## Lower Duwamish Waterway Sediment Core Log Key

### Visual Sediment Descriptions consist of the following:
- Moisture content, density/consistency (estimated based on visual observation), color, (Munsell Number), minor constituent (<20%) MAJOR CONSTITUENT/GROUP NAME with minor constituents (<0.5%). Amount and shape of minor constituents (e.g., wood, shells) followed by major constituent structure. Sheen and odor.

**Example:** wet, soft, olive green (GLE 1, 570Y) clayey SILT, little sand, moderate shell fragments, and (few) twigs and rootlets. Silt texture is uniform, slightly compressible, massive, blocky, and of low plasticity. Silt content is <10%, organic matter is <2%, and Fe, Mn, and P are low.

### Sediment Core Log Layout:
*Recovered = measured in the lab, actual sediment contained in the core tube.*
*In situ = calculated from recovered length and percent recovery, depths are expanded to match the drive interval and in situ conditions.*

<table>
<thead>
<tr>
<th>Heading</th>
<th>Recovered</th>
<th>Recovered</th>
<th>Recovered</th>
<th>Recovered</th>
<th>Recovered</th>
<th>Recovered</th>
<th>Recovered</th>
<th>Recovered</th>
<th>In-Situ Depth (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Sediment Description Terminology:

**Moisture Density:**
- Dry: Little perceptible moisture
- Damp: Some perceptible moisture, probably below optimum
- Moist: Probably near optimum moisture content, no visible water
- Wet: Visible free water, probably above optimum

**Density/Consistency:**
- Soil density and consistency are estimated based on visual observations and are presented in the core logs.

#### MAJOR and Minor Constituent % (by weight)

<table>
<thead>
<tr>
<th>Core Logs</th>
<th>Percent</th>
<th>Field Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace (clay, silt, etc.)</td>
<td>0-5</td>
<td>not identified</td>
</tr>
<tr>
<td>Few (clay, silt, etc.)</td>
<td>5-15</td>
<td>Slightly (clayey, silty, etc.)</td>
</tr>
<tr>
<td>Little (clay, silt, etc.)</td>
<td>15-20</td>
<td>Clayey, silt, sandy, gravelly</td>
</tr>
<tr>
<td>Clayey, silty, sandy, gravelly</td>
<td>30-50</td>
<td>Very (clayey, silty, sandy, etc.)</td>
</tr>
<tr>
<td>GROUP NAME &gt; 50 GROUP NAME</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Other Minor Constituents: % (by volume)

<table>
<thead>
<tr>
<th>Trace</th>
<th>Scattered</th>
<th>Moderate</th>
<th>Substantial</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5-10</td>
<td>10-30</td>
<td>30-50</td>
</tr>
<tr>
<td>GROUP NAME</td>
<td>&gt; 50 GROUP NAME</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Other Descriptions:

**Soil Test: % coverage**
- Silt: Silt test visual analysis
- Moderate: 2-15
- Strong: 15-40
- Heavy: 40-70

No odor or sheen observed unless noted.

#### Contacts:
- expressed as sharp, transitional, or gradational
  - color or minor change
  - major sediment change
  - depositional change

#### Core Acceptance Guidelines:
1. Desired drive depth is reached.
2. Core recovery is greater than 70%.
3. Core tube appears intact (no signs of blocking, bending).
4. Minimal sediment loss out the top or bottom (minimal winnowing).

#### General Notes:
- L = Length
- TV = Torvano shear stress measurements made on intact core in kg/cm².
- GT = Geotech sample collected in 2- or 3-inch push tubes.
- PDI = Physical description index method ASTM D-2487 and Visual manual classification method ASTM C468 for the description and identification of soils were used as a identification guide. Descriptions were compared to grain size and Atterberg limit results where applicable.

**REMARKS section**
- Drive notes express penetration depths.

**Classification of sediment on core logs is based on visual field and laboratory observations which include density/consistency, grain size, and plasticity.**

Plasticity estimates should not be construed to imply laboratory testing unless presented herein. Unified Soil Classification System ASTM D-2487 and Visual manual classification method ASTM C468 for the description and identification of soils were used as a identification guide. Descriptions were compared to grain size and Atterberg limit results where applicable.
## Core Log Key

### SEDIMENT LITHOLOGY

<table>
<thead>
<tr>
<th>Project: LDWG R/FSS</th>
<th>Water Body Type: Lower Duwamish Waterway</th>
<th>Tube Length (ft): xxx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project #: PORS-S18220-511</td>
<td>Water Elevation (ft/Tide): xxx</td>
<td>Penetration Depth (ft): xxx</td>
</tr>
<tr>
<td>Client: LDWG</td>
<td>Water Depth (ft): xxx</td>
<td>Sample Quality: xxx</td>
</tr>
<tr>
<td>Collection Date: xxx</td>
<td>Mudline Elevation (ft): xxx</td>
<td>Recovery in ft (%): xxx</td>
</tr>
<tr>
<td>Contractor: xxx</td>
<td>N/LAT: xxx</td>
<td>Process Date: xxx</td>
</tr>
<tr>
<td>Operator: xxx</td>
<td>Horiz. Datum: xxx (ft)</td>
<td>Logged By: xxx</td>
</tr>
<tr>
<td>Method/Tube ID: xxx</td>
<td>Vert. Datum: xxx (ft)</td>
<td></td>
</tr>
</tbody>
</table>

### Sediment Description

Classification Scheme: USCS

- **OH:** ORGANIC SILT/CLAY: Organic clays or organic silts of medium to high plasticity.
- **CL:** CLAY: Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, and lean clays.
- **CL:** ORGANIC SILT: Organic silts and organic silt-clays of low plasticity.
- **MH:** SILT: Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
- **SAND BLAST GRIT:** Sand blast grit with interbeds of silt, over 50% of matrix is non-native material.
- **ML:** SILT: Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
- **SM:** SAND: Silty sands, sand-silt mixtures.

**Remarks:** Sediment descriptions (lithology) based on USCS ASTM D2487-93 Standard Classification of Soil for Engineering Purposes (Unified Soil Classification System) and ASTM D2488-93 Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).

### Calculated Recovery

Sample Length/Penetration Length: \( xx / xx = xx \% \)

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**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
### Core Log Key

**SEDIMENT LITHOLOGY**

<table>
<thead>
<tr>
<th>Project: LDW RI/FS</th>
<th>Water Body Type: Lower Duwamish Waterway</th>
<th>Tube Length (ft): xxx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project #: PORS5-18220-511</td>
<td>Water Elevation (ft/Tide): xxx</td>
<td>Penetration Depth (ft): xxx</td>
</tr>
<tr>
<td>Client: LDWG</td>
<td>Water Depth (ft): xxx</td>
<td>Sample Quality: xxx</td>
</tr>
<tr>
<td>Collection Date: xxx</td>
<td>Mudline Elevation (ft): xxx</td>
<td>Recovery in ft (%): xx</td>
</tr>
<tr>
<td>Contractor: xxx</td>
<td>N.LAT: xxx E.LONG: xxx</td>
<td>Process Date: xxx</td>
</tr>
<tr>
<td>Operator: xxx</td>
<td>Method/Tube ID: xxx</td>
<td>Logged By: xxx</td>
</tr>
</tbody>
</table>

### Sediment Description

**Classification Scheme:** USCS

- **Sp:** SAND: Poorly graded sands or gravelly sands, little to no fines.
- **SW:** SAND: Well graded sand or gravelly sands, little to no fines.
- **SP:** SAND: Sand with interbeds of silt.
- **SP-SC:** Sand with interbeds of silt and pockets of clay.
- **SP-SM:** Sand with silt pockets.
- **GP:** GRAVEL: Poorly graded gravels or gravel sand mixtures.

**In-situ Depth (ft) & Graphic Log**

**End of core @ 13.0'. Driven to refusal.**

### Remarks


### Calculated Recovery

- Sample Length/Penetration Length: \( \frac{xx}{xx} = xx \% \)

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**Project:** LDW R/F

**Water Body Type:** Lower Duwamish Waterway

**Penetration Depth (ft):** 6.6

**Water Elevation (ft)/Tide:** 8.1

**Water Depth (ft):** 25.3

**Sample Quality:** Good

**Collection Date:** 2/8/06

**Mudline Elevation (ft):** -15.7

**Penetration Depth (ft):** 6.6 (91)

**Contractor:** MCS Environmental, Inc.

**Process Date:** 2/9/06

**N/LAT:** 211282

**Process Method:** Cut tube

**E/LONG:** 1266315

**Operator:** Gary Maxwell

**Method/Tube ID:** Diver Impact Core/4" sq Al

**Vessel:** MCS Barge

**Logged By:** N. Bacher

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**Sediment Description**

Classification Scheme: USCS

Contacts are recovered depth

(In-situ depth interval in feet with parentheses)

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ML: (0.0-0.2) wet, soft, greenish gray (GLEY 1, 5/10 Y), SILT, little sand, moderate shell fragments, and trace twigs and roots.

MH: (0.2-1.3) moist, medium soft, black (GLEY 1 2.5N) SILT, few sand, trace wood, and rootlets. Very slight H2S-like odor.

- 0.6" 1/2" gray CLAY seam
- 0.7" piece of bark 3" x 1.5" L
- 0.9-1.1" Layer of wet, medium dense, gray (GLEY 4/4) fine SAND, few silt. Sand grains are multicolored (black and white).

MH: (1.3-2.5) moist, medium stiff, black (GLEY 1 2.5N) SILT and scattered wood fragments.

Moderate H2S-like odor.

- 1.6" trace shells

SM: (2.3-6.6) moist, medium dense, very dark gray (GLEY 1 3/N) fine to medium SAND, few silt. Sand grains are multicolored (orange, red, white) and grade to medium to coarse @ 4.9'.

- 3.4" 1/2" round clay pocket
- 3.8' grades to trace silt

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End of core at 6.0'. Driven to refusal.

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**Remarks:** Drive Notes: slowed (6.2-3.4'), refusal (6.6').

Two drive attempts made at station.

**Calculated Recovery**

Sample Length/Penetration Length:

6.0 / 6.6 = 91 %

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Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**LDW-SC-2 (R1)**

**Project:** LDW RIFS  
**Water Body Type:** Lower Duwamish Waterway  
**Tube Length (ft):** 16.1

**Project #:** PORS5-18220-511  
**Water Elevation (ft)/Tide:** 7.4

**Client:** LDWG  
**Water Depth (ft):** 31.4

**Collection Date:** 2/9/06  
**Mudline Elevation (ft):** -23.7

**Contractor:** MCS Environmental, Inc.  
**N/LAT:** 211196  
**E/LONG:** 1267032

**Vessel:** MCS barge  
**Horiz. Datum:** NAD 83 N Vert. Datum: MLLW

**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4" sq Al

**Logged By:** N. Bacher, A. Fitzpatrick

**Sediment Description**  
**Classification Scheme:** USCS  
**Contacts are recovered dooth**  
(In-situ depth interval in feet with parentheses)

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>% Recovery &amp; Interval</th>
<th>Chemical Analysis</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>47% PCB SVOC Metals Hg Pesticides 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>100% (1-2) PCB SVOC Metals Hg Pesticides 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>100% (2-5) PCB SVOC Metals Hg Pesticides 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>100% (5-8) PCB SVOC Metals 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **9M:** (0.0-1.2) wet, loose, black (GLEY 1, 2.5/N) SAND, little silt.
- **0.7-0.9’’ wood fragments and subrounded gravel up to 1’’ L.
- **OL:** (1.2-2.4) wet, soft to medium stiff, light gray (2.5Y, 7/1), ORGANIC SILT, few sand and clay. Trace scattered shell fragments, moderate H2S-like odor that decreases with depth, and trace sheen. Horizontal banding of black and gray clay seams in 1/2” bands. Clay has some plasticity.
- **OL:** (2.4-4.1) wet, medium stiff, light gray (2.5Y, 7/1), ORGANIC SILT, few clay. Silt texture is homogeneous and of medium plasticity. Slight H2S-like odor and trace HC-like sheen.
- **OL:** (4.1-4.3) wet, stiff, light gray (2.5Y, 7/1) CLAYEY ORGANIC SILT.
- **ML:** (4.3-10.5) wet to moist, stiff, light gray (2.5Y, 7/1) to dark gray (2.5Y, 4/1) seams of SILT and rock flour and chunky balls of hard SILT (80% anthropogenic). Trace wood and minor sand seams with wood up to 3”. Trace sheen and black streaks associated with hard silt.
- **6.0’’ 5” L wood fragment**

**Comments**  
**In-situ Depths**

- **Transitional Contact**  
  **PID bag @ 9.9’** = 0.8
  **Sheen Test @ 1.0:** 50% rainbow w/ scattered 1/2” florets  
  **1.5’’ TV = 0.3 kg/cm²**

- **Transitional Contact**  
  **GT @ 2.9’’**  
  **3.2’’ TV = 0.4 kg/cm²**

- **Sharp Contact**  
  **Transitional Contact @ 4.3’’ TV = 0.5 kg/cm²**
  **GT @ 4.7’’**
  **Wet test @ 5.0’’ = gray silt melts away when wetted- no integrity, four/five-like**  
  **5.7’’ TV = 1.8 kg/cm²**

**Remarks:**  
**Drive Notes:** freefall (0.5’’), easy (2.2’’), moderate (4.9’’), hard (13.1’’), penetration goal reached. One drive attempt made at station. Core catcher was intact.

**Calculated Recovery**  
**Sample Length/Penetration Length:**  
13.1’’ 13.1 = 100%

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Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
# Sediment Core Log

**Project:** LDW R1/FS  
**Water Body Type:** Lower Duwamish Waterway  
**Tube Length (ft):** 16.1

**Project #:** PORS-18220-511  
**Water Elevation (ft):** 7.4  
**Penetration Depth (ft):** 13.1

**Client:** LDWG  
**Water Depth (ft):** 31.4  
**Sample Quality:** Good

**Collection Date:** 2/9/06  
**Mudline Elevation (ft):** -23.7  
**Recovery in %:** 13.1 (100)

**Contractor:** MCS Environmental, Inc.  
**N/LAT:** 211195  
**E/LONG:** 1267052  
**Process Date:** 2/9/06

**Vessel:** MCS barge  
**Horiz. Datum:** NAD 83  
**Vert. Datum:** MLLW  
**Process Method:** Cut tube

**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4" sq Al  
**Logged By:** N. Barch, A. Fitzpatrick

## Sediment Description

**Classification Scheme:** USCS  
**Contacts are recovered depth**  
(In-situ depth interval in feet with parentheses)

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>% Recovery Interval</th>
<th>Chemical Analysis</th>
<th>PID Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>100% (8-8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>100% (8-8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>92% (8-10.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>80% (10.6-11.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>75% (11.5-12)</td>
<td>PCB SVOC Metals</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>100% (12-13)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments for Recovered Depths**

- @ 8.4’ 1” layer of black SILT and shell fragments
- @ 9.0’ Grades to damp, medium stiff SILT and hard SILT chunks banded in 1 to 3” layers. Trace HC-like sheen in softer SILT.
- SM: (10.5-12.0) damp, dense, very dark greenish gray (GLEY 1, 3/5GY), medium to fine SAND, trace multicolored grains (orange, red, gray, white).
- SM: (12.1-13.1) damp, dense, very dark greenish gray (GLEY 1, 3/5GY), fine SAND with 1/2” brown SILT seams. Distinct horizontal layers, scattered rootlets, and 1/2”L wood fragment.
- Bottom 6” is very fine SAND, few silt in core shoe.

**End of core at 13.1’**

## Remarks

**Drive Notes:** freefall (0.5’), easy (2.2’), moderate (4.9’), hard (13.1’), penetration goal reached. One drive attempt made at station. Core catcher was intact.

**Calculated Recovery**

Sample Length/Penetration Length:

13.1' / 13.1 = 100%

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
### Sediment Core Log

**Project:** LDW RI/FS  
**Water Body Type:** Lower Duwamish Waterway  
**Tube Length (ft):** 16.1

**Project #:** PORS5-18220-511  
**Water Elevation (ft/Tide):** 7.9  
**Penetration Depth (ft):** 8.5

**Client:** LDWG  
**Water Depth (ft):** 57.0  
**Sample Quality:** Good

**Collection Date:** 2/9/06  
**Mudline Elevation (ft):** -49.3  
**Recovery in ft (%):** 8.5 (83)

**Contractor:** MCS Environmental, Inc.  
**N/LAT:** 210649  
**E/LONG:** 1266431  
**Process Date:** 2/9/06

**Vessel:** MCS barge  
**Horiz. Datum:** NAD 83 N Vert. Datum: MLLW

**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4" sq Al  
**Logged By:** N. Bacher, A. Fitzpatrick

### Sediment Description

<table>
<thead>
<tr>
<th>Recovery Interval</th>
<th>Recovery &amp; Sample</th>
<th>Chemical Analysis</th>
<th>P/I/D</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>93% (0-1)</td>
<td>PC5 SVOC Metals</td>
<td>Hg TBT</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>130% (1-2)</td>
<td>PC5 SVOC Metals</td>
<td>Hg TBT</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>83% (2-5)</td>
<td>PC5 SVOC Metals</td>
<td>Hg TBT</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>81% (5-7)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sediment Details:**
- SM: (0.0-1.0) moist, medium dense, very dark gray (10YR, 3/1) fine SAND, few silt, and scattered wood fragments. Sand is multicolored (orange, red, white).
- @ 0.9" thick SILT lens
- SP: SM: (1.6-5.1) moist to wet, medium dense, very dark gray (2.5Y, 3/1) fine to medium SAND interbedded with 1 / 2" to 3" thick SILT layers. Sand grains are multicolored and coarsen downward. Scattered wood fragments up to 1"L. Moderate H2S-like odor to 4.0'.
  - @ 1.6" 1" thick SILT lens
  - @ 2.4' 1.5" thick SILT lens
  - @ 2.7' 3"L x 1"W thin wood fragment
- @ 3.1' 3" thick SILT lens
- @ 4.0' Slight H2S-like odor to 4.6'
  - @ 4.2' 1/2" thick SILT lens
  - @ 4.6' Scattered twigs
- SP: SM: (5.1-10.2) damp, dense, greenish black (GLEY 1, 4/10V), medium SAND interbedded with SILT. Silt interbeds are frequent, horizontal, range from 1/2" to 2" thick and are spaced every 0.3'. Small, scattered wood fragments at bottom of core (7.0' to 8.0').

**Comments for Recovered Depths**
- GT @ 0.7'
  - @ 0.9' TV = 0.2 kg/cm2
  - Sharp Contact
- GT @ 1.5'
  - @ 3.0' TV = 0.4 kg/cm2
  - Gradational Contact: less water
  - @ 4.9' TV = 0.2 kg/cm2

### Calculated Recovery

**Sample Length/Penetration Length:**
- Calculated Recovery: 8.5 / 10.2 = 83 %

**Remarks:** Drive Notes: easy (5.0'), moderate (7.0'), hard (7.8'), refusal (8.7'). One drive attempt made at station.

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*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
### Sediment Core Log

**Project:** LDW R1/FS  
**Water Body Type:** Lower Duwamish Waterway  
**Tube Length (ft):** 16.1

**Project #:** PORS5-18220-511  
**Water Elevation (ft)/Tide:** 7.9  
**Penetration Depth (ft):** 8.5

**Client:** LDWG  
**Water Depth (ft):** 57.0  
**Sample Quality:** Good

**Collection Date:** 2/9/06  
**Mudline Elevation (ft):** -49.3  
**Recovery in ft (%):** 8.5 (83)

**Contractor:** MCS Environmental, Inc.  
**N/LAT:** 210648  
**Process Date:** 2/9/06

**Vessel:** MCS Barge  
**E/LONG:** 1256431  
**Process Method:** Cut tube

**Operator:** Gary Maxwell  
**Horiz. Datum:** NAD83  
**Logged By:** N. Bacher, A. Fitzpatrick

**Vert. Datum:** MLLW  

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#### Sediment Description

**Classification Scheme:** USCS  
**Contacts are recovered depth**  

**Chemical Analysis**  

**PID Measurement**

**Depth (ft) & Measurements**

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**Recovery & Sample**

**% Recovery (interval)**

**Chemical Analysis**

**Sediment Description**

- @ 7.0' wood fragments, elongated
- @ 7.2' 1.5' thick SILT lens
- @ 7.9' 1' thick SILT lens
- @ 8.1' small wood fragment
- End of core at 8.5'. Driven to refusal.

- @ 7.3' TV = 0.6 kg/cm2
- Not sampled below 8.0'.

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#### Calculated Recovery

**Sample Length/Penetration Length:**  

**8.5 / 10.2 = 83 %**

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**Remarks:** Drive Notes: easy (5.0'), moderate (7.0'), hard (7.8'), refusal (8.7'). One drive attempt made at station.

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**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-4 (R2)

Project: LDW R/FS
Water Body Type: Lower Duwamish Waterway

Project #: PORS5-18220-511
Water Elevation (ft): 7.9

Client: LDWG
Water Depth (ft): 41.9

Collection Date: 2/9/06
Mudline Elevation (ft): -34.0

Contractor: MCS Environmental, Inc.
N/LAT: 210597

Vessel: MCS barge
E/LONG: 1266933

Operator: Gary Maxwell
Horiz Datum: NAD 83

Method/Tube ID: Diver Impact Core/4" sq Al
Vert Datum: MLLW

Logged By: N. Bacher
Process Date: 2/9/06
Process Method: Cut tube

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

Recovered Depth (ft)
Recover Interval & Sample
% Recovery (interval)
Chemical Analysis
RIED Measurement

0
PCB SVOC Metals Hg TBT
92% (0-2)

1
PCB SVOC Metals Hg TBT
115% (2-4)

2
PCB SVOC Metals Hg TBT
92% (4-6)

3
PCB SVOC Metals Hg TBT
85% (6-7)

4

5

6

SM: (0.0-0.3) wet, very loose, dark greenish gray (GLEY 1, 4/10Y) SILTY SAND, trace subrounded gravel up to 1/2", trace shells and rootlets.

OL: (0.3-1.4) moist, medium stiff, black (GLEY 1, 2.5/N) ORGANIC SILT, little sand, trace angular gravel up to 1/2", and trace rootlets and twigs. Silt has medium plasticity.

GP: (1.4-1.8) wet, medium dense, dark greenish gray (GLEY 1, 4/55) GRAVEL, little silt and sand. Gravel is subangular and up to 2.5" in diameter. Trace HC-like odor and color.

OL: (1.6-2.5) moist, medium soft, black (GLEY 1, 2.5/N) ORGANIC SILT, trace sand. Silt to moderate H2S-like odor and trace HC-like sheen.

SP-SM: (2.5-3.3) moist, medium dense, very dark brown (10YR 2/2) fine SAND interbedded with lenses of gray CLAYEY SILT. Lenses are irregular and up to 3" thick. Moderate wood fragments, twigs, and rootlets increase toward basal contact.

SP-SC: (3.3-7.2) moist, medium dense, very dark greenish gray (GLEY 1, 3/10GY) fine to medium SAND with scattered 1/2" pockets of clay and 1" lenses of gray silt, and scattered wood fragments. Sand is multicolored (orange, red, white) and grades to medium grained below 3.5'.

Sharp Contact GT @ 0.4'
@ 0.6' TV = 0.4 kg/cm2

Sharp Contact
@ 2.1' TV = 0.4 kg/cm2

Sharp Contact
@ 4.5' TV = 0.5 kg/cm2

Calculated Recovery
Sample Length/Penetration Length:

Core catcher was intact.

Remarks: Drive Notes: moderate (7.5'), hard (9.0'), refusal (9.0'). Two drive attempts made at station.

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**LDW-SC-4 (R2)**

<table>
<thead>
<tr>
<th>Project: LDW RI/FS</th>
<th>Water Body Type: Lower Duwamish Waterway</th>
<th>Tube Length (ft): 16.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project #: PORS5-18220-511</td>
<td>Water Elevation (ft)/Tide: 7.9</td>
<td>Penetration Depth (ft): 8.0</td>
</tr>
<tr>
<td>Client: LDWG</td>
<td>Water Depth (ft): 41.8</td>
<td>Sample Quality: Not Indicated</td>
</tr>
<tr>
<td>Collection Date: 2/9/06</td>
<td>Mudline Elevation (ft): -34.0</td>
<td>Recovery in ft (%): 7.7 (85)</td>
</tr>
<tr>
<td>Contractor: MCS Environmental, Inc.</td>
<td>N/LAT: 210597</td>
<td>Process Date: 2/9/06</td>
</tr>
<tr>
<td>Vessel: MCS barge</td>
<td>E/LONG: 1265993</td>
<td>Process Method: Cut tube</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>Recov Interval &amp; Sample</th>
<th>% Recovery (In Situ)</th>
<th>Chemical Analysis</th>
<th>PFA</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>0</td>
<td>60% (7-8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>60% (8-9)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sediment Description**

Classification Scheme: USCS

Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

SP- SM: (7.2-9.0) most, dense, gray fine SAND interbedded with SILT. Interbeds are 1/8" thick, spaced 1/4" apart from 6.9' to 7.2', and scattered lenses 1/4" thick.

End of core at 7.7'. Driven to refusal.

**Comments**

Transitional Contact
@ 7.2' TV = 9.6
kg/m^2

**In-situ Depth (ft) & Graphic Log**

**Remarks:** Drive Notes: moderate (7.5'), hard (9.0').

refusal (9.0'). Two drive attempts made at station.

Core catcher was intact.

**Calculated Recovery**

Sample Length/Penetration Length:

7.7 / 9.0 = 85%

---

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
Sediment Core Log
LDW-SC-5 (R2)

Project: LDW RIFS
Project #: PORS-18220-511
Client: LDWG
Collection Date: 2/9/06
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell
Method/Tube ID: Diver Impact Core/4" sq Al

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft)/Tide: 7.7
Water Depth (ft): 19.7
Mudline Elevation (ft): -10.4

Penetration Depth (ft): 7.3
Sample Quality: Good
Recovery in ft (%): 62.2 (85)
Process Date: 2/10/06
Process Method: Cut tube
Logged By: N. Bacher, A. Fitzpatrick

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>% Recovery (Interval)</th>
<th>Chemical Analysis</th>
<th>Sediment Description</th>
<th>Comments for Recovered Depths</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>82% (3-1)</td>
<td></td>
<td>OL: (0.0-1.0) moist, medium stiff, black (2.5Y, 2.5/1) SILT, trace sand. Mottled appearance. Scattered rootlets, twigs, and shell fragments, and trace worms and worm tubes.</td>
<td></td>
</tr>
</tbody>
</table>
| 1         | 96% (1-2)             |                   | SM: (1.0-1.2) moist, medium dense, dark gray (2.5Y, 4/1) fine to medium SAND, trace silt and trace shell fragments. Sand grains are multicolored (orange, red, white).
| 3         | 95% (2-8)             |                   | SM: (1.2-1.5) moist, medium dense, dark gray (2.5Y, 4/1) SAND, little silt, abundant shell fragments, and strong H2S-like odor. |
| 4         | 92% (3-12)            |                   | ML: (1.5-2.4) moist, soft, dark gray (2.5Y, 4/1) GRAVELLY SILT, trace sand. Gravels are rounded and up to 1.5" diameter. Substantial shell fragments, barnacles on gravels, and strong H2S-like odor. |
| 5         | 77% (5-6.4)           |                   | SP- SM: (2.4-7.3) moist, medium dense, very dark greenish gray (GLEY 1, 3/10Y) medium SAND interbedded with SILT, scattered to 3.7". Scattered small shells and slight H2S-like odor. |
| 6         | 60% (6.4-7.3)         |                   | @ 2.4" lens of SILT with shells @ 2.7" pocket of SILT @ 3.6" lens of SILT with shells and wood fragments |
| End of core at 6.2'. Driven to refusal. |
| Note: Chemistry interval recorded as 4-6 ft but samples were collected to 6.2 ft. Graphic expresses depth of sample collection; sample name matches project nomenclature. |

Remarks:
Drive Notes:  freefall (9.5'), easy (5.0'), moderate (6.3'), hard (7.3'), refusal (7.3'). Two drive attempts made at station. Core catcher was intact. EPA oversight approved processing as Method A.

Calculated Recovery
Sample Length/Penetration: Length: 6.2 / 7.3 = 85 %

The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, WA 98124-1162
Phone: (206) 624-9349
Fax: (206) 624-2639

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-6 (R1)

Project: LDW RIFS
Project #: PORS5-18220-511
Client: LDWG
Collection Date: 2/9/06
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft): NA
Water Depth (ft): 8.6
Mudline Elevation (ft): -33.0
N/LAT: 209836
E/LONG: 1266285
Horiz. Datum: NAD 83
Vert. Datum: MLLW
Method/Tube ID: Diver Impact Core/4" sq Al
Logged By: N. Bacher, A. Fitzpatrick

Tube Length (ft): 16.1
Penetration Depth (ft): 11.0
Sample Quality: Good
Recovery in ft (%): 8.6 (77)
Process Date: 2/10/06
Process Method: Cut tube

Recovered Depth (ft) Recov Interval % Recovery Chemical Analysis Sediment Measurement

0 0 0 OL: (0.0-0.4) wet, very soft, olive (5Y, 4/3) ORGANIC SILT. Scattered twigs and trace worm OL: (0.4-4.8) wet, soft to medium stiff, greenish black (GLEY 1, 2.5/5G) ORGANIC SILT, little sand and scattered wood fragments. Silt texture is black, of moderate plasticity, increases in homogenous, of moderate plasticity, increases in stiffness with depth, and decreases in sand content with depth. Slight H2S-like odor.
3.4' 2" pocket of soft, stiff, gray SILT

6M: (4.8-6.8) moist, medium dense, very dark gray (10YR, 5/1) SAND, trace silt. Sand is multicolored (orange, red, white) with fining upward sequences; silt is non-layered with stiff clasts and abrupt edges (xenoclasts). Scattered debris (brick fragments).
@ 4.5' grades to fine sand
@ 5.4' grades to coarse to medium sand
@ 6.0' grades to medium sand
@ 6.4' grades to medium to fine sand

Transitional Contact
GT @ 1.1'
GT @ 1.7' TV = 0.6 kg/cm2
GT @ 3.2'
GT @ 3.5' TV = 0.7 kg/cm2
GT @ 4.3' TV = 1.2 kg/cm2
Bag @ 5.7' (debris)
Bag @ 6.0' (sand clast with odor)
Bag @ 6.5' TV = 0.5 kg/cm2

Remarks: Drive Notes: easy (2.6'), moderate (8.8'), hard (10.0'), refusal (11.0'). One drive attempt made at station. Core catcher was intact.

Calculated Recovery
Sample Length/Penetration Length:
8.6 / 11.0 = 78 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial investigation.
Sediment Core Log
LDW-SC-6 (R1)

Project: LDW R1/FS
Project #: PORS5-18220-511
Client: LDWG
Collection Date: 2/9/06
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft/Tide): NA
Water Depth (ft): 8.5
Mudline Elevation (ft): -33.0

Penetration Depth (ft): 11.0
Sample Quality: Good
Recovery in ft (%): 86 (77)
Process Date: 2/10/06
Method/Tube ID: Diver Impact Core/4" sq Al

Logged By: N. Bacher, A. Fitzpatrick

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

Recovery Interval

% Recovery

Chemical Analysis

PID Measurement

Recovery Interval

-7 -6.5
-6
-5.5
-5
-4.5
-4
-3.5
-3
-2.5
-2
-1.5
-1
-0.5
0
50%
40%
30%
20%
10%
0%

PCB
S voc
Metals
Hg

65%
(6.0-8.8)
60%
(8.8-10)
30%
(10-11)

7.1' grades to coarse to medium sand

7.4' grades to medium sand

7.5' scattered brick fragments to 1/8" L, coarse quartz sand present

SM: (8.8-11.0) Grading to moist, dense, medium SAND. No layers or hard silt clasts, more rounded coarse quartz grains than above. One intact half shell 1" L.

End of core at 8.5'. Driven to refusal.

Comments

In-situ Depth (ft)
& Graphic Log

Bag @ 7.9 (brick fragments, 1/2 shell)

Gradational Contact

Last 0.5' of core is slightly winnowed

Remarks: Drive Notes: easy (2.6'), moderate (8.6'), hard (10.0'), refusal (11.0'). One drive attempt made at station.
Core catcher was intact.

Calculated Recovery
Sample Length/Penetration Length:
8.6 / 11.0 = 78 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**LDW-SC-7 (R1)**

**Project:** LDW RI/FS  
**Water Body Type:** Lower Duwamish Waterway  
**Tube Length (ft):** 16.1

**Project #:** PORSS-19220-511  
**Water Elevation (ft)/Tide:** 6.7  
**Penetration Depth (ft):** 11.0

**Client:** LDWG  
**Water Depth (ft):** 34.8  
**Sample Quality:** Good

**Collection Date:** 2/10/06  
**Mudline Elevation (ft):** -27.1  
**Recovery in ft (%):** 8.7 (79)

**Contractor:** MCS Environmental, Inc.  
**N/LAT:** 209650  
**E/LONG:** 1266850  
**Process Date:** 2/10/06

**Vessel:** MCS barge  
**Horiz. Datum:** NAD 83 N  
**Vert. Datum:** MLLW  
**Process Method:** Cut tube

**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4" sq Al  
**Logged By:** A. Fitzpatrick

### Sediment Description

**Classification Scheme: USCS**  
**Contacts are recovered depth**  
**(in situ depth interval in feet with parentheses)**

- **ML:** (0.0-0.5) wet, very soft, black (GLEY 1, 2.5/N) ORGANIC SILT, trace clay, scattered wood fragments, trace worms and rootlets.
  - Transitional Contact
  - @ 0.5 TV = 0.2 kg/cm²
  - GT @ 0.9'

- **OL:** (0.5-1.8) very wet, very soft, very dark greenish gray (GLEY 1, 3/10Y) SANDY ORGANIC SILT. Scattered 1/2" rounded gravel.
  - Sharp Contact
  - GT @ 2.6'
  - @ 3.2' TV = 0.3 kg/cm²
  - @ 3.6' TV = 0.7 kg/cm²

- **SP:** (1.8-3.5) moist, loose to medium dense, dark greenish gray (GLEY 1, 4/5GY) very fine to fine SAND. Sand grains are uniform, multicolored (orange, red, white), and grade to coarse with depth.

- **SP-SM:** (3.5-7.1) moist, dense, dark greenish gray (GLEY 1, 4/5GY) medium SAND, trace gravel, and trace scattered greenish-gray (GLEY 1, 5/5GY) silt pockets at top 1/2" of unit and increasing in size and abundance (up to 4" L) toward basal contact. Gravel is scattered, well rounded, and 1 to 4" in diameter.

  - Bag @ 4.0 to 6.0" (silt clasts)

  - @ 5.3' TV = 0.4 kg/cm²

- **@ 4.0'** Gravel ends and silt pockets increase to substantial. Silt pockets are subrounded, hard, and up to 4" in diameter.

**Remarks:** Drive Notes: freefall (0.6'), moderate (9.4'), hard (10.7'), refusal (11'). One drive attempt made at station. Core shoe was 50% full of sand.

**Calculated Recovery**

Sample Length/Penetration Length: 8.7 / 11.0 = 79%

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
### Sediment Core Log

**Project:** LDW Rf/S  
**Water Body Type:** Lower Duwamish Waterway  
**Project #:** PORS5-18220-511  
**Water Elevation (ft)/Tide:** 6.7  
**Client:** LDWG  
**Water Depth (ft):** 34.8  
**Collection Date:** 2/10/06  
** Mudline Elevation (ft):** -27.1  
**Contractor:** MCS Environmental, Inc.  
**N/LAT:** 206605  
**E/LONG:** 1266856  
**Process Date:** 2/10/06  
**Vessel:** MCS barge  
**Horiz. Datum:** NAD 83  
**Method/Tube ID:** Diver Impact Core/4" sq Al  
**Vert. Datum:** MLLW  
**Logged By:** A. Fitzpatrick

### Sediment Description

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Recovery Interval &amp; Sample</th>
<th>% Recovery</th>
<th>Interval</th>
<th>PID</th>
<th>Chemical Analysis</th>
<th>Measurement</th>
<th>In-situ Depth Interval in feet with parentheses</th>
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</thead>
<tbody>
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<td>6.0</td>
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<tr>
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<tr>
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<tr>
<td>9.0</td>
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<tr>
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<tr>
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<td></td>
</tr>
<tr>
<td>11.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sediment:** SM (7.1-11.0) moist, dense, dark greenish gray (GLEY 1, 4/G4Y) medium SAND interbedded with fine SAND, trace silt (fluvial-looking).

**Transitional Contact**

- @ 7.1' TV = 0.5 kg/cm²

**End of core at 8.7':** Driven to refusal.

- @ 8.7 to 8.9' Core is withdrawn and was not sampled. Shoe is 50% of same material as above.

### Remarks

- Drive Notes: freefall (0.6'), moderate (9.4'), hard (10.7'), refusal (11'). One drive attempt made at station.
- Core shoe was 50% full of sand.

### Calculated Recovery

- Sample Length/Penetration Length:
  - 8.7 / 11.0 = 79%

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial investigation.*
**Sediment Core Log**

**Project:** LDW R/FS  
**Water Body Type:** Lower Duwamish Waterway  
**Penetration Depth (ft):** 16.1

**Project #:** PORS5-18220-511  
**Water Elevation (ft/Tide):** 7.3  
**Tube Length (ft):** 14.6

**Client:** LDWG  
**Penetration Depth (ft):** 46.5  
**Sample Quality:** Good

**Collection Date:** 2/10/06  
**Mudline Elevation (ft):** -39.1  
**Recovery in %:** 10.0 (68)

**Contractor:** MCS Environmental, Inc.  
**N/LAT:** 209589  
**Process Date:** 2/10/06  
**E./LONG:** 1266614  
**Process Method:** Cut tube

**Vessel:** MCS barge  
**Horiz. Datum:** NAD 83 N Vert. Datum: MLLW  
**Logged By:** A. Fitzpatrick

---

**Sediment Description**

<table>
<thead>
<tr>
<th>Sediment Type</th>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>ML: (0-0.4)</td>
<td>very wet, soft, olive gray (5Y, 4/2) SILT.</td>
<td>Transitional Contact</td>
</tr>
<tr>
<td>OL: (0.4-1.1)</td>
<td>wet, mottled black (2.5Y, 2.5/1) ORGANIC SILT, moderate wood fragments up to 4&quot; L, and scattered shell fragments.</td>
<td>GT @ 0.9'</td>
</tr>
<tr>
<td>OL: (1.1-4.0)</td>
<td>wet, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT, little clay interbedded with fine-medium black SAND. Silt texture is uniform, slightly compressible and of medium plasticity. Scattered rootlets and moderate to strong H2S-like odor.</td>
<td>Bag @ 1.2' (orange agglomerate) @ 1.5'TV = 0.6 kg/cm²</td>
</tr>
<tr>
<td>OL: (4.8-11.8)</td>
<td>Grades to moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT, little clay interbedded with fine-medium black SAND. Silt texture is stiffer than above due to decreased water content. @ 4.8 to 5.0' 2&quot; layer of wet, black (2.5Y, 4/2) SAND</td>
<td>2.5'TV = 0.34 kg/cm²</td>
</tr>
<tr>
<td>OL: (5.6-7.2)</td>
<td>2&quot; layer of black SAND, moderate wood fragments, trace sheen florets, faint HC-like odor</td>
<td>GT @ 3'</td>
</tr>
<tr>
<td>OL: (6.4')</td>
<td>end of sand interbeds</td>
<td>Gradational Contact: less water</td>
</tr>
<tr>
<td>OL: (7.0-8.0)</td>
<td>possible HC-like odor</td>
<td>Bag @ 4.8' (black chunk) @ 5'TV = 0.56 kg/cm²</td>
</tr>
</tbody>
</table>

**In-situ Depth (ft) & Graphic Log**

---

**Remarks:** Drive Notes: freefall (9.8'), easy-moderate (4.8').
**easy (9.6'), moderate (14.6'), penetration goal reached. One drive attempt made at station. Core catcher was intact but inverted.

**Calculated Recovery**

Sample Length/Penetration Length:

10.0'/14.6' = 68 %

---

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-8 (R1)

Project: LDW RI/FS
Project #: PORS5-18220-511
Client: LDWG
Collection Date: 2/10/06
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell
Log: 209589 N/LAT, 1266614 E/LONG
Process Date: 2/10/06
Process Method: Cut tube

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft)/Tide: 7.3
Water Depth (ft): 46.5
Mudline Elevation (ft): -39.1
Sample Quality: Good
Penetration Depth (ft): 14.6
Recovery in ft (%): 10.0 (68)

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(in situ depth interval in feet with parentheses)

ML: (11.8-14.6) wet, stiff, black (2.5Y, 2.5/1) SILT.
Start of core at 10.0'.

Remarks: Drive Notes: freefall (0.8'), easy-moderate (4.8'),
easy (9.6'), moderate (14.8'), penetration goal reached. One drive
attempt made at station. Core catcher was intact but inverted.

Calculated Recovery
Sample Length/Penetration Length:

10.0' / 14.6 = 68 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**Sheet 1 of 2**

- **Project:** LDW RIFS
- **Water Body Type:** Lower Duwamish Waterway
- **Tube Length (ft):** 16.1
- **Penetration Depth (ft):** 12.9
- **Sample Quality:** Good
- **Recovery in ft (%):** 8.5 (66)
- **Client:** LDWG
- **Water Depth (ft):** 30.0
- **Collection Date:** 2/13/06
- **Mudline Elevation (ft):** -31.6
- **Contractor:** MCS Environmental, Inc.
- **N.LAT:** 208919
- **E.LONG:** 1258863
- **Process Date:** 2/13/06
- **Vessel:** MCS barge
- **Horiz. Datum:** NAD 83
- **Vert. Datum:** MLLW
- **Operator:** Gary Maxwell
- **Method/Tube ID:** Diver Impact Core/4" sq Al
- **Logged By:** N. Bacher, A. Fitzpatrick

### Sediment Description

**Classification Scheme:** USCS

**Contacts are recovered depth**

*(In-situ depth interval in feet with parentheses)*

<table>
<thead>
<tr>
<th>Layer</th>
<th>Recovery &amp; Sample</th>
<th>% Recovery</th>
<th>Chemical Analysis</th>
<th>PID Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>78% (0-2)</td>
<td>0</td>
<td>SM: (0.0-0.5&quot;) wet, loose, greenish black (GLEY 1, 2.5/10GY) fine to medium SAND, few silt grading to black SANDY SILT. Scattered wood fragments and rootlets, moderate H2S-like odor.</td>
</tr>
<tr>
<td>1-2</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>100% (2-4)</td>
<td>0</td>
<td>OL: (0.5-1.3&quot;) wet, medium stiff, black (GLEY 1, 2.5/N) ORGANIC SILT. Scattered wood fragments and strong H2S-like odor.</td>
</tr>
<tr>
<td>2-3</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>70% (4-6)</td>
<td>0</td>
<td>OL: (1.3-2.6&quot;) wet, medium stiff, black (GLEY 1, 2.5/N) ORGANIC SILT. Silt texture is uniform, compressible, and of low plasticity. Moderate scattered rootlets and trace HC-like odor from 1.5' to 2.6'.</td>
</tr>
<tr>
<td>3-4</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>30% (6-8)</td>
<td>0</td>
<td>SM: (2.6-7.7&quot;) damp, loose to medium dense, very dark brown (10YR, 2/2) fine to medium SAND, little silt interbedded with SAND and substantial (40-60%) WOOD layers. Uniform, alternating layers of sand and wood about 2&quot; thick. Scattered wet, soft, fresh wood fragments up to 1&quot;L and rootlets.</td>
</tr>
</tbody>
</table>

### Comments for Recovered Depths

- @ 0.4' TV = 0.6 kg/cm²
- GT @ 0.9’ Transitional Contact
- @ 1.4' TV = 0.4 kg/cm²
- GT @ 2.5’
- @ 3.8 TV = 0.4 kg/cm²
- @ 4.6 TV = 0.5 kg/cm²

### Sharp Contact
- @ 6.9' TV = 0.2 kg/cm²

### Remarks:
- Drive Notes: freefall (1.9”), easy (7.9”), moderate (12.9”), no refusal. One drive attempt made at station. Core was intact but shoe was empty. Water elevation and mudline values were adjusted based on bathymetry.
- **Calculated Recovery:** Sample Length/Penetration Length: 8.5 / 12.9 = 66 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134-1162
Phone: (206) 624-9349
Fax: (206) 624-2699

Remarks: Drive Notes: freefall (1.9'), easy (7.9'), moderate (12.9').
no refusal. One drive attempt made at station. Core was intact but
shoe was empty. Water elevation and mudline values were
adjusted based on bathymetry.

Calculated Recovery
Sample Length/Penetration Length:
8.5 / 12.9 = 66 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
## Sediment Core Log

**LDW-SC-10 (R1)**

**Project:** LDW RIFS  
**Project #:** PORS5-19220-511  
**Client:** LDWG  
**Collection Date:** 2/10/06  
**Water Body Type:** Lower Duwamish Waterway  
**Water Elevation (ft/NGVD):** 6.8  
**Water Depth (ft):** 24.6  
**Mudline Elevation (ft):** -17.3  
**Penetration Depth (ft):** 10.6  
**Sample Quality:** Good  
**Contractor:** MCS Environmental, Inc.  
**N/LAT:** 208776  
**E/LONG:** 1267167  
**Process Date:** 2/10/06  
**Vessel:** MCS barge  
**Horiz. Datum:** NAD 83 N  
**Vert. Datum:** MLLW  
**Process Method:** Cut tube  
**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4" sq Al  
**Logged By:** A. Fitzpatrick

### Sediment Description

**Classification Scheme:** USCS  
**Contacts are recovered depth (In-situ depth interval in feet with parentheses)**

<table>
<thead>
<tr>
<th>Recov. Interval</th>
<th>% Recov.</th>
<th>Chemical Analysis</th>
<th>NOT</th>
<th>Sediment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>82%</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>0</td>
<td>MH: (0.0-0.05) very wet, very soft, brown SILT.</td>
</tr>
<tr>
<td>1</td>
<td>100%</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>0</td>
<td>GP: (0.0-0.7) wet, loose, greenish gray (GLEY 1, 4/5GY) GRAVEL, few sand and silt. Gravel is 1/2&quot;, subrounded, pea gravel-like; sand grains are white and black. Moderate scattered wood and very small shell fragments.</td>
</tr>
<tr>
<td>2</td>
<td>100%</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>0</td>
<td>OL: (0.7-4.1) wet, medium stiff, black (GLEY 1, 2.5/N) ORGANIC SILT, little sand and clay. Scattered rootlets, moderate H2S-like odor, trace shell fragments and hairpins. Silt texture uniform, slightly compressible, of high plasticity, and with less water with depth.</td>
</tr>
<tr>
<td>3</td>
<td>100%</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>0</td>
<td>OH: (4.1-5) wet, stiff, greenish gray (GLEY 1, 5/5Y) CLAY, little silt. Clay texture is uniform, massive, and of high plasticity.</td>
</tr>
<tr>
<td>4</td>
<td>100%</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>0</td>
<td>OL: (5-6) moist to wet, stiff, very dark greenish gray (GLEY 1, 3/10Y) SILT, few clay interbedded with fine SAND layers ~1.5&quot; thick. Moderate wood fragments, plant material, and scattered peat pockets about 1&quot; diameter decreasing with depth.</td>
</tr>
<tr>
<td>5</td>
<td>100%</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>0</td>
<td>SP: SM: (6-10.6) moist, dense, very dark greenish gray (GLEY 1, 3/10Y) medium SAND interbedded with 1/8&quot; thick gray SILT seams (fluvial-looking). Sand consists with depth. Scattered wood fragments.</td>
</tr>
</tbody>
</table>

### Comments for Recovered Depths & In-situ Depth (ft)

- **GT @ 0.9**:  
  - 1.2' TV = 0.5 kg/cm2  
  - 2.3' TV = 0.4 kg/cm2  
  - GT @ 2.9'  

- **Sharp Contact**
  - 4.5' TV = 0.4 kg/cm2
  - 5.4' TV = 0.5 kg/cm2
  - 6.3' TV = 0.8 kg/cm2

### Notes

- Stratigraphic interpretations are preliminary and subject to change during the Remedial investigation.

### Remarks

- **Drive Notes:** freefall (0.6'), easy (7.8'), moderate (9.8'), hard (10.5'), refusal (10.6'). One drive attempt made at station.
- **Core catcher was 50% full with partial winnowing. Core tube was intact.**

### Calculated Recovery

| Sample Length/Penetration Length: |  
|-----------------------------------|---
| 8.3 / 10.6 = 83 %                |  

---

The RETEC Group, Inc.  
211 SW Kickitat Way, Suite 207  
Seattle, WA 98113-1162  
Phone: (206) 621-9349  
Fax: (206) 621-2899  

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Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial investigation.
# Sediment Core Log

**Project:** LDW RI/FS  
**Water Body Type:** Lower Duwamish Waterway  
**Tube Length (ft):** 16.1

**Project #:** PORS5-18220-511  
**Water Elevation (ft/Tide):** 6.8  
**Penetration Depth (ft):** 10.6

**Client:** LDWG  
**Water Depth (ft):** 24.6  
**Sample Quality:** Good

**Collection Date:** 2/10/06  
**Mudline Elevation (ft):** -17.3  
**Recovery in ft (%):** 8.9 (83)

**Contractor:** MCS Environmental, Inc.  
**N/LAT:** 20877.6  
**E/LONG:** 1267167  
**Process Date:** 2/10/05

**Vessel:** MCS barge  
**Horiz. Datum:** NAD 83 N Vert. Datum: MLLW  
**Process Method:** Cut tube

**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4" sq Al  
**Logged By:** A. Fitzpatrick

## Sediment Description

- Classification Scheme: USCS
- Contacts are recovered depth (In-situ depth interval in feet with parentheses)

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>Recovery Interval</th>
<th>Sample</th>
<th>Chemical Analysis</th>
<th>P.I.</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments for Recovered Depths**

- 7.7 to 8.5' some slumping
- Core is winnowed from 8.0' to 8.6' and was not sampled.

**In-situ Depth (ft)**

- 8.0
- 7.7
- 7.0
- 6.0
- 5.0
- 4.0
- 3.0
- 2.8
- 2.5
- 2.0
- 1.0
- 0.5
- 0.2
- 0.0

**End of core @ 8.5'. Driven to refusal.**

**Remarks:**  
- Drive Notes: freefall (0.6'), easy (7.8'), moderate (8.8'), hard (10.5'), refusal (10.8'). One drive attempt made at station.  
- Core catcher was 50% full with partial winnowing. Core tube was intact.

**Calculated Recovery**

- Sample Length/penetration Length:  
  - 8.8 / 10.5 = 83%

---

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-11 (R1)

Project: LDW RI/FS
Water Body Type: Lower Duwamish Waterway
Tube Length (ft): 16.1
Penetration Depth (ft): 5.9

Project #: PORS5-18220-511
Water Elevation (ft/Tide): 5.3
Sample Quality: Good

Client: LDWG
Penetration Depth (ft): 5.9

Collection Date: 2/13/06
Mudline Elevation (ft): -5.1
Recovery in ft (%): 5.0 (85)

Contractor: MCS Environmental, Inc.
Process Date: 2/13/06

Vessel: MCS barge
Process Method: Cut tube

Operator: Gary Maxwell
Logged By: N. Bacher, A. Fitzpatrick

Method/Tube ID: Diver Impact Core/4" sq Al

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Recovery Interval &amp; Sample</th>
<th>% Recovery (Interval)</th>
<th>Chemical Analysis</th>
<th>Sediment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0-0.2</td>
<td>PCB SVOC Metals Hg</td>
<td>0</td>
<td></td>
<td>ML: (0.0-0.2) wet, soft, black (2.5 YR, 2.5/N) SILT, little sand. Texture is non-homogenous (jumbled) with substantial wood fragments and debris. Debris includes red chips (possibly paint), plastic, leather, glass shards, and wood chips with strong HS-like odor.</td>
</tr>
<tr>
<td>0.2-0.3</td>
<td>PCB SVOC Metals Hg</td>
<td>0</td>
<td></td>
<td>SM: (0.9-1.1) moist to wet, medium dense, very dark gray (10YR, 3/1) SILTY FINE SAND. Silt decreases with depth. Texture is homogenous.</td>
</tr>
<tr>
<td>0.3-0.5</td>
<td>PCB SVOC Metals Hg</td>
<td>0</td>
<td></td>
<td>GP: (4.1-4.5) wet, loose, dark gray (10YR, 4/1) GRAVEL, little silt and sand. Gravel is 2&quot; in diameter and surrounded and percentage decreases with depth. Moderate small shell fragments.</td>
</tr>
<tr>
<td>0.5-1.0</td>
<td>PCB SVOC Metals Hg</td>
<td>100%</td>
<td></td>
<td>CL: (4.9-5.0) damp, very hard, olive yellow (5Y, 6/4), mottled CLAY (possible glacial sequence), little silt. Massive, no layering, low plasticity.</td>
</tr>
<tr>
<td>1.0-1.5</td>
<td>PCB SVOC Metals Hg</td>
<td>67%</td>
<td></td>
<td>End of core at 5.0'. Driven to refusal.</td>
</tr>
<tr>
<td>1.5-2.0</td>
<td>PCB SVOC Metals Hg</td>
<td>79%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.0-2.2</td>
<td>PCB SVOC Metals Hg</td>
<td>85%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2-3.4</td>
<td>PCB SVOC Metals Hg</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4-4.0</td>
<td>PCB SVOC Metals Hg</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.0-5.0</td>
<td>PCB SVOC Metals Hg</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.0-5.6</td>
<td>PCB SVOC Metals Hg</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Core catcher found at 0.8'
Bag @ 0.7 (red chips, debris)
GT @ 0.9'
@ 1.2' TV = 0.8 kg/cm2

Remarks: Drive Notes: moderate (4.6), moderate to hard (5.6')

Core catcher was intact and 100% full. Difficult extraction.

Calculated Recovery
Sample Length/Penetration Length:
5.0 / 5.9 = 85 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**LDW-SC-12 (R1)**

<table>
<thead>
<tr>
<th>Project: LDW R/I/S</th>
<th>Water Body Type: Lower Duwamish Waterway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project #: PORS5-18220-511</td>
<td>Water Elevation (ft)/Tide: 2.8</td>
</tr>
<tr>
<td>Client: LDWG</td>
<td>Water Depth (ft): 13.7</td>
</tr>
<tr>
<td>Collection Date: 2/16/06</td>
<td>Mudline Elevation (ft): -7.5</td>
</tr>
<tr>
<td>Contractor: MCS Environmental, Inc.</td>
<td>N/LAT: 208217 E/LONG: 1266577</td>
</tr>
<tr>
<td>Operator: Gary Maxwell</td>
<td>Method/Tube ID: Diver Impact Core/4” sq Al</td>
</tr>
<tr>
<td>Logged By: L.McKee</td>
<td>Process Date: 2/16/06</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recov Interval (ft)</th>
<th>% Recovery (interval)</th>
<th>Chemical Analysis</th>
<th>PID Measurement</th>
<th>Sediment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>PCB SVOC Metals Hg TBT</td>
<td>0</td>
<td>ML: (0.0–0.1) wet, very soft, olive brown (2.5Y, 4/3) SILT.</td>
</tr>
<tr>
<td>1</td>
<td>100% (0-4)</td>
<td>PCB SVOC Metals Hg TBT</td>
<td>0</td>
<td>OL: (0.1-2.6) wet, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT, few sand. Silt texture is uniform, slightly compressible, massive, blocky, and of low plasticity. Abundant rosettes and wood fragments, scattered shell fragments up to 1/2” and plant matter. Moderate H2S-like odor.</td>
</tr>
<tr>
<td>2</td>
<td>89% (4-5)</td>
<td>PCB Hg</td>
<td>0</td>
<td>⊗ 1.0' wood fragments up to 0.5’L</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>⊗ 2.0’ strong H2S-like odor</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>OL: (2.5-6.0) moist, stiff, gray (2.5Y, 5/1) CLAYEY ORGANIC SILT interbedded with moist, medium stiff, black (2.5, 2.5/1) SILT, few sand. Scattered wood fragments and strong H2S-like odor. Grades to stiff with depth.</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td>5.0’ wood fragments up to 3” L</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>99% (5-7)</td>
<td></td>
<td></td>
<td>ML: (6.0-6.9) moist, medium stiff, dark greenish gray (GLEY 1, 4/10Y) SILT interbedded with up to 3” thick layers of sandy SILT, wood fragments up to 2” L, and mild H2S-like odor.</td>
</tr>
</tbody>
</table>

**Comments for Recovered Depths**

- Transitional Contact
  - GT @ 0.9’
  - @ 1.3 TV = 0.5 kg/cm²
- Transitional Contact
  - GT @ 2.9’
  - @ 3.4 TV = 0.2 kg/cm²
- Transitional Contact
  - @ 5.4’ TV = 0.6 kg/cm²

**In-situ Depth (ft)** & **Graphic Log**

**Remarks:** Drive Notes: easy (6.9'), moderate (7.6'), hard (9.6'), refusal (9.6'). One drive attempt made at station. Core catcher was intact and 83% full.

**Calculated Recovery**

Sample Length/Penetration Length:

8.7 / 9.8 = 91%
**Sediment Core Log**

**LDW-SC-12 (R1)**

<table>
<thead>
<tr>
<th>Project: LDW R1/FS</th>
<th>Water Body Type: <strong>Lower Duwamish Waterway</strong></th>
<th>Tube Length (ft): <strong>16.1</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Project #: PORS5-18220-511</td>
<td>Water Elevation (ft)/Tide: <strong>2.8</strong></td>
<td>Penetration Depth (ft): <strong>9.6</strong></td>
</tr>
<tr>
<td>Client: LDWG</td>
<td>Water Depth (ft): <strong>13.7</strong></td>
<td>Sample Quality: <strong>Good</strong></td>
</tr>
<tr>
<td>Collection Date: <strong>2/16/06</strong></td>
<td>Mudline Elevation (ft): <strong>-7.5</strong></td>
<td>Recovery in ft (%): <strong>8.7 (91)</strong></td>
</tr>
<tr>
<td>Contractor: <strong>MCS Environmental, Inc.</strong></td>
<td>N./LAT: <strong>208217</strong></td>
<td>Process Date: <strong>2/16/06</strong></td>
</tr>
<tr>
<td>Vessel: <strong>MCS barge</strong></td>
<td>E./LONG: <strong>1266577</strong></td>
<td>Process Method: <strong>Cut tube</strong></td>
</tr>
<tr>
<td>Horiz. Datum: <strong>NAD 83</strong></td>
<td>Vert. Datum: <strong>MLLW</strong></td>
<td>Logged By: <strong>L. McKee</strong></td>
</tr>
</tbody>
</table>

**Operator: Gary Maxwell**

**Method/Tube ID: Diver Impact Core/4" sq Al**

**Sediment Description**

**Classification Scheme: USCS**

Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Recovery Interval</th>
<th>% Recovery (Interval)</th>
<th>Chemical Analysis</th>
<th>PID Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>3.5-PCB-SC2-SC0</td>
<td>83%</td>
<td>Hg</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>4.5-PCB-SC2-SC0</td>
<td>70%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>5.0-PCB-SC2-SC0</td>
<td>80%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments for Recovered Depths**

END of core at 8.7'. Driven to refusal.

SP-SC: (6.9-9.6) moist, medium stiff, very dark greenish gray (GLEY 1, 3/1) SAND with clasts and layers of olive gray Silt up to 1/2" L. Sand grains are multicolored; silt is moist, slightly compressible, and rolls easily. Pockets of subrounded 1/2" peat at 8.0' to basal contact.

Sharp Contact

@ 8.2' TV = 0.8 kg/cm2

Note: Chemistry interval recorded as 6.7-8.7 ft but was collected at top of sand at 6.6 ft. Graphic Expresses depth of sand sample collection; sample name matches project nomenclature.

**In-situ Depth (ft) & Graphic Log**

**Remarks:** Drive Notes: easy (6.9'), moderate (7.6'), hard (9.6'), refusal (9.6'). One drive attempt made at station. Core catcher was intact and 83% full.

**Calculated Recovery**

Sample Length/Penetration Length: 8.7 / 9.6 = 91%

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**LDW-SC-13 (R1)**

**Project:** LDW RI/FS  
**Water Body Type:** Lower Duwamish Waterway  
**Project #:** PCRSS-18220-511  
**Water Elevation (ft/Tide):** 4.8  
**Client:** LDWG  
**Water Depth (ft):** 16.5  
**Collection Date:** 2/13/06  
**Mucline Elevation (ft):** -10.7  
**Contractor:** MCS Environmental, Inc.  
**N.LAT:** 207096  
**E.LONG:** 1267385  
**Vessel:** MCS barge  
**Horiz. Datum:** NAD 83  
**Vert. Datum:** MLLW  
**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4" sq Al  
**Logged By:** N. Bacher, A. Fitzpatrick

### Sediment Description

**Classification Scheme:** USCS  
**Contacts are recovered depth**  
**(In-situ depth interval in feet with parentheses)**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>% Recovery (interval)</th>
<th>Chemical Analysis</th>
<th>PID</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>115% (0-1)</td>
<td>PCB SVOC Metals Hg</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>94% (1-3)</td>
<td>PCB SVOC Metals Hg</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>71% (3-5)</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>67% (5-7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SW:** (0.0-0.2) wet, loose, greenish black (GLEY 1, 2.5/10GY) medium to coarse SAND, trace silt and gravel. Scattered shell fragments.

**SM:** (0.2-1.3) moist, medium dense, very dark greenish gray (GLEY 1, 3/1) SAND, little silt, and moderate wood, twigs, and rootlets. Moderate to strong H2S-like odor.

**OL:** (1.3-3.1) moist, medium stiff, very dark greenish grey (GLEY 1, 3/1) ORGANIC SILT, few sand and moderate wood, twigs, and rootlets. Trace H2S-like odor and very slight HC-like odor from 2.5’ to 3.0’.

**SP-SM:** (5.9-12.5) moist, medium dense, very dark grayish brown (10YR, 3/2) fine to medium SAND interbedded with 1” to 2” thick, moist, medium stiff, very dark greenish gray SILT, few sand. Sand grains are multicolored (orange, red, white). Trace scattered rootlets.  
@ 5.8’ to 6.0’ layer of shredded wood with fibrous, peaty material, and slight H2S-like odor.

**GT @ 9/’**  
@ 1.0 TV = 0.3 kg/cm2

**@ 2.4’ TV = 0.4 kg/cm2**

**@ 4.9’ TV = 0.4 kg/cm2**

**1-transitional Contact**

**SP- SM:** (5.9-12.5) moist, medium dense, very dark grayish brown (10YR, 3/2) fine to medium SAND interbedded with 1” to 2” thick, moist, medium stiff, very dark greenish gray SILT, few sand. Sand grains are multicolored (orange, red, white). Trace scattered rootlets.  
@ 5.8’ to 6.0’ layer of shredded wood with fibrous, peaty material, and slight H2S-like odor

### Comments for Recovered Depths

- Sharp Contact
- In-situ Depth (ft)

### In-situ Depth Log

**Remarks:** Drive Notes: easy (5.2’), moderate (10.4’), hard (12.5’), penetration goal reached. One drive attempt made at station.  
Core catcher was intact.

**Calculated Recovery:**

Sample Length/Penetration Length: 9.9 / 12.5 = 79 %

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-13 (R1)

Project: LDW R1/FS  Water Body Type: Lower Duwamish Waterway  Tube Length (ft): 16.1
Project #: PORSS6-18220-511  Water Elevation (ft/Tide): 4.8  Penetration Depth (ft): 12.5
Client: LDWG  Water Depth (ft): 16.5  Sample Quality: Good
Collection Date: 2/13/06  Mudline Elevation (ft): -10.7  Recovery in ft (%): 9.9 (75)
Contractor: MCS Environmental, Inc.  N/LAT: 207095  E/LONG: 1287/685  Process Date: 2/13/06
Operator: Gary Maxwell  Method/Tube ID: Diver Impact Core/4" sq Al  Logged By: N. Bacher, A. Fitzpatrick

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>Recovery Interval</th>
<th>% Recovery</th>
<th>Chemical Analysis</th>
<th>PID</th>
<th>Measurement</th>
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<tr>
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<td>0</td>
<td>75%</td>
<td>(7-9)</td>
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<tr>
<td>8</td>
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<tr>
<td>9</td>
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<td>(10-11)</td>
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<tr>
<td>10</td>
<td>70%</td>
<td>(11-12.5)</td>
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Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

Comments for Recovered Depths
In-situ Depth (ft) & Graphic Log

Remarks: Drive Notes: easy (5.2'), moderate (10.4'), hard (12.6'), penetration goal reached. One drive attempt made at station.
Core catcher was intact.

Calculated Recovery
Sample Length/Penetration Length:
9.9 / 12.5 = 79%

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
### Sediment Core Log

**LDW-SC-14 (R1)**

**Project:** LDWI/FS  
**Water Body Type:** Lower Duwamish Waterway  
**Tube Length (ft):** 16.1

**Project #:** POR5S-18220-511  
**Water Elevation (ft/Tide):** 6.7  
**Penetration Depth (ft):** 12.6

**Client:** LDWG  
**Water Depth:** 46.9  
**Sample Quality:** Good

**Collection Date:** 2/13/06  
**Mudline Elevation (ft):** 36.6  
**Recovery in %:** 11.6 (92)

**Contractor:** MCS Environmental, Inc.  
**N/LAT:** 207055  
**E/LONG:** 1267397  
**Process Date:** 2/13/06

**Vessel:** MCS barge  
**Horiz. Datum:** NAD 83 N Vert. Datum: ML/LW  
**Process Method:** Cut tube

**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4” sq Al  
**Logged By:** N. Bacher

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>Recov. Interval</th>
<th>% Recovery</th>
<th>Chemical Analysis</th>
<th>PID</th>
<th>Sediment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0-0.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SM: (0.0-0.3) wet, loose, dark greenish gray (GLEY 1, 4/10Y) SAND, few silt. Scattered shell fragments and intact shells.</td>
</tr>
<tr>
<td>1.4-2.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>OL: (0.3-3.7) wet, medium soft, black (GLEY 1, 2.5/6) ORGANIC SILT. Grades to more competent with a blocky texture with depth. Trace organics, twigs, rootlets, wood fragments, 1/16&quot; silt/florets, and very trace HC-like odor.</td>
</tr>
<tr>
<td>2.2-4.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 0.5' thick lens of moist, medium dense, brown fine SAND</td>
</tr>
<tr>
<td>3.2-4.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 1.4' color changes to mottled, grayish black, trace sheen noted below this depth</td>
</tr>
<tr>
<td>4.0-7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ML: (3.7-4.1) moist, soft, dark gray (2.5Y, 4/1) SILT, little clay. Trace horizontal black motting.</td>
</tr>
<tr>
<td>4.8-5.7</td>
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<td></td>
<td></td>
<td></td>
<td>ML: (4.1-8.7) moist, medium stiff, black (GLEY 1, 2.5/6) SILT with scattered 1/2&quot; brown sand pockets and discontinuous motled gray silt lenses to 8.0'. Silt has blocky texture. Scattered organics, twigs, rootlets, and wood fibers. Trace 1/16&quot; silt/florets and very trace HC-like odor to 8.0'.</td>
</tr>
</tbody>
</table>

**Remarks:** Drive Notes: freefall (1.8'), easy (9.0'), moderate (12.7'), penetration goal reached. One drive attempt made at station. Core catcher was intact.

**Calculuated Recovery**  
Sample Length/Penetration Length: 14.6'/12.6' = 116.12.6'  
92 %

---

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
# Sediment Core Log

**Project:** LDW RIFS  
**Project #:** PORS5-18220-511  
**Client:** LDWG  
**Collection Date:** 2/13/06  
**Contractor:** MCS Environmental, Inc.  
**Operator:** Gary Maxwell  
**Water Body Type:** Lower Duwamish Waterway  
**Water Elevation (ft/Tide):** 6.7  
**Water Depth (ft):** 46.0  
**Mudline Elevation (ft):** -35.8  
**N/LAT:** 47° 20' 55"  
**E/LONG:** 122° 37' 39.7  
**Horiz. Datum:** NAD 83 N  
**Vert. Datum:** MLLW  
**Process Date:** 2/13/06  
**Process Method:** Cut Tube  
**Logged By:** N. Bacher  

## Sediment Description

Classification Scheme: USCS  
Contacts are recovered depth  
(In situ depth interval in feet with parentheses)

<table>
<thead>
<tr>
<th>Recovery Interval</th>
<th>% Recovery</th>
<th>Chemical Analysis</th>
<th>PID</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0' (7-9)</td>
<td>62%</td>
<td>PCB Hg</td>
<td>0</td>
<td></td>
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<tr>
<td>7.7' (9-1)</td>
<td>74%</td>
<td>PCB Hg</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>11-12.6</td>
<td>57%</td>
<td>Hg</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

- **7.0'** 1.5" thick layer of grayish brown SILT, few sand  
- **7.7'** 1" thick layer of brown fine SAND  
- **SP- SM:** (8.7-9.5) moist, medium dense, very dark grayish brown (2.5Y, 3/2) fine SAND interbedded with grayish olive SILT, few clay. Color is mottled. Trace organics, roots, and wood fragments up to 4" L (transitional unit).
- **SP:** (9.5-12.6) moist, medium dense, very dark grayish brown (2.5Y, 3/2) fine SAND, trace silt. Sand grains are multicolored (orange, red, white) and grade to medium at 11.0'. Scattered organics, twigs, and rootlets.

---

**Remarks:** Drive Notes: freefall (1.6'), easy (9.0'), moderate (12.7').  
penetration goal reached. One drive attempt made at station.  
Core catcher was intact.

**Calculated Recovery**  
Sample Length/Penetration Length:  
11.6' / 12.6' = 92 %

---

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
### Sediment Core Log

**LDW-SC-15 (R1)**

**Project:** LDW RI/FS  
**Project #:** PORS5-18220-511  
**Client:** LDWG  
**Collection Date:** 2/16/06  
**Contractor:** MCS Environmental, Inc.  
**Vessel:** MCS Barge  
**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4" sq Al  
**Logged By:** L. McKee

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>Penetrometer &amp; Sample</th>
<th>% Recovery</th>
<th>Chemical Analysis</th>
<th>HQ</th>
<th>PQD</th>
<th>Measurement</th>
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</thead>
<tbody>
<tr>
<td>ML: 0-0.4</td>
<td>Wet, very soft, olive brown (2.5Y, 4/3) Silt, few sand.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>OL: 0.4-2.0</td>
<td>Moist to wet, (medium stiff), black (2.5Y, 2.5/1) ORGANIC SILT. Silt texture is uniform, slightly compressible, massive, and blocky. Scattered rootlets, wood fragments up to 0.4’ L, and worms and worm tubes in top 0.8’.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>@ 1.2’ to 2.0’</td>
<td>Trace HC-like florets up to 1/2’ L</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OL: 2.0-6.2</td>
<td>Moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT interbedded with 0.1’ thick pockets and 0.5’ thick layers of mottled, dark greenish gray (GLEY: 1, 4/10Y) SILT, little clay and scattered wood fragments. Interbedded silt texture is uniform, slightly compressible, and rolls easily. Scattered 1/2” L sheen florets from 2.0’ to 6.7’.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheen Test @ 4.0’</td>
<td>No sheen</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Sediment Description**

Classification Scheme: USCS  
Contacts are recovered depth (in-situ depth interval in feet with parentheses)

**Comments for Recovered Depths**

- GT @ 0.9’ Sheen Test @ 1.0’ no sheen
- @ 1.5’ TV = 0.3 kg/cm²
- Transitional Contact
- @ 2.5’ TV = 0.5 kg/cm²
- GT @ 2.5’
- Sheen Test @ 4.0’ no sheen
- @ 4.7’ TV = 0.1 kg/cm²

**Calculated Recovery**

Sample Length/Penetration Length:

10.1/12.7 = 80%

**Remarks:**

- Drive Notes: freefall (1.0’), moderate (7.0’), hard (12.7’).
- refusal (12.7’). One drive attempt made at station.
- Core catcher was intact but slightly winnowed.

---

__Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.__
# Sediment Core Log

**Project**: LDW RI/FS  
**Project #:** PORRS-18220-511  
**Client:** LDWG  
**Collection Date:** 2/15/06  
**Contractor:** MCS Environmental, Inc.  
**Vessel:** MCS barge  
**Operator:** Gary Maxwell  
**Tube Length (ft):** 16.1  
**Water Body Type:** Lower Duwamish Waterway  
**Water Elevation (ft)/Tide:** 6.6  
**Water Depth (ft):** 37.8  
**Mudline Elevation (ft):** -27.9  
**Depth (ft):** 37.8  
**Horiz. Datum:** NAD 83  
**Vert. Datum:** MLLW  
**Process Date:** 2/17/06  
**Sample Quality:** Good  
**Penetration Depth (ft):** 12.7  
**Recovery in ft (%):** 10.1 (80)  

## Sediment Description

**Classification Scheme:** USCS  
**Contacts are recovered depth**  
**In-situ depth interval in feet with parentheses**  

1. **SM:** (8.2-8.7) Alternating 1” thick layers of very fine SAND and SILT, little clay (transitional unit).

2. **SP:** (6.7-12.7) moist, medium dense, very dark greenish gray SAND with convex layers. SAND is multicolored (orange, red, white) and coarsens downward.

3. **@ 9.7’ 1/2”, silted, green-gray SILT pockets (siltstone)**

**End of core at 10.1’** Driven to refusal.

### Comments for Recovered Depths

**In-situ** Depth (ft)  
**& Graphic Log**

**Transitional Contact**  
@ 7.0’ TV = 0.8 kg/cm²

**Sharp Contact**  
@ 3.8’ TV = 0.8 kg/cm²

### Calculated Recovery

**Sample Length/penetration length:**

**10.1/12.7 = 80 %**

---

**Remarks:** Drive Notes: freefall (1.0’), moderate (7.0’), hard (12.7’), refusal (12.7’). One drive attempt made at station. Core catcher was intact but slightly winnowed.

---

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-16 (R1)

Project: LDW RI/FS
Water Body Type: Lower Duwamish Waterway
Tube Length (ft): 16.1

Project #: PORS5-18220-511
Water Elevation (ft)/Tide: 8.3
Penetration Depth (ft): 13.5

Client: LDWG
Water Depth (ft): 32.3
Sample Quality: Good

Collection Date: 2/13/06
Mudline Elevation (ft): -24.6
Recovery in ft (%): 10.8 (80)

Mudline Elevation (ft): -24.6
N/LAT: 206659
E/LONG: 1267959
Process Date: 2/14/06

Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Process Method: Cut tube

Operator: Gary Maxwell
Logged By: N. Bacher, L. McKee
Method/Tube ID: Diver Impact Core/4" sq Al

---

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth (in-situ depth interval in feet with parentheses)

---

Gradation: 4-6
ML: (3.2-7.4) moist, medium stiff, black (GLEY 1 2.5/N) SILT, few clay. Trace gravel from 3.3' to 3.4'. Grading to silt below 4.0'. Silt texture is blocky. Scattered wood fragments, twigs, and rootlets. Slightly mottled SILT, few clay and 1/4" to 1/2" silt inclusions from 5.0' to basal contact.
@ 4.0' to 7.4' trace HC-like odor and sheen

---

Gradation: 1-4
MH: (2.2-3.2) moist, soft, dark greenish gray (GLEY 2, 4/10G) SILT, little clay. Scattered horizontal, thin, black seams of SILT, little clay.

---

Gradation: 0-1
MH: (0.3-2.2) moist to wet, medium soft, black (GLEY 1, 2.5/N) SILT. Scattered twigs, rootlets, and worm tubes from 0.8' to 2.0'.
@ 0.5' 3/4" piece of thin, white plastic (garbage bag)
@ 1.3' to 2.0' trace 1/16" sheen florets

---

Gradation: 0
ML: (0.0-0.3) wet, very soft, olive gray, SILT, few sand and trace shell fragments.

---

Comments for Recovered Depths

---

In-situ Depth (ft)

---

Remarks: Drive Notes: freefall (3.8'), easy (8.1'), easy to moderate, (13.5'), penetration goal reached. One drive attempt made at station. Core catcher was intact and 100% full with a sily plug.

---

Calculated Recovery
Sample Length/Penetration Length: 10.8/13.5 = 80%

---

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
### Sediment Core Log

**LDW-SC-16 (R1)**

**Project:** LDW RI/FS  
**Water Body Type:** Lower Duwamish Waterway  
**Tube Length (ft):** 16.1

**Project #:** PORS5-1820-511  
**Water Elevation (ft)/Time:** 8.3  
**Penetration Depth (ft):** 13.5

**Client:** LDWG  
**Water Depth (ft):** 32.3  
**Sample Quality: Good**

**Collection Date:** 2/13/06  
**Mudline Elevation (ft):** -24.6  
**Recovery in ft (%):** 10.8 (80)

**Contractor:** MCS Environmental, Inc.  
**N.A./AT:** 206669  
**E/LONG:** 1267959  
**Process Date:** 2/14/06

**Vessel:** MCS barge  
**Horiz. Datum:** NAD 83 N  
**Vert. Datum:** MLLW  
**Process Method:** Cut tube

**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4 x sq Al  
**Logged By:** N. Becher, L. McKee

### Sediment Description

**Classification Scheme:** USCS  
**Contents are recovered depth**  
**In-situ depth interval in feet with parentheses**

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>Recovery Interval &amp; Sample</th>
<th>% Recovery (Interval)</th>
<th>Chemical Analysis</th>
<th>PID</th>
<th>Measurement</th>
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<tbody>
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<td>7</td>
<td>60% (6.8)</td>
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<td>55% (6.10)</td>
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<td>62% (10-12)</td>
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</table>

- **8.5' medium SAND with moderate wood fragments**
- **9.5' TV = 0.8 kg/cm²**
- **9.5' Unit grades to alternating 1/8" to 1/4" thick interbeds of very dark gray fine SAND and gray SILT.**
- **End of core at 10.8'.**

**Remarks:** Drive Notes: freefall (3.8'), easy (8.1'), easy to moderate, (13.5'), penetration goal reached. One drive attempt made at station. Core catcher was intact and 100% full with a silty plug.

**Calculated Recovery**  
Sample Length/Penetration Length: 10.8' / 13.5' = 80 %

---

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
**Sediment Core Log**

**Sheet 1 of 2**

<table>
<thead>
<tr>
<th>Project: LDW RI/FS</th>
<th>Water Body Type: Lower Duwamish Waterway</th>
<th>Tube Length (ft): 14.0</th>
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<tbody>
<tr>
<td>Project #: PORSS-18220-511</td>
<td>Water Elevation (ft)/Tide: NA</td>
<td>Penetration Depth (ft): 13.0</td>
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<tr>
<td>Client: LDWG</td>
<td>Water Depth (ft): 20.0</td>
<td>Sample Quality: Good</td>
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<tr>
<td>Collection Date: 2/23/06</td>
<td>Mudline Elevation (ft): -15.1</td>
<td>Recovery in ft (%): 8.6 (66)</td>
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<td>Contractor: MSS</td>
<td>N/LAT: 47 33.3751 E/LONG: 122 20.3911</td>
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<tr>
<td>Operator: Bill Jaworski</td>
<td>Method/Tube ID: Vibracore/3.5&quot; round Al</td>
<td>Logged By: L.McKee, C.Brackett</td>
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<th>Depth (ft)</th>
<th>Recov Interval &amp; Sample</th>
<th>% Recov (interval)</th>
<th>Chemical Analysis</th>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sediment Description**

Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

- **ML**: (0.0-0.9) wet, soft, olive brown (2.5Y, 4/3) SILT, little sand.
- **OL**: (0.9-12.3) damp to wet, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT, few sand and scattered layers of moist, medium stiff, dark grayish brown (2.5Y, 4/2) ORGANIC SILT, little clay. Silty texture is uniform, slightly compressible, massive, blocky, and of low plasticity. Trace pockets of peat and subrounded gravel with HC-like odor. Scattered shell fragments, rootlets, layers of wood and abundant debris with HC-like odor.
  - @ 1.4' to 1.8' A layer of shell fragments, rootlets, and wood fragments up to 1" L with a 2" piece of red, crumblly conglomerate, slight HC-like odor and rainbow sheen.
  - @ 2.4' A 0.2' thick layer of shell fragments, rootlets, and wood fragments up to 1" L, 1-1/4' x 1/8" anthropogenic conglomerate with strong HC-like odor and sheen, 7" piece of plastic (tape), and a piece of subrounded multicolored glass 1/2" L.
  - @ 3.2' to 4.5' A 2" piece of foliated red chip (possibly paint), 0.5' piece of plastic (tape), and wood fragment 0.5 x 0.2'. Slight to strong HC-like odor, rainbow streaks and flroets up to 1/4" in diameter.
  - @ 4.6' TV = 0.02 kg/cm²
  - GT @ 2.3'
  - Bag @ 2.6' (1/2") subrounded glass
  - Bag @ 3.2' foliated red chip

- **5.2' to 5.7'**: A 0.1' layer of wood, 2" pocket of peat, and 0.2' x 0.1' pieces of cloth with slight to moderate HC-like odor.

**Comments for Recovered Depths**

- Winnowing @ 0.2' (70%)
- Transitional Contact
- @ 0.9' TV = 0.02 kg/cm²
- GT @ 1.2'
- @ 1.6' TV = 0.1 kg/cm²
- GT @ 2.3'
- Bag @ 2.6' (1/2") subrounded glass
- Bag @ 3.2' foliated red chip

**In-situ Depth (ft)** & **Graphic Log**

**Remarks**: Drive Notes: freshfall (7.0'), moderate (10.0'), easy to moderate (14.0'), penetration goal reached. Five drive attempts made at station. Station re-occupied with vibracore. Rainbow sheen and strong HC-like odor on sidewalls from 2.0' to 6.0'. **ua** = upper alluvium

**Calculated Recovery**

Sample Length/Penetration Length: 8.6 / 13.0 = 66%

**Note**: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**LDW-SC-17 (R5)**

<table>
<thead>
<tr>
<th>Project: LDW RI/FB</th>
<th>Water Body Type: Lower Duwamish Waterway</th>
<th>Tube Length (ft): 14.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project #: PORS5-18220-511</td>
<td>Water Elevation (ft)/Tide: NA</td>
<td>Penetration Depth (ft): 13.0</td>
</tr>
<tr>
<td>Client: LDWG</td>
<td>Water Depth (ft): 20.0</td>
<td>Sample Quality: Good</td>
</tr>
<tr>
<td>Collection Date: 2/23/06</td>
<td>Mudline Elevation (ft): -15.1</td>
<td>Recovery in ft (%): 8.6 (66)</td>
</tr>
<tr>
<td>Contractor: MSS</td>
<td>N/LAT: 47 33.3761 E/LONG: 122 20.3911</td>
<td>Process Date: 2/24/06</td>
</tr>
<tr>
<td>Operator: Bill Jaworski</td>
<td>Method/Tube ID: Vibracorer/3.5' round Al</td>
<td>Logged By: L. McKee, C. Brackett</td>
</tr>
</tbody>
</table>

**Sediment Description**

- Classification Scheme: USCS
- Contacts are recovered depth
- In-situ depth interval in feet with parentheses

**Comments**

For Recovered Depths

**In-situ Depth (ft) & Graphic Log**

- @ 7.0' to 8.1' Wood fragments, 1 piece of 0.1' L subrounded gravel, 1' peat pocket, and foliated red chips (possibly peat) with slight to moderate HC-like odor.

- SM: (12.3-13.0) damp, medium dense, dark gray (GLEY 1, 3/N) fine SAND and layers of black SILT. SAND grains are multicolored (orange, red, white). SILT has slight HC-like odor. Trace detrital at basal contact (foliated red chips; transitional unit).

- End of core @ 8.5'.

**Note:** Chemistry interval recorded as 8.2 ft but sample was collected to the bottom of the core at 8.6 ft. Graphic expresses depth of sample collection, sample name matches project nomenclature.

**Remarks:**

- Drive Notes: freefall (7.0'), moderate (10.0'), easy to moderate (14.0'), penetration goal reached. Five drive attempts made at station. Station re-occupied with vibracorer. Rainbow sheen and strong HC-like odor on sidewalls from 2.0' to 6.0'. UA = upper alluvium.

**Calculated Recovery**

- Sample Length/Penetration Length: 8.6 / 13.0 = 66 %

---

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
Sediment Core Log
LDW-SC-18 (R1)

Project: LDW RI/FS
Project #: PORSS-18220-511
Client: LDWG
Collection Date: 2/16/06
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft/Tide): 4.6
Water Depth (ft): 26.7
Mudline Elevation (ft): -19.4
Sample Quality: Good
Recovery in ft (%): 10.7 (91)
Process Date: 2/17/06
Process Method: Cut tube
Method/Tube ID: Diver Impact Core/4" sq Al
Logged By: L. McKee

Recovered Sample & Sample % Recovery (interval) Chemical Analysis PFO Measurement

0.0-0.1' wet, soft, olive brown (2.5Y, 4/3) SILT, few sand.
SP- SM: (0.1-3.8) damp to moist, [medium dense],
black (2.5Y, 2.5/1) fine SAND interbedded with
distinct layers of moist, soft, dark greenish gray
(GLEY 1, 4/10Y) SILT up to 0.2' thick. SAND grains
are well sorted and multicolored (orange, red, white).
Scattered trace debris (glass),
@ 0.8' glass shard 0.2' L
@ 1.5' subangular rock 0.3' L

ML: (3.8-6.2) damp, soft, dark greenish gray (GLEY 1, 4/10Y) SILT, few sand interbedded with 0.09' thick
layers of damp, medium dense, black (2.5Y, 2.5/1)
very fine to fine SAND. SILT texture is slightly
compressible and of low plasticity.

@ 5.5' scattered shell fragments

SP- SM: (6.2-9.6) wet, medium dense, black (2.5Y, 2.5/1)
very fine SAND alternating with layers of dark
greenish gray (GLEY 1, 4/10Y) SILT, little clay.

Remarks: Drive Notes: freefall (0.8'), moderate (9.8'), moderate to
hard (10.8'), hard (11.8'), refusal (11.8'). One drive attempt made
at station. Core catcher was intact and 100% full. No
torvane measurements recorded. r = recent

Calculated Recovery
Sample Length/Penetration Length:
10.7/11.8 = 91 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**LDW-SC-18 (R1)**

**Project:** LDW RI/FS  
**Water Body Type:** Lower Duwamish Waterway  
**Water Elevation (ft)/Tide:** 4.6  
**Penetration Depth (ft):** 11.8

**Project #:** POSE5-18220-511  
**Water Depth (ft):** 27.6  
**Sample Quality:** Good

**Client:** LDWG  
**Mudline Elevation (ft):** -19.4  
**Recovery in ft (%):** 10.7 (91)

**Collection Date:** 2/16/06  
**N/LAT:** 206336  
**E/LONG:** 1257929

**Contractor:** MCS Environmental, Inc.  
**Horiz. Datum:** NAD 83  
**Process Date:** 2/17/06

**Vessel:** MCS barge  
**Vert. Datum:** MLLW  
**Process Method:** Cut tube

**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4" sq. Al  
**Logged By:** L. McKee

---

### Sediment Description

**Classification Scheme:** USCS  
**Contacts are recovered depth (In-situ depth interval in feet with parentheses)**

- 7 ft: 100% (6-9)
- 8 ft: 91% (6-9)
- 9 ft: 90% (10-11)
- 10 ft: 60% (11-17.0)

**Chemical Analysis:**

- 0 ft: 0%

**FID Measurement:**

- 0 ft: 0%

**In-situ Depth (ft) & Graphic Log**

**Upper alluvium**

- 8-9 ft: Ø 8.5' 1" thick layer of wood fragments up to 3/4" L
- 9-10 ft: SP- SM: (9.6-11.8) moist, dense, black (2.5Y, 2.5/1) fine SAND, few silt and layers of dark greenish gray (GLEY 1.4/10Y) SILT, few sand. Layers alternate every 0.1", are tightly spaced, and are convex in shape from 9.9" to 10.7".
- 10-11 ft: End of core at 10.7'. Driven to refusal.

---

**Remarks:** Drive Notes: freefall (0.8'), moderate (9.8'), moderate to hard (10.8'), hard (11.8'), refusal (11.8'). One drive attempt made at station. Core catcher was inact and 100% full. No torvana measurements recorded. r = recent

**Calculated Recovery**

Sample Length/Penetration Length: 10.7/11.8 = 91%

---

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**LDW-SC-19 (R5)**

<table>
<thead>
<tr>
<th>Project: LDW RI/FS</th>
<th>Water Body Type: Lower Duwamish Waterway</th>
<th>Tube Length (ft): 14.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project #: PORSS-18220-511</td>
<td>Water Elevation (ft)/Tide: NA</td>
<td>Penetration Depth (ft): 13.0</td>
</tr>
<tr>
<td>Client: LDWG</td>
<td>Water Depth (ft): 34.6</td>
<td>Sample Quality: Good</td>
</tr>
<tr>
<td>Collection Date: 2/24/06</td>
<td>Mudline Elevation (ft): -25.3</td>
<td>Recovery in ft (%): 11.9 (92)</td>
</tr>
<tr>
<td>Contractor: MSS</td>
<td>N/LAT: 47.33.3172 E/LONG: 122.20.7486</td>
<td>Process Date: 2/24/06</td>
</tr>
<tr>
<td>Operator: Bill Jaworski</td>
<td>Method/Tube ID: Vibracorer/3.5'' round Alum</td>
<td>Logged By: L.McKee, CBrackett</td>
</tr>
</tbody>
</table>

### Sediment Description

<table>
<thead>
<tr>
<th>Measured Depth (in)</th>
<th>Recovery Interval &amp; Sample</th>
<th>Chemical Analysis</th>
<th>PID</th>
<th>Sediment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>OL: (0.0-7.5') moist to damp, medium stiff, clack (2.5Y, 2.5/1) ORGANIC SILT, few sand with mottled olive-brown ORGANIC SILT, little clay. SILT texture is slightly compressible and of low plasticity. Scattered wood fragments up to 3' L, rootlets and shell fragments, trace worms and worm tubes in top 0.7&quot;, and slight H2S-like odor.</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>@ 1.9' rainbow sheen florets up to 1/4&quot; and wood fragments up to 1&quot; L</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>0.9' TV = 0.1 kg/cm2</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>GT @ 2.2</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>@ 2.6' TV = 0.2 kg/cm2</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>GT @ 3.1'</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td>@ 3.7' TV = 0.2 kg/cm2</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td>0.9' TV = 0.1 kg/cm2</td>
</tr>
</tbody>
</table>

### Comments

- Drive Notes: freefall (6.0'), moderate (6.5'), easy (13.0'), penetration goal reached. Five drive attempts made at station.
- Station re-occupied with vibracore. Core catcher was intact
- Intact but empty. Rainbow sheen on sidewalls from 0.8' to 7.0'.

**Calculated Recovery**

Sample Length/Penetration Length: 11.9/13.0 = 92%

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
# Sediment Core Log

**Project:** LDW R1/FS  
**Project #:** PORS5-18220-511  
**Client:** LDWG  
**Collection Date:** 2/24/06  
**Contractor:** MSS  
**Vessel:** R/V Nancy Anne  
**Operator:** Bill Jaworski

## Water Body Type: Lower Duwamish Waterway
- **Water Elevation (ft/Tide):** NA
- **Water Depth (ft):** 34.6
- **Modline Elevation (ft):** -25.3
- **N/LAT:** 47 33 31.72  
- **E/LONG:** 122 20.7486
- **Horiz. Datum:** NAD 83  
- **Vert. Datum:** MLLW
- **Process Date:** 2/24/06
- **Process Method:** Cut tube
- **Logged By:** L. McKee, C. Brackett

## Sediment Description
- **Classification Scheme:** USGS
- **Contacts:** recovered depth (in-situ depth interval in feet with parentheses)

### SW: (7.5-8.1) [wet, dense] black (2.5Y, 2.5/1) SAND, little gravel. Gravel is subrounded to subangular up to 1" diameter. Slight H2S-like odor.

### ML: (8.1-9.2) [moist to damp, medium stiff] black (2.5Y, 2.5/1) SILT interbedded with gray-brown very fine SAND.

### ML: (9.2-9.7) [damp, medium stiff] very dark greenish gray (2.5Y 1/2) SILT, little clay and 1/2' diameter peat pocket. Silt texture is slightly compressible and of low plasticity.

### SW: (9.7-13.0) moist, medium dense, medium grading to fine SAND, little gravel. Sand grains are multicolored (orange, red, white). Gravel is subrounded up to 1/4" in diameter.

### End of core at 11.9'.

## Remarks:
- **Drive Notes:** freefall (6.0'), moderate (6.5'), easy (13.0'), penetration goal reached. Five drive attempts made at station.
- **Station re-occupied with vibracore. Core catcher was intact but empty. Rainbow sheen on sidewalls from 0.8' to 7.0'.
# Sediment Core Log

**Project:** LDW RIFS  
**Project #:** PORSS-18220-511  
**Client:** LDWA  
**Collection Date:** 2/15/06  
**Contractor:** MCS Environmental, Inc.  
**Vessel:** MCS barge  
**Operator:** Gary Maxwell  
**Water Body Type:** Lower Duwamish Waterway  
**Water Elevation (ft)/Tide:** 7.4  
**Water Depth (ft):** 43.5  
**Mudline Elevation (ft):** -33.9  
**Penetration Depth (ft):** 12.6  
**Sample Quality:** Good  
**Recovery in ft (%):** 10.0 (79)  
**Process Date:** 2/15/06  
**Horiz. Datum:** NAD 83 N Vert. Datum:** MLLW  
**Process Method:** Cut tube  
**Method/Tube ID:** Diver Impact Core/4" sq Al  
**Logged By:** L.McKee

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Recover Interval</th>
<th>% Recovery</th>
<th>Chemical Analysis</th>
<th>Sediment Description</th>
<th>Comments for Recovered Depths</th>
<th>In-situ Depth &amp; Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ML: (0.0-0.1) moist, soft, olive brown (2.5Y, 4/3) SILT, few sand.</td>
<td>Transitional Contact</td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>OL: (0.1-2.1) moist, [medium stiff], black (2.5Y, 2.5/1) ORGANIC SILT with trace subrounded gravel up to 0.6&quot; diameter. Scattered rootlets, leaf and wood fragments up to 2&quot; L. Slight HC-like sheen and moderate HC-like odor.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>OL: (2.1-3.7) moist, [medium stiff,] black (2.5Y, 2.5/1) ORGANIC SILT, few sand interbedded with 0.5&quot; thick seams of convex, moist, stiff, gray (2.5Y, 5/1) SILT, little clay. Slight rainbow sheen and HC-like odor to 3.5 feet.</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td>OL: (3.7-4.1) moist, medium stiff, very dark greenish gray (GLEY 1, 3/1), SILT, little clay. Slight H2S-like odor.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ML: (4.1-12.6) moist, [stiff,] black (2.5Y, 2.5/1) SILT, few fine sand. Silt texture is uniform, slightly compressible, massive, blocky, low plasticity, and rolls easily. Trace small shell fragments up to 0.6&quot; in diameter.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:** Drive Notes: freefall (0.2'), moderate (12.6'), penetration goal reached. One drive attempt made at station. Core catcher was 50% full.

**Calculated Recovery**

<table>
<thead>
<tr>
<th>Sample Length/Fatneration Length:</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0' / 12.6' = 79%</td>
</tr>
</tbody>
</table>

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
Sediment Core Log
LDW-SC-20 (R1)

Project: LDW RI/FS
Project #: PORRSS-18220-511
Client: LDWG
Collection Date: 2/15/06
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft/Tide): 7.4
Water Depth (ft): 45.5
Mudline Elevation (ft): -33.9
Method/Tube ID: Diver Impact Core/4\* sq. Al
Logged By: L.McKee

% Recovered
Chemical Analysis
PID
Measurement

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

Comments for Recovered Depths

In-situ
Depth (ft)
& Graphic Log

Remarks: Drive Notes: freefall (0.2'), moderate (12.6'), penetration goal reached. One drive attempt made at station.
Core catcher was 60% full.

Calculated Recovery
Sample Length/Penetration Length:
10.0'/12.6 = 79 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
### Sediment Core Log
**LDW-SC-21 (R1)**

**Project:** LDW R/FS  
**Project #:** PORS5-18220-511  
**Client:** LDWG  
**Collection Date:** 2/14/06  
**Contractor:** MCS Environmental, Inc.  
**Vessel:** MCS barge  
**Operator:** Gary Maxwell  

**Water Body Type:** Lower Duwamish Waterway  
**Water Elevation (ft)/Tide:** 5.9  
**Water Depth (ft):** 34.1  
**Medline Elevation (ft):** -28.5  
**N/LAT:** 206167  
**E/LONG:** 1267485  
**Horiz. Datum:** NAD 83  
**Vert. Datum:** MLLW  
**Process Date:** 2/15/06  
**Process Method:** Cut tube  
**Logged By:** A. Fitzpatrick, L.McKee

#### Sediment Description
- **Classification Scheme:** USCS  
- **Contacts are recovered depth** (In-situ depth interval in feet with parentheses)

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>% Recovery (interval)</th>
<th>Chemical Analysis</th>
<th>PID Measurement</th>
<th>Sediment Description</th>
<th>Comments for Recovered Depths</th>
</tr>
</thead>
</table>
| 0         | 100% (0.3-0.5)        | PCB SVOC Metals Hg | 0              | ML: (0.0-0.5) moist, medium stiff, olive brown (2.5Y, 4/3) fine SANDY SILT. | Transitional Contact  
3.6' 2" layer of fine sand |
| 1         | 100% (0.5-3)          | PCB SVOC Metals Hg | 0              | OL: (0.5-5.1) moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT, trace fine sand. Silt texture is uniform, slightly compressible, massive, and of low plasticity. Scattered wood fragments and slight H2S-like odor. | GT @ 1.1' |
| 3         |                       |                   |                | @ 4.5' moderate H2S-like odor |
| 4         |                       |                   |                | ML: (5.1-6.5) moist, medium stiff, black (2.5Y, 2.5/1) SILT, few sand with clasts and layers of moist, stiff, gray (2.5Y, 5/1) medium SILT, little clay up to 0.1' L. Scattered layers of moist, black fine sand (transitional unit). | Transitional Contact  
5.8' TV = 0.6 kg/cm² |
| 5         |                       |                   |                | SP-SM: (6.5-10.1) moist, dense, grayish brown (2.5Y, 5/2) medium to fine SAND interbedded with layers of black SANDY SILT. Scattered wood fragments up to 4" L and scattered wood layers up to 5" W. | Sharp Contact |

**Remarks:** Drive Notes: freefall (0.5'), easy to moderate (8.0'), moderate (10.0'), hard (12.7'), penetration goal reached. One drive attempt made at station. Core catcher was empty with 0.2' lost from bottom.

**Calculated Recovery**  
Sample Length/Penetrator Length: 11.3' 12.7 = 89 %

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
# Sediment Core Log

**Project:** LDW R/FS  
**Project #:** PORSS-18220-511  
**Client:** LDWG  
**Collection Date:** 2/14/06  
**Contractor:** MCS Environmental, Inc.  
**Vessel:** MCS barge  
**Operator:** Gary Maxwell  
**Penetration Depth:** 12.7 ft  
**Recovery in ft (%):** 11.3 (89)  
**Process Date:** 2/15/06  
**Process Method:** Cut tube

### Sediment Description

**Classification Scheme:** USCS  
**Contacts are recovered depth:** (in-situ depth interval in feet with parentheses)

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Recovered Interval</th>
<th>% Recovery (Interval)</th>
<th>Chemical Analysis</th>
<th>PID Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td></td>
<td>98% (6-8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>91% (9-10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>57% (13-12.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
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</tr>
<tr>
<td>12</td>
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</tr>
</tbody>
</table>

- **2" thick. Grades to coarse SAND and trace wood at basal contact.**
- **3P: (10.1-12.7) moist, dense, very dark greenish grey (GLEY 1, 3V) medium SAND with multicolored grains (white, red, orange). Scattered wood layers up to 0.1" thick with orange-brown shredded wood fragments.**
- **At 11.0' non-lembered wood piece**
- **End of core at 11.3'.**

### Comments for Recovered Depths

- **In-situ Depth (ft) & Graphic Log**

### Calculated Recovery

**Sample Length/Penetration Length:** 11.3/12.7 = 89 %

**Remarks:** Drive Notes: freefall (6.5'), easy to moderate (8.0'), moderate, (10.0'), hard (12.7'), penetration goal reached. One drive attempt made at station. Core catcher was empty with 0.2' lost from bottom.

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
# Sediment Core Log

**LDW-SC-22 (R1)**

**Project:** LDW RIFS  
**Project #:** PORS-18220-511  
**Client:** LDWG  
**Collection Date:** 2/13/06  
**Contractor:** MCS Environmental, Inc.  
**/operator:** Gary Maxwell  
**Vessel:** MCS barge  
**Horiz. Datum:** NAD 83 N  
**Vert. Datum:** MLLW  
**Method/Tube ID:** Diver Impact Core / 4\" sq Al  
**Logs:** N. Bacher, L. McKee

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>% Recovery</th>
<th>Chemical Analysis</th>
<th>Sediment Description</th>
<th>Comments for Recovered Depths</th>
<th>In-situ Depth interval in feet with parentheses</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0-1.3</td>
<td>100%</td>
<td>PCB SVOC Metals Hg</td>
<td>SM: (0.0-1.3) wet, loose, dark yellowish brown (10YR, 4/4) medium SAND, few silt. Sand grains are multicolored (orange, red, white). Trace debris (brick fragments) and 1&quot; diameter pocket of brown woody SILT (possibly peat).</td>
<td>GT @ 0.7</td>
<td></td>
</tr>
<tr>
<td>1.3-2.0</td>
<td>100%</td>
<td>PCB SVOC Metals Hg</td>
<td>SM: (1.3-2.0) moist, medium dense, greenish black (GLEY 1, 2.5/10Y) medium SAND, few silt and moderate wood fragments up to 1.5&quot; L. Sand grains are multicolored (orange, red, white). Moderate creosote-like sheen from 0.9&quot; to 1.1&quot; and moderate HG-like staining and odor to 1.1&quot;.</td>
<td>Transitional Contact</td>
<td></td>
</tr>
<tr>
<td>2.0-3.0</td>
<td>100%</td>
<td>PCB SVOC Metals Hg</td>
<td>SP-SM: (2.0-9.3) moist, medium dense, black (GLEY 1, 2.5/5N) fine SAND with pockets and lenses of gray SILT, few sand up to 1/2&quot; L. Sand grains are multicolored (red, orange, white) and grade to medium below 6.5&quot;. Trace scattered debris (brick fragment) and trace wood fragments up to 2&quot; L. Trace pockets of brown peaty silt up to 1/2&quot; diameter.</td>
<td>@ 3.0 TV = 0.6 kg/cm²</td>
<td></td>
</tr>
<tr>
<td>3.0-4.0</td>
<td>95% (3-7)</td>
<td></td>
<td>@ 3.6&quot; one 3&quot; L red brick fragment</td>
<td>Transitional Contact GT @ 1.9</td>
<td></td>
</tr>
<tr>
<td>4.0-5.0</td>
<td>0</td>
<td></td>
<td>@ 5.1&quot; trace 1/4&quot; diameter pocket of brown peaty material</td>
<td>@ 5.0 TV = 0.7 kg/cm²</td>
<td></td>
</tr>
<tr>
<td>5.0-6.0</td>
<td>0</td>
<td></td>
<td>Winnowing from 5.7&quot; to 6.9&quot;.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:** Drive Notes: no freefall, easy (7.0\'), moderate (8.0\'), hard (9.0\'), refusal (9.3\'). One drive attempt made at station.

**Calculated Recovery:** Sample Length/Penetration Length: 7.7 / 9.3 = 83 %

---

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
**Sediment Core Log**

**LDW-SC-22 (R1)**

**Project:** LDW RI/FS  
**Water Body Type:** Lower Duwamish Waterway

**Project #:** PORS5-18220-511  
**Water Elevation (ft):** 9.1

**Client:** LDWG  
**Water Depth (ft):** 12

**Collection Date:** 2/13/06  
**Mudline Elevation (ft):** -3.4

**Contractor:** MCS Environmental, Inc.  
**N/LAT:** 205908  
**E/LONG:** 1268174

**Vessel:** MCS barge  
**Horiz. Datum:** NAD 83  
**Vert. Datum:** MLLW

**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4" sq Al

**Penetration Depth (ft):** 9.3  
**Sample Quality:** Good

**Tube Length (ft):** 16.1  
**Recovery in ft (%):** 7.7 (83)

**Process Date:** 2/14/06  
**Process Method:** Cut tube

**Logged By:** N. Bacher, L. McKee

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>Recov Interval &amp; Sample</th>
<th>% Recovery</th>
<th>Chemical Analysis</th>
<th>PID Measurement</th>
<th>Sediment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td>76% (7-8)</td>
<td>0</td>
<td></td>
<td></td>
<td>@ 7.0' TV = 0.4 kg/cm²</td>
</tr>
<tr>
<td>8.0</td>
<td>18% (8-9.3)</td>
<td></td>
<td></td>
<td></td>
<td>End of core at 7.7'. Driven to refusal.</td>
</tr>
</tbody>
</table>

**Comments for Recovered Depths**

**In-situ Depth (ft) & Graphic Log**

**Remarks:** Drive Notes: no freefall, easy (7.0'), moderate (8.0'), hard (9.0'), refusal (9.3'). One drive attempt made at station.

**Calculated Recovery**

**Sample Length/Penetration Length:** 7.7 / 9.3 = 83 %

---

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-23 (R1)

Project: LDW RIFS
Water Body Type: Lower Duwamish Waterway

Project #: PORS5-18220-511
Water Elevation (ft)/Tide: 2.1

Client: LDWG
Water Depth (ft): 23.2

Collection Date: 2/16/06
Mudline Elevation (ft): -18.7

Contractor: MCS Environmental, Inc.
N.LAT: 205418
E.LONG: 126229

Vessel: MCS barge

Operator: Gary Maxwell
Method/Tube ID: Diver Impact Core/4" sq Al

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

ML: (0.0-0.5) wet, very soft, olive brown (2.5Y, 4/2)
SILT and trace debris (piece of concrete).

OL: (0.5-5.3) moist, medium stiff, black (2.5Y, 2.5/1)
ORGANIC SILT with trace shell and wood fragments.
Silt texture is uniform, slightly compressible,
massive, blocky, and of low plasticity. Slight H&S-
like odor. Scattered layers of very dark greenish
grey (GLEY 1, 3/1) SILT, little clay up to 3" thick.

@ 1.8 ' 4" thick layer of stiff, black SILT, little sand
and few gravel up to 1/2" in diameter

OL: (5.3-6.4) moist, [medium stiff], very dark
greenish gray (GLEY 1, 3/5GY) SILT, few clay.
Silt texture is slightly compressible and rolls easily.
Slight H&S-like odor.

OL: (6.4-9.6) [moist, medium stiff] very dark greenish
grey (GLEY 1, 3/5GY) ORGANIC SILT, trace clay.
Silt texture is slightly compressible, rolls well. Slight
H&S-like odor.

Comments
for Recovered
Depths

In-situ
Depth (ft)
& Graphic Log

@ 0.0 to 1.0' Sheen
Test: no sheen
Transitional Contact

@ 0.9'
@ 0.9 TV = 0.6
kg/cm²
@ 1.0 to 2.0 Sheen
Test: no sheen

GT @ 2.9'
@ 2.9 TV = 0.6
kg/cm²

@ 4.4 TV = 0.3
kg/cm²

Remarks: Drive Notes: freefall (1.6'), easy (10.4'), moderate (12.4'),
penetration goal reached. One drive attempt made at station.

Tovrane had restricted maneuverability due to treating.

Calculated Recovery
Sample Length/Penetration Length:

10.7'/12.4' = 86 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**LDW-SC-23 (R1)**

<table>
<thead>
<tr>
<th>Project: LDW RI/FS</th>
<th>Water Body Type: Lower Duwamish Waterway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project #: PORS5-18220-511</td>
<td>Water Elevation (ft/Tide): 2.1</td>
</tr>
<tr>
<td>Client: LDWG</td>
<td>Water Depth (ft): 23.2</td>
</tr>
<tr>
<td>Collection Date: 2/16/06</td>
<td>Mudline Elevation (ft): -18.7</td>
</tr>
<tr>
<td>Contractor: MCS Environmental, Inc.</td>
<td>Tube Length (ft): 16.1</td>
</tr>
<tr>
<td>Vessel: MCS Barge</td>
<td>Penetration Depth (ft): 12.4</td>
</tr>
<tr>
<td>Operator: Gary Maxwell</td>
<td>Sample Quality: Good</td>
</tr>
<tr>
<td>Method/Tube ID: Diver Impact Core/4 sq. ft</td>
<td>Recovery in ft (%): 10.7 (66)</td>
</tr>
<tr>
<td>Logged By: L. McKee</td>
<td>Process Date: 2/17/06</td>
</tr>
<tr>
<td>Process Method: Cut Core</td>
<td></td>
</tr>
</tbody>
</table>

**Sediment Description**

- Classification Scheme: USCS
- Contacts are recovered depth
- (In-situ depth interval in feet with parentheses)

<table>
<thead>
<tr>
<th>Recovery Interval &amp; Sample</th>
<th>Recovery %</th>
<th>Chemical Analysis</th>
<th>PEC</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-9</td>
<td>85%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-10</td>
<td>65%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-10</td>
<td>65%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- ML: (9.6-12.4) moist, medium stiff, gray (2.5Y, 5/1)
- SILT, few clay and chunky clay balls. Scattered wood and shell fragments up to 1" L and [slight] H2S-like odor.

- End of core at 10.7'. Driven to refusal.
- @ 7.0' TV = 0.8 kg/cm²

**In-situ Depths**

- Transitional Contact
- Not sampled below 10.2'

**Remarks:**

- Drive Notes: freefall (1.6'), easy (10.4'), moderate (12.4')
- Penetration goal reached. One drive attempt made at station.
- Torvane had restricted maneuverability due to freezing.

**Calculated Recovery**

<table>
<thead>
<tr>
<th>Sample Length/Penetration Length:</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.7'/12.4 = 86%</td>
</tr>
</tbody>
</table>

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
### Sediment Core Log

**Project:** LDW RI/FS  
**Project #:** PORSS-18220-511  
**Client:** LDWG  
**Collection Date:** 2/17/06  
**Contractor:** MCS Environmental, Inc.  
**Vessel:** MCS barge  
**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4” sq Al  
**Logged By:** L. McKee

#### Water Body Type
- **Lower Duwamish Waterway**

#### Water Elevation (ft) / Tide
- **6.1**

#### Water Depth (ft)
- **26.3**

#### Penetration Depth (ft)
- **12.2**

#### Sample Quality
- **Good**

#### Mudline Elevation (ft)
- **-20.4**

#### Recovery in ft (%)
- **11.8 (97)**

#### Process Date: 2/17/06

#### Process Method: Cut tube

#### Horiz. Datum: NAD 83 N  
#### Vert. Datum: MLLW

---

#### Sediment Description

**Classification Scheme:** USCS

**Contacts are recovered depth**  
*(In-situ depth interval n feet with parentheses)*

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>Recov. interval % Recovery (interval)</th>
<th>Chemical Analysis</th>
<th>Physical Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>PC8 SVOC Metals</td>
<td>Mg</td>
</tr>
<tr>
<td>1</td>
<td>65% (0-1)</td>
<td>PC8 SVOC Metals</td>
<td>Mg</td>
</tr>
<tr>
<td>2</td>
<td>100% (1-2)</td>
<td>PC8 SVOC Metals</td>
<td>Mg</td>
</tr>
<tr>
<td>3</td>
<td>100% (2-5)</td>
<td>PC8 SVOC Metals</td>
<td>Mg</td>
</tr>
<tr>
<td>4</td>
<td>100% (5-7)</td>
<td>PC8 SVOC Metals</td>
<td>Mg</td>
</tr>
<tr>
<td>5</td>
<td>100% (7-9)</td>
<td>PC8 SVOC Metals</td>
<td>Mg</td>
</tr>
<tr>
<td>6</td>
<td>100% (9-11)</td>
<td>PC8 SVOC Metals</td>
<td>Mg</td>
</tr>
</tbody>
</table>

**OL:** (0.0-1.3) wet, soft, black (2.5Y, 2.5/1) ORGANIC SILT, little sand and few wood fragments less than 1/2”. Abundant worms.

**SP-SM:** (1.1-3.4) damp, [medium dense], black (2.5Y, 2.5/1) fine SAND interbedded with 1” thick layers and pockets of wet, medium stiff, dark greenish gray (GLEY 1, 4/10Y) SILT, few sand. Sand grains are multicolored (orange, red, white).

**SM:** (3.3-9.4) damp, dense, black (2.5Y, 2.5/1) medium SAND with scattered thin layers up to 1/4” thick of dark greenish gray (GLEY 1 4/10Y) SILT, few clay that decrease with depth. Scattered wood fragments up to 0.2” L. Grades to lower unit.

- **GT @ 0.9’**  
  **Gradational Contact**  
  **@ 1.3’ TV = 0.2 kg/cm2**

- **GT @ 2.6’**  
  **Sharp Contact**  
  **@ 3.2’ TV = 0.4 kg/cm2**

- **@ 6.0’ to 7.0’ slight H2S-like odor**  
  **@ 5.4’ TV = 0.6 kg/cm2**

#### Comments for Recovered Depths

- Calculated Recovery  
  **11.8’/12.2’ = 97%**

---

**Remarks:** Drive Notes: freefall (1.0’), easy (7.0’), moderate (11.0’), hard (12.2’), penetration goal reached. One drive attempt made at station. Core catcher was 100 % full.

---

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
# Sediment Core Log

**Project:** LDW RI/FS  
**Water Body Type:** Lower Duwamish Waterway  
**Tube Length (ft):** 16.1

**Project #:** PORS5-18220-611  
**Water Elevation (ft/Tide):** 6.1  
**Penetration Depth (ft):** 12.2

**Client:** LDWG  
**Water Depth (ft):** 26.2  
**Sample Quality:** Good

**Collection Date:** 2/17/06  
**Mudline Elevation (ft):** -20.4  
**Recovery in %:** 11.8 (97%)

**Contractor:** MCS Environmental, Inc.  
**N/LAT:** 205130  
**E/LONG:** 1267360

**Vessel:** MCS barge  
**Horiz. Datum:** NAD 83 N Vert. Datum: MLLW

**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4” sq Al  
**Process Date:** 2/17/06  
**Process Method:** Cut tube  
**Logged By:** L. McKee

---

## Sediment Description

**Classification Scheme:** USCS

- **Contacts are recovered depth:** (In-situ depth interval in feet with parentheses)

## Comments for Recovered Depths

- **Depth (ft):**
- **In-situ Depth (ft) & Graphic Log:

### 0 ft

- **7.0” TV = 0.5 kg/cm²**

### 9.0” TV = 0.5 kg/cm²

- **Transitional Contact**

- **Core not sampled below 10.0’.”**

### End of core at 11.8’.

---

## Calculated Recovery

- **Sample Length/Penetration Length:**
  
  \[
  11.8 / 12.2 = 97 \%
  \]

---

**Remarks:** Drive Notes: freetail (1.0”), easy (7.0”), moderate (11.0”), hard (12.2”), penetration goal reached. One drive attempt made at station. Core catcher was 100% full.

---

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-25 (R2)

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Recovery Interval</th>
<th>% Recovery Interval</th>
<th>Chemical Analyses</th>
<th>Sediment Description</th>
<th>Comments for Recovered Depths</th>
<th>In-situ Depth (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>67%</td>
<td>PCB SVOC Metals Hg TBT</td>
<td>ML: (0.0-0.4) very wet, very soft, black (2.5Y, 2.5/1) SILT, few sand and trace wood fragments up to 4&quot; L. Trace leaf stems and worms.</td>
<td>@ 1.8' clear glass shard and black clast 1&quot; in diameter</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>100%</td>
<td>PCB SVOC Metals Hg TBT</td>
<td>OL: (0.4-5.5) wet, soft to medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT with substantial wood fragments up to 1.2&quot; L. Silty texture is uniform, compressible, blocky, and of low plasticity. Substantial 4&quot; L layers of shredded wood fragments. Wood matter increases from 4.0&quot; to basal contact.</td>
<td>@ 2.0' slight H2S-like odor</td>
<td>1.4'</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>100%</td>
<td>PCB SVOC Metals Hg TBT</td>
<td></td>
<td></td>
<td>1.8' (black clast)</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>100%</td>
<td>PCB SVOC Metals Hg TBT</td>
<td></td>
<td></td>
<td>3.2</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>90%</td>
<td>SVOC Metals TBT</td>
<td>ML: (5.5-6.6) moist, medium stiff, black (2.5Y, 2.5/1) SILT with scattered small, stiff, gray SILT clasts up to 1/2&quot; diameter and trace medium SAND pockets 1&quot; in diameter. Moderate rootlets, twigs, and organics.</td>
<td>@ 6.6' TV = 0.3 kg/cm²</td>
<td>3.6' TV = 0.4 kg/cm²</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>90%</td>
<td>SVOC Metals TBT</td>
<td>SP-SM: (6.6-8.6) moist to wet, medium dense, black (2.5Y, 2.5/1) medium SAND, few silt with scattered pockets of soft, gray CLAY, little silt up to 2&quot; diameter.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>90%</td>
<td>SVOC Metals TBT</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remarks: Drive Notes: freefall (1.5'), easy (7.0'), moderate (9.0'), hard (10.3'), refusal (10.3'). Two drive attempts made at station. Core catcher was 80% full. Slight slumping below 8.3'.

Calculated Recovery
Sample Length/Penetration Length: 9.1 / 10.3 = 88%

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**LDW-SC-25 (R2)**

**Project:** LDW RUIFS

**Water Body Type:** Lower Duwamish Waterway

**Project #:** PORS5-18220-511

**Water Elevation (ft/Tide):** 18.7

**Penetration Depth (ft):** 10.3

**Client:** LDWG

**Water Depth (ft):** 18.7

**Sample Quality:** Good

**Collection Date:** 2/17/06

**Mudline Elevation (ft):** -15.2

**Recovery in ft (%):** 9.1 (88)

**Contractor:** MCS Environmental, Inc.

**N/LAT:** 204751

**E/LONG:** 1267380

**Process Date:** 2/18/06

**Horiz. Datum:** NAD 83

**Process Method:** Cut tube

**Vert. Datum:** MLLW

**Operator:** Gary Maxwell

**Method/Tube ID:** Diver Impact Core/4" sq Al

**Logged By:** L. McKee

**Recovered Depth (ft):**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Recover Interval &amp; Sample</th>
<th>% Recovery</th>
<th>Sediment Description</th>
<th>Comments for Recovered Depths</th>
<th>In-situ Depth (ft) &amp; Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.9</td>
<td></td>
<td>0</td>
<td>SP: (8.6-10.3) moist to wet, medium dense, black (2.5, 2.5/1) grading to greyish black (GLEY 1, 2.5/1) medium SAND. Sand grains are multicolored (orange, red, white) and well sorted.</td>
<td>@ 7.9' TV = 0.2 kg/cm2</td>
<td></td>
</tr>
<tr>
<td>8.0</td>
<td></td>
<td>0</td>
<td>End of core at 9.1'. Driven to refusal.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:** Drive Notes: freefall (1.5'), easy (7.0'), moderate (9.0'), hard (10.3'), refusal (10.3'). Two drive attempts made at station. Core catcher was 80% full. Slight slumping below 8.3'.

**Calculated Recovery**

Sample Length/Penetration Length: 9.1 / 10.3 = 88%

---

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**LDW-SC-26 (R1)**

**Project:** LDW RI/FS  
**Project #:** PORS-18220-511  
**Client:** LDWG

**Collection Date:** 2/22/06  
**Mudline Elevation (ft):** -26

**Contractor:** MCS Environmental, Inc.  
**Vessel:** MCS barge  
**Operator:** Gary Maxwell

**Water Body Type:** Lower Duwamish Waterway  
**Water Elevation (ft/Tide):** 18.7

**Water Depth (ft):** 35.4  
**Penetration Depth (ft):** 14.6

**Sample Quality:** Good  
**Recovery in ft (%):** 12.3 (84)

**Method/Tube ID:** Diver Impact Corer/4" sq Al  
**Logged By:** L. McKee

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>% Recovery (interval)</th>
<th>Chemical Analysis</th>
<th>sediments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>100%</td>
<td></td>
<td>SM: (5.3-6.6) wet, medium dense, black (2.5Y, 2.5/1), medium SAND, few silt.</td>
</tr>
<tr>
<td>1</td>
<td>93% (1-3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>81% (0-1)</td>
<td></td>
<td>OL: (0.6-5.3) wet, solid, black (2.5YR, 2.5/1)  ORGANIC SILT, few sand and little olive-gray mottled SILT, little clay. Silt texture is slightly compressible and of low plasticity. Trace roots, shell fragments, and wood fragments up to 1.2&quot; L.</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td></td>
<td>OL: (0.0-0.6) wet, olive brown (2.5Y, 4/3)  ORGANIC SILT, few sand and trace worms.</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sediment Description**

- **Classification Scheme:** USCS
- **Contacts are recovered depth**
  - (In-situ depth interval in feet with parentheses)

**Comments for Recovered Depths**

- **In-situ Depth (ft)**
- **Graphic Log**

**Remarks:** Drive Notes: freefall (1.0'), easy (5.0'), moderate (14.6'), penetration goal reached. One drive attempt made at station. Core catcher was 50% full. Rainbow HC-like sheen on sidewalks at 4.6'. Sampled 58' off station around barge.

**Calculated Recovery**

- **Sample Length/Penetration Length:** 12.3' / 14.6' = 84%

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
### Sediment Core Log

**LDW SC-26 (R1)**

**Project:** LDW R1/FS  
**Project #:** PORSSI-18220-511  
**Client:** LDWG  
**Collection Date:** 2/22/06  
**Contractor:** MCS Environmental, Inc.  
**Vessel:** MCS Barge  
**Operator:** Gary Maxwell  

**Sediment Description**

Classification Scheme: USCS  
Contacts are recovered depth  
(In situ depth interval in feet with parentheses)

<table>
<thead>
<tr>
<th>Recovery Depth (ft)</th>
<th>Recovery Interval &amp; Sample</th>
<th>Recovery Interval</th>
<th>Chemical Analysis</th>
<th>PIC</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>75% (5-7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>7</td>
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<td>9</td>
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<td>11</td>
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<td>13</td>
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<td>15</td>
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<tr>
<td>36</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

- **SW:** (6.6-7.7) [moist, dense] black (2.5Y, 2.5/1) SAND, few gravel. Sand is medium and multicolored (orange, red, white). Gravel is subangular and 1/4" diameter. Few seams of black SILT with wood fragments and rootlets. Strong HC-like odor and sheen on sand and gravel.

- **GP:** (7.7-9.1) moist, dense, black (2.5Y, 2.5/1) SANDY GRAVEL. Gravel is mostly subangular conglomerate with scattered 1/2 mm orange flecks (anthropogenic) attached. Large gravels have HC-like sheen. Scattered debris.  
  @ 7.6" L loliated chips (possibly paint)  
  @ 7.8" L amber glass

- **SP-SC:** (9.1-13.1) [moist, medium dense] black (2.5Y, 2.5/1) medium SAND interbedded with layers of [medium stiff,] black SILT and scattered pockets of olive-gray SILT, little clay. Few 2" thick layers of black SILT. Scattered debris.  
  @ 9.4" bronze/bass 3/8" nut

- **SP-SM:** (13.1-14.6) moist, medium dense, very dark greenish-gray (G10Y 3/1) fine SAND with pockets

**Comments**

- Transitional Contact  
- @ 6.5' TV = 0.0 kg/cm²
- Bag @ 7.6' (1' chips)
- Sharp Contact  
- @ 9.0' TV = 0.7 kg/cm²
- Bag @ 10.6' (1' plastic strips and metal clamp)

**In-situ Depth (ft)**

- 6.5' TV = 0.0 kg/cm²
- 7.6' TV = 0.0 kg/cm²
- 9.0' TV = 0.7 kg/cm²
- 10.6' TV = 0.0 kg/cm²

**Remarks:**

- Drive Notes: freetail (1.0'), easy (5.0'), moderate (14.8'). Penetration goal reached. One drive attempt made at station.  
- Core catcher was 50% full. Rainbow HC-like sheen on sidewalks at 4.6'. Sampled 58' off station around barge.

**Calculated Recovery**

Sample Length/Penetration Length:  
12.3'/14.6' = 84 %

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-26 (R1)

Project: LDW R/FS
Project #: PORSS-18220-511
Client: LDWG
Collection Date: 2/22/06
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell
Method/Tube ID: Diver Impact Core/4" sq Al
Log by: L. McKee

Water Body Type: Lower Duwamish Waterway
Water: Elevation (ft)/Tide: 18.7
Water Depth (ft): 35.4
Mudline Elevation (ft): -26
N/LAT: 284475 E/LONG: 1268157

Tube Length (ft): 16.1
Penetration Depth (ft): 14.6
Sample Quality: Good
Recovery in ft (%): 12.3 (84)
Process Date: 2/22/06
Process Method: Cut tube

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

Recovered
Depth (ft)
12
13
14

75%
(13-14.6)

Remarks:
Drive Notes: freefall (1.0'), easy (5.0'), moderate (14.6'),
penetration goal reached. One drive attempt made at station.
Core catcher was 50% full. Rainbow HC-like sheen on sidewalls at
4.6'. Sampled 58' off station around barge.

Calculated Recovery
Sample Length/Penetrations Length:
12.3' 14.6 = 84 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**LDW-SC-27 (R1)**

- **Project:** LDW Rl/Fs
- **Project #:** PORSS-18220-511
- **Client:** LDWG
- **Collection Date:** 2/14/06
- **Contractor:** MCS Environmental, Inc.
- **Operator:** Gary Maxwell
- **Vessel:** MCS barge
- **Water Body Type:** Lower Duwamish Waterway
- **Water Elevation (ft/Tide):** 6.8
- **Water Depth (ft):** 20.0
- **Mudline Elevation (ft):** -10.5
- **Horiz. Datum:** NAD83 N Vert. Datum: MLLW
- **Method/Tube ID:** Diver Impact Core/4" sq Al
- **Process Method:** Cut tube
- **Logged By:** L. McKee, N. Bacher
- **Penetration Depth (ft):** 11.2
- **Sample Quality:** Good
- **Tube Length (ft):** 16.1
- **Recovery in ft (%):** 9.5 (85)
- **Process Date:** 2/14/06

**Sediment Description**

Classification Scheme: USCS

Contacts are recovered depth (in-situ depth interval in feet with parentheses)

- **OL:** (0.0-4.5) wet, soft to medium stiff, black (GLEY 1, 2,5/N) grading to very dark greenish gray (GLEY 1, 3/5Y) ORGANIC SILT, few sand. Scattered shells, rootlets, and wood fragments up to 3" L and trace wood layers up to 5" thick. Moderate H2S-like odor. Silt becomes stiffer with depth.

- **SP- SM:** (4.6-6.1) moist, medium dense, very dark gray (10YR, 3/1) fine SAND, few silt interbedded with scattered convex layers of very dark grayish brown (2.5Y, 3/2) SILT, few sand, trace silt pockets, and trace subrounded gravel. SAND is multicolored (orange, red, white). Scattered wood fragments.

**In-situ**

- **Depth (ft):**
  - GT @ 0.9'
  - GT @ 1.0' TV = 0.3 kg/cm²
  - GT @ 2.5'
  - GT @ 3.0' TV = 0.6 kg/cm²
  - GT @ 5.5' TV = 0.7 kg/cm²
  - GT @ 6.5' TV = 0.6 kg/cm²

**Calculated Recovery**

Sample Length/Penetration Length: 9.5 / 11.2 = 85%

**Remarks:** Drive Notes: freefall (1.0'), moderates (5.0'), hard (11.2'), refusal (11.2'). One drive attempt made at station.

---

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
Sediment Core Log
LDW-SC-27 (R1)

Project: LDW RI/FS
Water Body Type: Lower Duwamish Waterway
Project #: PORSS-18220-511
Water Elevation (ft)/Tide: 6.8
Client: LDWG
Water Depth (ft): 20.0
Collection Date: 2/14/06
Mudline Elevation ('): -10.5
Contractor: MCS Environmental, Inc.
N/LAT: 204441  E/LONG: 1268518
Vessel: MCS barge
Operator: Gary Maxwell
Method/Tube ID: Diver Impact Core/4" sq Al
Logged By: L.McKee, N. Bacher

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

% Recovery

Chemical Analysis

PID Measurement

Recov Interval

Recover & Sample

Depth (ft)

7

8

9

10

11

73%
(7-10)

0

100%
(10-11.2)

0

End of core at 9.5'. Driven to refusal.

\@ 7.5' 1'' wood layer with substantial wood

\@ 8.8' TV = 0.6 kg/cm²

\@ 9.0' TV > 0.8 kg/cm²

Depositional Contact

Core catcher found @ 6.5''.

In-situ Depth (ft)

Comments for Recovered Depths & Graphic Log

In-situ

Depth (ft)

Calculations

Sample Length/Penetration Length:

9.5 / 11.2 = 85 %

Remark: Drive Notes: freefall (1.0'), moderate (5.0'), hard (11.2'), refusal (11.2'). One drive attempt made at station.

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
## Sediment Core Log

**Project:** LDW RI/FS  
**Water Body Type:** Lower Duwamish Waterway  
**Tube Length (ft):** 14.0

**Project #:** PORS5-18220-511  
**Water Elevation (ft)/Tide:** NA  
**Penetration Depth (ft):** 13.0

**Client:** LDWG  
**Water Depth (ft):** 38.5  
**Sample Quality:** Good

**Collection Date:** 2/24/06  
**Mudline Elevation (ft):** -30.6  
**Recovery in ft (%):** 12.6 (92)

**Contractor:** MSS  
**N/LAT:** 47.32.933  
**E/LONG:** 122 20.4721  
**Process Date:** 2/25/06

**Vessel:** R/V Nancy Anne  
**Horiz. Datum:** NAD 83 N  
**Vert. Datum:** MLLW  
**Process Method:** Cut tube

**Operator:** Bill Jaworski  
**Method/Tube ID:** Vibracorer/3.5" round Al  
**Logged By:** L.McKee, CBrackett

### Recovered Depth (ft) & Sample

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>% Recovery (Interval)</th>
<th>Chemical Analysis</th>
<th>PID</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
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<td>2</td>
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</tr>
<tr>
<td>3</td>
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</tr>
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<td>4</td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Sediment Description

- **Classification Scheme:** USCS
- **Contacts are recovered depth (in-situ depth interval in feet with parentheses)**

- OL: (0.0-0.6) wet, soft, brown (7.5YR, 4/3) ORGANIC SILT, few sand.
- OL: (0.6-5.8) moist, medium stiff, mottled black and very dark greenish gray (GLEY 1, 3/1) SILT, few sand and clay. Scattered rocklets, wood, worms, and shell fragments up to 3" L. Silt grades to stiff; texture is slightly compressible, uniform, masave, blocky, and of low plasticity.
- @ 5.1' subrounded gravel 1.5' L
- SAND BLAST GRIT: (5.8-12.8) wet, loose, black with metallic, shiny surface. Sand blast grit (80%) interbedded with 2" to 3" thick layers of wet, medium stiff, black (2.5Y, 2.5/1) SILT grading to very dark greenish gray (GLEY 1, 3/1) SILT, little clay. Sand blast grit is well sorted, coarse-grained, and has a metallic surface color and a moderate to strong MC-like odor. Scattered debris associated with sand blast grit.

### Comments for Recovered Depths & Graphic Log

- Transitional Contact
  - @ 1.0' TV = 0.1 kg/cm²
- @ 1.6' TV = 0.3 kg/cm²
- GT @ 2.0'
  - @ 3.1' TV = 0.4 kg/cm²
  - GT @ 3.5'
  - @ 5.0' TV = 1.2 kg/cm²
- Sharp Contact
  - Bag @ 6.5' (2" chips)

### Remarks

- **Drive Notes:** freefall (5.0'), easy (6.0'), very easy (9.0'), hard (11.0'), easy (13.0'), penetration goal reached. Five drive attempts made at station. Core catcher was intact and 100% full.
- **Rainbow sheen on sidewalks from 4.0' to 11.3'.**

### Calculated Recovery

- **Sample Length/Penetration Length:**
  - 11.9' / 13.0' = 92 %

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
# Sediment Core Log

**LDW-SC-28 (R5)**

**Project:** LDW RI/FS  |  **Water Body Type:** Lower Duwamish Waterway  |  **Tube Length:** 14.0 ft
**Project #:** PORS-18220-511  |  **Water Elevation (ft)/Tide:** NA  |  **Penetration Depth:** 13.0 ft
**Client:** LDWG  |  **Water Depth (ft):** 38.5  |  **Sample Quality:** Good
**Collection Date:** 2/24/06  |  **Mudline Elevation (ft):** -30.6  |  **Recovery in ft (%):** 12.6 (92)
**Contractor:** MSS  |  **N.LAT.: 47° 32.933**  |  **Process Date:** 2/25/06
**Vessel:** R/V Nancy Anne  |  **E.LONG.: 122° 20.4721**  |  **Process Method:** Cut tube
**Horiz. Datum:** NAD 83  |  **Vert. Datum:** MLLW  |  **Operator:** Bill Jaworski
**Logged By:** L.McKee, CBrackett

## Sediment Description

<table>
<thead>
<tr>
<th>Sediment Type</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.6' 2° foliated chips (possibly paint)</td>
<td>@ 5.6' TV = 0.4 kg/m²</td>
</tr>
<tr>
<td>6.25° anthropogenic conglomerates (asphalt-like) up to 0.3' l.</td>
<td>@ 6.5° Sheen Test: rainbow sheen florets and streaks up to 2' L.</td>
</tr>
<tr>
<td>6.5° 2° foliated red and green chips (possibly paint)</td>
<td>@ 8.0° TV = 0.1 kg/m²</td>
</tr>
<tr>
<td>8.3° 1° foliated red chips (possibly paint)</td>
<td>SP-SM: (12.8-13.0) damp, medium dense, very dark gray (GLEY 1, 3/N) fine SAND interbedded with moist, medium stiff, black SILT, little sand. Sand grains are multicolored (orange, red, white).</td>
</tr>
<tr>
<td>PCB, SVOC, Metals, Hg, TBT</td>
<td>Sharp Contact</td>
</tr>
<tr>
<td>End of core at 12.6'. Refusal reached with diver impact core at 7.0 feet. Station re-occupied with vibracore.</td>
<td></td>
</tr>
</tbody>
</table>

## Calculated Recovery

Sample Length/Penetration Length:
11.9' / 13.0' = 92% 

**Remarks:** Drive Notes: freefall (5.0'), easy (6.0'), very easy (9.0'), hard (11.0'), easy (13.0'), penetration goal reached. Five drive attempts made at station. Core catcher was intact and 100% full.

Rainbow sheen on sidewalls from 4.0' to 11.3'. u= upper alluvium

---

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**Project:** LDW RIFS  
**Project #:** PORSS-18220-511  
**Client:** LDWG  
**Collection Date:** 2/21/06  
** Contractor:** MCS Environmental, Inc.  
**Vessel:** MCS barge  
**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4" sq Al  
**Logged By:** L. McKee

### Sediment Description

**Classification Scheme:** USCS  
**Contacts are recovered depth**  
(In-situ depth interval in feet with parentheses)

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Recovery &amp; Sample</th>
<th>% Recovery (interval)</th>
<th>Chemical Analysis</th>
<th>PID Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>OL</td>
<td>100%</td>
<td>PCB SVOC Metals Hg Dioxins/ Furans</td>
<td></td>
</tr>
<tr>
<td>0.0-0.6</td>
<td>Wet to moist, soft, black (2.5Y, 2.5/1) ORGANIC SILT, few sand.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.6-1.8</td>
<td>ML</td>
<td>97% (0-5)</td>
<td>PCB SVOC Metals Hg Dioxins/ Furans</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Moist, soft, black (2.5Y, 2.5/1) SILT interbedded with 2&quot; thick layers of moist, dense, black, medium SAND and pockets of very dark greenish gray (GLEY 1, 3/1) SILT, little clay up to 1/2&quot; diameter. Sand grains are multicolored (orange, red, white).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.8-6.1</td>
<td>SP</td>
<td>32% (5-1)</td>
<td>PCB SVOC Metals Hg Dioxins/ Furans</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Moist, dense, black (2.5Y, 2.5/1) medium SAND. Sand grains are multicolored (orange, red, white).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.6</td>
<td>2.6 pockets of olive-gray clayey silt up to 1/2&quot; in diameter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.6</td>
<td>End of core at 3.6'. Driven to refusal.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Comments for Recovered Depths

- **In-situ Depth (ft) & Graphic Log:
- **Remarks:** Drive Notes: freefall (3.0'), hard (6.1'), refusal (6.1').  
  Two drive attempts made at station. Core catcher was 60% full.  
  No ternane measurements taken. Difficult intertidal access.

### Calculated Recovery

- **Sample Length/Penetration Length:** 3.6 / 6.1 = 59%

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
### Sediment Core Log

**LDW-SC-30 (R2)**

**Project:** LDW RIFS  
**Project #:** PORSS-18220-511  
**Client:** LDWG  
**Collection Date:** 2/14/06  
**Vessel:** MCS barge  
**Operator:** Gary Maxwell  

**Water Body Type:** Lower Duwamish Waterway  
**Water Elevation (ft)/Tide:** 3.5  
**Water Depth (ft):** 18  
**Mudline Elevation (ft):** -12.2  
**Contractor:** MCS Environmental, Inc.  
**N/LAT:** 203576  
**E/LONG:** 1258785  
**Horiz. Datum:** NAD 83 N Vert. Datum:** MLLW  
**Log:**  

#### Sediment Description

**Classification Scheme:** USCS  
**Contacts are recovered depth (in-situ depth interval in feet with parentheses)  
**Comments for Recovered Depths**

**Recovery (interval):**  
**Chemical Analysis:**  
**RQD:**  
**Measurement:**

<table>
<thead>
<tr>
<th>% Recovery</th>
<th>Sediment Description</th>
<th>Contacts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>88% (0-1)</td>
<td>SM: (0.0-0.2) wet, dense, very dark greenish gray (GLEY 1, 4/10Y) fine SAND, few silt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>97% (1-3)</td>
<td>SP: (0.2-2.7) moist, dense, black (2.5Y, 2.5/1) fine to medium SAND, few gravel, grading to fine to medium sand below 1.2 feet. Gravel is subrounded and up to 3.5&quot; in diameter with barnacle scars. Trace wood fragments up to 2&quot; L.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100% (3-5)</td>
<td>SP-SM: (2.7-3.4) moist, dense, dark gray (2.5Y, 4/1) fine to medium SAND with angular 3&quot; diameter pockets of moist, stiff, very dark greenish gray (GLEY 1, 4/10Y) SI. Sand grains are multicolored (orange, red, white, transitional unit).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>55% (5-6)</td>
<td>SP- SM: (3.4-6.9) moist, dense, black (2.5Y, 2/1) very fine SAND interbedded with layers of moist, stiff, dark grey (2.5Y, 4/1) SI, few sand. Sand is well sorted. Trace wood fragments less than 1&quot; L.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100% (6-6.9)</td>
<td>End of core at 5.9'. Driven to refusal.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:** Drive Notes: freefall (0.7'), easy (5.0'), moderate-hard (6.0'), hard (6.9'), refusal (6.9'). Two drive attempts made at station.  

**Calculated Recovery:**  
**Sample Length/Penetration Length:**  

```
5.9 / 6.9 = 86 %
```

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log  
LDW-SC-31 (R1)

<table>
<thead>
<tr>
<th>Depth Interval</th>
<th>Recovery</th>
<th>% Recovery</th>
<th>Chemical Analysis</th>
<th>Sediment Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0-0.7 ft</td>
<td>0</td>
<td>73%</td>
<td>PCB, SVOC, Metals, Hg, Pesticides</td>
<td>OL: (0.0-0.7) wet, soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand, Trace worms.</td>
<td>Transitional Contact GT @ 0.8'</td>
</tr>
<tr>
<td>1.0-1.2 ft</td>
<td>0</td>
<td>100%</td>
<td>PCB, SVOC, Metals, Hg, Pesticides</td>
<td>@ 2.3' trace subangular gravel up to 2&quot; L</td>
<td></td>
</tr>
<tr>
<td>2.0-3.4 ft</td>
<td>0</td>
<td>90%</td>
<td>PCB, SVOC, Metals, Hg, Pesticides</td>
<td>SM: (2.5-3.0) moist, dense, black SAND pocketed and layered with soft, black ORGANIC SILT. (transitional, unit)</td>
<td>GT @ 2.7' Sharp Contact</td>
</tr>
<tr>
<td>3.5-5.8 ft</td>
<td>0</td>
<td>80% to 50% (6.7-5.3)</td>
<td>PCB, SVOC, Metals, Hg, Pesticides</td>
<td>ML: (5.3-5.8) moist to damp, stiff, dark greenish gray (GLEY 1, 4/10Y) SILT, little clay and sand, trace subrounded gravel up to 1&quot; L.</td>
<td>Gradiational Contact</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SP: SM: (5.8-7.5) moist, dense, black (2.5Y, 2,5/1) SAND interbedded with 1&quot; thick convex layers of damp, stiff, dark greenish gray (GLEY 1, 4/10Y) CLAYEY SILT (alternating bands). Sand grains are multicolored (orange, red, white) and grade finer to basal contact.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bottom of core at 5.9'. Driven to refusal.</td>
<td></td>
</tr>
</tbody>
</table>

**Drive Notes:** 2.0', easy 6.0', moderate 7.0', hard 7.5', refusal 7.5'. One drive attempt made at station.

Core catcher was empty. Difficult core extraction.

**Calculated Recovery**

Sample Length/Penetration Length: 5.9 / 7.5 = 79%

**Remarks:**

ua = upper alluvium, fv = fluvial

---

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial investigation.*
Sediment Core Log
LDW-SC-32 (R1)

Project: LDW R/FS
Project #: PORSS-16220-511
Client: LDWG
Collection Date: 2/10/06
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft): 8.6
Water Depth (ft): 25.6
Mudline Elevation (ft): -17.2

Penetration Depth (ft): 12.7
Sample Quality: Good
Recovery in ft (%): 11.2 (88)
Process Date: 2/11/06
Process Method: Cut tube
Logged By: N. Bacher, A. Fitzpatrick

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

- OL: (0.0-0.4) wet, very soft, dark olive brown (2.5Y, 3/3) ORGANIC SILT, little sand.
- OL: (0.4-0.9) moist, medium stilt, black (2.5Y, 2.5/1) ORGANIC SILT, few sand. Trace twigs, rootlets, and worms.
- GP: (0.9-1.2) wet, loose, black (2.5Y, 2.5/1) GRAVEL, little silt and sand. Slight HC-like odor.
- MH: (1.2-3.1) wet, medium stilt, dark gray (2.5Y, 4/4) SILT, few to little clay, trace 1/2" diameter pockets of SAND. Sand pockets are slightly mottled and have thin black streaks. Trace twigs and rootlets. Trace to slight HC-like sheen florets up to 1/8" and moderate HC-like odor.
- @ 2.5` 1" diameter piece of gravel
- SM: (3.1-5.1) wet, medium dense, black (2.5Y, 2.5/1) medium SAND interbedded with dark olive brown (2.5Y, 3/3) SILT. Sand is multicolored (orange, red, white). Trace wood fragments up to 4" L. Slight HC-like sheen florets up to 1/8" and moderate HC-like odor.
- @ 4.8` end of sheen
- SP-SM: (5.1-7.2) moist, medium dense, very dark greenish gray (GLEY 1, 3/5GY) alternating 2" thick layers of SILT, SAND and silty SAND (banded). Trace rootlets and wood up to 2" L.
- @ 6.4` 2" diameter clast of hard, light gray clay

In-situ Depth (ft)
& Graphic Log

Remarks: Drive Notes: freefall (2.0'), easy (8.0'), moderate (10.0'), hard (12.7'), refusal (12.7'). One drive attempt made at station.

Calculated Recovery
Sample Length/Penetration Length:
11.2/12.7 = 88 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**LDW-SC-32 (R1)**

- **Project:** LDW R/FS
- **Project #:** PORS-18220-511
- **Client:** LDWG
- **Collection Date:** 2/10/06
- **Contractor:** MCS Environmental, Inc.
- **Vessel:** MCS barge
- **Operator:** Gary Maxwell
- **Method/Tube ID:** Diver Impact Core/4" sq Al

**Water Body Type:** Lower Duwamish Waterway

**Tube Length:** 16.1 ft

**Water Depth:** 25.6 ft

**Penetration Depth:** 12.7 ft

**Sample Quality:** Good

**Mudline Elevation:** -17.2 ft

**Recovery in ft:** 11.2 (88%)

**Horiz. Datum:** NAD 83
**Vert. Datum:** MLLW

**Process Method:** Cut tube

**Process Date:** 2/11/06

---

**Sediment Description**

Classification Scheme: USCS

Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

- **Depth (ft):**
  - Recovery Interval (Depth): 0.0 - 7.0
  - Recovery Interval (Sample): 0.0 - 7.0
  - Recovery Interval (Interp): 0.0 - 7.0
  - Recovery Interval (Micro): 0.0 - 7.0
  - Recovery Interval (VOC): 0.0 - 7.0
  - Recovery Interval (SVOC): 0.0 - 7.0

- **Percentage:**
  - 100% (7.0)
  - 89% (9.11)
  - 87% (11.11.8)
  - 73% (11.8 - 12.7)

- **PCB:** SVOC

---

**Comments for Recovered Depths**

- **0.0' TV = 0.9 kg/cm2 Transitional Contact**
- **9.1-10.0' fresh wood**
- **10.0' 1/8" diameter quartz grains to basal contact**
- **End of core at 11.2' Driven to refusal.**
- **Slumping @ 11.2' to end of core.**

---

**Remarks:** Drive Notes: freefall (2.0'), easy (8.0'), moderate (10.0'), hard (12.7'), refusal (12.7'). One drive attempt made at station.

**Calculated Recovery**

**Sample Length/Penetration Length:**

\[ \frac{11.2}{12.7} = 88 \% \]

---

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-33 (R2)

Project: LDW RI/F5
Water Body Type: Lower Duwamish Waterway

Project #: PORS5-18220-511
Water Elevation (ft/Tide): 8.4
Penetration Depth (ft): 13.1

Client: LDWG
Water Depth (ft): 24.1
Sample Quality: Good

Collection Date: 2/10/06
Mudline Elevation (ft): -14.7
Recovery in ft (%): 10.2 (78)

Contractor: MCS Environmental, Inc.

N/LAT: 202056
E/LONG: 1269267
Process Date: 2/11/06

Vessel: MCS barge
Process Method: Cut tube

Operator: Gary Maxwell
Method/Tube ID: Diver Impact Core/4" sq Al
Logged By: N.Bacher, A.Fitzpatrick

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

Depth (ft) Recover Interval % Recovery (Interval) Chemical Analysis FID Measurement

0 100% (0-0.6) PCB SVOC Metals Hg
0 100% (0.6-3) PCB SVOC Metals Hg
0 87% (3-6) PCB SVOC Metals Hg
0 78% (5-7) PCB SVOC Metals

OL: (0.0-0.3) wet, soft, dark greenish gray (GLEY 1, 4/1) ORGANIC SILT, little sand, trace clay and rootlets.

OH: (0.3-1.8) moist, medium stiff, black (GLEY 1, 2.5/N) ORGANIC SILT, little sand, trace worms.

@1.3': 5" layer of wet, medium dense, black, coarse SAND, little silt, trace gravel. Trace to moderate H2S-like odor and trace black sheen.

OL: (1.8-2.6) moist, medium stiff, very dark greenish gray (GLEY 1, 3/1) ORGANIC SILT, little clay and sand. Trace rootlets. Moderate H2S-like odor.

@1.4': pale yellow (5Y, 7/4) fibrous clast with strong H2S-like odor - clast disintegrates when rolled

ML/OH: (2.6-10.0) moist, medium stiff, black (2.5Y, 2.5/1) SILT to ORGANIC SILT, trace clay, sand, gravel, wood, and shell fragments. Trace 5" thick layers of silt, trace sand. Slight H2S-like odor. Trace debris (glass, metal).

@4.4-5.0': shiny layer of SAND with wood, abundant shell fragments, 1/2" angular debris (1/4" silver, shiny, metal chunk) and slight HC-like odor to 7.7'

@5.7': glass shard (top of soda bottle)

@6.0': no debris observed below 6.0'.

Transitional Contact

@0.9' TV = 0.6 kgf/cm2
@1.0' TV

Transitional Contact

Bag @ 1.9' (twine)

@2.5' TV = 0.5 kgf/cm2

GT @ 3.0'
Bag @ 3.2' (possible shell)

@5.0' TV = 0.6 kgf/cm2
Bag @ 3.5' (chunks)
Bag @ 3.6' (silver chunk)
Bag @ 5.7' (glass shard)

Calculated Recovery
Sample Length/Depth (ft)
10.2/13.1 = 78 %

The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134-1162
Phone: (206) 624-3499
Fax: (206) 624-2639

Remarks: Drive Notes: freefall (0.6'), easy (9.0'), moderate (13.1'), penetration goal reached. Two drive attempts made at station. Core catcher was empty. Core tip smashed and side walls scored.

Field replicate is SC-201.

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log

**LDW-SC-33 (R2)**

**Project:** LDW RI/FS  
**Water Body Type:** Lower Duwamish Waterway  
**Tube Length (ft):** 16.1

**Project #:** PORS5-18220-511  
**Water Elevation (ft)/Tide:** 8.4  
**Penetration Depth (ft):** 13.1

**Client:** LDWG  
**Water Depth (ft):** 24.1  
**Sample Quality:** Good

**Collection Date:** 2/10/06  
**Mudline Elevation (ft):** -14.7  
**Recovery in ft (%):** 10.2 (78)

**Contractor:** MCS Environmental, Inc.  
**N/LAT:** 202056  
**E/LONG:** 1269267

**Vessel:** MCS barge  
**Horiz. Datum:** NAD 83  
**Vert. Datum:** MLLW

**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4” sq Al  
**Process Date:** 2/11/06

**Logged By:** N. Becher, A. Fitzpatrick

---

**Sediment Description**

- Classification Scheme: USCS
- Contacts are recovered depth
- (In-situ depth interval in feet with parentheses)

**Comments**

- In-situ Depth (ft)
- & Graphic Log

---

**Recovered Depth (ft):**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Recovery Interval</th>
<th>% Recovery (Interval)</th>
<th>Chemical Analysis</th>
<th>PID Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>81%</td>
<td>(7-9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>PCB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>70%</td>
<td>(8-11)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>45%</td>
<td>(11-13.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SM:** (10-13.1) moist, medium dense, dark grayish brown (2.5Y, 4/2) SAND, little silt, grading to trace silt below 9.5 feet. Sand grains are multicolored (orange, red, white) and well sorted. Scattered rootlets (transitional unit to lower alluvium).

**End of core at 10.2’:**

**Transient Contact**

- @ 9.0’ TV = 0.1 kg/cm2

**Sampled to 10.0’:**

**Core catcher was empty. Core tip smashed and side walls scored.**

---

**Remarks:**

- Drive Notes: freefall (0.6’), easy (9.0’), moderate (13.1’).
- Penetration goal reached. Two drive attempts made at station.

**Calculated Recovery**

- Sample Length/Penetration Length: 15.2/13.1 = 78 %

**Field replicate is SC-201.**

---

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
## Sediment Core Log
### LDW-SC-34 (R2)

**Project:** LDW RI/FS  
**Water Body Type:** Lower Duwamish Waterway  
**Tube Length (ft):** 16.1

**Project #:** PORSS-18220-511  
**Water Elevation (ft)/Tide:** 9.1  
**Penetration Depth (ft):** 12.2

**Client:** LDWG  
**Water Depth:** 23.7  
**Sample Quality: Good**

**Collection Date:** 2/17/06  
**Mudline Elevation (ft):** -14.5  
**Recovery in ft (%):** 9.3 (76)

**Contractor:** MCS Environmental, Inc.  
**N/LAT:** 202014  
**E/LONG:** 1268831  
**Process Date:** 2/18/06

**Vessel:** MCS barge  
**Horiz. Datum:** NAD 83 N  
**Vert. Datum:** MLLW

**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver impact Core/4" sq Al  
**Logged By:** A. Fitzpatrick, C. Brackett

### Sediment Description
**Classification Scheme:** USCS  
**Contacts are recovered depth**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Recov Interval &amp; Sample</th>
<th>% Recovery (Interval)</th>
<th>Chemical Analysis</th>
<th>PID</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2</td>
<td>72% PCB SVOC Metals Hg Pesticides</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01% PCB SVOC Metals Hg Pesticides</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 6-12      | 100% PCB SVOC Metals Hg Pesticides | 0 | ML: (0.0-0.7) wet, medium stiff, dark olive brown (2.5Y, 3/3) SILT, little gravel, trace sand. Substantial wood fragments.  
OL: (0.7-3.0) moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT with substantial organic matter (twigs, leaves, stems, pine needles, shredded wood, wood fragments). Silt texture is slightly compressible, uniform, with moderate to low plasticity, and grading to unit below. Trace debris.  
@ 1.3" plastic zip-tie |
| 13-18     |                         |                       |                   |     |             |
| 0         |                         |                       |                   |     |             |
| 19-22     |                         |                       |                   |     |             |
| 0         |                         |                       |                   |     |             |
| 23-25     |                         |                       |                   |     |             |
| 0         |                         |                       |                   |     |             |
| 26-30     |                         |                       |                   |     |             |
| 0         |                         |                       |                   |     |             |
| 31-36     |                         |                       |                   |     |             |
| 0         |                         |                       |                   |     |             |
| 37-42     |                         |                       |                   |     |             |
| 0         |                         |                       |                   |     |             |
| 43-47     |                         |                       |                   |     |             |
| 0         |                         |                       |                   |     |             |
| 48-52     |                         |                       |                   |     |             |
| 0         |                         |                       |                   |     |             |
| 53-60     |                         |                       |                   |     |             |
| 0         |                         |                       |                   |     |             |

**Remarks:** Drive Notes: freefall (1.5'), easy (12.2'), penetration goal reached. Two drive attempts made at station. Core catcher was 100% full. No torvane or geotechnical samples taken due to frozen core. Field replicate of SC-203.

**Calculated Recovery**  
Sample Length/Penetration Length:  
9.3 / 12.2 = 76 %

### Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
### Sediment Core Log

**Project**: LDW RI/FS  |  **Water Body Type**: Lower Duwamish Waterway  |  **Tube Length (ft)**: 16.1
**Project #:** PORS5-18220-511  |  **Water Elevation (ft)/Tide**: 9.1  |  **Penetration Depth (ft)**: 12.2
**Client**: LDWG  |  **Water Depth (ft)**: 23.7  |  **Sample Quality**: Good
**Collection Date**: 2/17/06  |  **Mudline Elevation (ft)**: -14.5  |  **Recovery in ft (%): 9.3 (76)**
**Contractor**: MCS Environmental, Inc.  |  **N/LAT**: 202014  |  **Process Date**: 2/18/06
**Vessel**: MCS barge  |  **E/LONG**: 1268831  |  **Process Method**: Cut tube
**Operator**: Gary Maxwell  |  **Horiz. Datum**: NAD 83 N  |  **logged By**: A. Fitzpatrick, C. Brackett
**Method/Tube ID**: Diver Impact Core/44 sq Al  |  **Vert. Datum**: MLLW

### Sediment Description

- **Classification Scheme**: USCS
- **Contacts are recovered depth**
- **In-situ depth interval in feet with parentheses**

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>Recov Interval &amp; Sample</th>
<th>% Recovery (interval)</th>
<th>Chemical Analysis</th>
<th>PL Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>60% (7-9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>75% (8-10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>37% (10-11)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>54% (11-12.2)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SILT and scattered hard clay clasts. Sand is multicolored (orange, red, white) with quartz grains, slightly mottled. Trace debris (brick, glass).**

**GP (11.3-12.2) damp, dense, very dark greenish gray (GLEY 1, 2/1) SANDY GRAVEL with trace silt, light gray, silt clasts up to 2". Gravel is angular and up to 2" in diameter.**

**End of core at 9.3".**

**Note**: Chemistry interval recorded as 9.4 ft, but sample was collected at bottom of core at 9.3 ft. Graphic expresses depth of sample collection; sample name matches project nomenclature.

### Comments

- **In-situ Depth (ft) & Graphic Log**
  - Bag @ 7.9' (small brick fragment)
  - Bag @ 8.7' (amber glass shard)
  - Sharp Contact

### Remarks

- **Drive Notes**: freefall (1.5'), easy (12.2'), penetration goal reached. Two drive attempts made at station. Core catcher was 100% full. No terrane or geotechnical samples taken due to frozen core. Field replicate of SC-203.

### Calculated Recovery

- **Sample Length/Penetration Length**: 9.3 / 12.2 = 76%

---

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
**Sediment Core Log**

**Project:** LDW RI/FS  
**Project #:** PORSS-18220-511  
**Client:** LDWG  
**Collection Date:** 2/14/06  
**Contractor:** MCS Environmental, Inc.  
**Operator:** Gary Maxwell  

**Water Body Type:** Lower Duwamish Waterway  
**Water Elevation (ft)/Tide:** 6.7  
**Water Depth (ft):** 21.2  
**Mudline Elevation (ft):** -13.8  
**Sample Quality:** Good  
**Recovery in ft (%):** 8.3 (81)  
**Process Date:** 2/15/06  
**Process Method:** Cut tube  
**Logged By:** L. McKee, A. Fitzpatrick

**Sediment Description**

Classification Scheme: USGS  
Contacts are recovered depth (in-situ depth interval in feet with parentheses)

- **0**: OL: (0.0-0.7) wet, soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand.

- **0**: OL: (0.7-4.2) moist, soft, black (2.5Y, 2.5/1) ORGANIC SILT, little clay, trace pockets of SILT. Silt texture is slightly compressible, blocky, uniform, and of low plasticity. Scattered worms, rootlets, and wood fragments up to 2”. Slight H2S-like odor toward basal contact.

- **0**: ML: (4.2-5.9) moist, medium silt, black (2.5Y, 2.5/1) SILT, few sand, 1/2” layers and pockets of gray (2.5Y, 5/1) SILT, little clay. Slight H2S-like odor.

- **0**: SP: (5.5-10.2) [moist, dense], very dark greenish gray (GLEY 1, 3/1) fine SAND, trace gravel and 2” thick convex layers of olive gray silt. Sand grains are multicolored (orange, red, white); gravel is subrounded to subangular and is up to 2” L. Trace debris (concrete). @ 5.3’ to 5.9’ concrete fragments

**Remarks:** Drive Notes: freefall (0.8’), easy (3.7’), moderate (8.0’), hard (10.2’), refusal (10.2’). Two drive attempts made at this station. Core tip crushed, but full.

**Calculated Recovery**

Sample Length/Penetration Length: 8.3 / 10.2 = 81%

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**LDW-SC-35 (R2)**

- **Project**: LDW RI/FS
- **Water Body Type**: Lower Duwamish Waterway
- **Water Elevation (ft)**: 6.7
- **Penetration Depth (ft)**: 10.2
- **Tube Length (ft)**: 15.1
- **Client**: LDWG
- **Water Depth (ft)**: 21.2
- **Sample Quality**: Good
- **Collection Date**: 2/14/06
- **Mudline Elevation (ft)**: -13.8
- **Recovery in ft (%)**: 83 (81)
- **Contractor**: MCS Environmental, Inc.
- **N.LAT**: 201602
- **E.LONG**: 1269250
- **Process Date**: 2/15/06
- **Vessel**: MCS barge
- **Horiz. Datum**: NAD 83 N Vert. Datum: MLLW
- **Process Method**: Cut tube
- **Operator**: Gary Maxwell
- **Method/Tube ID**: Diver Impact Core/4" sq Al
- **Logged By**: L.McKee, A.Fitzpatrick

### Sediment Description

- Classification Scheme: USCS
- Contacts are recovered depth
- (In-situ depth interval in feet with parentheses)

### Comments

- **In-situ Depth (ft)**
- **Depth for Recovered Depths**
- **& Graphic Log**

### In Situ

- **End of core at 8.3'**. Driven to refusal.
- **Samples to 8.0'**

### Calculated Recovery

- **Sample Length/Penetration Length**:
  - **3.3 / 10.2 = 81 %**

**Remarks**:

- Drive Notes: freefall (0.8'), easy (3.7'), moderate (8.0'), hard (10.2'), refusal (10.2'). Two drive attempts made at this station.
- Core tip crushed, but full.

---

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
Sediment Core Log
LDW-SC-36 (R1)

Project: LDW RI/FS
Project #: PORS-18220-511
Client: LDWG
Collection Date: 2/15/06
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell

Water Body Type: Lower Duwamish Waterway
Water Depth (ft): 17.4
Water Elevation (ft)/Tide: 2.9

Tube Length (ft): 16.1
Penetration Depth (ft): 12.3
Sample Quality: Good
Recovery in ft (%): 10.2 (83)
Process Date: 2/16/06
Process Method: Cut tube
Logged By: L.McKee, A.Fitzpatrick

Method/Tube ID: Diver Impact Core/4" sq Al

Sediment Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

Comments for Recovered Depths
In-situ Depth (ft)

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>% Recovery</th>
<th>Sediment Analysis</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>100% PCB</td>
<td>OL: (0.0-0.4) wet, soft, olive brown (2.5Y, 4/0) ORGANIC SILT, few sand, trace worms.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>85% PCB</td>
<td>OL: (0.4-3.6) wet, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT. Scattered wood fragments up to 2&quot; L, small shell fragments, and rootlets decreasing with depth. Silt texture is slightly compressible, blocky, massive, and of low plasticity. Slight H2S-like odor.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>84% PCB</td>
<td>Ø 2.0' 1/2' thick layer of medium sand</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>83% PCB</td>
<td>ML: (3.0-6.2) wet, medium stiff, dark greenish gray (GLEY 1, 4/10Y) SILT, little sand, interbedded with 3&quot; thick layers of greenish black (GLEY 1, 4/10Y) ORGANIC SILT (banded), scattered rootlets and twigs. (transitional unit)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Ø 4.9' whole clam shell 1&quot; L</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>MH: (6.0-9.8) moist to wet, medium stiff, dark greenish gray (GLEY 1, 4/10Y), SILT. Silt texture is homogenous. Scattered rootlets.</td>
<td></td>
</tr>
</tbody>
</table>

Calculated Recovery
Sample Length/Penetration Length: 10.2/12.3 = 83 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.

Drive Notes: freefall (0.4'), easy (3.0'), moderate (11.0'), hard (12.3'), refusal (12.3'). One drive attempt made at station. Core catcher was 50% full. Field replicate of SC-202.
# Sediment Core Log

**Project:** LDW RI/FS  
**Project #:** PORS5-18220-511  
**Client:** LDWG  
**Collection Date:** 2/15/06  
**Contractor:** MCS Environmental, Inc.  
**Vessel:** MCS barge  
**Operator:** Gary Maxwell  
**Horiz. Datum:** NAD 83 N  
**Vert. Datum:** MLLW  
**Method/Tube ID:** Diver Impact Core/4'' sq Al  
**Process Date:** 2/16/06  
**Logged By:** L.McKee, A.Fitzpatrick

### Sediment Description

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Recovery &amp; Sample %</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>$7.4'' 5''$ thick layer of black SILT, few clay</td>
</tr>
<tr>
<td>8.5</td>
<td>85% (9-10)</td>
<td>SP-SM: (9.8-12.3) moist to damp, [dense], very dark greenish gray (GLEY 1, 3/1) fine SAND with uniform 1'' thick layers of alternating very fine SAND, little silt and SILT. Banded layers are slightly convex. Sand grains are multi-colored (red, white, orange) and grade to medium sand at basal contact. Trace wood fragments up to 3''.</td>
</tr>
<tr>
<td>9.5</td>
<td>69% (9-11)</td>
<td>End of core at 10.2'. Driven to refusal.</td>
</tr>
<tr>
<td>11.5</td>
<td>75% (11-12.3)</td>
<td>Slight winnowing from 10.5-10.2'. Sampled to 10.0.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Calculated Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Length/ penetrated Length: 10.2'/12.3' = 83%</td>
</tr>
</tbody>
</table>

**Water Body Type:** Lower Duwamish Waterway  
**Water Elevation (ft/Tide):** 2.9  
**Water Depth (ft):** 17.4  
**Mudline Elevation (ft):** -12.3  
**Tubo Length (ft):** 16.1  
**Penetration Depth (ft):** 12.3  
**Sample Quality:** Good  
**Recovery in %:** 10.2 (83)  

**In-situ Depth (ft) & Graphic Log**

**Remarks:** Drive Notes: freefall (0.4'), easy (3.0'), moderate (11.5'), hard (12.3'), refusal (12.3'). One drive attempt made at station.  
Core catcher was 50% full. Field replicate of SC-202.

---

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
Sediment Core Log

LDW-SC-37 (R1)

Project: LDW R1/FS
Water Body Type: Lower Duwamish Waterway

Project #: PORSS-19220-511
Water Elevation (ft/Tide): 8.2

Client: LDW
Water Depth (ft): 19.8

Collection Date: 2/22/06
Mudline Elevation (ft): -11.4

Contractor: MCS Environmental, Inc.
Recovery in ft (%): 6.5 (80)

Vessel: MCS barge
Process Date: 2/22/06

Operator: Gary Maxwell
Process Method: Cut tube

Logged By: L. McKee

Recover
Depth (ft) Recov Interval % Recovery Chemical Analysis P.I.D Measurement

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

Comments for Recovered Depths & Graphic Log

OL: (0.0-0.3) wet, soft, olive brown (2.5Y, 4/3)
ORGANIC SILT, few sand.

OL: (0.3-3.2) moist, medium stiff, black (2.5Y, 2.5/1)
ORGANIC SILT, few layers of olive gray silt, little clay and black fine to medium sand, little silt. Silt
texture is slightly compressible, [massive, blocky], and of low plasticity. Trace debris and scattered
wood fragments.

ML: (3.2-6.3) moist, medium stiff, black (2.5Y, 2.5/1)
SILT, layers of moist, dense, black, fine sand and trace 2" L of SILT, little clay. Abundant black
conglomerates up to 2" L (anthropogenic, asphaltic-like; 35%). Moderate metallic and rainbow sheen
florets up to 1" L and moderate HC-like odor associated with sand from 3.0' to 5.3'. Trace wood
fragments up to 3' L (10%).

Transition Contact

GT @ 0.4'

Bag @ 1.5' (copper wire)

GT @ 2.2'

ML: (2.5-2.5) moist, medium dense, black (2.5Y, 2.5/1) SAND, few 1" L green-gray silt clasts. Sand
grains are multi-colored (red, white, orange).

### Calculated Recovery

Sample Length/Penetration Length: 6.9 / 8.6 = 80%
### Sediment Core Log

**LDW-SC-37 (R1)**

<table>
<thead>
<tr>
<th>Project: LDW RI/FS</th>
<th>Water Body Type: Lower Duwamish Waterway</th>
<th>Tube Length (ft): 16.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project #: POR55-18220-511</td>
<td>Water Elevation (ft)/Tide: 8.2</td>
<td>Penetration Depth (ft): 8.6</td>
</tr>
<tr>
<td>Client: LDWG</td>
<td>Water Depth (ft): 19.8</td>
<td>Sample Quality: Good</td>
</tr>
<tr>
<td>Collection Date: 2/22/06</td>
<td>Mudline Elevation (ft): -11.4</td>
<td>Recovery in ft (%): 6.9 (80)</td>
</tr>
<tr>
<td>Contractor: MCS Environmental, Inc.</td>
<td>N.LAT: 201435 E.LONG: 1270690</td>
<td>Process Date: 2/22/06</td>
</tr>
<tr>
<td>Operator: Gary Maxwell</td>
<td>Method/Tube ID: Diver Impact Core/4&quot; sq Al</td>
<td>Logged By: L. McKea</td>
</tr>
</tbody>
</table>

#### Sediment Description

**Classification Scheme:** USCS  
**Contacts are recovered depth (in-situ depth interval in feet with parentheses)**

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>Recovery Interval &amp; Sample</th>
<th>% Recovery (Interval)</th>
<th>Chemical Analysis</th>
<th>PID Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.9 - 8.8</td>
<td>75% (6.9 - 8.8)</td>
<td>0</td>
<td>PCB SVOC Metals</td>
<td></td>
</tr>
</tbody>
</table>

- End of core at 6.9'. Driven to refusal.
- Lower alluvium
- rainbow sheen florets along sidewalls from 0.5' to 4.0' up to 1/2" diameter.

#### Remarks:

- Drive Notes: freefall (1.4'), easy (3.0'), moderate (6.5').
- One drive attempt made at station. Core catcher was 100% full. Steep slope and pier pilings in area. Scattered
- Calculated Recovery: Sample Length/Penetration Length: 6.9 / 8.6 = 80 %

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-38 (R1/R2)

Project: LDW R1/FS  Water Body Type: Lower Duwamish Waterway
Project #: PORSS-18220-511  Water Elevation (ft)/Tide: 9.8
Client: LDWG  Water Depth (ft): 6.6
Collection Date: 2/20/06  Penetration Depth (ft): 5.6
Mudline Elevation (ft): +3.4  Sample Quality: Good

Contractor: MCS Environmental, Inc.  Recovery in ft (%): 3.8 (68)
N/LAT: 209559  Process Date: 2/21/06
E/LONG: 1269745  Process Method: Cut tube

Operator: Gary Maxwell  Logged By: L.McKee, A.Fitzpatrick
Method/Tube ID: Diver Impact Core/4" sq Al

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

OL: (0.0-1.2) wet, medium stiff, mottled black (2.5Y, 2.5/1) SILT. Trace wood fragments up to 4" L. Silt texture is slightly compressible and of low plasticity. Slight HS-like odor.

ML: (1.2-2.5) wet, medium stiff, dark brown (7.5Y, 2/2) SILT, "1"" thick layer of fine sand. Silt is slightly jumbled and grades to black. Trace wood fragments and rootlets up to 1.5" L.

ML: (2.5-3.8) wet, medium stiff, black (2.5Y, 2.5/1) SILT, scattered seams of medium sand from 1/8" to 1/2" thick. Moderate to heavy HG-like rainbow sheen and odor concentrated in sand seams. Greasy texture.

SP: (3.8-5.6) wet, loose, very dark greenish gray (GLEY 1, 3/1) medium SAND, trace 1/2" diameter silt pockets and scattered wood fragments up to 1" L. Sand is well sorted.

End of R1 core at 3.1'. Driven to refusal at 4.5'.
End of R2 core at 3.8'. Driven to refusal at 5.6'.
Sample 3-3.3' collected from R2.
Other samples from R1, collected closer to shore.

GT @ 0.3'
- 0.5 TV = 0.1 kg/cm²

Transitional Contact
- 1.5 TV = 1.1 kg/cm²

2.0' to 3.0' Sheen Test = heavy rainbow sheen (100%)
- 2.5 TV = 0.7 kg/cm²

Sharp Contact

Core 20% winnowed below 3.3'. Not sampled below 3.3'.

Remarks: Drive Notes: no fresfall, easy (3'), moderate (4'), hard (5.6'), refusal (5.6'). Two drive attempts made at station. Core tip crushed.

Calculated Recovery

Core is combined: 0-3' (R1) and 3-3.8' (R2). Header notes are from R2.
Sample Length/Penetration Length:
3.8 / 5.6 = 68 %

R1 is from 1st Ave Bridge and R2 from 20' further downslope; tagged sand unit.

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-39 (R1)

Recovery Interval % Recovery Chemical Analysis PID Measurement

Recovered Depth (ft) 100% PCB SVOC Metals Hg Pesticides TBT Dioxins Furans

1 100% (0-1) OL: (0.0-0.4) very wet, very soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand.

2 82% (1-3)

3 82% (3-5) SM: (2.5-3.9) moist, dense, very dark greenish gray (GLEY 1, 3/1) medium SAND, little gravel, scattered interbeds of moist, stiff, black (2.5Y, 2.5/1) ORGANIC SILT, trace clay. Silt texture is slightly compressible, blocky, massive, and of low plasticity. Trace shell fragments, (transitional unit)

4 72% (5-9) OL: (3.9-7.5) moist, stiff, black (2.5Y, 2.5/1) ORGANIC SILT. Silt texture is uniform, slightly compressible, blocky, massive, and of low plasticity. Trace rootlets and wood fragments up to 5" L.

5 ML: (7.5-10.3) moist, stiff, dark greenish gray (GLEY 1, 4/10/1) SILT, scattered 1" thick interbeds of moist, dense, black (2.5Y, 2.5/1) fine to medium

Notes:
- Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
- Drive Notes: no freefall, easy (1.0'), moderate (9.0'), hard (12.4'), penetration goal reached. One drive attempt made at station.
- Core catcher was 100% full. Difficult core extraction. No torvane measurements taken.

Calculated Recovery
9.2 / 12.4 = 74 %
# Sediment Core Log
LDW-SC-39 (R1)

- **Project:** LDW RF/FS
- **Water Body Type:** Lower Duwamish Waterway
- **Tube Length (ft):** 16.1
- **Penetration Depth (ft):** 12.4
- **Client:** LDWG
- **Water Elevation (ft)/ Tide:** 5.3
- **Sample Quality:** Good
- **Collection Date:** 2/15/06
- **Water Depth (ft):** 9.8
- **Recovery in ft (%):** 9.2 (74)
- **Contractor:** MCS Environmental, Inc.
- **Mudline Elevation (ft):** -5
- **Process Date:** 2/16/06
- **Vessel:** MCS barge
- **Horiz. Datum:** NAD 83 N
- **Vert. Datum:** MLLW
- **Process Method:** Cut tube
- **Operator:** Gary Maxwell
- **Method/Tube ID:** Diver Impact Core
- **Logged By:** L. McKee

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Recovered Depth</th>
<th>% Recovery</th>
<th>Chemical Analysis</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SAND, Trace wood fragments up to 7&quot; L.</td>
<td>0</td>
<td>SP-SM: (10,3-12,4) moist, dense, very dark greenish gray (GLEY 1, 43/1) fine to medium SAND with alternating (banded) layers of very fine SAND, few silt and SILT.</td>
<td>End of core at 9.2'</td>
</tr>
<tr>
<td>3-6</td>
<td>Transitional Contact</td>
<td>71% (9-10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Widthing @ 9.2 to 9.3'</td>
<td>74% (10-12.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:** Drive Notes: no freefall, easy (1'), moderate (9.8'), hard (12.4'), penetration goal reached. One drive attempt made at station. Core catcher was 100% full. Difficult core extraction. No torvane measurements taken.

**Calculated Recovery**
Sample Length/Penetration Length: 9.2 / 12.4 = 74 %

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
# Sediment Core Log

**Project:** LDW RI/FS  
**Project #:** PORS5-18220-511  
**Client:** LDWG  
**Collection Date:** 2/23/06  
**Contractor:** MSS  
**Vessel:** R/V Nancy Anne  
**Operator:** Bill Jaworski  
**Method/Tube ID:** Vibracore/3.5" round Al  
**Logged By:** L. McKee, C. Brackett

<table>
<thead>
<tr>
<th>Recovery Depth (ft)</th>
<th>Recov Interval &amp; Sample</th>
<th>% Recovery (interval)</th>
<th>Chemical Analysis</th>
<th>RMD Measurement</th>
<th>Sediment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SP: (0.0-0.5) damp, medium dense, brown (7.5YR, 4/2) medium SAND. Sand grains are multicolored (orange, red, white).</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td>77% (0.13)</td>
<td></td>
<td></td>
<td>OL: (0.5-1.7) moist, soft, black (2.5YR, 2.5/1) ORGANIC SILT, little sand layers (2&quot;) alternating with layers (3&quot;) of moist, medium stiff, dark gray (GLEY 1, 4/N) SILT, few sand. Organic silt has scattered shell and wood fragments up to 1/2&quot; L. Grades to sand at basal contact.</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SW: (1.7-13.0) moist, medium dense, brown (7.5YR, 4/2) medium to coarse SAND. Sand grains are multicolored (orange, red, white) and coarsen towards basal contact (from 6.0&quot; to 10.0&quot;). Slight H2S-like odor from 4&quot; to 8&quot;. @ 1.5&quot; to 1.8&quot;: layer of SAND, little subrounded gravel up to 1/2&quot; L. Scattered brick fragments up to 1&quot; L.</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 4.4' color changes to very dark gray sand</td>
</tr>
</tbody>
</table>

**Water Body Type:** Lower Duwamish Waterway  
**Water Elevation (ft/Tide):** NA  
**Water Depth (ft):** 10.4  
**Mudline Elevation (ft):** -1.0  
**Sample Quality:** Good  
**Penetration Depth (ft):** 13.0  
**Penetration Depth in ft (%):** 10.0 (77)  
**Process Date:** 2/24/06  
**Process Method:** Cut tube

**Remarks:** Drive Notes: no freefall, easy (13.0'), penetration goal reached. Three drive attempts made at station. Station re-occupied with vibracore after MCS drives. Core catcher was empty (0.5' sediment loss).

**Calculated Recovery:** Sample Length/Penetration Length:  
10.0'/13.0' = 77 %

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-40 (R3)

Project: LDW RI/FS
Water Body Type: Lower Duwamish Waterway
Tube Length (ft): 14.0

Project #: POR65-18220-511
Water Elevation (ft)/Tide: NA
Penetration Depth (ft): 13.0

Client: LDWG
Water Depth (ft): 10.4
Sample Quality: Good

Collection Date: 2/23/06
Mudline Elevation (ft): -1.0
Recovery in ft (%): 10.0 (77)

Contractor: MSS
N/LAT: 200339
E/LONG: 1276298
Process Date: 2/24/06

Vessel: R/V Nancy Anne
Process Method: Cut tube

Operator: Bill Jaworski
Method/Tube ID: Vibracore/3.5" round Al
Logged By: L. McKee, C. Brackett

Recovered Depth (ft)

<table>
<thead>
<tr>
<th>Layer</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Lower alluvium</td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>

End of core at 10.0'.

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

Comments
for Recovered Depths

In-situ Depth (ft)
& Graphic Log

Remarks: Drive Notes: no freefall, easy (13.0'), penetration goal reached. Three drive attempts made at station. Station re-occupied with vibracore after MCS drives. Core catcher was empty (0.5' sediment loss).

Calculated Recovery
Sample Length/Penetration Length:

10.0'/13.0' = 77%

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
# Sediment Core Log

**LDW-SC-41 (R1)**

- **Project:** LDW RI/FS
- **Water Body Type:** Lower Duwamish Waterway
- **Water Elevation (ft/Tide):** 8.9
- **Water Depth (ft):** 15.6
- **Mudline Elevation (ft):** -5.5
- **Penetration Depth (ft):** 11.6
- **Period of Record:** 2/20/06
- **Sample Quality:** Good
- **Name LAT:** 200294
- **E./LONG:** 1271170
- **Process Date:** 2/21/06
- **Process Method:** Cut tube
- **Operator:** Gary Maxwell
- **Method/Tube ID:** Diver Impact Core/4" sq Al
- **Logged By:** L.McKee
- **Tube Length (ft):** 16.1

## Sediment Description

<table>
<thead>
<tr>
<th>% Recovery</th>
<th>Chemical</th>
<th>PID</th>
<th>Measurement</th>
<th>Sediment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>83% (0-1)</td>
<td>PCB SVOC</td>
<td>0</td>
<td>OL: (0.0-0.6) very wet, very soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand.</td>
<td></td>
</tr>
<tr>
<td>100% (1-3)</td>
<td>PCB SVOC Metals Hg Dioxins Furans</td>
<td>0</td>
<td>OL: (0.6-7.9) moist, soft to medium stiff, black (2.5Y, 2/1) ORGANIC SILT, few sand, interbedded with trace 1&quot; to 3&quot; thick layers of moist, soft, very dark greenish gray (GLEY 1, 3/1) SILT, little clay. Organic soil texture is uniform, slightly compressible, massive, blocky, and of low plasticity. Scattered rootlets, wood fragments up to 4&quot; L, and trace shell fragments up to 1/2&quot; L. Scattered 1/2&quot; L sheen florets at depth.</td>
<td></td>
</tr>
<tr>
<td>100% (3-5)</td>
<td>PCB SVOC Metals Hg Dioxins Furans</td>
<td>0</td>
<td>GT @ 1.2'</td>
<td></td>
</tr>
<tr>
<td>68% (5-8)</td>
<td>PCB SVOC Metals Hg Dioxins Furans</td>
<td>0</td>
<td>Slight winnowing @ 3.9' to 4.2'</td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:** Drive Notes: freefall (2.0'), easy (11.6'), penetration goal reached. One dive attempt made at station. Scattered HC-like sheen florets along sidewalks from 4.0' to 5.4'.

**In-situ Depth (ft) & Graphic Log**

**Estimated Recovery:** 7.7 / 11.6 = 9%  

**Calculated Recovery:** Sample Length/Penetration Length: 7.7 / 11.6 = 66%

---

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
**Sediment Core Log**  
**LDW-SC-41 (R1)**

<table>
<thead>
<tr>
<th>Project: LDW R1/FS</th>
<th>Water Body Type: Lower Duwamish Waterway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project #: PORS5-18220-511</td>
<td>Water Elevation (ft/Tide): 8.9</td>
</tr>
<tr>
<td>Client: LDWG</td>
<td>Penetration Depth (ft): 11.6</td>
</tr>
<tr>
<td>Collection Date: 2/20/06</td>
<td>Sample Quality: Good</td>
</tr>
<tr>
<td>Contractor: MCS Environmental, Inc.</td>
<td>Recovery in ft (%): 7.9 (66)</td>
</tr>
<tr>
<td>Vessel: MCS barge</td>
<td>Process Date: 2/21/06</td>
</tr>
<tr>
<td>Operator: Gary Maxwell</td>
<td>Process Method: Cut tube</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>% Recovery</th>
<th>Chemical Analysis</th>
<th>Piezometer Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>PCB</td>
<td>7.98 - 8.31 + 97.64 MCI</td>
</tr>
</tbody>
</table>

**Sediment Description**

- ML: (7.9-8.3) moist, soft, very dark greenish gray (GLEY 1 3/1) Silt, little clay.
- SP: Silt (8.3-10.9) damp, medium stiff, bluish gray (GLEY 2, 5/10B) Silt. Few sand layers grading to fine sand layers interbedded with black Silt (transitional unit).
- SP: (10.9-11.6) damp, medium dense, bluish gray (GLEY 2, 5/10B) fine SAND. Lost 0.2' of sand.

**In-situ Depth (ft)**

- @ 6.6' TV = 0.5 kg/ft²
- Transitional Contacts
- Sharp Contact
- Sheen florets along sidewalls from 4.0' to 5.4'.

**Remarks:**
- Drive Notes: freefall (2.0'), easy (11.6'), penetration goal reached. One drive attempt made at station. Scattered HC-like,
- Iz = lower alluvium

**Sample Length/Penetration Length:**  
7.7 / 11.6 = 66 %

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Project: LDW R/FS
Project #: PORSS-10220-511
Client: LDWG
Collection Date: 2/8/06
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell

Sediment Core Log
LDW-SC-42 (R2)

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft/Tide): 8.8
Water Depth (ft): 20.2
Mudline Elevation (ft): -11.9
N.LAT: 47° 52’ 04”
E.LONG: 122° 17’ 26”
Process Date: 2/8/06
Process Method: Cut tube

Method/Tube ID: Diver Impact Core/4” sq Al
Log By: N. Bacher

Tube Length (ft): 16.1
Penetration Depth (ft): 15.9
Sample Quality: Good
Recovery ft (%): 12.8 (79)

Recovery
Depth (ft) Recov Interval & Sample % Recov (interval) Chemical Analysis PID Measurement

0.0 100% 0
0.0-0.2 100% (0-5) PCB SVOC Metals Hg 0
ML: (0.0-0.2) very wet, very soft, very dark greenish gray (GLEY 1, 3/10Y) ORGANIC SILT, few sand and trace twigs.

OL: (0.2-4.0) moist, medium stiff, black (GLEY 1, 2.5/N) ORGANIC SILT, few sand and clay.
Scattered rootlets, shredded wood, and wood fibers. Less sand with depth. Trace H2S-like odor.

@ 3.4’ a distinct 3” thick layer of moist, soft, dark greenish grey SILT with scattered rootlets, fibers, shells, and black sheen

@ 0.7 TV = 0.3 kg/cm2
GT @ 0.9’
@ 1.3 TV = 0.5 kg/cm2
GT @ 2.2

ML: (4-5.6) moist, medium stiff, black (GLEY 1, 2.5/N) SILT, few clay, grading to SILT; trace sand at basal contact. Trace rootlets and wood fibers. Sand grains are multicolored (orange, red, white).

Transitional Contact

@ 4.3 TV = 0.5 kg/cm2

Calculated Recovery
Sample Length/Penetration Length: 12.8/15.9 = 81 %

Remarks: Drive Notes: freefall (0.0’), easy (2.4’), moderate (15.9’), penetration goal reached. Two drive attempts made at station. Core catcher was empty, but natural plug as described by boat crew. Fine sand in shoe.

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
### Sediment Core Log

**Project:** LDW RI/FS  
**Water Body Type:** Lower Duwamish Waterway  
**Tube Length (ft):** 16.1  
**Project #:** PORS/18220-511  
**Water Elevation (ft)/Tide:** 8.8  
**Penetration Depth (ft):** 15.9  
**Client:** LDWG  
**Water Depth (ft):** 20.2  
**Sample Quality:** Good  
**Collection Date:** 2/8/06  
**Murline Elevation (ft):** -11.9  
**Recovery in ft (%):** 12.8 (79)  
**Contractor:** MCS Environmental, Inc.  
**N/LAT:** 199898  
**E/LONG:** 1271361  
**Process Date:** 2/8/06  
**Vessel:** MCS barge  
**Horiz. Datum:** NAD 83 N  
**Process Method:** Cut tube  
**Vert. Datum:** MLLW  
**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4" sq Al  
**Logged By:** N. Bacher

#### Recovered Depth

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Recovery Interval</th>
<th>% Recovery Interval</th>
<th>Chemical Analysis</th>
<th>PID Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>85% (5-8)</td>
<td></td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>72% (8-13)</td>
<td></td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>110</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Sediment Description

**Classification Scheme:** USCS  
**Contacts are recovered depth**  
**(In-situ depth interval in feet with parentheses)**  
**Comments for Recovered Depths**  
**In-situ Depth (ft)**

- **SM:** (6.5-7.5) moist to wet, medium dense, dark greenish gray (GLEY 2, 4/10G) medium SAND, little gravel and silt. Sand grains are multicolored (orange, red, white). Gravel is rounded and up to 2" diameter.

- **ML:** (7.5-11.8) moist, medium stiff, black (GLEY 1, 2.5/N) SILT, little clay, grading to SILT, few gravel. Black sheen from 8" to basal contact.

- **ML:** (11.8-13.8) moist, medium stiff, dark greenish gray (GLEY 1, 4/10Y) SILT with 1/8" to 1/4" thick seams of pale olive gray CLAY spaced every half foot. Trace debris.

- **11.0' piece of thin plastic (resting ontop of core; location qualified)**

### Remarks

- Drive Notes: freefall (0.0'), easy (2.4'), moderate (15.9').  
- penetration goal reached. Two drive attempts made at station.  
- Core catcher was empty, but natural plug as described by boat crew.  
- Fine sand in shoe.

### Calculated Recovery

- **Sample Length/Penetration Length:** 12.8'/15.9 = 81 %

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-42 (R2)

Project: LDW RIFS
Project #: PORSS-18220-511
Client: LDWG
Collection Date: 2/8/06
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell
Logged By: N. Bacher

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft)/Tide: 8.8
Water Depth (ft): 26.2
Mudline Elevation (ft): -11.9
N/LAT: 199898
E/LONG: 1271361
Horiz. Datum: NAD 83
Vert. Datum: MLLW
Process Date: 2/8/06
Process Method: Cut tube

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

- ML: (13.8-15.0) [moist, medium stiff], dark greenish gray (GLEY 1, 4/10Y) SILT, little clay.
- GP: (15.0-15.9) damp, medium dense, dark greenish gray (GLEY 1, 4/5GY) fine SAND, few silt with trace fine, horizontal, black streaks.
- End of core at 12.8'.

Remarks: Drive Notes: freefall (0.8'), easy (2.4'), moderate (15.9'), penetration goal reached. Two drive attempts made at station.
Core catcher was empty, but natural plug as described by boat crew.
Fine sand in shoe.

Calculated Recovery
Sample Length/Penetration Length:
12.8' / 15.9 = 81 %

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1011 SW Klickitat Way, Suite 207
Seattle, WA 98134-1162
Phone: (206) 624-9349
Fax: (206) 624-2809

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
### Sediment Core Log
**LDW-SC-43 (R3)**

<table>
<thead>
<tr>
<th>Project:</th>
<th>LDW RIFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project #:</td>
<td>PORSS-18220-511</td>
</tr>
<tr>
<td>Client:</td>
<td>LDWG</td>
</tr>
<tr>
<td>Collection Date:</td>
<td>2/22/86</td>
</tr>
<tr>
<td>Contractor:</td>
<td>MCS Environmental, Inc.</td>
</tr>
<tr>
<td>Vessel:</td>
<td>MCS barge</td>
</tr>
<tr>
<td>Operator:</td>
<td>Gary Maxwell</td>
</tr>
</tbody>
</table>

#### Recovery Information
- **Recoveries**: 100%
  - PCB, SVOC Metals: 69%
  - PCB, SVOC Metals: 78%

#### Sediment Description
- **Classification Scheme**: USCS
- **Contacts**: Recovered depth
  - In-situ depth interval in feet with parentheses
- **Comments** for Recovered Depths
  - Transitional Contact
  - Transitional Contact
  - GT @ 0.9'
  - GT @ 3.1'

#### Sediment Types
- **OL**: (0.0-0.1) very wet, very soft, yellowish gray (5YR, 4/5) ORGANIC SILT, little sand.
- **OL**: (0.1-0.7) moist, medium silty, black (2.5Y, 2.5/1) ORGANIC SILT, little sand. Silt texture is uniform, slightly compressible, blocky, massive, and of low plasticity.
- **ML**: (0.7-3.8) moist, soft to medium stiff, gray (2.5Y, 5/1) SILT, little clay, interbedded with 1" thick, most, medium dense, black (2.5Y, 2.5/1) fine to medium SAND. Silt texture is slightly compressible, of low plasticity, and rolls easily. Sand grains are multicolored (orange, red, white). Trace gray (7.5YR, 5/1) pockets of SILT, little clay up to 1/2" L.
- **SP-SM**: (3.8-11.9) moist, medium dense, gray (7.5YR, 5/1) fine to medium SAND, grading to medium sand below 4.0', interbedded with 1" thick, moist, soft to medium stiff, gray (2.5Y, 5/1) SILT. Trace layers of moist, dense, dark gray brown, well sorted, fine sand.

#### Remarks
- Drive Notes: freefall (0.5'), easy (7.0'), moderate (13.0'), hard (14.0'), penetration goal reached. Core catcher was half full.
- Torvane measurements taken from R2. 1/2" HC-like sheen.
- sheen florets on sidewalks from 8.5' to 8.9'.

#### Calculated Recovery
- Sample Length/Penetration Length:
  - 9.8 / 15.9 = 62%

---

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
# Sediment Core Log

**Project:** LDW R/F/S  
**Project #:** PORS5-18220-511  
**Client:** LDWG  
**Collection Date:** 2/22/06  
**Contractor:** MCS Environmental, Inc.  
**Operator:** Gary Maxwell  
**Vessel:** MCS barge  
**Method/Tube ID:** Diver Impact Core/4" sq Al  
**Logged By:** L. McKee

<table>
<thead>
<tr>
<th>Recovery Interval (ft)</th>
<th>Recovery Interval Sampled</th>
<th>% Recovery Intervals</th>
<th>Chemical Analysis</th>
<th>PID Measurement</th>
<th>Sediment Description Classification Scheme: USCS</th>
<th>Contact Notes</th>
<th>Comments for Recovered Depths</th>
<th>In-situ Depth (ft) &amp; Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 6' 1&quot; thick layer of coarse SAND</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Winnowing @ 8.5' to 8.9'.</td>
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<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sharp Contact</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90%</td>
<td></td>
<td>(7-9)</td>
<td></td>
<td></td>
<td>SW: (11.9-15.9) damp, stiff, black (2.5', 2.5'), medium to coarse SAND, grading to coarse sand at basal contact.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75%</td>
<td></td>
<td>(9-11)</td>
<td></td>
<td></td>
<td>End of core at 9.8'.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45%</td>
<td></td>
<td>(11-13)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:** Drive Notes: freefall (0.5'), easy (7.0'), moderate (13.0'), hard (14.0'), penetration goal reached. Core catcher was half full.  
Torvane measurements taken from R2. 1/2' HC-like sheen  
sheen florets on sidewalls from 8.5' to 8.9'  
Calculated Recovery:  
Sample Length/Penetration Length: 9.8 / 15.9 = 62 %

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>Sediment Description</th>
<th>Comments for Recovered Depths</th>
<th>In-situ Depth (ft) &amp; Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
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<td>14</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:** Drive Notes: freefall (0.5'), easy (7.0'), moderate (13.0'), hard (14.0'), penetration goal reached. Core catcher was half full.

Torvane measurements taken from R2. 1/2" HC-like sheen sheen florets on sidewalls from 8.5' to 8.9'.

**Calculated Recovery**

Sample Length/Penetration Length: 9.8 / 15.9 = 62%

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
# Sediment Core Log

**LDW-SC-44 (R2)**

**Project:** LDW R/I/S

**Client:** LDWG

**Contractor:** MCS Environmental, Inc.

**Vessel:** MCS barge

**Operator:** Gary Maxwell

**Collection Date:** 2/21/06

**Mudline Elevation (ft):** 2.1

**N.LAT:** 198925  E.LONG: 1272230

**Process Date:** 2/21/06

**Process Method:** Cut tube

**Site:** Lower Duwamish Waterway

**Sample Quality:** Good

**Penetration Depth (ft):** 11.7

**Tube Length (ft):** 16.1

**Sample Length/Penetration Length:** 5.8 / 11.7 = 50%

### Sediment Description

- **Classification Scheme:** USCS
- **Contacts are recovered depth (in-situ depth interval in feet with parentheses)**
- **% Recovery (Interval)**
- **Chemical Analyses**
- **P/D Measurement**

### Comments

- **In-situ Depth (ft)**
- **Depth (ft)**
- **Recovered Depth:**
- **& Sample**

### Sediment Contacts

- **OL:** (0.0-0.4) wet to moist, soft, black (2.5Y, 2.5/1) ORGANIC SILT, few sand. Silt texture is uniform, massive, blocky, and slightly mottled.
- **OL:** (0.4-4.8) moist, soft, black (2.5Y, 2.5/1) ORGANIC SILT with 1" thick layers of fine SAND, medium SAND, and SILT, little clay. Trace roots, wood and shell fragments.
- **PCB SVCC Metals Hg**
- **PCB SVCC Metals Hg**

### Remarks

**Drive Notes:** freefall (3.0'), moderate (7.8'), hard (11.7'), refusal (11.7'). Two drive attempts made at station.

Core catcher was 66% full.

---

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
### Sediment Core Log

**LDW-SC-44 (R2)**

<table>
<thead>
<tr>
<th>Project: LDW RI/FS</th>
<th>Water Body Type: Lower Duwamish Waterway</th>
<th>Tube Length (ft): 16.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project #: PORS5-18220-511</td>
<td>Water Elevation (ft)/Tide: 10.0</td>
<td>Penetration Depth (ft): 11.7</td>
</tr>
<tr>
<td>Client: LDWG</td>
<td>Water Depth (ft): 12.6</td>
<td>Sample Quality: Good</td>
</tr>
<tr>
<td>Collection Date: 2/21/06</td>
<td>Mudline Elevation (ft): -2.1</td>
<td>Recovery in ft (%): 5.8 (50)</td>
</tr>
<tr>
<td>Contractor: MCS Environmental, Inc.</td>
<td>N./LAT: 47°49’54”</td>
<td>Process Date: 2/21/06</td>
</tr>
<tr>
<td>Vessel: MCS barge</td>
<td>E./LONG: 127°22’30”</td>
<td>Process Method: Cut tube</td>
</tr>
</tbody>
</table>

#### Sediment Description
- Classification Scheme: USCS
- Contacts are recovered depth
- (In-situ depth interval in feet with parentheses)

#### Comments
- for Recovered Depths
- In-situ Depth (ft)
- & Graphic Log

#### Recovery
- 56% (7-9)
- 24% (9-11)
- 40% (11-11.7)

**Remarks:**
- Drive Notes: freefall (3.0'), moderate (7.0'), hard (11.7').
- refusal (11.7'). Two drive attempts made at station.
- Core catcher was 86% full.

**Calculated Recovery**
- Sample Length/Penetration Length:
- 5.8 / 11.7 = 50 %

---

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
### Sediment Core Log

**LDW-SC-45 (R3)**

<table>
<thead>
<tr>
<th>Project: LDW RI/FS</th>
<th>Water Body Type: Lower Duwamish Waterway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project #: POR55-18220-511</td>
<td>Water Elevation (ft)/Tide: 9.2</td>
</tr>
<tr>
<td>Client: LDWG</td>
<td>Water Depth (ft): 22.7</td>
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<tr>
<td>Collection Date: 2/21/06</td>
<td>Mudline Elevation (ft): -13.5</td>
</tr>
<tr>
<td>Contractor: MCS Environmental, Inc.</td>
<td>N/LAT: 47.7083 E/LONG: 122.1951</td>
</tr>
<tr>
<td>Vessel: MCSarge</td>
<td>Process Date: 2/21/06</td>
</tr>
<tr>
<td></td>
<td>Process Method: Cut tube</td>
</tr>
</tbody>
</table>

#### Sediment Description

**Classification Scheme: USCS**

- **Contacts are recovered depth**
- **In-situ depth interval in feet with parentheses**

<table>
<thead>
<tr>
<th>Recorded Depth</th>
<th>Recovery Interval</th>
<th>% Recovery</th>
<th>Chemical Analysis</th>
<th>PID Measurement</th>
<th>Sediment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDW-SC-45-4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ML: (0.0-0.3) very wet, very soft, olive brown (2.5Y, 4/3) SILT.</td>
</tr>
<tr>
<td>LDW-SC-45-5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ML: (0.3-4.1) moist, medium stiff, black (2.5Y, 2.5/1) SILT, few sand, trace rootlets, wood and shell fragments.</td>
</tr>
<tr>
<td>LDW-SC-45-6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>@ 2.2' scattered rainbow sheen florets to basal contact</td>
</tr>
<tr>
<td>LDW-SC-45-7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>@ 3' 1&quot; thick layer of damp, black SAND with multicolored grains oriented transversely</td>
</tr>
<tr>
<td>LDW-SC-45-8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ML: (4.1-4.5) moist, medium stiff, gray (2.5Y, 5/1) SILT, little clay.</td>
</tr>
<tr>
<td>LDW-SC-45-9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>ML: (4.5-5.2) moist, medium stiff, black (2.5Y, 2.5/1) SILT, few sand, trace rootlets. Trace debris.</td>
</tr>
<tr>
<td>LDW-SC-45-10</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>@ 4.8' 2&quot; L piece of subrounded anthropogenic conglomerate (concrete)</td>
</tr>
<tr>
<td>LDW-SC-45-11</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>SW: (5.2-7.7) moist, medium dense, black (2.5Y, 2.5/1) medium SAND, few silt and gravel. SAND grains are multicolored (orange, red, white) and grade to coarse near basal contact. Gravel is subrounded up to 1&quot; L.</td>
</tr>
</tbody>
</table>

**Comments**

- **In-situ Depth (ft)**
- **Depth (ft)**

**Remarks:** Drive Notes: freefall (0.8'), easy (5.0'), moderate (7.5'), hard (7.7'), refusal (7.7'). Three drive attempts made at station. Core catcher was 50% full. HC-like rainbow sheen on sidewalls and parting seams from 1.8' to 4.2'. r = recent

**Calculated Recovery**

Sample Length/Penetration Length: 6.5 / 7.7 = 84%

---

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial investigation.

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Fax: (206) 624-2639
**Sediment Core Log**

**LDW-SC-45 (R3)**

<table>
<thead>
<tr>
<th>Project: LDW RI/FS</th>
<th>Water Body Type: Lower Duwamish Waterway</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Water Elevation (ft/Tide): 9.2</td>
</tr>
<tr>
<td></td>
<td>Water Depth (ft): 22.7</td>
</tr>
<tr>
<td></td>
<td>Mudline Elevation (ft): -13.5</td>
</tr>
<tr>
<td>Project #: PORS5-18220-511</td>
<td>Penetration Depth (ft): 7.7</td>
</tr>
<tr>
<td>Client: LDWG</td>
<td>Sample Quality: Good</td>
</tr>
<tr>
<td>Collection Date: 2/21/06</td>
<td>Recovery in ft (%): 6.5 (84)</td>
</tr>
<tr>
<td>Contractor: MCS Environmental, Inc.</td>
<td>Process Date: 2/21/06</td>
</tr>
<tr>
<td>Vessel: MCS barge</td>
<td>Process Method: Cut tube</td>
</tr>
<tr>
<td>Operator: Gary Maxwell</td>
<td>Logged By: L. McKee, A. Fitzpatrick</td>
</tr>
</tbody>
</table>

### Sediment Description

**Classification Scheme:** USCS  
*Contacts are recovered depth  
(In-situ depth interval in feet with parentheses)*

- **End of core at 6.6'**. Driven to refusal.
- **Note:** R1 core driven closer to shore (-7.2' MLLW) and to refusal at 9.5'; end of recovered core at 5.3'. A heavy petroleum-like sheen and odor observed from 4.5' to 5.3' in a gravel layer and throughout matrix (bottom of core). Trace staining on sidewalls and free phase blebs. A discrete sample collected of this unit at 5.0'.

### In-situ Depth (ft) & Graphic Log

**Sheen test:** heavy rainbow sheen and free phase product blebs.

### Remarks

**Drive Notes:** freefall (0.8'), easy (5.0'), moderate (7.5'), hard (7.7'), refusal (7.7'). Three drive attempts made at station. Core catcher was 50% full. HC-like rainbow sheen on sidewalls and paring seams from 1.8' to 4.2'. r = recent

**Calculated Recovery**

Sample Length/Penetration Length:  

6.5 / 7.7 = 84 %

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
Sediment Core Log
LDW-SC-46 (R1)

Project: LDW Rl/FS
Water Body Type: Lower Duwamish Waterway
Tube Length (ft): 14.0
Project #: PORS5-18220-511
Water Elevation (ft): NA
Penetration Depth (ft): 13.0
Client: LDWG
Water Depth (ft): 16.8
Sample Quality: Good
Collection Date: 2/24/06
Mudline Elevation (ft): -7.6
Recovery in ft (%): 11.2 (85)
Contractor: MSS
N, LAT: 198577
E, LONG: 1272117
Process Date: 2/24/06
Vessel: R/V Nancy Anne
Process Method: Cut tube
Operator: Bl; Jaworski
Method/Tube ID: Vibrocoring/3.5" round Al
Logged By: L. McKee, C. Brackett

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>% Recovery (Interval)</th>
<th>Chemical Analysis</th>
<th>PID</th>
<th>Measurement</th>
<th>Sediment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>OL: (0.0-2.3) wet to moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT, fine sand, with silt, very dark grayish (GLEY 1, 3/1) SILT, little clay. Trace subrounded gravel, wood and shell fragments, rootlets, and worms. Silt texture is slightly compressible, of low plasticity, and increases in competency towards basalt contact.</td>
</tr>
<tr>
<td>1</td>
<td>66% (0-13)</td>
<td>PCB SVOC Metals Hg</td>
<td>0</td>
<td></td>
<td>GT @ 1.1'</td>
</tr>
</tbody>
</table>
| 2                    | 80%                  | PCB SVOC Metals Hg| 0   |             | @ 1.8' TV = 0.3 kg/cm²  
|                      |                      |                   |     |             | Translational Contact 
|                      |                      |                   |     |             | GT @ 2.1' |
| 3                    | 100%                 | PCB SVOC Metals Hg| 0   |             | @ 3.2' TV = 0.3 kg/cm² |
|                      |                      |                   |     |             | @ 3.9' TV = 0.2 kg/cm² |
|                      |                      |                   |     |             | @ 3.9' TV = 0.2 kg/cm² |
| 4                    | 100%                 | PCB SVOC Metals Hg| 0   |             | @ 3.9' TV = 0.2 kg/cm² |
|                      |                      |                   |     |             | @ 3.9' TV = 0.2 kg/cm² |
| 6                    | 100%                 | PCB SVOC Metals Hg| 0   |             | @ 3.9' TV = 0.2 kg/cm² |

Remarks: Drive Notes: freefall (3.5'), easy (13.0'), penetration goal reached. One drive attempt made at station. Core catcher was empty (0.5' sediment loss).

Calculated Recovery
Sample Length/Penetration Length: 11.2/13.0 = 86 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**LDW-SC-46 (R1)**

**Project:** LDW RI/FS  
**Water Body Type:** Lower Duwamish Waterway
  **Water Elevation (ft)/Tide:** NA  
**Penetration Depth (ft):** 13.0

**Project #:** POR5-18220-511  
**Water Depth (ft):** 16.8  
**Penetration Depth (ft):** 13.0

**Client:** LDWG  
**Water Depth (ft):** 16.8  
**Penetration Depth (ft):** 13.0

**Collection Date:** 2/24/06  
**Mudline Elevation (ft):** -7.6  
**Recovery in ft (%):** 11.2 (86)

**Contractor:** MSS  
**N/LAT:** 198577  
**E/LONG:** 1272117  
**Process Date:** 2/24/06

**Vessel:** R/V Nancy Anne  
**Horiz. Datum:** NAD 83 N  
**Vert. Datum:** MLLW  
**Process Method:** Cut tube

**Operator:** Bill Jaworski  
**Method/Tube ID:** Vibracorer/3.5" round Al  
**Logged By:** L.McKee, CBrackett

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>Recov Interval</th>
<th>Sample</th>
<th>% Recovery</th>
<th>Chemical Analysis</th>
<th>PID</th>
<th>Measurement</th>
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<tr>
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<td>7</td>
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<td>0</td>
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<td>9</td>
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<td>0</td>
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<td>0</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
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<td>13</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Sediment Description**

Classification Scheme: USCS  
Contacts are recovered depth  
(In-situ depth interval in feet with parentheses)

- @ 6.9' 2" L piece of plastic  
- SP: (7.9-13.0) damp, medium dense, brown (7.5YR, 4/2) medium SAND with trace 1-2" pockets of olive gray (GLEY 1, 3/1) SILT, little clay. Trace subrounded gravel up to 2". Grades to very dark greenish gray (GLEY 1, 3/1) medium SAND.

**Comments**

for Recovered Depths  
*In-situ Depth (ft) & Graphic Log*

- Sharp Contact

**Remarks:**

- Drive Notes: freefall (3.5'), easy (13.0'), penetration goal reached. One drive attempt made at station. Core catcher was empty (0.5' sediment loss).

**Calculated Recovery**

Sample Length/Penetration Length: 11.2/13.0 = 86 %

---

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial investigation.*
Sediment Core Log
LDW-SC-47 (R3)

Project: LDW RIFS
Project #: PORSS-18220-511
Client: LDWG
Collection Date: 2/23/06
Contractor: MSS
Vessel: R/V Nancy Anne
Operator: Bill Jaworski

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft): NA
Water Depth (ft): 10
Mudline Elevation (ft): -0.4
Penetration Depth (ft): 13.0
sample Quality: Good

Penetration Depth (ft): 13.0
Sample Quality: Good
Recovery in ft (%): 10.3 (79)
Process Date: 2/23/06
Process Method: Cut tube
Logged By: L.McKe, CBrackett

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(in-situ depth interval in feet with parentheses)

ML: (0.0-0.1) very wet, very soft, olive brown (2.5Y, 4/3) Silt, few sand.

SW: (0.1-0.7) moist, medium dense, brown (7.5YR, 4/2) medium to coarse SAND. Sand grains are multicolored (orange, red, white) and poorly sorted. Scattered rootlets.

OL: (0.7-2.9) moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT, little sand, trace layers of black, coarse SAND. Scattered shell and wood fragments up to 1" L and trace debris. Strong to mild H2S-like odor.

@ 1" piece of 2" L anthropogenic conglomerate (concrete)

SP: SM: (2.9-3.8) damp, medium dense, black (2.5Y, 2.5/1) medium SAND interbedded with black ORGANIC SILT, few sand.

SP: (3.8-13.0) damp to moist, dense, brown (7.5YR, 4/2) [medium] SAND, trace 1" thick layers of coarse sand and fine sand. Sand grains are multicolored (orange, red, white), uniform, and well sorted. Grades to very dark greenish gray (GLEY 1, 3/1) fine sand at basal contact. Trace wood fragments up to 1/2" L.

GT @ 1.4
@ 1.8 TV = 0.2 kg/cm²
Sharp Contact
@ 2.6 TV = 0.2 kg/cm²
Sharp Contact
Oxidation @ 5.0' to 7.6'
@ 5.5 TV = 0.1 kg/cm²
Calculating Recovery
Sample Length/Penetration Length:
10.3'/13.0' = 79%

Remarks: Drive Notes: moderate (8.0'), hard (10.0'), refusal (13.0').
Core catcher was 50% full, instrument not reading correctly during early part of the drive. Three drive attempts made at station; station re-occupied with vibracore.

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**Project**: LDW RI/FS

**Project #**: PORS5-18220-511

**Client**: LDWG

**Collection Date**: 2/23/06

**Contractor**: MSS

**Vessel**: R/V Nancy Anne

**Operator**: Bill Jaworski

**Water Body Type**: Lower Duwamish Waterway

**Water Elevation (ft)/Tide**: NA

**Water Depth (ft)**: 10

**Mudline Elevation (ft)**: -0.4

**Penetration Depth (ft)**: 13.0

**Sample Quality**: Good

**N./LAT**: 197422

**E./LONG**: 1273340

**Horiz. Datum**: NAD 83

**Vert. Datum**: MLLW

**Process Date**: 2/23/06

**Process Method**: Cut tube

**Method/Tube ID**: Vibracorer/3.5" round Al

**Logged By**: L. McKee, C. Brackett

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>Recov Interval &amp; Sample</th>
<th>% Recovery (interval)</th>
<th>Chemical Analysis</th>
<th>PID Measurement</th>
<th>Sediment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>8.9' 2&quot; pocket of green-gray CLAYEY SILT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks**: Drive Notes: moderate (8.0'), hard (10.0'), refusal (13.0').

Core catcher was 50% full. Instrument not reading correctly during early part of the drive. Three drive attempts made at station; station re-occupied with vibracore.

**Calculated Recovery**: Sample Length/Penetration Length:

10.3' / 13.0 = 79%

**In-situ Depth (ft)**

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
Sediment Core Log

Project: LDW RI/FS
Project #: PORS5-18220-511
Client: LDWG
Collection Date: 2/8/06
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft/Tide): 9.4
Water Depth (ft): 37.4
Midline Elevation (ft): -22.3
N./LAT: 196558
E./LONG: 127453
Process Date: 2/8/06
Process Method: Cut tube

Log Entry by: N. Bacher

Recovered Depth (ft) & Sample % Recovery Interval Chemical Analysis PID Measurement
0 100% PCB SVOC Metals Hg 0 ML: (0.0-0.2) very wet, very soft, dark olive gray (5Y, 3/2) SILT, few sand, trace wood fragments, and worms.

1 0 PCB SVOC Metals Hg 0 SW: (0.2-4.5) moist, medium dense, very dark greenish gray (GLEY 1, 2/5GY) fine to medium SAND, few silt. Sand grains are multicolored (orange, red, white).

2 0 PCB SVOC Metals Hg 0 SP- SM: (4.5-5.5) [moist, medium dense], dark greenish gray (GLEY 1, 4/5GY) fine SAND, little silt to SILT, little sand, thinly interbedded with 1/8" thick seams of moist, [medium stiff], dark grayish brown (10YR, 4/2) SILT, little clay.

3 0 85% (4-6) 0 50.0' 0.2' thick layer of medium stiff gray SILT, little clay, trace horizontal black streaks.

4 0 85% (6-9.3) 0 SM: (5.5-6.7) moist, medium dense, dark greenish gray (GLEY 1, 4/5GY) line SAND, little silt. Sand grains are multicolored (orange, red, white).

5 0 95% (8-11.3) 0 End of core at 5.6'. Driven to refusal.

6 0 0 (11.3-6) 0 50% winnowing below 5.6'.

Remarks: Drive Notes: freefall (0.2'), easy (6.0'), hard (6.6'), refusal (6.7'). Two drive attempts made at station. Core catcher was 50% full. r = recent

Calculations: Sample Length/Penetration Length:

Calculated Recovery

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
### Sediment Core Log

**Project:** LDW RIFS  
**Project #:** PORSS-18229-511  
**Client:** LDWG  
**Collection Date:** 2/6/06  
**Contractor:** MCS Environmental, Inc.  
**Vessel:** MCS barge  
**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4" sq Al  
**Logged By:** N. Bacher, A. Fitzpatrick

### Sediment Description

**Classification Scheme:** USCS  
**Contacts are recovered depth  
(in-situ depth interval in feet with parentheses)**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>% Recovery</th>
<th>Chemical Analysis</th>
<th>Sediment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0-1.1</td>
<td>63%</td>
<td>PCB SVOC Metals Hg</td>
<td>OL: (0.0-1.1) very wet, soft, greenish black (GLEY 2, 2.5/10GY) ORGANIC SILT, little clay. Trace rootlets and worms. Moderate H2S-like odor. @ 0.7&quot; thick layer of wet, soft, black, silt, WOOD FRAGMENTS (60%), shredded, natural</td>
</tr>
<tr>
<td>1.1-2.4</td>
<td>93%</td>
<td>PCB SVOC Metals Hg</td>
<td>OL: (1.1-4.1) moist to wet, medium stiff, greenish black (GLEY 2, 2.5/10GY) ORGANIC SILT, little clay. Silt texture is homogeneous, uniform, slightly compressible, and blocky; trace shell fragments up to 1/2&quot; diameter and rootlets.</td>
</tr>
<tr>
<td>2.4-4.4</td>
<td>PCB</td>
<td></td>
<td>SP: (4.1-4.4) damp, medium dense, very dark greenish gray (GLEY 1, 3/10GY) fine SAND. Sand grains are multicolored (orange, red, white). Moderate H2S-like odor.</td>
</tr>
<tr>
<td>4.4-6.4</td>
<td>PCB</td>
<td></td>
<td>MH: (4.4-14.0) moist, medium stiff, greenish black (GLEY 1, 2.5/10Y) grading to black (GLEY 1, 2.5/10N) SILT, few clay, with trace 1&quot; thick layers of wood fragments and 1/2&quot; to 6&quot; thick layers of dark greenish gray (GLEY 1, 4/10Y) fine sand. Silt texture is slightly compressible and has a slight H2S-like odor that increases with depth; scattered wood fragments. Increasing stiffness with depth.</td>
</tr>
</tbody>
</table>

**Tube Length:** 16.1 ft  
**Penetration Depth:** 14.0 ft  
**Sample Quality:** Good  
**Recovery in %:** 11.4 [81]

**Remarks:** Drive Notes: none taken. One drive attempt made at station. Core shoe was 100% full.

**Calculated Recovery:** 11.4/14.0 = 81 %

---

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
### Sediment Core Log

**LDW-SC-49 (R1)**

<table>
<thead>
<tr>
<th>Project: LDW RI/FS</th>
<th>Water Body Type: Lower Duwamish Waterway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project #: PORS5-18220-511</td>
<td>Water Elevation (ft)/Tide: 5.5</td>
</tr>
<tr>
<td>Client: LDWG</td>
<td>Water Depth (ft): 28.9</td>
</tr>
<tr>
<td>Collection Date: 2/6/06</td>
<td>Mudline Elevation (ft): -19.6</td>
</tr>
<tr>
<td>Contractor: MCS Environmental, Inc.</td>
<td>Penetration Depth (ft): 14.0</td>
</tr>
<tr>
<td>Vessel: MCS barge</td>
<td>Sample Quality: Good</td>
</tr>
<tr>
<td>Operator: Gary Maxwell</td>
<td>Recovery in ft (%): 11.4 (81)</td>
</tr>
<tr>
<td>Method/Tube ID: Diver Impact Core/4&quot; sq Al</td>
<td>Process Date: 2/6/06</td>
</tr>
<tr>
<td>Logged By: N.Bacher, A.Fitzpatrick</td>
<td>Process Method: Cut tube</td>
</tr>
</tbody>
</table>

### Sediment Description

**Classification Scheme: USCS**

Contacts are recovered depth
*(In-situ depth interval in feet with parentheses)*

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>Recovery Interval</th>
<th>% Recovery (Interval)</th>
<th>Chemical Analysis</th>
<th>PID</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>88% (8-10)</td>
<td>PCB</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65% (10-12)</td>
<td></td>
<td>500</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70% (12-14)</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**In-situ Depth (ft) & Graphic Log**

- @ 9.0' TV = 0.5 kg/cm²
- @ 10.5' TV = 0.5 kg/cm²

**Sheen Test @ 10.6' = very slight sheen with green iridescence (two 1/16" florets).**
Not sampled below 11.9'.

End of core at 11.4'.

### Remarks

Drive Notes: none taken. One drive attempt made at station. Core shoe was 100% full.

**Calculated Recovery**

Sample Length/Penetration Length:

11.4/14.0 = 81%

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
### Sediment Core Log

**Project:** LDW RI/FS  
**Water Body Type:** Lower Duwamish Waterway

**Project #:** PORS-18220-511  
**Water Elevation (ft/Tide):** NA

**Client:** LDWG  
**Water Depth (ft):** 11.6

**Collection Date:** 2/24/06  
**Mudline Elevation (ft):** -4.0

**Contractor:** MSS  
**N/LAT:** 194871  
**E/LONG:** 1276045

**Vessel:** R/V Nancy Anne  
**Horiz. Datum:** NAD 83  
**Vert. Datum:** MLLW

**Operator:** Bill Jaworski  
**Method/Tube ID:** Vibracore/3.5" round Al

**Logged By:** L.McKee, C.Brackett

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>PCB SVOC Metals Hg</th>
<th>% Recovery</th>
<th>Chemical Analysis</th>
<th>RIR Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0-1.2</td>
<td>0</td>
<td>75% (0-13)</td>
<td></td>
<td></td>
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<tr>
<td>2.0-4.0</td>
<td>0</td>
<td>75% (0-13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.0-5.0</td>
<td>0</td>
<td>75% (0-13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.0-6.0</td>
<td>0</td>
<td>75% (0-13)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Sediment Description

**Classification Scheme:** USCS  
**Contacts are recovered depth**  

**ML:** (0.0-1.2) wet, soft, black (2.5Y, 2.5/1) SANDY SILT grading to SILTY SAND at basal contact.

**MH:** (1.2-2.7) wet, soft, black (2.5Y, 2.5/1) GRAVEL, subangular, up to 1" diameter with possible 1/4" paint chip.

**SM:** (2.7-3.7) moist, [medium dense], very dark gray (GLEY 1, 3/N) fine SAND with moderate 1" diameter pockets of mosst, medium stiff, black (2.5Y 2.5/1) SILT, few sand. Trace rootlets, wood fragments, and 1" diameter subangular gravel. Slight H2S-like odor.

**SP:** (3.7-13.0) moist, medium dense, very dark greenish gray (GLEY 1, 3/N) medium SAND with few 1" thick layers of coarse sand, trace 2" to 3" diameter pockets of very dark greenish gray (GLEY 1, 3/1) SILT, little clay or black SILT, few sand from 2.8' to 5.5'. Grades to coarse sand at basal contact.

#### Comments for Recovered Depths

**In-situ Depth (ft)**  
**& Graphic Log**

- **Transitional Contact**
  - 0.0' TV = 0.0 kg/cm2
  - GT @ 1.2'
  - @ 1.5' TV = 0.2 kg/cm2

- **Sharp Contact**
  - 3.2' TV = 0.0 kg/cm2
  - Salinity collected at 2.0' intervals from 2.8' to 9.8'.

#### Drive Notes:
- **Freefall (4.0'), easy (10.0'), hard (13.0'), penetration goal reached. Three drive attempts made at station; station reoccupied with vibracore. Core catcher was 100% full.**

**Calculated Recovery**
- Sample Length/Penetration Length: 9.8 / 13.0 = 75 %

---

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
Sediment Core Log
LDW-SC-50 (R3)

Project: LDW RI/FS
Water Body Type: Lower Duwamish Waterway
Tube Length (ft): 14.0

Project #: PORS-18220-51
Water Elevation (ft)/Tide: NA
Penetration Depth (ft): 13.0

Client: LDWG
Mudline Elevation (ft): -4.0
Sample Quality: Good

Collection Date: 2/24/06
Water Depth (ft): 11.6
Recovery in ft (%): 9.8 (75)

Contractor: MSS
N/LAT: 194871
Process Date: 2/24/06
E/LONG: 1276045

Vessel: RV Nancy Anne
Process Method: Cut tube

Operator: Bill Jaworski
Method/Tube ID: Vibracorer/3.5" round Al
Logged By: L. McKee, C. Brackett

Recovered Depth (ft)
Recov. Interval
Reco. & Sample
% Recovery (interval)
Chemical Analysis
PID
Measurement

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

Comments
for Recovered Depths

In-situ Depth (ft)
& Graphic Log

End of core at 9.8'.

The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, WA 98124-1162
Phone: (206) 624-3549
Fax: (206) 624-3239

Remarks: Drive Notes: freefall (4.0'), easy (10.0'), hard (13.0'), penetration goal reached. Three drive attempts made at station; station reoccupied with vibracore. Core catcher was 100% full.

Calculated Recovery
Sample Length/Penetration Length:
9.8 / 13.0 = 75 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-51 (R1)

Water Body Type: Lower Duwamish Waterway
Project #: PORSS-18220-511
Client: LDWG
Collection Date: 2/22/06
Mudline Elevation (ft): 0.8
Contractor: MCS Environmental, Inc.
N/LAT: 194728
E/LONG: 1276135
Vessel: MCS barge
Operator: Gary Maxwell
Method/Tube ID: Diver Impact Core/4" sq Al
Logged By: L.McKee

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

ML: (0.0-0.4) very wet, very soft, dark reddish brown (2.5YR, 3/3) Silt, little sand. Scattered HC-like sheen filaments and streaks up to 1" L.

SW: (0.4-1.7) damp to moist, dense, black (2.5YR, 2.5/1) SAND, little gravel. Gravel is subangular and ranges in size from 1/4" to 1" L. Trace 1" layer of Silt, few sand.

SM: (1.7-5.0) damp, medium dense, dark greenish gray (GLEY 1, 4/1) SAND with scattered pockets and 1/2" L seams of black (2.5YR, 2.5/1) Silt, few sand. Scattered 1" to 2" thick layers of GRAVEL or coarse SAND, few gravel. Scattered debris. Slight HC-like sheen associated with gravel and debris. Moderate HC-like odor.
- 1.8" brick fragment
- 2.0" rock fragment (marble) 0.2 L
- 2.6" 2" thick layer of coarse SAND, few gravel

@ 3.5" 1" thick layer of GRAVEL and moderate amounts of blue-metallic, flat, angular, sharp anthropogenic material.

SP: (6.0-10.6) moist, dense, black (2.5YR, 2.5/1) medium SAND with trace 1" thick layers of coarse sand. Sand grains are multicolored (orange, red, white). Trace wood fragments up to 1" L.

Sheen Test = trace
HC-like sheen
GT @ 1.0'
@ 1.1 TV = 0.8
kg/cm2
Transitional Contact

Sheen Test = moderate HC-like sheen
Bag @ 2.0" (marble)
@ 2.4 TV = 0.2
kg/cm2
GT @ 2.5'

Sheen Test = trace
HC-like sheen
Bag @ 3.5" (anthropogenic)
Sharp Contact

@ 4.5" TV = 0.2
kg/cm2

Remarks:
Drive Notes: freefall (1.4'), moderate (5.6'), hard (10.6'), refusal (10.6'). One drive attempt made at station. Core catcher was 50% full.

Calculated Recovery
Sample Length/Penetration Length:
6.1 / 10.6 = 58 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
### Sediment Core Log

**Project:** LDW RI/FS  
**Project #:** PORS5-18220-511  
**Client:** LDWG

**Collection Date:** 2/22/06  
**Contractor:** MCS Environmental, Inc.  
**Vessel:** MCS barge  
**Operator:** Gary Maxwell

**Water Body Type:** Lower Duwamish Waterway  
**Water Elevation (ft/Tide):** 9.2  
**Water Depth (ft):** 8.5  
**Mudline Elevation (ft):** 0.6

**Penetration Depth (ft):** 10.6  
**Sample Quality:** fair  
**Recovery in ft (%):** 6.1 (58)

**N/LAT:** 194728  
**E/LONG:** 1276135

**Process Date:** 2/22/06  
**Horiz. Datum:** NAD 83  
**Vert. Datum:** MLLW  
**Process Method:** Cut tube  
**Logged By:** L. McKee

### Sediment Description

**Classification Scheme:** USCS  
**Contacts are recovered depth (In-situ depth interval in feet with parentheses)**

**% Recovery:** 44%  
**Chemical Analysis:**  
**P.I.D. Measurement:**

- End of core at 6.1'. Driven to refusal.
- Not sampled below 5.6' due to winnowing.

### Comments

For Recovered Depths  
In-situ Depth (ft) & Graphic Log

### Calculated Recovery

**Remarks:** Drive Notes: freefall (1.4'), moderate (5.6'), hard (10.6'), refusal (10.6'). One drive attempt made at station. Core catcher was 50% full.

**Sample Length/Penetration Length:**  6.1 / 10.6 = 58 %

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-52 (R3)

Project: LDW R/W
Project #: PORSS-18220-511
Client: LDWG
Collector Date: 2/7/06
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft)/Tide: 4
Water Depth (ft): 5.8
Mudline Elevation (ft): 1.3
Sample Quality: fair
Recovery in ft (%): 5.9 (57)
Process Date: 2/8/06
Process Method: Cut tube
Log: N.Bachner

Recovered Depth (ft) & Graphic Log

- ML: (0.0-0.3) very wet, very soft, dark grayish brown (2.5Y, 3/2) Silt, few sand. Trace shredded wood fragments and twigs.
- OL: (0.3-0.9) moist, medium stiff, dark greenish gray (GLEY 4, 4/10G/1Y) ORGANIC Silt, trace sand. Trace shredded wood fragments. Slight to moderate H2S-like odor.
- OL: (0.9-3.2) moist, medium stiff, black (GLEY 1, 2.5N) ORGANIC Silt with trace lenses of CLAY, few silt. Trace shredded wood fragments throughout and 1" thick layer of wood fragments at basal contact. Slight H2S-like odor.
- SP: (3.2-10.3) moist, medium dense, greenish black (GLEY 1, 2.5/5G) fine SAND, little silt, grading to coarse sand towards basal contact. Sand grains are multicolored (orange, red, white). Trace wood fragments.
- End of sediment at 4.8'. One foot void (48% recovery)
- End of core at 5.9'. Driven to refusal.

In-situ Depth (ft)

Transitional Contact
Transitional Contact
GT @ 1.2'
GT @ 1.6 TV = 1.9 kg/cm²
Sharp Contact
GT @ 3.7'

Remarks: Drive Notes: moderate (4'), hard (10.3'), refusal (10.3'). Three drive attempts made at station. One foot of void space between 2.0' and 3.0' at silt/sand contact; logged continuously.

Calculated Recovery
Sample Length/Penetration Length: 5.9 / 10.3 = 57 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
# Sediment Core Log

**LDW-SC-52 (R3)**

**Project:** LDW R13S  
**Water Body Type:** Lower Duwamish Waterway  
**Tube Length (ft):** 16.1

**Project #:** PORSS-18226-511  
**Water Elevation (ft)/Tide:** 4  
**Penetration Depth (ft):** 10.3

**Client:** LDWG  
**Water Depth (ft):** 5.8  
**Sample Quality:** fair

**Collection Date:** 2/7/05  
**Mudline Elevation (ft):** 1.3  
**Recovery in ft (%):** 5.9 (57)

**Contractor:** MCS Environmental, Inc.  
**N/LAT:** 194160  
**E/LONG:** 1276279  
**Process Date:** 2/8/06

**Vessel:** MCS barge  
**Horiz. Datum:** NAD 83 N Vert. Datum:** MLLW  
**Process Method:** Cut tube

**Operator:** Gary Maxwell  
**Method/Tube ID:** Diver Impact Core/4" sq Al  
**Logged By:** N.Bacher

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>Recov. Interval &amp; Sample</th>
<th>% Recovery (Interval)</th>
<th>Chemical Analysis</th>
<th>PID Measurement</th>
<th>Sediment Description</th>
<th>Comments for Recovered Depths</th>
<th>in-situ Depth (ft) &amp; Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.4</td>
<td>(6-7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.0</td>
<td>(7-9)</td>
<td>48%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.3</td>
<td>(9-10.3)</td>
<td>31%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**  
- Drive Notes: moderate (4'), hard (10.3'), refusal (10.3').  
- Three drive attempts made at station. One foot of void space between 2.0' and 3.0' at silt/sand contact; logged continuously.  
- EPA oversight.

**Calculated Recovery:**  
Sample Length/Penetration Length:  
5.9 / 10.3 = 57 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**LDW-SC-53 (R1)**

**Project:** LDW RI/FS  
**Water Body Type:** Lower Duwamish Waterway

**Project #:** PORS5-18220-511  
**Water Elevation (ft)/Tide:** 0.8

**Client:** LDWG  
**Water Depth (ft):** 16.3

**Collection Date:** 2/6/06  
**Penetration Depth (ft):** 13.6

**Contractor:** MCS Environmental, Inc.  
**Mudline Elevation (ft):** -12.6

**Vessel:** MCS barge  
**Sample Quality:** NA

**Operator:** Gary Maxwell  
**Recovery in ft (%):** 11.1(82)

**Log No:** 192927  
**Process Date:** 2/7/06

**Horiz. Datum:** NAD 83 N  
**Process Method:** Cut tube

**Vert. Datum:** MLLW  

**Method/Tube ID:** Diver Impact Core/4" sq Al

**Logged By:** N.Bacher, A.Fitzpatrick

### Sediment Description

Classification Scheme: USCS  
Contacts are recovered depth  
(In-situ depth interval in feet with parentheses)

<table>
<thead>
<tr>
<th>Recovery Depth (ft)</th>
<th>Recov Interval &amp; Sample</th>
<th>% Recovery (Interval)</th>
<th>Chemical Analysis</th>
<th>P.I.D. Measurement</th>
<th>Sediment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>OL: (0.0-0.5) very wet, very soft, black (GLEY 1, 2.5/N) ORGANIC SILT, little sand. Trace rootlets, wood fragments, and worms. Transitional Contact</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>64% (0-2)</td>
<td></td>
<td></td>
<td>OL: (0.5-6.3) wet to moist, soft to medium stiff, black (GLEY 1, 2.5/N) ORGANIC SILT, few clay decreasing downstream (&lt;1%), Trace rootlets and shell fragments. Moderate H2S-like odor. Transitional Contact</td>
</tr>
</tbody>
</table>
| 2                   |                         | 95% (2-4)             |                   |                    | GT @ 1.0'  
|                     |                         |                       |                   |                    | @ 1.0' TV = 1.0 kg/cm2 |
| 3                   |                         |                       |                   |                    | GT @ 2.0' No Sheen |
| 4                   |                         |                       |                   |                    | @ 1.0' TV = 1.2 kg/cm2  
|                     |                         |                       |                   |                    | GT @ 3.0' |
| 5                   |                         |                       |                   |                    | @ 4.2' TV = 1.5 kg/cm2 |
| 6                   |                         | 79% (4-6)             |                   |                    | Transitional Contact  
|                     |                         |                       |                   |                    | @ 5.2' Trace possible anthropogenic fibers |
| 7                   |                         |                       |                   |                    | Transitional Contact  
|                     |                         |                       |                   |                    | @ 6.2' TV = 1.0 kg/cm2  
| 8                   |                         |                       |                   |                    | Top of unit has arched contact from 6.3' to 7.0'  
- 95% (6-8) | 85% (6-8) | 0 | 85% (6-8) | ML: (7.9-9.2) moist, stiff, dark brown (7.5YR, 3/2) SILT, trace sand and clay. Trace small wood fragments at basal contact. |

### Comments

- **Depth (ft):** for Recovered Depths  
- **In-situ Depth & Graphic Log**

**In-situ Depth & Graphic Log**

### Remarks

- **Drive Notes:** none taken. One drive attempt made at station. Core catcher was 100% full.

### Calculated Recovery

Sample Length/Penetration Length:  

11.1/13.6 = 82%

---

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-53 (R1)

Project: LDW RI/FS
Project #: PORS5-18220-511
Client: LDWG
Collection Date: 2/6/06
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft): 0.8
Water Depth (ft): 16.3
Mudline Elevation (ft): -12.6
N.LAT: 192927
E.LONG: 1277458
Method/Tube ID: Diver Impact Core/4” sq Al

Tube Length (ft): 16.1
Penetration Depth (ft): 13.6
Sample Quality: NA
Recov. Rate: 82% (8-9)
Recovery in %: 11.1/82
Process Date: 2/7/06
Process Method: Cut tube
logged by: N.Baker, A.Fitzpatrick

Recovered Depth (ft) % Recovery Chemical Analysis PLI Measurement
7... 100% (10-11)
9 82% (8-9)
10 80% (9-10)
11 83% (11-13.6)
13

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

SP: (9.2-10.6) moist, dense to medium dense, dark brown (7.5YR, 3/2) fine to medium SAND. Sand grains are multicolored (orange, red, white). Trace small wood fragments at basal contact.

ML: (10.6-11.1) moist, medium stiff, dark brown (7.5YR, 3/2) SILT, few sand.

SP: SM: (11.1-13.6) moist, medium dense to dense, dark brown (7.5YR, 3/2) fine SAND interbedded with 1” to 4” thick layers of SILT.

End of core at 11.1’.

Comments for Recovered Depths
7’ TV = 1.4
8.2’ TV = 0.5
9.5’ TV = 0.3
10.4’ TV = 0.5

In-situ Depth (ft) & Graphic Log

Remarks: Drive Notes: none taken. One drive attempt made at station. Core catcher was 130% full.

Calculated Recovery
Sample Length/Penetration Length:

11.1/13.6 = 82%
### Sediment Core Log

**LDW-SC-54 (R3)**

**Project:** LDW R/FS  
**Project #:** PORSS-18220-511  
**Client:** LDWG  
**Collector Date:** 2/23/06  
**Contractor:** MSS  
**Vessel:** R/V Nancy Anne  
**Operator:** Bili Jaworski  
**Logged By:** L. McKee, N. Bacher

<table>
<thead>
<tr>
<th>Recovered Depth (ft)</th>
<th>Recover Interval &amp; Sample</th>
<th>% Recovery (Interval)</th>
<th>Chemical Analysis</th>
<th>Sediment Description</th>
<th>Comments for Recovered Depths</th>
<th>In-situ Depth (ft) &amp; Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>ML: (0.0-0.2) wet, soft, brown (7.5YR, 4/2) SILT, few sand.</td>
<td>Transitional Contact</td>
<td>@ 1&quot; TV = 0.1 kgt/cm²</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>MH: (0.2-2.9) wet to moist, soft to medium stiff, black (2.5Y, 2.5/1) SILT, few sand moistened with very dark greenish gray (GLEY 1, 3/1) SILT, few sand. Silt texture is slightly compressible, blocky, massive, and of low plasticity. Trace wood fragments up to 9&quot; L and rootlets.</td>
<td></td>
<td>@ 1.2&quot;</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>Ol: (2.9-4.8) moist, medium stiff, black (2.5Y, 2.5/1) ORGANIC SILT. Trace 1&quot; thick layer of damp, medium stiff, dark grayish brown (2.5Y, 4/2) SILT, fine clay. Trace wood fragments and rootlets.</td>
<td>Transitional Contact</td>
<td>@ 2.8&quot;</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>ML: (4.8-6.5) moist, medium stiff, dark grayish brown (2.5Y, 4/2) SILT, few clay and trace 6&quot; L transverse seams of medium SAND. Sand grains are multicolored.</td>
<td>Transitional Contact</td>
<td>@ 3.2&quot; TV = 0.2 kgt/cm²</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>@ 5.2&quot; to 5.4&quot; SILT, few sand mixed with SILT, little clay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>SP: (6.5-13.0) damp, dense, black (2.5Y, 2.5/1) coarse SAND. Sand grains are multicolored (orange, red, white) and grade to medium towards basal contact. Scattered 3&quot; diameter pockets of damp, soft, dark grayish brown (2.5Y, 4/2) SILT, few clay.</td>
<td>Sharp Contact</td>
<td>@ 5.1&quot; TV = 0.4 kgt/cm²</td>
</tr>
</tbody>
</table>

**Water Body Type:** Lower Duwamish Waterway  
**Water Elevation (ft)/Tide:** NA  
**Water Depth (ft):** 9.4  
**Mudline Elevation (ft):** -0.2  
**Penetration Depth (ft):** 13.0  
**Sample Quality:** Good  
**Recovery in ft (%):** 10.2 (78)

**Remarks:** Drive Notes: easy to moderate (10.0), hard (11.0). moderate (13.0), penetration goal reached. Three drive attempts made at station. Core catcher was 50% full. Station re-occupied with vibrocore.

**Calculated Recovery:**  
Sample Length/Penetration Length: 10.2' / 13.0 = 78 %

---

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
Sediment Core Log
LDW-SC-54 (R3)

Project: LDW RIFS
Project #: PORS5-18220-511
Client: LDW
Collection Date: 3/23/08
Contractor: MSS
Vessel: R/V Nancy Anne
Operator: Bill Jaworski

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft)/Tide: NA
Water Depth (ft): 9.4
Mudline Elevation (ft): -0.2
N/LAT: 192179  E/LONG: 1276312
Method/Tube ID: Vibracorer/3.5" round Al
Logged By: L. McKee, N. Bachar

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

End of core at 10.2'.

Not sampled below 10.0'.

Calculated Recovery
Sample Length/Penetration Length: 10.2'/13.0 = 76%

Remarks: Drive Notes: easy to moderate (10.0'), hard (11.0'), moderate (13.0'), penetration goal reached. Three drive attempts made at station. Core catcher was 50% full. Station re-occupied with vibracorer.

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial investigation.
# Sediment Core Log

**Project:** LDW RI/FS  
**Project #:** PORS5-18220-511  
**Client:** LDWG  
**Collection Date:** 2/5/06  
**Contractor:** MCS Environmental, Inc.  
**Vessel:** MCS barge  
**Operator:** Gary Maxwell  
**Process Date:** 2/6/06

## Water Body Type

<table>
<thead>
<tr>
<th>Water Body Type</th>
<th>Lower Duwamish Waterway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tube Length (ft):</td>
<td>16.1</td>
</tr>
<tr>
<td>Water Depth (ft):</td>
<td>8.5</td>
</tr>
<tr>
<td>Penetration Depth (ft):</td>
<td>11.3</td>
</tr>
<tr>
<td>Mudline Elevation (ft):</td>
<td>1.6</td>
</tr>
<tr>
<td>Sample Quality:</td>
<td>NA</td>
</tr>
<tr>
<td>Recovery in ft (%):</td>
<td>6.2 (55)</td>
</tr>
<tr>
<td>N/LAT:</td>
<td>100389</td>
</tr>
<tr>
<td>E/LONG:</td>
<td>1278266</td>
</tr>
</tbody>
</table>

**Horiz. Datum:** NAD 83 N  
**Vert. Datum:** MLLW  
**Method/Tube ID:** Diver Impact Core/4" sq Al  
**Logged By:** N.Bacher, A.Fitzpatrick

## Sediment Description

- **Classification Scheme:** USCS  
- **Contacts are recovered depth**  
  (In-situ depth interval in feet with parentheses)

### 0.0 - 0.7
- **ML:** Very wet, very soft, greenish black (GLEY 1, 2.5/105Y) fine SAND, trace clay. Trace sheet/black organic streaks and moderate HS-like odor.
- **SP:** Wet, loose, greenish black (GLEY 1, 2.5/10Y) fine SAND. Sand is homogeneous.
- **OL:** Moist, soft, greenish black (GLEY 1, 2.5/10Y) ORGANIC SILT, trace sand.

### 0.8 - 2.6
- **SP:** Moist, medium dense, greenish black (GLEY 2, 2.5/10BG) fine to medium SAND, trace gravel. Sand grains are multicolored (orange, red, white). Trace HS-like odor.
- **SP:** Moist, medium dense, dark greenish gray (GLEY 1, 4/8G) fine SAND interbedded with 1/4" thick, convex layers of SILT. Sand grains are multicolored (orange, red, white).
- **SP:** Moist, medium dense, greenish black (GLEY 2, 10BG) medium to coarse SAND, trace gravel. Sand grains are multicolored (orange, red, white) and grade to fine sand near basal contact. Trace 1" thick layers of greenish black (GLEY 2, 10BG) SILT. Trace wood fragments and rootlets.

### 2.7 - 5.6
- **SP:** 4.8' grades to medium sand
- **SP:** 4.9' abundant wood fragments to 5.6' (75%)
- **SP:** 5.6' grades to fine sand

### 5.7 - 6.0
- **GT:** 4.8'  
- **GT:** 5.7' TV = 0.8 kg/cm²  
- **GT:** 6.0' Slightly winnowed below 6.0'

### 6.1
- **End of core at 6.2' Driven to refusal.**

## Remarks

- **Drive Notes:** refusal (11.3). Three drive attempts made at station. Abundant logs/wood observed in vicinity. Wood found in core catcher.

## Calculated Recovery

- **Sample Length/Penetration Length:** 6.2 / 11.3 = 55 %

---

**Note:** Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-55 (R1)

Project: LDW R1/FS
Project #: PORS5-18220-511
Client: LDWG
Collection Date: 2/6/06
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft)/Tide: 10.4
Mudline Elevation (ft): 1.6
Horiz. Datum: NAD 83
Vert. Datum: MLLW

Penetration Depth (ft): 11.3
Sample Quality: NA
Recovery in ft (%): 6.2 (55)
Process Date: 2/6/06
Process Method: Cut tube
Logged By: N.Bacher, A.Fitzpatrick

Recovery Interval
Recovered Depth (ft)
% Recovery (Interval)
Chemical Analysis
PIT Measurement

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

Comments for Recovered Depths

In-situ Depth (ft)

Remarks: Drive Notes: refusal (11.3). Three drive attempts
made at station. Abundant log/wood observed in vicinity.
Wood found in core catcher.

Calculated Recovery
Sample Length/Penetration Length: 6.2 / 11.3 = 55 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-56 (R3)

Project: LDW RII/S
Project #: PORS-18220-511
Client: LDWG
Collection Date: 2/7/06
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft/Tide): 9.6
Water Depth (ft): 8.5
Mudline Elevation (ft): 1.0
N/LAT: 190022
E/LONG: 1277575

Method/Tube ID: Diver Impact Core/4" sq Al

Recovered Depth (ft)
Recover Interval
% Recovery (interval)
Chemical Analysis
RIP
Measurement

MH: (0.0-0.3) very wet, very soft, yellowish red (5YR, 4/6) SILT, trace sand. Trace wood fragments on surface.

SW: (0.3-0.6) wet, loose, yellowish red (5YR, 4/6) SAND, few gravel.

GP: (0.6-1.0) wet, loose, black (2.5YR, 2.5/1) GRAVEL, little sand, few silt. Trace 1" thick seam of black SILT, little mottled gray clay. Trace HC-like sheen and slight odor on top of silt.

SP: (1.0-3.8) wet, loose, red (2.5YR, 4/6) fine to medium SAND grading to very dark greenish gray (GLEY 1, 3/5G) medium to coarse SAND. Trace shredded wood fragments and larger wood fragments up to 4" L at basal contact. Sand grains are multicolored (orange, red, white).

SP- SM: (3.8-10.7) moist, medium dense, very dark greenish gray (GLEY 1, 3/5G) fine to medium SAND, few silt interbedded with 1/8" to 2" thick layers of gray and brown SILT. Scattered layers of wood fragments associated with the silt interbeds. Abundant wood fragments.

Below 4.0' SAND becomes fine grained with seams of fine sand and silt, decreasing wood content with depth.

End of sediment at 5.6'.

Material ends at 5.6' due to 1.6' void

PCB SVOC Metals Hg
100% (0.0-0.3)
60% (0.5-8)

@ 0.6' TV = 1.0 kg/cm2
Pb measurement @ 0.6' in bag
Sheen Test @ 0.6' heavy rainbow sheen with 1/16" florets
Oxidation @ 1.0' to 1.3'
@ 1.3' TV = 0.5 kg/cm2

@ 2.9' TV = 0.8 kg/cm2

@ 5.6' TV = 0.6 kg/cm2

Remarks: Drive Notes: easy (6.4'), hard (10.7'), refusal (10.7'). Three drive attempts made at station. Void space in bottom 1.6'; lost fine sand. r = recent

Calculated Recovery
Sample Length/Penetration Length:
5.6 / 10.7 = 52 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-56 (R3)

Project: LDW RI/FS
Project #: PORSS-18220-511
Client: LDWG
Collection Date: 2/7/06
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft)/Tide: 9.6
Water Depth (ft): 8.5
Mudline Elevation (ft): 1.0

Penetration Depth (ft): 10.7
Sample Quality: fair
Recovery in ft (%): 5.6 (52)
Process Date: 2/7/06
Process Method: Cut tube
Logged By: N. Bacher, A. Fitzpatrick

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

Remarks: Easy (5.4'), hard (10.7'), refusal (10.7'). Three drive attempts made at station. Void space in bottom 1.6'; lost fine sand, r = recent

Void (material lost out of bottom of core).
End of core at 7.2'. Driven to refusal.

Calculating Recovery
Sample Length/Penetration Length:
5.6 / 10.7 = 52 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
**Sediment Core Log**

**LDW-SC-201 (R1)**

- **Project:** LDW RI/FS  
- **Water Body Type:** Lower Duwamish Waterway
- **Project #:** PORSS-18220-511  
- **Water Elevation (ft)/Tide:** 8
- **Client:** LDWG  
- **Water Depth (ft):** 24.0
- **Collection Date:** 2/10/06  
- **Mudline Elevation (ft):** -14.6
- **Contractor:** MCS Environmental, Inc.  
- **N.LAT:** 202052  
- **E.LONG:** 126266
- **Vessel:** MCSarge  
- **Horiz. Datum:** NAD 83  
- **Vert. Datum:** MLLW
- **Operator:** Gary Maxwell  
- **Method/Tube ID:** Diver Impact Core/4" sq Al
- **Penetration Depth (ft):** 13.6
- **Sample Quality:** Good
- **Recovery in ft (%):** 11.8 (87)
- **Process Date:** 2/11/06
- **Process Method:** Cut tube
- **Logged By:** N. Bacher, A. Fitzpatrick

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Recovery Interval &amp; Sample</th>
<th>% Recovery</th>
<th>Chemical Analysis</th>
<th>Sediment Measurement</th>
<th>Tube Length (ft)</th>
<th>Sediment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>71% (0-1)</td>
<td>PCB SVOC Metals Hg</td>
<td>0</td>
<td></td>
<td></td>
<td>16.1</td>
<td>OL: (0.0-0.6) wet, medium stiff, dark greenish gray (GLEY 1, 4/1) ORGANIC SILT, little sand, trace gravel. Moderate wood fragments.</td>
</tr>
<tr>
<td>100% (1-5)</td>
<td>PCB SVOC Metals Hg</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>OL: (0.8-4.0) wet, soft, black (GLEY 1, 2.5/N) ORGANIC SILT, little sand, grading to alternating layers of stiff, black ORGANIC SILT and medium stiff, dark gray (5Y, 3/2) SILT, little clay. Trace sand seams and a 2&quot; diameter rounded gravel with barnacle scars. Trace rootlets, small shell and wood fragments, and piece of brick fragment. Silt is of low plasticity. Trace H2S odor.</td>
</tr>
<tr>
<td>95% (5-8)</td>
<td></td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>@1.5' a 6&quot; thick layer of dark olive gray clayey SILT</td>
</tr>
<tr>
<td>89% (8-10)</td>
<td>PCB SVOC</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>OL: (4.0-8.0) moist, medium stiff, black (GLEY 1, 2.5/N) ORGANIC SILT, little clay. Silt texture is homogenous, blocky, and of moderate plasticity. Scattered HC-like sheen florets with trace HC-like odor up to 6'.</td>
</tr>
<tr>
<td>5.6' (9-10)</td>
<td>PCB SVOC</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>@ 4.0' a distinct 2&quot; thick layer of large wood and shell fragments up to 4&quot; L with strong H2S-like odor</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>@ 5.6' 2&quot; thick layer of moderate HC-like sheen florets in parting seam</td>
</tr>
</tbody>
</table>

**Remarks:** Drive Notes: freefall (1.0'), moderate (8.0'), easy (13.6'). Penetration goal reached. One drive attempt made at station.

Orange-silver film settled over residual sediment in core shoe.

Field replicate of SC-33. Core shoe empty.

Calculated Recovery:

Sample Length/Penetration Length: 11.8'/13.6' = 87%

*Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.*
Sediment Core Log
LDW-SC-201 (R1)

Project: LDW RI/FS
Project #: PORSS-18220-311
Client: LDWG
Contractor: MCS Environmental, Inc.
Operator: Gary Maxwell

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft)/Tide: 8
Water Depth (ft): 24.0
Horiz. Datum: NAD 83
Vert. Datum: MLLW

Mudline Elevation (ft): -14.6
N.LAT: 202052
E.LONG: 1269266
Process Date: 2/11/06

Penetration Depth (ft): 13.6
Sample Quality: Good
Process Method: Cut tube

Recovery Depth (ft)

% Recovery

Chemical Analysis

PID, Measurement

Logged By: N.Bacher, A.Fitzpatrick

Recovery Interval & Sample

90%
(10-12)

ML: (8.0-11.3) moist, medium stiff, very dark greenish gray (GLEY 1, 3/SGY) SILT, few clay with trace 2" thick interbeds of grayish brown very fine SAND, little silt. Trace rocklets and shell fragments up to 1/8" L.

81%
(12-13.6)

SM: (11.3-13.6) moist, medium dense, dark grayish brown (2.5Y 4/2) fine SAND, little silt, and seams of silt up to 1/8" thick. Sand is well sorted. Trace rocklets and scattered wood fragments.

End of core at 11.8'.

PCB SVOC

© 7.0 TV = 0.6 kg/cm²

© 9.0 TV = 1.1 kg/cm²

© 10.6 TV = 1.0 kg/cm²

Transitional Contact

Remarks:
Drive Notes: freefall (1.0'), moderate (8.0'), easy (13.6'), penetration goal reached. One drive attempt made at station.
Orange-silver film settled over residual sediment in core shoe.
Field replicate of 8C-33. Core shoe empty.

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.

The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134-1162
Phone: (206) 524-9349
Fax: (206) 624-2839

Calculated Recovery
Sample Length/Penetration Length:

11.8' / 13.6' = 87 %

Sheet 2 of 2
Sediment Core Log
LDW-SC-202 (R1)

<table>
<thead>
<tr>
<th>Project: LDW RI/FS</th>
<th>Water Body Type: Lower Duwamish Waterway</th>
<th>Tube Length (ft): 16.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project #: PORS5-18220-511</td>
<td>Water Elevation (ft)/Tide: 3.8</td>
<td>Penetration Depth (ft): 12.5</td>
</tr>
<tr>
<td>Client: LDWG</td>
<td>Water Depth (ft): 16.5</td>
<td>Sample Quality: Good</td>
</tr>
<tr>
<td>Collection Date: 2/15/06</td>
<td>Mudline Elevation (ft): -12.2</td>
<td>Recovery in ft (%): 10.1 (81)</td>
</tr>
<tr>
<td>Contractor: MCS Environmental, Inc.</td>
<td></td>
<td>Process Date: 2/16/06</td>
</tr>
<tr>
<td>Operator: Gary Maxwell</td>
<td>Method/Tube ID: Diver Impact Core/4&quot; sq Al</td>
<td>Logged By: L. McKee</td>
</tr>
</tbody>
</table>

Sediment Description

Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Recover Interval &amp; Sample</th>
<th>% Recovery</th>
<th>Chemical Analysis</th>
<th>Sediment Description</th>
<th>Comments for Recovered Depths</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>100% (0-1)</td>
<td>PCB</td>
<td>SVOC Metals Hg TBT</td>
<td>OL (0.0-0.4) wet, soft, olive brown (2.5Y, 4/3) ORGANIC SILT, few sand.</td>
<td>Transitional Contact @ 1.1' TV = 0.6 kg/cm²</td>
</tr>
<tr>
<td>1</td>
<td>79% (1-2)</td>
<td>PCB</td>
<td>SVOC Metals Hg TBT</td>
<td>OL (0.4-3.7) wet, stiff (2.5Y, 2.5/1) ORGANIC SILT, Scattered wood fragments up to 2&quot; L. Silt texture is slightly compressible, massive, blocky, and of low plasticity.</td>
<td>GT @ 2.1'</td>
</tr>
<tr>
<td>2</td>
<td>68% (2-5)</td>
<td>PCB</td>
<td>SVOC Metals Hg TBT</td>
<td>ML: (3.7-5.2) wet, medium stiff, very dark greenish gray (GLEY 1, 4/10Y) SILT, little sand interbedded with 3&quot; thick layers of greenish black (GLEY 1, 4/10Y) ORGANIC SILT with scattered rootlets and wood fragments up to 1&quot; L (transitional unit).</td>
<td>Transitional Contact @ 3.5' TV = 0.6 kg/cm²</td>
</tr>
<tr>
<td>3</td>
<td>83% (5-10)</td>
<td>PCB</td>
<td>SVOC Metals Hg TBT</td>
<td>ML: (5.2-10.0) moist, medium stiff, dark greenish gray (GLEY 1, 4/10Y), SILT with scattered rootlets. Silt texture is uniform, massive, and blocky.</td>
<td>@ 5.0' TV = 1.4 kg/cm²</td>
</tr>
</tbody>
</table>

Remarks: Drive Notes: freefall (0.1'), easy (5.3'), moderate (11.9'), hard (12.5'), refusal (12.5'). One drive attempt made at station. Core catcher was 75% full. Field replicate of SC-36.

Calculated Recovery
Sample Length/Penetration Length: 10.1/12.5 = 81 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-202 (R1)

Project: LDW RI/FS
Project #: PORS5-18220-511
Client: LDWG
Collection Date: 2/15/06
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft/Tide): 3.8
Mudline Elevation (ft): -12.2
Method/Tube ID: Diver Impact Core/4" sq Al

Depth (ft)
Recover Interval
% Recovery
Chemical Analysis
P/D Measurement

Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(in-situ depth interval in feet with parentheses)

End of core at 10.1'. Driven to refusal.
Winnowing @ 10.0' to 10.1'

In-situ
Depth (ft) & Graphic Log

Remarks: Drive Notes: freefall (0.1'), easy (5.3'), moderate (11.0'), hard (12.5'), refusal (12.5'). One drive attempt made at station.
Core catcher was 75% full. Field replicate of SC-36.

The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, WA 98116-1162
Phone: (206) 524-9049
Fax: (205) 624-2839

Calculated Recovery
Sample Length/Penetration Length: 10.1/12.5 = 81 %
Sediment Core Log
LDW-SC-203 (R1)

Project: LDW R1/FS
Project #: PORS5-18220-511
Client: LDWG
Collection Date: 2/17/05
Contractor: MCS Environmental, Inc.
Vessel: MCS barge
Operator: Gary Maxwell
Method/Tube ID: Diver Impact Core/4" sq Al
Logged By: A. Fitzpatrick, N. Bacher

Water Body Type: Lower Duwamish Waterway
Water Elevation (ft/Tide): 7.8
Mudline Elevation (ft): -16.6
Water Depth (ft): 24.4
Penetration Depth (ft): 12.1
Sample Quality: Good
Recovery in %: 8.8 (73)
Process Date: 2/18/06
Process Method: Out tube

Recovered Depth (ft)

<table>
<thead>
<tr>
<th>Recovery Interval</th>
<th>% Recovery (Interval)</th>
<th>Chemical Analysis</th>
<th>Sediment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>49% (3-1)</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>OL: (0.0-4.1) very wet, very soft, olive brown SILT over, wet, medium stiff, black (2.5Y, 2.5/1) to dark brown ORGANIC SILT with moderate organic matter (twigs, leaves, stems, pine needles, shredded wood, wood fragments). Silt texture is uniform and slightly compressible. Strong H2S-like odor between 2.0' to 3.0'. @ 0.5' One piece of plastic @ 1.0' Two pieces of plastic</td>
</tr>
<tr>
<td>1-2</td>
<td>100% (1-2)</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>GT @ 1.1'</td>
</tr>
<tr>
<td>2-3</td>
<td>100% (2-4)</td>
<td>PCB SVOC Metals Hg Pesticides</td>
<td>GT @ 1.7' TV= 2.0 kg/cm2</td>
</tr>
<tr>
<td>3-4</td>
<td>91% (4-6)</td>
<td>PCB SVOC Metalt</td>
<td>SP: SM. (4.1-5.1) moist, dense, black (2.5Y, 2.5/1) fine SAND with 6&quot; thick interbeds of very dark greenish gray (GLEY 1.3/1) SILT with moderate to substantial organic matter. Sand grains are multicolored (orange, red, white) and grade to coarse to medium sand with silt interbeds. Scattered rootlets, twigs, leaves, small shell fragments and shredded wood up to 2&quot; L. Trace debris. @ 3.0' Sharp contact</td>
</tr>
<tr>
<td>4-5</td>
<td>80% (6-8)</td>
<td>PCV SVOC Metalt</td>
<td></td>
</tr>
</tbody>
</table>

Remarks:
Drive Notes: freefall (1.5'), easy (12.2'), penetration goal reached. One drive attempt made at station. Core catcher was 80% full. Torvane measurements skewed high. Field replicate of SC-34.

Calculated Recovery
Sample Length/Penetration Length:
8.8 / 12.1 = 73%

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.
Sediment Core Log
LDW-SC-203 (R1)

Project: LDV RI/FS
Water Body Type: Lower Duwamish Waterway
Tube Length (ft): 16.1

Project #: PORS5-18220-511
Water Elevation (ft)/Tide: 7.8
Penetration Depth (ft): 12.1

Client: LDWG
Water Depth (ft): 24.4
Sample Quality: Good

Collection Date: 2/17/06
Mudline Elevation (ft): -16.6
Recovery in ft (%): 8.8 (73)

Contractor: MCS Environmental, Inc.
N./LAT: 202013
E./LONG: 1268832
Process Date: 2/18/06

Vessel: MCS barge

Operator: Gary Maxwell
Method/Tube ID: Diver Impact Core/4" sq. AI
Process Method: Cut tube
Logged By: A. Fitzpatrick, N. Bacher

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Sediment Description
Classification Scheme: USCS
Contacts are recovered depth
(In-situ depth interval in feet with parentheses)

Recovered Depth (ft)

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Chemical Analysis

Physical Measurement

@ 6.6' small brick fragment

SM: (8.1-12.1) damp, medium dense, very dark greenish gray (GLEY 1, 3'1') medium SAND, little gravel, few silt, light gray, clay clasts up to 2" diameter. Gravel is angular and up to 2" diameter.

End of core at 8.8'.

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In-situ Depth (ft)
Comments for Recovered Depths

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In-situ Depth Log & Graphic Log

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Remarks: Drive Notes: freefall (1.5'), easy (12.2'), penetration goal reached. One drive attempt made at station. Core catcher was 80% full. Torvane measurements skewed high. Field replicate of SC-34.

Calculated Recovery
Sample Length/Penetration Length: 8.8 / 12.1 = 73 %

Note: Stratigraphic interpretations are preliminary and subject to change during the Remedial Investigation.