## LOG OF EXPLORATORY BORING

<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>RECOVERY (R.R.I.)</th>
<th>BLOW COUNTS (IN COMP)</th>
<th>GROUND WATER LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1.5/1.5</td>
<td>3-4-6 (10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0-5' SILTY CLAY (CL), black (5Y, 2.5/1); 90% fines, low to medium plasticity; 10% fine sand; common wood chips; damp.</td>
</tr>
<tr>
<td>#2</td>
<td>1.5/1.5</td>
<td>2-2-4 (6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5-10.1' SILTY CLAY (CL), grayish brown (2.5Y, 5/2); 100% fines, low to medium plasticity, slightly silty; trace fine sand; stiff; damp.</td>
</tr>
<tr>
<td>#3</td>
<td>1.5/1.5</td>
<td>2-2-4 (6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10.1-15' CLAYEY SILT (ML), dark grayish brown (10YR, 4/2); 100% fines, low to medium plasticity; trace fine sand, common quartz or mica (identification difficult due to size); minor rootlets; rapid dilatancy; firm; damp.</td>
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<td></td>
<td>15-26' SILTY CLAY (CL) AND CLAYEY SILT (ML) INTERBEDDED, dark grayish brown (10YR, 4/2); 10% fine sand; firm. Silty Clay: 90% fines, low to medium plasticity; slow dilatancy. Clayey Silt: 90% fines, slight to low plasticity; rapid dilatancy; damp to wet.</td>
</tr>
</tbody>
</table>

**REMARKS**
Drilled by 10-inch O.D. continuous flight, hollow stem auger. Samples collected with 1 1/2-inch O.D. split spoon sampler. Borehole converted to a 2-inch monitoring wall.

EMCON Northwest, Inc.
<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>RECOVERY</th>
<th>SLOW COUNTS</th>
<th>GROUND WATER LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>#4</td>
<td>1.5/1.5</td>
<td>1-2-4 (6)</td>
<td>20'</td>
<td></td>
<td></td>
<td></td>
<td>@20 ft: increasing silty content.</td>
</tr>
<tr>
<td>#5</td>
<td>1.5/1.5</td>
<td>2-3-3 (6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>26-35' SILTY CLAY (CL), dark gray (5Y, 4/1); 100% fines, low to medium plasticity; trace fine sand; slow dilatancy; firm; damp to wet.</td>
</tr>
<tr>
<td>#6</td>
<td>1.5/1.5</td>
<td>1-2-3 (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>26-35' SILTY CLAY (CL), continued from previous page.</td>
</tr>
<tr>
<td>#7</td>
<td>1.5/1.5</td>
<td>5-9-10 (19)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>35-40' SILTY CLAY (CL), dark gray (5Y, 3/2); 100% fines; low to medium plasticity; trace fine sand; common quartz or mica; common hard clay nodules; very stiff; damp.</td>
</tr>
</tbody>
</table>

**REMARKS**
Drilled by 10-inch O.D. continuous flight, hollow stem auger. Samples collected with 1 1/2-inch O.D. split spoon sampler. Borehole converted to a 2-inch monitoring well.

EMCON Northwest, Inc.
### LOG OF EXPLORATORY BORING

**PROJECT NAME:** Riverbend Landfill  
**LOCATION:** McMinnville, Oregon  
**DRILLED BY:** Geo-Tech  
**DRILL METHOD:** H/S AUGER  
**LOGGED BY:** G. Kelty  
**BORING NO.:** MW- 1A  
**PAGE:** 3 OF 4  
**GROUND ELEV.:**  
**TOTAL DEPTH:** 61.50'  
**DATE COMPLETED:** 09/06/89

<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>RECOVERY (L/L)</th>
<th>BLOW COUNTS (N COMP)</th>
<th>GROUND WATER LEVELS</th>
<th>DEPTH IN FEET</th>
<th>VESSEL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>#8</td>
<td>1.5/1.5</td>
<td>4-4-6 (10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>40-45' CLAY (CL), dark gray (5Y, 4/1); 100% fines, low to medium plasticity; trace fine sand; common iron oxide staining; common white altered feldspar; stiff; damp.</td>
</tr>
<tr>
<td>#9</td>
<td>1.5/1.5</td>
<td>6-8-11 (19)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>45-50' SILTY CLAY (CL), olive gray (5Y, 5/2); 100% fines, low to medium plasticity; trace fine sand; common iron staining; common organic material; very stiff; damp.</td>
</tr>
<tr>
<td>#10</td>
<td>0.8/1.5</td>
<td>45-50-0 (50)</td>
<td></td>
<td></td>
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<td></td>
<td>50-55' CLAYEY SANDY GRAVEL (GC), dark grayish brown (10YR, 4/2); 15% fines, low to medium plasticity; 35% fine sand; 50% fine to coarse gravel; common iron oxide staining; very dense; damp.</td>
</tr>
<tr>
<td>#11</td>
<td>1.5/1.5</td>
<td>5-35-50 (85)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>55-55.5' CLAYEY SAND (SC), olive (5Y, 4/4); 40% fines low to medium plasticity, slightly silty; 60% fine sand; occasional fine gravel; dense; wet.</td>
</tr>
</tbody>
</table>

**REMARKS**

Drilled by 10-inch O.D. continuous flight, hollow stem auger. Samples collected with 1 1/2-inch O.D. split spoon sampler. Borehole converted to a 2-inch monitoring well.

**EMCON Northwest, Inc.**
**LOG OF EXPLORATORY BORING**

**PROJECT NAME:** Riverbend Landfill  
**LOCATION:** McMinnville, Oregon  
**DRILLED BY:** Geo-Tech  
**DRILL METHOD:** H/S AUGER  
**LOGGED BY:** G. Kelty  

<table>
<thead>
<tr>
<th>BORENG NO.</th>
<th>MW-1A</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAGE</td>
<td>4 Of 4</td>
</tr>
<tr>
<td>GROUND ELEV.</td>
<td></td>
</tr>
<tr>
<td>TOTAL DEPTH</td>
<td>61.50'</td>
</tr>
<tr>
<td>DATE COMPLETED</td>
<td>09/06/89</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>RECOVERY (K./F.L.)</th>
<th>BLOW COUNTS (N COMP)</th>
<th>GROUND WATER</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>#12</td>
<td>1.5/1.5</td>
<td>12-14-16 (30)</td>
<td></td>
<td>plasticity: 35% fine sand; 50% fine to coarse gravel; common iron oxide staining; very dense; damp to wet.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>60-61.5' CLAY (CL), dark gray (2.5Y, N/4); 100% fines, low to medium plasticity; trace fine sand; common hard gray blue clay nodules; very stiff; damp.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>BOTTOM OF BORING AT 61.5 FEET.</td>
</tr>
</tbody>
</table>

**REMARKS**

Drilled by 10-inch O.D. continuous flight, hollow stem auger. Samples collected with 1 1/2-inch O.D. split spoon sampler. Borehole converted to a 2-inch monitoring well.
# LOG OF EXPLORATORY BORING

<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>RECOVERY (%)</th>
<th>BLOW COUNTS (in comp)</th>
<th>GROUND WATER LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>0.8/1.5</td>
<td>3-5-9 (14)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0-5' SILTY CLAY (CL), black (5Y, 2.5/1); 90% fines, low to medium plasticity; 10% fine sand; common wood chips; damp.</td>
</tr>
<tr>
<td>#2</td>
<td>1.5/1.5</td>
<td>2-3-4 (7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5-10.1' SILTY CLAY (CL), grayish brown (2.5Y, 5/2); 100% fines, low to medium plasticity, slightly silty; trace fine sand; stiff; damp.</td>
</tr>
<tr>
<td>#3</td>
<td>1.5/1.5</td>
<td>1-2-2 (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10.1-15' CLAYEY SILT (ML), dark grayish brown (10YR, 4/2); 100% fines, low to medium plasticity; trace fine sand, common quartz or mica (identification difficult due to size); minor rootlets; rapid dilatancy; firm; damp.</td>
</tr>
</tbody>
</table>

15-26' SILTY CLAY (CL) AND CLAYEY SILT (ML) INTERBEDDED, dark grayish brown (10YR, 4/2); 10% fine sand; firm.
Silty Clay: 90% fines, low to medium plasticity; slow dilatancy.
Clayey Silt: 90% fines, slight to low plasticity; rapid dilatancy; damp to wet.

**REMARKS**
Drilled by 10-inch O.D. continuous flight, hollow stem auger. Samples collected with 1 1/2-inch O.D. split spoon sampler.
Borehole converted to a 2-inch monitoring well.
<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>RECOVERY (ft./ft.)</th>
<th>BLOW COUNTS (N COMP)</th>
<th>GROUND WATER LEVELS</th>
<th>DEPTH IN FEET</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>#4</td>
<td>1.5/1.5</td>
<td>2-3-5 (8)</td>
<td></td>
<td>20'</td>
<td></td>
<td>@20 ft: increasing silty content.</td>
</tr>
<tr>
<td>#5</td>
<td>1.5/1.5</td>
<td>2-5-10 (15)</td>
<td></td>
<td>25</td>
<td></td>
<td>26-26.5' SILTY CLAY (CL), dark gray (5Y, 4/1); 100% fines, low to medium plasticity; trace fine sand; slow dilatancy; firm; damp to wet. BOTTOM OF BORING AT 26.5 FEET.</td>
</tr>
</tbody>
</table>

**REMARKS**

Drilled by 10-inch O.D. continuous flight, hollow stem auger. Samples collected with 1 1/2-inch O.D. split spoon sampler. Borehole converted to a 2-inch monitoring well.
NOTE This hole is adjacent to Test Pit #7, see log for TP-7 for materials description from 0.0-10.0'.

10.0'-26.0' **SANDY CLAYEY SILT**

<table>
<thead>
<tr>
<th>UNIFIED CLASS</th>
<th>DEPTH (ft)</th>
<th>ELEVATION (ft)</th>
<th>SAMPLE NO</th>
<th>Blows per 6 inches</th>
<th>Recovery w/n. 0.1 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>ML</td>
<td>10</td>
<td>15</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CL</td>
<td>25</td>
<td>30</td>
<td>2</td>
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<td></td>
<td></td>
<td>A</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SANDY CLAYEY SILT** - Uniformly medium brown, mic flake visible, slightly sticky & stiff, some open tubers & voids.

26.0'-40.0' **SANDY SILTY CLAY AND SILTY CLAY** - grey-blue, compact, moderately sticky and stiff, locally sandy.

**REMARKS:** All samples washed.
**NOTE:** Increased drilling resistance below 30.0'.

B.O.H. 40'
0 to 8.5 feet: SILTY CLAY (CL), dark brown (10YR 3/3), evenly colored; medium plasticity fines; stiff to very stiff; damp. (COMPACTED LANDFILL ENGINEERED BERM).

@ 3.5 to 7.0 feet: weakly developed platy soil peds.
@ 4.5 feet: traces reddish brown mottling, horizontally oriented.

@ 6.5 feet: very stiff.
@ 7.0 to 8.0 feet: two dark grayish brown intervals, approximately 2-inches thick.

8.5 to 10.4 feet: CLAYEY SILT (ML), dark yellowish brown (10YR 4/4); 97% low to medium plasticity fines; 3% fine sand; soil is crumbly; very stiff; damp to moist.

10.4 to 13.0 feet: SILTY CLAY (CL), dark greenish gray (5G 4/1); medium plasticity fines; stiff; moist.

@ 12.5 feet: moist to wet.

13.0 to 13.75 feet: SANDY SILT (ML), dark yellowish brown (10YR 4/4); 85-90% low to medium plasticity fines; 3% fine sand, subrounded, micaceous; stiff; wet.

13.75 to 28.5 feet: SILTY CLAY (CL), dark gray with some dark grayish brown mottling; medium plasticity fines, some silt content; blocky soil peds, crumbly soil; trace macropores; stiff to very stiff; moist along soil peds; easy drilling.
# LOG OF EXPLORATORY BORING

**PROJECT NAME**: Remedial Investigation  
**LOCATION**: Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY**: GeoTech Explorations  
**DRILL METHOD**: Hollow Stem Auger  
**LOGGED BY**: Craig D. Fanshier  
**BORING NO.**: MW-3A  
**PAGE**: 2 OF 2  
**GROUND ELEV.**: 138.20'  
**TOTAL DEPTH**: 35.00'  
**DATE COMPLETED**: 06/23/93

<table>
<thead>
<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETRATION (Totals/ SF)</th>
<th>PENETRATION (Blows/ft)</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>3</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td>13.75 to 28.5 feet: SILTY CLAY (CL), continued.</td>
</tr>
<tr>
<td>1.5</td>
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<td></td>
<td>@ 20.0 feet: color changes to dark brown (10Y¥ 4/3), with 30% light gray mottling, 5% rust red mottling; trace fine sand, some mica; weakly developed blocky soil pedds; approximately two small macropore per foot of core; moist to wet; free water along vertical soil ped fractures.</td>
</tr>
<tr>
<td>2.5</td>
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<td>@ 21.0 to 25.5 feet: soil is stiff.</td>
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<tr>
<td>1.5 to 2.5</td>
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<td>@ 23.5 to 24.0 feet: wet along vertical soil ped fractures.</td>
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<tr>
<td>2.5</td>
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<td>@ 24.0 to 26.8 feet: brown and gray mottling; 5% fine sand; soil is crumbly.</td>
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<tr>
<td>0.75</td>
<td>1</td>
<td></td>
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<td></td>
<td>@ 26.5 to 28.5 feet: soil is firmer.</td>
</tr>
<tr>
<td>2.0</td>
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<td></td>
<td>@ 27.0 to 28.5 feet: color changes to a blue gray (SB 6/1), and is light gray brown along open soil pedd; some rust reddish staining along soil ped fractures (iron oxide?); trace black staining along relic root traces; medium to highly plasticity fines; 1- to 1.5-inch blocky soil pedds.</td>
</tr>
<tr>
<td>2.5</td>
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<td>28.5 to 35.0 feet: CLAY (CL), bluish gray (SB 5/1), with 15% strong reddish brown mottling along ped fractures; medium to high plasticity fines; very few macropores; very stiff; moist to wet; drilling is easy, sample in core barrel is hard to cut open with sampling trowel.</td>
</tr>
<tr>
<td>2.5</td>
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<td>BORING TERMINATED AT 35.0 FEET.</td>
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<tr>
<td>2.25</td>
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</tbody>
</table>

**REMARKS**

Drilled w/8" OD (4.25" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted wrings. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.
WELL DETAILS

CLIENT     Riverbend Landfill Company, Inc.
PROJECT NUMBER     0258-001.24
PROJECT NAME     MW-5 Remedial Investigation
LOCATION     McMinnville, Oregon
WELL PERMIT NO.     54789
BORING / WELL NO.     MW-3A
TOP OF CASING ELEV.     140.81
GROUND SURFACE ELEV.     138.2
DATUM     Feet Mean Sea Level
INSTALLATION DATE     6/24/93

EXPLORATORY BORING

a. Total depth     35.0 ft.
b. Diameter     8 in.
   Drilling method     Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length     37.5 ft.
   Material     Schedule 40 PVC
d. Diameter     2 in.
e. Depth to top perforations     24.3 ft.
f. Perforated length     9.5 ft.
   Perforated interval from     24.3 to     33.8 ft.
   Perforation type     Machine Slotted
   Perforation size     0.010 Inches
g. Surface seal     2.2 ft.
   Material     Concrete
h. Backfill     NA ft.
   Material     NA
i. Seal     18.8 ft.
   Material     Bentonite Chips
j. Gravel pack     14.0 ft.
   Gravel pack interval from     21.0 to     35.0 ft.
   Material     10-20 Gradation Sand
k. Bottom seal/fill     NA ft.
   Material     NA
l. Casing stickup     2.5 ft.
m. Protective casing diameter     6.5 in.

Prepared by: Craig Fanshier
Reviewed by: [Signature]
Date: 10/1/92
# LOG OF EXPLORATORY BORING

**PROJECT NAME:** Remedial Investigation  
**LOCATION:** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY:** GeoTech Explorations  
**DRILL METHOD:** Hollow Stem Auger  
**LOGGED BY:** Craig D. Fanshier  
**BORING NO.:** MW-38  
**PAGE:** 1 OF 7  
**GROUND ELEV.:** 137.80'  
**TOTAL DEPTH:** 68.50'  
**DATE COMPLETED:** 06/28/93

<table>
<thead>
<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETROMETER (Tensile/SF)</th>
<th>PENETRATION (Blows/Ft)</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>97</td>
<td>3</td>
<td>3</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>0 to 8.0 feet: SILTY CLAY (CL), dark brown (10YR 4/3), evenly colored; medium plasticity fines; some small rootlets; soft to stiff; dry to damp.</td>
</tr>
<tr>
<td></td>
<td>4.5</td>
<td></td>
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<td></td>
<td>@ 6.5 feet: approximately 3-inches thick, gray; very soft.</td>
</tr>
<tr>
<td></td>
<td>2.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 7.5 feet: approximately 3 to 5-inch thick, gray; very soft.</td>
</tr>
<tr>
<td>100</td>
<td>1</td>
<td></td>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td>8.0 to 13.3 feet: CLAYEY SILT (ML), dark brown (10YR 4/3), evenly colored; low plasticity fines, with some micas; trace (less than 5%) fine sand; stiff; damp.</td>
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<td>2</td>
<td>3</td>
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<td>Note: easy drilling.</td>
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**REMARKS:**
Drilled w/10" OD (6.5" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted w/rings. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.  
0266-001.24.MCMIN.1476; 2.09/27/93; EMWSWW2
8.0 to 13.3 feet: CLAYEY SILT (ML), continued. 
@ 10.0 feet: moist.

@ 12.0 feet: approximately 0.4-foot thick, dark brownish gray zone.

13.3 to 22.0 feet: SILTY CLAY (CL), dark olive gray (5Y 3/2) to black (5Y 2.5/1); medium plasticity fines; very stiff; damp.

@ 16.0 feet: wet along soil ped surfaces.

@ 17.0 feet: color changes to dark brown (10YR 3/3); macropores present; soil peds develop a prismatic vertical blocky appearance.

@ 17.5 to 18.5 feet: gray and approximately 20% brown motting; stiff; wet on soil peds.

@ 18.5 feet: wet.

REMARKS
Drilled w/10" OD (6.5" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted w/rings. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.
### LOG OF EXPLORATORY BORING

**PROJECT NAME** Remedial Investigation  
**LOCATION** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY** GeoTech Explorations  
**DRILL METHOD** Hollow Stem Auger  
**LOGGED BY** Craig D. Fanshier  
**BORING NO.** MW-3B  
**PAGE** 3 OF 7  
**GROUND ELEV.** 137.80'  
**TOTAL DEPTH** 68.50'  
**DATE COMPLETED** 06/28/93

<table>
<thead>
<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETRATION (Tons/SF)</th>
<th>PENETRATION (Bams/Feet)</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLIGIC COLUMN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>13.3 to 22.0 feet: SILTY CLAY (CL), continued.</td>
</tr>
<tr>
<td>2.5</td>
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<td></td>
<td>@ 20.0 feet: silt content is variable; moist to wet, free water inside macro pores.</td>
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<td>2</td>
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<td>22.0 to 27.0 feet: CLAYEY SILT (ML), brown (10YR 4/3), with 10-30% gray mottling, trace rust red mottling; 95% low to medium plasticity fines; 5% fine sand; several 0.5 to 1.0 foot zones of SANDY SILT (ML), with 20% fine sand; firm to stiff; few to some small macro pores; soil structure forms 1/4-inch horizontal partings; moderately developed platy soil ped which are hard and crumbly; damp to wet, some zones are damp to moist while others are moist to wet.</td>
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<tr>
<td>100</td>
<td>1.5</td>
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<td>25</td>
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<td></td>
<td>@ 24.0 to 27.0 feet: rust red mottles are approximately 1/2-inch diameter.</td>
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<td>1</td>
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<td></td>
<td>@ 27.0 feet: contact with underlying clay unit is distinctively sharp.</td>
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<td>1.5</td>
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<td>27.0 to 38.5 feet: CLAY (CL), dark olive gray (5Y 3/2), with greenish tint, approximately 50% brown and trace black mottling; medium to high plasticity fines; prismatic soil ped, smooth and shiny soil ped partings; stiff; moist; drilling is harder and sticky. @ 36.5 to 38.5 feet: 50% brown and trace black mottling; medium to high plasticity fines; approximately 5-15% 1/4-inch gravels, rounded, matrix supported, coarsening downward; stiff; moist.</td>
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<td>1.5</td>
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<td>1.5</td>
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<tr>
<td>2.5</td>
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<tr>
<td>100</td>
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</tbody>
</table>

**REMARKS**
Drilled w/10" OD (6.5" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted w/rings. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.  
0268-001.24.MC4M.147\(\+1.09/27/93..ENWLSWW2
27.0 to 38.5 feet: CLAY (CL), continued.

38.5 to 40.0 feet: CLAYEY GRAVEL (GC), dark brown (7.5Y 4/4), 45% low to medium plasticity fines; 5% fine sand; 50% 1/8 to 1-inch gravels, rounded, low to medium sphericity, matrix supported; wet.

@ 39.5 to 40.0 feet: color grades to a very pale brown (10YR 7/4).

REMARKS
Drilled w/10" OD (6.5" ID) HSA. Samples continuously collected w/5'4"long, 3" ID split barrel and 1.5'4"long, 3" OD split spoon fitted w/rings. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented.
Well Details. See explanation for definition of symbols.
### Log of Exploratory Boring

**Project Name:** Remedial Investigation  
**Location:** Riverbend Landfill; McMinnville, Oregon  
**Drilled By:** GeoTech Explorations  
**Logged By:** Craig D. Fanshier

<table>
<thead>
<tr>
<th>Recovery Percent</th>
<th>Pocket Penetration (Tons/SF)</th>
<th>Ground Water Level</th>
<th>Depth in Feet</th>
<th>Samples</th>
<th>VSCL Details</th>
<th>Lithologic Column</th>
<th>Lithologic Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td></td>
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<td></td>
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<td></td>
<td>40.0 to 41.0 feet: Clayey Silt (ML), light olive brown (2.5Y 5/4); low to medium plasticity fines; stiff; wet.</td>
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<td>40</td>
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<td>41.0 to 42.0 feet: Silty Sand (SM), light olive brown (2.5Y 5/4); 15% silt; 85% fine sand, moderately well sorted; appears loose to medium dense, wet.</td>
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<tr>
<td>45</td>
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<td></td>
<td>42.0 to 43.0 feet: Sand (SP), reddish brown (5YR 4/4); &lt;10% low plasticity silts; 90% medium sand, subrounded to subangular, mixed lithologies of chert fragments and arkosic sands; appears dense to very dense; some 1/16 to 1/8-inch horizontal laminations; moist to wet; slightly cemented.</td>
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<td>10</td>
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<td></td>
<td>43.0 to 43.5 feet: Gravelly Sands (SP), reddish brown (5YR 4/4), with iron oxide staining; 10% low plasticity fines; 75% medium sand subrounded to subangular, mixed lithologies of chert fragments and arkosic sands; 15% 3/8 to 2-inch gravels, angular to subrounded, basalt: dense to very dense; wet.</td>
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<td>10</td>
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<td>43.5 to 53.0 feet: Sandy Gravel (GP), reddish brown (5YR 4/4) to dark yellowish brown (10YR 3/6); 5-10% low plasticity fines; 20-30% medium to coarse sand, subangular; 60-75% fine to coarse gravels, subrounded to angular, low to medium sphericity; approximately 70% in point contact, the gravels are slightly to moderately imbricated, the matrix is firm to stiff and moderately binds the gravels together, several sand layers approximately 0.5 feet thick where graded (SW).</td>
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</tbody>
</table>

**Remarks:**  
Drilled w/10" OD (6.5" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted wrings. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.
### LOG OF EXPLORATORY BORING

**PROJECT NAME** Remedial Investigation  
**LOCATION** Riverbend Landfill, McMinnville, Oregon  
**DRILLED BY** GeoTech Explorations  
**DRILL METHOD** Hollow Stem Auger  
**LOGGED BY** Craig D. Fanshier  

**BORING NO.** MW-3B  
**PAGE** 6 OF 7  
**GROUND ELEV.** 137.80  
**TOTAL DEPTH** 68.50'  
**DATE COMPLETED** 06/28/93

<table>
<thead>
<tr>
<th>RECOVERY</th>
<th>POCKET PENETROMETER (Tons/SF)</th>
<th>PENETRATION (Blows/Ft)</th>
<th>GROUND WATER LEVELS</th>
<th>GROUND SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC DESCRIPTION</th>
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<tbody>
<tr>
<td></td>
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<td>43.5 to 53.0 feet: SANDY GRAVEL (GP), continued.</td>
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<td>53.0 to 63.0 feet: SANDY GRAVEL (GM), dark greenish gray (5G 4/1); 10-20% low plasticity fines; 25-35% medium to coarse sand; 60% 3/8 to 3/4-inch gravels, subrounded to angular, poorly sorted, mostly basalts; several 1 to 3-inch zones firmly cemented; appears lose; wet.</td>
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<td>@ 53.5 to 58.5 feet: easier drilling.</td>
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<td>@ 59.0 feet: gravels mostly 3/8 to 1/2 inch; several 1 to 1.5-inch thick firmly cemented zones.</td>
</tr>
</tbody>
</table>

### REMARKS

Drilled w/10" OD (6.5" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted wirings. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented Well Details. See explanation for definition of symbols.
**LOG OF EXPLORATORY BORING**

**PROJECT NAME**: Remedial Investigation  
**LOCATION**: Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY**: GeoTech Explorations  
**DRILL METHOD**: Hollow Stem Auger  
**LOGGED BY**: Craig D. Fanshier  
**BORING NO.**: MW-3B  
**PAGE**: 7 OF 7  
**GROUND ELEV.**: 137.80'  
**TOTAL DEPTH**: 68.50'  
**DATE COMPLETED**: 06/28/93

<table>
<thead>
<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETROMETER (Tons/Fl)</th>
<th>PENETRATION (Blows/Fl)</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
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</table>

53.0 to 63.0 feet: **SANDY GRAVEL (GM)**, continued.

@ 60.0 feet: 20-35% low plasticity fines (silt); 20-40% medium sand; 50% 3/8 to 1/2-inch gravels, appears rounded; dense, wet.

63.0 to 63.5 feet: **SAND (SP)**, dark greenish gray (5G 4/1); <5% fines, 95% medium sand, well sorted; wet.

**BORING TERMINATED AT 63.5 FEET.**

**REMARKS**

Drilled w/10" OD (6.5" ID) HSA. Samples continuously collected w/5' long, 3" ID split barrel and 1.5' long, 3" OD split spoon fitted withings. A 2" PVC monitoring wall was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.
**WELL DETAILS**

CLIENT: Riverbend Landfill Company, Inc.  
BORING / WELL NO.: MW-3B  
PROJECT NUMBER: 0258-001.24  
TOP OF CASING ELEV.: 140.57  
PROJECT NAME: Remedial Investigation  
GROUND SURFACE ELEV.: 137.80  
LOCATION: McMinnville, Oregon  
DATUM: Feet-Mean Sea Level  
WELL PERMIT NO.: 54789  
INSTALLATION DATE: 6/29/93

**EXPLORATORY BORING**

a. Total depth: 63.5 ft.  
b. Diameter: 10.5 in.  
Drilling method: Hollow Stem Auger

c. Total casing length: 57.8 ft.  
   Material: Schedule 40 PVC

d. Diameter: 2 in.
e. Depth to top perforations: 45.3 ft.
f. Perforated length: 9.5 ft.  
   Perforated interval from 45.3 to 54.8 ft.  
   Perforation type: Machine Slotted  
   Perforation size: 0.010 Inches

g. Surface seal (0 to 2.0): 2.0 ft.  
   Material: Concrete

h. Backfill (2.0 to 36.8): 34.8 ft.  
   Material: High Solids Bentonite Grout

i. Seal (36.8 to 42.0): 5.2 ft.  
   Material: Bentonite Chips

j. Gravel pack: 14.0 ft.  
   Gravel pack interval from 42.0 to 56.0 ft.  
   Material: 10-20 Gradation Sand

k. Bottom seal/fill (56.0 to 63.5): 7.5 ft.  
   Material: Bentonite Chips

l. Casing stickup: 2.8 ft.
m. Protective casing diameter: 6.5 in.

Prepared by: Craig Fanshier  
Reviewed by: [Signature]  
Date: 10/1/93

---

The diagram shows a cross-sectional view of the well with labels for each section, including TOC (Top of Casing), Steel Protective Casing (Std.), and various depths and diameters as specified in the text.
# Log of Exploratory Boring

**Project Name:** Remedial Investigation  
**Location:** Riverbend Landfill; McMinnville, Oregon  
**Drilled By:** GeoTech Explorations  
**Drill Method:** Hollow Stem Auger  
**Logged By:** Craig D. Fanshier  

**Boring No.:** MW-4A  
**Page:** 1 of 2  
**Ground Elev.:** 139.20'  
**Total Depth:** 71.80'  
**Date Completed:** 06/10/93

<table>
<thead>
<tr>
<th>Recovery Percent</th>
<th>Pocket Penetration (Tons/SF)</th>
<th>Penetration (Brls/Ft)</th>
<th>Ground Water Level</th>
<th>Depth in Feet</th>
<th>Core Details</th>
<th>Lithologic Column</th>
<th>Lithologic Description</th>
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<td>75</td>
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<td></td>
<td>0 to 9.5 feet: SILTY CLAY (CL), dark grayish brown (10YR 4/2), trace reddish brown mottling; medium plasticity; some small rootlets; stiff; damp.</td>
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<td></td>
<td>© 3.5 to 5.3 feet: color changes to gray; wet.</td>
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<td></td>
<td>© 4.5 to 8.0 feet: very stiff to hard.</td>
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<td></td>
<td>© 5.3 feet: color changes to light brown with 10-30% gray mottling.</td>
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<td></td>
<td>© 6.5 to 7.5 feet: silt content increases.</td>
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<tr>
<td>100</td>
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<td>4.5</td>
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<td>28</td>
<td></td>
<td></td>
<td>9.5 to 16.5 feet: CLAYEY SILT (ML), dark grayish brown (10YR 4/2), with 5-10% gray mottling 1/2-inch diameter; low to medium plasticity fines; trace fine sand, micaceous; weakly developed platy soil; stiff; damp.</td>
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<td>4.5</td>
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<td>© 12.5 feet: less gray mottling, rust red mottling starts.</td>
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<td></td>
<td>4.5</td>
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<td></td>
<td>© 13.0 feet: all brown.</td>
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<tr>
<td></td>
<td></td>
<td>4.5</td>
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<td></td>
<td></td>
<td>© 13.5 to 16.0 feet: dark brown (10YR 3/2), very little to no mottling; low plasticity; trace mica; very stiff; damp.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.5</td>
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<td>© 15.5 to 16.0 feet: transition to next soil unit indicated by increasing greenish gray crumbly soil with some decayed organic material.</td>
</tr>
<tr>
<td>100</td>
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<td>1</td>
<td></td>
<td>15</td>
<td></td>
<td></td>
<td>16.5 to 36.2 feet: SILTY CLAY (CL), grayish brown (10YR 4/2), very little mottling; medium plasticity; stiff to very stiff; damp to moist.</td>
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<td></td>
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<td>2 to 3</td>
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<td></td>
<td>© 17.0 to 17.5 feet: approximately 50% brown mottling.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.5</td>
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<td>© 17.5 to 21.5 feet: 95% gray, very little mottling; silt content increases.</td>
</tr>
</tbody>
</table>

**Remarks:** Drilled w/8" OD (4.25" ID) HSA. Samples continuously collected w/5'-long, 3' ID split barrel and 1.5'-long, 3" OD split spoon fitted w/linings. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.  
0269-001.24_MCMN.L47/xx.09/26/93...ENWLSWWZ
### LOG OF EXPLORATORY BORING

**PROJECT NAME:** Remedial Investigation  
**LOCATION:** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY:** GeoTech Explorations  
**DRILL METHOD:** Hollow Stem Auger  
**LOGGED BY:** Craig D. Fanshier  
**BORING NO.:** MW-4A  
**PAGE:** 2 OF 2  
**GROUND ELEV.:** 139.20'  
**TOTAL DEPTH:** 71.80'  
**DATE COMPLETED:** 06/10/93

<table>
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<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETROMETER (Tons/SF)</th>
<th>PENETRATION (Blows/ft)</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAIL</th>
<th>LITHOLOGIC COLUMN</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>1.5 to 2</td>
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<td></td>
<td>16.5 to 36.2 feet: SILTY CLAY (CL), continued.</td>
</tr>
<tr>
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<td>1.75</td>
<td>2</td>
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<td></td>
<td>@ 21.5 feet: low to medium plasticity fines; moderately developed granular to blocky soil ped; some small macro pores; trace very fine root hairs; wet.</td>
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<td></td>
<td>2.5</td>
<td>2.5</td>
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<td>@ 25.0 to 27.0 feet: approximately 2% of soil matrix contains black wood fragment; some small pin-hole size macro pores.</td>
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<td>3</td>
<td>2</td>
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<td></td>
<td>@ 29.0 feet: free water in macro pores.</td>
</tr>
<tr>
<td>93</td>
<td>1.5</td>
<td>22</td>
<td>8/10/93</td>
<td></td>
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<td></td>
<td>@ 31.0 to 34.0 feet: color changes to light brown with 10-30% gray mottling; medium to high plasticity clay; abundant macro pores up to 1/4-inch.</td>
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<tr>
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<td>2.5 to 2</td>
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<td>@ 34.0 to 36.0 feet: increases silt content; soil in core barrel is crumbly.</td>
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<tr>
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<td>1.5</td>
<td>3.5</td>
<td>3.5</td>
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<td>BORING TERMINATED AT 36.2 FEET.</td>
</tr>
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<td>1.5</td>
<td>3.5</td>
<td>3.5</td>
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**REMARKS**
Drilled w/8" OD (4.25" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted w/rings. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.  
0268-001.24.MCM88.L4744:2.09/28/93...ENVILSWW2
WELL DETAILS

CLIENT  Riverbend Landfill Company, Inc.
PROJECT NUMBER  0258-001.24
PROJECT NAME  MW-5 Remedial Investigation
LOCATION  McMinnville, Oregon
WELL PERMIT NO.  52006
BORING / WELL NO.  MW-4A
TOP OF CASING ELEV.  142.31
GROUND SURFACE ELEV.  139.5
DATUM  Feet Mean Sea Level
INSTALLATION DATE  5/25/93

EXPLORATORY BORING
a. Total depth  36.2 ft.
b. Diameter  8 in.
   Drilling method  Hollow Stem Auger

WELL CONSTRUCTION
c. Total casing length  38.31 ft.
   Material  Schedule 40 PVC
d. Diameter  2 in.
e. Depth to top perforations  26.3 ft.
f. Perforated length  9.5 ft.
   Perforated interval from  26.3 to  35.8 ft.
   Perforation type  Machine Slotted
   Perforation size  0.010 Inches
g. Surface seal  2.0 ft.
   Material  Concrete
h. Backfill  NA ft.
   Material  NA
i. Seal  20.41 ft.
   Material  Bentonite Chips
j. Gravel pack  13.75 ft.
   Gravel pack interval from  22.4 to  36.2 ft.
   Material  10-20 Gradation Sand
k. Bottom seal/fill  NA ft.
   Material  NA
l. Casing stickup  2.81 ft.
m. Protective casing diameter  6.5 in.

Prepared by: Craig Fanshier
Reviewed by: Craig Fanshier
Date: 10/11/93
### LOG OF EXPLORATORY BORING

**PROJECT NAME:** Remedial Investigation  
**LOCATION:** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY:** GeoTech Explorations  
**DRILL METHOD:** Hollow Stem Auger  
**LOGGED BY:** Craig D. Fanshier  
**BORING NO.** MW-4B  
**PAGE:** 1 of 8  
**GROUND ELEV.** 137.80'  
**TOTAL DEPTH** 71.80'  
**DATE COMPLETED** 06/10/93

<table>
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<th>RECOVERY PERCENT</th>
<th>POCKET PENETROMETER (Tons/6Ft)</th>
<th>PENETRATION (Bows/Feet)</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN DESCRIPTION</th>
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<td></td>
<td>0 to 13.0 feet: SILTY CLAY (CL), dark brown (10YR 3/3); medium plasticity fines; no sands; some small fine roots; no developed soil peds; soft to firm; damp.</td>
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<td>4.5</td>
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<td>@ 3.3 to 3.5 feet: slight reddish brown mottling. @ 3.5 feet: greenish gray (5G 4/1).</td>
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<td>@ 5.5 feet: dark yellowish brown (10YR 4/4); medium plasticity fines, silt content increases; no macro pores; some horizontal bedding; stiff; moist to damp (wetting front?).</td>
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<td>@ 8.0 feet: several 1-inch diameter gray mottling.</td>
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<td>1.5</td>
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<td>@ 9.5 to 13.0 feet: stiff; damp.</td>
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</table>

**REMARKS**

Drilled w/10" OD (6.5" ID) HSA. Samples continuously collected w/5"-long, 3" ID split barrel and 1.5"-long, 3" OD split spoon fitted w/rings. Bedrock was cored w/NX (3.5" O.D.) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.
<table>
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<tr>
<th>RECOVERY PERCENT</th>
<th>PENETRATION (Tone/SF)</th>
<th>PENETRATION (Blows/Ft)</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
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<td>4.5</td>
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<td>0 to 13.0</td>
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<td>0 to 13.0 feet: SILTY CLAY (CL), continued. @ 10.0 feet: some gray mottling.</td>
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<td>13.0 to 16.5</td>
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<td>13.0 to 16.5 feet: CLAYEY SILT (ML), dark yellowish brown (10YR 4/4); low to medium plasticity fines; very stiff to hard; damp.</td>
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<td>16.5 to 31.5</td>
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<td>16.5 to 31.5 feet: SILTY CLAY (CL), 50% dark yellowish brown (10YR 4/4) and 50% olive dark olive gray (5Y 3/2), trace black and rust red mottling; medium plasticity fines; some macro pores; stiff to very stiff; damp.</td>
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<td>100</td>
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<td>@ 18.5 to 21.5</td>
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<td>@ 18.5 to 21.5 feet: dark greenish gray (5G 4/1).</td>
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</tbody>
</table>

**REMARKS**

Drilled w/10" OD (6.5" ID) HSA. Samples continuously collected w/5"-long, 3" ID split barrel and 1.5"-long, 3" OD split spoon fitted w/risers. Bedrock was cored w/NX (3.5" O.D.) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.
# LOG OF EXPLORATORY BORING

**PROJECT NAME:** Remedial Investigation  
**LOCATION:** Riverbend Landfill, McMinnville, Oregon  
**DRILLED BY:** GeoTech Explorations  
**DRILL METHOD:** Hollow Stem Auger  
**LOGGED BY:** Craig D. Fanshier  
**BORING NO.:** MW-4B  
**PAGE:** 3 OF 8  
**GROUND ELEV.:** 137.80'  
**TOTAL DEPTH:** 71.80'  
**DATE COMPLETED:** 06/10/93

<table>
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<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETRATION METER (Tone/SF)</th>
<th>PENETRATION (Blows/FT)</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
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<td>16.5 to 31.5 feet: <strong>SILTY CLAY</strong> (CL), continued.</td>
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© 21.5 feet: color transitions back to 20% brown and 80% gray mottling.

© 23.5 to 31.5 feet: traces of black carbonized plant and wood fragments; loose vertical columnar soil peds; less macropores than the units above; damp to moist, moisture along ped surfaces.

© 28.5 feet: 80% dark olive gray (5Y 3/2), with 10-20% reddish brown mottling; moist to wet along soil ped surfaces.

**REMARKS**

Drilled w/10" OD (6.5" ID) HSA. Samples continuously collected w/5"-long, 3" ID split barrel and 1.5"-long, 3" OD split spoon fitted w/rings. Bedrock was cored w/NX (3.5" O.D.) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.

0256-001 24.MCMIN.L47/2.09 07/93..ENWLSWW2
LOG OF EXPLORATORY BORING

PROJECT NAME: Remedial Investigation
LOCATION: Riverbend Landfill; McMinnville, Oregon
DRILLED BY: GeoTech Explorations
DRILL METHOD: Hollow Stem Auger
LOGGED BY: Craig D. Fanshier

BORING NO. MW-4B
PAGE: 4 OF 8
GROUND ELEV.: 137.80'
TOTAL DEPTH: 71.80'
DATE COMPLETED: 06/10/93

<table>
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<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETRATOR (Tons/SF)</th>
<th>PENETRATION (Brown/Ft)</th>
<th>GROUND WATER LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
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<td>16.5 to 31.5 feet: SILTY CLAY (CL), continued.</td>
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<td>31.5 to 37.5 feet: CLAY (CH), 50% dark yellowish brown (10YR 4/4) and 50% olive dark olive gray (5Y 3/2); high plasticity fines; very stiff to hard; damp.</td>
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<td>@ 33.5 to 37.5 feet: olive brown (2.5Y 4/4) to light olive brown (2.5Y 5/4).</td>
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<td>37.5 to 41.0 feet: SILTY CLAY (CL), olive brown (2.5Y 4/4), 97% medium plasticity fines; 3-5% fine sand; very stiff; moist.</td>
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REMARKS
Drilled w/10" OD (6.5" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted w/ings. Bedrock cored w/NX (3.5" 0.01) diamond core. A 2" PVC monitoring well was constructed in th. borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.
### LOG OF EXPLORATORY BORING

- **PROJECT NAME**: Remedial Investigation
- **LOCATION**: Riverbend Landfill; McMinnville, Oregon
- **DRILLED BY**: GeoTech Explorations
- **DRILL METHOD**: Hollow Stem Auger
- **LOGGED BY**: Craig D. Fanshier
- **BORING NO.**: MW-4B
- **PAGE**: 5 OF 8
- **GROUND ELEV.**: 137.80'
- **TOTAL DEPTH**: 71.80'
- **DATE COMPLETED**: 06/10/93

<table>
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<th>RECOVERY PERCENT</th>
<th>POCKET PENETROMETER (Tons/SF)</th>
<th>PENETRATION (Blows/FT)</th>
<th>SOUNDING LEVELS</th>
<th>CORE SAMPLES</th>
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</table>

#### LITHOLOGIC DESCRIPTION

- **37.5 to 41.0 feet**: SILOY CLAY (CL), continued.
- **41.0 to 42.5 feet**: CLAYEY SAND (SC), yellowish brown (10YR 5/6); 20% medium plasticity fines; 77% fine sand, 3% gravels, 3/8 to 2/3-inch, rounded, matrix supported; wet.
- **42.5 to 50.0 feet**: SILOY SAND (SM), dark grayish brown (2.5Y 4/2), 20% gray mottling, some rust red staining; 15% low plasticity fines; 80% fine to medium sand, moderately well sorted, subangular to subrounded; 5% 1/4-inch gravels, rounded; no bedding; wet.
- **NOTE**: 45.8 feet: color changes to all gray. 15-20% low plasticity fines; 80-85% fine to medium sand, moderately sorted; some 1-inch lenses of medium sand with no fines; wet.
- **NOTE**: 47.0 feet: several small brown wood fragments.

### REMARKS

Drilled w/10" OD (6.5" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted w/tings. Bedrock was cored w/NX (3.5" O.D.) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.
## LOG OF EXPLORATORY BORING

**PROJECT NAME:** Remedial Investigation  
**LOCATION:** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY:** GeoTech Explorations  
**DRILL METHOD:** Hollow Stem Auger  
**LOGGED BY:** Craig D. Fanshier  

<table>
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<th>RECOVERY PERCENT</th>
<th>POCKET PENETRATION</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
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<td>50.0 to 53.0 feet: SANDY GRAVEL (GM), dark olive gray (2.5Y 3/2); 5% low to medium plasticity fines; 20% fine to medium sand; 75-80% gravels, rounded, 3/8 to 2-inch; appears dense, well compacted, 50% are fine grained basalts; wet.</td>
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<td>© 51.5 feet: dark yellowish brown (10YR 3/4); gravels in point contact in a sandy clay matrix, appears well compacted; wet.</td>
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<td>53.0 to 54.5 feet: CLAYEY GRAVEL (GC), gray; 25% medium plasticity fines; 15% sand, fine to medium; 60% gravels, 3/8 to 2-inch, gravels in point contact; some yellowish palagonitic weathering product; appears dense, moist to wet.</td>
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<td>54.5 to 61.5 feet: SANDY GRAVEL (GP), dark yellowish brown (10YR 3/4), some iron oxide staining; 10% low plasticity fines; 30% fine to medium sand, subrounded, low sphericity, lithic marine sediment fragments; 60% 3/8 to 3/4-inch gravels, mostly 1/2-inch, approximately 50% in point contact, some gravels are elongated and oriented horizontally; several 1-inch sand lenses; appears dense, crumbles when removed from core; wet.</td>
</tr>
</tbody>
</table>

### REMARKS
Drilled w/10" OD (6.5" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted wrings. Bedrock was cored w/NX (3.5" 0.D) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.
### LOG OF EXPLORATORY BORING

**PROJECT NAME:** Remedial Investigation  
**LOCATION:** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY:** GeoTech Explorations  
**DRILL METHOD:** Hollow Stem Auger  
**LOGGED BY:** Craig D. Fanshier  
**BORING NO.:** MW-4B  
**PAGE:** 7 OF 8  
**GROUND ELEV.:** 137.80'  
**TOTAL DEPTH:** 71.80'  
**DATE COMPLETED:** 06/10/93

### RECOVERY PERCENT

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<tr>
<th>Depth Range</th>
<th>Lithologic Description</th>
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<tbody>
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<td>54.5 to 61.5 feet</td>
<td>SANDY GRAVEL (GP), continued.</td>
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<tr>
<td>61.5 to 61.8 feet</td>
<td>SILTY (ML), brown; low plasticity fines, wet.</td>
</tr>
<tr>
<td>61.8 to 71.8 feet</td>
<td>BASALT, olive black (5Y 2/2) (GSA rock color chart, massive, fine to medium grained; calcite and zeolite filled vesicles, and fractures; minor disseminated pyrite. RQD = 53% (NESTUCCA FORMATION).</td>
</tr>
</tbody>
</table>

### REMARKS
Drilled w/10" OD (6.5" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted w/rings. Bedrock was cored w/NX (3.5" O.D.) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

**EMCON Northwest, Inc.**

0258-001.24.MCMin,(47)xx;2,09/27/93...ENWLSWWW2
# LOG OF EXPLORATORY BORING

**PROJECT NAME** Remedial Investigation  
**LOCATION** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY** GeoTech Explorations  
**DRILL METHOD** Hollow Stem Auger  
**LOGGED BY** Craig D. Fanshier  
**BORING NO.** MW-48  
**PAGE** 8 OF 8  
**GROUND ELEV.** 137.80'  
**TOTAL DEPTH** 71.80'  
**DATE COMPLETED** 06/10/93

<table>
<thead>
<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETROMETER (Tons/Feet)</th>
<th>PENETRATION (Bore/Feet)</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>61.8 to 71.8 feet: BASALT, continued.</td>
</tr>
</tbody>
</table>

**BORING TERMINATED AT 71.8 FEET.**

**REMARKS**
Drilled w/10” OD (6.5” ID) HSA. Samples continuously collected w/5’-long, 3” ID split barrel and 1.5’-long, 3” OD split spoon fitted w/rings. Bedrock cored w/NX (3.5” O.D.) diamond core. A 2” PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.
0256-001.24, MCMIN.47/x:2.09/27/93...ENWLSWW2
WELL DETAILS

CLIENT: Riverbend Landfill Company, Inc.
PROJECT NUMBER: 0258-001.24
PROJECT NAME: MW-5 Remedial Investigation
LOCATION: McMinnville, Oregon
WELL PERMIT NO.: 52009

BORING / WELL NO.: MW-4B
TOP OF CASING ELEV.: 141.81
GROUND SURFACE ELEV.: 139.2
DATUM: Feet Mean Sea Level
INSTALLATION DATE: 6/11 to 6/14/93

EXPLORATORY BORING

a. Total depth: 71.8 ft.
b. Diameter: 10.5 and 3.5 in.
   Drilling method: Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length: 74.6 ft.
   Material: Schedule 40 PVC
d. Diameter: 2 in.
e. Depth to top perforations: 52.3 ft.
f. Perforated length: 9.5 ft.
   Perforated interval from 52.3 to 61.3 ft.
   Perforation type: Machine Slotted
   Perforation size: 0.010 Inches
g. Surface seal: 2.0 ft.
   Material: Concrete
h. Backfill: 45.0 ft.
   Material: High Yield Bentonite Grout
i. Seal: 2.0 ft.
   Material: Bentonite Chips
j. Gravel pack: 14.0 ft.
   Gravel pack interval from 49.0 to 63.0 ft.
   Material: 10-20 Gradation Sand
k. Bottom seal/fill: 8.8 ft.
   Material: Bentonite Chips
l. Casing stickup: 2.6 ft.
m. Protective casing diameter: 6.5 in.

Prepared by: Craig Fanshier  Reviewed by: Craig Fanshier  Date: 10/1/93
# LOG OF EXPLORATORY BORING

**PROJECT NAME**: Riverbend Landfill  
**LOCATION**: McMinnville, Oregon  
**DRILLED BY**: GeoTech Explorations  
**DRILL METHOD**: Hollow Stem Auger  
**LOGGED BY**: Brian Kier  

**BORING NO.**: MW-5A  
**PAGE**: 1 OF 2  
**GROUND ELEV.**:  
**TOTAL DEPTH**: 28.00'  
**DATE COMPLETED**: 09/08/92

<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>RECOVERY PERCENT</th>
<th>BLOW COUNTS (N COMP)</th>
<th>GROUND LEVELS</th>
<th>SITES IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MW-8-5 SS</strong></td>
<td>67%</td>
<td>4-6-8</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MW-8-10 SS</strong></td>
<td>78%</td>
<td>3-4-8</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MW-8-15 SS</strong></td>
<td>94%</td>
<td>4-7-10</td>
<td>15</td>
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</tbody>
</table>

**LITHOLOGIC DESCRIPTION**:

- **0-5 feet**: SILTY CLAY, brown, moist, stiff, medium plasticity, some organic matter. (ALLUVIUM)
- **5-6 feet**: SILTY CLAY, dark gray, moist, stiff, medium plasticity, some organic matter. (ALLUVIUM)
- **10-11.1 feet**: SILTY CLAY, brown with gray mottling, moist, stiff, medium plasticity. (ALLUVIUM)
- **15-16.4 feet**: SILTY CLAY, brown with gray and reddish mottling, moist, stiff, medium plasticity. (ALLUVIUM)

**REMARKS**

Drilled with continuous sampling barrel. Well constructed as shown with 2-inch PVC with 0.010-inch slots. Well casing protected with 0.5” high locking steel protective casing and three 3 foot high steel posts in.
## LOG OF EXPLORATORY BORING

**PROJECT NAME**: Riverbend Landfill  
**LOCATION**: McMinnville, Oregon  
**DRILLED BY**: GeoTech Explorations  
**DRILL METHOD**: Hollow Stem Auger  
**LOGGED BY**: Brian Kier  
**BORING NO.**: MW-5A  
**PAGE**: 2 OF 2  
**GROUND ELEV.**:  
**TOTAL DEPTH**: 28.00'  
**DATE COMPLETED**: 09/08/92

<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>RECOVERY PERCENT</th>
<th>BLOW COUNTS (N COMP)</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW-8-20</td>
<td>100%</td>
<td>3-6-8 (14)</td>
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<td>20-21.5 feet: SILTY CLAY, brown with gray and reddish mottling, moist, stiff, medium plasticity. (ALLUVIUM)</td>
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</tr>
<tr>
<td>MW-8-25</td>
<td>100%</td>
<td>3-4-5 (9)</td>
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<td></td>
<td>25-28 feet: SILTY CLAY, brown with gray and reddish mottling, moist, stiff, medium plasticity, some water in pore spaces. (ALLUVIUM)</td>
</tr>
</tbody>
</table>

Bottom of boring at 28.0 feet below ground surface.

---

**REMARKS**

Drilled with continuous sampling barrel. Well constructed as shown with 2-inch PVC with 0.010-inch slots. Well casing protected with 0.5' high locking steel protective casing and three 3 foot high steel posts in.

EMCON Northwest, Inc.
WELL DETAILS

PROJECT NUMBER: 0256-001.18
PROJECT NAME: Phase I Preliminary Assessment
LOCATION: Riverbend Landfill
WELL PERMIT NO.: NA

BORING/WELL NO.: HW - 5A
TOP OF CASING ELEV.: 138.75
GROUND SURFACE ELEV.: 132.29
DATUM: Mean Sea Level
INSTALLATION DATE: 9-8-92

EXPLORATORY BORING

a. Total depth: 28 ft.
b. Diameter: 10.25 in.

Drilling method: Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length: 34.46 ft.
   Material: Schedule 40 PVC

d. Diameter: 2 in.
e. Depth to top perforations: 18 ft.
f. Perforated length: 10 ft.
   Perforated interval from 18 to 28 ft.
   Perforation type: Machine Slotted
   Perforation size: 0.010-Inch

h. Surface seal: 2 ft.
   Seal material: Concrete

i. Seal: 14 ft.
   Seal material: Bentonite Chips

j. Gravel pack: 12 ft.
   Pack material: 10 x 20 Gradation Sand

k. Bottom seal: 0 ft.
   Seal material: NA

l. Casing stickup: 6.46 ft.
m. Protective casing diameter: 6 in.

NA = Not Applicable

Prepared by:

Reviewed by: __________________________ Date: __________________________
# LOG OF EXPLORATORY BORING

**PROJECT NAME** | Riverbend Landfill  
**LOCATION** | McMinnville, Oregon  
**DRILLED BY** | GeoTech Explorations  
**DRILL METHOD** | Hollow Stem Auger  
**LOGGED BY** | Brian Kier  

**BORING NO.** | MW-5B  
**PAGE** | 1 OF 3  
**GROUND ELEV.** |  
**TOTAL DEPTH** | 44.70'  
**DATE COMPLETED** | 09/03/92

<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>RECOVERY PERCENT</th>
<th>BLOW COUNTS (N COMP)</th>
<th>GROUND WATER LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
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</tbody>
</table>

0-20 feet: SILTY CLAY, brown, moist, stiff, low to medium plasticity. (ALLUVIUM)

@ 5-6 feet: Dark gray, moist.

@ 6-13.8 feet: Brown with gray and reddish mottling, medium plasticity.

@ 13.8-14 feet: Dark gray.

@ 14-20 feet: Brown with gray and reddish mottling, trace organic debris.

**REMARKS**
Drilled with continuous sampling barrel. Well constructed as shown with 2-inch PVC with 0.010-inch slots. Well casing protected with 6.4' high locking steel protective casing and three 3 foot high steel posts in.

EMCON Northwest, Inc.
**Log of Exploratory Boring**

**Project Name:** Riverbend Landfill  
**Location:** McMinnville, Oregon  
**Drilled By:** GeoTech Explorations  
**Drill Method:** Hollow Stem Auger  
**Logged By:** Brian Kier  
**Boring No.:** MW-5B  
**Page:** 2 of 3  
**Ground Elev.:** 2  
**Total Depth:** 44.70'  
**Date Completed:** 09/03/92

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Recovery Percent</th>
<th>Blow Counts</th>
<th>Ground Water Levels</th>
<th>Depth (in Feet)</th>
<th>Well Details</th>
<th>Lithologic Column</th>
<th>Lithologic Description</th>
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<tbody>
<tr>
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<td>20-22 feet: CLAYEY SILT, brown with gray and reddish mottling, moist, low plasticity, stiff. (ALLUVIUM)</td>
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<td>22-34.1 feet: SILTY CLAY, brown with gray and reddish mottling, moist, stiff, medium plasticity, trace plant rootlets, some water in pore spaces. (ALLUVIUM)</td>
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<td>@ 31.8-34.1 feet: Gray.</td>
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<td>34.1-37.3 feet: CLAYEY SILT, gray, moist, stiff, trace plant rootlets. (ALLUVIUM) @ 34.5 feet: Moist to wet.</td>
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<td>37.3-38.3 feet: SANDY SILT, gray, fine-grained sand, wet. (ALLUVIUM)</td>
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<td>38.3-38.7 feet: SILTY SAND, gray, fine-grained, wet. (ALLUVIUM)</td>
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<td>38.7-40.5 feet: GRAVELLY SAND, gray, fine-</td>
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</tbody>
</table>

**Remarks:** Drilled with continuous sampling barrel. Well constructed as shown with 2-inch PVC with 0.010-inch slots. Well casing protected with 6.4' high locking steel protective casing and three 3 foot high steel posts in.

EMCON Northwest, Inc.
coarse-grained sand, up to 1/4-inch diameter subangular and subrounded gravel, wet. (ALLUVIUM)

40.5-41.5 feet: Sandy gravel, gray, poorly graded, medium-to coarse-grained sand, up to 1/4-inch diameter rounded to subrounded gravel, wet. (ALLUVIUM)

41.5-41.9 feet: Clayey silt, gray, trace medium-to coarse-grained sand, firm, wet. (ALLUVIUM)

41.9-44 feet: Sandy gravel, gray, medium-to coarse-grained sand, up to 1/4-inch diameter rounded to subrounded gravel, wet. (ALLUVIUM)

44-44.5 feet: Sand, gray, coarse-grained sand, minor-medium-grained sand, minor gravel up to 1/4-inch diameter, subrounded to rounded gravel, wet. (ALLUVIUM)

44.5-44.7 feet: Bedrock.

Bottom of boring at 44.7 feet below ground surface.

REMARKS
Drilled with continuous sampling barrel. Well constructed as shown with 2-inch PVC with 0.010-inch slots. Well casing protected with 6.4" high locking steel protective casing and three 3 foot high steel posts in.
WELL DETAILS

PROJECT NUMBER: 0258-001.10
PROJECT NAME: Phase I Preliminary Assessment
LOCATION: Riverbend Landfill
WELL PERMIT NO.: NA

BORING / WELL NO.: MW - 58
TOP OF CASING ELEV.: 138.90
GROUND SURFACE ELEV.: 132.49
DATUM: Mean Sea Level
INSTALLATION DATE: 9-3-92

EXPLORATORY BORING

a. Total depth: 44.7 ft.
b. Diameter: 10.25 in.
   Drilling method: Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length: 51.11 ft.
   Material: Schedule 40 PVC

d. Diameter: 2 in.
e. Depth to top perforations: 41.7 ft.
f. Perforated length: 3.0 ft.
   Perforated interval from 41.7 to 44.7 ft.
   Perforation type: Machine Slotted
   Perforation size: 0.010-Inch

g. Surface seal: 2.8 ft.
   Seal material: Concrete

h. Backfill: 0 ft.
   Backfill material: NA

i. Seal: 37.1 ft.
   Seal material: Bentonite Chips

j. Gravel pack: 4.8 ft.
   Pack material: 10 x 20 Gradation Sand

k. Bottom seal: 0 ft.
   Seal material: NA

l. Casing stickup: 6.41 ft.
m. Protective casing diameter: 6 in.

NA = Not Applicable

Prepared by: __________________________
Reviewed by: __________________________ Date: __________________________
<table>
<thead>
<tr>
<th>Recovery Percent</th>
<th>Pocket Penetration (Tons/ft³)</th>
<th>Penetration (Blows/ft)</th>
<th>Ground Water Level</th>
<th>Depth in Feet</th>
<th>Samples</th>
<th>Well Details</th>
<th>Lithologic Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>96</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
<td>0 to 15.0 feet: SILTY CLAY (CL), light to dark brown with 20-30% strong grayish motting, some reddish brown motting; medium plasticity fines, some silt; granular soil ped; no macropores; stiff; damp. @ 1.5 to 4.5 feet: approximately 50% gray and 50% brown mottled soil. @ 4.0 to 4.5 feet: crushed red bricks. @ 4.5 to 6.0 feet: wet. @ 5.5 feet: color changes to dark yellowish brown (10YR 4/4) with 10% light gray motting. @ 7.5 feet: some 1/16-inch macropores. @ 8.5 to 9.0 feet: approximately 20% gray motting.</td>
</tr>
<tr>
<td>100</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td>@ 13.0 feet: dark brown (10YR 3/3). @ 14.0 to 15.0 feet: color change from the overlying brown to dark olive gray is sharp.</td>
</tr>
<tr>
<td>90</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
<td>15.0 to 22.5 feet: CLAY (CL), dark olive gray (5Y 3/2 to a bluish gray (5B 5/1), slight purplish tint; medium to high plasticity fines; 5% 1/32- to 1/4-inch macropores; stiff; moist to wet, free water along soil ped surfaces. @ 18.5 feet: no purplish tint; soil slightly firmer.</td>
</tr>
<tr>
<td>87</td>
<td>2.5</td>
<td>27</td>
<td>8/10/93</td>
<td>15</td>
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<td>15</td>
<td>5/24/93</td>
<td>15</td>
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</table>

**REMARKS**

Drilled w/8" OD (4.25" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted w/rings. A 2" PCC monitoring well was constructed in the borehole. Wall construction information presented in Well Details. See explanation for definition of symbols.
REMARKS

Drilled w/8" OD (4.25" ID) HSA. Samples continuously collected w/S'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted wireling. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.
EXPLORATORY BORING

a. Total depth 22.5 ft.
b. Diameter 8 in.
   Drilling method: Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length 24.3 ft.
   Material: Schedule 40 PVC

d. Diameter 2 in.
e. Depth to top perforations 11.8 ft.
f. Perforated length 9.5 ft.
   Perforated interval from 11.8 to 21.3 ft.
   Perforation type: Machine Slotted
   Perforation size: 0.010 Inches

g. Surface seal (0 to 2.5) 2.5 ft.
   Material: Concrete

h. Backfill NA ft.
   Material: NA

i. Seal (2.5 to 8.5) 6.0 ft.
   Material: Bentonite Chips

j. Gravel pack 14.0 ft.
   Gravel pack interval from 8.5 to 22.5 ft.
   Material: 10-20 Gradation Sand

k. Bottom seal/fill NA ft.
   Material: NA

l. Casing stickup 2.8 ft.
m. Protective casing diameter 6.5 in.
### LOG OF EXPLORATORY BORING

**PROJECT NAME** Remedial Investigation  
**LOCATION** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY** GeoTech Explorations  
**DRILL METHOD** Hollow Stem Auger  
**LOGGED BY** Craig D. Fanshier

<table>
<thead>
<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETRATION (Tons/SF)</th>
<th>PENETRATION (Bows/ft)</th>
<th>GROUND LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>88</td>
<td>2.5</td>
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<td></td>
<td>0 to 17.5 feet: SILTY CLAY (CL), dark yellowish brown (10YR 4/4), with grayish brown and 1/8-inch diameter rust red mottling; low to medium plasticity fines; trace black organic material; some small (1/16-inch) macropores, vertical and horizontally oriented; small to medium granular peds; soft to firm, damp.</td>
</tr>
</tbody>
</table>

| 88               | 2.5                         |                       |               |               |         |               |                     | @ 0 to 6.0 feet: moderately well developed granular soil peds. |

| 2                |                            |                       |               |               |         |               |                     | @ 5.5 feet: no mottling; slightly more silt than above. |

| 2                |                            |                       |               |               |         |               |                     | @ 6.0 to 9.0 feet: abundant macropores, approximately 5 per square inch, vertical and horizontally oriented, some large (1/4-inch) contain free water, 1/16 to 1/8-inch gray ring around some macropores which contain free water; poorly developed granular soil peds; stiff to very stiff; moist, moisture along soil peds. |

**REMARKS**

Drilled w/8" OD (4.25" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted w/rings. Bedrock was cored w/NX (3.5" OD) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.
0 to 17.5 feet: SILTY CLAY (CL), continued.

@ 12.0 to 13.0 feet: gradational color change to a dark greenish gray (5GY 4/1); looser vertical columnar soil peds, soil ped surfaces are glossy; damp, no moisture along ped surfaces, very stiff.

@ 15.0 feet: slight purplish tint; loose granular to blocky peds.

17.5 to 28.0 feet: CLAYEY SILT (ML), dark olive gray (5Y 3/3), low to medium plasticity fines; stiff to very stiff; moist.

REMARKS
Drilled w/8" OD (4.25" ID) HSA. Samples continuously collected w/5'"-long, 3" ID split barrel and 1.5'"-long, 3" OD split spoon fitted w/rings. Bedrock was cored w/NX (3.5" OD) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for the definition of symbols.
LOG OF EXPLORATORY BORING

PROJECT NAME: Remedial Investigation
LOCATION: Riverbend Landfill; McMinnville, Oregon
DRILLED BY: GeoTech Explorations
DRILL METHOD: Hollow Stem Auger
LOGGED BY: Craig D. Fanshier

BORING NO. MW-6B
PAGE: 3 OF 6
GROUND ELEV.: 137.80'
TOTAL DEPTH: 56.00'
DATE COMPLETED: 06/09/93

<table>
<thead>
<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETRATION (Tons/ft)</th>
<th>PENETRATION (Bowl/ft)</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
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<tbody>
<tr>
<td>2</td>
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<td>0 to 17.5 feet: SILTY CLAY (CL), continued. Note: the clay and silt content varies in this soil unit. The variations are subtle and appear to be gradational between a CLAYEY SILT (ML) and a SILTY CLAY (CL).</td>
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<td>@ 20.0 to 21.0 feet: slight purplish tint, looser, vertical columnar soil ped.</td>
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<td>@ 27.5 feet: approximately 10-15% reddish brown mottling, 1/16 to 1/4-inch, spherical, randomly distributed.</td>
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<td>28.0 to 34.0 feet: SILTY CLAY (CL), dark olive gray (5Y 3/3), some brown mottling; 85-100% medium plasticity fines; 0-15% fine sand, amount gradationally increases from approximately 0% at 32.0 feet to 15% at 34.0 feet; firm to stiff; moist.</td>
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<td>30</td>
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</table>

REMARKS
Drilled w/8" OD (4.25" ID) HSA. Samples continuously collected w/5'4"ong, 3" ID split barrel and 1.5'4"ong, 3" OD split spoon fitted w/riings. Bedrock was cored w/NX (3.5" OD) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for defition of symbols.

EMCON Northwest, Inc.
<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Lithologic Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.0 to 34.0</td>
<td>SILTY CLAY (CL), continued.</td>
</tr>
<tr>
<td>34.0 to 36.0</td>
<td>SILTY SAND (SM), very dark gray (5Y 3/10; 15% nonplastic to low plasticity fines; 80% fine to medium sand (F:M = 9:1) subangular; 1-3% gravels, 1/16 to 1/4-inch, rounded, quartz, marine sediment fragments; trace small wood fragments; wet.</td>
</tr>
<tr>
<td>36.0 to 42.5</td>
<td>SANDY GRAVEL (GM), brown, some iron oxide staining; 10-15% nonplastic to low plasticity fines; 20-25% fine to medium sand, arkosic; 60-70% gravels, fine to coarse, subrounded to rounded, medium sphericity, no orientation; appears loose, wet.</td>
</tr>
</tbody>
</table>

**REMARKS**

Drilled w/8" OD (4.25" ID) HSA. Samples continuously collected w/5' long, 3" ID split barrel and 1.5' long, 3" OD split spoon fitted wirings. Bedrock was cored w/NX (3.5" OD) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.
**LOG OF EXPLORATORY BORING**

**PROJECT NAME** Remedial Investigation  
**LOCATION** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY** GeoTech Explorations  
**DRILL METHOD** Hollow Stem Auger  
**LOGGED BY** Craig D. Fanshier  
**BORING NO.** MW-6B  
**PAGE** 5 of 6  
**GROUND ELEV.** 137.80'  
**TOTAL DEPTH** 56.00'  
**DATE COMPLETED** 06/09/93

<table>
<thead>
<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETRATION (Tons/SF)</th>
<th>PENETRATION (Gross Feet)</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH (FEET)</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>36.0 to 42.5 feet</td>
<td>36.0 to 42.5 feet</td>
<td>36.0 to 42.5 feet</td>
<td>36.0 to 42.5 feet</td>
<td>36.0 to 42.5 feet</td>
<td>36.0 to 42.5 feet</td>
<td>SANDY GRAVEL (GM), continued.</td>
<td></td>
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</tr>
<tr>
<td>42.5 feet</td>
<td>3-inch basalt cobble.</td>
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</tr>
<tr>
<td>42.5 to 45.5 feet</td>
<td>GRAVELLY SAND (SW), dark greenish gray (5G 4/1); 75-85% fine to medium sand; 15-25% gravels, 3/8 to 1/2-inch, subrounded to subangular; the gravels are matrix supported; appear medium dense; wet.</td>
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<tr>
<td>44.0 feet</td>
<td>damp.</td>
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</tr>
<tr>
<td>45.5 to 56.0 feet</td>
<td>BASALT, greenish gray, alphanitic, very small vesicles, calcite veining, trace disseminated pyrite. 100% RQD. (FLOW FOOT BRECIA NESTUCCA FORMATION).</td>
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</tr>
</tbody>
</table>

**REMARKS**

Drilled w/8" OD (4.25" ID) HSA. Samples continuously collected w/14"-
long, 3" ID split barrel and 1.5"-long, 3" OD split spoon fitted wirengs. Bedrock was cored w/NX (3.5" OD) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.
## Log of Exploratory Boring

**Project Name:** Remedial Investigation  
**Location:** Riverband Landfill; McMinnville, Oregon  
**Drilled by:** GeoTech Explorations  
**Drill Method:** Hollow Stem Auger  
**Logged by:** Craig D. Fanshier

<table>
<thead>
<tr>
<th>Recovery Percent</th>
<th>Pocket Penetration Meter (Ton/5Ft)</th>
<th>Penetration (Blows/Ft)</th>
<th>Ground Water Level</th>
<th>Depth in Feet</th>
<th>Samples</th>
<th>Well Details</th>
<th>Lithologic Column</th>
<th>Lithologic Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>45.5 to 56.0 feet: BASALT, continued.</td>
</tr>
</tbody>
</table>

**Boring No.:** MW-6B  
**Page:** 6 of 6  
**Ground Elev.:** 137.80'  
**Total Depth:** 56.00'  
**Date Completed:** 06/09/93

**Remarks:**  
Drilled w/8° OD (4.25" ID) HSA. Samples continuously collected w/5'-long, 3° T0 split barrel and 1.5'-long, 3° OD split spoon fitted w/rings. Bedrock was cored w/NX (3.5" OD) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.
**WELL DETAILS**

**CLIENT** Riverbend Landfill Company, Inc.

**PROJECT NUMBER** 0258-001.24

**PROJECT NAME** MW-5 Remedial Investigation

**LOCATION** McMinnville, Oregon

**WELL PERMIT NO.** 52008

**BORING / WELL NO.** MW-6B

**TOP OF CASING ELEV.** 128.59

**GROUND SURFACE ELEV.** 125.8

**DATUM** Feet Mean Sea Level

**INSTALLATION DATE** 6/10/93

---

**EXPLORATORY BORING**

a. **Total depth** 56.0 ft.

b. **Diameter** 8 and 3.5 in.

Drilling method **Hollow Stem Auger**

---

**WELL CONSTRUCTION**

c. **Total casing length** 48.8 ft.

Material **Schedule 40 PVC**

d. **Diameter** 2 in.

e. **Depth to top perforations** 36.3 ft.

f. **Perforated length** 9.5 ft.

Perforated interval from 36.3 to 45.3 ft.

Perforation type **Machine Slotted**

Perforation size **0.010 Inches**

g. **Surface seal** 2.5 ft.

Material **Concrete**

h. **Backfill** NA ft.

Material **NA**

i. **Seal** 31.7 ft.

Material **Bentonite Chips**

j. **Gravel pack** 12.6 ft.

Gravel pack interval from 34.2 to 47.0 ft.

Material **10-20 Gradation Sand**

k. **Bottom seal/fill** 9.0 ft.

Material **Bentonite Chips**

l. **Casing stickup** 2.8 ft.

m. **Protective casing diameter** 6.5 in.

---

Prepared by: Craig Fanshier

Reviewed by: Craig Fanshier

Date: 10/1/93
LOG OF EXPLORATORY BORING

PROJECT NAME: Remedial Investigation
LOCATION: Riverbend Landfill; McMinnville, Oregon
DRILLED BY: GeoTech Explorations
DRILL METHOD: Hollow Stem Auger
LOGGED BY: Craig D. Fanshier

BORING NO. MW-7A
PAGE 1 OF 2
GROUND ELEV. 137.80'
TOTAL DEPTH 32.50'
DATE COMPLETED 05/26/93

<table>
<thead>
<tr>
<th>RECOVERY</th>
<th>POCKET PENETRATION</th>
<th>PENETRATION (Blows/ft)</th>
<th>GROUND WATER LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAIL</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>4.5</td>
<td></td>
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<td></td>
<td>0 to 17.0 feet: SILT (ML), dark brown (10yr 4/3), 95-98% low plasticity fines; 2-5% fine sand, rounded; some small root traces (open); stiff to very stiff; damp. (WILLAMETTE SILTS)</td>
</tr>
<tr>
<td>90</td>
<td>2.5</td>
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<td></td>
<td>@ 4.5 to 13.5 feet: faint rust red mottling inside macropore; 5-10% fine sand, well sorted, micaceous; very abundant 1/16- to 1/4-inch diameter macropores, approximately three per square inch.</td>
</tr>
<tr>
<td>90</td>
<td>1.5 to 2</td>
<td></td>
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<td></td>
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<td></td>
<td>@ 10.5 feet: grades to a brown (10YR 5/3).</td>
</tr>
<tr>
<td>100</td>
<td>1.5 to 2</td>
<td>1.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 13.5 feet: approximately one macropore per sq. inch.</td>
</tr>
<tr>
<td>100</td>
<td>1.5 to 2</td>
<td>1.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 14.0 feet: driller notes water in borehole.</td>
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<tr>
<td>86</td>
<td>1</td>
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<td>17.0 to 32.5 feet: CLAYEY SILT (CL), brown (10YR 3/2), slight rust red mottling, low plasticity fines; stiff; wet.</td>
</tr>
<tr>
<td>68</td>
<td>1</td>
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<td>@ 18.8 feet: light olive gray (2.5Y 5/4).</td>
</tr>
</tbody>
</table>

REMARKS
Drilled w/10" OD (4.25" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted wirings. Bedrock was cored w/NX (3.5" OD) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.
17.0 to 32.5 feet: CLAYEY SILT (CL), continued.

@ 21.0 feet: dark olive gray (5Y 3/2), with slight greenish tint.

@ 24.5 feet: dark greenish gray (5G 4/1); small moderately developed platy soil pedds; minor relic root traces; some macropores; wet.

@ 30.9 feet: slight purplish tint, no mottling; abundant 1/32- to 1/16-inch macropores, approximately 10 per sq. inch; very stiff; wet.

BORING TERMINATED AT 32.5 FEET.

Remarks:
Drilled w/10" OD (4.25" ID) HSA. Samples continuously collected w/5"-long, 3" ID split barrel and 1.5"-long, 3" OD split spoon fitted w/rings. Bedrock was cored w/NX (3.5" OD) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.
**WELL DETAILS**

<table>
<thead>
<tr>
<th>CLIENT</th>
<th>Riverbend Landfill Company, Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROJECT NUMBER</td>
<td>0258-001.24</td>
</tr>
<tr>
<td>PROJECT NAME</td>
<td>MW-5 Remedial Investigation</td>
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<tr>
<td>LOCATION</td>
<td>McMinnville, Oregon</td>
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<tr>
<td>WELL PERMIT NO.</td>
<td>52007</td>
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<td>BORING / WELL NO.</td>
<td>MW-7A</td>
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<tr>
<td>TOP OF CASING ELEV.</td>
<td>149.56</td>
</tr>
<tr>
<td>GROUND SURFACE ELEV.</td>
<td>146.7</td>
</tr>
<tr>
<td>DATUM</td>
<td>Feet Mean Sea Level</td>
</tr>
<tr>
<td>INSTALLATION DATE</td>
<td>5/26/93</td>
</tr>
</tbody>
</table>

**EXPLORATORY BORING**

a. Total depth | 32.5 ft.
b. Diameter | 8 in.
Drilling method | Hollow Stem Auger

**WELL CONSTRUCTION**

c. Total casing length | 28.7 ft.
Material | Schedule 40 PVC
d. Diameter | 2 in.
e. Depth to top perforations | 16.3 ft.
f. Perforated length | 9.5 ft.
Perforated interval from | 16.3 to 25.3 ft.
Perforation type | Machine Slotted
Perforation size | 0.010 Inches
g. Surface seal | 2.5 ft.
Material | Concrete
h. Backfill | NA ft.
Material | NA

i. Seal | 11.0 ft.
Material | Bentonite Chips
j. Gravel pack | 14.0 ft.
Gravel pack interval from | 13.0 to 27.0 ft.
Material | 10-20 Gradation Sand
k. Bottom seal/fill | 5.5 ft.
Material | Bentonite Chips
l. Casing stickup | 2.9 ft.
m. Protective casing diameter | 6.5 in.
# LOG OF EXPLORATORY BORING

**PROJECT NAME:** Remedial Investigation  
**LOCATION:** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY:** GeoTech Explorations  
**DRILL METHOD:** Hollow Stem Auger  
**LOGGED BY:** Craig D. Fanshier  
**BORING NO.** MW-7B  
**PAGE:** 1 OF 9  
**GROUND ELEV.** 146.50’  
**TOTAL DEPTH** 146.50’  
**DATE COMPLETED** 06/18/93

<table>
<thead>
<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETRATION (Tons/DF)</th>
<th>PENETRATION (Bxns/Ft)</th>
<th>GROUND LEVEL</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
</table>
| 88               | 1                            | 1                     |              |               |         |              |                   | 0 to 14.0 feet: CLAYEY SILT (ML), dark brown (10YR 3/3), low to medium plasticity, high silt content, quartz and mica; several thin (2 to 8-inch zones of SANDY SILT with 20% fine sand; poorly developed granular soil peds; crumbly; stiff, damp. (WILLAMETTE SILTS). 
|                  |                              |                       |              |               |         |              |                   | @ 0 to 4.0 feet: small roots. |
| 100              | 1.5                          | 1.5                   | 5            | 10            | 100     | 0.75 to 1    |                   | @ 6.0 to 14.0 feet: abundant small macro pores, approximately 5 per square inch. |
|                  |                              |                       |              |               | 1       |              |                   | @ 8.8 feet: moist. |

**REMARKS**

Drilled w/8” OD (4.25” ID) HSA. Samples continuously collected w/5’-long, 3” ID split barrel and 1.5’-long, 3” OD split spoon fitted w/rings. Bedrock was cored w/NX (3.5” OD) diamond core. A 2” PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.
0 to 14.0 feet: CLAYEY SILT (ML), continued.

@ 11.5 feet: 10-20% faint gray mottling; wet.

14.0 to 14.5 feet: SILTY SAND (SM), dark yellowish brown (10YR 3/4), 10-20% faint gray mottling; 20-40% low plasticity fines; 60-80% fine sand, well rounded and sorted; wet. (WILLAMETTE SILTS)
Granular soil peds; stiff, crumbly.

14.5 to 15.4 feet: CLAYEY SILT (ML), as above at 14.0 to 14.5 feet.
Lower gradational contact.

15.4 to 15.8 feet: SILTY SAND (SM), as above at 14.0 to 14.5 feet.
Gradational lower contact.

15.8 to 16.7 feet: CLAYEY SILT (ML), as above at 14.0 feet without sandy silt interbeds.
Gradational lower contact.

16.7 to 17.0 feet: SILTY SAND (SM), as above at 14.0 to 14.5 feet.
Gradational lower contact.

17.0 to 20.0 feet: CLAYEY SILT (ML), dark brown (10YR 3/3), low to medium plasticity, high silt content, quartz and mica; weakly developed platy soil peds; lower gradational contact; stiff, crumbly; damp. (WILLAMETTE SILTS)

REMARKS
Drilled w/8" OD (4.25" ID) HSA. Samples continuously collected w/5'4-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted w/rings. Bedrock was cored w/NX (3.5" OD) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.
## LOG OF EXPLORATORY BORING

**PROJECT NAME:** Remedial Investigation  
**LOCATION:** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY:** GeoTech Explorations  
**DRILL METHOD:** Hollow Stem Auger  
**LOGGED BY:** Craig D. Fanshier  

**BORING NO.** MW-7B  
**PAGE:** 3 OF 9  
**GROUND ELEV.** 146.50'  
**TOTAL DEPTH:** 146.50'  
**DATE COMPLETED:** 06/18/93

<table>
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<tr>
<th>RECOVERY PERCENT</th>
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<th>PENETRATION (Bowe/Fe)</th>
<th>GROUND WATER LEVELS</th>
<th>DEPTH FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
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<tr>
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</tbody>
</table>

20.0 to 22.0 feet: SILTY SAND (SM) AND CLAYEY SILT (ML) INTERBEDDED; wet, gradational lower contact. SILTY SAND as above at 14.0 to 14.5 feet. CLAYEY SILT as above at 17.0 to 20.0 feet.  
@ 20.5 feet: color changes to olive brown (2.5Y 4/4)

22.0 to 24.0 feet: CLAYEY SILT (ML), as above at 17.0 to 20.0 feet, higher silt content.

24.0 to 24.5 feet: SILTY SAND (SM), dark brown (10YR 3/3), 20% low to medium plasticity fines, quartz and abundant mica; no to very few (2/linear foot) trace developed soil peds; moist to wet. (WILLAMETTE SILTS)

24.5 to 25.3 feet: SILTY CLAY (CL), dark brown (10YR 3/3), evenly colored; low to medium plasticity fines, quartz and abundant mica; trace macro pores (2/linear), trace developed soil peds; stiff; moist to wet. (WILLAMETTE SILTS)  
@ 25.3 to 25.5 feet: SILTY SAND (SM), as above at 24.0 to 24.5 feet.

25.3 to 26.8 feet: SILTY CLAY (CL), dark brown (10YR 3/3), medium plasticity fines; stiff; moist to wet. (WILLAMETTE SILTS)

26.8 to 29.0 feet: SILTY SAND (SM), as above at 24.0 to 24.5 feet with the following exceptions: poorly developed platy soil peds, 1/4-inch thick, possible varves; wet.

29.0 to 29.5 feet: SILTY CLAY TO SANDY CLAY (CL), continues.

29.5 to 32.5 feet: CLAYEY SILT TO SANDY SILT (ML), continues.

### REMARKS
Drilled w/8" OD (4.25" ID) HSA. Samples continuously collected w/6'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted w/rods. Bedrock was cored w/INX (3.5" OD) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

[EMCON Northwest, Inc.]  
[0256-001.24.MCMN.147/ww:2.08/27/93...ENWLSWW7]
## LOG OF EXPLORATORY BORING

**PROJECT NAME:** Remedial Investigation  
**LOCATION:** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY:** GeoTech Explorations  
**DRILL METHOD:** Hollow Stem Auger  
**LOGGED BY:** Craig D. Fanshier  
**BORING NO.:** MW-7B  
**PAGE:** 4 OF 9  
**GROUND ELEV.:** 146.50'  
**TOTAL DEPTH:** 146.50'  
**DATE COMPLETED:** 06/18/93

<table>
<thead>
<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETRATION (Tone/ft²)</th>
<th>PENETRATION (Bowl/ft)</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td></td>
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<td></td>
<td></td>
<td>29.0 to 29.5 feet: SILTY CLAY TO SANDY CLAY (CL), dark brown (10YR 3/3); 80% low to medium plasticity fines; 10-20% fine sand; soil peds well developed, platy (1/4 inch) easy-to-part; varves, crumbly, soft, wet. (WILLAMETTE SILTS)</td>
</tr>
<tr>
<td>1.5</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>29.5 to 32.5 feet: CLAYEY SILT TO SANDY SILT (ML), dark brown (10YR 3/3), 80% low to medium plasticity fines; 10-20% fine sand; soil peds well developed, platy (1/4 inch), easy-to-part; varves, crumbly, soft, wet. (WILLAMETTE SILTS)</td>
</tr>
<tr>
<td>100</td>
<td>1.5</td>
<td>35</td>
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<td></td>
<td></td>
<td></td>
<td>32.5 to 38.5 feet: SILTY CLAY (CL), dark greenish gray (5GY 4/1) 95% medium plasticity fines, evenly colored; silt content variable; 5% fine sand (micaceous); weakly developed blocky ped structure; firm to stiff; moist to wet.</td>
</tr>
<tr>
<td>1.75</td>
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<td>@ 34.5 to 37.8 feet: medium to high plasticity; columnar peds with 2-4&quot; vertical fractures, moist. Note: very little water in borehole.</td>
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<tr>
<td>1</td>
<td></td>
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<td>@ 38.5 feet: 1&quot; thick lense of stained soil, olive brown.</td>
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<td>38.5 to 40.0 feet: CLAYEY SILT (ML), olive brown (2.5Y 4/4); 90% low to medium plasticity fines; 10% fine sand; stiff; moist.</td>
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<tr>
<td>100</td>
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### REMARKS

Drilled w/Ø 4" OD (4.25" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted w/rings. Bedrock was cored w/NX (3.5" OD) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.
**LOG OF EXPLORATORY BORING**

**PROJECT NAME**: Remedial Investigation  
**LOCATION**: Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY**: GeoTech Explorations  
**DRILL METHOD**: Hollow Stem Auger  
**LOGGED BY**: Craig D. Fanshier

<table>
<thead>
<tr>
<th>Recovery Percent</th>
<th>Pocket Penetration (Tons/6°Ft)</th>
<th>Penetration (Blow/Ft)</th>
<th>Depth (Ft)</th>
<th>Well Details</th>
<th>Lithologic Column</th>
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<tbody>
<tr>
<td>1</td>
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<td></td>
<td></td>
<td></td>
<td>40.0 to 46.5 feet: SILTY SAND (SM), dark greenish gray (5G 4/1), with reddish brown mottling; 40% low plasticity fines; 55% fine and 5% medium sand, subrounded, moderately well sorted; 2 macro pores/linear foot, no bedding structure; firm, wet.</td>
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<tr>
<td>1</td>
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<td></td>
<td>@ 43.4 feet: very pale brown (10YR 7/4), with rust reddish mottling; 30% medium plasticity fines; 70% fine to medium sand, subangular to subrounded, arkose; firm; moist to wet.</td>
</tr>
<tr>
<td>0.75</td>
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<td></td>
<td>@ 45.5 to 46.5 feet: 10-20% fines; very stiff, damp to moist. @ 46.0 feet: yellowish brown (10YR 5/6 to 5/8).</td>
</tr>
<tr>
<td>0.75</td>
<td></td>
<td></td>
<td>1.5</td>
<td></td>
<td>46.5 to 47.5 feet: CLAYEY SAND (SC), yellowish brown (10YR 5/6); 40% medium plasticity fines; 60% fine to medium sand; some varves; dense to very dense; dry to damp. @ 47.2 to 47.5 feet: sand, gravel layer. @ 47.5 to 47.2 feet: silty sand and sandy gravel lense.</td>
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<tr>
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<td>31</td>
<td>45</td>
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<td>47.5 to 54.5 feet: SILTY GRAVEL (GM), olive (5Y 4/3), with streaks of reddish staining; 25% low to medium plasticity fines, 35% fine to coarse sand; 3/8 to 3-inch, subangular to rounded, 45% fine to coarse gravel, basaltic cemented; appears loose to medium dense; wet.</td>
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<tr>
<td>86</td>
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<td>20</td>
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</table>

**REMARKS**: Drilled w/8" OD (4.25" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted w/rings. Bedrock was cored w/NX (3.5" OD) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.
**LOG OF EXPLORATORY BORING**

**PROJECT NAME**: Remedial Investigation  
**LOCATION**: Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY**: GeoTech Explorations  
**DRILL METHOD**: Hollow Stem Auger  
**LOGGED BY**: Craig D. Fanshier  
**BORING NO.**: MW-7B  
**PAGE**: 6 OF 9  
**GROUND ELEV.**: 146.50'  
**TOTAL DEPTH**: 146.50'  
**DATE COMPLETED**: 06/18/93

<table>
<thead>
<tr>
<th>Recovery Percent</th>
<th>Pocket Penetration (Tons/SF)</th>
<th>Penetration Rate (Blows/Ft)</th>
<th>Ground Water Level</th>
<th>Depth (Feet)</th>
<th>Samples</th>
<th>Well Details</th>
<th>Lithologic Column</th>
<th>Lithologic Description</th>
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<tr>
<td>70</td>
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<td>47.5 to 54.5 feet: SILTY GRAVEL (GM), olive (5Y 4/3), with streaks of reddish staining; 25% low to medium plasticity fines, 35% fine to coarse sand; 3/8 to 3-inch, subangular to rounded, 45% fine to coarse gravel, basaltic cemented; appears loose to medium dense; wet.</td>
</tr>
<tr>
<td>100</td>
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<td></td>
<td>54.5 to 57.5 feet: SANDY GRAVEL (GP), 20% low to medium plasticity fines, 20-30% fine to coarse sands (F:MC = 2:7:1) subrounded to angular, low sphericity (flat), mostly basalt fragments; 50% fine to coarse gravels, (F:C = 8:2) 50% is matrix supported.</td>
</tr>
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<td></td>
<td>57.5 to 61.0 feet: SILTY GRAVEL (GM), olive (5Y 4/3).</td>
</tr>
</tbody>
</table>

**REMARKS**

Drilled w/8" OD (4.25" ID) HSA. Samples continuously collected w/5"-long, 3" ID split barrel and 1.5"-long, 3" OD split spoon fitted w/rings. Bedrock was cored w/NX (3.5" OD) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.
**LOG OF EXPLORATORY BORING**

**PROJECT NAME:** Remedial Investigation  
**LOCATION:** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY:** GeoTech Explorations  
**DRILL METHOD:** Hollow Stem Auger  
**LOGGED BY:** Craig D. Fanshier  

**BORING NO.** MW-7B  
**PAGE:** 7 OF 9  
**GROUND ELEV:** 146.50'  
**TOTAL DEPTH:** 146.50'  
**DATE COMPLETED:** 06/18/93

<table>
<thead>
<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETRATION (Tons/SF)</th>
<th>PENETRATION (Bore/Ht)</th>
<th>GROUND LEVELS</th>
<th>DUG IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
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<td>2.5</td>
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<td></td>
<td>47.5 to 54.5 feet: SILTY GRAVEL (GM), continued.</td>
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<td>61.0 to 64.5 feet: CLAYEY SILT (ML), dark greenish grey (5G 4/1); 80 to 90% low to medium plasticity fines, 10-20% fine sand, minor amounts of pyrite replacement; trace amounts of fossilized leaves, twigs, and snail shells; dense to very dense; moist.</td>
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<tr>
<td>4</td>
<td>100</td>
<td>65</td>
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<td>64.5 to 65.0 feet: SILTY GRAVEL (GM), dark greenish grey (5G 4/1): 20% low to medium plasticity fines; 20% fine sand; 60% gravels, 1/4 to 3/4-inch, mostly rounded, low sphericity (flat), clayey silt matrix supported; dense; wet.</td>
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<tr>
<td>4.5</td>
<td>70</td>
<td>90</td>
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<td>65.0 to 67.0 feet: CLAYEY GRAVEL (GC), dark greenish grey (5G 4/1): 40 to 50% medium plasticity fines; 5 to 10% fine sand; 50 to 60% gravels, 1/4 to 3/4-inch; dense; wet.</td>
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<td>67.0 to 68.5 feet: SILTY GRAVEL (GM), dark greenish grey (5G 4/1): 20% low to medium plasticity fines; 20% fine sand; 60% gravels, 1/4 to 1/2-inch mostly rounded, low sphericity (flat), mostly clayey silt matrix supported some point contact; dense; wet.</td>
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<td>68.5 to 71.0 feet: CLAYEY SILT (ML), continues.</td>
</tr>
</tbody>
</table>

**REMARKS**
Drilled w/8" OD (4.25" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted w/rings. Bedrock was cored w/NX (3.5" OD) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.
68.5 to 71.0 feet: CLAYEY SILT (ML), dark greenish gray (5G 4/1) evenly colored; 98% low to medium plasticity fines, trace fine sand; trace 1/4-inch pebbles; minor amounts of pyrite replacement; trace amounts of fossilized leaves, twigs, and clam (mollusca?) shells; dense to very dense; damp.

71.0 to 72.5 feet: SANDY GRAVEL (GP), dark greenish gray (5G 4/1) evenly colored; trace none to low plasticity fines; 30% medium sand, angular, 90% basalt fragments and 10% quartz; 70% gravels, 1/4 to 1/2-inch; the sandy gravel is moderately cohesive; medium dense to dense; wet.

Note: bedrock contact at 72.5 feet.

72.5 to 82.6 feet: BASALT, olive gray (5Y 4/1) [GSA rock color chart]; fine grained; vesiculated; secondary mineralization of calcite and zeolites in vertical and sub-vertical fractures. (NESTUCCA FORMATION)

REMARKS
Drilled w/ 6" OD (4.25" ID) HSA. Samples continuously collected w/ 5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted w/ rings. Bedrock was cored w/ NX (3.5" OD) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.
72.5 to 82.6 feet: BASALT, continued.

BORING TERMINATED AT 82.6 FEET.

REMARKS
Drilled w/8" OD (4.25" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted w/rings. Bedrock was cored w/NX (3.5" OD) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.
EXPLORATORY BORING
a. Total depth 82.6 ft.
b. Diameter 8 in.
  Drilling method Hollow Stem Auger

WELL CONSTRUCTION
c. Total casing length 61.8 ft.
  Material Schedule 40 PVC
d. Diameter 2 in.
e. Depth to top perforations 49.3 ft.
f. Perforated length 9.5 ft.
  Perforated interval from 49.3 to 58.8 ft.
  Perforation type Machine Slotted
  Perforation size 0.010 Inches
g. Surface seal (0 to 2.6) 2.0 ft.
  Material Concrete
h. Backfill (2.0 to 43.5) 41.5 ft.
  Material High Solids Bentonite Grout
i. Seal (43.5 to 47.2) 3.7 ft.
  Material Bentonite Chips
j. Gravel pack 12.8 ft.
  Gravel pack interval from 47.2 to 60.0 ft.
  Material 10-20 Gradation Sand
k. Bottom seal/fill (60.0 to 82.6) 22.6 ft.
  Material Bentonite Chips
l. Casing stickup 2.8 ft.
m. Protective casing diameter 6.5 in.
### LOG OF EXPLORATORY BORING

**PROJECT NAME:** Additional Hydrogeologic Investigation  
**LOCATION:** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY:** Geo-Tech Explorations, Inc.  
**DRILL METHOD:** Hollow Stem Auger  
**LOGGED BY:** Craig D. Fanshier  
**BORING NO.:** MW-8A  
**PAGE:** 1 OF 2  
**GROUND ELEV.:** 124.10'  
**TOTAL DEPTH:** 24.50'  
**DATE COMPLETED:** 10/20/93

<table>
<thead>
<tr>
<th>Recovery Percent</th>
<th>Pocket Penetration Meter (Blows/ft)</th>
<th>Ground Water Levels</th>
<th>Depth in Feet</th>
<th>Samples</th>
<th>Lithologic Column</th>
<th>Well Details</th>
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</tbody>
</table>

**Lithologic Description:**

- **0 to 24.0 feet:** Silty Clay (CL), dark brown (7.5 YR 3/3), with faint gray mottling; low to medium plasticity fines; abundant pin-sized macro pores (approximately 5 per square inch); firm angular blocky soil peds; stiff to hard; damp.

- @ 6.5 feet: damp to moist, some moisture along ped sutures.
- @ 7.0 to 14.5 feet: medium plasticity fines; decreasing abundance of macro pores (1 per inch); soil has slightly crumbly partings along soil peds.

- @ 12.0 feet: some large, 1/4-inch-diameter, vertical oriented gray mottling; moisture same as above.

- @ 14.5 feet: sharp color change to dark greenish gray (5G 4/1), no mottling, no visible macro pores; wet (mostly along soil ped surfaces).

- @ 16.5 to 19.5 feet: slight purplish tint.
- @ 17.0 to 18.5 feet: soft crumbly zone; stiff; soil parts in horizontal blocky planes, parting surfaces are smooth and glisten.

**REMARKS:**

Drilled with 8-inch O.D. (4.25-inch I.D.) hollow stem auger. Samples continuously collected with 5-foot long, 3-inch I.D. split barrel and 1.5-foot long, 3-inch 0.D. split spoon fitted with rings. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

**EMCON Northwest, Inc.**
LOG OF EXPLORATORY BORING

PROJECT NAME: Additional Hydrogeologic Investigation
LOCATION: Riverbend Landfill; McMinnville, Oregon
DRILLED BY: Geo-Tech Explorations, Inc.
DRILL METHOD: Hollow Stem Auger
LOGGED BY: Craig D. Fanshier

BORING NO.: MW-8A
PAGE: 2 OF 2
GROUND ELEV.: 124.10'
TOTAL DEPTH: 24.50'
DATE COMPLETED: 10/20/93

RECOVERY PERCENT

POCKET PENETRATION (Tons/FT)

GROUND WATER LEVEL

DEPTH IN FEET

SAMPLES

LITHOLOGIC COLUMN

WELL DETAILS

LITHOLOGIC DESCRIPTION

0 to 24.0 feet: SILTY CLAY (CL), continued.

@ 22.0 feet: wet.

24.0 to 24.5 feet: CLAYEY SAND (SC), olive brown (2.5Y 4/3) with gray mottling; 30 to 40 percent medium plasticity fines; 60 to 70 percent medium sand, mostly angular; appears loose, wet.

BORING TERMINATED AT 24.5 FEET.

REMARKS
Drilled with 8-inch O.D. (4.25-inch I.D.) hollow stem auger. Samples continuously collected with 5-foot long, 3-inch I.D. split barrel and 1.5-foot long, 3-inch O.D. split spoon fitted with rings. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.
**Well Details**

**Client:** Riverbend Landfill Company, Inc.

**Project Number:** 0258-001.28

**Project Name:** Additional Hydrogeologic Inv.

**Location:** McMinnville, Oregon

**Well Permit No.:** 59126

**Boring/Well No.:** MW-8A

**Top of Casing Elev.:** 126.01

**Ground Surface Elev.:** 124.1

**Datum:** Feet-Mean Sea Level

**Installation Date:** 10/20/93

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**Exploratory Boring**

- **Total depth:** 24.5 ft.
- **Diameter:** 8 in.
  - Drilling method: Hollow Stem Auger

**Well Construction**

- **Total casing length (+1.9 to 23.6):** 25.5 ft.
  - Material: Schedule 40 PVC
- **Diameter:** 2 in.
- **Depth to top perforations:** 13.3 ft.
- **Perforated length:** 9.5 ft.
  - Perforated interval from: 13.3 to 22.8 ft.
  - Perforation type: Machine Slotted
  - Perforation size: 0.010 Inches
- **Surface seal (0 to 3.0):** 3.0 ft.
  - Material: Concrete
- **Backfill:** N.A. ft.
  - Material: N.A.
- **Seal (3.0 to 10.2):** 7.2 ft.
  - Material: Bentonite
- **Gravel pack:** 13.3 ft.
  - Gravel pack interval from: 10.2 to 23.5 ft.
  - Material: 10-20 Gradation Sand
- **Bottom seal/fill (23.5 to 24.5):** 1.0 ft.
  - Material: Bentonite
- **Casing stickup:** 1.9 ft.
- **Protective casing diameter:** 6.5 in.

Prepared by: Craig Fanshier
### LOG OF EXPLORATORY BORING

**PROJECT NAME:** Additional Hydrogeologic Investigation  
**LOCATION:** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY:** Geo-Tech Explorations, Inc.  
**DRILL METHOD:** Hollow Stem Auger  
**LOGGED BY:** Craig D. Fanshier  
**BORING NO.:** MW-8B  
**PAGE:** 1 OF 3  
**GROUND ELEV.:** 124.30'  
**TOTAL DEPTH:** 49.50'  
**DATE COMPLETED:** 10/25/93

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<td>3.0</td>
<td>DEPTH IN FEET</td>
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<tr>
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<td>1.75</td>
<td>SAMPLING</td>
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<td>LITHOLOGIC COLUMN</td>
</tr>
<tr>
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<td>2.0</td>
<td>WELL DETAILS</td>
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<td>2.0</td>
<td>DESCRIPTION</td>
</tr>
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<td>2.5</td>
<td>0 to 5.0 feet: SILTY CLAY (CL), very dark grayish brown (10YR 3/2), with gray mottling, medium plasticity fines; trace roots (small) to 2.0 feet; abundant small (pin-sized) macro pores, 5 per square inch; stiff to very stiff; damp.</td>
</tr>
<tr>
<td></td>
<td>2.5</td>
<td>4.0 to 9.0 feet: CLAY (CL), brown (10YR 4/3), with gray mottling; medium to high plasticity fines; no visible macro pores; sticky texture; very stiff; moist.</td>
</tr>
<tr>
<td></td>
<td>1.75</td>
<td>9.2 to 22.0 feet: SILTY CLAY (CL), brown (10YR 4/3), medium plasticity fines; stiff to very stiff; damp.</td>
</tr>
<tr>
<td></td>
<td>1.75</td>
<td>@ 11.0 feet: minor amounts of vertically oriented gray mottling on poorly developed ped surfaces.</td>
</tr>
<tr>
<td></td>
<td>2.0</td>
<td>@ 14.5 feet: bluish gray (5B 4/1) and dark greenish gray (5BG 4/1).</td>
</tr>
<tr>
<td></td>
<td>1.5</td>
<td>@ 16.0 feet: wet, soil somewhat crumbly - parts easily along poorly developed angular blocky ped.</td>
</tr>
<tr>
<td></td>
<td>1.5</td>
<td>@ 17.0 to 18.0 feet: soil ped surfaces are smooth to slick, slightly glazed and glistening.</td>
</tr>
<tr>
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<td>100</td>
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<tr>
<td></td>
<td></td>
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<td>15</td>
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<td>1/5/94</td>
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</table>

**REMARKS:** Drilled with 8-inch O.D. (4.25-inch I.D.) hollow stem auger. Samples continuously collected with 5-foot long, 3-inch I.D. split barrel and 1.5-foot long, 3-inch O.D. split spoon fitted with rings. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.  
0256-001.28.RIVER.15/22a/5.03/22/94...MMM-REM
## Project Name
Additional Hydrogeologic Investigation

## Location
Riverbend Landfill; McMinnville, Oregon

## Drilled By
Geo-Tech Explorations, Inc.

## Drill Method
Hollow Stem Auger

## Logged By
Craig D. Fanshier

## Boring No.
MW-8B

## Page
2 of 3

## Ground Elev.
124.30'

## Total Depth
49.50'

## Date Completed
10/25/93

### Recovery Percent
<table>
<thead>
<tr>
<th>Recovery Percent</th>
<th>Pocket Penetration (Tons/SF)</th>
<th>Penetration (Gross/Ft)</th>
<th>Ground Water Levels</th>
<th>Depth in Feet</th>
<th>Samples</th>
<th>Lithologic Column</th>
<th>Well Details</th>
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<tbody>
<tr>
<td>100</td>
<td>1.5</td>
<td>24</td>
<td></td>
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<td></td>
<td>9.2 to 22.0 feet: Silty Clay (CL), continued.</td>
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<td>100</td>
<td>1.75</td>
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<td>22.0 to 24.5 feet: Clayey Silt (ML), dark greenish gray (5G 4/1) and olive gray (5Y 4/2); low plasticity fines; trace fine sand; trace small macro pores; stiff; wet; gradational contact with the underlying lithology.</td>
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<tr>
<td>90</td>
<td>1.0</td>
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<td>25</td>
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<td>23.5 to 27.5 feet: Silty Sand (SM), olive gray (5Y 4/2) with dark greenish gray (5G 4/1) and reddish brown mottling; 30 percent low plasticity fines; 70 percent fine sand, mostly angular to subangular, moderately sorted, mixed lithologies (chert, k-spar, some quartz); appears medium dense; wet; gradational contact with underlying sand.</td>
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<td>83</td>
<td>46</td>
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<td>30</td>
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<td>26.5 to 30.0 feet: Sand (SP), olive gray (5Y 4/2), no mottling; 5 percent low plasticity fines; 95 percent fine to coarse sand, poorly sorted; dense; wet.</td>
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<td>14</td>
<td>40</td>
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<td>35</td>
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<td>@ 28.5 feet: 15 percent fine (3/8-inch) gravel.</td>
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<td>40</td>
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<td>29.0 to 39.0 feet: Sandy Gravel (GP), coarse sands and gravels (approximately 50 percent of each).</td>
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<td>@ 31.5 feet: sand lenses.</td>
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<td>@ 32.0 to 34.5 feet: no recovery in corebarrel, 1.0 foot of sand heave in augers.</td>
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<td>@ 36.0 to 38.5 feet: rocky hard drilling.</td>
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<td>@ 38.5 to 39.5 feet: easier drilling, less rocky.</td>
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<td>@ 39.5 feet: hard drilling.</td>
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<td>100</td>
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<td></td>
<td></td>
<td>38.0 to 39.5 feet: Clayey Gravel (GC), dark greenish gray (5GY 4/1); 30% low to medium plasticity fines; 10 to 20% fine to coarse sand, (F:C = 2:5); 50 to 60% gravels, up to 3-inch-diameter, randomly oriented, matrix supported; appears dense; damp.</td>
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<td>39.5</td>
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<td></td>
<td>39.5 to 42.0 feet: Sandstone (SS), continued.</td>
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</tbody>
</table>

### Remarks
Drilled with 8-inch O.D. (4.25-inch I.D.) hollow stem auger. Samples continuously collected with 5-foot long, 3-inch I.D. split barrel and 1.5-foot long, 3-inch O.D. split spoon fitted with rings. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.
# LOG OF EXPLORATORY BORING

**PROJECT NAME:** Additional Hydrogeologic Investigation  
**LOCATION:** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY:** Geo-Tech Explorations, Inc.  
**DRILL METHOD:** Hollow Stem Auger  
**LOGGED BY:** Craig D. Fanshier  
**BORING NO.:** MW-8B  
**PAGE:** 3 OF 3  
**GROUND ELEV.:** 124.30'  
**TOTAL DEPTH:** 49.50'  
**DATE COMPLETED:** 10/25/93

<table>
<thead>
<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETRATION</th>
<th>PENETRATION (Blows/Ft)</th>
<th>GROUND WATER LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>LITHOLOGIC COLUMN</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC DESCRIPTION</th>
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</thead>
<tbody>
<tr>
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<td></td>
<td>39.5 to 42.0 feet: SANDSTONE (SS), gray; medium grain; no fractures; low hardness (friable); weakly to moderately weathered; 0.5 foot soft zones every 2.0 feet.</td>
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<td></td>
<td>42.0 to 46.5 feet: SILTSTONE (SLST), gray; fine grain, low to moderate hardness; weakly to moderately weathered; locally hard drilling.</td>
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<td>@ 43.5 feet: few very small (0.5 mm) pyrite crystals.</td>
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<td>@ 45.0 feet: approximately 1.25-inch-thick subvertical basaltic injection dyke.</td>
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<td></td>
<td>46.5 to 49.5 feet: BASALT, gray; fine grain; massive; hard, fresh, brecciated; locally very hard drilling.</td>
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BORING TERMINATED AT 49.5 FEET.

**REMARKS**
Drilled with 8-inch O.D. (4.25-inch I.D.) hollow stem auger. Samples continuously collected with 5-foot long, 3-inch I.D. split barrel and 1.5-foot long, 3-inch O.D. split spoon fitted with rings. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.
EXPLORATORY BORING

a. Total depth  49.5 ft.
b. Diameter  8 in.
Drilling method  Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length (+2.5 to 39.6)  42.1 ft.
Material  Schedule 40 PVC

d. Diameter  2 in.
e. Depth to top perforations  29.3 ft.
f. Perforated length  9.5 ft.
Perforated interval from 29.3 to 38.8 ft.
Perforation type  Machine Slotted
Perforation size  0.010 Inches

g. Surface seal (0 to 2.0)  2.0 ft.
Material  Concrete

h. Backfill  N.A. ft.
Material  N.A.

i. Seal (2.0 to 27.0)  25.0 ft.
Material  Bentonite

j. Gravel pack  13.0 ft.
Gravel pack interval from 27.0 to 40.0 ft.
Material  10-20 Gradation Sand

k. Bottom seal/fill (40.0 to 49.5)  9.5 ft.
Material  Bentonite

l. Casing stickup  2.5 ft.
m. Protective casing diameter  6.5 in.

Prepared by: Craig Fanshier
# LOG OF EXPLORATORY BORING

**PROJECT NAME:** Additional Hydrogeologic Investigation  
**LOCATION:** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY:** Geo-Tech Explorations, Inc.  
**DRILL METHOD:** Hollow Stem Auger  
**LOGGED BY:** Craig D. Fanshier  
**BORING NO.:** MW-9A  
**PAGE:** 1 OF 2  
**GROUND ELEV.:** 125.80'  
**TOTAL DEPTH:** 24.50'  
**DATE COMPLETED:** 10/21/93

<table>
<thead>
<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETROMETER (Tone/SCF)</th>
<th>PENETRATION (Blows/Feet)</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>LITHOLOGIC COLUMN</th>
<th>WELL DETAILS</th>
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</table>

- **0 to 24.5 feet:** SILTY CLAY (CL), dark brown (7.5 YR 3/2), with approximately 20 percent gray mottling (0 to 13.0 feet); medium to high plasticity fines; stiff to very stiff, damp.
  - Note: soil is generally tight 0 to 24.0 feet.
  - @ 0 to 8.0 feet: some small macro pores, 2 to 5 per square inch.
  - @ 3.0 to 9.0 feet: rust red mottling (approximately 40 percent).
  - @ 3.0 to 16.0 feet: mostly high plasticity fines.
  - @ 5.0 to 24.0 feet: several larger diameter (1/8 to 1/2-inch) macro pores.
  - @ 7.5 feet: moist.

- **@ 13.0 feet:** color change to very dark gray (5Y 3/1) with approximately 20 percent reddish brown mottling.

- **@ 16.0 feet:** soil ped surfaces have glazed, smooth, glistening surfaces; wet.

**REMARKS**

Drilled with 8-inch O.D. (4.25-inch I.D.) Hollow Stem Auger. Samples continuously collected with 5-foot long, 3-inch I.D. split barrel and 1.5-foot long, 3-inch O.D. split spoon fitted with rings. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.
**LOG OF EXPLORATORY BORING**

**PROJECT NAME**  
Additional Hydrogeologic Investigation

**LOCATION**  
Riverbend Landfill; McMinnville, Oregon

**DRILLED BY**  
Geo-Tech Explorations, Inc.

**DRILL METHOD**  
Hollow Stem Auger

**LOGGED BY**  
Craig D. Fanshier

**BORING NO.**  
MW-9A

**PAGE**  
2 OF 2

**GROUND ELEV.**  
125.80'

**TOTAL DEPTH**  
24.50'

**DATE COMPLETED**  
10/21/93

<table>
<thead>
<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETRATION (Tons/SF)</th>
<th>PENETRATION (Bows/Ft)</th>
<th>GROUND WATER LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
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<th>LITHOLOGIC DESCRIPTION</th>
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<td>0 to 24.5 feet: SILTY CLAY (CL), continued.</td>
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**BORING TERMINATED AT 24.5 FEET.**

**REMARKS**

Drilled with 8-inch O.D. (4.25-inch I.D.) Hollow Stem Auger. Samples continuously collected with 5-foot long, 3-inch I.D. split barrel and 1.5-foot long, 3-inch O.D. split spoon fitted with rings. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.

0258-001.2B.RIVER.152/4:4.03/24/84_NWM-REM
EMCON NORTHWEST

WELL DETAILS

CLIENT Riverbend Landfill Company, Inc.
PROJECT NUMBER 0259-001.28
PROJECT NAME Additional Hydrogeologic Inv.
LOCATION McMinnville, Oregon
WELL PERMIT NO. 59128
BORING / WELL NO. MW-9A
TOP OF CASING ELEV. 128.42
GROUND SURFACE ELEV. 125.8
DATUM Feet-Mean Sea Level
INSTALLATION DATE 10/21/93

EXPLORATORY BORING

a. Total depth 24.5 ft.
b. Diameter 8 in.
Drilling method Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length (42.6 to 24.6) 27.2 ft.
   Material Schedule 40 PVC
d. Diameter 2 in.
e. Depth to top perforations 14.3 ft.
f. Perforated length 9.5 ft.
   Perforated interval from 14.3 to 23.8 ft.
   Perforation type Machine Slotted
   Perforation size 0.010 Inches
g. Surface seal (0 to 2.0) 2.0 ft.
   Material Concrete
h. Backfill N.A. ft.
   Material N.A.
i. Seal (2.0 to 11.0) 9.0 ft.
   Material Bentonite
j. Gravel pack 13.5 ft.
   Gravel pack interval from 11.0 to 24.5 ft.
   Material 10-20 Gradation Sand
k. Bottom seal/fill N.A. ft.
   Material N.A.
l. Casing stickup 2.6 ft.
m. Protective casing diameter 6.5 in.

Prepared by: Craig Fanshier
# LOG OF EXPLORATORY BORING

## Project Information
- **Project Name:** Riverbend Landfill
- **Location:** McMinnville, Oregon
- **Drilled by:** Geo-Tech Exploration
- **Drill Method:** Hollow Stem Auger w/Split Spoon (SPT)
- **Logged by:** Craig D. Fanshier
- **Boring No.:** MW-9B(R)
- **Page:** 1 of 2
- **Ground Elevation:** 124.80'
- **Total Depth:** 36.50'
- **Date Completed:** 08/24/94

## Lithologic Description

- **0 to 20.5 feet:** SILTY CLAY (CL), dark brown (7.5YR 3/2); approximately 5 percent small (1 mm diameter) reddish brown mottling; medium plasticity fines; soft; damp.

- **@ 8.5 feet:** color changes to dark greenish gray (5GY 4/1), with 20 percent reddish brown mottling; stiff.

- **@ 13.5 feet:** color is all dark greenish gray (5GY 4/1).

- **@ 18.5 feet:** color changes to dark greenish gray (5G 4/1), blocky soil peds.

## Remarks
- Drilled with 10-inch O.D. (6.5-inch I.D.) hollow stem auger. Samples collected with either a 1.5-inch or 3-inch I.D. by 1.5-foot-long split spoon. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information presented in well details. See explanation for definition of symbols. MW-9B(R) was installed approximately 50 feet east of MW-9B, which was decommissioned.

---

**EMCON Northwest, Inc.**

0258-001.46.RIVLF.LS9/ex:7:05/19/94_RIVLF
# LOG OF EXPLORATORY BORING

**PROJECT NAME**: Riverbend Landfill  
**LOCATION**: McMinnville, Oregon  
**DRILLED BY**: Geo-Tech Exploration  
**DRILL METHOD**: Hollow Stem Auger w/Split Spoon (SPT)  
**LOGGED BY**: Craig D. Fanshier  
**BORING NO.**: MW-9B(R)  
**PAGE**: 2 OF 2  
**GROUND ELEV.**: 124.80'  
**TOTAL DEPTH**: 36.50'  
**DATE COMPLETED**: 08/24/94

<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
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<th>BLOW COUNTS (IN COMP)</th>
<th>GROUND WATER LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
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<td>S-9</td>
<td>27-50/6&quot;</td>
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</table>

0 to 20.5 feet: **SILTY CLAY (CL)**, continued.

20.5 to 28.0 feet: **CLAYEY SILT (ML)**, dark greenish gray (5GY 4/1); low to medium plasticity fines; 5 percent brown wood fragments (1 mm to 5 mm); soft; wet.

@ 25.0 to 28.5 feet: smooth drilling.

@ 27.5 to 28.5 feet: transitional contact between clayey silt (ML) and silty sand (SM).

28.0 to 33.5 feet: **SILTY SAND (SM)**, dark greenish gray (5GY 4/1); 40 percent non to low plasticity fines; 60 percent fine sand, angular; loose; wet.

@ 30.0 to 33.5 feet: no gravelly drilling (drills smooth).

@ 33.3 feet: 0.2-inch of **SILTY SAND**.

33.5 to 34.6 feet: **CLAYEY GRAVEL (GC)**, dark greenish gray (5GY 4/1); 30 to 40 percent low plasticity silt, 60 to 70 percent fine to coarse gravel, dense; wet.

@ 33.8 feet: 0.3-foot-thick silty clay (CL) layer, dark brown, several 1/2-inch gravels; moist.

34.6 to 36.5 feet: **SILTSTONE (SS)**, brown.

Drilling terminated at 36.5 feet below ground surface.

**REMARKS**

Drilled with 16-inch O.D. (6.5-inch I.D.) hollow stem auger. Samples collected with either a 1.5-inch or 3-inch I.D. by 1.5-foot-long split spoon. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information presented in well details. See explanation for definition of symbols. MW-9B(R) was installed approximated 50 feet east of MW-9B, which was decommissioned.

EMCON Northwest, Inc.
EXPLORATORY BORING
a. Total depth 36.5 ft.
b. Diameter 10 in.
Drilling method Hollow Stem Auger

WELL CONSTRUCTION
c. Total casing length (+2.2 to 34.2) 36.4 ft.
   Material Schedule 40 PVC
d. Diameter 2 in.
e. Depth to top perforations 28.2 ft.
f. Perforated length 4.5 ft.
   Perforated interval from 28.2 to 32.7 ft.
   Perforation type Machine Slotted
   Perforation size 0.010 Inches
g. Surface seal (0 to 2.0) 2.0 ft.
   Material Concrete
h. Backfill N.A. ft.
   Material N.A.
i. Seal (2.0 to 26.0) 24.0 ft.
   Material Bentonite
j. Gravel pack 7.4 ft.
   Gravel pack interval from 26.0 to 33.4 ft.
   Material 10-20 Gradation Sand
k. Bottom seal/fill (33.4 to 36.5) 3.1 ft.
   Material Bentonite
l. Casing stickup 2.2 ft.
m. Protective casing diameter 6.5 in.
   Centralizers at 16 and 32 feet bgs.

Note: MW-9B was decommissioned and MW-9B (R) was installed approximately 50 feet to the east.
**LOG OF EXPLORATORY BORING**

**PROJECT NAME**  Additional Hydrogeologic Investigation  
**LOCATION**  Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY**  Geo-Tech Explorations, Inc.  
**DRILL METHOD**  Hollow Stem Auger  
**LOGGED BY**  Craig D. Fanshier  
**BORING NO.**  MW-10A  
**PAGE**  1 OF 2  
**GROUND ELEV.**  150.80'  
**TOTAL DEPTH**  28.30'  
**DATE COMPLETED**  10/27/93

<table>
<thead>
<tr>
<th>RECOVERY</th>
<th>POCKET PENETRATION</th>
<th>PENETRATION (Blows/ft)</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>LITHOLOGIC COLUMN</th>
<th>WELL DETAILS</th>
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</table>
| @ 7.5 feet: 3-inch-thick SILTY SAND (SM) lense, 10 percent low plasticity fines; 90 percent fine sand, rounded to subrounded, well sorted; appears loose; moist.  
@ 8.0 feet: brown (10YR-4/3); moist.  
@ 10.5 feet: 3-inch-thick SILTY SAND (SM) lense, similar to the one at 7.5 feet.  
@ 14.5 feet: wet.  
@ 16.0 feet: 0.4-foot-thick SILTY CLAY (CL) lense. Paleo-soil horizon with black (carbon) root traces.  
@ 16.4 to 19.0 feet: minor amounts of almost indistinct SILTY SAND lenses, approximately 1- to 3-inch-thick, abundant platy varves, gradational between silt and sand. Note: core is very wet.  
0 to 25.5 feet: CLAYEY SILT (ML), dark grayish (10YR 4/2); 95 percent low plasticity fines; 5 percent sand, micaceous; abundant small macro pores, 1/32 to 1/15 inch in diameter, minor amount of slightly larger ones approximately 3/32 inch in diameter; minor amounts of 1/4 to 3/8 inch horizontal soil partings; stiff to very stiff; damp.  

**REMARKS**
Drilled with 8-inch O.D. (4.25-inch I.D.) Hollow Stem Auger. Samples continuously collected with 5-foot long, 3-inch I.D. split barrel and 1.5-foot long, 3-inch O.D. split spoon fitted with rings. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.
### LOG OF EXPLORATORY BORING

**PROJECT NAME** Additional Hydrogeologic Investigation  
**LOCATION** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY** Geo-Tech Explorations, Inc.  
**DRILL METHOD** Hollow Stem Auger  
**LOGGED BY** Craig D. Fanshier  
**BORING NO.** MW-10A  
**PAGE** 2 OF 2  
**GROUND ELEV.** 150.80'  
**TOTAL DEPTH** 28.30'  
**DATE COMPLETED** 10/27/93

<table>
<thead>
<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETRATION (Tone/5F)</th>
<th>PENETRATION (Blows/Ft)</th>
<th>GROUND WATER LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>LITHOLOGIC COLUMN</th>
<th>WELL DETAILS</th>
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0 to 25.5 feet: CLAYEY Silt (ML), continued.  

@ 21.0 feet: color changes to dark grayish gray (5G 4/1); 2-inch sand lens above color change.  
@ 22.0 to 23.5 feet: platy varves, sandy surface to each varve (fine sand).

25.5 to 27.0 feet: SILTY SAND (SM), dark greenish gray (5G 4/1); 10 percent low plasticity fines; 90 percent fine sand; appears loose, wet.

27.0 to 28.3 feet: SILTY CLAY (CL), dark greenish gray (5G 4/1); medium plasticity fines; very stiff; wet.

BORING TERMINATED AT 28.3 FEET.

### REMARKS

Drilled with 8-inch O.D. (4.25-inch I.D.) Hollow Stem Auger. Samples continuously collected with 5-foot long, 3-inch I.D. split barrel and 1.5-foot long, 3-inch O.D. split spoon fitted with rings. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.

0258-001 28 RIVER.LS54:3:03/24/94, NW-REM
WELL DETAILS

CLIENT  Riverbend Landfill Company, Inc.

PROJECT NUMBER  0259-001.28

PROJECT NAME  Additional Hydrogeologic Inv.

LOCATION  McMinnville, Oregon

WELL PERMIT NO.  59129

BORING / WELL NO.  MW-10A

TOP OF CASING ELEV.  153.21

GROUND SURFACE ELEV.  150.8

DATUM  Feet-Mean Sea Level

INSTALLATION DATE  10/28/93

EXPLORATORY BORING

a. Total depth  28.3 ft.
b. Diameter  8 in.

Drilling method  Hollow Stem Auger

WELL CONSTRUCTION

c. Total casing length (+2.4 to 27.6)  30.0 ft.
   Material  Schedule 40 PVC

d. Diameter  2 in.
e. Depth to top perforations  17.3 ft.
f. Perforated length  9.5 ft.
   Perforated interval from 17.3 to 26.8 ft.
   Perforation type  Machine Slotted
   Perforation size  0.010 Inches

h. Surface seal  (0 to 2.5)  2.5 ft.
   Material  Concrete

i. Seal  (2.2 to 14.0)  11.8 ft.
   Material  Bentonite

j. Gravel pack  14.3 ft.
   Gravel pack interval from 14.0 to 28.3 ft.
   Material  10-20 Gradation Sand

k. Bottom seal/fill  N.A. ft.
   Material  N.A.

l. Casing stickup  2.4 ft.
m. Protective casing diameter  6.5 in.

Prepared by  Craig Fanshier
### LOG OF EXPLORATORY BORING

**PROJECT NAME**: Additional Hydrogeologic Investigation  
**LOCATION**: Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY**: Geo-Tech Explorations, Inc.  
**DRILL METHOD**: Hollow Stem Auger  
**LOGGED BY**: Craig D. Fanshier  
**BORING NO.**: MW-10B  
**PAGE**: 1 OF 4  
**GROUND ELEV.**: 150.80'  
**TOTAL DEPTH**: 69.00'  
**DATE COMPLETED**: 10/25/93

<table>
<thead>
<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETRATION (Percent)</th>
<th>PENETRATION (Bows/Ft)</th>
<th>GROUND WATER LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>LITHOLOGIC COLUMN</th>
<th>VEIN DETAILS</th>
<th>LITHOLOGIC DESCRIPTION</th>
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<td>0 to 4.0 feet: CLAYEY SILT (ML), brown (10YR 5/3), mostly evenly colored, trace lightly reddish brown motting; low plasticity fines; trace fine sand, micaceous; some small macro pores (approximately 1/16-inch-diameter); very stiff; damp. Approximately 3/8-inch-thick poorly developed horizontal partings.</td>
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<td>4.0 to 28.0 feet: SANDY SILT (SM), brown (10YR 4/3), approximately 5 percent small, light reddish brown motting; 50 to 80 percent low plasticity fines; 20 to 50 percent fine sand, moderately sorted, subangular to subrounded, micaceous; abundant small (at 4.0 to 24.0 feet) macro pores (approximately 1/32- to 1/16-inch-diameter), approximately (5 to 10 per square inch) some larger vertically oriented macro pores (1/4-inch-diameter) approximately 1 to 2 per foot of core, open with no moisture, horizontal partings, are absent or very poorly developed; very stiff; damp to moist, moist at 8.0 feet, minor 2- to 3-inch-thick SILTY SAND lenses from 4.0 to 19.0 feet interbedded with gradational contact.</td>
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<td>© 9.0 feet: changes to medium stiff to stiff.</td>
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<td>© 11.0 feet: wet.</td>
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<td>© 14.0 to 14.5 feet: SILTY SAND (SM) lens.</td>
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<td>© 17.5 to 17.9 feet: CLAYEY SILT (ML), very stiff.</td>
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<td>© 18.4 to 18.9 feet: SILTY SAND (SM) lens.</td>
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<td>© 19.5 feet: very sharp change in color to dark greenish gray (5G 4/1); strongly developed 1/4 to 3/8 inch varves (soil partings).</td>
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**REMARKS**

Drilled with 10-inch O.D. (6.5-inch I.D.) Hollow Stem Auger. Samples continuously collected with 5-foot long, 3-inch I.D. split barrel and 1.5-foot long, 3-inch O.D. split spoon fitted with rings. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.
LOG OF EXPLORATORY BORING

PROJECT NAME: Additional Hydrogeologic Investigation
LOCATION: Riverbend Landfill; McMinnville, Oregon
DRILLED BY: Geo-Tech Explorations, Inc.
DRILL METHOD: Hollow Stem Auger
LOGGED BY: Craig D. Fanshier

<table>
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<th>RECOVERY PERCENT</th>
<th>POCKET PENETRATION (Tons/SP)</th>
<th>PENETRATION (Blows/ft)</th>
<th>GROUND WATER LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>LITHOLOGIC COLUMN</th>
<th>WELL DETAILS</th>
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LITHOLOGIC DESCRIPTION

- 4.0 to 28.0 ft: SANDY SILT (SM), continued.
  - @ 20.0 ft: interbedded small (0.2- to 0.6-foot-thick) CLAYEY SILT (ML) and SILTY SAND (SM) lenses.
  - @ 20.0 to 23.0 ft: slight purplish tint.

- @ 26.0 feet: SANDY SILT (ML) lenses.

- @ 28.0 feet: soil is crumbly; wet.

- 28.0 to 38.0 feet: SILTY CLAY (CL), dark greenish gray (5G 4/1), evenly colored; 95 percent low to medium plasticity fines; 0 to 5 percent fine sand; abundant very small 1/32 inch macro pores; some minor lenses of varves (1/4-inch-thick partings); soft to medium stiff; wet.

- @ 35.0 to 39.0 feet: drilling gets harder (hard layers with several small gravels); very stiff.

- @ 37.0 to 38.0 feet: 20 percent fine gravels; grayish green (5G 4/2).

- @ 38.0 feet: rocky drilling noise.

- 38.0 to 39.0 feet: SANDY GRAVEL (GP), grayish green (5G 4/2); 10 to 15 percent low to medium plasticity fines; continues.

REMARKS

Drilled with 10-inch O.D. (6.5-inch I.D.) Hollow Stem Auger. Samples continuously collected with 5-foot long, 3-inch I.D. split barrel and 1.5-foot long, 3-inch O.D. split spoon fitted with rings. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.
**LOG OF EXPLORATORY BORING**

**PROJECT NAME:** Additional Hydrogeologic Investigation  
**LOCATION:** Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY:** Geo-Tech Explorations, Inc.  
**LOGGED BY:** Craig D. Fanshier  
**BORING NO.:** MW-10B  
**PAGE:** 3 OF 4  
**GROUND ELEV.:** 150.80'  
**TOTAL DEPTH:** 69.00'  
**DATE COMPLETED:** 10/25/93

<table>
<thead>
<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETRATION METER (Tons/ft)</th>
<th>PENETRATION (Inches/Ft)</th>
<th>GROUND WASTE LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
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<th>WELL DETAILS</th>
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<td>38.0 to 39.0 feet: SANDY GRAVEL (GP), continued: 30 to 40 percent fine to coarse sands; 50 to 60 percent fine to coarse gravel; appears medium dense; wet.</td>
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<td>39.0 to 44.5 feet: CLAYEY GRAVEL (GC), dark yellowish brown (10YR 3/4), shade varies, some moderate iron oxide staining; 10 to 30 percent medium plasticity fines; 10 to 20 percent fine to coarse sand; 50 to 60 percent fine gravel, matrix supported, mostly rounded; appears medium dense; wet. Note: the clayey matrix is sticky. Minor 2 to 6 inch lens with approximately 5 percent fines; loose.</td>
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<td>@ 41.0 feet: core barrel recovery blocked by 3 inch rock wedged into the core barrel.</td>
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<td>44.0</td>
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<td>@ 44.0 feet: split spoon in CLAYEY GRAVEL (GC), penetration blocked by gravel; dense.</td>
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<td>44.5 to 60.0 feet: SANDY GRAVEL (GP), dark yellowish brown (10YR 3/6); 10 to 15 percent low plasticity fines; 30 percent fine to coarse sand (F:C = 1:1); 55 to 60 percent fine to coarse gravel (F:C = 2:1), gravel subangular, matrix supported; dense to very dense; wet.</td>
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<td>@ 49.0 to 54.0 feet: mostly fine gravel in a dense silty sand with trace clay matrix; very hard drilling, engine is lugging.</td>
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<td>@ 53.5 to 53.8 feet: 2-inch-thick SILTY CLAY (CL) lens in the core barrel shoe.</td>
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<td>@ 54.0 feet: color changes to dark greenish gray (5GY 4/1).</td>
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<td>@ 54.0 to 54.3 feet: CLAYEY GRAVEL (GC).</td>
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<td>@ 57.5 to 58.2 feet: lenses of SILTY CLAY (CL) with 5 percent medium sand (possibly altered volcanic ash).</td>
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<td>@ 59.0 feet: thin clay lense.</td>
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</table>

**REMARKS**

Drilled with 10-inch O.D. (6.5-inch I.D.) Hollow Stem Auger. Samples continuously collected with 5-foot long, 3-inch I.D. split barrel and 1.5-foot long, 3-inch O.D. split spoon fitted with rings. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.
**LOG OF EXPLORATORY BORING**

**PROJECT NAME**: Additional Hydrogeologic Investigation  
**LOCATION**: Riverbend Landfill; McMinnville, Oregon  
**DRILLED BY**: Geo-Tech Explorations, Inc.  
**DRILL METHOD**: Hollow Stem Auger  
**LOGGED BY**: Craig D. Fanshier  
**BORING NO.**: MW-10B  
**PAGE**: 4 OF 4  
**GROUND ELEV.**: 150.80'  
**TOTAL DEPTH**: 69.00'  
**DATE COMPLETED**: 10/25/93

<table>
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<tr>
<th>RECOVERY PERCENT</th>
<th>POCKET PENETROMETER (Tonnes/SP)</th>
<th>PENETRATION (Blows/Feet)</th>
<th>GROUND WATER LEVELS</th>
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<th>SAMPLES</th>
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<td>60.0 to 61.0 feet: CLAYEY SAND (SC), dark greenish gray; 40 percent medium plasticity fines; 60 percent fine to medium sand; hard; wet.</td>
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<td>61.0 to 61.5 feet: SILTY SAND (SM)</td>
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<td>61.5 to 62.5 feet: SAND (SP)</td>
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<td>62.5 to 69.0 feet: SANDY GRAVEL (GP), dark greenish gray; 40 percent medium to coarse sand (M:C = 1:1), angular to subrounded; 60 percent gravels (F:C = 2:1), larger gravels are smooth (water worked); minor amounts of brown wood fragments at 62.0 to 64.0 feet; appears dense; wet.</td>
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<td>◎ 67.0 feet: several 1-inch by 1/16-inch gravels (flat), many gravels rounded.</td>
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<td>◎ 68.0 to 69.0 feet: appears looser.</td>
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<td>◎ 69.0 feet: 1-foot of sand heave in auger.</td>
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<td></td>
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<td>BORING TERMINATED AT 69.0 FEET.</td>
</tr>
</tbody>
</table>

**REMARKS**
Drilled with 10-inch O.D. (6.5-inch I.D.) Hollow Stem Auger. Samples continuously collected with 5-foot long, 3-inch I.D. split barrel and 1.5-foot long, 3-inch O.D. split spoon fitted with rings. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.

EMCON Northwest, Inc.
**WELL DETAILS**

**CLIENT** Riverbend Landfill Company, Inc.

**PROJECT NUMBER** 0258-001.28

**PROJECT NAME** Additional Hydrogeologic Inv.

**LOCATION** McMinnville, Oregon

**WELL PERMIT NO.** 59133

**BORING / WELL NO.** MW-10B

**TOP OF CASING ELEV.** 152.87

**GROUND SURFACE ELEV.** 150.8

**DATUM** Feet-Mean Sea Level

**INSTALLATION DATE** 10/27/93

---

**EXPLORATORY BORING**

a. Total depth 69.0 ft.

b. Diameter 10 in.

Drilling method Hollow Stem Auger

---

**WELL CONSTRUCTION**

c. Total casing length (+2.1 to 54.6) 56.7 ft.

Material Schedule 40 PVC

d. Diameter 2 in.

e. Depth to top perforations 44.3 ft.

f. Perforated length 9.5 ft.

Perforated interval from 44.3 to 53.8 ft.

Perforation type Machine Slotted

Perforation size 0.010 Inches

g. Surface seal (0 to 2.0) 2.0 ft.

Material Concrete

h. Backfill N.A. ft.

Material N.A.

i. Seal (2.0 to 40.9) 38.9 ft.

Material Bentonite

j. Gravel pack 14.4 ft.

Gravel pack interval from 40.9 to 55.3 ft.

Material 10-20 Gradation Sand

k. Bottom seal/fill (55.3 to 69.0) 13.7 ft.

Material Bentonite

l. Casing stickup 2.1 ft.

m. Protective casing diameter 6.5 in.

Centralizers at 20.0 and 43.0 feet bgs.
WELL DETAILS

CLIENT
Riverbend Landfill Company, Inc

BORING / WELL NO.
MW-12A

PROJECT NUMBER
0258-001.50

PROJECT NAME
Additional Hydrogeologic Investigation

TOP OF CASING ELEV.
126.0

LOCATION
McMinnville, Oregon

GROUND SURFACE ELEV.
123.8

DATUM
FT - MSL

WELL PERMIT NO.
80945

INSTALLATION DATE
7/19/95

EXPLORATORY BORING

a. Total depth
25.5 ft.

b. Diameter
10.5 in.

Drilling method
Hollow-Stem Auger

WELL CONSTRUCTION

c. Total casing length
28.1 ft.

Material
Schedule 40 PVC

d. Diameter
2.0 in.

e. Depth to top perforations
15.3 ft.

f. Perforated length
9.5 ft.

Perforated interval from
15.3 to
24.8 ft.

Perforation type
Machine-Slotted

Perforation size
0.010 in.

g. Surface seal
(0.0 to 0.5)
0.5 ft.

Material
Concrete

h. Backfill
NA ft.

Material
NA

i. Seal
(0.5 to 12.0)
11.5 ft.

Material
Bentonite

j. Gravel pack
13.5 ft.

Gravel pack interval from
12.0 to
25.5 ft.

Material
10-20 Gradation Sand

k. Bottom seal/fill
None
0 ft.

Material
NA

l. Casing stickup
2.75 ft.

m. Protective casing diameter
6.5 in.
**LOG OF EXPLORATORY BORING**

**PROJECT NAME**  Riverbend, Monitoring Well Installation  
**LOCATION**  McMinnville, Oregon  
**DRILLED BY**  Geo-Tech Explorations, Inc.  
**DRILL METHOD**  Hollow Stem Auger  
**LOGGED BY**  Craig D. Fanshier  
**BORING NO.**  MW-12A  
**PAGE**  1 OF 2  
**GROUND ELEV.**  123.80'  
**TOTALDEPTH**  25.50'  
**DATE COMPLETED**  07/19/95

<table>
<thead>
<tr>
<th>SAMPLE METHOD AND NUMBER</th>
<th>RECOVERY (PERCENT)</th>
<th>BLOW COUNTS (IN COMP)</th>
<th>GROUND WATER LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS S-1</td>
<td>60</td>
<td>6-7-9 (16)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0 to 23.0 feet: Silty Clay (CL); dark brown (10YR 3/3), with 20 percent reddish brown mottling; medium plasticity fines; very stiff; damp.</td>
</tr>
<tr>
<td>SS S-2</td>
<td>80</td>
<td>6-8-8 (16)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 9.0 feet: approximately 20 to 30 percent gray mottling.</td>
</tr>
<tr>
<td>SS S-3*</td>
<td>100</td>
<td>2-2-3 (5)</td>
<td>7/24/95</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td>@ 14.0 feet: 5 percent fine sand; firm; moist, visible moisture on mottled soil.</td>
</tr>
<tr>
<td>SS S-4*</td>
<td>100</td>
<td>1-1-2 (3)</td>
<td>7/19/95</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td>@ 19.0 feet: wet.</td>
</tr>
</tbody>
</table>

**REMARKS**
Borehole drilled with 10.6-inch O.D. (6.25-inch I.D.) hollow stem augers. Soil samples collected with 2.0-inch O.D. (1.4-inch I.D.) split spoons (SS). Blow counts are for 6-inch intervals. A 2-inch-diameter Schedule 40 PVC monitoring well was constructed in the borehole. Well construction information is presented in well details diagram (attached). See explanation for definition of symbols. * = intervals where split spoons were inadvertently overdriven.
**LOG OF EXPLORATORY BORING**

**PROJECT NAME**  Riverbend, Monitoring Well Installation  
**LOCATION**  McMinnville, Oregon  
**DRILLED BY**  Geo-Tech Explorations, Inc.  
**DRILL METHOD**  Hollow Stem Auger  
**LOGGED BY**  Craig D. Fanshier  

**BORING NO.**  MW-12A  
**PAGE**  2 OF 2  
**GROUND ELEV.**  123.80'  
**TOTAL DEPTH**  25.50'  
**DATE COMPLETED**  07/19/95

---

**SAMPLE METHOD AND NUMBER**

<table>
<thead>
<tr>
<th>METHOD</th>
<th>PERCENT RECOVERY</th>
<th>BLOW COUNTS (N COMP)</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS S-5*</td>
<td>100</td>
<td>1-2-2 (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0 to 23.0 feet: SILTY CLAY (CL); continued.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 20.0 feet: dark greenish gray (5G 4/1), with 10 to 20 percent reddish brown mottling; trace fine sand.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>23.0 to 25.5 feet: CLAYEY SILT (ML); dark greenish gray (5G 4/1); 95 percent low to medium plasticity fines; 5 percent fine sand; soft; wet. 0.5-inch-thick layers of silty sands (50 percent fine sand and 50 percent low plasticity fines) at 23.5, 24.2, and 25.0 feet. 0.5-inch irregularly shaped areas of reddish brown iron oxide(?) staining.</td>
</tr>
</tbody>
</table>

**REMARKS**

Borehole drilled with 10.5-inch O.D. (6.25-inch I.D.) hollow stem augers. Soil samples collected with 2.0-inch O.D. (1.4-inch I.D.) split spoons (SS). Blow counts are for 6-inch intervals. A 2-inch-diameter Schedule 40 PVC monitoring well was constructed in the borehole. Well construction information is presented in well details diagram (attached). See explanation for definition of symbols. * = Intervals where split spoons were inadvertently overdriven.
EXPLORATORY BORING

a. Total depth 49.9 ft
b. Diameter 10.5 in.
Drilling method Hollow-Stem Auger

WELL CONSTRUCTION

c. Total casing length 46.8 ft
Material Schedule 40 PVC

d. Diameter 2.0 in.

e. Depth to top perforations 34.3 ft
f. Perforated length 9.5 ft
Perforated interval from 34.3 to 43.8 ft
Perforation type Machine-Slotted
Perforation size 0.010 in.

g. Surface seal (0.0 to 1.9) 1.9 ft
Material Concrete

h. Backfill NA ft
Material NA

i. Seal (1.9 to 31.0) 29.1 ft
Material Bentonite

j. Gravel pack 14.0 ft
Gravel pack interval from 31.0 to 45.0 ft
Material 10-20 Gradation Sand

k. Bottom seal/fill (45.0 to 49.9) 4.9 ft
Material Bentonite

l. Casing stickup 2.54 ft

m. Protective casing diameter 6.5 in.
Centralized at 18 to 32 feet bgs

Well Constructed by CDF
### LOG OF EXPLORATORY BORING

**PROJECT NAME**: Riverbend, Monitoring Well Installation  
**LOCATION**: McMinnville, Oregon  
**DRILLED BY**: Geo-Tech Explorations, Inc.  
**DRILL METHOD**: Hollow Stem Auger  
**LOGGED BY**: Craig D. Fanshier  
**BORING NO.**: MW-12B  
**PAGE**: 1 OF 3  
**GROUND ELEV.**: 124.00'  
**TOTAL DEPTH**: 49.90'  
**DATE COMPLETED**: 07/19/95

<table>
<thead>
<tr>
<th>POCKET PENETROMETER (Tons/Sf)</th>
<th>SAMPLE TYPE</th>
<th>BLOW COUNTS (RECOVERY PERCENT)</th>
<th>GROUND WATER LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CS</td>
<td>93</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0 to 6.0 feet: Silty Clay (CL); brown (10YR 4/3); medium plasticity fines, trace micaceous; mineralogy stiff; damp.</td>
</tr>
<tr>
<td>3.35</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 1.0 to 3.5 feet: 5 percent, 1/4- to 1/2-inch pieces of charcoal.</td>
</tr>
<tr>
<td></td>
<td>CS</td>
<td>98</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 4.0 feet: 5 percent gray motting.</td>
</tr>
<tr>
<td>3.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.0 to 12.5 feet: Clay (CL); brown (10YR 4/3), with 5 to 10 percent reddish brown and 5 percent gray indistinct motting; medium plasticity fines; very stiff; damp.</td>
</tr>
<tr>
<td>2.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 12.5 feet: moist.</td>
</tr>
<tr>
<td>2.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12.5 to 22.0 feet: Silty Clay (ML) With Sand; brown (10YR 4/3), 5 percent reddish brown indistinct motting; 80 to 95 percent medium plasticity fines; 5 to 20 percent fine sand; stiff; moist.</td>
</tr>
</tbody>
</table>

**REMARKS**

Borehole drilled with 10.5-inch O.D. (6.25-inch I.D.) hollow stem augers. Soil samples collected with 5.5-inch I.D. continuous sampler (CS). A 2-inch-diameter Schedule 40 PVC monitoring well was constructed in the borehole. Well construction information is presented in well details diagram (attached). See explanation for definition of symbols.
**LOG OF EXPLORATORY BORING**

**PROJECT NAME**  Riverbend, Monitoring Well Installation  
**LOCATION**  McMinnville, Oregon  
**DRILLED BY**  Geo-Tech Explorations, Inc.  
**DRILL METHOD**  Hollow Stem Auger  
**LOGGED BY**  Craig D. Fanshier  
**BORING NO.**  MW-12B  
**PAGE**  2 OF 3  
**GROUND ELEV.**  124.00'  
**TOTAL DEPTH**  49.90'  
**DATE COMPLETED**  07/19/95

<table>
<thead>
<tr>
<th>POCKET PENETROMETER (Tonm/Sp)</th>
<th>SAMPLE TYPE</th>
<th>BLOW COUNTS (RECOVERY PERCENT)</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH IN FEET</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.8</td>
<td>CS</td>
<td>96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12.5 to 22.0 feet: SILTY CLAY (ML) WITH SAND; continued.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 20.0 to 21.7 feet: 50 percent dark reddish brown and 50 percent gray mottling.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 22.0 feet: wet.</td>
</tr>
<tr>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>22.0 to 25.5 feet: SILT WITH SAND (ML); dark greenish gray (5GY 4/1) with 10 percent reddish brown mottling; 75 to 80 percent low to medium plasticity fines; 20 to 25 percent fine sand; soft; wet.</td>
</tr>
<tr>
<td>&lt;0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 22.5 feet: a single 3-inch by 1/2-inch basalt gravel found within the silt matrix.</td>
</tr>
<tr>
<td></td>
<td>CS</td>
<td>100</td>
<td></td>
<td>25</td>
<td></td>
<td></td>
<td>25.5 to 29.0 feet: CLAYEY SILT (ML); dark greenish gray (5GY 4/1); 95 percent low to medium plasticity fines; 5 percent fine sand; firm to stiff; moist to wet. Several small (0.5-mm-diameter) macropores.</td>
</tr>
<tr>
<td></td>
<td>CS</td>
<td>76</td>
<td></td>
<td>30</td>
<td></td>
<td></td>
<td>29.0 to 37.2 feet: SANDY GRAVEL (GP); very dark grayish green (2.5Y 3/2); 5 percent nonplastic fines (several 0.5-inch-thick layers contain 15 to 25 percent fines); 30 to 40 percent fine to medium angular sand; 55 to 65 percent fine subrounded gravels; wet.</td>
</tr>
<tr>
<td></td>
<td>CS</td>
<td>100</td>
<td></td>
<td>35</td>
<td></td>
<td></td>
<td>37.2 to 40.0 feet: SILTY GRAVEL (GM); very dark greenish grayish green (2.5Y 3/2); 30 percent low plasticity fines; 15 to 20 percent fine sand; 50 to 55 percent fine gravels, gravels in point contact, description continued on next page.</td>
</tr>
</tbody>
</table>

**REMARKS**
Borehole drilled with 10.5-inch O.D. (6.25-inch I.D.) hollow stem augers. Soil samples collected with 5.5-inch I.D. continuous sampler (CS). A 2-inch-diameter Schedule 40 PVC monitoring well was constructed in the borehole. Well construction information is presented in well details diagram (attached). See explanation for definition of symbols.
# LOG OF EXPLORATORY BORING

**PROJECT NAME:** Riverbend, Monitoring Well Installation  
**LOCATION:** McMinnville, Oregon  
**DRILLED BY:** Geo-Tech Explorations, Inc.  
**DRILL METHOD:** Hollow Stem Auger  
**LOGGED BY:** Craig D. Fanshier  
**BORING NO.:** MW-12B  
**PAGE:** 3 OF 3  
**GROUND ELEV.:** 124.00'  
**TOTAL DEPTH:** 49.90'  
**DATE COMPLETED:** 07/19/95

<table>
<thead>
<tr>
<th>POCKET</th>
<th>SAMPLE TYPE</th>
<th>BLOW COUNTS (RECOVERY PERCENT)</th>
<th>GROUND LEVEL</th>
<th>DEPTH FEET</th>
<th>SAMPLING DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS</td>
<td>NA</td>
<td>90</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37.2 to 40.0 feet: <strong>Silty Gravel (GM), continued:</strong> in the silty matrix; dense; driller noted very hard drilling; wet. The contact with the overlying unit is abrupt.</td>
</tr>
<tr>
<td>CS</td>
<td>NA</td>
<td>94</td>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td>40.0 to 48.0 feet: <strong>Sandy Gravel (GP); dark greenish gray (5GY 4/1), with a light olive brown layer at 42.3 to 43.0 feet; 5 percent nonplastic fines, 20 to 35 percent medium sand; 60 to 75 percent fine to coarse subrounded gravels (F:M:C = 3:1:1); appears medium to very dense; wet.</strong> @ 40.0, 43.0, 46.0 to 46.5 feet: low angle (approximately 15 degrees) 0.5-inch-thick layers containing 20 to 25 percent low plasticity fines. @ 44.8 to 48.0 feet: very hard drilling.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td>48.0 to 49.9 feet: <strong>Clayey Gravel (GG); dark greenish gray (5GY 4/1); 30 percent medium plasticity fines; 10 to 15 percent fine to medium sand; 55 to 60 percent fine to coarse subrounded gravels (F:M:C = 5:1:1); moist to wet. The gravel unit appears to be semi-consolidated and the fines in the matrix binds the gravels together.</strong> Total depth drilled = 49.9 feet. Total depth sampled = 49.9 feet.</td>
</tr>
</tbody>
</table>

**REMARKS:** Borehole drilled with 10.5-inch O.D. (6.25-inch I.D.) hollow stem augers. Soil samples collected with 5.5-inch I.D. continuous sampler (CS). A 2-inch-diameter Schedule 40 PVC monitoring well was constructed in the borehole. Well construction information is presented in well details diagram (attached). See explanation for definition of symbols.
**WELL DETAILS**

<table>
<thead>
<tr>
<th>Project Number:</th>
<th>40258-001.053</th>
<th>Boring/Well No.:</th>
<th>MW-14A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client Name:</td>
<td>Riverbend Landfill</td>
<td>Top of Casing Elev.:</td>
<td>See note</td>
</tr>
<tr>
<td>Project Name:</td>
<td>Compliance Well Installation</td>
<td>Ground Surface Elev.:</td>
<td>See note</td>
</tr>
<tr>
<td>Location:</td>
<td>McMinnville, Oregon</td>
<td>Installation Date:</td>
<td>10/16/96</td>
</tr>
<tr>
<td>Driller:</td>
<td>Geo-Tech Explorations, Inc.</td>
<td>Permit/Start Card No.:</td>
<td>93674</td>
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</tbody>
</table>

**EXPLORATORY BORING**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Elev. (ft. msl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0</td>
<td>21.0 ft.</td>
</tr>
<tr>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td></td>
</tr>
</tbody>
</table>

Drilling method:
- **21.0 ft.**
- **10.0 in.**
- **Hollow-stem auger**

**WELL CONSTRUCTION**

<table>
<thead>
<tr>
<th>C. Well casing length:</th>
<th>23.5 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well casing material:</td>
<td>Flush-threaded schedule 40 PVC</td>
</tr>
<tr>
<td>D. Well casing diameter:</td>
<td>2.0 in.</td>
</tr>
<tr>
<td>E. Well screen length:</td>
<td>9.5 ft.</td>
</tr>
<tr>
<td>Well screen type:</td>
<td>Machine-slotted schedule 40 PVC</td>
</tr>
<tr>
<td>Well screen slot size:</td>
<td>0.010 in.</td>
</tr>
<tr>
<td>F. Well sump/end cap length:</td>
<td>0.8 ft.</td>
</tr>
<tr>
<td>G. Well casing height (stickup):</td>
<td>2.5 ft.</td>
</tr>
<tr>
<td>H. Surface seal thickness:</td>
<td>2.0 ft.</td>
</tr>
<tr>
<td>I. Surface seal material:</td>
<td>Concrete</td>
</tr>
<tr>
<td>J. Annular seal thickness:</td>
<td>5.6 ft.</td>
</tr>
<tr>
<td>K. Annular seal material:</td>
<td>Bentonite chips</td>
</tr>
<tr>
<td>L. Filter pack seal thickness:</td>
<td>NA ft.</td>
</tr>
<tr>
<td>M. Filter pack seal material:</td>
<td>NA</td>
</tr>
<tr>
<td>N. Sand pack thickness:</td>
<td>13.2 ft.</td>
</tr>
<tr>
<td>O. Sand pack material:</td>
<td>10-20 graded silica sand</td>
</tr>
<tr>
<td>P. Bottom material thickness:</td>
<td>NA ft.</td>
</tr>
<tr>
<td>Q. Bottom material:</td>
<td>NA</td>
</tr>
<tr>
<td>R. Protective casing material:</td>
<td>Anodized aluminum</td>
</tr>
<tr>
<td>Well centralizer depths:</td>
<td>- ft.</td>
</tr>
<tr>
<td>S. Protective casing diameter:</td>
<td>6.0 in.</td>
</tr>
</tbody>
</table>

**NOTES:**

Well elevations were not surveyed because of restricted access due to weather conditions. Elevations will be surveyed and submitted when available.

Installed by: Craig Fanshier

Reviewed by: Louis Caruso

Date: 12/6/96
**LOG OF EXPLORATORY BORING**

**PROJECT NAME** Riverbend Landfill - Sanifill  
**LOCATION** McMinnville, Oregon  
**DRILLED BY** Geo-Tech Explorations, Inc.  
**DRILL METHOD** Hollow Stem Auger  
**LOGGED BY** Craig D. Fanshier  
**BORING NO.** MW-14A  
**PAGE** 1 OF 2  
**GROUND ELEV.**  
**TOTAL DEPTH** 42.00'  
**DATE COMPLETED** 10/15/96

<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>SAMPLE TYPE</th>
<th>BLOW COUNTS (IN COMP)</th>
<th>GROUND WATER LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
<td>Grab</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0 to 3.0 feet: <strong>SILTY CLAY (CL)</strong>; dark brown; medium plasticity fines; damp.</td>
</tr>
<tr>
<td>S-2 (100)</td>
<td>SS2</td>
<td>1-1-3 (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.0 to 16.5 feet: <strong>SANDY SILT (ML)</strong>; reddish brown; trace reddish mottling; 60 to 70 percent low to medium plasticity fines; 30 to 40 percent fine sand; very soft; moist.</td>
</tr>
<tr>
<td>S-3 (100)</td>
<td>SS1</td>
<td>1-1-0 (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16.5 to 19.0 feet: <strong>SILTY SAND (SM)</strong>; reddish brown; 40 percent low to medium plasticity fines; 60 percent fine sand; wet; very loose; some layers (approximately 0.2-feet thick) have approximately 15 to 25 percent fines.</td>
</tr>
<tr>
<td>S-4 (100)</td>
<td>SS1</td>
<td>1-1-1 (2)</td>
<td>10/16/96 8:30</td>
<td></td>
<td></td>
<td></td>
<td>19.0 to 21.0 feet: <strong>SANDY SILT (ML)</strong>; reddish brown with 5 to 10 percent gray mottling; cont.</td>
</tr>
</tbody>
</table>

**REMARKS**  
Exploratory boring drilled with 10-inch OD (6.25-inch ID) hollow stem augers. Soil sampled with 1.4-inch (SS1) and 2.5-inch (SS2) ID, 1.5-foot-long split-spoon samplers. Additional lithologic detail was provided from samples collected from the deeper boring approximately 8-feet away. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information is summarized on the attached well details. See explanation for definition of symbols.
**LOG OF EXPLORATORY BORING**

**PROJECT NAME**  
Riverbend Landfill - Sanifill

**LOCATION**  
McMinnville, Oregon

**DRILLED BY**  
Geo-Tech Explorations, Inc.

**DRILL METHOD**  
Hollow Stem Auger

**LOGGED BY**  
Craig D. Fanshier

<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>SAMPLE TYPE</th>
<th>BLOW COUNTS (IN COMPL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-5</td>
<td>SS2</td>
<td>3-6-8</td>
</tr>
<tr>
<td>(100)</td>
<td>(13)</td>
<td></td>
</tr>
</tbody>
</table>

**GROUND WATER LEVELS**

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
</tr>
<tr>
<td>30</td>
</tr>
<tr>
<td>35</td>
</tr>
</tbody>
</table>

**LITHOLOGIC DESCRIPTION**

- 70 percent low plasticity fines; 30 percent fine sand; stiff; moist to wet.
- @ 21.4 to 21.5 feet: bright reddish brown zone.
- @ 21.5 feet: sandy silt to silty sand, dark greenish gray; low plasticity fines; 50 percent fine sand; moist to wet.

Drilling terminated at 21.0 feet bgs.

**REMARKS**

- Exploratory boring drilled with 10-inch OD (6.25-inch ID) hollow stem augers. Soil sampled with 1.4-inch (SS1) and 2.6-inch (SS2) ID, 1.5-foot-long split-spoon samplers. Additional lithologic detail was provided from samples collected from the deeper boring approximately 8-feet away. A 2-inch PVC monitoring well was constructed in the borehole. Wall construction information is summarized on the attached well details. See explanation for definition of symbols.

**EMCON**

40258-001.058.RIVB.D:3.13/10/96...STANDARD
**WELL DETAILS**

<table>
<thead>
<tr>
<th>Project Number:</th>
<th>40258-001.053</th>
<th>Boring/Well No.:</th>
<th>MW-14B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client Name:</td>
<td>Riverbend Landfill</td>
<td>Top of Casing Elev.:</td>
<td>See note</td>
</tr>
<tr>
<td>Project Name:</td>
<td>Compliance Well Installation</td>
<td>Ground Surface Elev.:</td>
<td>See note</td>
</tr>
<tr>
<td>Location:</td>
<td>McMinnville, Oregon</td>
<td>Installation Date:</td>
<td>10/15/96</td>
</tr>
<tr>
<td>Driller:</td>
<td>Geo-Tech Explorations, Inc.</td>
<td>Permit/Start Card No.:</td>
<td>93673</td>
</tr>
</tbody>
</table>

### EXPLORATORY BORING

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Elev. (ft, msl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>2.6</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td>NA</td>
<td>28.5</td>
</tr>
<tr>
<td></td>
<td>31.7</td>
</tr>
<tr>
<td></td>
<td>41.2</td>
</tr>
<tr>
<td></td>
<td>42.0</td>
</tr>
<tr>
<td></td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>42.0</td>
</tr>
</tbody>
</table>

### WELL CONSTRUCTION

- **A.** Total depth: 42.0 ft.
- **B.** Diameter: 10.0 in.
- **Drilling method:** Hollow-stem auger

- **C.** Well casing length: 44.6 ft.
- **Well casing material:** Flushed-threaded schedule 40 PVC

- **D.** Well casing diameter: 2.0 in.

- **E.** Well screen length: 9.5 ft.
- **Well screen type:** Machine-slotted schedule 40 PVC
- **Well screen slot size:** 0.020 in.

- **F.** Well sump/end cap length: 0.8 ft.

- **G.** Well casing height (stickup): 2.5 ft.

- **H.** Surface seal thickness: 2.0 ft.

- **I.** Surface seal material: Concrete

- **J.** Annular seal thickness: 26.5 ft.

- **K.** Annular seal material: Bentonite chips

- **L.** Filter pack seal thickness: NA ft.

- **M.** Filter pack seal material: NA

- **N.** Sand pack thickness: 13.5 ft.

- **O.** Sand pack material: 10-20 graded silica sand

- **P.** Bottom material thickness: NA ft.

- **Q.** Bottom material: NA

- **R.** Protective casing material: Anodized aluminum
- **Well centralizer depths:** 31 & 41.5 ft.

- **S.** Protective casing diameter: 6.0 in.

### NOTES:

Well elevations were not surveyed because of restricted access due to weather conditions. Elevations will be surveyed and submitted when available.

Installed by: Craig Fanshier

Reviewed by: Louis Caruso

Date: 12/6/96
LOG OF EXPLORATORY BORING

PROJECT NAME: Riverbend Landfill - Sanifill
LOCATION: McMinnville, Oregon
DRILLED BY: Geo-Tech Explorations, Inc.
DRILL METHOD: Hollow Stem Auger
LOGGED BY: Craig D. Fanshier

BORING NO.: MW-14B
PAGE: 1 OF 3
GROUND ELEV.: TOTAL DEPTH: 42.00'
DATE COMPLETED: 10/19/96

SAMPLE NUMBER (RECOVERY PERCENT) | SAMPLE TYPE | BLOW COUNTS (IN COMP) | GROUND LEVEL | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION
--- | --- | --- | --- | --- | --- | --- | --- | ---
S-1 (53) | SS1 | 2-4-4 (8) | | 5 | | | | 0 to 3.0 feet: SILTY CLAY (CL); dark brown; medium plasticity fines; damp.
S-2 (66) | SS1 | 2-2-4 (8) | | 10 | | | | 3.0 to 15.0 feet: CLAYEY SILT (ML); brown with trace reddish mottling; low plasticity; medium stiff; damp.
S-3 (100) | SS1 | 1-1-0 (1) | 11/2/96 | 15 | | | | 15.0 to 21.0 feet: SANDY SILT (ML); reddish brown; 70 percent medium plasticity fines; medium plasticity; 30 percent fine sand; very soft; moist.

© 10.0 feet: 0.2-foot thick layer with 85 to 90 percent medium plasticity fines; 10 to 15 percent fine sand; firm; damp.
© 17.0 feet: potential coarsening downward sequence.

REMARKS: Exploratory boring drilled with 10-inch OD (6.25-inch ID) hollow stem augers. Soil sampled with 1.4-inch (SS1) and 2.5-inch (SS2) ID, 1.5-foot-long split-spoon samplers. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information is summarized on the attached well details. See explanation for definition of symbols.

EMCON
## Log of Exploratory Boring

**Project Name:** Riverbend Landfill - Sanifill  
**Location:** McMinnville, Oregon  
**Drilled By:** Geo-Tech Explorations, Inc.  
**Logged By:** Craig D. Fanshier  
**Boring No.:** MW-14B  
**Page:** 2 of 3  
**Ground Elev.:**  
**Total Depth:** 42.00'

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Sample Type</th>
<th>Blow Counts (in Comp)</th>
<th>Ground Water Level</th>
<th>Depth in Feet</th>
<th>Samples</th>
<th>Well Details</th>
<th>Lithologic Column</th>
<th>Lithologic Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-4</td>
<td>SS1</td>
<td>1-1-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15.0 to 21.0 feet: SANDY SILT (ML); continued.</td>
</tr>
<tr>
<td>(100)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 20.0 feet: 20 percent dark reddish brown montill; 2 percent wood fragments.</td>
</tr>
<tr>
<td>S-5</td>
<td>SS2</td>
<td>1-2-3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>21.0 to 27.8 feet: SILTY SAND (SM); dark greenish gray with reddish montill; 38 to 45 percent low plasticity fines; 55 to 60 percent fine sand; 2 percent wood fragments (1/4-inch-by-1-inch-diameter long, brown); very loose; moist.</td>
</tr>
<tr>
<td>(100)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 23.5 feet: grades to 25 percent fine, 70 percent fine to medium sand (F:M = 2:1) with 5 percent wood fragments; wet.</td>
</tr>
<tr>
<td>S-6</td>
<td>SS2</td>
<td>1-1-2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24.0 to 27.8 feet: sand; reddish brown; 15 percent low plasticity fines; wet.</td>
</tr>
<tr>
<td>(100)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 27.5 to 27.8 feet: clayey silt.</td>
</tr>
<tr>
<td>S-7</td>
<td>SS2</td>
<td>1-4-4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>27.8 to 33.0 feet: SANDY GRAVEL (GP); greenish gray with some reddish brown montill around gravel contacts; 5 percent medium to low plasticity fines; 20 to 30 percent fine to medium (F:M = 1:1); sand; 65 to 75 percent fine to medium gravel (subrounded); (bit blocked by 2.5-inches gravel); mostly basalt gravels in a silty sand matrix; dense; wet.</td>
</tr>
<tr>
<td>(100)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 31.0 feet: some sand and gravel heave in augers.</td>
</tr>
<tr>
<td>S-8</td>
<td>SS1</td>
<td>1-17-19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>33.0 to 33.5 feet: SILTY GRAVEL (GM); greenish gray; 30 percent low plasticity fines; 20 percent fine to medium sand; 50 percent 1/4 inch rounded gravel; dense; wet.</td>
</tr>
<tr>
<td>(100)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>33.5 to 35.1 feet: CLAYEY GRAVEL (GC); brown; 30 percent medium plasticity fines; 20 percent fine to medium sand; 50 percent gravel; dense; wet.</td>
</tr>
<tr>
<td>S-9</td>
<td>SS1</td>
<td>15-18-21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>35.1 to 42.0 feet: SILTY GRAVEL (GM); reddish brown; 15 to 25 percent low plasticity fines; 20 to 30 percent fine to medium sand (F:M = 2:1); 55 percent fine gravel, subangular to subrounded; dense; wet.</td>
</tr>
<tr>
<td>(66)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 38.5 feet: several 1.5-inch rounded basalt</td>
</tr>
</tbody>
</table>

### Remarks

Exploratory boring drilled with 10-inch OD (6.25-inch ID) hollow stem augers. Soil sampled with 1.4-inch (SS1) and 2.5-inch (SS2) ID, 1.5-foot-long split-spoon samplers. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information is summarized on the attached well details. See explanation for definition of symbols.
LOG OF EXPLORATORY BORING

PROJECT NAME: Riverbend Landfill - Sanifill
LOCATION: McMinnville, Oregon
DRILLED BY: Geo-Tech Explorations, Inc.
DRILL METHOD: Hollow Stem Auger
LOGGED BY: Craig D. Fanshier

BORING NO. MW-148
PAGE 3 OF 3
GROUND ELEV. 42.00'
TOTAL DEPTH 42.00'
DATE COMPLETED 10/19/96

SAMPLE NUMBER S-16
SAMPLE TYPE SS2
BLOW COUNTS 50/5"

REMARKS
Exploratory boring drilled with 10-inch OD (6.25-inch ID) hollow stem augers. Soil sampled with 1.4-inch (SS1) and 2.5-inch (SS2) ID, 1.5-foot-long split-spoon samplers. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information is summarized on the attached well details. See explanation for definition of symbols.
WELL DETAILS

Project Number: 40258-001.053
Client Name: Riverbend Landfill
Project Name: Compliance Well Installation
Location: McMinnville, Oregon
Driller: Geo-Tech Explorations, Inc.

Boring/Well No.: MW-15A
Top of Casing Elev.: See note
Ground Surface Elev.: See note
Installation Date: 10/21/96
Permit/Start Card No.: 93678

EXPLORATORY BORING

- A. Total depth: 22.8 ft.
- B. Diameter: 13.8 in. to 9.2 ft.
- 10 in. to 22.8 ft.
- Drilling method: Hollow-stem auger

WELL CONSTRUCTION

- C. Well casing length: 25.3 ft.
- Well casing material: Flush-threaded schedule 40 PVC
- D. Well casing diameter: 2.0 in.
- E. Well screen length: 9.5 ft.
- Well screen type: Machine-slotted schedule 40 PVC
- Well screen slot size: 0.010 in.
- F. Well sump/end cap length: 0.8 ft.
- G. Well casing height (stickup): 2.5 ft.
- H. Surface seal thickness: 2.0 ft.
- I. Surface seal material: Concrete
- J. Annular seal thickness: 8.0 ft.
- K. Annular seal material: Bentonite chips
- L. Filter pack seal thickness: NA ft.
- M. Filter pack seal material: NA
- N. Sand pack thickness: 12.8 ft.
- O. Sand pack material: 10-20 graded silica sand
- P. Bottom material thickness: NA ft.
- Q. Bottom material: NA
- R. Protective casing material: Anodized aluminum
- Well centralizer depths: 11.8 and 22 ft.
- S. Protective casing diameter: 6.0 in.

NOTES:

Well elevations were not surveyed because of restricted access due to weather conditions. Elevations will be surveyed and submitted when available.
**LOG OF EXPLORATORY BORING**

**PROJECT NAME**: Riverbend Landfill - Sanifill  
**LOCATION**: McMinnville, Oregon  
**DRILLED BY**: Geo-Tech Explorations, Inc.  
**DRILL METHOD**: Hollow Stem Auger  
**LOGGED BY**: Craig D. Fanshier  

<table>
<thead>
<tr>
<th>SAMPLE NUMBER (RECOVERY PERCENT)</th>
<th>SAMPLE TYPE</th>
<th>BLOW COUNTS IN COMPL</th>
<th>BOREHOLE LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 20.0 feet: SILTY CLAY (CL); dark reddish brown; medium plasticity fines; damp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>@ 2.0 feet: changes to dark yellowish brown.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>@ 5.0 feet: dark yellowish brown; with less than 10 percent grey mottling; stiff to very stiff.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>@ 10.0 feet: several 1/16-inch diameter macropores with gray interior linings, many smaller macropores (0.1- to 0.2-mm diameter).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>@ 15.0 feet: trace black organic material.</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**REMARKS**

12-inch ID temporary surface casing was installed in a 14-inch diameter borehole drilled with HSA to approximately 9 feet. The annulus between the surface casing and the borehole was filled with bentonite. The exploratory boring was drilled through the surface casing with 10-inch OD (6.25-inch ID) hollow stem augers. Soil sampled with 1.4-inch (SS1) and 2.5-inch (SS2) ID, 1.5-foot-long split-spoon samplers. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information is summarized on the attached well details. See explanation for definition of details.
### Log of Exploratory Boring

**Project Name:** Riverbend Landfill - Sanifill  
**Location:** McMinnville, Oregon  
**Drilled By:** Geo-Tech Explorations, Inc.  
**Logged By:** Craig D. Fanshier  
**Boring No.:** MW-15A  
**Page:** 2 of 2  
**Ground Elevation:**  
**Total Depth:** 22.80'  
**Date Completed:** 10/21/96

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Sample Type</th>
<th>Blow Counts (N Comp)</th>
<th>Ground Water Levels</th>
<th>Depth (in)</th>
<th>Samples</th>
<th>Well Details</th>
<th>Lithologic Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
<td>SS1</td>
<td>6-13-23 (36)</td>
<td>11/21/96</td>
<td>20.0 to 22.8 feet: SILTY CLAY (CL): dark greenish grey; trace brownish mottling; medium plasticity fines; stiff; moist; small blocky beds with weakly developed waxy surfaces small (1/16-inch) macropores; with water.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**  
12-inch ID temporary surface casing was installed in a 14-inch diameter borehole drilled with HSA to approximately 9 feet. The annulus between the surface casing and the borehole was filled with bentonite. The exploratory bore was drilled through the surface casing with 10-inch OD (6.25-inch ID) hollow stem augers. Soil sampled with 1.4-inch (SS1) and 2.5-inch (SS2) ID, 1.5-foot-long split-spoon samplers. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information is summarized on the attached well details. See explanation for details.
WELL DETAILS

Project Number: 40258-001.053
Client Name: Riverbend Landfill
Project Name: Compliance Well Installation
Location: McMinnville, Oregon
Driller: Geo-Tech Explorations, Inc.

Boring/Well No.: MW-15B
Top of Casing Elev.: See note
Ground Surface Elev.: See note
Installation Date: 10/21/96
Permit/Start Card No.: 93677

EXPLORATORY BORING
A. Total depth: 44.0 ft.
B. Diameter
13.8 in. to 9.5 ft.
10 in. to 44 ft.
Drilling method:
Hollow-stem auger

WELL CONSTRUCTION
C. Well casing length: 46.5 ft.
Well casing material:
Flush-threaded schedule 40 PVC

D. Well casing diameter: 2.0 in.

E. Well screen length:
9.5 ft.
Well screen type:
Machine-slotted schedule 40 PVC

F. Well sump/end cap length:
0.8 ft.

G. Well casing height (stickup):
2.5 ft.

H. Surface seal thickness:
2.0 ft.

I. Surface seal material:
Concrete

J. Annular seal thickness:
28.2 ft.

K. Annular seal material:
Bentonite chips

L. Filter pack seal thickness:
NA ft.

M. Filter pack seal material:
NA

N. Sand pack thickness:
13.8 ft.

O. Sand pack material:
10-20 graded silica sand

P. Bottom material thickness:
NA ft.

Q. Bottom material:
NA

R. Protective casing material:
Anodized aluminum
Well centralizer depths:
32.1 and 43 ft.

S. Protective casing diameter:
6.0 in.

NOTES:
Well elevations were not surveyed because of restricted access due to weather conditions.
Elevations will be surveyed and submitted when available.
LOG OF EXPLORATORY BORING

**PROJECT NAME**: Riverbend Landfill - Sanifill  
**LOCATION**: McMinnville, Oregon  
**DRILLED BY**: Geo-Tech Explorations, Inc.  
**DRILL METHOD**: Hollow Stem Auger  
**LOGGED BY**: Craig D. Fanshier

**BORING NO.**: MW-15B  
**PAGE**: 1 OF 3  
**GROUND ELEV.**: 44.00'  
**TOTAL DEPTH**: 10/18/96

<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>SAMPLE TYPE</th>
<th>BLOW COUNTS (IN COMP)</th>
<th>GROUND LEVELS</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
<td>Grab</td>
<td>6-13-23 (36)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0 to 20.0 feet: SILTY CLAY (CL): dark reddish brown; medium plasticity fines; damp.</td>
</tr>
<tr>
<td>S-2</td>
<td>Grab</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 2.0 feet: changes to dark yellowish brown.</td>
</tr>
<tr>
<td>S-3 (100)</td>
<td>SS1</td>
<td>4-6-9 (15)</td>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td>@ 5.0 feet: dark yellowish brown; with less than 10 percent gray mottling; stiff to very stiff.</td>
</tr>
<tr>
<td>S-4 (100)</td>
<td>SS1</td>
<td>2-5-7 (12)</td>
<td></td>
<td>10</td>
<td></td>
<td></td>
<td>@ 10.0 feet: several 1/16-inch diameter macro pores with gray interior linings, many smaller macro pores (0.1- to 0.2-mm diameter).</td>
</tr>
<tr>
<td>S-5 (100)</td>
<td>SS1</td>
<td>5-9-12 (21)</td>
<td></td>
<td>15</td>
<td>10/23/98</td>
<td></td>
<td>@ 15.0 feet: trace black organic material.</td>
</tr>
</tbody>
</table>

**REMARKS**

12-inch ID temporary surface casing was installed in a 14-inch diameter borehole drilled with HSA to approximately 9 feet. The annulus between the surface casing and the borehole was filled with bentonite. The exploratory boring was drilled through the surface casing with 10-inch OD (6.25-inch ID) hollow stem augers. Soil sampled with 1.4-inch (SS1) and 2.5-inch (SS2) ID, 1.5-foot-long split-spoon samplers. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information is summarized on the attached well details. See explanation for definition of details.

**EMCON**
**LOG OF EXPLORATORY BORING**

**PROJECT NAME**
Riverbend Landfill - Sanifill

**LOCATION**
McMinnville, Oregon

**DRILLED BY**
Geo-Tech Explorations, Inc.

**DRILL METHOD**
Hollow Stem Auger

**LOGGED BY**
Craig D. Fanshier

**BORING NO.**
MW-15B

**PAGE**
2 OF 3

**GROUND ELEV.**
TOTAL DEPTH 44.00'

**DATE COMPLETED**
10/18/96

<table>
<thead>
<tr>
<th>SAMPLE NUMBER (RECOVERY PERCENT)</th>
<th>SAMPLE TYPE</th>
<th>BLOW COUNTS (IN COMPOUND)</th>
<th>WATER LEVEL</th>
<th>DEPTH</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOGENIC COLUMN</th>
<th>LITHOGENIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-6 (73)</td>
<td>SS1</td>
<td>5-8-12 (20)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20.0 to 25.2 feet: SILTY CLAY (CL); dark greenish gray; trace brownish mottling; medium plasticity fines; stiff; moist; small blocky peds with weakly developed waxy surfaces small (1/16-inch) macro pores; with water.</td>
</tr>
<tr>
<td>S-7 (100)</td>
<td>SS2</td>
<td>3-4-6 (10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25.2 to 29.5 feet: SANDY SILT (ML); brown, 20 percent gray mottling; 35 percent low plasticity fines; 65 percent fine sand, subangular to angular, firm; wet. Large macro pores with wet interiors; silt content varies from approximately 65 to 65 percent with gradational silty sand layers 0.1 to 0.3-feet thick.</td>
</tr>
<tr>
<td>S-8 (100)</td>
<td>SS1</td>
<td>2-2-3 (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 29.5 feet: driller notes slightly rougher drilling, possibly gravels.</td>
</tr>
<tr>
<td>S-9 (67)</td>
<td>SS2</td>
<td>21-50/5&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>29.5 to 34.0 feet: SANDY GRAVEL (GP); brown; 10 percent nonplastic fines; 30 percent fine to medium sands (F:M = 2:1); 60 percent fine gravels; very dense; wet.</td>
</tr>
<tr>
<td>S-10 (73)</td>
<td>SS1</td>
<td>26-21-23 (44)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>34.0 to 42.0 feet: SILTY GRAVEL (GM); dark yellowish brown; 15 percent nonplastic fines; 25 to 35 percent fine to coarse sand (F:M:C = 3:3:1); 50 to 60 percent fine (3/8 inch to 1/2 inch) rounded to subrounded gravels; dense; wet.</td>
</tr>
<tr>
<td>S-11 (80)</td>
<td>SS2</td>
<td>8-23-39 (62)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**REMARKS**

12-inch ID temporary surface casing was installed in a 14-inch diameter borehole drilled with HSA to approximately 9 feet. The annulus between the surface casing and the borehole was filled with bentonite. The exploratory boring was drilled through the surface casing with 10-inch OD (6.25-inch ID) hollow stem augers. Soil samples with 1.4-inch (SS1) and 2.5-inch (SS2) ID, 1.5-foot-long split-spoon samplers. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information is summarized on the attached well details. See explanation for definition of details.

EMCON

40268-001.OG3.RV03.G3: 3.12/10/96, STANDARD
**LOG OF EXPLORATORY BORING**

**PROJECT NAME** Riverbend Landfill - Sanifill  
**LOCATION** McMinnville, Oregon  
**DRILLED BY** Geo-Tech Explorations, Inc.  
**DRILL METHOD** Hollow Stem Auger  
**LOGGED BY** Craig D. fanshier  
**BORING NO.** MW-15B  
**PAGE** 3 OF 3  
**GROUND ELEV.**  
**TOTAL DEPTH** 44.00'  
**DATE DEPTH** 10/18/96

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>BLOW COUNTS (N COMP)</th>
<th>GROUND LEVELS (IN FEET)</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-12</td>
<td>6-21-45 (66)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>34.0 to 42.0 feet: SILTY GRAVEL (GM); continued.</td>
</tr>
<tr>
<td>(80)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>42.0 to 44.0 feet: SILTY SAND (SM); dark greenish gray; 20 to 30 percent non to low plasticity fines; 78 percent fine to medium sand (F:M = 3:1); 2 percent fine (3/8 to 1/2 inch) rounded gravels; very dense; moist to wet. Fines act as a matrix binding the sand together.</td>
</tr>
<tr>
<td>S-13</td>
<td>16-28-50/5.5&quot; (78 +)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Drilling terminated at 44.0 feet bgs.</td>
</tr>
</tbody>
</table>

**REMARKS**

12-inch ID temporary surface casing was installed in a 14-inch diameter borehole drilled with HSA to approximately 9 feet. The annulus between the surface casing and the borehole was filled with bentonite. The exploratory boring was drilled through the surface casing with 10-inch ID (6.25-inch OD) hollow stem augers. Soil sampled with 1.4-inch (SS1) and 2.6-inch (SS2) ID, 1.5-foot-long split-spoon samplers. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information is summarized on the attached well details. See explanation for definition of details.
WELL DETAILS

Project Number: 40258-001.053
Client Name: Riverbend Landfill
Project Name: Compliance Well Installation
Location: McMinnville, Oregon
Driller: Geo-Tech Explorations, Inc.
Boring/Well No.: MW-16A
Top of Casing Elev.: See note
Ground Surface Elev.: See note
Installation Date: 10/23/96
Permit/Start Card No.: 93680

EXPLORATORY BORING

A. Total depth: 23.5 ft.
B. Diameter 10.0 in.
   Drilling method: Hollow-stem auger

WELL CONSTRUCTION

C. Well casing length: 26.0 ft.
   Well casing material: Flush-threaded schedule 40 PVC
D. Well casing diameter: 2.0 in.
E. Well screen length: 9.5 ft.
   Well screen type: Machine-slotted schedule 40 PVC
   Well screen slot size: 0.010 in.
F. Well sump/end cap length: 0.8 ft.
G. Well casing height (stickup): 2.5 ft.
H. Surface seal thickness: 2.0 ft.
I. Surface seal material: Concrete
J. Annular seal thickness: 9.5 ft.
K. Annular seal material: Bentonite chips
L. Filter pack seal thickness: NA ft.
M. Filter pack seal material: NA
N. Sand pack thickness: 12.5 ft.
O. Sand pack material: 10-20 graded silica sand
P. Bottom material thickness: NA ft.
Q. Bottom material: NA
R. Protective casing material: Anodized aluminum
   Well centralizer depths: 12.8 and 23.0 ft.
S. Protective casing diameter: 6.0 in.

NOTES:
Well elevations were not surveyed because of restricted access due to weather conditions. Elevations will be surveyed and submitted when available.

Installed by: Craig Fanshier
Reviewed by: Louis Caruso
Date: 12/6/96
0 to 25.0 feet: SILTY CLAY (CL): yellowish red with 20 to 40 percent gray mottling; medium plasticity fines; very stiff; damp; some very small macro pores (less than 0.2 mm in diameter).

@ 1.5 feet: color changes from dark brown to brown to yellowish red.
**LOG OF EXPLORATORY BORING**

**PROJECT NAME**  
Riverbend Landfill - Sanifill

**LOCATION**  
McMinnville, Oregon

**DRILLED BY**  
Geo-Tech Explorations, Inc.

**DRILL METHOD**  
Hollow Stem Auger

**LOGGED BY**  
Craig D. Fanshier

<table>
<thead>
<tr>
<th>SAMPLE NUMBER (RECOVERY PERCENT)</th>
<th>SAMPLE TYPE</th>
<th>BLOW COUNTS (IN COMP)</th>
<th>GROUND WATER Level</th>
<th>DEPTH IN FEET</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>(100)</td>
<td>(15)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0 to 25.0 feet: Silt clay (CL); continued.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 20.0 feet: several small macropores with water, pores are light gray.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 22.0 to 23.5 feet: firm drilling, green clay returns.</td>
</tr>
</tbody>
</table>

Drilling terminated at 23.5 feet.

**BORING NO.**  
MW-16A

**PAGE**  
2 OF 2

**GROUND ELEV.**  
23.50'

**TOTAL DEPTH**  
23.50'

**DATE COMPLETED**  
10/23/96

---

**REMARKS**

Exploratory boring drilled with 10-inch OD (6.25-inch ID) hollow stem augers. Soil sampled with 1.4-inch (SS1) ID 1.5-foot-long split-spoon samplers. Additional lithologic detail was provided from samples collected from the deeper boring approximately 8-feet away. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information is summarized on the attached well details. 12-inch ID temporary surface casing was installed in a 14-inch diameter borehole drilled with HSA to approximately 9 feet. The annulus between the surface casing and the borehole was filled with bentonite.

EMCON
WELL DETAILS

Project Number: 40258-001.053  Boring/Well No.: MW-16B
Client Name: Riverbend Landfill  Top of Casing Elev.: See note
Project Name: Compliance Well Installation  Ground Surface Elev.: See note
Location: McMinnville, Oregon  Installation Date: 10/23/96
Driller: Geo-Tech Explorations, Inc.  Permit/Start Card No.: 93679

EXPLORATORY BORING
A. Total depth: 45.0 ft.
B. Diameter 10.0 in.
Drilling method: Hollow-stem auger

WELL CONSTRUCTION
C. Well casing length: 47.5 ft.
Well casing material: Flush-threaded schedule 40 PVC
D. Well casing diameter: 2.0 in.
E. Well screen length: 9.5 ft.
Well screen type: Machine-slotted schedule 40 PVC
Well screen slot size: 0.020 in.
F. Well sump/end cap length: 0.8 ft.
G. Well casing height (stikup): 2.5 ft.
H. Surface seal thickness: 2.0 ft.
I. Surface seal material: Concrete
J. Annular seal thickness: 13.4 ft.
K. Annular seal material: Bentonite chips
L. Filter pack seal thickness: NA ft.
M. Filter pack seal material: NA
N. Sand pack thickness: 13.4 ft.
O. Sand pack material: 10-20 graded silica sand
P. Bottom material thickness: NA ft.
Q. Bottom material: NA
R. Protective casing material: Anodized aluminum
Well centralizer depths: 34.0 and 44.5 ft.
S. Protective casing diameter: 6.0 in.

NOTES:
Well elevations were not surveyed because of restricted access due to weather conditions.
Elevations will be surveyed and submitted when available.
0 to 25.0 feet: **SILTY CLAY (CL)**; yellowish red with 20 to 40 percent gray mottling; medium plasticity fines; very stiff; damp; some very small macropores (less than 0.2 mm in diameter).

@ 1.5 feet: color changes from dark brown to brown to yellowish red.

@ 16.1 feet: brownish-organic looking inclusion 2-by 1/4-inch mottle.

@ 16.2 feet: change to dark greenish gray; wet; with 30 percent dark brown mottling.
**LOG OF EXPLORATORY BORING**

**PROJECT NAME**  Riverbend Landfill - Senifill  
**LOCATION**  McMinnville, Oregon  
**DRILLED BY**  Geo-Tech Explorations, Inc.  
**DRILL METHOD**  Hollow Stem Auger  
**LOGGED BY**  Craig D. Fanshier  

<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>SAMPLE TYPE</th>
<th>BLOW COUNTS (IN COMP)</th>
<th>GROUND WATER LEVEL</th>
<th>DEPTH (F)</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
<th>LITHOLOGIC DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-4 (100)</td>
<td>SS1</td>
<td>4-7-9 (16)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0 to 25.0 feet: SILTY CLAY (CL): continued. @ 20.0 feet: several small macro pores with water, pores are light gray. @ 22.0 to 24.0 feet: firm drilling, green clay returns.</td>
</tr>
<tr>
<td>S-5 (100)</td>
<td>SS1</td>
<td>2-2-3 (5)</td>
<td></td>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td>25.0 to 25.5 feet: CLAYEY Silt (ML): gradational to unit below; soft; wet. @ 26.0 feet: driller notes softer drilling. 25.5 to 30.0 feet: SANDY Silt (ML): olive brown; 85 percent low plasticity fines; 15 percent fine sand; firm; wet.</td>
</tr>
<tr>
<td>S-6 (100)</td>
<td>SS1</td>
<td>1-2-2 (4)</td>
<td></td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td>30.0 to 32.5 feet: SILTY SAND (SP) with layers of SANDY Silt (ML): silty sand is dark yellowish brown; 20 percent low plasticity fines; 80 percent fine to medium sand (F:M = 1:2); wet; some reddish brown and gray motting in the sandy silt layers (approximately 0.2- to 0.5-feet thick).</td>
</tr>
<tr>
<td>S-7 (0.5)</td>
<td>SS1</td>
<td>8-23-26 (45)</td>
<td></td>
<td>35</td>
<td></td>
<td></td>
<td></td>
<td>32.5 to 40.0 feet: SANDY GRAVEL (GP): dark yellowish brown; 10 percent nonplastic fines; 20 to 30 percent medium to coarse angular sand (M:C = 2:1); 60 to 70 percent fine gravel (1/4- to 1/2-inch, mostly 1/4- to 3/8-inch); very dense; wet. @ 36.5 to 40.0 feet: driller notes coarse gravel; looser; drilled faster.</td>
</tr>
</tbody>
</table>

**REMARKS**

12-inch ID temporary surface casing was installed in a 14-inch diameter borehole drilled with HSA to approximately 9 feet. The annulus between the surface casing and the borehole was filled with bentonite. The exploratory boring was drilled through the surface casing with 10-inch OD (6.25-inch ID) hollow stem augers. Soil sampled with 1.4-inch (SS1) and 2.5-inch (SS2) ID, 1.5-foot-long split-spoon samplers. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information is summarized on the attached well details.
**LOG OF EXPLORATORY BORING**

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>SAMPLE</th>
<th>BLOW</th>
<th>GROUND</th>
<th>DEPTH</th>
<th>SAMPLES</th>
<th>WELL DETAILS</th>
<th>LITHOLOGIC COLUMN</th>
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</thead>
<tbody>
<tr>
<td>NUMBER</td>
<td>TYPE</td>
<td>COUNTS</td>
<td>LEVELS</td>
<td>IN MTS</td>
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<td></td>
</tr>
<tr>
<td>RECPer</td>
<td></td>
<td>(N COMP)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **S-8** (1.0) SS2 7-50/6" 45
  - 40.0 to 45.0 feet: **SANDY GRAVEL (GP)**; dark greenish gray; 10 percent low plasticity fines; 30 percent fine to medium sand; 60 percent fine gravels (3/8- to 3/4-inch gravels); dense; wet.

- **S-9** (1.0) SS1 21-15
  - Drilling terminated at 45.0 feet.

**REMARKS**

12-inch ID temporary surface casing was installed in a 14-inch diameter borehole drilled with HSA to approximately 9 feet. The annulus between the surface casing and the borehole was filled with bentonite. The exploratory boring was drilled through the surface casing with 10-inch OD (6.25-inch ID) hollow stem augers. Soil sampled with 1.4-inch (SS1) and 2.5-inch (SS2) ID, 1.5-foot-long split-spoon samplers. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information is summarized on the attached well details.
Well Completion Diagram

1. Ground elevation at well 151.12 ft msl
2. Top of casing elevation 153.83 ft msl
3. Wellhead protection cover type
   a) drain tube? No
   b) concrete pad dimensions Approx 2' x 2'
4. Diameter/type of well casing 2" Sch. 40 PVC
5. Type/slot size of screen 2" Sch. 40 PVC / 0.010 slot
6. Type screen filter
   a) Quantity used Silica sand (10–20)
   b) 8-50 lb bags
7. Type of seal
   a) Quantity used Medium bentonite clips
   b) Top of seal 8-50 lb bags
   Concrete

Development method Pump & surge
Development time Approx. 5 hours
Estimated purge volume 448 gallons

Comments
Well screen length is nominal; actual screened portion is approx. 1 foot shorter than labeled length
**SOIL BORING LOG**

**PROJECT:** Riverbend Landfill  
**LOCATION:** McMinnville, Oregon  
**ELEVATION:** 191.12 ft msl  
**DRILLING CONTRACTOR:** Geo-Tech Explorations, Inc.  
**DRILLING METHOD:** HSA-6.25 ID Hollow-Stem Auger  
**WATER LEVELS:**  
<table>
<thead>
<tr>
<th>START</th>
<th>END</th>
<th>LOGGER</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:30 pm</td>
<td>10:30 am</td>
<td>R. E. Long</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DEPTH BELOW SURFACE (FT)</th>
<th>SAMPLE No.</th>
</tr>
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<tbody>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>ML</td>
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<tr>
<td>15</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>ML</td>
</tr>
<tr>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

**SOIL DESCRIPTION**  
- **GRAPHIC LOG**  
  - Sandy SILT (ML); reddish-brown; moist; medium stiff; low plasticity; non-stratified; macropores, some rootlets  
  - Sandy SILT with 10-15% clay (ML); dark reddish-brown to brown; moist; medium stiff; low plasticity; non-stratified; macropores  
  - SILT w/very fine sand, clay (15+%) (ML); It brown to tan; mottled from 8'-12'; moist; stiff; medium plasticity; non-stratified  
  - Thin (1/4") seam of coarse sand @ 18.5 ft  
  - Noted density increase @ 20 ft  
  - End of boring @ 25 ft bgs  

- **COMMENTS**
**SOIL BORING LOG**

**PROJECT:** Riverbend Landfill  
**LOCATION:** McMinnville, Oregon  
**ELEVATION:** 151.12 ft msl  
**DRILLING CONTRACTOR:** Geo-Tech Explorations, Inc.  
**DRILLING METHOD:** Hollow-Stem Auger  
**WATER LEVELS:**  
**START:** 9:00  
**END:** 11:50  
**DATE:** 09/20-22/2000  
**LOGGER:** D. Orlofski

<table>
<thead>
<tr>
<th>DEPTH BELOW SURFACE (FT)</th>
<th>SOIL DESCRIPTION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Sandy SILT (ML), reddish-brown, moist, stiff, low plasticity, nonstratified, macropores, some rootlets</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Sandy SILT with 10-15% clay (ML); dark reddish-brown to brown; moist; stiff; low plasticity; non-stratified; macropores</td>
<td></td>
</tr>
</tbody>
</table>
| 15                       | Silt w/very fine sand, clay (15+ %) (ML); light brown; mottled from 0'-12'; moist; med. stiff; medium plasticity; non-stratified | Thin (1/4") seam of coarse sand @ 18.5 ft  
Noted density increase @ 20 ft |
| 20                       | Silt w/very fine sand, clay (16-20%) (ML); gray; moist to wet; stiff to very stiff; medium - high plasticity | |
| 25                       | Sandy Silt with trace of clay (ML); gray; moist; stiff  
low-medium plasticity, becomes drier with depth below 30 feet. | |
<table>
<thead>
<tr>
<th>DEPTH BELOW SURFACE (FT)</th>
<th>SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>41.5 ft</td>
<td>SILT (ML); bluish-gray; dry to moist; stiff; medium plasticity; massive</td>
<td>Fine sand seam (&lt;1/2&quot; thick)</td>
</tr>
<tr>
<td>57 ft</td>
<td>CLAY with gravel (CL); Light gray &amp; greenish; moist, stiff, medium plasticity; gravel clasts oxidized, subangular, up to 2 cm dia.; matrix supported; moist; stiff; medium plasticity</td>
<td>Drilling slows drastically @ 57 ft &amp; deeper (to approx 5 ft/hr)</td>
</tr>
<tr>
<td>63 ft</td>
<td>SILTSTONE; dark gray silty; moist to dry, trace very fine sand; very dry; trace fine sand; friable; medium plasticity when crushed and mixed with water</td>
<td>Distinct transition @ 63 ft to very dry &amp; dense; blow counts increase 2-3 times</td>
</tr>
</tbody>
</table>
### SOIL BORING LOG

**PROJECT:** Riverbend Landfill  
**LOCATION:** McMinnville, Oregon  
**DATE:** 09/20-22/2000  
**ELEVATION:** 151.12 ft msl  
**DRILLING CONTRACTOR:** Geo-Tech Explorations, Inc.  
**DRILLING METHOD:** Hollow-Stem Auger  
**WATER LEVELS:** START: 9:00  
END: 11:50  
**LOGGER:** D. Orłowski

<table>
<thead>
<tr>
<th>DEPTH BELOW SURFACE (FT)</th>
<th>SAMPLE INTERVAL</th>
<th>GRAPHIC LOG</th>
<th>SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, CONSISTENCY, SOIL STRUCTURE, MINERALOGY</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td></td>
<td></td>
<td>SILTSTONE (SLST), dark gray, hard, dry, friable</td>
<td>Note: Sampling intervals reduced due to difficult drilling; driller reported similar response for ranges not sampled</td>
</tr>
<tr>
<td>80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>85</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90</td>
<td></td>
<td></td>
<td></td>
<td>At approx 90 ft, drilling rate about 2-3 ft/hr</td>
</tr>
<tr>
<td>95</td>
<td></td>
<td></td>
<td></td>
<td>Beginning @ approx 95 ft, drillers must trip-in rods repeatedly to unplug bit.</td>
</tr>
<tr>
<td>100</td>
<td></td>
<td></td>
<td>Basalt, black, vesicular, with interstitial secondary (clay) mineralization, moderate moisture.</td>
<td>End of boring @ 99.5 ft bgs</td>
</tr>
</tbody>
</table>

Riverbend borelogs11_16.xls
1. Ground elevation at well: 146.77 ft msl
2. Top of casing elevation: 146.77 ft msl
3. Wellhead protection cover type:
   a) Drain tube? No
   b) Concrete pad dimensions: Approx. 2' x 2'
4. Diameter/type of well casing: 2" Sch. 40 PVC
5. Type/slot size of screen: 2" Sch. 40 PVC / 0.010 slot
6. Type screen filter:
   a) Quantity used: Silica sand (20-40) 8-50 lb bags
7. Type of seal:
   a) Quantity used: Med. bentonite chips (45-43 ft), bent. grout to conc. pad
   b) Top of seal: Concrete

Development method: Pump & surge
Development time: Approx. 3 hours
Estimated purge volume: 33 gallons
Comments: Well screen length is nominal; actual screened portion is approx. 1 foot shorter than labeled length
<table>
<thead>
<tr>
<th>DEPTH BELOW SURFACE (FT)</th>
<th>SOIL DESCRIPTION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>Grass field, pea gravel (old road bed)</td>
<td>Samples not obtained 0'-4'</td>
</tr>
<tr>
<td>5</td>
<td>SILT (ML), Lt. Brown, moist, medium stiff, platey, massive, mica fragments, fine roots, macropores, trace clay.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>CLAY (CL), Lt brown (10-30% clay), medium stiff, platey, mica fragments, rootlets, macropores, increasing moisture @ 10'. From 13-25 feet - 1'-2' seams of sandy silt @ 5'-10' intervals;</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>As above, but mottled Lt brown, fewer rootlets &amp; macropores, saturated</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>As above w/some organic fragments, no rootlets or macropores</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Clay (CL), bluish-gray, wet, stiff, homogeneous, trace mica.</td>
<td></td>
</tr>
</tbody>
</table>
PROJECT NUMBER: 159636.A0.03
BORING NUMBER: MW-18B (L40374)

WELL COMPLETION DIAGRAM

PROJECT: Riverbend Landfill
LOCATION: McMinnville, Oregon
ELEVATION: 146.58 ft msl
Installation date(s): 09/25/2000
DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.
DRILLING METHOD AND EQUIPMENT USED: B-69 Mobile Hollow-Stem Auger (6.25" ID)
WATER LEVELS:

START: END: LOGGER: B. Long

1- Ground elevation at well: 146.58 ft msl
2- Top of casing elevation: 148.57 ft msl

3- Wellhead protection cover type: Above-ground monument
   a) drain tube?
   b) concrete pad dimensions: Approx. 2' x 2'

4- Diameter of well casing: 2" Sch. 40 PVC

5- Type/slot size of screen: 2" Sch. 40 PVC / 0.010 slot

6- Type screen filter:
   a) Quantity used: Silica sand (10-20)
   b) Storage bag:

7- Type of seal:
   a) Quantity used:
   b) Top of seal: Bentonite plug
   2.50 lb bags
   Concrete

Development method: Pump & surge
Development time: Approx. 2.5 hrs
Estimated purge volume: 80 gallons

Comments: Well screen length is nominal; actual screened portion is approx. 6 inches shorter than labeled length.
## SOIL BORING LOG

**PROJECT**: Riverbend Landfill  
**LOCATION**: McMinnville, Oregon  
**DATE**: 09/25-26/2000  
**ELEVATION**:  
**DRILLING CONTRACTOR**: Geo-Tech Explorations, Inc.  
**DRILLING METHOD**: Hollow-Stem Auger  
**WATER LEVELS**: START: 12:00  
**LOGGER**: B. Long

<table>
<thead>
<tr>
<th>DEPTH BELOW SURFACE (FT)</th>
<th>SOIL DESCRIPTION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5</strong></td>
<td>Grass field, pea gravel (old road bed), over light brown SILT</td>
<td>Samples not obtained 0'-4'</td>
</tr>
<tr>
<td><strong>10</strong></td>
<td>SILT (ML), Lt. Brown, moist, medium stiff, platey, massive, mica fragments, fine roots, macropores, trace clay.</td>
<td></td>
</tr>
</tbody>
</table>
| **15**                   | CLAY with silt (CL), Lt brown, medium stiff, platey, mica fragments, rootlets, macropores, increasing moisture @ 10'  
  From 13-25 feet - 1''-2'' seams of sandy silt @ 6'-10' intervals | As above, but mottled lt brown, fewer rootlets & macropores, saturated |
<p>| <strong>20</strong>                   | As above w/some organic fragments, no rootlets or macropores |          |
| <strong>25</strong>                   | Clay (CL), bluish-gray, wet, stiff, homogeneous, trace mica. |          |
| <strong>30</strong>                   |                  |          |
| <strong>35</strong>                   |                  |          |</p>
<table>
<thead>
<tr>
<th>DEPTH BELOW SURFACE (FT)</th>
<th>SAMPLE INTERVAL, #</th>
<th>GRAPHIC LOG</th>
<th>SOIL DESCRIPTION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td></td>
<td></td>
<td>CLAY (CL), dark gray, moist, med stiff to stiff, homogeneous, trace of mica fragments</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td></td>
<td></td>
<td>Poorly graded fine GRAVEL with clay (GP), dark gray, moist, very dense, iron oxide on gravel clasts; basalt clasts to 1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
<td></td>
<td>CLAY (CL), Yellowish-brown to lt gray (mottled), moist, stiff, trace coarse sand, highly weathered</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Poorly graded fine GRAVEL (GP) with sand and silt, reddish brown, wet, dense, clast supported, basalt.</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td></td>
<td></td>
<td>As above with greater silt content</td>
<td>End of boring @ 62 ft</td>
</tr>
</tbody>
</table>
**WELL COMPLETION DIAGRAM**

**PROJECT**: Riverbend Landfill

**LOCATION**: McMinnville, Oregon

**ELEVATION**: 149.05 ft msl

**DRILLING CONTRACTOR**: Geo-Tech Explorations, Inc.

**DRILLING METHOD AND EQUIPMENT USED**: B-69 Mobile Hollow-Stem Auger (6.25" ID)

**WATER LEVELS**

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ground elevation at well</td>
</tr>
<tr>
<td>2</td>
<td>Top of casing elevation</td>
</tr>
<tr>
<td>3</td>
<td>Wellhead protection cover type</td>
</tr>
<tr>
<td></td>
<td>a) drain tube?</td>
</tr>
<tr>
<td></td>
<td>b) concrete pad dimensions</td>
</tr>
<tr>
<td>4</td>
<td>Diameter/type of well casing</td>
</tr>
<tr>
<td>5</td>
<td>Type/slot size of screen</td>
</tr>
<tr>
<td>6</td>
<td>Type screen filter</td>
</tr>
<tr>
<td></td>
<td>a) Quantity used</td>
</tr>
<tr>
<td>7</td>
<td>Type of seal</td>
</tr>
<tr>
<td></td>
<td>a) Quantity used</td>
</tr>
<tr>
<td></td>
<td>b) Top of seal</td>
</tr>
</tbody>
</table>

**Development method**: Pump & surge

**Development time**: Approx. 3 hrs

**Estimated purge volume**: 60 gallons

**Comments**: Well screen length is nominal; actual screened portion is approx. 1 foot shorter than labeled length
<table>
<thead>
<tr>
<th>DEPTH BELOW SURFACE (FT)</th>
<th>SOIL DESCRIPTION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>SILT (ML), LL Brown, moist, soft, plowed field; no sample 0'-4'</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Sandy SILT (ML), Lt brown, dry to moist, soft, platey, root channels, trace clay, trace organics</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>CLAY (CL), light brown to light gray, moist to wet, medium stiff, medium plasticity.</td>
<td>Interbeds of silt &amp; clay, Lt brown to Lt gray, moist to wet, no roots or macro pores (ML-CL)</td>
</tr>
<tr>
<td>20</td>
<td>seams of silty sand, 1'-3' thick @ 6'-8' intervals</td>
<td>seams of very fine sand, 3'-6' thick @ 1'-3' intervals</td>
</tr>
<tr>
<td>25</td>
<td>Interbeds of Lt gray clay &amp; reddish-brown silty-sand; some iron-rich nodules</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>CLAY (CL), bluish-gray to dark gray, medium stiff, moist to wet, trace of mica particles</td>
<td>End of Boring 30 Feet.</td>
</tr>
</tbody>
</table>
# Soil Boring Log

**Borehole 19B**

**PROJECT:** Riverbend Landfill  
**LOCATION:** McMinnville, Oregon  
**DATE:** 08/27/2000

**ELEVATION:** 149.05 ft msf  
**DRILLING CONTRACTOR:** Geo-Tech Explorations, Inc.

**WATER LEVELS:**  
**START:**

**LOGGER:** R.E. Long

<table>
<thead>
<tr>
<th>Depth Below Surface (ft)</th>
<th>Soil Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>Silt (ML), Lt. Brown, moist, soft, plowed field; no sample</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Sandy Silt (ML), Lt brown, dry to moist, soft, platy, root channels, trace clay, trace organics</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Clay (CL), light brown to light gray, moist to wet, medium stiff, medium plasticity.</td>
<td>Seams of silty sand, 1&quot;-3&quot; thick @ 6'-8&quot; intervals</td>
</tr>
<tr>
<td>15</td>
<td>Interbeds of silt &amp; clay, Lt brown to Lt gray, moist to wet, no roots or macropores (ML-CL)</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Seams of very fine sand, 3&quot;-6&quot; thick @ 1'-3' intervals</td>
<td></td>
</tr>
<tr>
<td>Interbeds of Lt gray clay &amp; reddish-brown silty-sand; some iron-rich nodules</td>
<td>CLAY (CL), bluish-gray to dark gray, medium stiff, moist to wet, trace of mica particles</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>CLAY (CL), bluish-gray to dark gray clay, stiff, wet, interbedded with reddish-brown clay (approx. 1.5 ft. thick beds)</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEPTH BELOW SURFACE (FT)</td>
<td>SOIL DESCRIPTION</td>
<td>COMMENTS</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------</td>
<td>----------</td>
</tr>
<tr>
<td>40</td>
<td>CLAY (CL), dark gray clay, moist, stiff, massive, plastic (CL)</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>CLAY (CL), dark gray &amp; dark reddish-brown clay, moist, stiff, trace of coarse sand, plastic.</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Poorly graded fine GRAVEL with clay (GC), dark reddish-brown, moist, trace sand, matrix-supported.</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>CLAY (CL), light gray clay, mottled with reddish-brown, moist, plastic (CL)</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>SILTSTONE (SLST), dark gray, hard, sand content (15-20%), friable, semi-consolidated, dry. Thin interbeds of clay.</td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>CLAY (CL), dark grayish-green, moist, soft, with 1-inch to 2-inch interbeds of siltstone</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>SILTSTONE, Grayish-green siltstone, dry, hard</td>
<td></td>
</tr>
</tbody>
</table>
### SOIL BORING LOG

**Borehole 19B**

**PROJECT:** Riverbend Landfill  
**LOCATION:** McMinnville, Oregon  
**ELEVATION:** 149.05 ft msl  
**DRILLING CONTRACTOR:** Geo-Tech Explorations, Inc.  
**DRILLING METHOD:** Hollow-Stem Auger  
**WATER LEVELS:**  
**START:**  
**END:**  
**LOGGER:** B. Long

<table>
<thead>
<tr>
<th>DEPTH BELOW SURFACE (FT)</th>
<th>SOIL DESCRIPTION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>SILTSTONE, Grayish-green, dry, hard, friable, little fine sand.</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>SANDSTONE, gray, dry, very dense. Mostly basalt sand.</td>
<td></td>
</tr>
<tr>
<td>85</td>
<td>SILTSTONE, Grayish-green, dry, hard. Some sand.</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>As above, with occasional seams of soft plastic clay</td>
<td></td>
</tr>
<tr>
<td>95</td>
<td>SANDSTONE, light gray to gray, with silt &amp; clay, moist, friable, weak to moderate cementation</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>SILTSTONE, olive to gray, moist, very dense. Fine-grained, friable</td>
<td></td>
</tr>
</tbody>
</table>

Riverbend borelogs11_16.xls
# SOIL BORING LOG

**PROJECT:** Riverbend Landfill  
**LOCATION:** McMinnville, Oregon  
**ELEVATION:** 149.05 ft msl  
**DRILLING CONTRACTOR:** Geo-Tech Explorations, Inc.  
**DRILLING METHOD:** Hollow-Stem Auger  
**WATER LEVELS:**  
**DATE:** 09/27/2000  
**LOGGER:** B. Long

<table>
<thead>
<tr>
<th>DEPTH BELOW SURFACE (FT)</th>
<th>SOIL DESCRIPTION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>92.5</td>
<td>SANDSTONE, bluish-gray to gray, dry. Coarse-grained, with seams of plastic clay, moist; sandstone weak to mod-cemented</td>
<td></td>
</tr>
<tr>
<td>105.0</td>
<td>CLAY (CL), dark gray to black plastic clay with siltstone fragments; organics present</td>
<td>End of boring @ 111 ft</td>
</tr>
</tbody>
</table>
1- Ground elevation at well
   127.20 ft msl

2- Top of casing elevation
   129.92 ft msl

3- Wellhead protection cover type
   a) drain tube?
      No
   b) concrete pad dimensions
      Approx. 3' x 2'

4- Diameter/Type of well casing
   2" Sch. 40 PVC

5- Type/Size of screen
   2" Sch. 40 PVC / 0.010 slot

6- Type screen filter
   a) Quantity used
      Silica sand (20-40)
      9 - 50 lb bags

7- Type of seal
   a) Quantity used
      Medium bentonite chips
      6 - 50 lb bags
   b) Top of seal
      Concrete

Development method
   Pump & surge

Development time
   Approx 3.5 hrs

Estimated purge volume
   68 gallons

Comments
   Well screen length is nominal; actual screened portion
   Is approx. 1 foot shorter than labeled length
## Soil Boring Log

**Project:** Riverbend Landfill  
**Location:** McMinnville, Oregon  
**Elevation:** 127.20 ft NAD  
**Drilling Contractor:** Geo-Tech Explorations, Inc.  
**Drilling Method:** Hollow-Stem Auger  
**Water Levels:**  
**Start:**  
**Date:** 10/02/2000  
**Logger:** B. Long

<table>
<thead>
<tr>
<th>Depth Below Surface (FT)</th>
<th>Soil Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grassy field</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cuttings: CLAY (CL), gray, moist, medium stiff</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>CL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CLAY w/silt (CL), mottled reddish-brown, medium stiff, moist, trace organics, sand-sized iron nodules, small root channels</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>As above, but stiffer, moist to wet; darker gray beginning @ 12'</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>CL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CLAY with silt and very fine sand (CL), grey, moist, stiff, few root channels, moist</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

- [Soil log data and descriptions](Riverbend_borelogs11_16.xls)
**WELL COMPLETION DIAGRAM**

**PROJECT**: Riverbend Landfill  
**LOCATION**: McMinnville, Oregon  
**ELEVATION**: 127.10 ft msl  
**DRILLING CONTRACTOR**: Geo-Tech Explorations, Inc.  
**DRILLING METHOD AND EQUIPMENT USED**: B-58 Mobile Hollow-Stem Auger (6.25" ID)  
**INSTALLATION DATE(S)**: 10/02/2000

1. **Ground elevation at well**  
   127.10 ft msl

2. **Top of casing elevation**  
   129.72 ft msl

3. **Wellhead protection cover type**  
   a) chain link  
   b) concrete pad dimensions
   - Above-ground monument:  
   - No
   - Approx. 2' x 2'

4. **Diameter of well casing**  
   2" Sch. 40 PVC

5. **Type/size of screen**  
   2" Sch. 40 PVC / 0.010 slot

6. **Type screen filter**  
   a) Quantity used  
   - Silica sand (19-20g)
   - 7-50 lb bags

7. **Type of seal**  
   a) Quantity used  
   b) Top of seal  
   - Bentonite chips
   - 26 - 50 lb bags
   - Concrete

**Development method**: Pump & surge  
**Development time**: Approx. 4 hours  
**Estimated purge volume**: 248 gallons

**Comments**:  
Well screen length is nominal; actual screened portion is approx. 6 inches shorter than labeled length.

---

**Diagram** with labeled sections:  
- 1. Ground elevation at well  
- 2. Top of casing elevation  
- 3. Wellhead protection cover type (chain link, concrete pad dimensions)  
- 4. Diameter of well casing (2" Sch. 40 PVC)  
- 5. Type/size of screen (2" Sch. 40 PVC / 0.010 slot)  
- 6. Type screen filter (Silica sand)  
- 7. Type of seal (Bentonite chips, concrete)  

**Symbols** used in the diagram:
# SOIL BORING LOG

**PROJECT:** Riverbend Landfill  
**LOCATION:** McMinnville, Oregon  
**DATE:** 09/30/2000  
**ELEVATION:** 127.10 ft msl  
**DRILLING CONTRACTOR:** Geo-Tech Explorations, Inc.  
**DRILLING METHOD:** Hollow-Stem Auger  
**WATER LEVELS:**  
**START:**  
**LOGGER:** B. Long

<table>
<thead>
<tr>
<th>DEPTH BELOW SURFACE (FT)</th>
<th>SOIL DESCRIPTION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Grassy field</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cuttings: CLAY (CL), gray, moist, medium stiff.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CLAY w/silt (CL), mottled reddish-brown, medium stiff, moist, trace organics, sand-sized iron nodules, small root channels,</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>As above, but stiffer, moist to wet, darker gray beginning ø 12'</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td>CLAY with silt and very fine sand (CL), gray, moist, stiff, few root channels, moist</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>fine root channels to 24 feet.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Poorly graded fine GRAVEL with sand and silt, yellow-brown to red-brown, wet, very dense, oxidized weathered gravel, occasional interbeds of gray plastic clay (GP)</td>
</tr>
</tbody>
</table>
### Soil Boring Log

**Project:** Riverbend Landfill  
**Location:** McMinnville, Oregon  
**Date:** 09/30/2000  
**Elevation:** 127.10 ft MSL  
**Drilling Contractor:** Geo-Tech Explorations, Inc.  
**Drilling Method:** Hollow-Stem Auger  
**Water Levels:**  
**Start:**  
**Logger:** B. Long

<table>
<thead>
<tr>
<th>Depth Below Surface (FT)</th>
<th>Soil Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>GRAVEL with clay, reddish-brown, moist to wet, dense, matrix supported, basalt gravel clasts</td>
<td>End of boring @ 40 ft</td>
</tr>
</tbody>
</table>

SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.
1. Ground elevation at well: 116.18 ft msl
2. Top of casing elevation: 120.02 ft msl
3. Wellhead protection cover type:
   a) drain tube: No
   b) concrete pad dimensions: Approx. 2' x 2'
4. Diameter/type of well casing: 2" Schedule 40 PVC
5. Type/slot size of screen: 2" Schedule 40 PVC / 0.010 slot
6. Type screen filter:
   a) Quantity used: Silica sand (20-40)
   b) 8 - 50 lb bags
7. Type of seal:
   a) Quantity used: Bentonite chips
   b) 3 - 50 lb bags
   c) Top of seal: Concrete

Development method: Pump & surge
Development time: Approx. 5 hours
Estimated purge volume: 8 gallons

Comments: Well screen length is nominal, actual screened portion is approx. 6 inches shorter than labeled length.
<table>
<thead>
<tr>
<th>SAMPLE INTERVAL, #</th>
<th>SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Grassy field  No samples obtained 0'-4'</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>SILT with fine sand (ML), reddish-brown, moist, medium stiff; low plasticity; root channels present</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SILT (ML), reddish-brown; moist; medium stiff; some mottled gray areas; higher moisture than 4'-6'; medium plastic.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Brown and gray mottling; some rootlets; decayed wood particle @ 11'; increased gray mottling @ 11'; very moist; med-high plasticity</td>
<td>End of boring @ 13 ft</td>
</tr>
</tbody>
</table>
WELL COMPLETION DIAGRAM

1- Ground elevation at well 116.56 ft msl

2- Top of casing elevation 119.53 ft msl

3- Wellhead protection cover type
   a) drain tube? No
   b) concrete pad dimensions Approx. 2' x 2'

4- Diameter/length of well casing 2" Sch. 40 PVC

5- Type/size of screen 2" Sch. 40 PVC / 0.010 slot

6- Type screen filter
   a) Quantity used Silica sand (10-20)
      7 - 50 lb bags
   b) Top of seal Bentonite chips
      16 - 50 lb bags
      Concrete

Development method Pump & surge

Development time Approx. 5 hours

Estimated purge volume 312 gallons

Comments Well screen length is nominal; actual screened portion
is approx. 6 inches shorter than labeled length
**SOIL BORING LOG**

**PROJECT:** Riverbend Landfill  
**LOCATION:** McMinnville, Oregon  
**ELEVATION:** 116.66 ft msl  
**DRILLING CONTRACTOR:** Geo-Tech Explorations, Inc.  
**DRILLING METHOD:** Hollow-Stem Auger  
**WATER LEVELS:**  
**DEPTH BELOW SURFACE (FT) | SAMPLE INTERVAL, | GRAPHIC | SOIL NAME, USCS GROUP, SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, COMMENTS**
---|---|---|---|---
| | SOIL DESCRIPTION | |
| 5 | Grassy field, over It. Brown SILT. No samples obtained 0'-4' | |
| 10 | SILT with fine sand (ML), reddish-brown, moist, med. stiff low plasticity | |
| 15 | Silt (ML), brown and gray mottling, moist, stiff; some rootlets; decayed wood particle @ 11'; increased gray mottling @ 11'; Higher moisture, high plasticity | |
| 20 | Poorly-graded SAND with silt (SP); gray-brown, wet, dense. clay present (10%); (SP) | |
| 25 | Poorly-graded GRAVEL with silt and sand; reddish-brown, wet, dense, gravel clasts subrounded, 5-20 mm; (GP), sand is medium to coarse. | |
| 30 | Poorly-graded coarse SAND with silt (SP); gray, wet, dense. | |
| 35 | GRAVEL with silt, sand, and clay, reddish-brown and gray (GM); wet, dense, sand (10%), round gravel to 25 mm; clast-supported; SILTY SAND (SM), red-brown, wet; dense, gravel (10%) (SM) SILT with sand (ML), red-brown; moist; stiff, low plast. | End of boring @ 34 ft |

Riverbend borelogs11_16.xls