APPENDIX A. RECONNAISSANCE SURVEY DATA

TABLES

LIST OF TABLES

Table A-1. GPS coordinates\textsuperscript{a} for seeps identified during the reconnaissance survey

Table A-2. Water quality data from seeps sampled during the reconnaissance survey

Table A-3. Water quality data from seeps and associated LDW locations sampled during the reconnaissance survey

Table A-4. Transcribed field notes of seep observations made during the reconnaissance survey

\textsuperscript{a} GPS coordinates
Table A-1. GPS coordinates\textsuperscript{a} for seeps identified during the reconnaissance survey

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\textsuperscript{a} NAD 1983 State Plane Washington North
### Table A-2. Water quality data from seeps sampled during the reconnaissance survey

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<th>pH</th>
<th>OXIDATION-REDUCTION POTENTIAL&lt;sup&gt;a&lt;/sup&gt; (mV)</th>
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### Table A-3. Water quality data from seeps and associated LDW locations sampled during the reconnaissance survey

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<th>Specific Conductivity (µS/cm)</th>
<th>Dissolved Oxygen (mg/L)</th>
<th>pH</th>
<th>Oxidation-Reduction Potential (mV)</th>
<th>Salinity (ppt)</th>
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* a Calculated from temperature and conductivity
* b Value in field notes was one order of magnitude less. It was assumed to be a transcription error.
Table A-4. Transcribed field notes of seep observations made during the reconnaissance survey

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<td>Flow rate</td>
<td>Low</td>
</tr>
<tr>
<td>Substrate description</td>
<td>(GP) gravel; dark gray brown; 95% gravel fill, w/riprap &amp; debris steel; 5% muck (silt &amp; clay); loose; wet; no odor</td>
</tr>
<tr>
<td>Seep observations</td>
<td>No sheen, no odor; light brown cloudy; trace of sediment</td>
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<tr>
<td>Description</td>
<td>Steep; riprap w/rounded gravel; construction debris to 20 ft, iron, wood, brick; pavement</td>
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<td>Seep location</td>
<td>Mid-bank, about 10 ft below vegetation; angle/corner bank; near dock</td>
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<tr>
<td>Flow rate</td>
<td>Low-medium</td>
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<td>Substrate description</td>
<td>(SM/GP); silty sand w/gravel, dark gray to brown; 60% fine-to-medium sand; 25% rounded gravel to 2 in; 15% silty (muck); loose, wet, overlain w/riprap (concrete) w/construction debris, cable, and pipe</td>
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<tr>
<td>Seep observations</td>
<td>No sheen, no odor; slime and vegetation cover surfaces, water clear to translucent yellow brown, sediment trace</td>
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<tr>
<td>Description</td>
<td>(below parking area), low bank seep ~15 ft (estimated) below high water; straight bank behind barge</td>
</tr>
<tr>
<td>Seep location</td>
<td>Broad linear seep line along toe of riprap, at low-low tide contact w/riprap (base of bank)/toe</td>
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<td>Substrate description</td>
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<tr>
<td>Seep observations</td>
<td>No sheen, no odor, clear to translucent trace fine sediment, rust precipitate surfaces at seep</td>
</tr>
<tr>
<td>Description</td>
<td>Steep riprap w/metal debris (collapsed boat rail?), broad seep area at toe/base of riprap</td>
</tr>
<tr>
<td>Seep location</td>
<td>Toe of riprap, about 15 ft from high water line/fence liner to broad seep area of about 10 small seeps</td>
</tr>
<tr>
<td>LDW-SP-04</td>
<td></td>
</tr>
<tr>
<td>Flow rate</td>
<td>Medium-high</td>
</tr>
<tr>
<td>Substrate description</td>
<td>(ML) silt, dark brownish gray, 95% silt w/black organics fine, very soft, wet, below steep concrete blocks to 10 ft, trace of fine sand</td>
</tr>
<tr>
<td>Seep observations</td>
<td>Clear to trace gray sediment, no odor, no sheen, slimy surface</td>
</tr>
<tr>
<td>Description</td>
<td>Below dock/piling remains, steep bank of large concrete blocks, very mucky area underlain by large concrete block</td>
</tr>
<tr>
<td>Seep location</td>
<td>About mid-bank, below concrete blocks (north of scrap yard)</td>
</tr>
<tr>
<td>LDW-SP-05</td>
<td></td>
</tr>
<tr>
<td>Flow rate</td>
<td>Medium-high</td>
</tr>
<tr>
<td>Substrate description</td>
<td>(GP) gravel and riprap, with sand and silty muck, 90% rounded gravel w/crushed concrete to 10 in, 10% sand , trace of silt muck on surface, medium to dense, wet</td>
</tr>
<tr>
<td>Seep observations</td>
<td>No odor, no sheen, no color or trace of sediment, slime on surface rock</td>
</tr>
<tr>
<td>Description</td>
<td>Step bank, south of metal scrap yard/crane</td>
</tr>
<tr>
<td>Seep location</td>
<td>Mid-low bank, within riprap zone</td>
</tr>
<tr>
<td>SEEP LOCATION ID</td>
<td>OBSERVATIONS*a, b</td>
</tr>
<tr>
<td>-----------------</td>
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<tr>
<td>LDW-SP-06</td>
<td></td>
</tr>
<tr>
<td>Flow rate</td>
<td>High</td>
</tr>
<tr>
<td>Substrate description</td>
<td>(ML) silt dark grayish brown, 95% fine silt, clay, organic, trace of sand gravel, soft, wet</td>
</tr>
<tr>
<td>Seep observations</td>
<td>No odor/no sheen, clear to trace gray sediment, slime on surface area of seep, barnacles on piling, seep in 4-in channel, meander over broad beach ~50 ft</td>
</tr>
<tr>
<td>Description</td>
<td>Flat alluvial beach/bar, sand and fine silt, seep near former piling/stud</td>
</tr>
<tr>
<td>Seep location</td>
<td>Channelized across broad beach</td>
</tr>
<tr>
<td>LDW-SP-07</td>
<td></td>
</tr>
<tr>
<td>Flow rate</td>
<td>High</td>
</tr>
<tr>
<td>Substrate description</td>
<td>(SM/ML) dark brownish gray w/some rust brown gravel, silty sand w/gravel, 80% coarse to fine sand, 15% silty, 5% gravel to 2 in, medium dense, wet</td>
</tr>
<tr>
<td>Seep observations</td>
<td>From channel about 20 ft across beach from stake, silty muck over beach sand w/gravel/riprap, no odor, no sheen, trace of fine sediment (muck)</td>
</tr>
<tr>
<td>Description</td>
<td>Channel seep from broad beach</td>
</tr>
<tr>
<td>Seep location</td>
<td>Stake at riprap toe, seep lower channel below semi tractor-trailer parking</td>
</tr>
<tr>
<td>LDW-SP-08</td>
<td></td>
</tr>
<tr>
<td>Flow rate</td>
<td>Medium-High</td>
</tr>
<tr>
<td>Substrate description</td>
<td>(ML) silt, 95% silt, dark grayish brown, 5% fine sand, medium to soft, wet, 40-50 ft from retaining wall at bank, 6-in wide channel across bank</td>
</tr>
<tr>
<td>Seep observations</td>
<td>No odor/no sheen, clear; trace of gray silt</td>
</tr>
<tr>
<td>Description</td>
<td>Amongst former pier pilings (+20)</td>
</tr>
<tr>
<td>Seep location</td>
<td>Channel across broad beach</td>
</tr>
<tr>
<td>LDW-SP-09</td>
<td></td>
</tr>
<tr>
<td>Flow rate</td>
<td>Medium-Low</td>
</tr>
<tr>
<td>Substrate description</td>
<td>(GP) gravel, 90% rounded gravel to 3 in, 10% fine sand and silty muck, very dense, wet, below pavement riprap</td>
</tr>
<tr>
<td>Seep observations</td>
<td>No odor/no sheen, clear, slime on area of seep</td>
</tr>
<tr>
<td>Description</td>
<td>Gravel w/broken asphalt, (below tanks)-above ground storage</td>
</tr>
<tr>
<td>Seep location</td>
<td>Mid-bank, moderate slope, point seep</td>
</tr>
<tr>
<td>LDW-SP-10</td>
<td></td>
</tr>
<tr>
<td>Flow rate</td>
<td>Medium-High</td>
</tr>
<tr>
<td>Substrate description</td>
<td>(ML/GP) silt w/gravel, 85% silty muck, 15% round gravel, dark grayish to brown, soft, wet</td>
</tr>
<tr>
<td>Seep observations</td>
<td>No odor/no sheen, trace of brown sediment to clear</td>
</tr>
<tr>
<td>Description</td>
<td>Channel to 10 in wide, from broad seep to 20 ft, weeping from retaining wall</td>
</tr>
<tr>
<td>Seep location</td>
<td>Channel about 40 ft from wall, meanders across broad mucky/silty beach</td>
</tr>
<tr>
<td>LDW-SP-11</td>
<td></td>
</tr>
<tr>
<td>Flow rate</td>
<td>High</td>
</tr>
<tr>
<td>Substrate description</td>
<td>(ML) silt, 95% silty muck, dark gray to brownish, soft, wet, 5% fine-medium sand, broad flat beach, w/retaining wall and building</td>
</tr>
<tr>
<td>Seep observations</td>
<td>No odor/no sheen, trace to cloudy w/sediment (fine)</td>
</tr>
<tr>
<td>Description</td>
<td>10-in wide channel, strong flow, meanders across 50-70 ft of beach</td>
</tr>
<tr>
<td>Seep location</td>
<td>Channel from toe of retaining wall (100+) below building/public access point</td>
</tr>
</tbody>
</table>

*Observations include flow rate, substrate description, seep observations, description, and seep location.

**a** Indicates measurements were taken on the day of sampling.

**b** Indicates measurements were taken on the day after sampling.
<table>
<thead>
<tr>
<th>SEEP LOCATION ID</th>
<th>OBSERVATIONS</th>
<th>Substrate description</th>
<th>Seep observations</th>
<th>Description</th>
<th>Seep location</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDW-SP-12</td>
<td>High</td>
<td>(ML/SP) silt w/sand, 80% silty muck, 10% sand, 10% gravel fill, soft, wet</td>
<td>No odor/no sheen, trace of fine sediment, slimy surface</td>
<td>Strong channel flow from toe of riprap and sheet pile, concrete surface (pallets and drums)</td>
<td>Base of riprap, channel (flow) over short beach at lower low tide water</td>
</tr>
<tr>
<td>LDW-SP-13</td>
<td>High</td>
<td>(ML) silt, dark grayish brown, 90% silty muck, 10% fine sand, soft, wet, (channel across wide low tide beach)</td>
<td>No odor/no sheen, translucent gray brown sediment</td>
<td>Wide weeping gravel and riprap at bank, channelize to sample point</td>
<td>~50 ft from toe of riprap bank, below Boeing fence vegetated area</td>
</tr>
<tr>
<td>LDW-SP-14</td>
<td>High</td>
<td>(ML) silt, dark gray brown, 95% silty muck, soft, wet, broad flat beach/alluvium, trace of sand, gravel</td>
<td>No odor/no sheen, gray sediment</td>
<td>Strong channel flow to 12 in wide</td>
<td>Collects from broad area at toe of riprap below Boeing building; channelizes and meanders across broad ~50 ft beach alluvium w/pilings (old)</td>
</tr>
<tr>
<td>LDW-SP-15</td>
<td>High</td>
<td>(ML) dark gray brown silty muck w/rust-color gravel, 80% silty muck, 10% fine-to-medium sand, 10% round gravel to 2 in, soft, wet, green seaweed</td>
<td>No odor/no sheen, trace of gray sediment-rust precipitate on gravel surfaces in seep channel</td>
<td>10-in strong flowing channel from toe of riprap to narrow beach/alluvium (20 ft)</td>
<td>Channel from riprap base, w/broken brick wall debris, south end of Boeing building/gravel boat ramp</td>
</tr>
<tr>
<td>LDW-SP-16</td>
<td>Medium</td>
<td>(GP) 90% riprap fill w/5% fine-to-medium sand, 5% muck/silt, dense, wet, dark gray to brown</td>
<td>No odor/no sheen, trace of sediment</td>
<td>Steep riprap below Boeing fence, vegetation, trickle seep sample above stake location</td>
<td>Mid to lower on steep riprap bank, stake submerge ~2 ft below rising tide</td>
</tr>
<tr>
<td>SEEP LOCATION ID</td>
<td>OBSERVATIONSᵃ,ᵇ</td>
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<tr>
<td>LDW-SP-17</td>
<td>Flow rate Medium-high</td>
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<tr>
<td></td>
<td>Substrate description (GP) gravel and riprap, 90% gravel rounded to 2 in, 10% fine sand and muck, dense, wet, barnacles</td>
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<tr>
<td></td>
<td>Seep observations No odor, no sheen, clear, slimy on surfaces near seep</td>
<td></td>
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<tr>
<td></td>
<td>Description Steep bank, waterfall from riprap cover</td>
<td></td>
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<tr>
<td></td>
<td>Seep location Mid-bank, at collapsed wooden wall, below Boeing fence and vegetation</td>
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<tr>
<td>LDW-SP-18</td>
<td>Flow rate Medium-high</td>
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<tr>
<td></td>
<td>Substrate description (GP/SM) gravel w/silty sand, 70% gravel to 2 in, 20% firm to medium sand, 10% silty muck, medium, wet</td>
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<tr>
<td></td>
<td>Seep observations No odor, no sheen, clear to trace sediment (suspect outfall behind lumber/pipe debris)</td>
<td></td>
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<tr>
<td></td>
<td>Description 10-in channel from toe of riprap, stacked concrete, and collapsed pilings</td>
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<tr>
<td></td>
<td>Seep location Base of riprap, below Boeing fence/vegetation</td>
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<tr>
<td>LDW-SP-19</td>
<td>Flow rate Medium</td>
<td></td>
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<tr>
<td></td>
<td>Substrate description (GP/SM) 80% [crushed] to rounded gravel w/brick, 10% sand, 10% silty (muck), dark gray to brown, firm, wet</td>
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<tr>
<td></td>
<td>Seep observations No odor/no sheen, trace of gray sediment</td>
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<tr>
<td></td>
<td>Description Steep riprap broken brick, concrete slabs, topped w/steel mill? Furnace slag lobes</td>
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<tr>
<td></td>
<td>Seep location Very low bank, toe of brick riprap, moderate-to-strong seep, broad shallow channel to 3 ft</td>
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<tr>
<td>LDW-SP-20</td>
<td>Flow rate Medium-low</td>
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<tr>
<td></td>
<td>Substrate description (GP/SM) dark gray brown, gravel w/silty sand, 70% rounded to [crushed] gravel w/brick and concrete, 20% fine sand, 10% silty muck, medium dense, wet (small channel at base of concrete wall)</td>
<td></td>
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<tr>
<td></td>
<td>Seep observations No odor, no sheen, clear w/trace of sediment</td>
<td></td>
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<tr>
<td></td>
<td>Description From toe of wall; narrow, flat gravelly beach visible only at low tide</td>
<td></td>
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<tr>
<td></td>
<td>Seep location Base of 15-ft wall (concrete and steel), small channel to 4 in</td>
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<tr>
<td>LDW-SP-21</td>
<td>Flow rate High</td>
<td></td>
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<tr>
<td></td>
<td>Substrate description (GP/SM) dark gray brown, gravel w/silty sand, 80% gravel crushed fill to 10 in, 10% coarse to fine sand, 10% silty muck, dense, wet, barnacles</td>
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<tr>
<td></td>
<td>Seep observations No odor/no sheen, trace sediment to clear</td>
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<tr>
<td></td>
<td>Description Steel I-beam wall to 12 ft over low sloping riprap</td>
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<tr>
<td></td>
<td>Seep location Point seep, mid-bank in riprap</td>
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<tr>
<td>LDW-SP-22</td>
<td>Flow rate Medium-low</td>
<td></td>
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<tr>
<td></td>
<td>Substrate description (GP) gravel, w/sand, 90% round gravel to 3 in, 10% fine-to-medium sand, trace, silt, dense, wet</td>
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<tr>
<td></td>
<td>Seep observations No odor, no sheen</td>
<td></td>
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<tr>
<td></td>
<td>Description Riprap; steep slope</td>
<td></td>
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<tr>
<td></td>
<td>Seep location Seep from toe of riprap, begins channel to 12 in across</td>
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<tr>
<td>SEEP LOCATION ID</td>
<td>OBSERVATIONS*&lt;sup&gt;a,b&lt;/sup&gt;</td>
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<tr>
<td>LDW-SP-23</td>
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<tr>
<td>Flow rate</td>
<td>Medium</td>
<td></td>
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<tr>
<td>Substrate description</td>
<td>(GP/ML) 80% riprap over silty (river alluvium) bank dark gray to brown, very soft silt bank, wet, organic muck</td>
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</tr>
<tr>
<td>Seep observations</td>
<td>No odor, no sheen, clear</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Steep riprap above silty river bank-beach, below vegetation and aboveground tank</td>
<td></td>
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<tr>
<td>Seep location</td>
<td>Multiple seeps from toe of riprap join rapid 4 to 6-in channel, meander/cutting silty riverbank below</td>
<td></td>
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<tr>
<td>LDW-SP-24</td>
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<tr>
<td>Flow rate</td>
<td>Medium-low</td>
<td></td>
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</tr>
<tr>
<td>Substrate description</td>
<td>(GP) dark gray brown, 95% gravel rounded to crushed rock w/riprap, 5% fine sand, dense, wet, trace of muck w/green slime</td>
<td></td>
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<tr>
<td>Seep observations</td>
<td>Clear, trace of floating white dust, (pollen?) no odor, no sheen</td>
<td></td>
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</tr>
<tr>
<td>Description</td>
<td>Steep riprap slope, over gravelly sand, small channel flow</td>
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<tr>
<td>Seep location</td>
<td>High bank several feet below higher high water line, below fence</td>
<td></td>
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<tr>
<td>LDW-SP-25</td>
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<tr>
<td>Flow rate</td>
<td>Medium</td>
<td></td>
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<tr>
<td>Substrate description</td>
<td>(SP/GP) dark brown, 80% coarse to fine sand, 20% crushed gravel to riprap, dense, wet, green vegetation over riprap</td>
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<tr>
<td>Seep observations</td>
<td>No odor, no sheen, clear to trace of fine brown sediment, green slime/vegetation in area of seep</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Description</td>
<td>Shelf bank (collapse?), riprap and sand, steep to water line</td>
<td></td>
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<tr>
<td>Seep location</td>
<td>Mid-bank at shelf, tree trunk fallen from fence line</td>
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<tr>
<td>LDW-SP-26</td>
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<tr>
<td>Flow rate</td>
<td>Medium</td>
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<tr>
<td>Substrate description</td>
<td>(GP) gravel, dark gray brown, 95% rounded to 3 in and large angular riprap, 5% medium-coarse sand, trace of silt, medium-dense, wet, (strong channel flow)</td>
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</tr>
<tr>
<td>Seep observations</td>
<td>No odor, no sheen, clear w/trace of fine sediment, [little] slime/growth</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Description</td>
<td>Gravel to riprap, moderate slope to alluvium shore beach, below vegetation/Boeing fence</td>
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</tr>
<tr>
<td>Seep location</td>
<td>Mid-bank at shelf, gravel/riprap develop strong flowing channel carving into mud bank</td>
<td></td>
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<tr>
<td>LDW-SP-27</td>
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<tr>
<td>Flow rate</td>
<td>Medium</td>
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<tr>
<td>Substrate description</td>
<td>(SM) silty sand, 80% medium to coarse sand, 15% silty, 5% pebbles to gravel (base of riprap), loose, wet (fill w/alluvium)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Seep observations</td>
<td>No odor/no sheen, clear to trace sediment</td>
<td></td>
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<tr>
<td>Description</td>
<td>Adjacent to concrete/steel pile wall, seep below very large (concrete to 10 ft) block of riprap</td>
<td></td>
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</tr>
<tr>
<td>Seep location</td>
<td>Mid-bank at toe of riprap channel to 6 in wide</td>
<td></td>
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<tr>
<td>SEEP LOCATION ID</td>
<td>OBSERVATIONS*.&lt;sup&gt;a, b&lt;/sup&gt;</td>
<td></td>
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<tr>
<td>LDW-SP-28</td>
<td>Flow rate Medium&lt;br&gt;Substrate description (SM) silty sand, dark gray to brown, 80% fine-to-medium sand, 20% silty river alluvium, medium sand dense, wet, (collapsed river bank w/pilings)&lt;br&gt;Seep observations Silty sediment translucent gray brown, no odor/no sheen&lt;br&gt;Description Recent?Collapsed river bank along colonnade of pilings, mid-bank seep cutting steep channel&lt;br&gt;Seep location Mid-bank multiple small seep channeling to steeply cutting 10-in channel</td>
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<tr>
<td>LDW-SP-29</td>
<td>Flow rate Medium-high&lt;br&gt;Substrate description (ML) silt w/organics, 95% silty muck, 5% sand (fine) very soft, wet, log jam in river bank/bar, large old cedars to 30-40 ft, set in mud&lt;br&gt;Seep observations No odor/no sheen, clear w/trace of fine sediment&lt;br&gt;Description Wide steep mud bank w/~half dozen large stumps and logs on and in mud, no riprap below vegetated fence line&lt;br&gt;Seep location Mid-bank below log within log jam</td>
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<tr>
<td>LDW-SP-30</td>
<td>Flow rate Medium&lt;br&gt;Substrate description (SM) silty sand, dark gray brown, 70% fine-to-medium sand, 30% silty muck, trace of pebbles to gravel, below riprap, loose, wet, seep at large log wedged in riprap&lt;br&gt;Seep observations Clear, no odor/no sheen, trace of sediment&lt;br&gt;Description Lower mid-bank, river sand and silt, overlain by riprap, tree stump and log snag&lt;br&gt;Seep location Toe of riprap at river bank, moderate channel to 5 in wide</td>
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<td>LDW-SP-31</td>
<td>Flow rate Medium&lt;br&gt;Substrate description (SM/ML) very silty sand, 60% fine-to-coarse sand, 40% silty alluvium (muck), trace of gravel fill, loose/soft, wet, below (concrete blocks) riprap&lt;br&gt;Seep observations No odor/no sheen, clear&lt;br&gt;Description Steep riprap blocks adjacent to natural bank, no riprap, seep at toe&lt;br&gt;Seep location Low bank at riprap contact w/shoreline, below willows/fence</td>
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<tr>
<td>LDW-SP-32</td>
<td>Flow rate High&lt;br&gt;Substrate description (ML/GP) silt w/riprap, 75% silt, 25% riprap and debris (pipe, wood), soft, wet (broad mud bank)&lt;br&gt;Seep observations No odor/no sheen, trace of fine sediment&lt;br&gt;Description Broad low slope mud bank w/log snags, just south of Boeing bridge&lt;br&gt;Seep location Mid-bank at rubble/riprap outcrop in mud bank, low sloping mud bank w/snags</td>
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<tr>
<td><strong>Seep Location ID</strong></td>
<td><strong>Observations</strong>(^{a},^{b})</td>
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<tr>
<td>LDW-SP-33</td>
<td><strong>Flow rate</strong> Medium-low</td>
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<td></td>
<td><strong>Substrate description</strong> (ML/GP) silty muck w/riprap gravel, dark gray w/rusty brown surfaces, soft, wet, river bank sediments below short pier</td>
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<td></td>
<td><strong>Seep observations</strong> No odor/no sheen, trace of fine sediment</td>
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<td></td>
<td><strong>Description</strong> Upper river bank muds at toe of riprap, seep channels to 4 in width down bank</td>
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<td></td>
<td><strong>Seep location</strong> Moderate slope upper mid-bank, toe of riprap beneath existing pier structure/building</td>
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<tr>
<td>LDW-SP-34</td>
<td><strong>Flow rate</strong> High</td>
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<td></td>
<td><strong>Substrate description</strong> (SM/ML) dark gray brown, very silty sand, 60% very fine sand, 40% silty muck, loose/soft, wet, (river bank/bar), long seep channel from riprap</td>
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<td></td>
<td><strong>Seep observations</strong> No odor, no sheen, trace of sediment</td>
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<td></td>
<td><strong>Description</strong> Steep riprap along roadway above wide (~100 ft?) river bank</td>
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<td></td>
<td><strong>Seep location</strong> Seep channels across wide bank</td>
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<tr>
<td>LDW-SP-35</td>
<td><strong>Flow rate</strong> na</td>
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<td></td>
<td><strong>Substrate description</strong> (ML) silt, 100% mucky silt (river bank), dark gray brown, very soft, wet</td>
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<td></td>
<td><strong>Seep observations</strong> Clear to trace of gray sediment, no odor, no sheen</td>
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<td></td>
<td><strong>Description</strong> Low bank, seep spring on low sloping river bank low tide zone</td>
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<td></td>
<td><strong>Seep location</strong> Low bank, very soft muck/silt, few tree branches</td>
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<tr>
<td>LDW-SP-36</td>
<td><strong>Flow rate</strong> Medium</td>
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<tr>
<td></td>
<td><strong>Substrate description</strong> (ML/GP) 100% silt below riprap and gravel, dark gray brown, soft, wet</td>
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<td></td>
<td><strong>Seep observations</strong> No odor/no sheen, trace of sediment, gray</td>
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<tr>
<td></td>
<td><strong>Description</strong> Very steep riprap to low tide water, (marker submerged) small seep adjacent to large channel</td>
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<td></td>
<td><strong>Seep location</strong> Toe of riprap below foundation/&quot;electric substation?&quot;</td>
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<tr>
<td>LDW-SP-37</td>
<td><strong>Flow rate</strong> High</td>
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<td></td>
<td><strong>Substrate description</strong> (GP/ML) dark gray to brown cobbles to 6 in, over silty river bank/muck, very soft, wet, broad river bank (low tide ~75 ft)</td>
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<td></td>
<td><strong>Seep observations</strong> No odor/no sheen</td>
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<tr>
<td></td>
<td><strong>Description</strong> Moderate steep cobbles, base overlain w/riprap</td>
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<td></td>
<td><strong>Seep location</strong> Broad seep zone at toe of riprap ~100 ft, 3 main channels combine to one cut channel, strong flow 2 ft across</td>
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<tr>
<td>LDW-SP-38</td>
<td><strong>Flow rate</strong> Medium-high</td>
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<tr>
<td></td>
<td><strong>Substrate description</strong> (ML/GP)silt with gravel, dark gray brown, 70% silt (below riprap), 30% crushed gravel, (below riprap), soft, wet</td>
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<td></td>
<td><strong>Seep observations</strong> No odor/no sheen, trace of sediment</td>
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<tr>
<td></td>
<td><strong>Description</strong> Low tide river bank w/channel seep, from toe of riprap</td>
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<tr>
<td></td>
<td><strong>Seep location</strong> Mid-bank at base of riprap, across exposed low tide bank (~30 ft)</td>
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<tr>
<td>SEEP LOCATION ID</td>
<td>OBSERVATIONS</td>
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<tr>
<td><strong>LDW-SP-39</strong></td>
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<tr>
<td>Flow rate</td>
<td>High</td>
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<tr>
<td>Substrate description</td>
<td>(SM/GP) silty sand and gravel, 50% fine-to-medium sand, 25% silty, 25% rounded gravel, firm, wet</td>
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<tr>
<td>Seep observations</td>
<td>No odor/no sheen/trace of sediment</td>
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<tr>
<td>Description</td>
<td>Low sloping bank to industrial yard, seep at sand/gravel contact and low tide bank</td>
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<tr>
<td>Seep location</td>
<td>Below Delta Marine pier, mid-bank, low/moderate slope, sand/gravel contact</td>
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<td><strong>LDW-SP-40</strong></td>
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<tr>
<td>Flow rate</td>
<td>Medium</td>
<td></td>
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<tr>
<td>Substrate description</td>
<td>(ML/GP) silt (95%), below steep riprap, soft, wet, dark brown gray, construction debris (wood, plastic, leaves)</td>
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<tr>
<td>Seep observations</td>
<td>No odor, no sheen</td>
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<tr>
<td>Description</td>
<td>Steep riprap below gray house</td>
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<tr>
<td>Seep location</td>
<td>Toe of riprap, stake submerged</td>
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<tr>
<td><strong>LDW-SP-41</strong></td>
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<tr>
<td>Flow rate</td>
<td>High</td>
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<tr>
<td>Substrate description</td>
<td>(SM/GP) silty sand 60%, 40% rounded cobble fill, firm, wet (dark gray brown)</td>
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<tr>
<td>Seep observations</td>
<td>Slow/weeping seep along 100 ft of bank between mooring piles, sheen at seep, (light; not observed in river)</td>
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<tr>
<td>Description</td>
<td>Low to moderate grade cobbles and sand to high level of riprap and vegetation</td>
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<tr>
<td>Seep location</td>
<td>From cobble/sand, silt (mid-bank) contact, south of work pier/barge repair</td>
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<td><strong>LDW-SP-42</strong></td>
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<tr>
<td>Flow rate</td>
<td>Medium-high</td>
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<tr>
<td>Substrate description</td>
<td>(SM/GP) 60% silty sand, 40% rounded cobbles and small riprap; firm, wet (dark gray brown)</td>
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<tr>
<td>Seep observations</td>
<td>No odor/no sheen, trace of sediment</td>
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<tr>
<td>Description</td>
<td>Low to moderate slope cobbles to small riprap top, seep forms small channel to 6 in</td>
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<tr>
<td>Seep location</td>
<td>Mid-bank at cobble/riprap contact w/river silty sand, vegetation/white building (set back), (grounded barges to south)</td>
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<td><strong>LDW-SP-43</strong></td>
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<tr>
<td>Flow rate</td>
<td>High</td>
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<tr>
<td>Substrate description</td>
<td>(GP/ML) 80% angular dark gray gravel fill, 20% silty muck river bank, soft/firm, wet</td>
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<tr>
<td>Seep observations</td>
<td>No odor/no sheen, trace of sediment</td>
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<tr>
<td>Description</td>
<td>Low-grade mud bank grading to fill rock and large riprap levee/vegetated (Boeing fence)</td>
<td></td>
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<tr>
<td>Seep location</td>
<td>Low bank broad head forms channel across silty (muck) to 6-in, good flow</td>
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<tr>
<td><strong>LDW-SP-44</strong></td>
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<tr>
<td>Flow rate</td>
<td>Medium-high</td>
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<tr>
<td>Substrate description</td>
<td>(ML/SM) very silty sand, dark gray brown, 50% fine-to-coarse sand/trace of gravel, 50% silty, soft, wet</td>
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<tr>
<td>Seep observations</td>
<td>No odor/no sheen, trace of gray sediment</td>
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<tr>
<td>Description</td>
<td>Steep riprap topped with about 6 ft of concrete blocks</td>
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<tr>
<td>Seep location</td>
<td>Very low bank, strong seep from base of riprap, below Marina parting, channels 10 in wide</td>
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<tr>
<td>SEEP LOCATION ID</td>
<td>OBSERVATIONS$^*,^b$</td>
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<tr>
<td>LDW-SP-45</td>
<td>Flow rate Low</td>
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<tr>
<td></td>
<td>Substrate description (ML/SM) very silty sand, dark gray to brown, 60% firm to coarse sand, 40% silty muck, soft-firm, wet, trace of riprap from above</td>
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<td></td>
<td>Seep observations No sheen/no odor, trace of gray sediment</td>
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<tr>
<td></td>
<td>Description Moderate to steep riprap w/tires, seep at riverbank contact</td>
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<tr>
<td></td>
<td>Seep location Very low bank, seep at base of rubble brick; weeping seep to short channel</td>
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<tr>
<td>LDW-SP-46</td>
<td>Flow rate Medium-high</td>
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<tr>
<td></td>
<td>Substrate description (SM/GP) 60% fine-to-medium sand, 20% silty muck, 20% crushed brick fill, debris (tires, wood) and small riprap, firm, wet</td>
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<td></td>
<td>Seep observations No odor/no sheen, trace of sediment</td>
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<tr>
<td></td>
<td>Description Steep brick concrete riprap over river bank, mud with sand, broad seep to 10 ft forming small channels</td>
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<td></td>
<td>Seep location Low bank, base of riprap on low tide river bank</td>
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<tr>
<td>LDW-SP-47</td>
<td>Flow rate Medium-high</td>
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<tr>
<td></td>
<td>Substrate description (SM/GP) silty sand with gravel and riprap, dark grayish brown, soft/loose, wet</td>
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<tr>
<td></td>
<td>Seep observations No odor/no sheen, trace of sediment</td>
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<tr>
<td></td>
<td>Description Steep riprap below vegetated fence line</td>
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<tr>
<td></td>
<td>Seep location Low bank, base of riprap at start/contact over mud bank/river's edge</td>
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<tr>
<td>LDW-SP-48</td>
<td>Flow rate High</td>
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<tr>
<td></td>
<td>Substrate description (SM/GP) 60% fine-to-medium sand, 20% rounded pebbles to occasional riprap, 20% silty muck, firm, wet</td>
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<td></td>
<td>Seep observations No odor/no sheen, clear w/trace of sediment</td>
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<tr>
<td></td>
<td>Description Low-to-moderate beach/shore access area</td>
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<td></td>
<td>Seep location Low-to-mid-bank channel steep from broad beach sand/access point</td>
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<tr>
<td>LDW-SP-49</td>
<td>Flow rate Medium</td>
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<tr>
<td></td>
<td>Substrate description (SM/GP) silty sand, dark grayish brown, 40% silt muck, 60% fine-to-coarse sand, firm, wet</td>
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<tr>
<td></td>
<td>Seep observations No odor/no sheen, clear w/trace of sediment</td>
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<tr>
<td></td>
<td>Description 20-ft wide mud bank with seep, 10 ft below steep riprap bank and vegetation</td>
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<td></td>
<td>Seep location &quot;Spring&quot; seep, low river bank, forming channel to 10-in width</td>
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<tr>
<td>LDW-SP-50</td>
<td>Flow rate Medium</td>
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<td>Substrate description (ML/SM) 80% dark gray to brown silty muck, 10% fine sand, 10% riprap concrete debris, very soft, wet</td>
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<td></td>
<td>Seep observations No odor/no sheen, trace of sediment (gray)</td>
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<tr>
<td></td>
<td>Description Construction debris w/concrete pour? ledge over river bank muds w/seep</td>
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<td></td>
<td>Seep location Low bank, point/spring seep; low slope, river bank behind barge, vegetated levee</td>
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<tr>
<td><strong>SEEP LOCATION ID</strong></td>
<td><strong>OBSERVATIONS</strong>&lt;sup&gt;a, b&lt;/sup&gt;</td>
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<tr>
<td>LDW-SP-51</td>
<td><strong>Flow rate</strong> Medium-low&lt;br&gt;&lt;br&gt;<strong>Substrate description</strong> (SM) silty sand, dark grayish brown, 60% fine-to-coarse sand, 40% silt muck river bank, firm to soft, wet&lt;br&gt;&lt;br&gt;<strong>Seep observations</strong> No odor/no sheen, trace of gray sediment&lt;br&gt;&lt;br&gt;<strong>Description</strong> Steep riprap above seep, seep weeps across 20-ft length forming small channels&lt;br&gt;&lt;br&gt;<strong>Seep location</strong> Low bank, base of brick riprap bank, below tractor trailer parking</td>
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<tr>
<td>LDW-SP-52</td>
<td><strong>Flow rate</strong> Low&lt;br&gt;&lt;br&gt;<strong>Substrate description</strong> (GP-SM) 90% rounded gravel (to 2-in), 10% fine sand w/silt, medium dense, wet, dark grayish-brown&lt;br&gt;&lt;br&gt;<strong>Seep observations</strong> No sheen/sulfide odor, light gray w/gray to black sediment&lt;br&gt;&lt;br&gt;<strong>Description</strong> From base of wood wall, seep small w/white slime&lt;br&gt;&lt;br&gt;<strong>Seep location</strong> Low bank, below wood retaining wall, w/concrete pour, seep at contact w/river bed, muck/grass</td>
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<tr>
<td>LDW-SP-53</td>
<td><strong>Flow rate</strong> Low&lt;br&gt;&lt;br&gt;<strong>Substrate description</strong> (SM/GP) silty sand with pebbles, 60% sand, 25% pebbles, 15% silts, firm, wet&lt;br&gt;&lt;br&gt;<strong>Seep observations</strong> Black ooze (NAPL?), little flow, no sheen, TPH odor&lt;br&gt;&lt;br&gt;<strong>Description</strong> NAPL? seep at bottom of channel, steep sloping bank, with wood terrace below; asphaltic blob topped with vegetated levee&lt;br&gt;&lt;br&gt;<strong>Seep location</strong> Low low bank adjacent to horizontal timber/ties within channel inlet</td>
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<tr>
<td>LDW-SP-54</td>
<td><strong>Flow rate</strong> Low&lt;br&gt;&lt;br&gt;<strong>Substrate description</strong> (GP) 90% rounded pebbles, 5% sandy, 5% silty, firm, wet&lt;br&gt;&lt;br&gt;<strong>Seep observations</strong> Trace sheen, trace odor, “gray water” sulfide and trace petroleum odor, clear to trace gray sediment&lt;br&gt;&lt;br&gt;<strong>Description</strong> moderate slope of pebbles, sand and silt&lt;br&gt;&lt;br&gt;<strong>Seep location</strong> Upper bank, small trickle seep, below dock with structure and metal debris levee</td>
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<tr>
<td>LDW-SP-55</td>
<td><strong>Flow rate</strong> na&lt;br&gt;&lt;br&gt;<strong>Substrate description</strong> (GP) Anthropogenic fill, with silt, dark grayish brown, firm-dense, wet, in terminus of inlet&lt;br&gt;&lt;br&gt;<strong>Seep observations</strong> No odor/no sheen; trace of fine brown sediment&lt;br&gt;&lt;br&gt;<strong>Description</strong> Steep, riprap and construction debris bank adjacent to pier/dock with structure&lt;br&gt;&lt;br&gt;<strong>Seep location</strong> Mid-bank at base of former cement truck tumbler? in asphalt concrete rubble w/gravel</td>
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<tr>
<td>LDW-SP-56</td>
<td><strong>Flow rate</strong> na&lt;br&gt;&lt;br&gt;<strong>Substrate description</strong> (GP/SM) gravel with silty sand, 50% rounded pebbles to large concrete riprap, 40% fine-to-medium sand, 10% silt muck surface, firm, wet&lt;br&gt;&lt;br&gt;<strong>Seep observations</strong> No odor/no sheen&lt;br&gt;&lt;br&gt;<strong>Description</strong> Steep riprap bank in inlet channel, gravelly channel seep&lt;br&gt;&lt;br&gt;<strong>Seep location</strong> Mid-bank in steep riprap below vegetation and stacked drums</td>
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<tr>
<td>SEEP LOCATION ID</td>
<td>OBSERVATIONS*&lt;sup&gt;a&lt;/sup&gt;,&lt;sup&gt;b&lt;/sup&gt;</td>
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<tr>
<td>LDW-SP-57</td>
<td>Flow rate High</td>
<td></td>
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<tr>
<td></td>
<td>Substrate description (GP) 95% gravel rounded and crushed to 2 in, riprap, medium, wet</td>
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<td></td>
<td>Seep observations No odor/no sheen trace of brown sediment</td>
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<tr>
<td></td>
<td>Description Moderate sloping riprap at 1st Ave bridge pilings over river bank sediment; strong seep from toe of riprap</td>
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<tr>
<td></td>
<td>Seep location Mid-bank, among bridge caisson/pilings, vegetated levee with roadside guardrail</td>
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<tr>
<td>LDW-SP-58</td>
<td>Flow rate Medium-low</td>
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<tr>
<td></td>
<td>Substrate description (SM) 75% fine-to-coarse sand, 25% silty, firm-loose, wet, broken pilings along bank</td>
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<td></td>
<td>Seep observations No sheen/no odor, trace of gray sediment</td>
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<tr>
<td></td>
<td>Description Sand berm fencing with geotextile collapse above slump at seep, broad and shallow with narrow channels</td>
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<tr>
<td></td>
<td>Seep location Low bank above tributary stream, below sand ledge at roadway/guardrail, former pilings to the right and left</td>
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<tr>
<td>LDW-SP-59</td>
<td>Flow rate Medium-low</td>
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<tr>
<td></td>
<td>Substrate description (SM/GP) silty sand with gravel, 60% fine-to-medium sand, 20% silty, 20% round angular gravel (fill), loose, wet</td>
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<td></td>
<td>Seep observations No sheen/no odor, trace of gray sediment</td>
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<tr>
<td></td>
<td>Description Beneath roadway bridge, slump of fill sand and gravel; seep weeps from broad 15-ft slump, forms multiple channels</td>
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<tr>
<td></td>
<td>Seep location Low bank above tributary stream, below sand ledge at roadway/guardrail, former pilings to the right and left</td>
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<tr>
<td>LDW-SP-60</td>
<td>Flow rate Medium-low</td>
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<tr>
<td></td>
<td>Substrate description (SM) silty sand, dark grayish brown, 70% fine-to-medium sand, 40% silty muck, soft-loose, wet, below small brick riprap and pier debris</td>
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<tr>
<td></td>
<td>Seep observations No sheen/no odor, trace of gray sediment</td>
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<tr>
<td></td>
<td>Description Low sloping riverbed with sand below riprap and pilings, collapsing decking overhead</td>
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<tr>
<td></td>
<td>Seep location Mid-bank at riprap toe over silty beach sand below decrepit dock/pilings, little flow to multiple channels</td>
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<tr>
<td>LDW-SP-61</td>
<td>Flow rate Medium-high</td>
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<tr>
<td></td>
<td>Substrate description (ML) 100% dark gray w/brown river muck, trace of fine sand, very soft, wet, below gravel/riprap and debris</td>
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<tr>
<td></td>
<td>Seep observations Water dark yellow w/black sediment and floating black organic silt/clay (muck), sulfide odor</td>
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<tr>
<td></td>
<td>Description Low flat riverbank below steep riprap w/log snags, drum and rebar in riprap</td>
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<tr>
<td></td>
<td>Seep location Very low bank, in river bed, spring-like flow, dark organic fines, strong flow from broad area of seeps w/multiple channels in soft muck</td>
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<tr>
<td>SEEP LOCATION ID</td>
<td>OBSERVATIONS*&lt;sup&gt;a,b&lt;/sup&gt;</td>
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<tr>
<td><strong>LDW-SP-62</strong></td>
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<tr>
<td>Flow rate</td>
<td>Low</td>
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<tr>
<td>Substrate description</td>
<td>(GP/ML) gravel and silt, 50% gravel grading to riprap in matrix of muck with trace of sand, dark gray to brown, stiff, wet</td>
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<tr>
<td>Seep observations</td>
<td>No odor/no sheen, trace of brown sediment</td>
<td></td>
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</tr>
<tr>
<td>Description</td>
<td>Low sloping river bank sediments below riprap, concrete and rock, vegetated levee</td>
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<tr>
<td>Seep location</td>
<td>Mid-bank at base of riprap over riverbank, very slow flow, one narrow channel</td>
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</table>

| **LDW-SP-63**   |                             |
| Flow rate       | Medium                      |
| Substrate description | (ML/SM) silty with sand, 60% silty muck, 40% firm to medium sand, trace of gravel to 1 in, soft-firm, wet, some rust-color slime over gravel |
| Seep observations | No odor/no sheen, slime, trace of floating orange organics |
| Description | Steep riprap over bank |
| Seep location | Low bank, toe of large concrete riprap over river bank sediments, between piles |

| **LDW-SP-64**   |                             |
| Flow rate       | Medium                      |
| Substrate description | (SM/GP) silty sand w/gravel, 60% fine-to-coarse sand, 20% rounded pebbles to crushed rock in riprap, 20% silty muck; firm, wet; trace of shells/barnacle detritus |
| Seep observations | No odor/no sheen, light brownish yellow |
| Description | Steep riprap rock overlain by crushed rock top w/vegetation and fence at silos |
| Seep location | Low bank at toe of riprap, contact w/riverbank silts and sand (slow/small seep) |

| **LDW-SP-65**   |                             |
| Flow rate       | Low                         |
| Substrate description | (GP/SM) silty sand w/gravel, dark gray to brown, 60% sand fine-to-coarse, 20% silty muck w/20% crushed gravel to fine; firm, wet |
| Seep observations | No odor/no sheen, clear to trace of brown sediment |
| Description | Top of low tide riverbank, base of riprap, small low flow seep to single channel, about 4 in wide |
| Seep location | Low bank at toe of crushed rock riprap topped with lobe of concrete, vegetation, and fence |

<p>| <strong>LDW-SP-66</strong>   |                             |
| Flow rate       | Medium-high                 |
| Substrate description | (SP/GM) gravelly sand with silt, 50% fine-to-coarse sand, 25% pebbles to large riprap rock, 25% silty river sediment, dark to medium brown, firm to loose, wet |
| Seep observations | No odor/no sheen, trace of brown sediment |
| Description | Low sloping gravelly beach over river low tide mud flat, strong seep from 20 ft wide weepy area, forms 10-in wide cutting channel |
| Seep location | Lower beach strand at river bar low tide muck |</p>
<table>
<thead>
<tr>
<th>SEEP LOCATION ID</th>
<th>OBSERVATIONS*a, b</th>
</tr>
</thead>
</table>
| LDW-SP-67       | **Flow rate** High
|                 | **Substrate description** (GP) gravel (brick riprap) w/ 5% sand, 5% muck, dense, wet (seep strong from brick pile)  
|                 | **Seep observations** No sheen/no odor, trace of gray sediment  
|                 | **Description** Steep brick riprap over flat tidal flat to Kellogg Island  
|                 | **Seep location** Very low bank, top of tidal flat, base of brick riprap, strong flowing channelized, meanders 100 ft to river |
| LDW-SP-68       | **Flow rate** Medium-low  
|                 | **Substrate description** (SM/GP) shelly silty sand w/crushed brick, 60% fine-to-medium sand, 20% red brick, 10% silty black muck, 10% white broken shells, firm/medium, wet  
|                 | **Seep observations** No odor/no sheen, clear to trace of brown sediment  
|                 | **Description** Low sloping sands mix w/ brick collapse from above log snags topped w/steep brick and log wall with trees and canes  
|                 | **Seep location** Mid-bank at base of brick riprap and log wall, broad weep zone to 50 ft wide, forms several shallow low flow channels |
| LDW-SP-69       | **Flow rate** Medium-low  
|                 | **Substrate description** (ML) 100% silty muck, w/drift logs, trace of shells, very soft, dark gray w/brown surface, wet  
|                 | **Seep observations** No odor/no sheen, clear  
|                 | **Description** 100 ft of natural low-loping mud and drift log bank to lowland vegetation/trees  
|                 | **Seep location** Very low bank, about 100 ft from vegetation/fence; springs from below log jam in muck |
| LDW-SP-70       | **Flow rate** Medium-high  
|                 | **Substrate description** (GP) 95% rounded gravel w/brick, 5% sand, gray to brown, loose, wet (fill behind wall)  
|                 | **Seep observations** No odor/no sheen, clear  
|                 | **Description** Low sloping sands to steel wall w/pilings; strong “waterfall” seep onto beach sands  
|                 | **Seep location** Mid-bank from hole in steel plate wall below deck w/structure |
| LDW-SP-71       | **Flow rate** Medium-low  
|                 | **Substrate description** (SM) silty sand at riprap pile, 80% firm medium sand, 20% silty, firm/medium dense, wet  
|                 | **Seep observations** No odor/no sheen, trace of fine gray silt, *Fucus* algae at pilings  
|                 | **Description** Low sloping beach over broad river bank  
|                 | **Seep location** Mid-bank at riprap outcrop in beach sands, with multiple pilings, medium flow seep, channels to 6 in |
| LDW-SP-72       | **Flow rate** Medium  
|                 | **Substrate description** 85% riprap covered partially with concrete flows, 5% gravel, 10% coarse to medium sand  
|                 | **Seep observations** No odor/no sheen, slight yellow color  
|                 | **Description** Steep concrete covered riprap, small trees and vegetation at top of bank, *Fucus* and green on riprap  
<p>|                 | <strong>Seep location</strong> Seep flows from toe of riprap bank |</p>
<table>
<thead>
<tr>
<th>SEEP LOCATION ID</th>
<th>OBSERVATIONS*a, b</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDW-SP-73</td>
<td></td>
</tr>
<tr>
<td>Flow rate</td>
<td>Medium-low</td>
</tr>
<tr>
<td>Substrate description</td>
<td>(SP) 95% medium to fine sand, dark gray, loose, wet, cover peat ledge to 2-ft thick</td>
</tr>
<tr>
<td>Seep observations</td>
<td>No odor/no sheen, clear to trace of gray sediment, trace of foamy bubbles</td>
</tr>
<tr>
<td>Description</td>
<td>Low sloping broad beach w/peat, construction debris and fill gravel at low bank</td>
</tr>
<tr>
<td>Seep location</td>
<td>Mid- to upper bank above peat ledge, large area of weeping seep (about 100 ft linear) above peat shelf</td>
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</table>

| LDW-SP-74        |                   |
| Flow rate        | Medium            |
| Substrate description | (SM) dark gray to brown silty sand, 60% fine-to-medium sand, 30% silty w/10% crushed gravel at riprap, loose, wet |
| Seep observations | No odor/no sheen, yellowish color, trace of gray sediment |
| Description      | Low sloping natural bank topped with gravel and riprap to road |
| Seep location    | Very low bank, channel from broad weeping area to 100 ft in former slip?/cove below public access park |

| LDW-SP-75        |                   |
| Flow rate        | Medium-low        |
| Substrate description | Riprap (90%), silty medium sand (10%) |
| Seep observations | No odor, no sheen, pale yellowish color, some suspended fines (minimal) |
| Description      | Moderately sloped riprap w/Fucus |
| Seep location    | Seep flows from base of riprap |

| LDW-SP-76        |                   |
| Flow rate        | Low               |
| Substrate description | (GP/SM) gravel w/silty sand, 70% rounded gravel to 2 in., 20% fine-to-medium sand, 10% silty, loose, wet |
| Seep observations | No odor/no sheen, light yellow color, trace of sediment |
| Description      | Low sloping gravel below wooden broken shoreline |
| Seep location    | Low bank at pilings below collapsed decking; low flow from small weeping area about 10 ft across |

| LDW-SP-77        |                   |
| Flow rate        | Medium            |
| Substrate description | Pipes, wood planks, metal debris, cut-off piling; medium sand, gravel (fill gravel 2-3 in), cobble and riprap |
| Seep observations | No odor/no sheen, clear sample |
| Description      | Large (8 x 10 ft) concrete structure w/moderate slope riprap/concrete/gravel surrounding |
| Seep location    | Seep flows from base of concrete structure from which a large metal pipe extends into waterway |

<p>| LDW-SP-78        |                   |
| Flow rate        | Medium            |
| Substrate description | (GP/SM) 15% silty sand, some gravel (5%), riprap bank (80%) |
| Seep observations | No odor/no sheen, clear sample |
| Description      | Moderate slope, riprap, concrete chunks w/ Fucus and green algae |
| Seep location    | Seep located lower mid-bank in concrete/riprap w/trace of gravel |</p>
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<thead>
<tr>
<th>SEEP LOCATION ID</th>
<th>OBSERVATIONS*a,b</th>
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<tbody>
<tr>
<td>LDW-SP-79</td>
<td>Flow rate Medium</td>
</tr>
<tr>
<td></td>
<td>Substrate description (GP/ML) 80% gravel rounded to 2 in, 20% dark gray silt (muck), loose, wet</td>
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<td></td>
<td>Seep observations No sheen/no odor, trace of gray sediment</td>
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<tr>
<td></td>
<td>Description Moderate to steep riprap slope w/multiple cut-off pilings, vegetated top w/tractor trailer parking</td>
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<tr>
<td></td>
<td>Seep location Low bank, toe of riprap at cutoff piling w/Fucus algae (low flowing small seep)</td>
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<tr>
<td>LDW-SP-80</td>
<td>Flow rate Medium</td>
</tr>
<tr>
<td></td>
<td>Substrate description (GP/SM) gravel w/silty sand, dark gray-brown, 50% gravel riprap, 25% silt, 25% fine-to-medium sand, loose, wet</td>
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<tr>
<td></td>
<td>Seep observations No odor/no sheen, clear</td>
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<tr>
<td></td>
<td>Description Steep bank, cut edge of peat to 5 ft overlain w/large riprap topped w/industrial yard (concrete? gypsum?)</td>
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<tr>
<td></td>
<td>Seep location Mid-bank above peat shelf to 5 ft, seep at toe of riprap</td>
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<tr>
<td>LDW-SP-81</td>
<td>Flow rate Medium</td>
</tr>
<tr>
<td></td>
<td>Substrate description (GP w/SM) 90% concrete and brick riprap, with 10% silty sand (dark gray to brown, loose, wet</td>
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<tr>
<td></td>
<td>Seep observations No sheen/no odor, trace of gray sediment</td>
</tr>
<tr>
<td></td>
<td>Description Steep riprap bank, gravel and brick</td>
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<tr>
<td></td>
<td>Seep location Mid-bank, small steady seep in concrete-brick riprap</td>
</tr>
<tr>
<td>LDW-SP-82</td>
<td>Flow rate Medium-high</td>
</tr>
<tr>
<td></td>
<td>Substrate description (GP/SM) 60% pebbles to cobbles to 2 in, 20% fine-to-medium sand, 20% silty loose, wet with Fucus algae</td>
</tr>
<tr>
<td></td>
<td>Seep observations No odor/no sheen; trace of gray sediment</td>
</tr>
<tr>
<td></td>
<td>Description Broad bank of sand/gravel to 25 ft overlain (steeply) by pavement slabs as riprap</td>
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<tr>
<td></td>
<td>Seep location Mid-bank, moderate spring-like from 5-ft-wide area in sand and gravel</td>
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</tbody>
</table>

Note: Observations were made by Tim Fitzgerald in the second boat, except for flow rate observations, which were made by Windward personnel in the first boat

a All percentages are field-estimated
b Flow rate is defined as low if seep could be sampled, but had a very low flow, whereas flow rate was defined as high if the flow resulted in a significant rivulet and flow was strong

GP – poorly sorted gravel
ML -- silt
SP – poorly sorted sand
SM – silty sand
GM – silty gravel
muck – organic-rich silt and clay