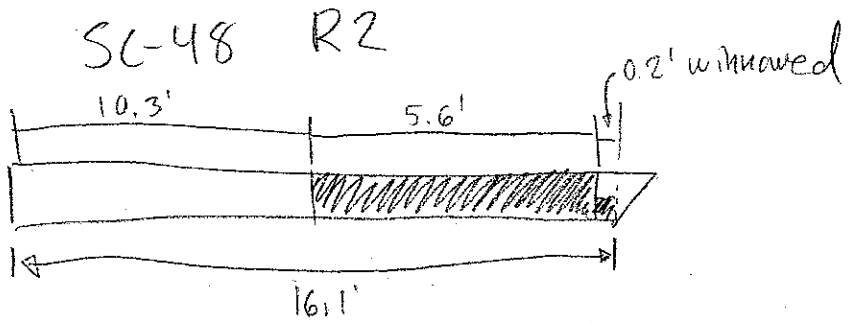
Job: LDWG coring
 Job Number: PORS5-18220
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction:

Core Location/Sample Number: LDWG-SC-48 R2
 Date/Time: 2/8/06 1310-1350
 Sample Logged by: N. Bacher
 Type/Diameter of Sample: 4" sq. aluminium
 Sample Quality: good fair poor disturbed

Notes: Penetr: 6.65 → R: 85%
 On-Deck: 5.65
 Measured length 5.6', missing 0.2' on bottom of core, core catcher partially full.

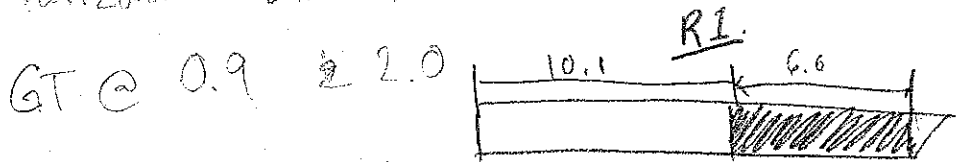
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch	
		5Y 3/2 dk. olive gray		95	5	⊙	soapy wet, olive gray, silty sandy silt. wood brown fragments @ base. polychaete present.		1330			
		6LEY1 3/5GY v. dk. greenish gray		98	2	⊙	moist, med. dense, greenish gray sand w/ trace to upper silt. silt decreasing downward.	1.0	3-1602	GT @ 0.9 M RI		@ 0.6' TV=0.5 sig
							below this point only trace silt otherwise SAA.		1335			@ 1.5' TV=0.5 sig
							Multi colored grains from top to bottom. orange, red, white.	2.0	3-1602	GT @ 2.0 M RI		
									1340			@ 3.0' TV=0.7 sig
								3.0	3-1602			
		10YR 4/2 dk. grayish brown		55	45	⊙	silty sand to sandy silt inter bedded w/ 1/8" clayey silt lenses. → 98% fines		1345			@ 4.7' TV=2.0 sig
		6LEY1 4/5GY dk. greenish gray		85	15		gray, med. stiff clayey silt.	5.0	2-1602			
							moist, brown, med. dense silty fine sand. still multicolored.					
							50% missing, w/ unavail. SAA					
							End of core @ 5.8'	6.0				

GT Shelby's taken in RI. See quick log on back. Thicker upper unit in RI. GT taken in this unit.



R1 quick log

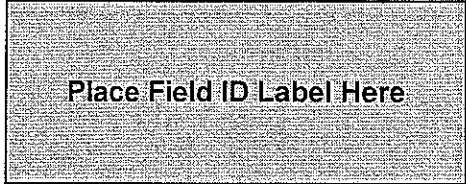
- 0-1 soft, moist to wet, olive gray sl. clayey silt trace to minor wood pieces/shreds.
- 1-5.8 Multicolored sand w/ trace to minor silt, med dense.
grained sand is fine to medium
- 3.4-4.3 SAA but w/ shredded wood pieces, natural color, not black
- 5.8-6.0 moist, stiff, sl. clayey silt. gray w/ trace black horizontal streaks



MCS Environmental MudMole Bore Log

Collection Information

Date: 2-8-06 Recorder: GSM



Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 48 R2

Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 30.9

Time: 846

Northing 196658

Est. Tide Height (ft) 9.4

(MLLW)

Easting 127453

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 10.4

Comments: rising tide - Bottom sandy silt - no debris

Diver 29 ft, no logs

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.9</u>	<u>15.6</u>	
<u>14.3</u>	<u>14.5</u>	
<u>12.0</u>	<u>12.2</u>	
<u>10.0</u>	<u>10.5</u>	
<u>9.7</u>	<u>10.3</u>	<u>penetration slowed</u>
<u>9.4</u>	<u>10.3</u>	<u>refusal</u>

Mudmole™ Bore Log

Project: LDWG Duwamish Coring
Project No: 341185.001
Collected by: GSM
Date: 2/8/2006
Water depth: 30.4 ft

Station: 48 R2
Position: NAD83
 196658
 1274534

Time: 8:46
Mudline: -21.0 ft MLLW (estimated using tide tables)

WAN
 Northing
 Easting

Place Field ID Label Here

Weather/Comments: Overcast

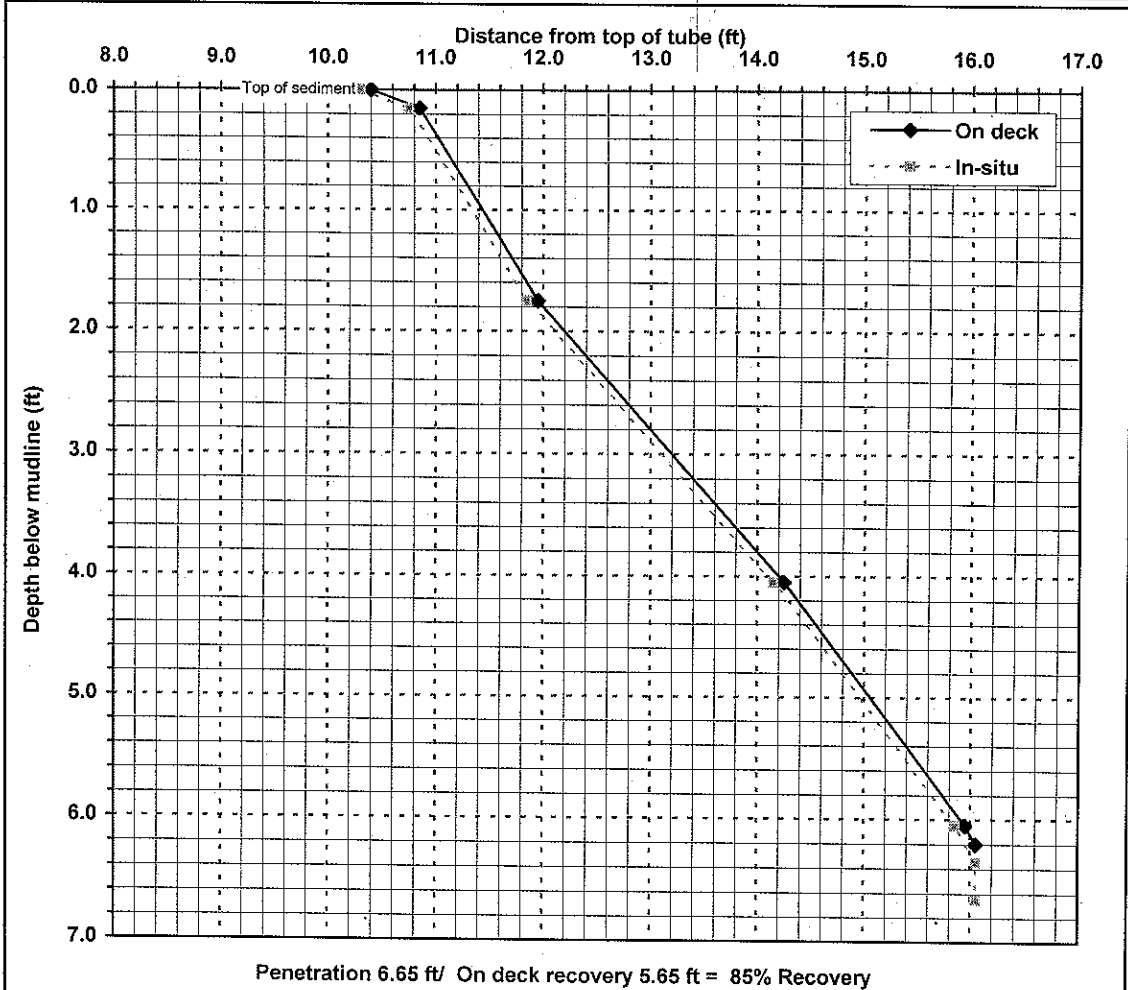
Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------

0-0.15	0.45	300%
0.15-1.75	1.1	69%
1.75-4.05	2.3	100%
4.05-6.05	1.7	85%
6.05-6.35	0.199	66%
6.35-6.65	0.001	0%

Mudline	10.4
1	11.43
2	12.20
3	13.20
4	14.20
5	15.06
6	15.91
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Station Number: 48
 Attempt: 2
 Field Technician: LM
 Contractor: MCS
 On-site Visitor: none
 Latitude: _____
 Longitude: _____

Date: 2/9/06
 Core Tube Length: 16.05
 Lead Line Water Depth: _____
 Diver Water Depth: 29.0'
 Tip Probe Depth: _____
 Disk Probe Depth: _____
 Drive Initiation Time: 0842

Shoreline & surrounding area observations: mid-channel, deeper depth to sediment bottom
 Sediment surface & slope description: level ground, no slope
 Water current: light current, visibility = 1-2'

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
15.9	15.6	(Drive offset:) diver recorded
14.3	14.5	easy drive, cannot see mudmole leave
12.0	12.2	
10.0	10.5	
9.7	10.3	drive slows, moderate-drive, to hard-drive
9.4	10.3	refusal - hit hard bottom? refused almost instantly
Totals		
6.65	5.75	

98.05
 9.4
 6.65
 18.05
 10.3
 5.75

Estimated angle of drive: core tube - mudmole not visible - angle not discernable
 Reason for ending drive: refusal at very hard bottom

Drive Completion Time: 0850

On Boat Recovery: 10.4'

85%

End of Core Tube Observations
Staining: <u>none on core tube</u>
Tube Deformation: <u>no deformation</u>
Loss of Sediment: <u>none (calc-based)</u>
Sediment Description: <u>fine gray sand</u>
Water in Tube: <u>yes - 6 ft of water removed</u>

Keep or Retry: keep

Diver capped core at sed-water interface w/ screwplug & the bit & wrapped on deck
Core extracted by wrench not with hammer

Notes:

Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

0839 Diver in the water
 0845 Diver out of the water

Station Number: AB
 Attempt: 2
 Field Technician: TD, AF, LM
 Contractor: MCS, ESS
 On-site Visitor: —

Date: 2/2/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 30.4 Diver depth 29 ft
 Diver Water Depth: 29 ft.
 Tip Probe Depth: —
 Disk Probe Depth: —
 Drive Initiation Time: 0043

(ND) Latitude: 196658
 (EA) Longitude: 127453
5' off target

Shoreline & surrounding area observations: rip rap, wood pilings (bumper) under S. Park Bridge.
 Bottom conditions: Sediment surface & slope description: no slope, sandy silt, no debris, vis 1-2'
 Water current: flood tide, light current, countering outgoing flow.

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)	
15.9	15.6	(Drive offset:)	core tube guide not used. easy
14.3	14.5		
12.0	12.2		
10.0	10.5		
9.7	10.3	penetration slowed	diff.
9.4	10.3	refusal	

cannot see
(diver retracted into)

Estimated angle of drive: 90 ± 10° est. - not visible
 Reason for ending drive: refusal

Drive Completion Time: 0040 On Boat Recovery: 10.4 on deck top of sediment

End of Core Tube Observations
Staining: <u>—</u>
Tube Deformation: <u>none</u>
Loss of Sediment: <u>Catcher end plugged as it breaks surface (diver)</u>
Sediment Description: <u>fine gray sand</u>
Water in Tube: <u>yes, siphoned out (43 pumps)</u>

Keep or Retry: _____

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-6-08 Recorder: SSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 48 R1

Tube Length (ft): 16.05

Water Depth (ft): 25

Est. Tide Height (ft): 2.0 (MLLW)

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 196 657

Easting 1274517

On Deck Top of Sediment 10.2

Comments: very strong current - core tipped 15° from vertical

Penetration Tape Reading

Recovery Tape Reading

Comments

13.4

12.5

probably should be 13.5

11.2

10.3

7.5 10.5

10.0 10.0

10.3

10.0

no recovery

16.0

16

16

16

16

11.2

13.4

12.5

10.3

13.5

5.8

2.6

3.5

5.7

2.5

reject

not processed, bent tube

Mudmole™ Bore Log

Project: LDWG Duwamish Coring
Station: 48 R1
Project No: 341185.001
Position: NAD83
Collected by: GSM
Time: 14:25
Date: 2/6/2006
Water depth: 25.0 ft
Mudline: -23.0 ft MLLW (estimated using tide tables)

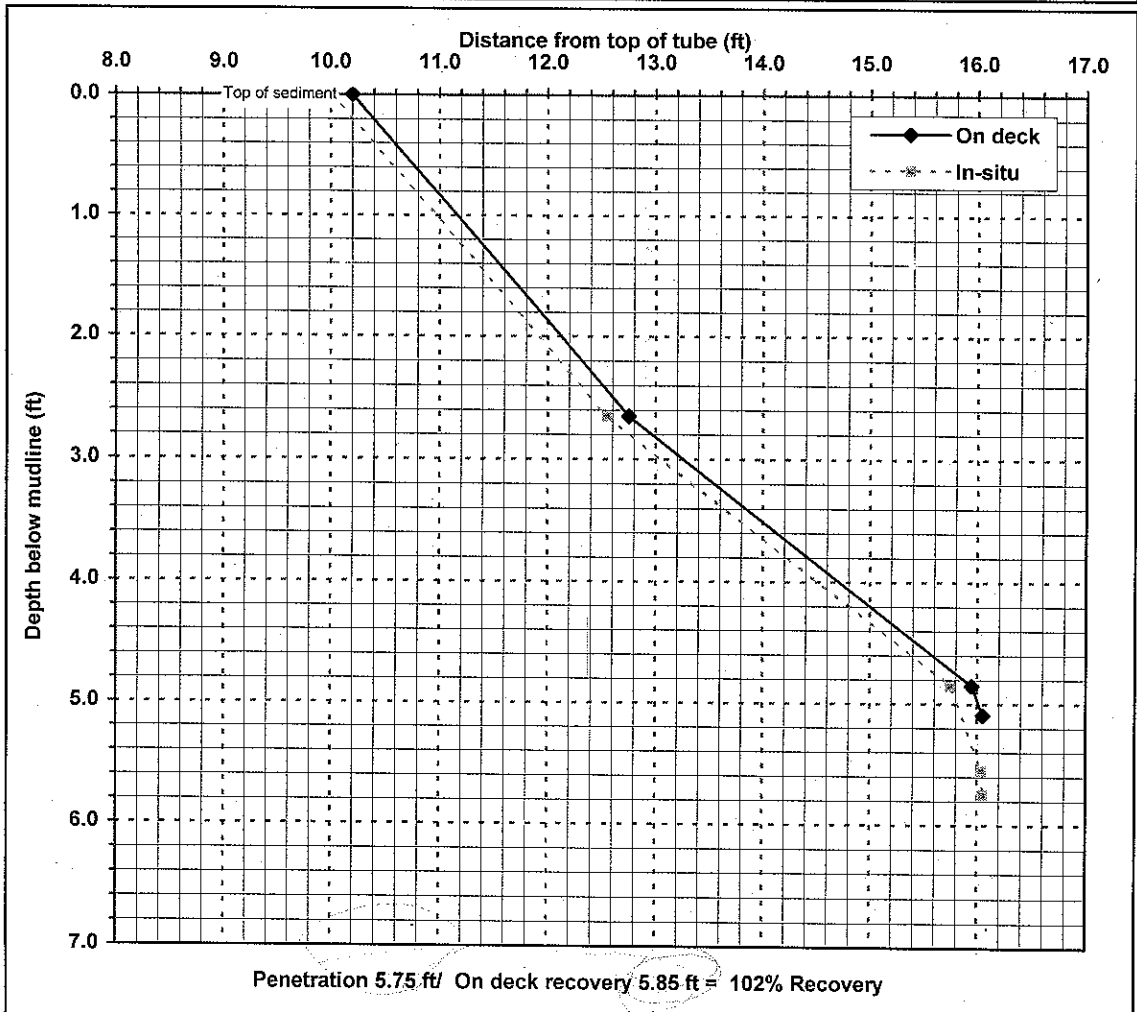
WAN
 Northing
 Easting

Place Field ID Label Here

Weather/Comments: Sunny
 Very strong current core tipped 15deg from vertical

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
---------------------------	------------------------	------------------	--------------------------	--------------------------------

0-2.65	2.55	96%	Mudline	10.2
2.65-4.85	3.2	145%	1	11.16
4.85-5.55	0.29	41%	2	12.12
5.55-5.75	0.01	5%	3	13.26
			4	14.71
			5	16.01
			6	No sample
			7	No sample
			8	No sample
			9	No sample
			10	No sample
			11	No sample
			12	No sample
			13	No sample
			14	No sample
			15	No sample
			16	No sample
			17	No sample
			18	No sample
			19	No sample
			20	No sample



not processed bent tube

Sediment Core Processing Log



Job: LDWG core
 Job Number: PORSS-18220
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction: DRK = 14.0
 Notes: R = 11.4
R' 100 & 80%

Core Location/Sample Number: LDW-49 R1
 Date/Time: 2/6/06 1545 start
 Sample Logged by: W. Badner, Anne Fitz.
 Type/Diameter of Sample: 4" square.
 Sample Quality: good fair poor disturbed

Page 1

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		6 LEY 2 25/10GY greenish black	TV = 2.75 60% WOOD	85 45 2.75 big	85 45	(1.1)	1' of soggy SILT over v. soft, wet, black sl. clayey SILT, organic silt, compressible shine on surface = clayey, one ribbon worm (red flat), scattered rootlets. Moderate H2S no sheen	0.0 1620 0-1 0.7 3-1602 1.0	1620 0-1 3-1602	0.0 2.1 2.1	Wet SILT - - - WOOD -
							blackish, wet, soft, silty WOOD FRAGS shredded, natural.				0.7 TV = 2.75 big
							ORGANIC moist to wet, med. stiff, clayey SILT blocky texture, uniform, sl. compressible trace rootlets, 0.15 Ft = shell frag 1/2 no layers, texture ≈ soft playdoh				1.5 TV = 3 big
							↓ same as above but stiffer softer more standing water				3.0 TV = 2 big
		6 LEY 1 25/10Y greenish black		tr	100	(2.9)					
		3/10GY v.d. greenish gray		90	10		SAND: damp, loose to med dense, F-SAND w/ red + white m.c. grains, H2S odor.				
							↓ same as above but denser, less water black, med stiff, moist, clayey SILT less clayey, less shiny surface sl. compressible but not organic silt				
							- At 4.8-5.0 = 2" sand lenses to 6ft				
							- At 5.4' soggy, shredded wet natural wood layer				
							* H2S odor throughout core				5.0 1635 4-6 6.0

- no sheen or TPH-like odor throughout core

Sediment Core Processing Log



Job: LDWG DUNKMISH
 Job Number: POSS-18220
 No. of Sections: _____
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: LDW-49 R1 Page 2
 Date/ Time: 2/6/06
 Sample Logged by: N. Bacher, Anne Fitz
 Type/Diameter of Sample: _____
 Sample Quality: good fair poor disturbed

Notes: _____

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Depth Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
							At 6.2' 2" pc of natural wood				
				tr 100			Same as above	6.0	1640 6-8		SILT
				15 85		(5.0)	st. sandy silt layer, more gray	7.0	1-1602 1-1602 1-1602	chem- grainsize archive	← C7.0' TV=3.0 big
	R=80%	6LEY 4 4/10Y d. greenish gray ↓ grading to					increasing stiffness w/ depth. st. compressible, scattered frags strong H ₂ S odor	8.0			st. sandy SILT
				tr 100				10.0	1645 8-10		← at 9.0' TV=2.5 big
		2.5/1N 6LEY1 black				(5.0)	did a shear test cuz of PID. Only trace sheen, mostly organic, two tiny 1/16" sheen w/ green inestance.	10.5	1650 1-1602		← CID.5 TV=2.5 big
		4/10Y					st. clayey stiff SILT, damp, sticky	11.0	1-2iplock		
							B of core=11.4' shoe=full	12.0			

PID = VK500 calibrated today

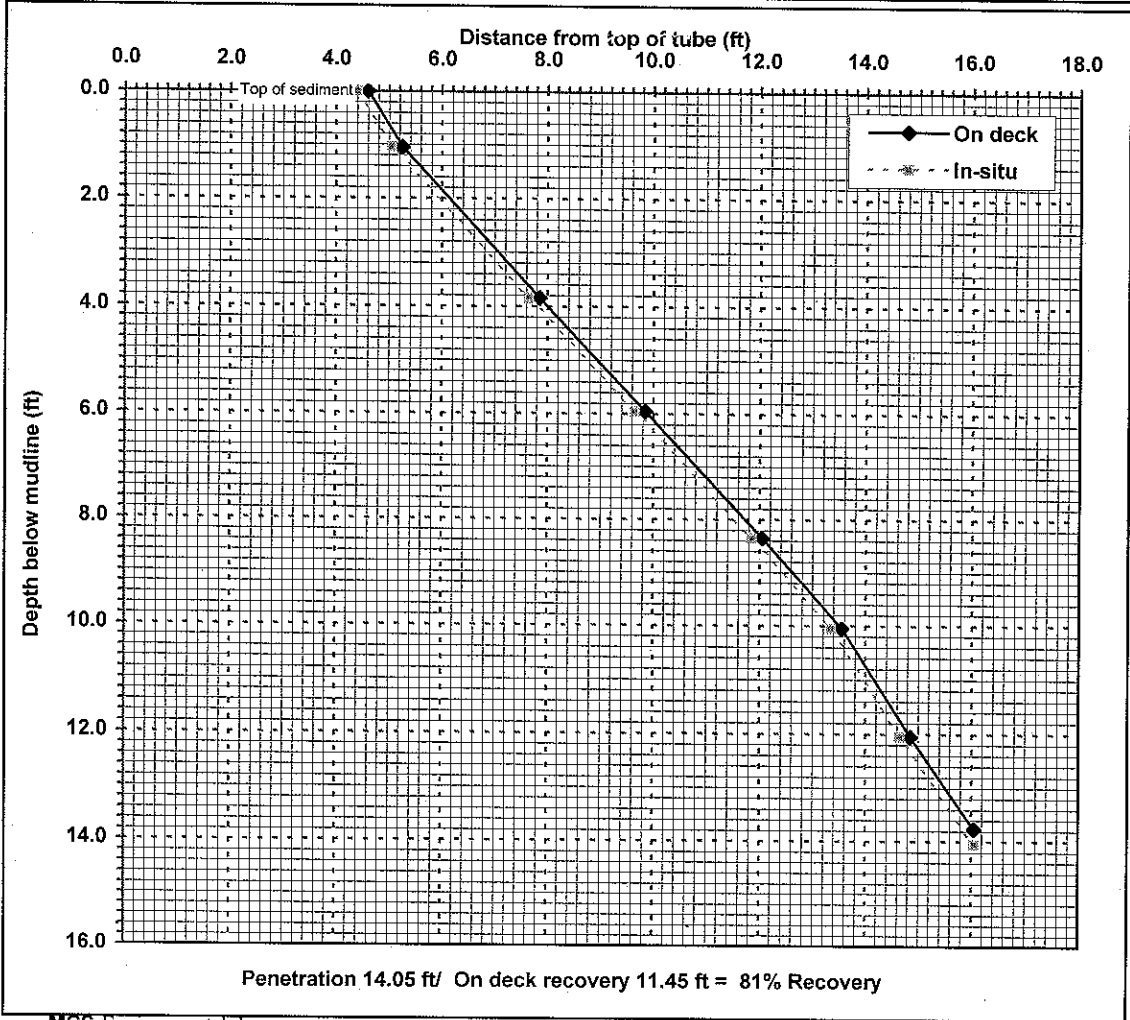
Mudmole™ Bore Log

Project: LDWG Duwamish Coring **Station:** 49 R1
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 195851 Northing
Date: 2/6/2006 **Time:** 12:44 1275477 Easting
Water depth: 28.9 ft **Mudline:** -23.4 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Sunny
 Mudline is 0.4 ft on tape offset penetration readings

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
---------------------------	------------------------	------------------	--------------------------	--------------------------------



2-1.05	0.65	62%	Mudline	4.6
1.05-3.85	2.6	93%	1	5.22
3.85-5.95	2	95%	2	6.13
5.95-8.35	2.2	92%	3	7.06
8.35-10.05	1.5	88%	4	7.99
10.05-12.05	1.3	65%	5	8.95
12.05-14.05	1.4	70%	6	9.90
			7	10.81
			8	11.73
			9	12.62
			10	13.51
			11	14.17
			12	14.82
			13	15.52
			14	No sample
			15	No sample
			16	No sample
			17	No sample
			18	No sample
			19	No sample
			20	No sample

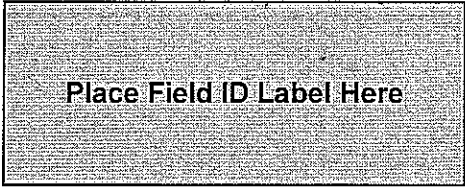
Corrected 2/9/06

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-6-08 Recorder: CSM

Project: 341185.001 Windward Lower Duwamish Coring



Station Name: 49 R1

Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 28.9

Time: 1244

Northing 195851

Est. Tide Height (ft) 5.5 (MLLW)

Easting 1275477

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment _____

Comments: Mudline is 0.4 ft on tape - offset penetration reading

Penetration Tape Reading

Recovery Tape Reading

Comments

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.4</u>	<u>15.4</u>	
<u>12.6</u>	<u>12.4</u>	
<u>10.5</u>	<u>12.8</u>	
<u>8.1</u>	<u>10.8</u>	
<u>6.4</u>	<u>8.6</u>	
<u>4.4</u>	<u>7.1</u>	
<u>2.4</u>	<u>5.8</u>	
	<u>4.4</u>	

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 49 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

195851

Northing

Date: 2/6/2006

Time: 12:44

1275477

Easting

Water depth: 28.9 ft

Mudline: -23.4 ft MLLW (estimated using tide tables)

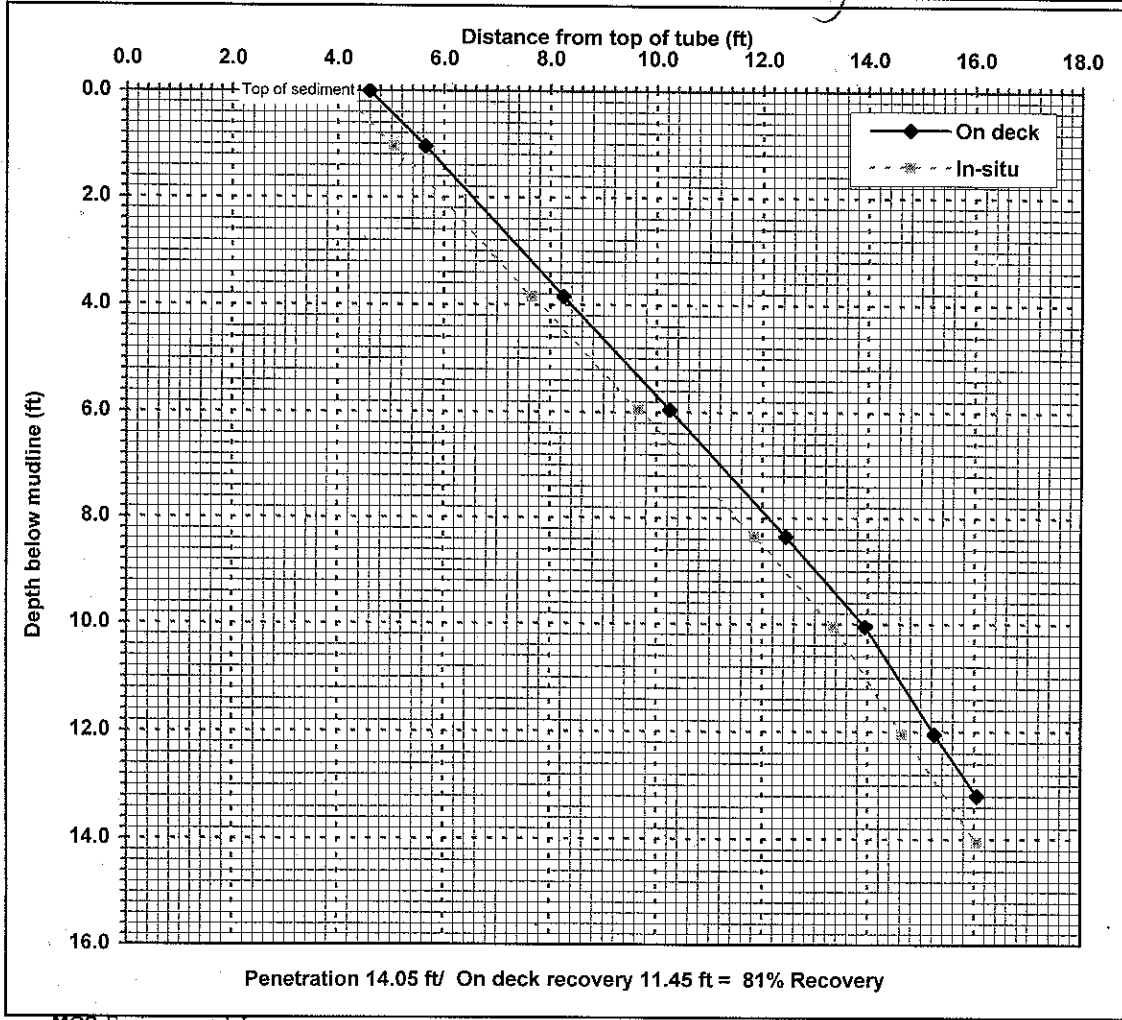
Place Field ID Label Here

Weather/Comments: Sunny

Mudline is 0.4 ft on tapeoffset penetration readings - *adjusted already*

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-1.05	1.05	100%
1.05-3.85	2.6	93%
3.85-5.95	2	95%
5.95-8.35	2.2	92%
8.35-10.05	1.5	88%
10.05-12.05	1.3	65%
12.05-14.05	1.4	70%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	4.6
1	5.60
2	6.53
3	7.46
4	8.39
5	9.35
6	10.30
7	11.21
8	12.13
9	13.02
10	13.91
11	14.57
12	15.22
13	15.92
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Sediment Core Processing Log

Job: LNWG Core Processing
 Job Number: PORS-R220-511
 No. of Sections: 1
 Sample Length (from log): 38' 12.3'
 Avg. % Compaction:
 Notes: Pen = 15.4' 7771
on Deck Roc = 11.8' 7771

Core Location/Sample Number: SC-49-R2
 Date/Time: 2/22/06
 Sample Logged by: LM 1115
 Type/Diameter of Sample: 4" sq. aluminum
 Sample Quality: good fair poor disturbed
 VOC'S ONLY

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5Y 4/3 olive brown	-	10	90	⊕	0-0.5 olive wet, soft, olive-brown + black mottled sl. sandy SILT		0-1 1130		SILT
		2.5Y 2.5/1 black	-	10	90	⊕	0.5- moist, soft-med. stiff, black, sl. sandy SILT • blocky, massive, sl. compressibility • low plasticity • occasional rootlets	1	1-2 1135	0-2	SILT (org)
		GLEYS 3/1 v. dk greenish grey		10	90	⊕	⊕ 2.0 - mottled black + olive grey clayey SILT sl. sandy SILT	2	2-3 1140	2-4	
		2.5Y 2.5/1 black		90	10		⊕ 3.8 = 2" seam of bl. fine-grained SAND ⊕ 4.0 0.2" seam of bl. fine-grained SAND SAND IS multicolored + well-sorted 4-4.5 layer of rootlets + wood fragments 2" L → 30% wood 4.8 in. layer of fine black SAND	3	3-4 1145		
				30%				4	4-5		← wood
							5.2-5.7 layer seam of fine black SAND	5	4-6		
								6	5-6		

Sediment Core Processing Log

Job: LWG Core Processing
 Job Number: POPS-18220-511
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____
 Notes: Pen = 15.4' } 77%
On Deck Rec = 11.8' }

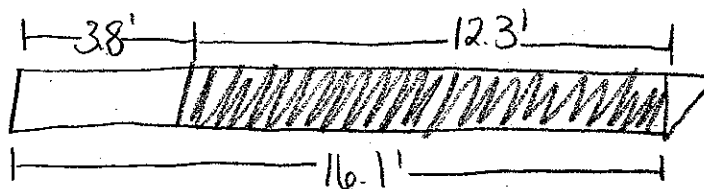
Core Location/Sample Number: SC-49-R2
 Date/ Time: 2/22/06
 Sample Logged by: LM
 Type/Diameter of Sample: 4" sq. alum
 Sample Quality: good fair poor disturbed
 Continued

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		@ 6.2 311					6.2 layer of moist, med. stiff olive grey to clayey SILT with alternating seams of fine black SAND w/ multicolored grains @ 6.6 few shem florets ~ 1cm in size @ 7.0 layers of alternating SAND + clayey SILT (as described above) @ 7.2 SILT is metallic in color Sheen Test: see notes on opp page	6-7	6-8		SILT
							@ 8.2 Sheen test: see notes on opp page PID w/ a bag = 20.5	7	7-8		Sheen test odor
							@ 9.0 alt. black SAND + olive grey clayey SILT layers w/ w/ SILT (w/ g) unit From 9-10.0 slight color change to metallic but is occasional	8	8-9		Sheen test odor
						100	@ 10.0-12.3' sl. sandy SILT is impacted color change to metallic grey strong flt. like odor	9	8-10		
		@ 10.5 471 dk. green sh gray				850	@ 10.5 PID = 267, 757 PID w/ a bag (enil)	10	9-10		
						330	@ 11.0 @ 11.0 PID = 357: PID w/ a bag (enil)	11	10-11	1072	color + PID + metallic color
						220	Note: shem on surface (green zone) from 12.0-12.3'	12	11-12		

End of core @ 12.3'

SC-49-R2

2/22/06
LM



midline = 3.8

$$\begin{array}{r} 16.1 \\ 3.8 \\ \hline 12.3 \end{array}$$

core shoe is 1/2 full of black
sandy SILT

7.2' shen test 4oz jar

- 15-20% iridescent sheen on water surface
- rainbow/iridescent
- none on jar side
- on water surface: florets ~ 1cm ϕ , 0.5" streaks
- ^{strong} odor upon opening jar lid

8.2' shen test 4oz jar

- odor upon sample extraction
- moderate odor upon opening jar
- 10% ^(0.5" ϕ) florets & streaks (0.5") on water surface
- none on jar side

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 49 R2

Project No: 341185.001

Position: NAD83

Collected by: GSM

195852

WAN

Date: 2/22/2006

Time: 10:21

1275498

Northing

Easting

Water depth: 28.0 ft **Mudline:** -18.1 ft MLLW (estimated using tide tables)

Place Field ID Label Here

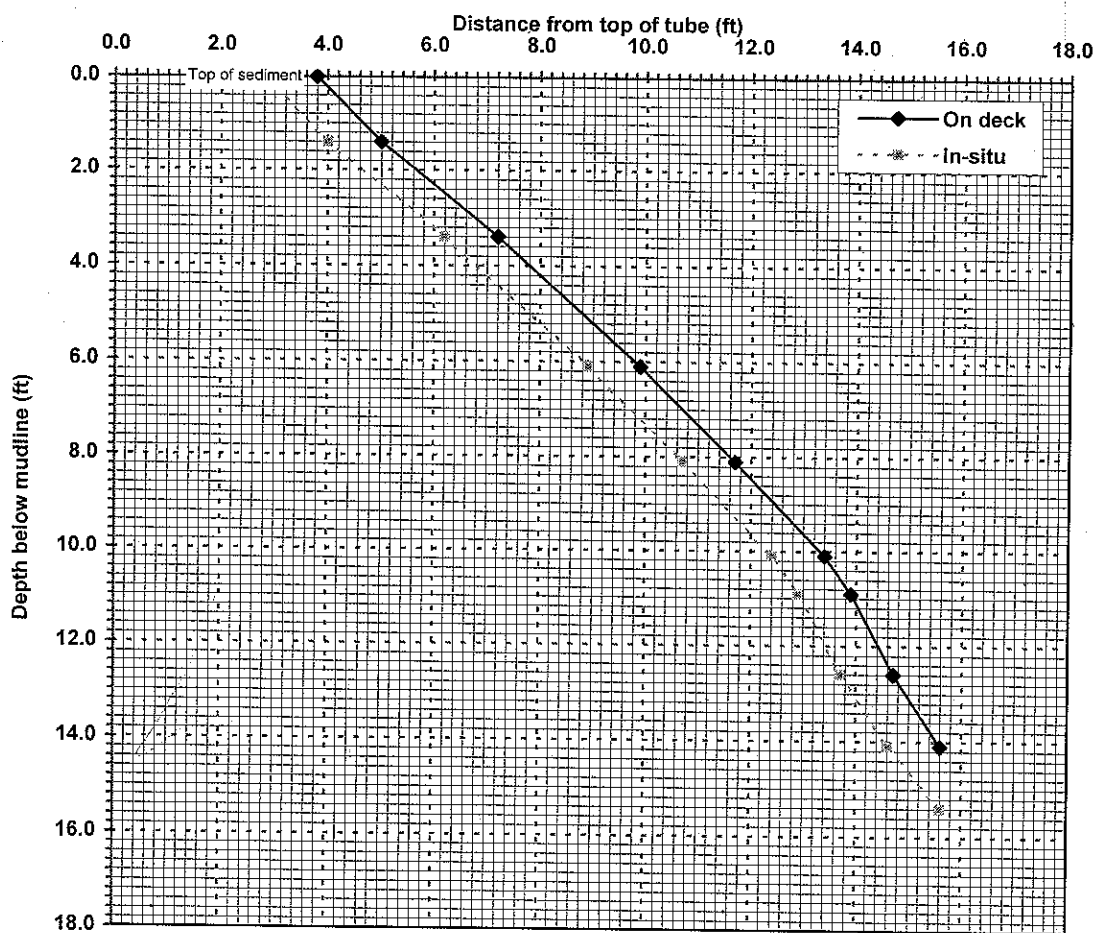
Weather/Comments: N/A

Full Penetration

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
---------------------------	------------------------	------------------	--------------------------	--------------------------------

0-1.4	1.2	86%
1.4-3.4	2.2	110%
3.4-6.1	2.7	100%
6.1-8.1	1.8	90%
8.1-10.1	1.7	85%
10.1-10.9	0.5	63%
10.9-12.6	0.8	47%
12.6-14.1	0.9	60%
14.1-15.4	1	77%

Mudline	3.8
1	4.66
2	5.66
3	6.76
4	7.80
5	8.80
6	9.80
7	10.71
8	11.61
9	12.47
10	13.32
11	13.95
12	14.42
13	14.94
14	15.54
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Penetration 15.4 ft/ On deck recovery 11.8 ft = 77% Recovery

Station Number: 49 Date: 07/22/06 Station Arrival Time: 1005
 Attempt: 2 Core Tube Length: 15.6 Station Departure Time: 1042
 Field Technician: TD Lead Line Water Depth: 28.0 Dist. From Target Station: 8
 Contractor: MCS/RSS Latitude: 195852
 On-site Visitor: _____ Longitude: 1775498

Pre-Drive and Diver Observations:

Shoreline & surrounding area: mid channel, rip rap to east and west, wood dolphins and S. Park Marina to west
 Sediment surface & slope: silty bottom, no slope, no debris
 Water current and visibility: high slack tide, 5 ft. vis, no current
 Diver Water Depth 27 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1026 Drive Completion Time: 1033 Drive Offset: _____
 Estimated angle of drive: est. 10° - eqpt under water - cannot see

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
14.2	14.4	over measured, free fall
12.2	12.2	moderate drive
9.5	9.5	moderate drive
7.5	7.7	moderate drive
5.5	6.0	moderate drive
4.7	5.5	moderate drive
3.0	4.7	moderate drive -
1.5	3.8	mod-diff drive
0.2	2.8	mod-diff drive
TOTAL 154	TOTAL 178	Percent Recovered: <u>83.1%</u> (<u>-76.6% on deck</u>)

Reason for ending drive: end of core tube, full penetration
 If refusal, reason for refusal: _____

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): turbid, ~ 300 ml
 On Boat Recovery: 3.8 Loss of Sediment: 1 ft.
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy.

On Deck Observations:

Staining: streaks of dk silty sprayed off.
 Tube Deformation: none
 Sediment Description (odor or sheen?): silt, fine sand no odor

Keep or Retry: diver inserted screw plug at seal/H₂O interface

The RETEC Group, Inc.
 1011 SW Klickitat Way, Suite 207
 Seattle, WA 98134-1162



Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

206.624.9349 Phone
 206.624.2839 Fax
 www.retec.com

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-22-06 Recorder: GM

Project: 341185.001 Windward Lower Duwamish Coring

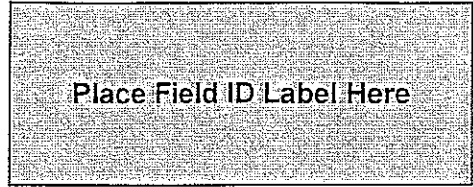
Station Name: 49 R2

Tube Length (ft): 15.6

Water Depth (ft): 28.0

Est. Tide Height (ft) 9.9 (MLLW)

Est. Mudline: _____ (MLLW)



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 195852

Easting 1275498

On Deck Top of Sediment 3-8

Comments: high slack tide - diver depth 27 A, visibility 5 A

silty bottom - no slope - no current - no debris
~ 8 A off station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.2</u>	<u>14.4</u>	
<u>12.2</u>	<u>12.2</u>	
<u>9.5</u>	<u>9.5</u>	
<u>7.5</u>	<u>7.7</u>	
<u>5.5</u>	<u>6.0</u>	
<u>4.7</u>	<u>5.5</u>	
<u>3.0</u>	<u>4.7</u>	
<u>1.5</u>	<u>3.8</u>	
<u>0.2</u>	<u>2.8</u>	<u>full penetration</u>

Sediment Core Processing Log

Job: LDWG Core Processing
 Job Number: PORS-18220-511
 No. of Sections: 1
 Sample Length (from log): 5.8'
 Avg. % Compaction:

Core Location/Sample Number: SC-50-R2
 Date/Time: 2/2/06 0816
 Sample Logged by: LM
 Type/Diameter of Sample: 4" sq. alum.
 Sample Quality: good (fair) poor disturbed

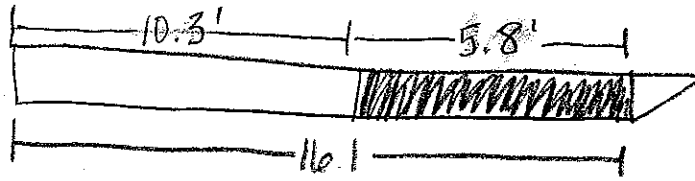
Notes: Pen = 9.4'
DN Beck Rec = 5.8' } 62%

Recovered Length (ft)	% Compaction	Color	Size % - C	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5/4.1/3.8' ^{0.5'}	-	10	90	⊕	2.0-2.1 brown, soggy, soft sl. sandy SILT				SILT
		2.5/1 2.5/1 black		10	90	⊕	0.1-3.6 moist-damp, soft, sl. sandy SILT (org) low plasticity, sl. compressible, massive & blocky texture, uniform until 2.5' (see below) • polychaetes + shell fragments in top 0.5"		0-1 0845 GT 0.9 3/koz		②0.5' TV=0.6 B16
		v. dk green to grey grey 3/1 2.5/1 2.5/1 black	-	11	98	-	@ 2.5 interbed of olive-grey clayey SILT extending to 3.1;		1-2 0850 3/koz		SILT (ORG) ②1.5' TV=1.4 B16
		2.5/4 3/1 dk reddish grey	-	90	10	-	@ 3.1 ^{seam} interbed of fine-med bl. SAND about 0.1' in thickness		2-4 0855 GT 3.0 4/koz		②2.8' TV=2.0 B16
	compressible	2.5/4 3/1 dk reddish grey	-	10	90	⊕	transitional silty SANDS intermixed units of SILT from above, both black(org) SILT & olive grey clayey SILT with med SANDS from below		4		← woody layer SAND + SILT (WOOD)
		2.5/4 2.5/1 black					@ 3.7-3.9 wood fragments up to 0.1' L, substantial woody fragments (20) @ 4.5' wood fragment 0.2' L Sharp		4-4.5 0900		②4.3' TV=4.1 B16
		2.5/4 2.5/1 black					SANDS: moist-damp, med dense, black fine-med. SAND w/ multicolored grains (red, orange, white) (Note: sand was not sampled due to excessive winnowing.) ↙ coarsening downward		5 NOT SAMPLED due to MINORITY		SAND
							5.8' End of Core		6		

* Noz salinity samples collected here from 0-2 & 2-4

SC-50-R2

2/22/06
LM



mudline = 10.3'

core catcher is 1/2 full with
black med grained sand

$$\begin{array}{r} 5' \\ 16.1 \\ \hline 10.3 \\ \hline 5.8' \end{array}$$

winnowing
 4.5' - end of core is winnowed @ 80% void up to 5.2'
 where core catcher becomes 1/2 full from 5.2 - 5.8 (end of core)

Note: R1 was opened. Core lithology mirrored R2.
 winnowing was greater on R1 so it was not
 sampled (3.5' - end of core was >60% winnowed)

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-21-08 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 50 R2

Tube Length (ft): 16.1

Water Depth (ft): 15.0

Est. Tide Height (ft): 5.2

Est. Mudline: _____ (MLLW)

Comments: falling tide ~ 14A depth - vis 4 ft -

silty bottom - no debris - gentle slope

~ 27 ft station 2/10" angle off vertical on core

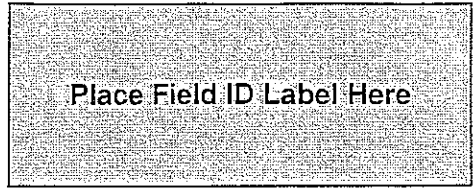
Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 194872

Easting 1276017

On Deck Top of Sediment 10.3



Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.0</u>	<u>14.9</u>	
<u>12.7</u>	<u>12.8</u>	
<u>11.4</u>	<u>12.1</u>	
<u>10.4</u>	<u>11.2</u>	
<u>8.7</u>	<u>10.4</u>	<u>penetration slowed</u>
<u>7.7</u>	<u>10.0</u>	
<u>6.7</u>	<u>9.6</u>	<u>refusal</u>

Mudmole™ Bore Log

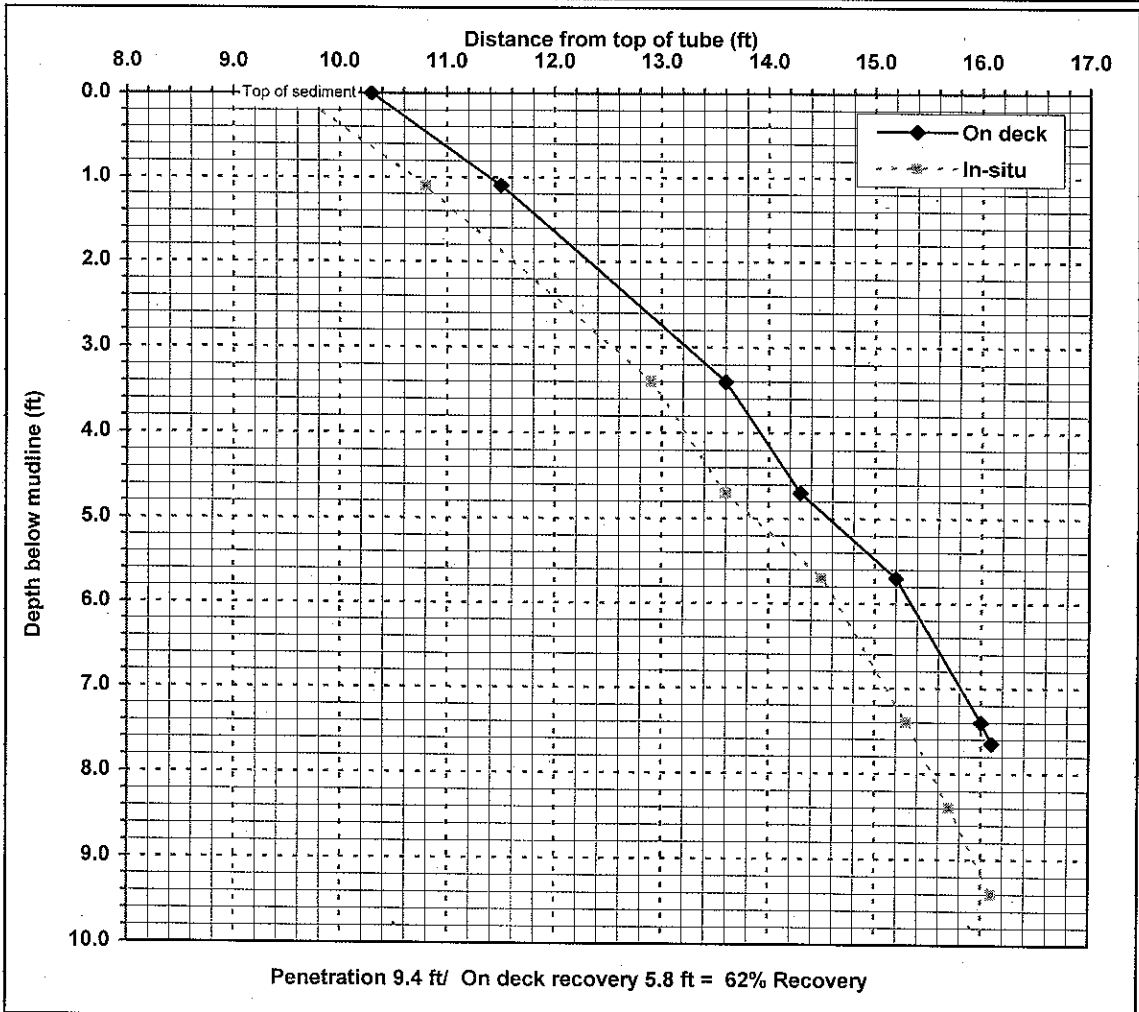
Project: LDWG Duwamish Coring	Station: 50 R2	
Project No: 341185.001	Position: NAD83	WAN
Collected by: GSM	194872	Northing
Date: 2/21/2006	Time: 13:27	1276017
Water depth: 15.0 ft	Mudline: -9.8 ft MLLW	(estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A
 Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------



0-1.1	1.2	109%
1.1-3.4	2.1	91%
3.4-4.7	0.7	54%
4.7-5.7	0.9	90%
5.7-7.4	0.8	47%
7.4-8.4	0.4	40%
8.4-9.4	0.4	40%

Mudline	10.3
1	11.39
2	12.32
3	13.23
4	13.92
5	14.57
6	15.34
7	15.81
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 50

Date: 02/21/06

Station Arrival Time: 1245

Attempt: 2

Core Tube Length: 16.1

Station Departure Time: 1400

Field Technician: TD

Lead Line Water Depth: 15.0

Dist. From Target Station: 09 m
moved offshore

Contractor: MCS/RSS

Latitude: 194872

On-site Visitor: Allison Hillier
John W. Wilson

Longitude: 1276017

Pre-Drive and Diver Observations:

Shoreline & surrounding area: same as R1
Sediment surface & slope: gentle slope, no debris, silty bottom
Water current and visibility: vis. 4 ft., falling tide
Diver Water Depth 14 Tip Probe Depth — Disk Probe Depth —

Drive Observations:

Drive Initiation Time: 1333 Drive Completion Time: 1342 Drive Offset: —
Estimated angle of drive: est 10°-15° off

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
15.0	14.9	diver recorded, free fall
12.7	12.8	easy drive
11.4	12.1	moderate drive
10.4	11.2	moderate-difficult drive
9.7	10.4	moderate-difficult drive
7.7	10.0	difficult drive
6.7	9.6	difficult drive, refusal
TOTAL 9.4	TOTAL 6.5	Percent Recovered: <u>69.1%</u> (<u>61.7%</u> on deck)

Reason for ending drive: refusal
If refusal, reason for refusal: hard substrate

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
Overlying water in core (quantity and description): clear, ~3L
On Boat Recovery: 10.3 Loss of Sediment: 0.7 ft (5.8 ft on deck recovery)
Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: some sandy silt, sprayed off
Tube Deformation: none
Sediment Description (odor or sheen?): med sand no odor/no sheen

?
Keep or Retry: diver inserted screw plug @ sed/ltd interface and wrapped
may resample w/ Vibracore?

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Seattle, WA 98134-1162



Notes:
Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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MCS Environmental MudMole Bore Log

Collection Information

Date: 2-21-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 50 R1

Tube Length (ft): 16.05

Water Depth (ft): 8.9

Est. Tide Height (ft): 6.6

Est. Mudline: _____ (MLLW)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 194878

Easting 1276048

On Deck Top of Sediment 10.8

Comments: falling tide - ~ 8A off station - diver depth 7A

visibility 5 silty bottom with scattered gravel + quarry spoil

gentle slope

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.2</u>	<u>14.5</u>	
<u>12.3</u>	<u>13.0</u>	
<u>11.1</u>	<u>12.2</u>	
<u>8.7</u>	<u>10.9</u>	<u>penetration slowed</u>
<u>7.8</u>	<u>10.6</u>	
<u>6.8</u>	<u>10.2</u>	<u>refusal</u>

Mudmole™ Bore Log

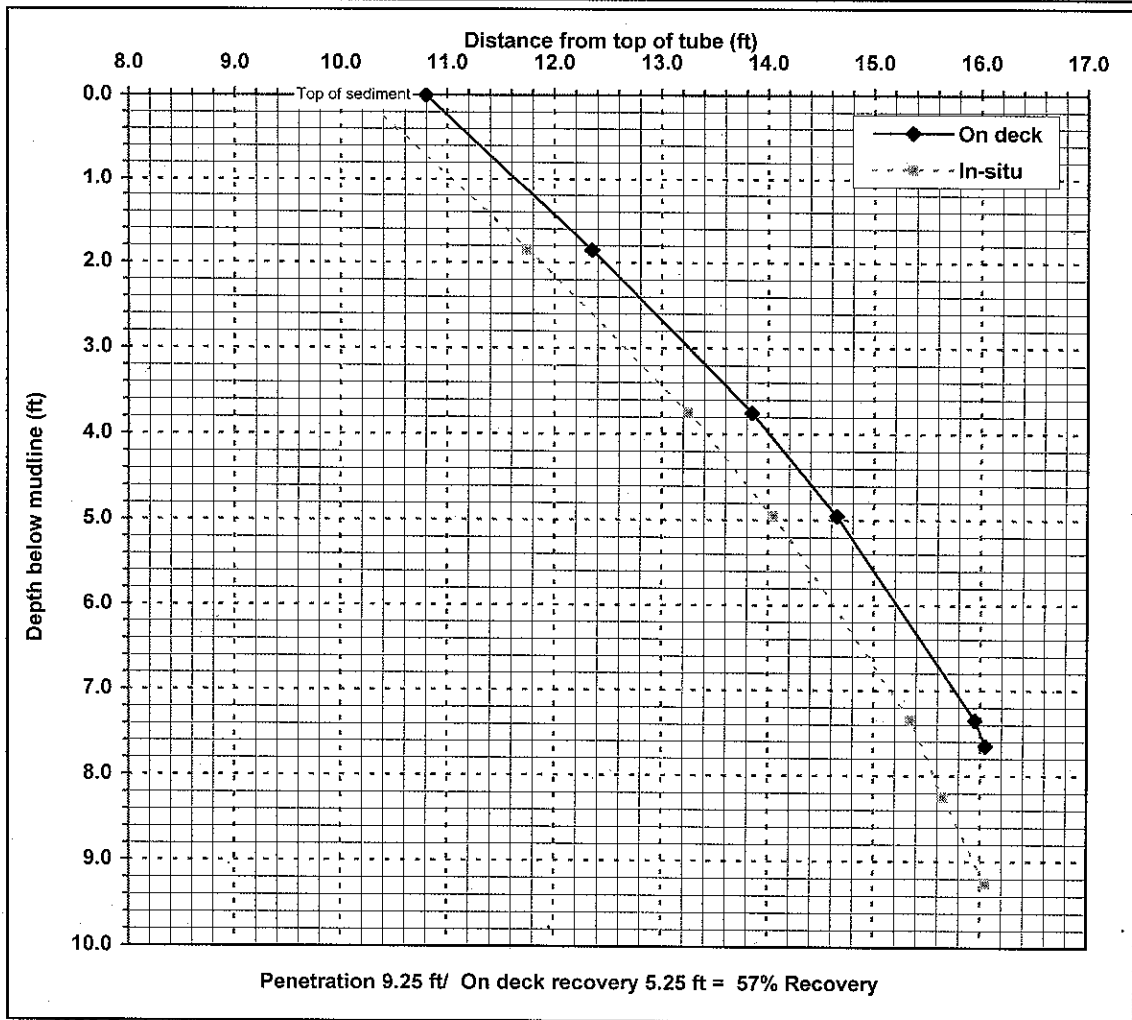
Project: LDWG Duwamish Coring **Station:** 50 R1
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 194878 Northing
Date: 2/21/2006 **Time:** 12:45 1276048 Easting
Water depth: 8.9 ft **Mudline:** -2.3 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A
Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------



0-1.85	1.55	84%
1.85-3.75	1.5	79%
3.75-4.95	0.8	67%
4.95-7.35	1.3	54%
7.35-8.25	0.3	33%
8.25-9.25	0.4	40%

Mudline	10.8
1	11.64
2	12.47
3	13.26
4	14.02
5	14.68
6	15.22
7	15.76
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 50 Date: 01/24/06 Station Arrival Time: 1245
 Attempt: 1 Core Tube Length: 16.05 Station Departure Time: 1400
 Field Technician: TD Lead Line Water Depth: 8.9 Dist. From Target Station: 8
 Contractor: M/S/RSS Latitude: 194878
 On-site Visitor: Allison Hittner ^{Debra} Longitude: 1276048

Pre-Drive and Diver Observations:

Shoreline & surrounding area: Retaining wall (wood/concrete/steel); asphalt riprap & debris
 Sediment surface & slope: silty bottom, scattered gravel/corals/rocks; gentle slope
 Water current and visibility: Vis. 5 ft., falling tide
 Diver Water Depth 7 ft. Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 1253 Drive Completion Time: 1305 Drive Offset: _____
 Estimated angle of drive: ~10°-15°

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
14.2	14.5	deck measured, free fall
12.3	13.0	easy drive
11.1	12.2	easy drive - moderate drive
8.7	10.9	moderate - difficult drive, penetration slowed
7.8	10.6	diver measured - difficult drive
6.8	10.2	difficult drive, refusal
TOTAL 9.25	TOTAL 5.85	Percent Recovered: <u>63.2%</u> (<u>56.8% on-deck</u>)

Reason for ending drive: refusal
 If refusal, reason for refusal: hard substrate

Extraction Observations:

Tension on line? YES Stability of vessel: no problem
 Overlying water in core (quantity and description): clear, ~2.5L
 On Boat Recovery: 10.8 Loss of Sediment: 0.6 ft
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy

On Deck Observations:

Staining: some sand/silt, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): med. gray/brown sand, no odor/sheen

Keep or Retry: diver inserted screw plug at sediment/H₂O interface
will retry for R2

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

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Sediment Core Processing Log



Job: LDW7 Core Processing
 Job Number: PORS-18220-511
 No. of Sections: 1
 Sample Length (from log): 9.8'
 Avg. % Compaction:

Core Location/Sample Number: SC-50-R3
 Date/ Time: 2/24/06 1217
 Sample Logged by: LM, CB
 Type/Diameter of Sample: 3" round
 Sample Quality: good fair poor disturbed

Notes: Pen = 13' }
 On Deck Rec = 8.8' } 69%

Salinity collected from 2.8 - end of core every 2'
 0-2.8' is on hold at ARI from SC-50-R2
 (0-2, 2-4)

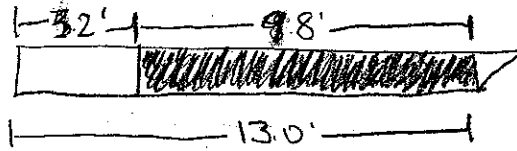
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, blots, wood, other debris)	In Situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		25/4 2.5/1 black		10	90	0	0-0.8 Wet, soft, very sandy SILT, black, grading to a very silty SAND towards 0.8		0-1 1240 2-16oz		1-1 SILT w/ SAND
1			50	70		0	@ 0.8-0.9 layer of gravel, subangular D1/L woody fragments up to 1/4" L @ 1.0 woody fragments 0.12x 1/4", possible paint chip 1/4" L	1	1-2 1245 3-16oz GT 1.2		@ 0.8' TV = 0.1 BIG
		GLEYS 3/4 v. dk grey		20	80		1.4 1" Ø pocket of clayey SILT (grey-green) 1.5 0.2' L woody fragment 1.6 - 1/4" sandy SILT - grey 1.7 - moist, med dense, black multicolored grains med-SAND layer				@ 1.5 TV = 0.9 BIG
2		GLEYS 3/4 v. dk grey		95	5		1.85-1.9 sandy SILT - grey 1.9-2 subangular gravel, occasional	2			
			10	90		0	2.0 - thin, occasional fibrous woody fragments up to 1/4" L, sl. HC-like odor 2.0 - fine sand, grey intermixed w/ a pocket (0.1" x 0.1") of moist, black, med. stiff sl. sandy SILT (org) with rootlets & 0.1" wood fragment @ 2.2 subangular gravel 1" Ø sl. H ₂ S odor sharp		2-2.8 1250 GT = 2.5 2-16oz		SAND w/ SILT (org)
3		GLEYS 3/4 v. dk grey	90	10			SAND moist, med dense, black med. SAND w/ multicolored grains (white, red, orange) @ 2.8 clayey silt pockets, few, 2" Ø	3	2.8-4 1255 4-16oz		@ 3.2 TV = 0.1 BIG
4								4			SAND
5							@ 5.0' 2" Ø pocket of grey-green clayey SILT	5	4-6 1300 3-16oz		
6							@ 5.5' 3" Ø pocket of black sl. sandy SILT	6			

SALINITY COLLECTED @ 2' INTERVALS -

SC-50-R3

2/24/06

LM



$\begin{array}{r} 2.1 \\ 8.0 \\ \hline 8.8 \\ 4.2 \end{array}$

core catcher is 100% full
core catcher is full of gray med. sand
Some water (~200 mL) on surface

Note: length recovered on boat = 8.8'

length recovered at processing = 9.8'

2082

Sediment Core Processing Log

Job: UNUS Core Processing

Core Location/Sample Number: SC-50-R3

Job Number: PORS-18380-511

Date/Time: 2/24/06

No. of Sections: _____

Sample Logged by: LM, CB

Sample Length (from log): 8.8'

Type/Diameter of Sample: 3" round

Avg. % Compaction: _____

Sample Quality: good fair poor disturbed

Notes: CONT'D

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
	SAA						6-9.8: medium SAND w/ occasional layers of coarse SAND coarsening downward from 8-9.8		6-8 1305 3-16oz		SAND SALINITY COLLECTED @ 2' INTERVALS
							@ 7.0 very coarse SAND ~ 10% in med sand matrix	7			
		v. dk greenish gray					@ 7.8' 3" & pockets of gray-green clay SILT	8			
									8-9.8 1310 3-16oz		
							↓ coarsening downward	9			
							End of core @ 9.8'	10			

f:\fieldforms\coreprocess



SEDIMENT CORE DRIVE LOG

Project: LDW Subsurface Sed.
 Project #: 05-08-00-32
 Field Crew: TD, NB
 Contractor: MSS

Core Location: LDW-5C50
 Date: 02-24-06 Time: 0828
 Attempt #: 3 Accept/Reject
 Sample Method: Vibracore

Proposed Coordinates N: 194871 E: 1276045 Mudline: Core Drive: 13 ft.	Actual Coordinates N: 47 31.4784N E: 122 18.4912W Mudline: Core Drive: 13ft. Core Recovery: 8.75 ft (67.3%)
---------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------



DTS Boat:

DTS Lead Line:

11.6 / 12.9
on slope

Mudline Elevation:

Tide Measurements (Datum:)

Time/Height:

Time/Height:

Description:

(free fall, fingers inverted, vibration needed to drive/extract, estimation of density, debris encountered, slopes, refusal, mudline conditions, drive action, etc.)

0-4 free fall
4-10 easy drive
10-13 difficult drive

core catcher full of brown/gray medium sand, some fine sand

silt on surface (suspended in water)
↳ most of it settled before excess core tube was cut off.

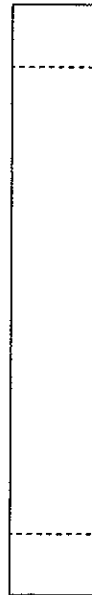
Total Drive: 13 ft.

Length Recovered: 8.75
67.3%

Measurement (to nearest 0.1 foot):

Avg. % Recovery:

Avg. % Compaction:



Core Tube Length:

Section:	Length:	Description at Cuts:
A =		
B =		
C =		
D =		

Notes: ~6ft off target, meets amended BAPP acceptance criteria (>10ft penetration and >60% recovery)

Sediment Core Processing Log



Job: TDWG Core Processing
 Job Number: PORS-18220-511
 No. of Sections: 1
 Sample Length (from log): 6.1'
 Avg. % Compaction: _____

Core Location/Sample Number: 5051-R1
 Date/Time: 2/22/16
 Sample Logged by: LM 1300
 Type/Diameter of Sample: 4" sq. alum.
 Sample Quality: good fair poor disturbed

Notes: Pen = 10.55' 257%
In Deck Rec = 6.05' 257%
salinity from homogenized units

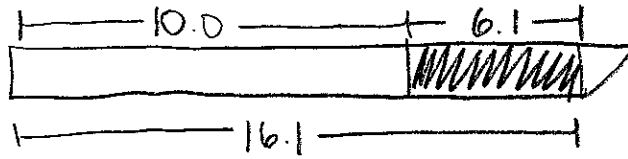
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5YR 3/3 dk reddish brown	-	5	85	0	wet, soft, dk brown sandy SILT 0-0.3 with sheen streaks + sm florets <1" transitional			0-0.5 1325 1-lb02	SILT
		2.5YR 2.5/1 black	30	70	-	0	0.3-1.3 damp moist dense gravelly SAND w/ subangular 1/4-1/8" L gravel @ 0.6 sheen test of gravel: 1mm streak, sl odor @ 1.1 layer of brown-grey sandy SILT about 0.1" transitional		0-2 1310 6T1.0 3-lb02 (sal.)	0.5-1 1328 1-lb02	SAND w/ gravel sheen test @ 1.1 TV = 3.9 B16
		4.5Y 4/1 dk greenish grey + 2.5YR 2.5/1 black	9	10	90	0	damp, mod dense, grey SAND with occasional pockets + 4" seams of black sl. sandy SILT (org?) @ 1.8 1/4" piece of brick @ 1.9 sheen test: mod. odor, iridescent film 2" @ 2.0: 2" & 0.2" L piece of rock (marble)		2	1-1.5 1331 1-lb02	sheen test
			15	85	-	0	2.0-2.8 layer of coarse gravelly SAND next to pockets of SILT sheen test: mod. odor, iridescent 1mm florets + streaks			15-2 1334 1-lb02	sheen test SAND (gravel + silt)
		4.5Y 2 4/1 dk greenish grey					@ 3.5 0.1" gravel w/ iridescent sheen and pockets of bl. silt, metallic grey color Baggie: 2 1/2" pieces of non-native natural sharp			2-2.5 1337 1-lb02	@ 2.4 TV = 1.2 B16
		2.5YR 2.5/1	-	90	10		moist, dense, black SAND w/ multicolored grains SAND is medium grained w/ red, white, orange grains larger grains are subangular @ 4.6 0.1" layer of coarse SAND @ 5.0 0.1" layer of coarse SAND @ 5.3 1" layer of wood fragments, small chopped up: 1" L			2-3.5 1343 1-lb02	sheen test
							End of Core @ 6.0			3.5-3.8 1346 1-lb02	
										3.8-4.5 1349 1-lb02	SAND @ 4.5 TV = 1.1 B16
										4.5-5 1353 1-lb02 (sal.)	
										5-5.5 1556 1-lb02	
										5.5-5.8 1559 1-lb02	
									6	winnowed	

Baggie @ 2.0
 Baggie @ 3.5

SC-51-R1

2/22/06

LM



midline = 10.0

core shoe is 1/2 full of
fine-med bl. sand

57. winnowing @ 3.6 ~~to 1.63.2~~

- surface smear @ 1.63.2 - smear zone only

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-22-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring



Station Name: 51 R1

Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 8.5

Time: 758

Northing 194728

Est. Tide Height (ft) 9.2

(MLLW)

Easting 1276135

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 10.1

Comments: diver depth 9 ft - 2 visibility - silty sand with

scattered cobble & crushed rock - moderate current - gentle slope

~ 1 ft off station

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.7</u>	<u>15.0</u>	
<u>13.1</u>	<u>13.9</u>	
<u>11.8</u>	<u>12.8</u>	
<u>10.5</u>	<u>11.9</u>	
<u>8.1</u>	<u>11.0</u>	<u>slow penetration</u>
<u>7.1</u>	<u>10.7</u>	
<u>5.5</u>	<u>10.0</u>	<u>refusal</u>

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 51 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

194728

Northing

Date: 2/22/2006

Time: 7:58

1276135

Easting

Water depth: 8.5 ft

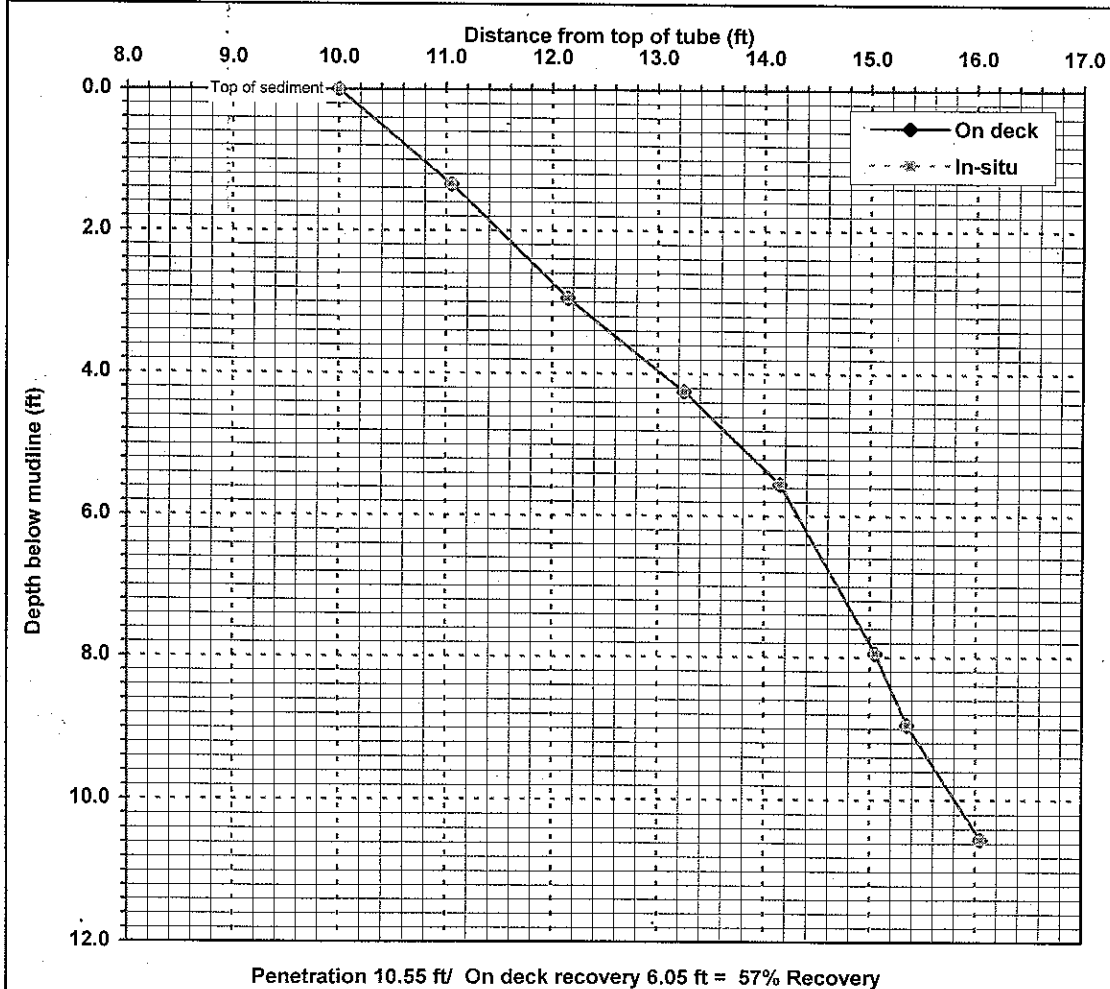
Mudline: 0.7 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A

Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
0-1.35	1.05	78%	Mudline	10
1.35-2.95	1.1	69%	1	10.78
2.95-4.25	1.1	85%	2	11.50
4.25-5.55	0.9	69%	3	12.19
5.55-7.95	0.9	38%	4	13.04
7.95-8.95	0.3	30%	5	13.77
8.95-10.55	0.7	44%	6	14.32
			7	14.69
			8	15.07
			9	15.37
			10	15.81
			11	No sample
			12	No sample
			13	No sample
			14	No sample
			15	No sample
			16	No sample
			17	No sample
			18	No sample
			19	No sample
			20	No sample



Station Number: 51

Date: 02/22/06

Station Arrival Time: 0743

Attempt: 1

Core Tube Length: 16.05

Station Departure Time: 0950

Field Technician: TD

Lead Line Water Depth: 8.5

Dist. From Target Station: 01

Contractor: MIS/ESS

Latitude: 194728

TD

On-site Visitor: _____

Longitude: 1276135

Pre-Drive and Diver Observations:

Shoreline & surrounding area: outfall pipe, ^{concrete,} steel retaining wall, slag pile, asphalt debris
 Sediment surface & slope: silty sand, scattered coarse & crushed rock, gentle slope
 Water current and visibility: moderate current, vis. 2 ft., flooding tide
 Diver Water Depth 9 Tip Probe Depth _____ Disk Probe Depth _____

Drive Observations:

Drive Initiation Time: 0829 Drive Completion Time: 0854 Drive Offset: _____
 Estimated angle of drive: est 50-10° off

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
14.7	15.0	deck measured, free fall, moderate drive.
13.1	13.9	moderate drive
11.8	12.8	moderate drive
10.5	11.9	moderate - difficult drive, diver measured
8.1	11.0	moderate difficult drive, slow penetration
7.1	10.7	difficult drive
5.5	10.0	difficult drive, refusal
TOTAL 10.55	TOTAL 6.05	Percent Recovered: <u>57.3%</u> (56.4% on deck)

Reason for ending drive: refusal
 If refusal, reason for refusal: hard substrate

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): clear, ~ 2.5 L
 On Boat Recovery: 10.1 Loss of Sediment: 0.1 ft.
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, moderately easy

On Deck Observations:

Staining: dark silty sand, sprayed DPP
 Tube Deformation: none
 Sediment Description (odor or sheen?): brown fine sand w/silt, no odor/sheen

Keep or Retry: crow plug inserted by diver at sed/H₂O interface

The RETEC Group, Inc.
 1011 SW Klickitat Way, Suite 207
 Seattle, WA 98134-1162



Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

206.524.9349 Phone
 206.524.2839 Fax
 www.retec.com

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-22-06 Recorder: GSM



Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 5) R2

Position Information

Tube Length (ft): 16.1

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 11.9

Time: 917

Northing 194707

Est. Tide Height (ft) 9.8

(MLLW)

Easting 1276135

Est. Mudline: _____

(MLLW)

On Deck Top of Sediment 11.9

Comments: rising tide - 11 ft diver depth - 1A visibility -

moderate slope - silty bottom - slight current -

220 ft off station

Penetration Tape Reading

Recovery Tape Reading

Comments

13.9

13.8

11.3

12.6

10.3

12.3

9.1

11.8

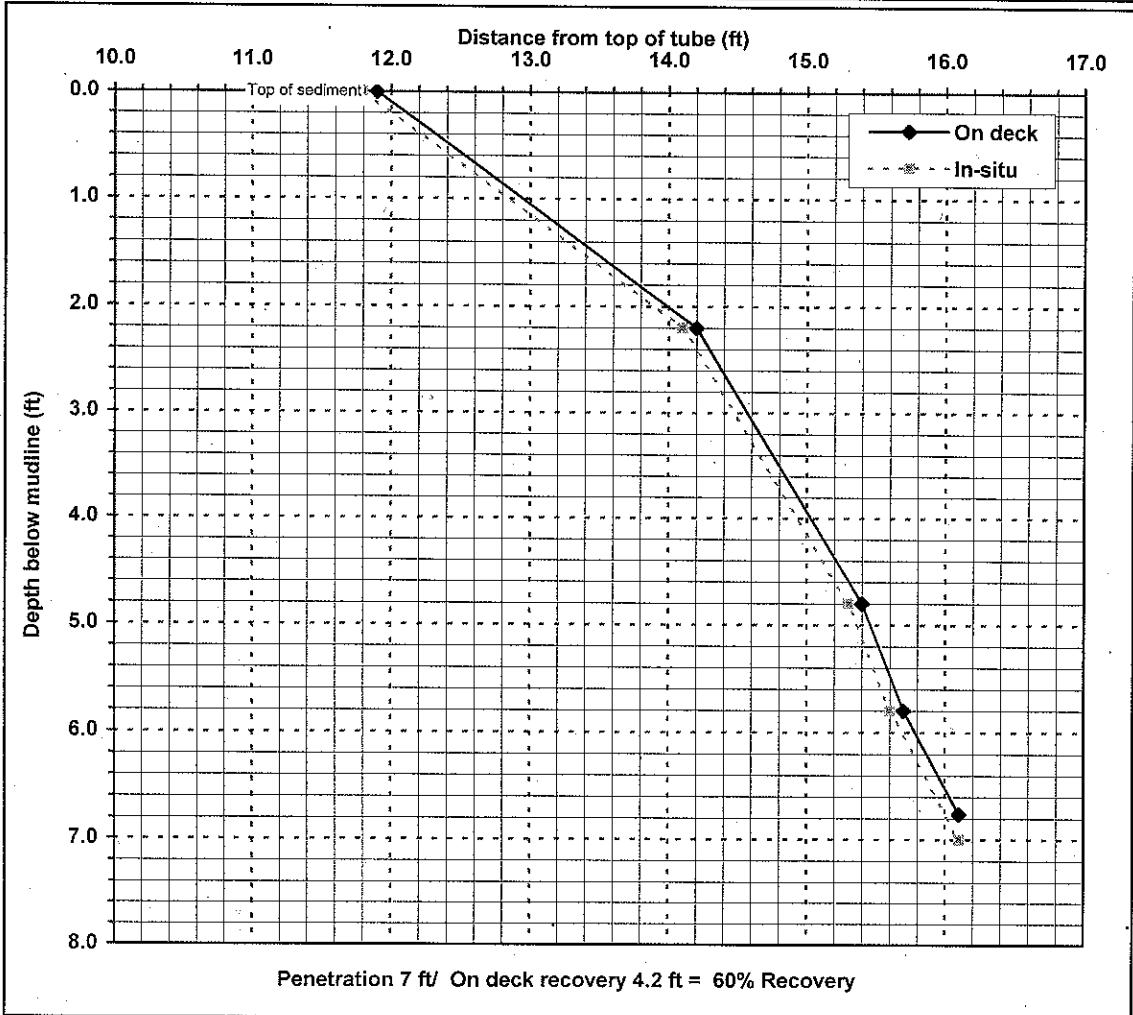
very slow penetration
return

Mudmole™ Bore Log

Project: LDWG Duwamish Coring **Station:** 51 R2
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 194707 Northing
Date: 2/22/2006 **Time:** 9:17 1276135 Easting
Water depth: 11.0 ft **Mudline:** -1.2 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: N/A
Driven to refusal



Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

0-2.2	2.3	105%
2.2-4.8	1.2	46%
4.8-5.8	0.3	30%
5.8-7	0.5	42%

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------

Mudline	11.9
1	12.95
2	13.99
3	14.57
4	15.03
5	15.46
6	15.78
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Station Number: 51 Date: 02/24/04 Station Arrival Time: 0743
 Attempt: 2 Core Tube Length: 16.1 Station Departure Time: 0950
 Field Technician: TD Lead Line Water Depth: 11.9 Dist. From Target Station: 20
 Contractor: M/S/RS Latitude: 194707
 On-site Visitor: — Longitude: 1276135

Pre-Drive and Diver Observations:

Shoreline & surrounding area: Same as R1
 Sediment surface & slope: silty bottom, moderate slope.
 Water current and visibility: flooding tide, 1ft vs. slight current
 Diver Water Depth: 11 Tip Probe Depth: — Disk Probe Depth: —

Drive Observations:

Drive Initiation Time: 0923 Drive Completion Time: 0933 Drive Offset: —
 Estimated angle of drive: Est 10-15° off.

Penetration	Recovery	Drive Notes (e.g. easy, moderate, difficult; measured by diver or deck)
11.3 13.9	12.6 13.8	deck measured, easy-moderate drive.
11.3	12.6	diver measured, moderate drive
10.3	12.3	difficult drive, pen slow pen.
9.1	11.8	difficult drive, refusal
TOTAL 7.0	TOTAL 4.3	Percent Recovered: <u>61.4%</u> (<u>100.0% on deck</u>)

Reason for ending drive: refusal
 If refusal, reason for refusal: hard substrate.

Extraction Observations:

Tension on line? yes Stability of vessel: no problem
 Overlying water in core (quantity and description): slightly turbid ~ 3L.
 On Boat Recovery: 11.9 Loss of Sediment: 0.1 ft.
 Extraction Notes: (i.e. winch or hammer, easy, hard) winch, easy.

On Deck Observations:

Staining: brown silty sand, sprayed off
 Tube Deformation: none
 Sediment Description (odor or sheen?): gray med. sand, no odor/sheen

Keep or Retry: diver inserted screw plug at sed/H₂O interface

The RETEC Group, Inc.
 1011 SW Kirkland Way, Suite 207
 Seattle, WA 98134-1162



Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

206.624.9349 Phone
 206.624.2839 Fax
 www.retec.com

Sediment Core Processing Log



Job: LDWG coning
 Job Number: POR55-18220
 No. of Sections: 1
 Sample Length (from log): 4.9'
 Avg. % Compaction:

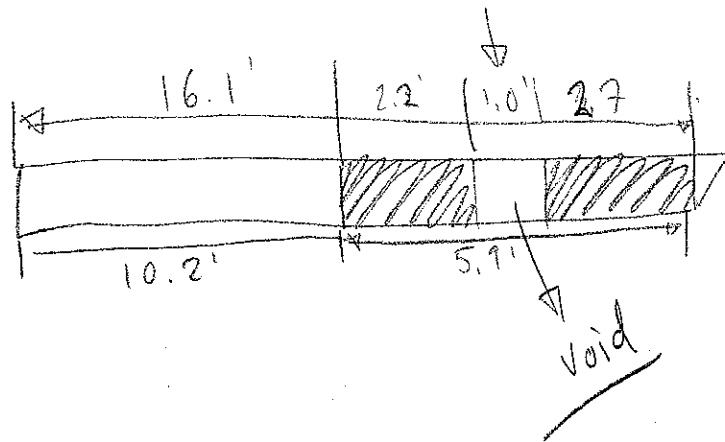
Core Location/Sample Number: LDWG-SC-52 R3
 Date/ Time: 2/8/06 0920
 Sample Logged by: N. Bacher
 Type/Diameter of Sample: 4" sq. tube
 Sample Quality: good (fair) poor disturbed

Notes: P=10.25 Rec%: 57% VOID from 2.2 to 3.2 logged as continuous.
 On deck R: 5.85 Top of tube to seal open core = 10.2'

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.5/3 1/2 dk. gray 4 mm		12	88		wet, sandy, brownish gray, sl. sandy silt minor twigs and small shredded wood frags				
		GLE Y 2 4/1004 dark green gray		5	95		moist, med. soft, olive gray SILT w/ trace sand. slight to mod. H ₂ S odor. trace to minor small shredded wood frags.		0930		
		GLE Y 1 2.5/N Black			100	⊘	moist, med. stiff, black SILT w/ minor wood shreds (small) and twigs slight H ₂ S odor.	1.0		GT@ 1.2'	@0.8' TV=2.3 medium
						⊘	1.3-1.4. small gray, sl. silty clay lens: high plasticity.			0935	
						⊘	Increasing stiffness downward as moisture content decreases.	2.0			@1.6' TV=1.9 medium
		GLE Y 1 2.5/564 greenish black		10	90		wood shreds, slivers thin and long (part base of layer 3' x 1/8") moist, med. loose, olive green sl. silty sand. sand is fine and grades coarser downward.			0940	
						⊘	trace wood shreds @ 2.6'	3.0			
						⊘	multi colored grams and orange, red, white			GT@ 3.75'	@3.4' TV=2.3 big
								4.0		0945	
				5	95		SAA but coarse and trace silt.	5.0			
							End of core @ 4.9'				
							NOTE: 1' void between 2.2-3.2'. Based on on deck measurements and open tube measurement, loss				
								6.0			true end of core was 5.9' incl. void

Please see note.

Based on oversight consultation & approval. → is through bottom of core. For logging and sediment below void more F-2 40 06 90



R2 quick log

0-0.2': good intact surface layer, pale olive gray.
 polychaete tubes?

0.2-1.5: then black silt as 0.6-2.2 m R3.

1.5-3.5: fine to medium sand.

never gets into coarse sand
 as m R3 which was driven
 3' further. 50% missing from 1.5-2.2'

Mudmole™ Bore Log

Project: LDWG Duwamish Coring
Station: 52 R1
Project No: 341185.001
Position: NAD83 WAN
Collected by: GSM
 194173 Northing
Date: 2/7/2006
Time: 13:16 1276289 Easting
Water depth: 7.1 ft
Mudline: -0.9 ft MLLW (estimated using tide tables)

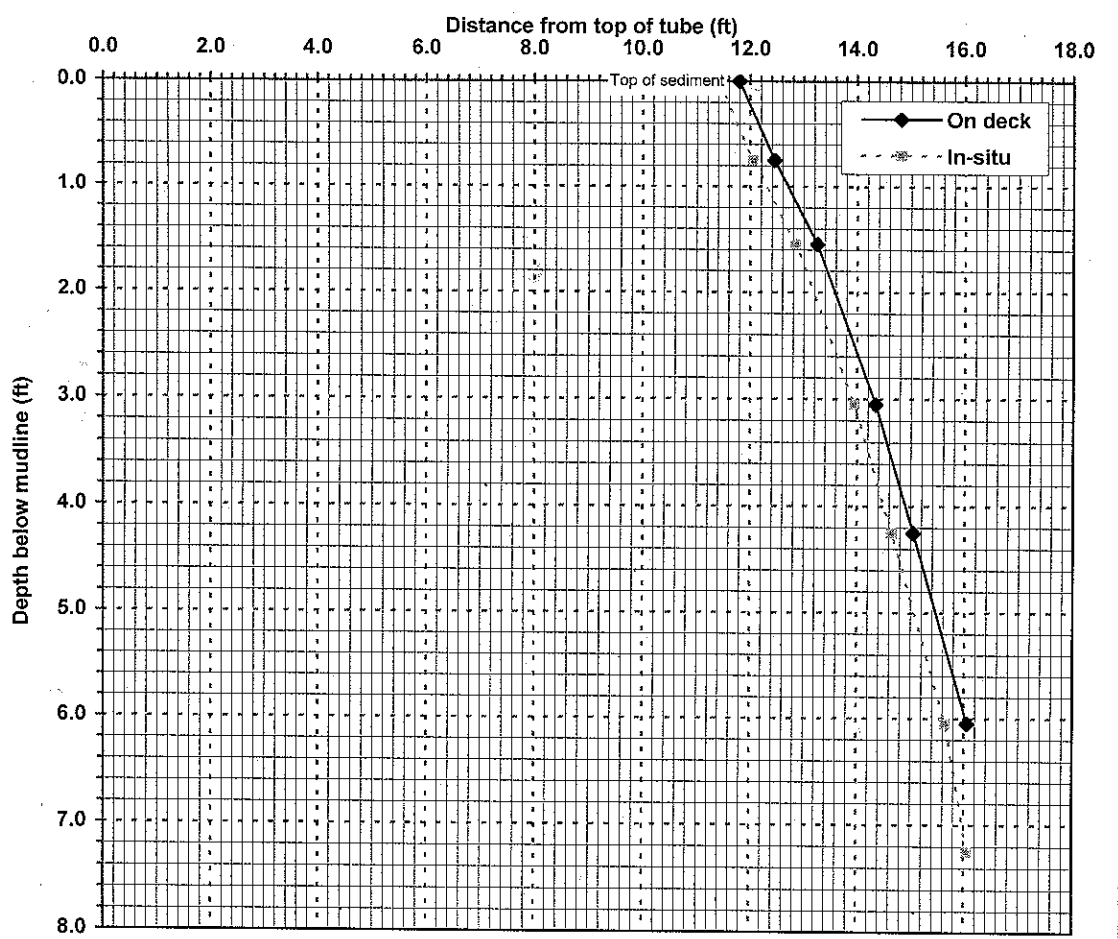
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Weather/Comments: Sunny
 medium fine sand in tip of core

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
---------------------------	------------------------	------------------	--------------------------	--------------------------------

0-0.75	0.65	87%	Mudline	11.8
0.75-1.55	0.8	100%	1	12.70
1.55-3.05	1.1	73%	2	13.58
3.05-4.25	0.7	58%	3	14.31
4.25-6.05	1	56%	4	14.90
6.05-7.25	0.4	33%	5	15.47

6	16.02
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Penetration 7.25 ft/ On deck recovery 4.25 ft = 59% Recovery

Station Number: 52
 Attempt: 1
 Field Technician: LM, CB
 Contractor: MCS
 On-site Visitor: Tim
 Latitude: 194173
 Longitude: 1276089

Date: 2/7/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 7.1'
 Diver Water Depth: not taken
 Tip Probe Depth: _____
 Disk Probe Depth: 0.8'
 Drive Initiation Time: 1319

Shoreline & surrounding area observations: sheet pile along shoreline, slay downstream, 10' upriver from stream drain
 Sediment surface & slope description: hard bottom, silty sand. Depth not measured by diver
 Water current: negligible

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
15.3	15.4	(Drive offset:) hard-drive, slow start - boat
14.5	14.68	hard drive - boat measurement
13.0	14.5	easy easier-drive - boat measurement
11.8	12.8	easier drive - boat measurement, beginning to slow
10.0	11.8	medium hard drive, slow - boat measurement
8.8	11.4	very hard, slow - " "
Totals		
7.25	4.65	

} mud/mole
 in guide
 mechanism
 out of guide
 " " "

15.3
 16.05
 8.8
 7.25

Estimated angle of drive: 10' from vertical
 Reason for ending drive: refusal

Drive Completion Time: 1335 On Boat Recovery: 11.8

10411

End of Core Tube Observations
Staining: <u>petroleum-like odor, no stain evident</u>
Tube Deformation: <u>none evident</u>
Loss of Sediment: <u>0.4' lost: large thin - sand coming out of tube bottom - diver observed</u>
Sediment Description: <u>black, wet, muddy</u>
Water in Tube: <u>water removed from top of core</u>

Keep or Retry: Keep

Diver wrapped under water

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

1302 - diver in the water to search for good location to core.
 1340 - diver in the water for core

Station Number: 52

Date: 2/7/06

Attempt: 1

Core Tube Length: 16.05

Field Technician: TD (NW) CBALN (EOTE)

Lead Line Water Depth: 7.1

Contractor: USI, ESS

Diver Water Depth: _____

On-site Visitor: TH (SAC)

Tip Probe Depth: _____

(NO)

Latitude: 19.4173

Disk Probe Depth: _____

(EA)

Longitude: 127.6289

Drive Initiation Time: 1319

Shoreline & surrounding area observations: retaining wall (sheet); piles of slag visible

Sediment surface & slope description: cannot see

Water current: light wind; low-mid. current.

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
15.3	15.4	(Drive offset:)
14.5	14.6	
13.0	14.5	
11.8	12.8	
10.0	11.8	
8.8	11.4	

Estimated angle of drive: 90° ± 10°

Reason for ending drive: refusal

Drive Completion Time: 1334

On Boat Recovery: ON DECK TOP OF SEDIMENT

End of Core Tube Observations
Staining:
Tube Deformation:
Loss of Sediment:
Sediment Description:
Water in Tube:

Keep or Retry: _____

Notes:
Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Station Number: 52
 Attempt: 2
 Field Technician: IM, CB
 Contractor: MCS
 On-site Visitor: none
 Latitude: 194178
 Longitude: 1876216

Date: 2/7/00
 Core Tube Length: 16.05'
 Lead Line Water Depth: 5.9'
 Diver Water Depth: _____
 Tip Probe Depth: _____
 Disk Probe Depth: _____
 Drive Initiation Time: 1402 off-site during initiation

Shoreline & surrounding area observations: slag, rip-rap, same location as attempt 1
 Sediment surface & slope description: same as attempt 1
 Water current: same as attempt 1

arrive after coring has begun

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
13.3	13.7	(Drive offset:)
12.3	12.7	
11.2	12.1	hard, slow drive
10.1	11.6	refusal
Totals		
5.95	4.45	

16.05
 10.10
 5.95
 11.60
 4.45

Estimated angle of drive: 15' from vertical
 Reason for ending drive: refusal

Drive Completion Time: 1410 On Boat Recovery: 11.9 on deck to top of sed.

275%

End of Core Tube Observations
Staining: <u>none</u>
Tube Deformation: <u>none</u>
Loss of Sediment: <u>none apparent</u>
Sediment Description: <u>black, muddy, wet</u>
Water in Tube: <u>water siphoned from top of tube</u>

1417 diver enters water
 1418 tug buoy over take to starboard

Keep or Retry: Retry

diver wrapped in water

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Station Number: 52
 Attempt: 2
 Field Technician: TD/CA/LM
 Contractor: UCR, ESS
 On-site Visitor: TK(SAO)

Date: 4/10/06
 Core Tube Length: ~~16.05~~ 16.05
 Lead Line Water Depth: 59
 Diver Water Depth: _____
 Tip Probe Depth: _____
 Disk Probe Depth: _____
 Drive Initiation Time: 1402

(W) Latitude: 19° 17' 28"
 (E) Longitude: 157° 16' 29.6"

Shoreline & surrounding area observations: same as R1
 Sediment surface & slope description: _____
 Water current: _____

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
13.5	13.7	(Drive offset:)
12.3	12.7	
11.2	12.1	
10.1	11.6	

Estimated angle of drive: ~90° ± 10°
 Reason for ending drive: refusal

Drive Completion Time: 1411 On Boat Recovery: 11.9 on deck top of sediment -

End of Core Tube Observations
Staining: _____
Tube Deformation: <u>NO</u>
Loss of Sediment: <u>core catcher and wrapped in situ</u>
Sediment Description: <u>cannot see</u>
Water in Tube: <u>yes, siphoned off</u>

Keep or Retry will try for 3rd core.

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Station Number: 52
 Attempt: 3
 Field Technician: CB, LM
 Contractor: MCS
 On-site Visitor: None
 Latitude: 194160
 Longitude: 1276279

Date: 2/7/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 5.8'
 Diver Water Depth: _____
 Tip Probe Depth: _____
 Disk Probe Depth: _____
 Drive Initiation Time: 1440

(23.0' off shore)

Shoreline & surrounding area observations: same as Attempt 1

Sediment surface & slope description: _____

Water current: 1.0 foot visibility

Pen.	Rec.	Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
		14.5	15.0	(Drive offset:)
14.5	15.0	13.3	14.2	moderate-drive boat-measured
13.3	14.2	11.9	13.2	moderate-hard drive
11.9	13.2	9.8	12.0	Moderate-hard drive
9.8	12.0	8.4	11.1	hard drive
		8.4	11.1	hard drive
		7.1	10.5	hard drive
		5.8	10.1	hard drive; refusal
totals		10.25	595	

mud mole
in guide
mechanism
↓
no guide

Estimated angle of drive: ~~90 + 5~~ 80-85° in guide mechanism; 80° no guide
 Reason for ending drive: refusal

Drive Completion Time: 1503

On Boat Recovery: 10.2

58%

End of Core Tube Observations
Staining: <u>None</u>
Tube Deformation: <u>None</u>
Loss of Sediment: _____
Sediment Description: <u>wet, black, muddy - lots of residual as tube is brought up</u>
Water in Tube: <u>Siphoned out</u>

Keep or Retry: _____

Diver caps core end in water
 wind picks up to 10 mph

Notes:

Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

1503 Diver in water to wrap core bottom

14.05
~~13.65~~
~~5.95~~
 18.45
~~5.8~~
~~12.65~~

Station Number: 52

Date: 2/7/06

Attempt: 3

Core Tube Length: 16.05

Field Technician: TD/CO/LM

Lead Line Water Depth: 5.8

Contractor: UCS, ESS

Diver Water Depth: _____

On-site Visitor: Ø

Tip Probe Depth: _____

(LD)

Latitude: 194160

Disk Probe Depth: _____

(PA)

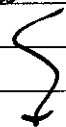
Longitude: 1276279

Drive Initiation Time: 1443

Shoreline & surrounding area observations: SAME AS R1 & R2

Sediment surface & slope description: _____

Water current: _____



Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
14.5	15.0	(Drive offset:)
13.3	14.2	
11.9	13.2	
9.8	12.0	
8.4	11.1	
7.1	10.5	
5.8	10.1	

Estimated angle of drive: ~90 ± 5°

Reason for ending drive: refusal

Drive Completion Time: 1503

On Boat Recovery: 10.2 ON DECK TOP OF SEDIMENT

End of Core Tube Observations
Staining: <u>✓</u>
Tube Deformation: <u>NO</u>
Loss of Sediment: <u>core catcher end capped in situ</u>
Sediment Description: <u>cannot see</u>
Water in Tube: <u>yes, siphoned off</u>

Keep or Retry: _____

Notes:

Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

- Eric marks midline w/ knife ~~after we have an on deck recovery measurement~~
- Drill drain hole 2' ft above midline on deck recovery.

Changes

- Third headset option

Mudmole™ Bore Log

11.9 / 12.6

Project: LDWG Duwamish Coring

Station: 52 R2

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

194178

Northing

Date: 2/7/2006

Time: 13:59

1276296

Easting

Water depth: 5.9 ft Mudline: -1.0 ft MLLW (estimated using tide tables)

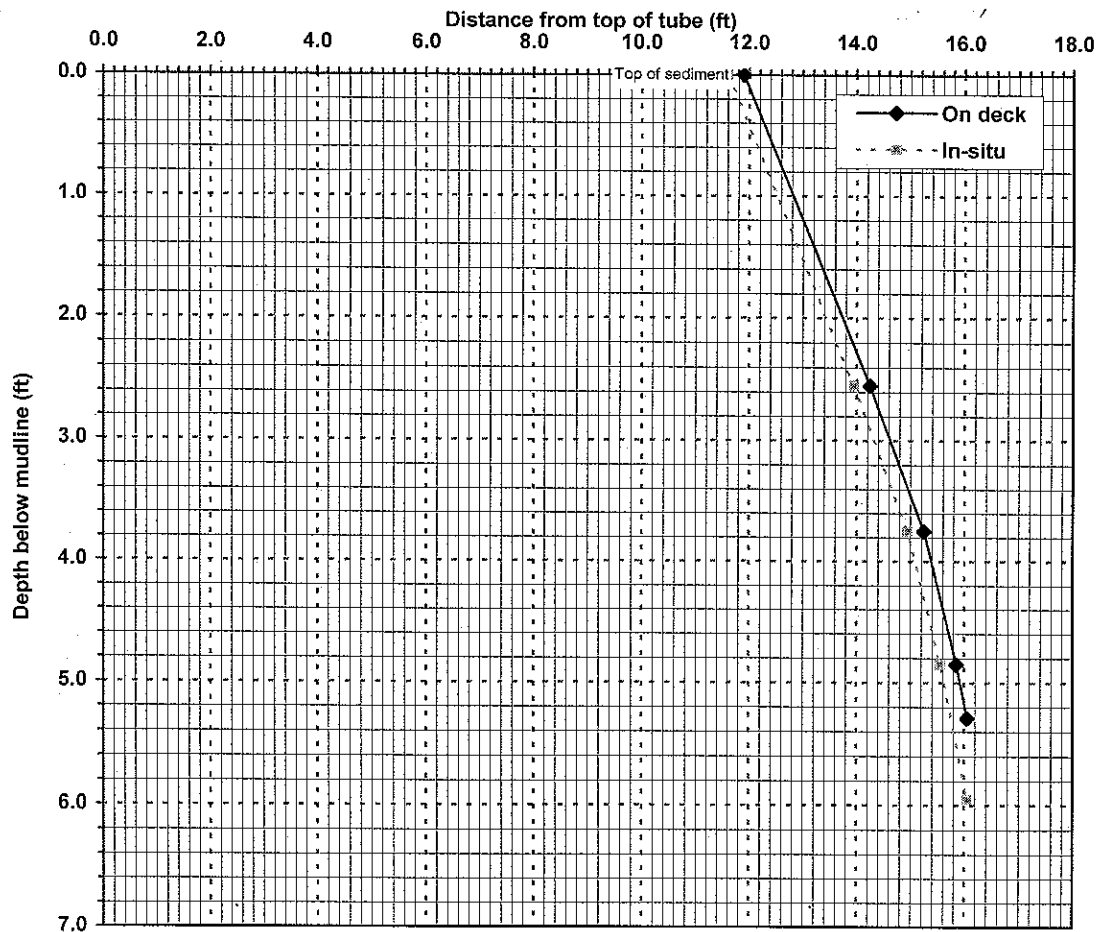
Place Field ID Label Here

Weather/Comments: Sunny

Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-2.55	2.35	92%
2.55-3.75	1	83%
3.75-4.85	0.6	55%
4.85-5.95	0.5	45%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	11.9
1	12.82
2	13.74
3	14.63
4	15.39
5	15.92
6	No sample
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

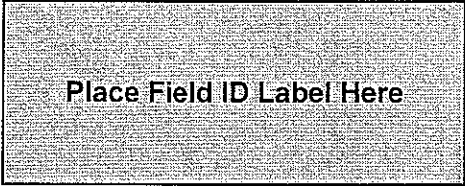


MCS Environmental MudMole Bore Log

Collection Information

Date: 2-7-08 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring



Station Name: 52 R1

Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 7.1

Time: 1316

Northing 194173

Est. Tide Height (ft) 6.2 (MLLW)

Easting 1276289

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 11.8

Comments: medium fine sand in tip of core

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.3</u>	<u>15.4</u>	
<u>14.5</u>	<u>14.6</u>	
<u>13.0</u>	<u>14.5</u> <u>13.5</u> <u>R46</u>	
<u>11.8</u> <u>12.9</u>	<u>12.8</u>	
<u>10.0</u>	<u>11.8</u>	
<u>8.8</u>	<u>11.4</u>	

(Handwritten signature/initials)

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-7-06 Recorder: SSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 52 R2



Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 5.9

Time: 1359

Northing 194178

Est. Tide Height (ft) 4.9

(MLLW) predicted

Easting 1276296

Est. Mudline: _____

(MLLW)

On Deck Top of Sediment 11.9

Comments: _____

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>13.5</u>	<u>13.7</u>	
<u>12.3</u>	<u>12.7</u>	
<u>11.2</u>	<u>12.1</u>	
<u>10.1</u>	<u>11.6</u>	<u>return</u>

Mudmole™ Bore Log

10.2 / 10.3

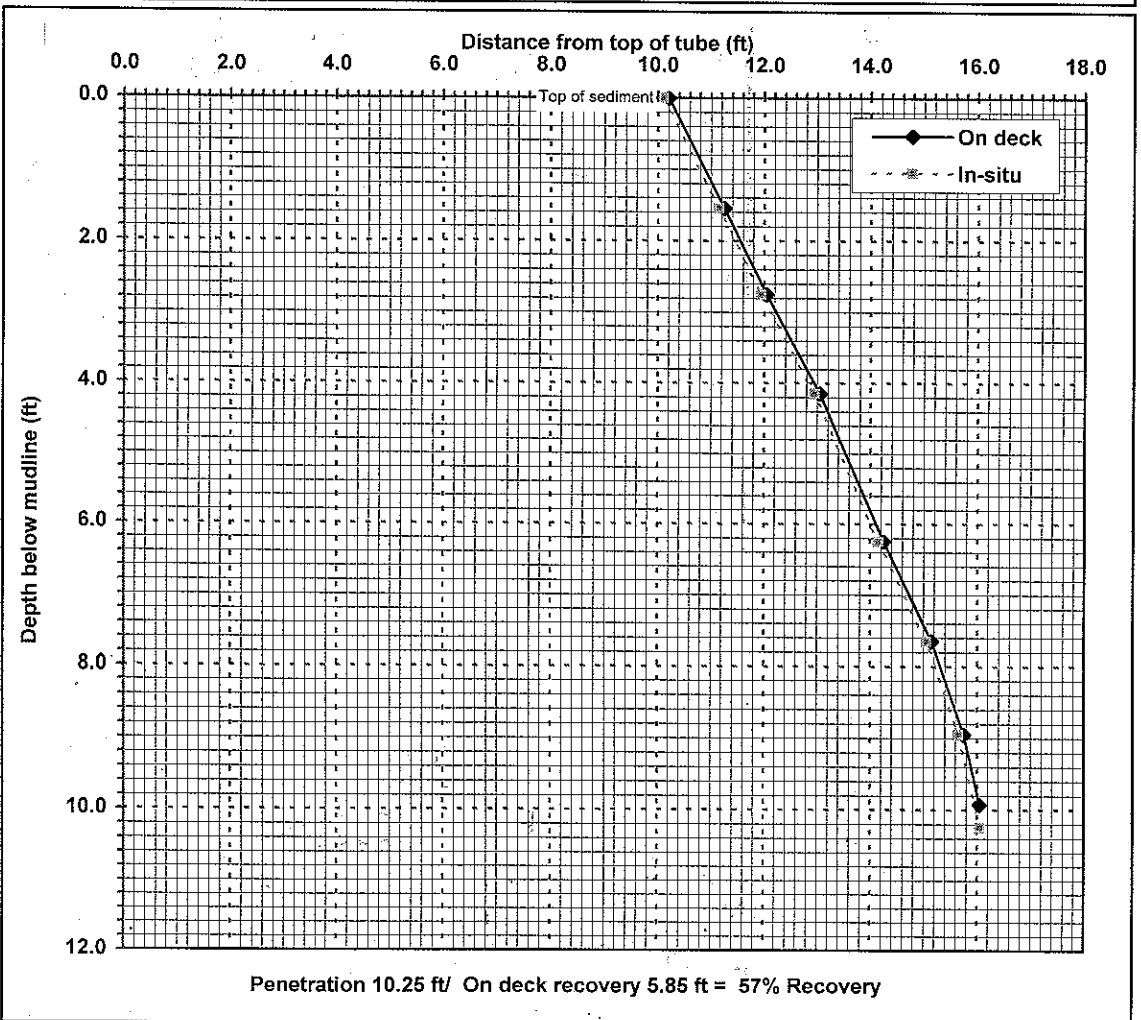
Project: LDWG Duwamish Coring **Station:** 52 R3
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 194160 Northing
Date: 2/7/2006 **Time:** 14:35 1276279 Easting
Water depth: 5.8 ft **Mudline:** -1.8 ft MELW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Sunny
Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------



0-1.55	1.05	68%
1.55-2.75	0.8	67%
2.75-4.15	1	71%
4.15-6.25	1.2	57%
6.25-7.65	0.9	64%
7.65-8.95	0.6	46%
8.95-10.25	0.4	31%

Mudline	10.2
1	10.88
2	11.55
3	12.23
4	12.94
5	13.54
6	14.11
7	14.73
8	15.31
9	15.77
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

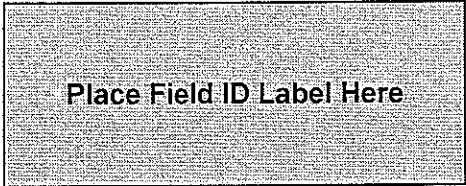
MCS Environmental MudMole Bore Log

Collection Information

Date: 2-7-06 Recorder: SSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 52 83



Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 5.8

Time: 1735

Northing 194160

Est. Tide Height (ft) 4.0

(MLLW)

Easting 1276279

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 19.2

Comments: _____

Penetration Tape Reading

Recovery Tape Reading

Comments

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.5</u>	<u>15.0</u>	
<u>13.3</u>	<u>14.2</u>	
<u>11.9</u>	<u>13.2</u>	
<u>9.8</u>	<u>12.0</u>	
<u>8.4</u>	<u>11.1</u>	
<u>7.1</u>	<u>10.5</u>	
<u>5.8</u>	<u>10.1</u>	<u>refusal</u>

Sediment Core Processing Log

Page 1 of 2
 RETEC

Job: LDW Dunamish
 Job Number: POS5-18220-518
 No. of Sections: 1
 Sample Length (from log): drive = 13.6'
 Avg. % Compaction: recovery = 11.1'
 Notes: 16.1 %R = 82%
= 5.0

Core Location/Sample Number: LDN-SC-53 R1
 Date/Time: Day #2 02-07-06 start 0650
 Sample Logged by: N. Bacher A. Fitzpatrick
 Type/Diameter of Sample: 4" aluminum MCS
 Sample Quality: good fair poor disturbed
 Top of tube to sed when opened: 4.85'
ALL TORVANE'S WITH MEDIUM WHEEL

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		OLEY 1 25/N Black		10	90		Soupy wet, loose, olive green, sl. sandy silt w/ trace organics (roots) and one worms and tubes this woody frags @ base			1000 1-16	
				2	98		wet to moist, moderately soft, SILT greenish gray (dark) slightly clayey trace rootlets, moderately H ₂ S odor. whole shell frag @ 0.4'	1.0	0850 2-1602	1602	
						(0)			1-1602 arch	1010	
				2	98		moist, moderately stiff to stiff, SILT, SAA just stiffer greenish gray (dark) slightly clayey trace rootlets, mod. H ₂ S odor.	2.0	6Te 1.0'	1602	
						(0)			6Te 3.0'	1013 1602	
									3.0	1016 1602	
							Note: this unit is very sticky, have to scrape spoons to get it to come off.		0855 2-1602 1-1602 arch	1019 1602	
									4.0	1022 1602	
										1025 1602	
										1028 1602	
		OLEY 1 5/564 OLEY 1 4/564 dark greenish gray		100			moist, grey, mod. stiff, clayey silt, homogeneous transition unit. moist, mod. dense gray fine to med. sand w/ silt interbeds (1/2" thick) interbeds anthropogenic? fibers @ 5.2'	5.0	0900 2-1602 arch	1031 1602	
				85	15		moist, mod. dense to dense, gray medium sand, multi colored grains are orange, white, green, gray. trace small trace roots. wood shells @ 6.2'	6.0		1034 1602	

R = 82%

TV = 1.0 @ 1.0'

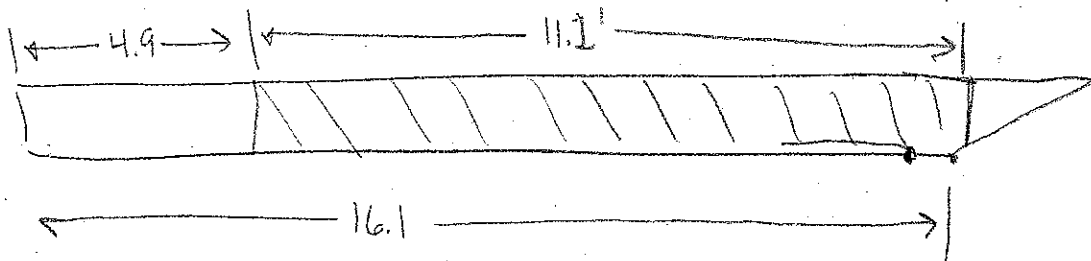
TV = 1.2 @ 2.7

TV = 1.5 @ 4.2'

TV = 1.0 @ 5.2'

LDW-SC-53

Feb. 7, 06 08516



↑
Flap open

↑
shoe fill
of silty
sand, good
plug

Sediment Core Processing Log

Job: DUNAMISH LDWG
 Job Number: PDR 55-18230
 No. of Sections: 1
 Sample Length (from log): see page
 Avg. % Compaction: 28

Core Location/Sample Number: LDN-SC-53 R1
 Date/ Time: 2/7/11
 Sample Logged by: NPR ACF
 Type/Diameter of Sample: 4" □
 Sample Quality: good fair poor disturbed

Notes:

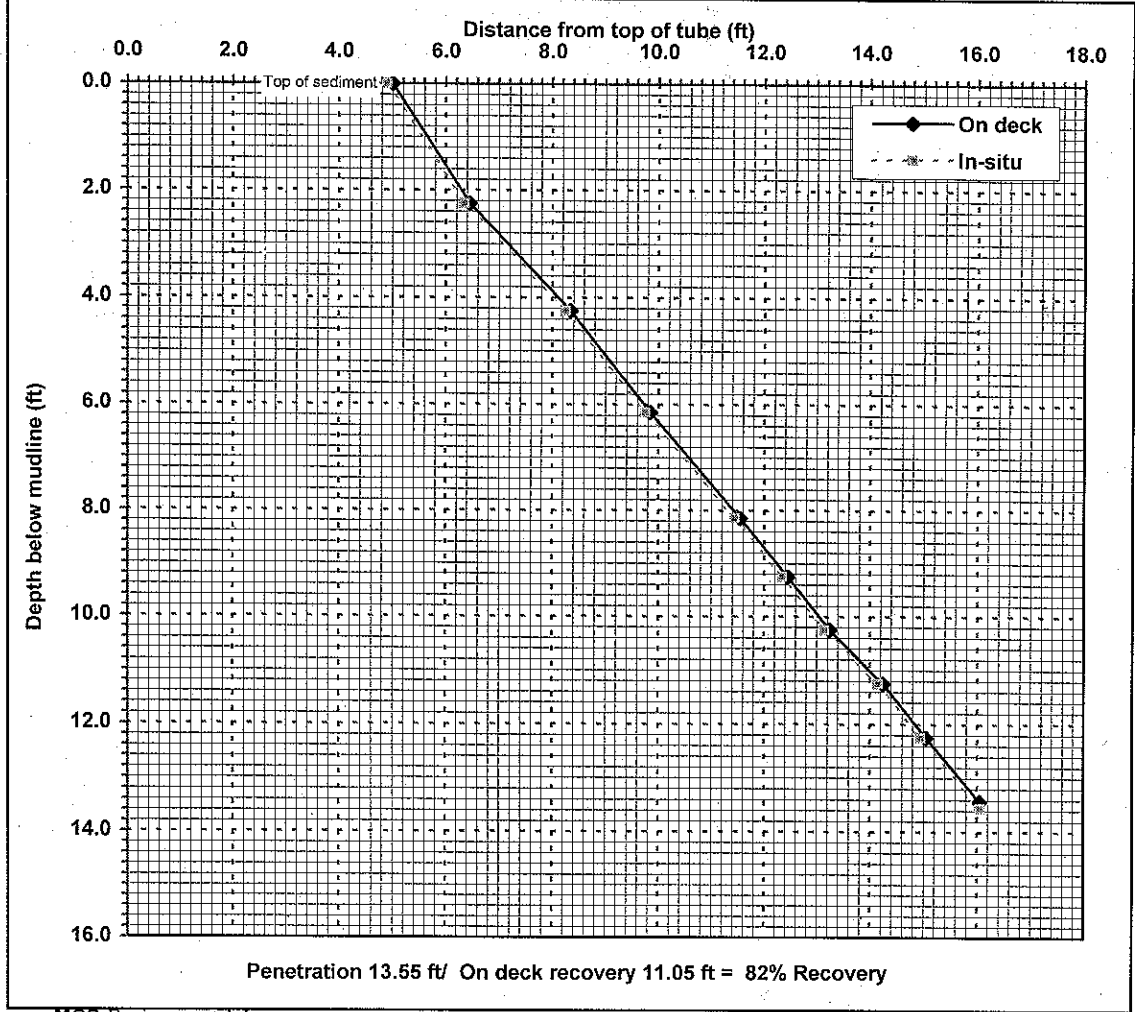
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	Insitu Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
							- at 6.3' thru 1" fibers. Shw & Tell.				
		7.5YR 3/2 dark brown		2	98		\$d contact moist, stiff, brownish gray, SILT trace sand, trace to minor clay trace small wood frags @ base.	7.0	0905 2-16.04 arch		TV=1.4 @ 7'
				98	2		moist, dense to med. dense, fine to medium sand, multi colored grains are orange, white, clean looking. in terms of silt content, gray to brownish gray.	8.0			TV=1.5 @ 8.2'
				10	90	0	8.5 small, shredded wood frags moist, med. stiff, gray SILT w/ minor sand.	9.0	0910 2-16.04 arch		N=0.75 @ 9.5'
				95	5		Fine sand w/ 1" silt interbeds. brownish gray, med. dense to dense. clean sand appearance. 1" silt beds @ 10.1' and 10.6' 4" silt bed/layer @ 10.8' extends into slice.	10.0			TV=0.5 @ 10.4'
							Bottom of core: 11.1	11.0			
							No TPH-like sheen / odor observed through core				
							Jar sheen test @ 2 Ft = None				

Mudmole™ Bore Log

Project: LDWG Duwamish Coring Project No: 341185.001 Collected by: GSM Date: 2/6/2006 Water depth: 16.3 ft	Station: 53 R1 Position: NAD83 192927 1277458 Mudline: -15.5 ft MLLW (estimated using tide tables)	WAN Northing Easting	Place Field ID Label Here
-----------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------	----------------------------	---------------------------

Weather/Comments: Overcast

Penetration interval (ft)	Interval recovery (ft)	Percent recovery	Depth below mudline (ft)	Distance from top of tube (ft)
---------------------------	------------------------	------------------	--------------------------	--------------------------------



0-2.25	1.45	64%	Mudline	5
2.25-4.25	1.9	95%	1	5.64
4.25-6.15	1.5	79%	2	6.29
6.15-8.15	1.7	85%	3	7.16
8.15-9.25	0.9	82%	4	8.11
9.25-10.25	0.8	80%	5	8.94
10.25-11.25	1	100%	6	9.73
11.25-12.25	0.8	80%	7	10.57
12.25-13.55	1.1	85%	8	11.42
			9	12.25
			10	13.05
			11	14.00
			12	14.85
			13	15.68
			14	No sample
			15	No sample
			16	No sample
			17	No sample
			18	No sample
			19	No sample
			20	No sample

processed

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-6-08 Recorder: GSN

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 53 R1

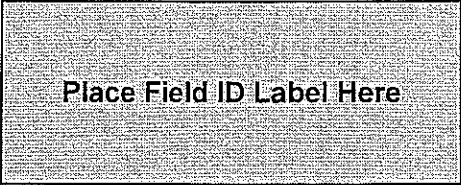
Tube Length (ft): 16.05

Water Depth (ft): 16.3

Est. Tide Height (ft): 0.8

Est. Mudline: _____ (MLLW)

Comments: _____



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 192927

Easting 1277458

On Deck Top of Sediment 5.0

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>13.8</u>	<u>14.6</u>	
<u>11.8</u>	<u>12.7</u>	
<u>9.9</u>	<u>11.2</u>	
<u>7.9</u>	<u>9.5</u>	
<u>6.8</u>	<u>8.6</u>	
<u>5.8</u>	<u>7.8</u>	
<u>4.8</u>	<u>6.8</u>	
<u>3.8</u>	<u>6.0</u>	
<u>2.6 2.5</u>	<u>4.9</u>	

processed

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 53 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

192927

Northing

Date: 2/6/2006

Time: 15:20

1277458

Easting

Water depth: 16.3 ft

Mudline: -15.5 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Overcast

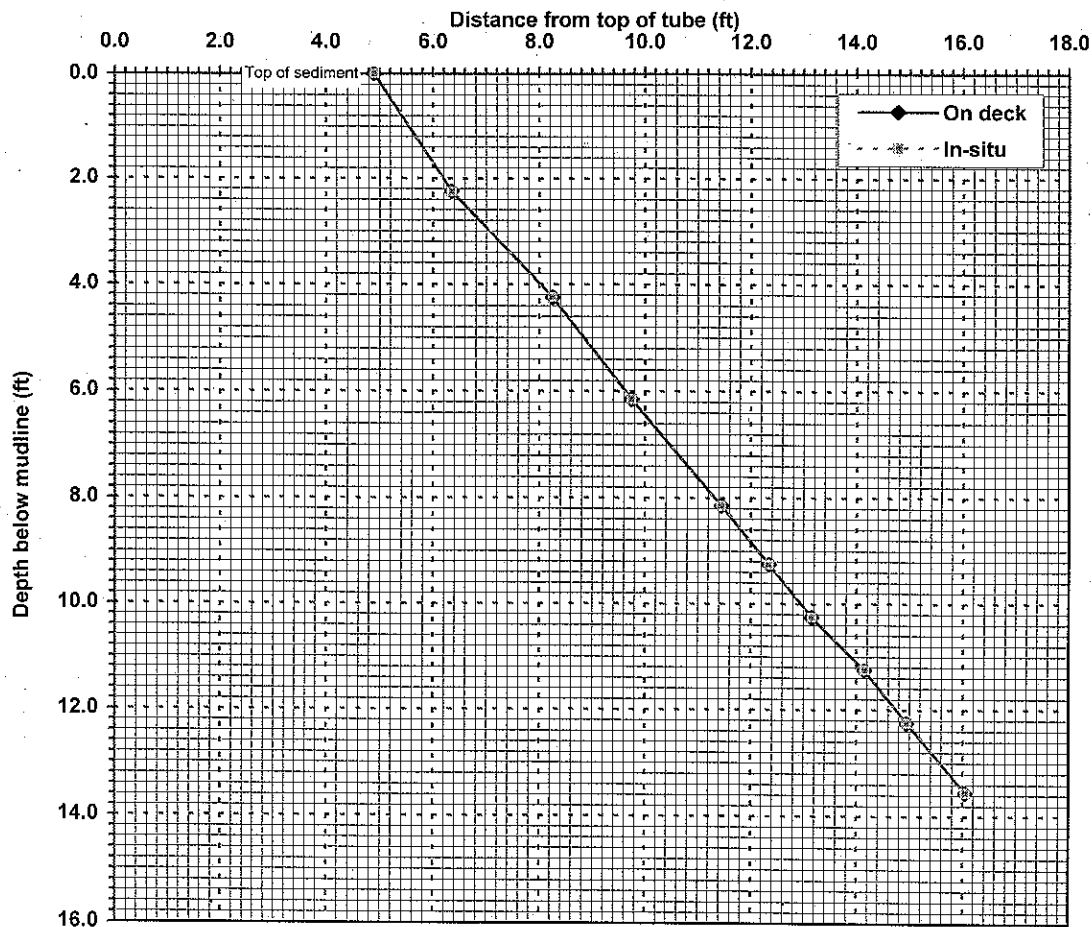
On-deck measurement revised to 4.9 ft from top of tube in lab

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------

0-2.25	1.45	64%
2.25-4.25	1.9	95%
4.25-6.15	1.5	79%
6.15-8.15	1.7	85%
8.15-9.25	0.9	82%
9.25-10.25	0.8	80%
10.25-11.25	1	100%
11.25-12.25	0.8	80%
12.25-13.55	1.1	85%

Mudline	4.9
1	5.54
2	6.19
3	7.06
4	8.01
5	8.84
6	9.63
7	10.47
8	11.32
9	12.15
10	12.95
11	13.90
12	14.75
13	15.58
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Penetration 13.55 ft/ On deck recovery 11.15 ft = 82% Recovery



Sediment Core Processing Log

Job: LDW/6 Core Processing
 Job Number: PORS-18220-511
 No. of Sections: 1
 Sample Length (from log): 10.25'
 Avg. % Compaction:

Core Location/Sample Number: SC-54 (R3)
 Date/ Time: 2/23/06
 Sample Logged by: LM, NB
 Type/Diameter of Sample: 4" round alum.
 Sample Quality: good fair poor disturbed

Notes: Pen = 13.0' ? 83%
 On Deck Rec = 10.8' 83%

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		1.5-4/2 4/2 brown	-	10	90	8	Wet, soft, brown silty sandy SILT	0-0.2		0-05	SILT
		2.54 2.5/1 black + GREY 3/1 v. dk. greenish grey	-	10	90	8	Wet-moist, soft-med stiff black (org) silty sandy SILT mottled with olive grey sandy SILT • blocky & massive • sh. compressible, low plasticity • increasing competency with depth • occasional rootlets • Occ. 4 wood fragments 3' x 1/4"	0.2-2.0	0-2 1240 GT=1.2	0.5-1 1-1.5 1.5-2	SILT
		2.54 4/2 dk. greyish brown	tr	98	0	8	@ 2.0 black SILT is dominant unit and mottling is no longer present @ 2.4 damp med. grey clayey SILT mottling ends at 2.4	2	2-4 1245 GT=2.8	2-2.5 2.5-3	SILT (org)
		(2.5/1 2.5/1)	-	80	80	8	@ 3.0 1" thick rootlets @ 3.3' wood fragments 1x2"	3		3-3.5 3.5-4	SILT
4		(2.54 4/2)	tr	98		8	@ 3.8' SAND increases to sandy SILT sl. o. @ 3.9 0.2' L piece of wood, no odor @ 4.0 transition to sh. clayey SILT w/ SAND seam @ 4.3 rootlets and wood fragments upto 1" L @ 4.6 : transverse seam of med. multicolored SAND	4		4-4.5 4.5-5 4.5-5	SILT + SAND
		2.54 2.5/1					transitional	5		5-5.5	SILT + SAND
		2.64 2.5/1 black	-	90	10	8	5.5-6.0 damp, dense, multicolored coarse SAND fining downward at 6.0' @ 5.9' clayey SILT pocket ~ 1" o.	6	5.5-8 1265	5.5-6	SAND

@1.0
TV=0.3
B16

@3.2
TV=0.8 B16
Wind

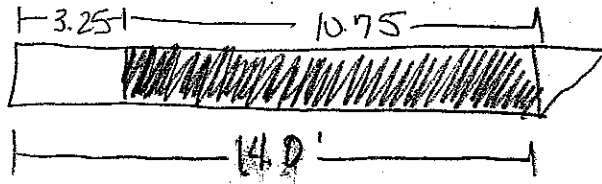
@5.11
TV=2.0
B16

SC-54-R3

2/23/06

LM

NB



Mid line = 3.25

Core catcher is
50% full of multicolored med. sand
w/ clay pockets

Core catcher is 50% full of multicolored med. sand w/ clay pockets



Sediment Core Processing Log

Job: LAW 6 Core Processing
 Job Number: POS-18220-54
 No. of Sections: 1
 Sample Length (from log): 10.25'
 Avg. % Compaction:

Core Location/Sample Number: SC-54-R3
 Date/ Time: 2/23/06
 Sample Logged by: LM, NB
 Type/Diameter of Sample:
 Sample Quality: good fair poor disturbed

Notes: Pen = 13.0'
DN Deck Lec = 10.8'

CONT'D

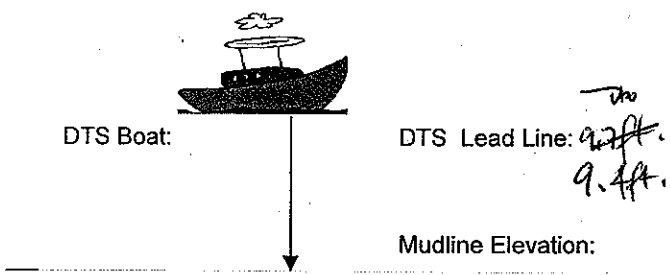
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		2.54 2.511 black	-	90	10	Ø	SAND (SAA) (medium grained, mottled damp, med. dense)				
		2.54 4/2 d greyish brown	-	98	Ø	Ø	@ 7.0' 0.1" layer of wood fragments w/ (<0.1") 3" grey brown clayey SILT pockets	7			
							@ 7.9' 1" Ø clayey SILT pocket (grey-brown)	8			SAND
							@ 8.3' soft damp, 1" Ø clayey SILT pocket (grey-brown)		8-10 1300		
							@ 9.0' soft, damp 1" Ø clayey SILT pockets (grey-brown)	9			
		2.54 472	-	98			@ 10.0' clayey silt layer about 2" L ₂₅ @ 10.1 " " " " " " (grey-brown)	10			
							End of core @ 10.2'				
								11			
								12			



SEDIMENT CORE DRIVE LOG

Project: LDW Subsurface Sed.	Core Location: LDW-5054
Project #: 05 DB-06-32	Date: 02.23.06 Time: 0920
Field Crew: TD, NB	Attempt #: 3 Accept/Reject
Contractor: MS MSS	Sample Method: Vibracore

Proposed Coordinates N: 192179 E: 1270342 Mudline: Core Drive:	Actual Coordinates * 47 31.0380N. 122 18.4029W Mudline: Core Drive: Core Recovery:
-------------------------------------------------------------------------	---------------------------------------------------------------------------------------------



Tide Measurements (Datum:)
Time/Height:
Time/Height:

Description:

(free fall, fingers inverted, vibration needed to drive/extract, estimation of density, debris encountered, slopes, refusal, mudline conditions, drive action, etc.)

1st 5' easy drive
no after difficult drive
easier driving towards end
no record of 1st 7ft. b/c transducer out of H₂O.
7-10' - med-hard drive
10-11 - hard drive
11-13 - moderate drive
core catcher has 50% multicolored med. sand w/ clay pockets.

Total Drive: Length Recovered:

Measurement (to nearest 0.1 foot):



Avg. % Recovery:

Avg. % Compaction:

Section:	Length:	Description at Cuts:
A =		
B =		
C =		
D =		

Notes: * 16ft. off target.

14ft core, 10.75ft recovery = 75% ~~76.8%~~

Accept core.

→ 82.7%

core catcher cut off 10.25ft - same material

Core tube length 14'

Penetration 13.0'

Recovered 10.75'

in tube 10.25'

cut off 0.5' core catcher on boat. tube length delivered to lab 10.25'

material in core catcher is same as in cut above core catcher.

POISS - 18220 -

Sediment Core Processing Log



Job: LDW - SC - 54
 Job Number: Dunamish LDW
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction: DIVE = 7.8'

Core Location/Sample Number: LDW - SC - 54 (R1) Page 1 of 1
 Date/ Time: 02-07-16 Tuesday 1445 16.30 end
 Sample Logged by: N. Bachar, A. Fitzpatrick
 Type/Diameter of Sample: 4" ID
 Sample Quality: good (fair) poor disturbed

Notes: Recovery = 5.8' Winnowed 2 ft out bottom
 Hit (chisel) 74% All torvanes w/ big wheel.
 little holes in sediment

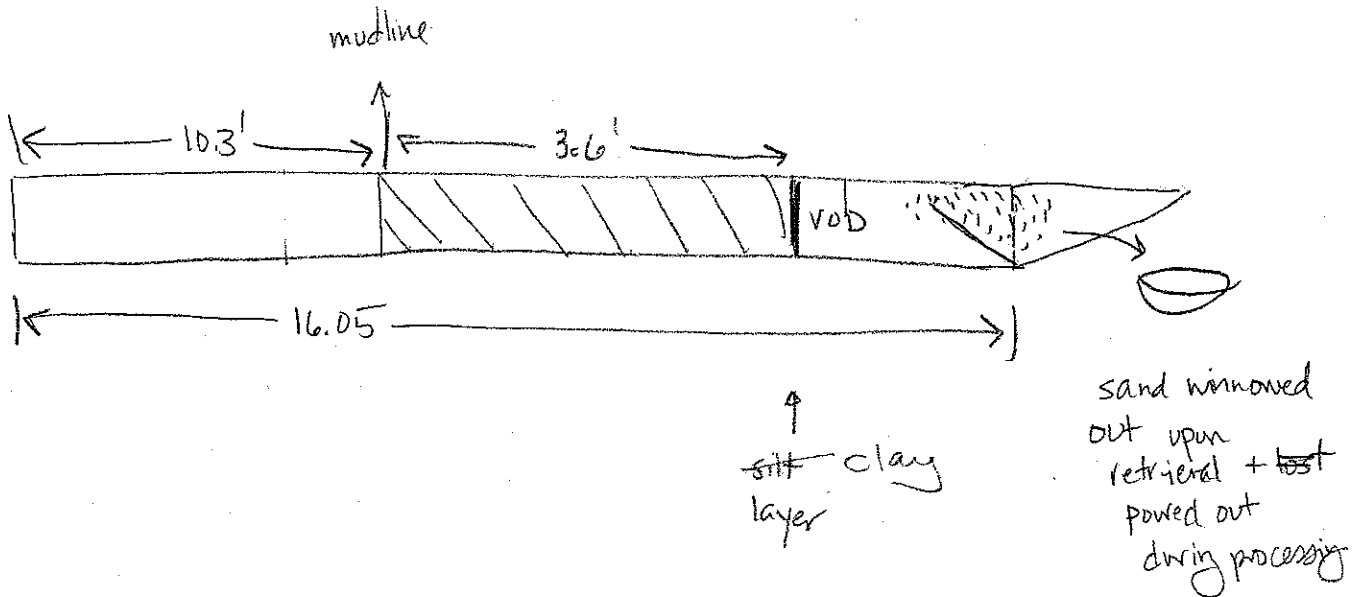
Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		10YR 3/2 v. dark grayish brown		10	90		wet, soft, olive brown, sl. sandy silt, trace H ₂ S odor, trace roots.		1500	1545	
		6.5Y 2.25/1 N black		10	90	0.0	wet to moist, soft, black sl. sandy silt, trace H ₂ S odor, trace roots.			1602	
										1548	
						0.0		1.0	1520	1602	
				80	20	0.0	moist, med. dense, black, slightly silty. Sand: Sand is f-m. multicolored grains orange, white, very trace H ₂ S odor.		3-1602	1557	
		6.5Y 1.3/5GY v. dark greenish gray		5	95	0.0	moist, med. soft to med. stiff, gray silt w/ trace sand. Minor to trace clay (slightly plastic). Plasticity increases downward. Becomes more blocky in texture w/ depth as moisture content decreases. trace roots scattered throughout. @ 1.7' 3x1" wood piece, pile like material.	2.0	GT @ 1.8'	1554	
						0.0			GT @ 2.8'	1557	
		d. g. clay 6.5Y 2.4/10GY	38	70			moist, dense/firm, gray sandy silt grading to a medium sand. trace wood shreds @ 2.7 (small).	3.0	3-1602	1602	
	light	10YR 6/2 brownish gray	95	5	100	0.0	moist, stiff, pale gray sl. silty clay. Wet contrast.			1603	
		7.5YR 4/1 brown		5	100		moist, med. dense, reddish brown, med. sand trace silt.			1602	
		3.6-3.7 l. brownish gray					moist, stiff, gray w/ orange mottling clay w/ minor silt.				
							3.6-5.0 missing sample logged below probably slid down during core retrieval.	4.0			V O I D
			98	2			moist, med. dense, orange brown medium to coarse sand. very trace silt.	5.0	1530	2-1602	
							Bottom of CWC = 6.0'	6.0			

@ 0.6' TV = 3.0
 @ 1.0' TV = 2.0
 @ 1.5' TV = 3.0
 @ 2.3' TV = 3.75
 @ 3.3' TV = 2.25

no sheen/odor throughout cwc; no shells

LDW-SC-54

02/07/06



R1

- 0-1.2: org. silt, black,
 - 1.2-3.6: interbedded silt & sand
 - 3.6-4.0: clean fine sand, black NOT reddish ox.
- ↑ bottom of core. test is winnowed.

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 54 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

192181

Northing

Date: 2/7/2006

Time: 11:07

1276337

Easting

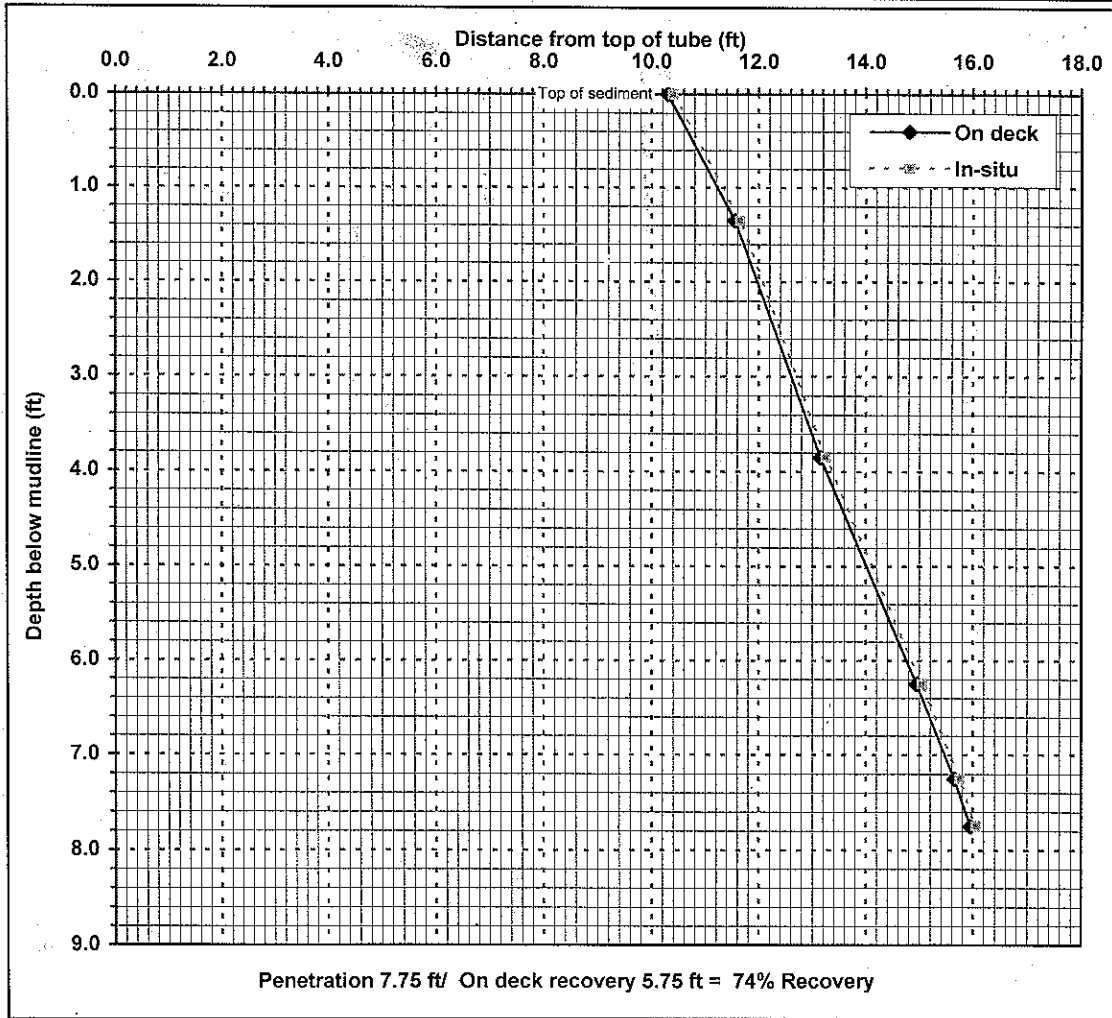
Water depth: 8.8 ft

Mudline: -0.2 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Sunny

Sediment surface 10.3 ft from top of tube in field lab. Driven to refusal



Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-1.35	1.25	93%
1.35-3.85	1.6	64%
3.85-6.25	1.8	75%
6.25-7.25	0.7	70%
7.25-7.75	0.3	60%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	10.3
1	11.23
2	11.97
3	12.61
4	13.26
5	14.01
6	14.76
7	15.48
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-7-08 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 54 R1

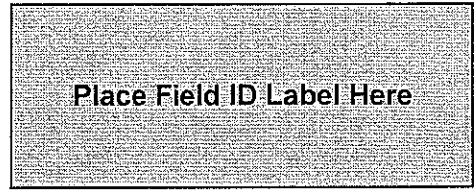
Tube Length (ft): 16.05

Water Depth (ft): 8.8

Est. Tide Height (ft): 8.6

Est. Mudline: _____ (MLLW)

Comments: _____



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 192181

Easting 1276337

On Deck Top of Sediment 10.5 10.3_{peaks}

Penetration Tape Reading

Recovery Tape Reading

Comments

14.7

14.8

12.2

13.2

9.8

11.4

8.8

10.7

8.3

10.4

refusal

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-7-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 54 R2

Tube Length (ft): 16.05

Water Depth (ft): 8.4

Est. Tide Height (ft) 8.2 (MLLW)

Est. Mudline: _____ (MLLW)

Comments: moved 25' upriver (upstream side of logs caught

against pilings)

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 192154

Easting 1276352

On Deck Top of Sediment 10.8 10.3
R15

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.1</u>	<u>14.3</u>	
<u>12.4</u>	<u>13.2</u>	
<u>11.5</u>	<u>12.5</u>	
<u>9.5</u>	<u>11.1</u>	
<u>8.9</u>	<u>10.5</u>	<u>refusal</u>

Station Number: 54
 Attempt: 2nd
 Field Technician: M, CB
 Contractor: MCS
 On-site Visitor: Jim
 Latitude: 19 21 54
 Longitude: 12 76 352

Date: 2/7/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 8.4
 Diver Water Depth: _____
 Tip Probe Depth: _____
 Disk Probe Depth: _____
 Drive Initiation Time: 11:57

3rd concrete piling
 = 51.0' reading
 at waterline

26.0' off station

Shoreline & surrounding area observations: South of ~~Access~~ 3 pilings at southern end of wharf piling
 Sediment surface & slope description: fine sand to medium, level, minor debris, sandy silt surface
 Water current: negligible

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
		(Drive offset:)
14.1	14.3	easy drive - boat operated
12.4	13.2	↓
11.5	12.5	↑
9.5	11.1	hard drive, - boat operated
8.9	10.5	diver in water
		diver caps at 12:15
Totals		
	5.5'	

(2.9' hard drive)
 12:42
 1211 - pumping
 water from
 top of core casing

boat operated

Estimated angle of drive: 10° from vertical - 15° to vertical as depth increased
 Reason for ending drive: refusal before 10 feet

Drive Completion Time: 12:09

On Boat Recovery: 10.8
 top of sediment

78% recovery

End of Core Tube Observations
Staining: <u>no staining</u>
Tube Deformation: <u>none</u>
Loss of Sediment: <u>minimal</u>
Sediment Description: <u>dark, wet, soft, muddy</u>
Water in Tube: <u>pumped from top of tube at 12:11</u>

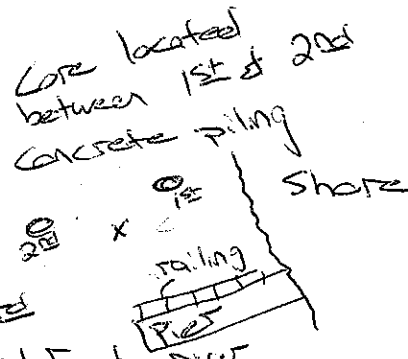
Keep or Retry: (177) Keep

Observer boat is tied to other side of debris ~6 feet away
 and values for penetration/recovery + forms are inaccessible during
 drive; diver wrapped coil underwater

Notes:
 Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Station Number: 54
 Attempt: 1
 Field Technician: LM
 Contractor: MCS
 On-site Visitor: TIM
 Latitude: _____
 Longitude: _____

Date: 2/02/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 8.8
 Diver Water Depth: 4
 Tip Probe Depth: _____
 Disk Probe Depth: _____
 Drive Initiation Time: ?



Shoreline & surrounding area observations: LWD floating perpendicular to river
 Sediment surface & slope description: diver did not investigate
 Water current: "negligent" EP comment

11/6 observation boat arrives & MCS is already driving core tube. He made 3 close to the water surface.

11/31 pumping water

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
14.7	14.8	(Drive offset:)
12.2	13.2	
9.8	11.4	} diver boat arrives } DIVE in water at opposing core } difficult drive (slow)
8.8	10.7	
4.3	10.4	
Totals		
~7.75	5.65	

Estimated angle of drive: 50% from vertical
 Reason for ending drive: Rebital

Drive Completion Time: 11:27 On Boat Recovery: 10:5

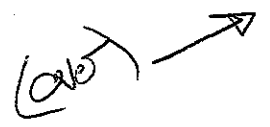
Diver wrapping tip at sediment/water interface

End of Core Tube Observations
Staining: <u>no staining</u>
Tube Deformation: <u>no apparent deformation</u>
Loss of Sediment: <u>Slight turbid drip through wrap</u>
Sediment Description: <u>Dark, wet, muddy appearance</u>
Water in Tube: <u>pumped from top of tube</u>

Keep or Retry: Shy of sediment recovery goal (6') & % Recovery goal (75%)

Try again upstream of concrete pilings

Notes: Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)



Station Number: 54

Date: 2/2/06

Attempt: 1

Core Tube Length: 16.05

Field Technician: T.D. (WV) C.B. & L.M. (CET)

Lead Line Water Depth: B.B

Contractor: MCS, PSS

Diver Water Depth: _____

On-site Visitor: F.H. (SAMU)

Tip Probe Depth: _____

(No.) Latitude: 192181

Disk Probe Depth: _____

(Ea.) Longitude: 1276337

Drive Initiation Time: 1112

Shoreline & surrounding area observations: intertidal; bank slightly undercut, sandy

Sediment surface & slope description: cannot see surface sed; shallow slope

Water current: slight current, light wind

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
14.7	14.8	(Drive offset: _____)
12.2	13.2	
9.8	11.4	
8.8	10.7	
8.3	10.4	

Estimated angle of drive: ~90°

Reason for ending drive: refusal

Drive Completion Time: 1128

On Boat Recovery: 10.5 (on deck top of sediment)

End of Core Tube Observations
Staining: <u>—</u>
Tube Deformation: <u>no</u>
Loss of Sediment: <u>catcher end wrapped in situ</u>
Sediment Description: <u>—</u>
Water in Tube: <u>yes, siphoned out</u>

Keep or Retry: will try for 2nd core from other side of logs

Notes:

Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Station Number: 54

Date: 2/7/06

Attempt: 2

Core Tube Length: 16.05

Field Technician: TD (WR) CB & M (CARE)

Lead Line Water Depth: 8.4

Contractor: MCS, B66

Diver Water Depth: _____

On-site Visitor: TH (SAMO)

Tip Probe Depth: _____

(NO.) Latitude: 192154

Disk Probe Depth: _____

(E.A.) Longitude: 1276352

Drive Initiation Time: 1159

Shoreline & surrounding area observations: SAME AS R1

Sediment surface & slope description: _____

Water current: _____



Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
14.1	14.3	(Drive offset:)
12.4	13.2	
11.5	12.5	
9.5	11.1	
8.9	10.5	

Estimated angle of drive: ~90° ± 5°

Reason for ending drive: refusal

Drive Completion Time: 1207

On Boat Recovery: 10.8 ON DECK TOP OF SEDIMENT

End of Core Tube Observations
Staining:
Tube Deformation:
Loss of Sediment: <u>core catcher end wrapped in situ</u>
Sediment Description:
Water in Tube: <u>yes, siphoned off</u>

Keep or Retry: Similar penetration and recovery to R1

R2 - 26 ft off target b/c of relocation to south side of log/piling

Notes:

Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Sediment Core Processing Log



Job: LDWG coring
 Job Number: PORES-14220
 No. of Sections: 1
 Sample Length (from log): _____
 Avg. % Compaction: _____

Core Location/Sample Number: 55 R1
 Date/ Time: 2/6/06 1325 start 1510 stop
 Sample Logged by: N. Bacher, Ann Fitz
 Type/Diameter of Sample: 4" square alum.
 Sample Quality: good fair poor disturbed

Notes: Penetration: 11.25' On deck: 6.95'
R = 6.2

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch	
		CLEY1 2.5/10DY greenish black		25%	50%	0	moderate silt, H ₂ S odor, trace clay. soupy, wet trace sheen, trace black organic streaks.		55 0-1 1400		GT=0.9'	TV=1.0 big @ 0.7'
				75	25	0	fine sand, wet, homogeneous, loose,	1.0				
		CLEY2 2.5/10BG greenish black	3	80	12	0	org. silt w/ trace sand, soft fine to medium sand, multi-colored red white grains, trace gravel. orange, gray. trace H ₂ S odor.		1-2 1405		GT=1.8'	TV=0.8 @ 1.5' medium
								2.0				
		CLEY4 4-5GY dolt greenish gray		75	25	0	sand w/ interbedded silt @ bottom. sand is fine and homogeneous. 2.3' wood silver. sand is multi- colored, red brown white. 2.7-3.0 silt laminations, convex. 1/4" hardness		1410		GT=2.1'	TV=1.0 @ 2.5' small
								3.0				
		CLEY2 10BG greenish black	5	95		0	coarse to medium sand grading finer. multi-colored grains. trace gravel. medium dense 2.4" natural wood piece w/ red, white, orange, brown specs. very clean sand. 4.4 wood piece, shredded splinters water-logged wood, pulls apart easily. grades to med. sand @ 4.6 5.1 2x2" natural wood piece 4.9-5.6' is 75% wood		1415		GT=2.1'	TV=0.6 @ 3.3' small
								4.0				
									1420			
									4-6 Arch.		GT=4.8'	TV=0.5 @ 4.3 small
								5.0				
				5	95	0	silt layer, med. firm, trace sand.					
				95	5	0	grades to fine sand. trace rootlets / twigs.					TV=0.4 small @ 5.7'
								6.0				
								6.2				

show
and tell

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-6-08 Recorder: GSV

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 55 R2

Tube Length (ft): 16.05

Water Depth (ft): 9.2

Est. Tide Height (ft) 9.8

Est. Mudline: _____ (MLLW)

Comments: wood in tip of core

Place Field ID Label Here

Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 190389

Easting 1278268

On Deck Top of Sediment 11.3

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.8</u>	14.8 <u>15.2</u>	
<u>12.3</u>	<u>13.2</u>	
<u>10.2</u>	<u>12.1</u>	
<u>9.2</u>	<u>11.9</u>	
<u>8.5</u>	<u>11.8</u>	
<u>7.9</u>	11.6 <u>11.7</u>	
<u>6.5</u>	<u>11.4</u>	
<u>6.0</u>	<u>11.2</u>	<u>retusal</u>

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-6-06 Recorder: ESM

Project: 341185.001 Windward Lower Duwamish Coring

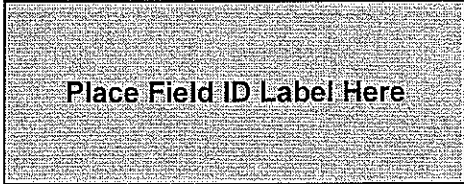
Station Name: 55 R3

Tube Length (ft): 16.05

Water Depth (ft): 13.8

Est. Tide Height (ft): 8.8

Est. Mudline: _____ (MLLW)



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 190372

Easting 1278253

On Deck Top of Sediment 12.4

Comments: moved offshore ^{220'} - logs in area

lost some sand out of bottom during recovery

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>14.1</u>	<u>15.2</u>	
<u>11.3</u>	<u>13.2</u>	
<u>10.8</u>	<u>12.4 12.5</u>	
<u>7</u>	<u>12.3</u>	
<u>9.3</u>	<u>12.2</u>	<u>refusal</u>

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-6-06 Recorder: GSN



Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 55 R1

Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 8.5

Time: 0902

Northing 190389

Est. Tide Height (ft) 10.4

(MLLW)

Easting 1278266

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 9.1

Comments: Auto tide phone not working - tide from

tide chart for 8th Ave S / Divers probe of bottom:

0.8 ft soft over firm material - scattered rip rap
sample on steep clay slope

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.4</u>	<u>15.5</u>	
<u>12.5</u>	<u>13.4</u>	
<u>12.0</u>	<u>10.9</u> bad reading	
<u>9.4</u>	<u>9.9</u> <u>11.3</u>	
<u>8.3</u>	<u>10.8</u>	
<u>7.3</u>	<u>10.3</u>	
<u>6.3</u>	<u>9.8</u>	
<u>5.3</u>	<u>9.4</u>	<u>refusal</u>
<u>4.8</u>	<u>9.1</u>	

16.05
4.8

12.25

16.55
9.1

7.95

Mudmole™ Bore Log

* processed

Project: LDWG Duwamish Coring

Station: 55 R1

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

190389

Northing

Date: 2/6/2006

Time: 9:02

1278266

Easting

Water depth: 8.5 ft

Mudline: 1.9 ft MLLW (estimated using tide tables)

Place Field ID Label Here

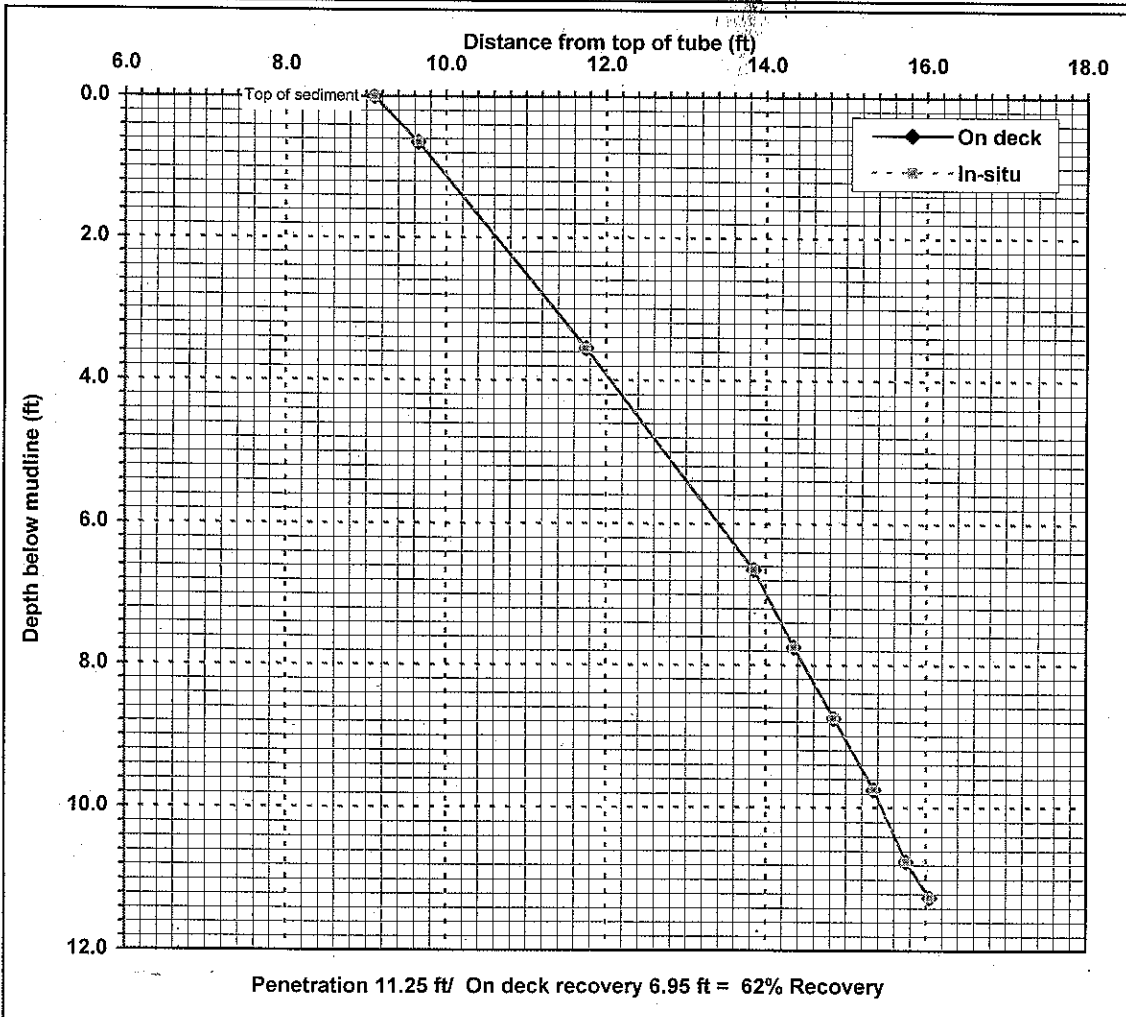
Weather/Comments: Sunny

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------

0-0.65	0.55	85%
0.65-3.55	2.1	72%
3.55-6.65	2.1	68%
6.65-7.75	0.5	45%
7.75-8.75	0.5	50%
8.75-9.75	0.5	50%
9.75-10.75	0.4	40%
10.75-11.25	0.3	60%

Mudline	9.1
1	9.90
2	10.63
3	11.35
4	12.05
5	12.73
6	13.41
7	14.01
8	14.48
9	14.98
10	15.45
11	15.90
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



Mudmole™ Bore Log

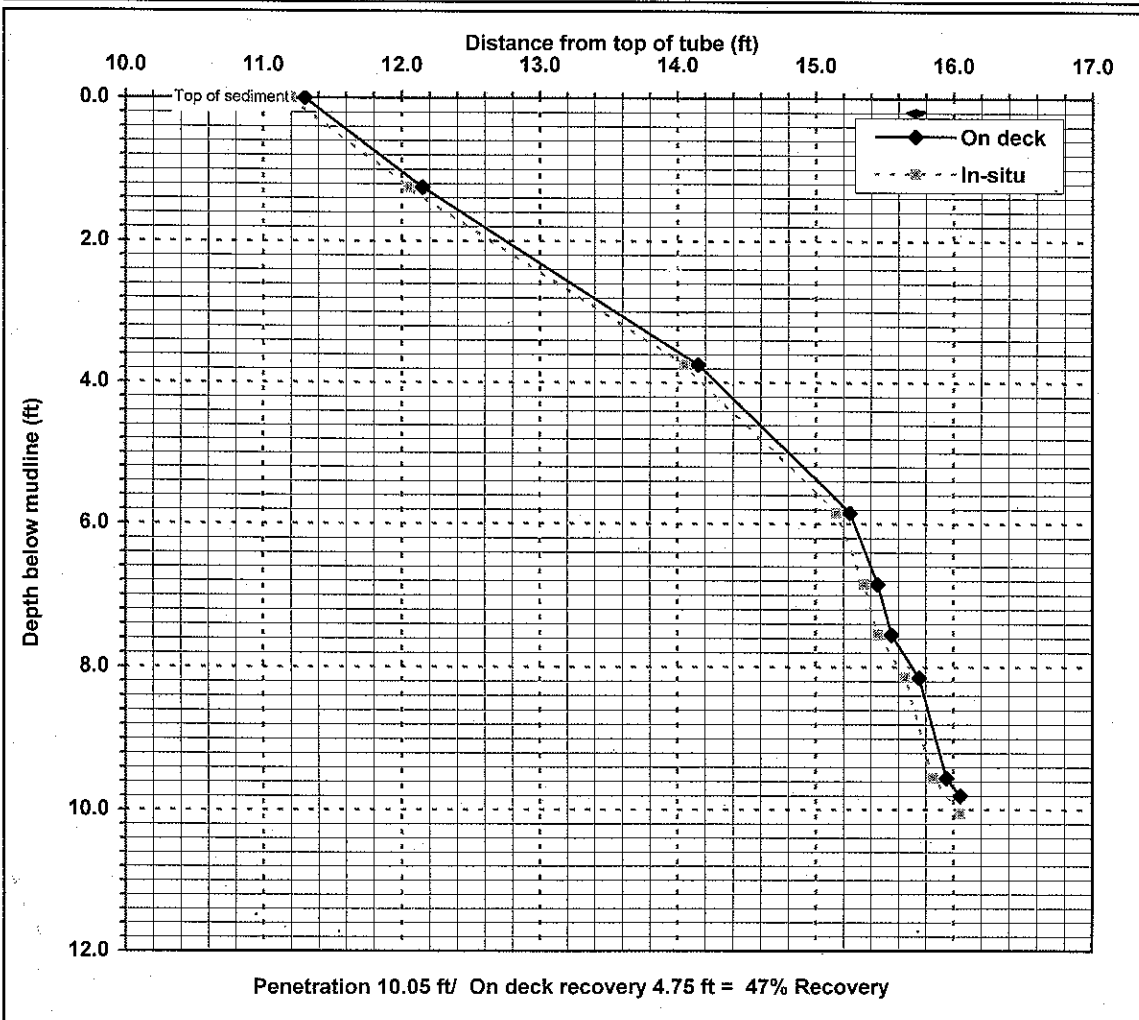
Project: LDWG Duwamish Coring **Station:** 55 R2
Project No: 341185.001 **Position:** NAD83 WAN
Collected by: GSM 190389 Northing
Date: 2/6/2006 **Time:** 10:10 1278268 Easting
Water depth: 9.2 ft **Mudline:** 0.6 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Sunny
 Wood in tip of core, driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------



0-1.25	0.85	68%
1.25-3.75	2	80%
3.75-5.85	1.1	52%
5.85-6.85	0.2	20%
6.85-7.55	0.1	14%
7.55-8.15	0.2	33%
8.15-9.55	0.2	14%
9.55-10.05	0.2	40%

Mudline	11.3
1	11.98
2	12.75
3	13.55
4	14.28
5	14.80
6	15.28
7	15.47
8	15.70
9	15.87
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 55 R3

Project No: 341185.001

Position: NAD83

Collected by: GSM

190372

WAN

Date: 2/6/2006

Time: 10:50

1278253

Northing

Easting

Water depth: 13.8 ft

Mudline: -5.0 ft MLLW (estimated using tide tables)

Place Field ID Label Here

Weather/Comments: Sunny

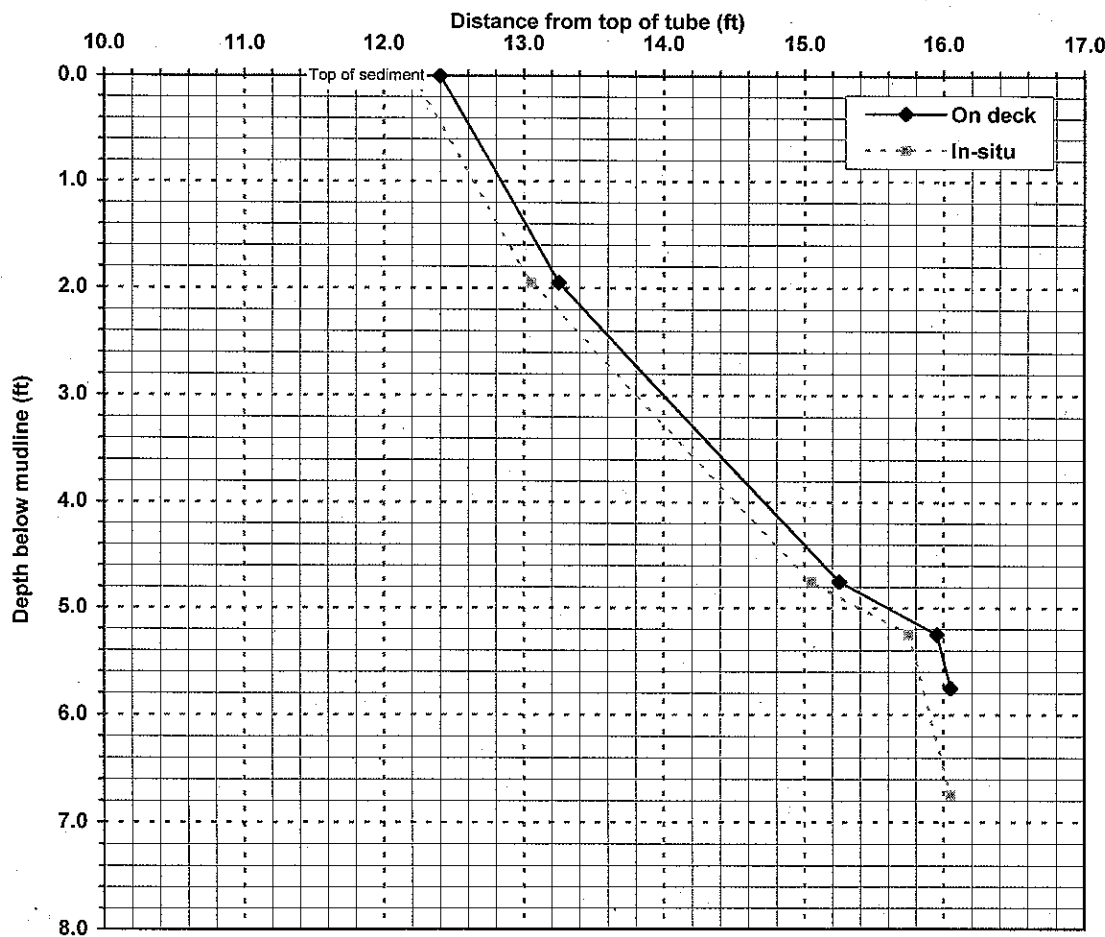
Driven to refusal

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
---------------------------	------------------------	------------------

Depth below mudline (ft)	Distance from top of tube (ft)
--------------------------	--------------------------------

0-1.95	0.85	44%
1.95-4.75	2	71%
4.75-5.25	0.7	140%
5.25-6.75	0.3	20%

Mudline	12.4
1	12.84
2	13.29
3	14.00
4	14.71
5	15.60
6	No sample
7	No sample
8	No sample
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



See BACK

Sediment Core Processing Log

56



Job: DUNAMISH
 Job Number: PORS-18220
 No. of Sections: 1
 Sample Length (from log):
 Avg. % Compaction: Dive = 10.7

Core Location/Sample Number: LDN-SC-56 (R3)
 Date/Time: 02/07/06 Staff: noon
 Sample Logged by: N. Bachar, A. Fitzpatrick
 Type/Diameter of Sample: 4" ID
 Sample Quality: good Fair poor disturbed

Notes: Recover = 7.2
% R = 67%
All borvaner w/ big wheel

Recovered Length (ft)	% Compaction	Color	Size % - G	Size % - S	Size % - F	PID	Description (grain size, color, moisture, sheen/odor, biota, wood, other debris)	In situ Actual Depth (ft)	Sample Depth	Subsample No.	Summary Sketch
		5YR 4/6 Yellowish red		tr	98		soft Brown Soupy SILT: reddish brown, trace wood frags on surface, loose, trace sand	0.3	1230	0-0.5 1245	SILT
		↓	tr	20	90		SAND: loose, red, silty, & gravelly SAND trace	0.6	0-2'	1-16-2	Fine SAND
1.0	SHEEN TEST	↑ transit ↓ BLACK	80	35	5	10.7 0.0	GRAVEL: black, wet, loose, sl. silty, sandy GRAVEL trace sheen on top of silt, slight odor BLACK CLAYEY SILT 1" mortar gray	1.0	3-16-2	0.5 to 1 1248 1-16-2	Gravel SILT
		2.5YR 4/6 RED	tr	tr	tr	0.0	SAND: wet, loose, F-M SAND w/ skidzation color, trace wood frags, grading coarser w/ depth At 1.9' - shredded wood frag		GT e1.3	1.4 to 1.5 1251 1-16-2	F-M Fining UP
2.0		transit					Color change, slightly coarser	2.0		1.5 to 2 1253 1-16-2	SAND
		CLAY 1 3/5 Very dark greenish gray	tr	98		(NEW SAND TYPE) 0.0	SAND: wet, loose, lustrous brown-gray grading to dark gray, trace silt M-C SAND grading to F SAND. multicolored grains - Qtz white, green (no red), 4" D wood frags (x2) WOODY FRAGS + GRAY SILT SEAM	2.9 3.0		1.5 to 2 1256 2 to 2.5 1-16-2	C
3.0	R= 67						At 3.0 to 3.5 gray silt seam 1/8" thick w/ abundant wood frag below 2" x 2" & thin fresh twigs			2.5 to 3.0 1259 1-16-2	SILT
		CLAY 1 dark greenish gray w/ lots of color layers		90	20		At 3.5 4' of twigs, 2" L zone of twigs SAND: moist, dark gray, med dense, sl. silty M-F SAND, w/ moderate wood, slightly brown. lots of little layers. At 4.1 rootlet, 2" long brown silt layer	4.0		3.5 to 4.0 1260 1-16-2	SAND w/ WOOD
4.0							SAND: wet, moist, med dense, dark gray "clean" F-SAND w/ multicolored red + white grains w/ brown silt interbeds, trace scattered wood At 5.1 - 5.3 brown silt layer w/ wood			4-4.5 1304 1-16-2	SAND
5.0				98	tr	(100 interbeds) 0.0	lots of small fine layers noted throughout, intact core, silt seams color seams	5.0		4.5-5 1312 1-16-2	SILT interbeds
5.6		CLAY 1 4/10 d. greenish gray					Bottom of sediment 5.6 Last 1.6' out bottom	5.6			SILT

e0.6
TV=5.0
Slight odor + sheen

e1.5
TV=2.5

4" wood
e2.9
TV=3.75

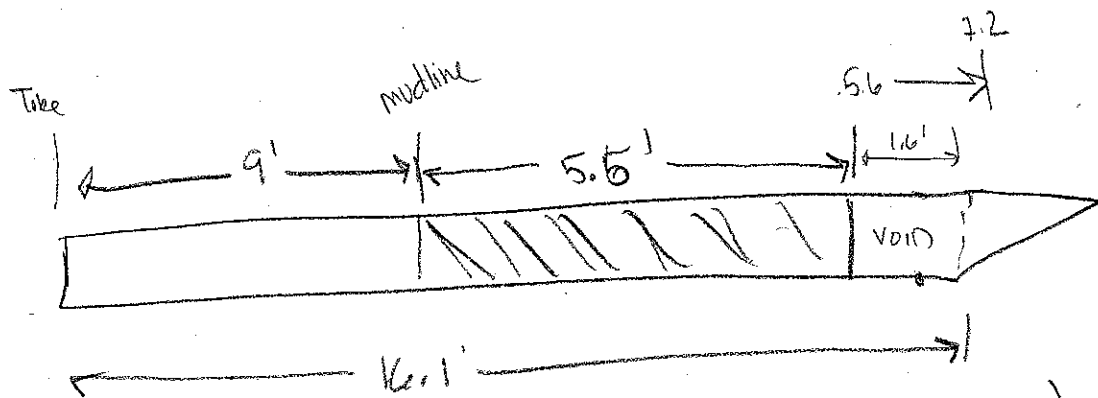
e5.0
TV=3.0

Slight 100

Slight sheen + odor from 0.6 to 0.95 Ft (in gravel)
 only 1 geotech core this core. twigs + wood frags - all fresh, not blackened; natural

LDW-SC-56 (R3)

02/07/06

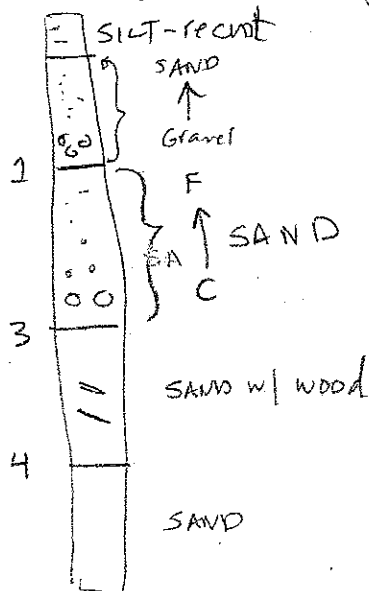


7.2
5.6

1.6

↓
Lost clean
sand F-M
black w/
red+white
frains
"washed"
out
bottom

Notes: Flooding / depositional sequences
suspected. Typically fining upwards patterns



Jar Sheen Test @ 0.8 Ft = TPH-like odor + sheen, film over entire surface
iridescent, floccs of sheen 1/16" &. PID in bag = 10.7

Mudmole™ Bore Log

Project: LDWG Duwamish Coring

Station: 56 r3

Project No: 341185.001

Position: NAD83

WAN

Collected by: GSM

190022

Northing

Date: 2/7/2006

Time: 9:58

1277575

Easting

Water depth: 8.5 ft

Mudline: 1.1 ft MLLW (estimated using tide tables)

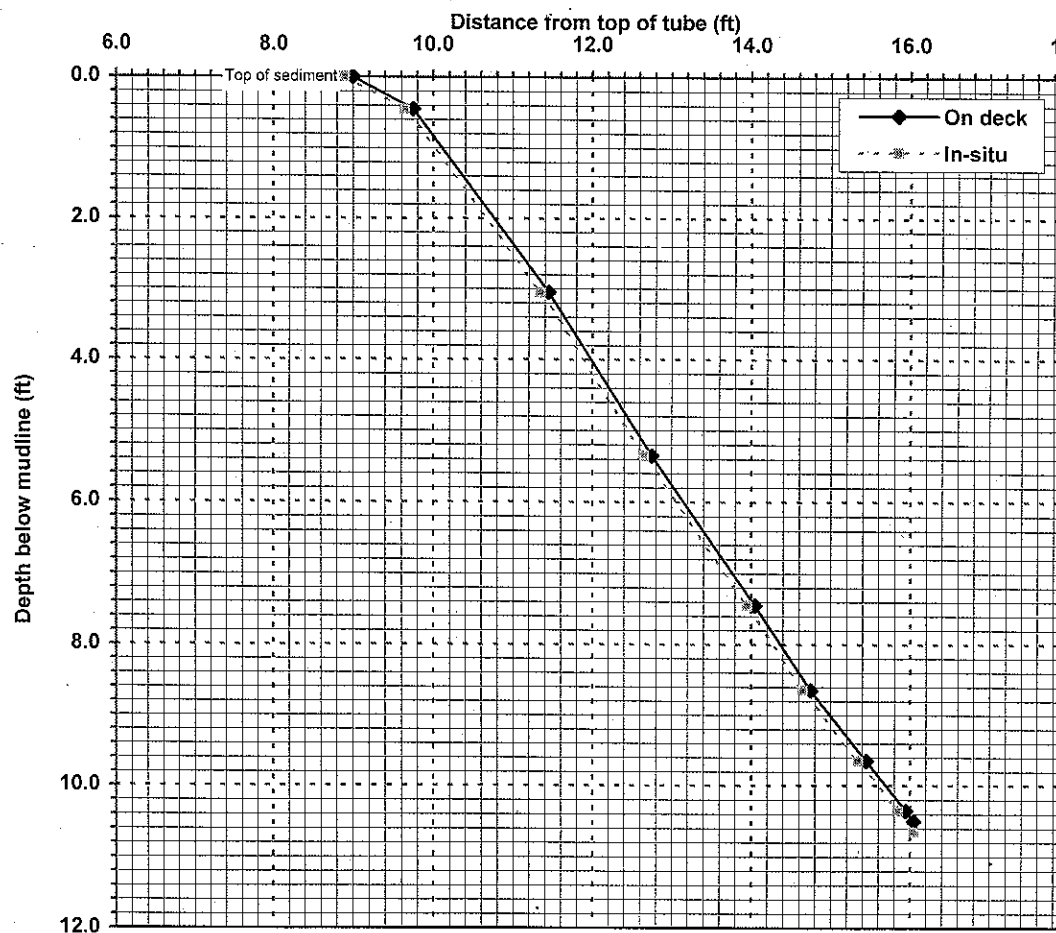
Place Field ID Label Here

Weather/Comments: Overcast and cold

On-deck measurement determined in field lab

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-0.45	0.75	167%
0.45-0.90	1.7	65%
0.90-1.35	1.3	57%
1.35-1.80	1.3	62%
1.80-2.25	0.7	58%
2.25-2.70	0.7	70%
2.70-3.15	0.5	71%
3.15-3.60	0.2	67%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	9
1	10.11
2	10.76
3	11.42
4	11.99
5	12.55
6	13.15
7	13.77
8	14.37
9	15.00
10	15.70
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample



0-0.45	0.75	167%
0.45-0.90	1.7	65%
0.90-1.35	1.3	57%
1.35-1.80	1.3	62%
1.80-2.25	0.7	58%
2.25-2.70	0.7	70%
2.70-3.15	0.5	71%
3.15-3.60	0.2	67%

Mudline	9
1	10.11
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13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-7-06 Recorder: SSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: 56 R1

Tube Length (ft): 16.05

Water Depth (ft): 7.5

Est. Tide Height (ft): 9.3

Time: 830
(MLLW) predicted

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 15.3

Comments: core catcher gone - no recovery



Position Information

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Northing 189987

Easting 1277564

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.25</u>	<u>15.25</u>	
<u>14.2</u>	<u>14.6</u>	
<u>12.0</u>	<u>13.0</u>	
<u>10.3</u>	<u>12.5</u>	
<u>9.5</u>	<u>12.2</u>	<u>refusal</u>

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-7-06 Recorder: SSM

Project: 341185.001 Windward Lower Duwamish Coring

Station Name: ~~15.05~~ 56 R2



Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 7.8

Time: 9 25

Northing 190009

Est. Tide Height (ft) 9.6 (MLLW)

Easting 1277577

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment 12.6

Comments: lost gravel out of bottom during extraction

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.0</u>	<u>15.2</u>	
<u>13.2</u>	<u>13.7</u>	
<u>12.1</u>	<u>13.0</u>	
<u>10.6</u>	<u>12.3</u>	<u>refusal</u>

MCS Environmental MudMole Bore Log

Collection Information

Date: 2-7-06 Recorder: GSM

Project: 341185.001 Windward Lower Duwamish Coring



Station Name: 56 R3

Position Information

Tube Length (ft): 16.05

Coordinate Datum: WA State Plane N, NAD 83, Survey Ft

Water Depth (ft): 8.5

Time: 958

Northing 190022

Est. Tide Height (ft) 9.6

(MLLW) predicted

Easting 1277575

Est. Mudline: _____ (MLLW)

On Deck Top of Sediment _____

Comments: _____

Penetration Tape Reading	Recovery Tape Reading	Comments
<u>15.6</u>	<u>15.3</u>	
<u>13.0</u>	<u>13.6</u>	
<u>10.7</u>	<u>12.3</u>	
<u>8.6</u>	<u>11.0</u>	
<u>7.4</u>	<u>10.3</u>	
<u>6.4</u>	<u>9.6</u>	
<u>5.7</u>	<u>9.1</u>	
<u>5.4</u>	<u>8.9</u>	

processed

Station Number: 56

Date: 2/10/06

Attempt: 1

Core Tube Length: 16.05

Field Technician: CB & LM

Lead Line Water Depth: 7.5

Contractor: MCS

Diver Water Depth: _____

On-site Visitor: Tim (SAIC)

Tip Probe Depth: _____

Latitude: _____ } not possible to read from obs. boat
Longitude: _____

Disk Probe Depth: _____

Drive Initiation Time: 0855

Shoreline & surrounding area observations: appearance of steep slopes

Sediment surface & slope description: _____

Water current: no apparent current in a protected cove

Mudmole operated from boat using guide to keep tube straight

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
15.25	15.25	(Drive offset:)
14.2	14.6	easy drive
12.0	13.0	mudmole bounced 2-3 times & then punched through
10.3	12.5	drive slows down, but visual progression still evident (obj.?)
9.5	12.2	*(see comment)
		drive slows considerably ~ 1 inch per 15 seconds
~6.55	~3.85	

Estimated angle of drive: ~100% off vertical

Reason for ending drive: Refusal

Drive Completion Time: 0910

On Boat Recovery: Empty

- Mudmole removed from core; tube in c-clamp drops & hits bottom a second time
- observation boat leaves MCS boat -> unable to observe end of core when tube removed from water
- CB asks to return

End of Core Tube Observations
Staining: _____
Tube Deformation: _____
Loss of Sediment: <u>All lost</u>
Sediment Description: _____
Water in Tube: _____

Keep or Retry: Must retry as tube is empty -> core catcher is gone

*In attempt to remove tube from guides, boat rocked back & forth; upon getting free, tube moved forward a bit by fast -> potential for bent tube

Notes:
Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Windward

Station Number: 56

Date: 2/7/06

Attempt: 1

Core Tube Length: 16.05

Field Technician: T. Do (WW), C. Brackley (LPTC)

Lead Line Water Depth: 7.5

Contractor: MCS, RSS L. McKee

Diver Water Depth: _____

On-site Visitor: T.H. (SALC)

Tip Probe Depth: _____

Latitude: _____

Disk Probe Depth: _____

Longitude: _____

Drive Initiation Time: 0830

Shoreline & surrounding area observations: H. blackberry, Reed canopy grass

Sediment surface & slope description: shallow slope, intertidal station

Water current: not much

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
		(Drive offset:)

Estimated angle of drive: 90°

Reason for ending drive: refusal, hit log

Drive Completion Time: _____

On Boat Recovery: _____

End of Core Tube Observations
Staining:
Tube Deformation:
Loss of Sediment: <u>no sediment</u>
Sediment Description:
Water in Tube:

Keep or Retry core catcher lost; hit log during drive

Notes: Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Station Number: 56
 Attempt: 2
 Field Technician: CB LM
 Contractor: MCS
 On-site Visitor: TAM
 Latitude: _____
 Longitude: _____

Date: 2/1/06
 Core Tube Length: _____
 Lead Line Water Depth: _____
 Diver Water Depth: _____
 Tip Probe Depth: _____
 Disk Probe Depth: _____
 Drive Initiation Time: 0928

Shoreline & surrounding area observations: Apparent Steep Slope: ~75' from shore
 Sediment surface & slope description: no diver
 Water current: no current due to protected cove

Observation boat is not tied to MCS boat & drifting Gon a distance

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
15.0	15.2	(Drive offset:)
13.2	13.7	Easy drive
12.1	13.0	Easy drive
10.6	12.3	Out of drive guides; slow drive (difficult) → measurements taken while mudmole still hammering

Estimated angle of drive: 10% off of vertical
 Reason for ending drive: Refusal

Drive Completion Time: 0934 On Boat Recovery: ~~None~~ Very limited

This → ~4' penetration until refusal; gravel layer likely

End of Core Tube Observations
Staining: <u>none</u>
Tube Deformation: <u>good; no bends</u>
Loss of Sediment: _____
Sediment Description: _____
Water in Tube: _____

Keep or Retry: _____
0938 → mudmole de-coupled from tube
hand pumping water from tube (pump isn't very long; pumped as much clear water as possible w/ pumptube length)
0944 → a small amount of gravel → most of sediment is lost; wrapping to package remnants in tube
 Notes: Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

Station Number: 56
 Attempt: 3
 Field Technician: OB LM
 Contractor: MCS
 On-site Visitor: TM
 Latitude: _____
 Longitude: _____

Date: 2/27/06
 Core Tube Length: 16.05
 Lead Line Water Depth: 8.5
 Diver Water Depth: _____
 Tip Probe Depth: _____
 Disk Probe Depth: _____
 Drive Initiation Time: 0959

operated from deck & measurement taken from deck

Shoreline & surrounding area observations: Steep banks; ~50' dist from shore
 Sediment surface & slope description: _____
 Water current: No apparent current due to protected cove

Observation boat not tied to MCS boat; observation from a distance

Penetration	Recovery	Drive Notes (e.g. easy, difficult, etc.)
15.6	15.3	(Drive offset:)
13.0	13.6	Easy drive to begin
10.7	12.3	Easy drive; removing core tube from guide device
8.6	11.0	Still relatively
7.4	10.3	Slowed a bit, but still good vertical progression
6.4	9.6	Very hard drive - slow
5.7	9.1	
5.4	8.9	

operator of measurement from diver

1006 -> obs. boat tied to MCS boat; EP to other water

Estimated angle of drive: 03/27/06 10% from vertical
 Reason for ending drive: Refusal

Drive Completion Time: 1017 On Boat Recovery: _____

*1018 -> diver class separating mudline from tube
 1023 -> pumping water (tube still in sediment from top of tube)
 1025 -> EP wrapping tip*

End of Core Tube Observations
Staining: <u>None</u>
Tube Deformation: <u>No apparent deformation</u>
Loss of Sediment: <u>~1 liter of turbid water from tip</u>
Sediment Description: <u>N/A -> wrapped by EP in water</u>
Water in Tube: <u>Ripped -> some will remain</u>

Keep or Retry: Recovery looks good; lab determination required to see if too much was lost

Notes: Penetration & Recovery measured from top of core tube to sediment surface in feet (tenths)

6.4 9.6
5.4 8.9