

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 **1 OF 4**
 GROUND ELEV. _____
 TOTAL DEPTH **61.50'**
 DATE COMPLETED **09/06/89**

SAMPLE NUMBER	RECOVERY (ft./ft.)	BLOW COUNTS (N COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
				5				0-5' SILTY CLAY (CL), black (5Y, 2.5/1); 90% fines, low to medium plasticity; 10% fine sand; common wood chips; damp.
#1	1.5/1.5	3-4-6 (10)		5				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.
#2	1.5/1.5	2-2-4 (6)		10				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.
#3	1.5/1.5	2-2-4 (6)		15				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.
				20				

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.



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PAGE 2 OF 4
GROUND ELEV.
TOTAL DEPTH 61.50'
DATE COMPLETED 09/06/89

SAMPLE NUMBER	RECOVERY (ft./ft.)	BLOW COUNTS (IN COMPI)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
#4	1.5/1.5	1-2-4 (6)		20'				@20 ft: increasing silty content.
#5	1.5/1.5	2-3-3 (6)		25'				26-35' SILTY CLAY (CL), dark gray (5Y, 4/1); 100% fines, low to medium plasticity; trace fine sand; slow dilatency; firm; damp to wet.
#6	1.5/1.5	1-2-3 (5)		30'				26-35' SILTY CLAY (CL), continued from previous page.
#7	1.5/1.5	5-9-10 (19)		35'				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.
				40'				

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.



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BORING NO. MW- 1A
PAGE 3 OF 4
GROUND ELEV.
TOTAL DEPTH 61.50'
DATE COMPLETED 09/06/89

SAMPLE NUMBER	RECOVERY ((L./L.))	BLOW COUNTS (N COMPI)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
#8	1.5/1.5	4-4-6 (10)						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.
#9	1.5/1.5	6-8-11 (19)		45				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.
#10	0.8/1.5	45-50-0 (50)		50				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.
#11	1.5/1.5	5-35-50 (85)		55				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. 55.5-56' SANDY CLAY (CL), pale olive (5Y, 6/3); 60% fines, low to medium plasticity, slightly silty; 40% fine sand; common altered feldspar; dense; damp.
				60				56-60' CLAYEY SANDY GRAVEL (GC), dark grayish brown (10YR, 4/2); 15% fines, low to medium

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.



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BORING NO. MW- 1A
PAGE 4 OF 4
GROUND ELEV.
TOTAL DEPTH 61.50'
DATE COMPLETED 09/06/89

SAMPLE NUMBER	RECOVERY (ft./ft.)	BLOW COUNTS (N COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
#12	1.5/1.5	12-14-16 (30)		65				plasticity; 35% fine sand; 50% fine to coarse gravel; common iron oxide staining; very dense; damp to wet. 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. BOTTOM OF BORING AT 61.5 FEET.
				70				
				75				
				80				

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

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DRILLED BY Geo-Tech
DRILL METHOD H/S AUGER
LOGGED BY G. Kelty

BORING NO. MW- 1B
PAGE 1 OF 2
GROUND ELEV.
TOTAL DEPTH 26.50'
DATE COMPLETED 09/08/89

SAMPLE NUMBER	RECOVERY ((L./L.))	BLOW COUNTS (N COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
#1	0.8/1.5	3-5-9 (14)		5	1		1	0-5' SILTY CLAY (CL), black (5Y, 2.5/1); 90% fines, low to medium plasticity; 10% fine sand; common wood chips; damp.
#2	1.5/1.5	2-3-4 (7)		10	2		2	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.
#3	1.5/1.5	1-2-2 (4)		15	3		3	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 dilatency; firm; damp.
				20			4	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 dilatency. Clayey Silt: 90% fines, slight to low plasticity; rapid dilatency; 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.



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- 1B
PAGE 2 OF 2
GROUND ELEV.
TOTAL DEPTH 26.50'
DATE COMPLETED 09/08/89

SAMPLE NUMBER	RECOVERY (ft./ft.)	BLOW COUNTS (IN COMPI)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
#4	1.5/1.5	2-3-5 (8)		20'				@20 ft: increasing silty content.
#5	1.5/1.5	2-5-10 (15)		25				26-26.5' SILTY CLAY (CL), dark gray (5Y, 4/1); 100% fines, low to medium plasticity; trace fine sand; slow dilatency; firm; damp to wet.
				30				
				35				
				40				

BOTTOM OF BORING AT 26.5 FEET.

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.





Sweet, Edwards & Associates, Inc.

MW-2
BORING LOG (AH-4)

Project YAMHILL SOLID WASTE

Sheet 1 of 2

Client _____

Drilled By Sweet-Edwards

Feature _____

Logged By D.A. COPPELL

Location _____

Date Logged 1/26/81

Depth to Water _____

Surf Elev. _____

Date 1/26/81

Total Depth 40.0'

WELL DETAIL	UNIFIED CLASS	DEPTH (ft)	ELEVATION (ft)	SAMPLE RECORD				DESCRIPTION	
				Sample No	Blows per 6 inches	Recovery w/n 0.1 ft	Sample Type		
	ML	0-5						NOTE This hole is adjacent to Test Pit #7, see log for TP.7 for materials description from 0.0-10.0'	
		5-10							
		10-15							
		15-20			1				
		20-25			2				
		25-30			3				
		30-35			4				
		35-40							
	CL	26.0-30.0						26.0-40.0 SANDY SILTY CLAY AND SILTY CLAY - grey-blue, compact, moderately sticky and stiff, locally sandy.	
		30.0-40.0							

REMARKS: All samples pushed



Sweet, Edwards & Associates, Inc.

MW-2
BORING LOG (AH-4)

Project _____ Sheet 2 of 2
 Client _____ Drilled By _____
 Feature _____ Logged By _____
 Location _____ Date Logged _____
 Depth to Water _____ Surf Elev. _____
 Date _____ Total Depth _____

WELL DETAIL	UNIFIED CLASS	DEPTH (ft)	ELEVATION (ft)	SAMPLE RECORD				DESCRIPTION
				Sample No	Blows per 6 inches	Recovery w/o 0.1 ft	Sample Type	
		35						NOTE: increased drilling resistance below 30.0' B.O.H. 40'
		40		S		100%	SS	

REMARKS:

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 1 OF 2
GROUND ELEV. 138.20'
TOTAL DEPTH 35.00'
DATE COMPLETED 06/23/93

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
100								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).
100	0.5			5				@ 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.
100	2.5			10				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.
	2.5							10.4 to 13.0 feet: SILTY CLAY (CL), dark greenish gray (5G 4/1); medium plasticity fines; stiff; moist.
	1.5							@ 12.5 feet: moist to wet.
100	1.5 to 2.5		6/23/93	15				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.
	3							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.
	2							
	2							
	2							
	1.5 to 2.5		8/10/93					
100	3			20				

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.



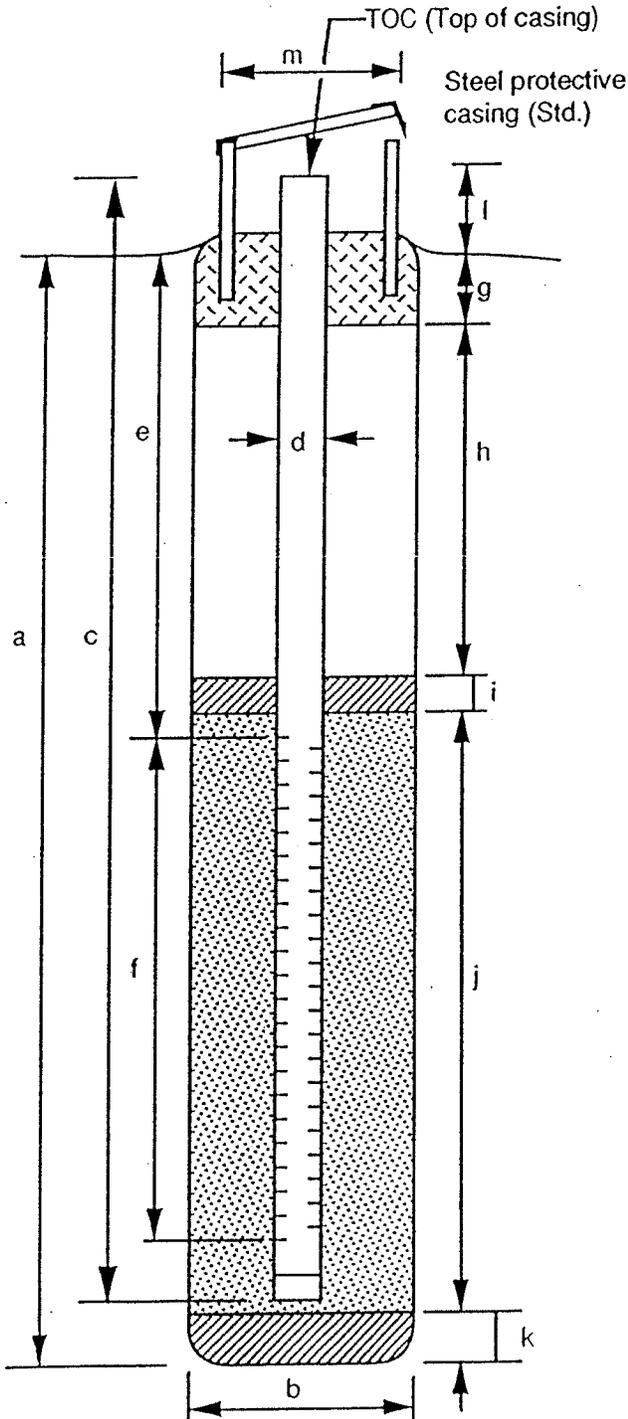
WELL DETAILS



EMCON
ASSOCIATES

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: Craig D. Frazier Date: 10/1/93

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

BORING NO. MW-3B
PAGE 1 OF 7
GROUND ELEV. 137.80'
TOTAL DEPTH 68.50'
DATE COMPLETED 06/28/93

RECOVERY PERCENT	POCKET PENETROMETER (Tone/SF)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
97	3			0				<p>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.</p> <p>@ 6.5 feet: approximately 3-inches thick, gray; very soft.</p> <p>@ 7.5 feet: approximately 3 to 5-inch thick, gray; very soft.</p> <p>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.</p> <p>Note: easy drilling.</p>
	4.5			1				
				2				
100	1			3				
				4				
	2			5				
				6				
	2			7				
	3.5			8				
	4.5			9				
100	3			10				
	3			11				
	2			12				

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.



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

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	1.5							13.3 to 22.0 feet: SILTY CLAY (CL), continued. @ 20.0 feet: silt content is variable; moist to wet, free water inside macropores.
	2.5							
	2							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 peds which are hard and crumbly; damp to wet, some zones are damp to moist while others are moist to wet. @ 24.0 to 27.0 feet: rust red mottles are approximately 1/2-inch diameter.
100	1.5							
	1.5							
	1.5			25				@ 27.0 feet: contact with underlying clay unit is distinctively sharp.
	1							
	1.5							
	1.5							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 peds, 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.
100	1.5							
	2							
				30				

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.



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BORING NO. MW-3B
PAGE 4 OF 7
GROUND ELEV. 137.80'
TOTAL DEPTH 68.50'
DATE COMPLETED 06/28/93

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
				27.0				27.0 to 38.5 feet: CLAY (CL), continued.
	2.5							
	2							
	1.5							
100	1.5	51						
	1.5			35				
	1.5							
	2.5							
	1.5							
100				40				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'-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 Well Details. See explanation for definition of symbols.



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BORING NO. MW-3B
PAGE 5 OF 7
GROUND ELEV. 137.80'
TOTAL DEPTH 68.50'
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RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	1.5							40.0 to 41.0 feet: CLAYEY SILT (ML), light olive brown (2.5Y 5/4); low to medium plasticity fines; stiff; wet.
	1.5							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.
40								42.0 to 43.0 feet: SAND (SP), reddish brown (5YR 4/4); <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.
				45				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.
10								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).
								@ 49.0 to 53.5 feet: very rough drilling, possible larger cobbles.
				50				

REMARKS

Drilled w/10" OD (8.5" 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.



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

RECOVERY PERCENT	POCKET PENETROMETER (Tone/SF)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
100				55				<p>43.5 to 53.0 feet: SANDY GRAVEL (GP), continued.</p> <p>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 loose; wet. @ 53.5 to 58.5 feet: easier drilling.</p> <p>@ 59.0 feet: gravels mostly 3/8 to 1/2 inch; several 1 to 1.5-inch thick firmly cemented zones.</p>
100				60				

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 Well Details. See explanation for definition of symbols.



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

RECOVERY PERCENT	POCKET PENETRO-METER (Tons/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
				65				<p>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.</p> <p>63.0 to 63.5 feet: SAND (SP), dark greenish gray (5G 4/1); < 5% fines, 95% medium sand, well sorted; wet.</p> <p>BORING TERMINATED AT 63.5 FEET.</p>
				70				

REMARKS

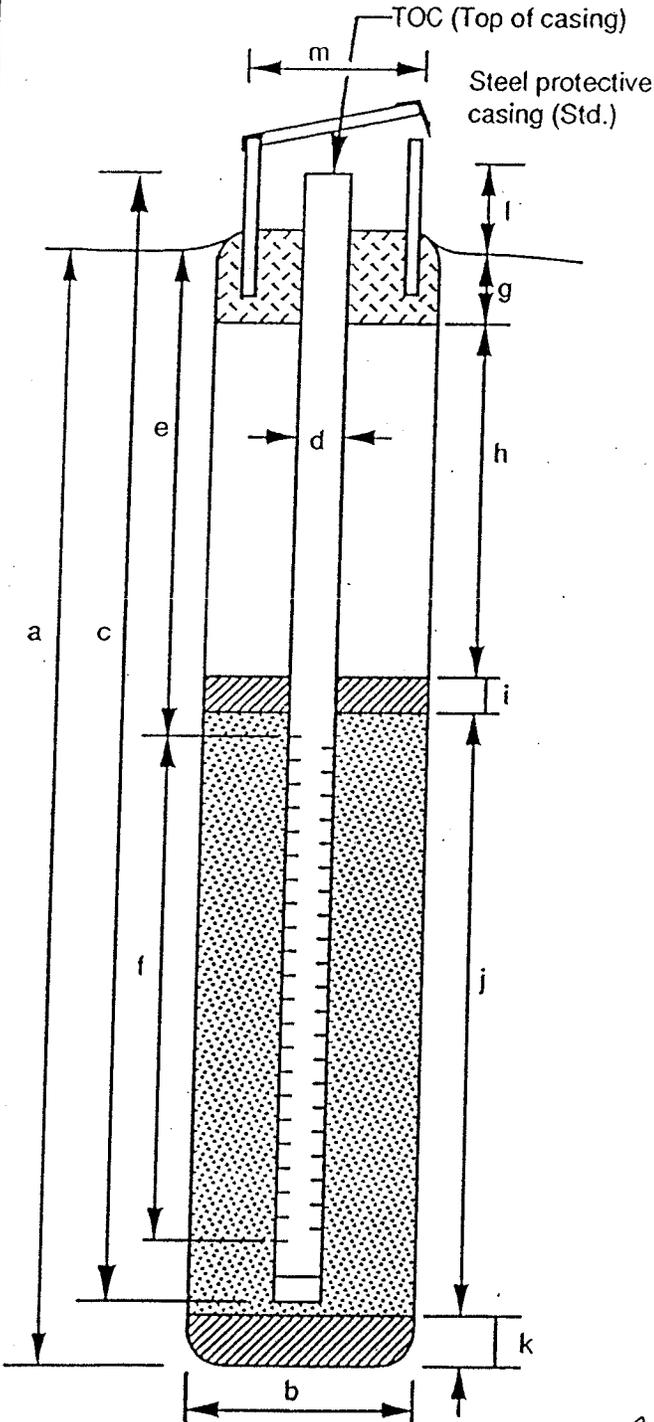
Drilled w/10" OD (6.5" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted w/rings. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. See explanation for definition of symbols.



WELL DETAILS

CLIENT Riverbend Landfill Company, Inc.
 PROJECT NUMBER 0258-001.24
 PROJECT NAME Remedial Investigation
 LOCATION McMinnville, Oregon
 WELL PERMIT NO. 54789

BORING / WELL NO. MW-3B
 TOP OF CASING ELEV. 140.57
 GROUND SURFACE ELEV. 137.80
 DATUM Feet-Mean Sea Level
 INSTALLATION DATE 6/28/93



EXPLORATORY BORING

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

WELL CONSTRUCTION

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: Craig R. 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-4A
PAGE 1 OF 2
GROUND ELEV. 139.20'
TOTAL DEPTH 71.80'
DATE COMPLETED 06/10/93

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
75	2.5 3 1 1			0			0	0 to 9.5 feet: SILTY CLAY (CL), dark grayish brown (10YR 4/2), trace reddish brown mottling; medium plasticity fines; some small rootlets; stiff; damp. @ 3.5 to 5.3 feet: color changes to gray; wet. @ 4.5 to 8.0 feet: very stiff to hard. @ 5.3 feet: color changes to light brown with 10-30% gray mottling. @ 6.5 to 7.5 feet: silt content increases.
100	4.5 4.5 4.5 4 3.5 3 2 2.5 1.5			5			5	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 peds; stiff, damp. @ 12.5 feet: less gray mottling, rust red mottling starts. @ 13.0 feet: all brown. @ 13.5 to 16.0 feet: dark brown (10YR 3/2), very little to no mottling; low plasticity fines; trace mica; very stiff; damp. @ 15.5 to 16.0 feet: transition to next soil unit indicated by increasing greenish gray crumbly soil with some decayed organic material.
100	1 to 1.5	28		10			10	
100	1			15			15	16.5 to 36.2 feet: SILTY CLAY (CL), grayish brown (10YR 4/2), very little mottling; medium plasticity fines; stiff to very stiff; damp to moist. @ 17.0 to 17.5 feet: approximately 50% brown mottling. @ 17.5 to 21.5 feet: 95% gray, very little mottling; silt content increases.
100	2 to 2.5 1.5 to 2 1.5 to 2 3 3 3.5 to 4			20			20	

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.



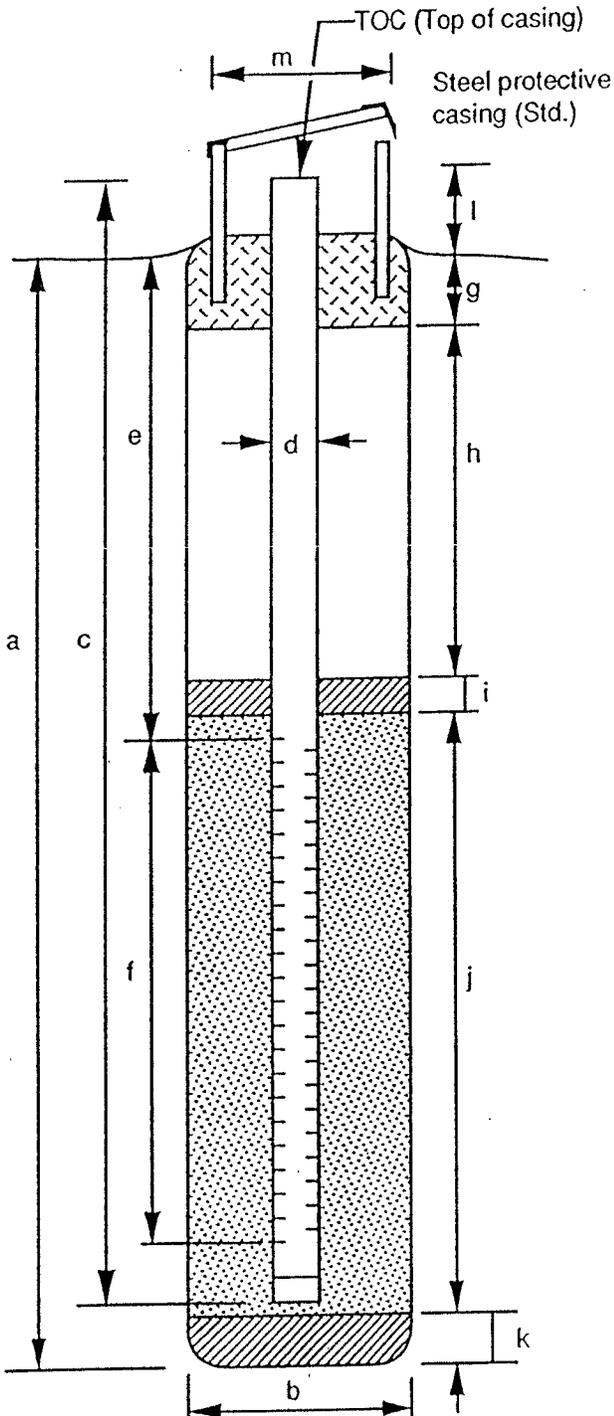
WELL DETAILS



EMCON
ASSOCIATES

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: Raig R. Fanshier Date: 10/1/93

Ventu. c.4 Rev. 7/23/91

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

RECOVERY PERCENT	POCKET PENETROMETER (Tone/SF)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
88	4 to 4.5			0.5 1 1.5				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. @ 3.3 to 3.5 feet: slight reddish brown mottling. @ 3.5 feet: greenish gray (5G 4/1).
100				5				@ 5.5 feet: dark yellowish brown (10YR 4/4); medium plasticity fines, silt content increases; no macropores; some horizontal bedding; stiff; moist to damp (wetting front?).
	4.5			2 1 1				@ 8.0 feet: several 1-inch diameter gray mottling.
100	2			1.5				@ 9.5 to 13.0 feet: stiff; damp.
				10				

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.



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 2 OF 8
GROUND ELEV. 137.80'
TOTAL DEPTH 71.80'
DATE COMPLETED 06/10/93

RECOVERY PERCENT	POCKET PENETROMETER (Tone/SF)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
100	1.5 1.5 3 2.5 4.5			15				0 to 13.0 feet: SILTY CLAY (CL), continued. @ 10.0 feet: some gray mottling. @ 11.0 to 12.0 feet: 15-25% rust red mottling.
100	4.5 0.5 1.5							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.
100	1.5 1 3							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. @ 18.5 to 21.5 feet: dark greenish gray (5G 4/1).

REMARKS

Drilled w/10" OD (8.5" 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.



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

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	2.5							16.5 to 31.5 feet: SILTY CLAY (CL), continued.
	2.5							@ 21.5 feet: color transitions back to 20% brown and 80% gray mottling.
	2.5							
	2.5							
	3							@ 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.
100	2.5			25				
	3							
	2.5							
	2.5							
	3							
	2.5		6/10/93					
	3.5		8/10/93					@ 28.5 feet: 80% dark olive gray (5Y 3/2), with 10-20% reddish brown mottling; moist to wet along soil ped surfaces.
	3.5							
100	2.25			30				

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.



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

RECOVERY PERCENT	POCKET PENETROMETER (Tons/SF)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	2							16.5 to 31.5 feet: SILTY CLAY (CL), continued.
	2.5							
	3							
	3							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.
	3.5							
	3							@ 33.5 to 37.5 feet: olive brown (2.5Y 4/4) to light olive brown (2.5Y 5/4).
100	3.5			35				
	4							
	3							
	2.5							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.
	2.5							
100		36		40				

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.



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

RECOVERY PERCENT	POCKET PENETRO-METER (Tons/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
								37.5 to 41.0 feet: SILTY CLAY (CL), continued.
100	0.25							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.
	1							
	2							42.5 to 50.0 feet: SILTY 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.
	2							
100	0.75			45				@ 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.
	1.5							@ 47.0 feet: several small brown wood fragments.
	1							
	0.5							
100	0.5							
				50				

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.



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 6 OF 8
GROUND ELEV. 137.80'
TOTAL DEPTH 71.80'
DATE COMPLETED 06/10/93

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
				80			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. @ 51.5 feet: dark yellowish brown (10YR 3/4); gravels in point contact in a sandy clay matrix, appears well compacted; wet.	
				100			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.	
				100			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.	
				55				
				60				

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.



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	POCKET PENETROMETER (Tone/SF)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
89				65				<p>54.5 to 61.5 feet: SANDY GRAVEL (GP), continued.</p> <p>61.5 to 61.8 feet: SILTY (ML), brown; low plasticity fines, wet.</p> <p>61.8 to 71.8 feet: 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).</p>
				70				

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.



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 8 OF 8
 GROUND ELEV. 137.80'
 TOTAL DEPTH 71.80'
 DATE COMPLETED 06/10/93

RECOVERY PERCENT	POCKET PENETROMETER (Tone/SF)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
				75	80			61.8 to 71.8 feet: BASALT, continued. 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 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.



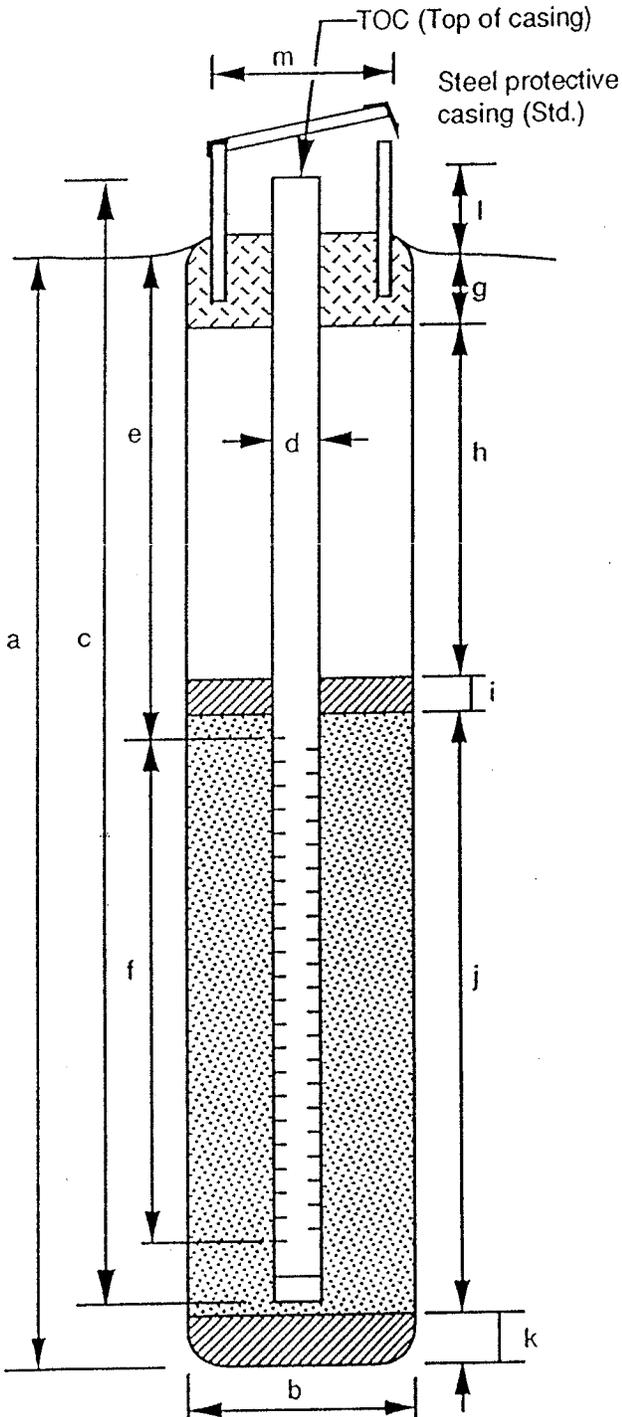
WELL DETAILS



EMCON
ASSOCIATES

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 R. 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**

SAMPLE NUMBER SAMPLE TYPE	RECOVERY PERCENT	BLOW COUNTS (N COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
MW-8-5 SS	67%	4-6-8 (14)		5	5		0-5	0-5 feet: SILTY CLAY , brown, moist, stiff, medium plasticity, some organic matter. (ALLUVIUM)
MW-8-10 SS	78%	3-4-8 (12)		10	10		10-11.1	5-6 feet: SILTY CLAY , dark gray, moist, stiff, medium plasticity, some organic matter. (ALLUVIUM)
MW-8-15 SS	94%	4-7-10 (17)		15	15		15-16.4	10-11.1 feet: SILTY CLAY , brown with gray mottling, moist, stiff, medium plasticity. (ALLUVIUM)
				20				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 6.5' 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**

SAMPLE NUMBER SAMPLE TYPE	RECOVERY PERCENT	BLOW COUNTS (N COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
MW-8-20 SS	100%	3-6-8 (14)		24.2' (Static)	25			20-21.5 feet: SILTY CLAY , brown with gray and reddish mottling, moist, stiff, medium plasticity. (ALLUVIUM)
MW-8-25 SS	100%	3-4-5 (9)						25-28 feet: SILTY CLAY , brown with gray and reddish mottling, moist, stiff, medium plasticity, some water in pore spaces. (ALLUVIUM)
								Bottom of boring at 28.0 feet below ground surface.
				30				
				35				
				40				

REMARKS

Drilled with continuous sampling barrel. Well constructed as shown with 2-inch PVC with 0.010-inch slots. Well casing protected with 6.5' high locking steel protective casing and three 3 foot high steel posts in

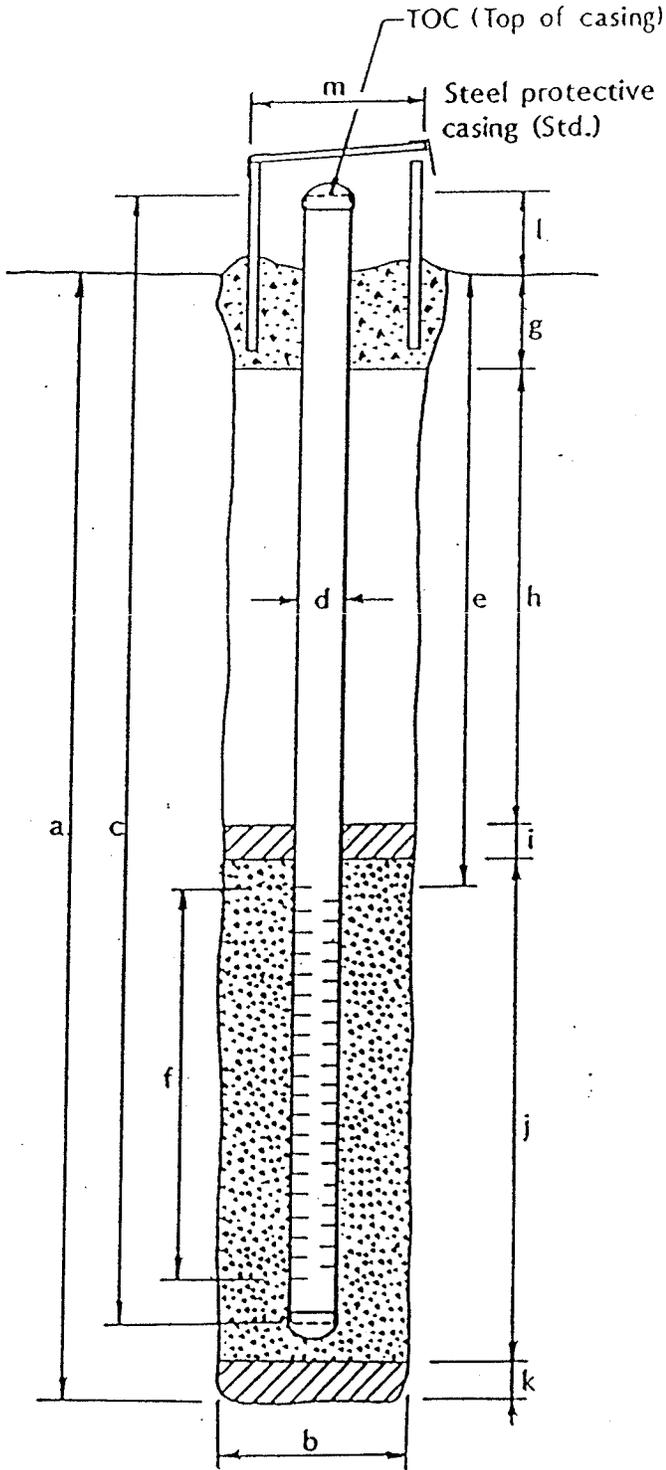


WELL DETAILS



PROJECT NUMBER 0258-001.18
 PROJECT NAME Phase I Preliminary Assessment
 LOCATION Riverbend Landfill
 WELL PERMIT NO. NA

BORING / WELL NO. MW - 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
- g. Surface seal 2 ft.
Seal material Concrete
- h. Backfill 0 ft.
Backfill material NA
- 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 2 OF 3
GROUND ELEV.
TOTAL DEPTH 44.70'
DATE COMPLETED 09/03/92

SAMPLE NUMBER	RECOVERY PERCENT	BLOW COUNTS (IN COMPI)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
				25				20-22 feet: CLAYEY SILT, brown with gray and reddish mottling, moist, low plasticity, stiff. (ALLUVIUM)
			▽ 27.6' (Static)					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)
				30				@ 31.8-34.1 feet: Gray.
			▽ 35' During drilling					34.1-37.3 feet: CLAYEY SILT, gray, moist, stiff, trace plant rootlets. (ALLUVIUM) @ 34.5 feet: Moist to wet.
				35				37.3-38.3 feet: SANDY SILT, gray, fine-grained sand, wet. (ALLUVIUM)
								38.3-38.7 feet: SILTY SAND, gray, fine-grained, wet. (ALLUVIUM)
				40				38.7-40.5 feet: GRAVELLY SAND, gray, fine- to

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



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 **3 OF 3**
 GROUND ELEV.
 TOTAL DEPTH **44.70'**
 DATE COMPLETED **09/03/92**

SAMPLE NUMBER	RECOVERY PERCENT	BLOW COUNTS (N COMPI)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
				45				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.
				50				
				55				
				60				

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



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-6A
PAGE 1 OF 2
GROUND ELEV. 126.20'
TOTAL DEPTH 22.50'
DATE COMPLETED 05/24/93

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
96								0 to 15.0 feet: SILTY CLAY (CL) , light to dark brown with 20-30% strong grayish mottling, some reddish brown mottling; medium plasticity fines, some silt; granular soil peds; no macropores; stiff; damp.
	2							@ 1.5 to 4.5 feet: approximately 50% gray and 50% brown mottled soil.
	2							@ 4.0 to 4.5 feet: crushed red bricks.
	2							@ 4.5 to 6.0 feet: wet.
	2							@ 5.5 feet: color changes to dark yellowish brown (10YR 4/4) with 10% light gray mottling.
100	1.5			5				@ 7.5 feet: some 1/16-inch macropores.
	1							@ 8.5 to 9.0 feet: approximately 20% gray mottling.
	2							
	2							
	1							
	1.5							
90	2			10				@ 13.0 feet: dark brown (10YR 3/3).
	1.5							
	1.5							
	1.5							
	1.5							
	1.5							
	1.5							
87	2.5	27	8/10/93	15				@ 14.0 to 15.0 feet: color change from the overlying brown to dark olive gray is sharp.
								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.
100	2.5		5/24/93					@ 18.5 feet: no purplish tint; soil slightly firmer.
	1.5							
	1.5							
	15							
	15							
100				20				

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.



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-6A
PAGE 2 OF 2
GROUND ELEV. 126.20'
TOTAL DEPTH 22.50'
DATE COMPLETED 05/24/93

RECOVERY PERCENT	POCKET PENETROMETER (Tons/SF)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
				25	30	35	40	15.0 to 22.5 feet: CLAY (CL), continued. @ 20.5 feet: color changes to olive gray, with very slight purplish tint; soil is crumbly.
								BORING TERMINATED AT 22.5 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. 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**

WELL DETAILS

CLIENT Riverbend Landfill Company, Inc.

BORING / WELL NO. MW-6A

PROJECT NUMBER 0258-001.24

TOP OF CASING ELEV. 128.95

PROJECT NAME Remedial Investigation

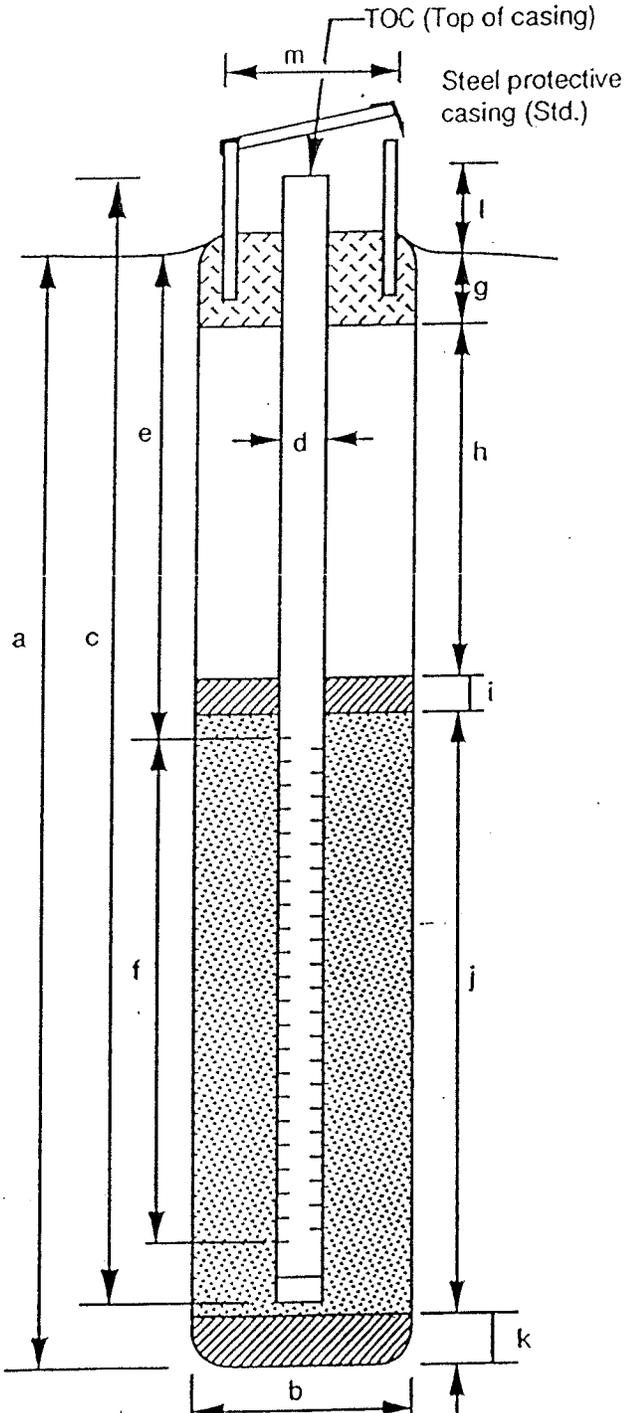
GROUND SURFACE ELEV. 126.2

LOCATION McMinnville, Oregon

DATUM Feet-Mean Sea Level

WELL PERMIT NO. 52005

INSTALLATION DATE 5/24/93



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.

Rev. 7/23/91

Mac 4

Prepared by: Craig Fanshier

Reviewed by: Ray D. Fankin 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-6B
PAGE 1 OF 6
GROUND ELEV. 137.80'
TOTAL DEPTH 56.00'
DATE COMPLETED 06/09/93

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
88				0				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. @ 0 to 6.0 feet: moderately well developed granular soil peds.
88	2.5			5				@ 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.
	2							
	2.5							
100	2.5			10				

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-6B
PAGE 4 OF 6
GROUND ELEV. 137.80'
TOTAL DEPTH 56.00'
DATE COMPLETED 06/09/93

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
70				35				<p>28.0 to 34.0 feet: SILTY CLAY (CL), continued.</p> <p>@ 32.0 to 34.0 feet: approximately 10% brown mottling.</p> <p>34.0 to 36.0 feet: 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.</p> <p>36.0 to 42.5 feet: 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.</p>
70				40				

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-6B
PAGE 5 OF 6
GROUND ELEV. 137.80'
TOTAL DEPTH 56.00'
DATE COMPLETED 06/09/93

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
				75			45	36.0 to 42.5 feet: SANDY GRAVEL (GM), continued. @ 42.5 feet: 3-inch basalt cobble.
								42.5 to 45.5 feet: 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. @ 44.0 feet: damp.
				100				45.5 to 56.0 feet: BASALT, greenish gray, alphanitic, very small vesicles, calcite veining, trace dessiminated pyrite. 100% RQD. (FLOW FOOT BRECIA NESTUCCA FORMATION).
							50	

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-6B
PAGE 6 OF 6
GROUND ELEV. 137.80'
TOTAL DEPTH 56.00'
DATE COMPLETED 06/09/93

RECOVERY PERCENT	POCKET PENETROMETER (Tone/SF)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
				55				45.5 to 56.0 feet: BASALT, continued.
				60				BORING TERMINATED AT 56.0 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.



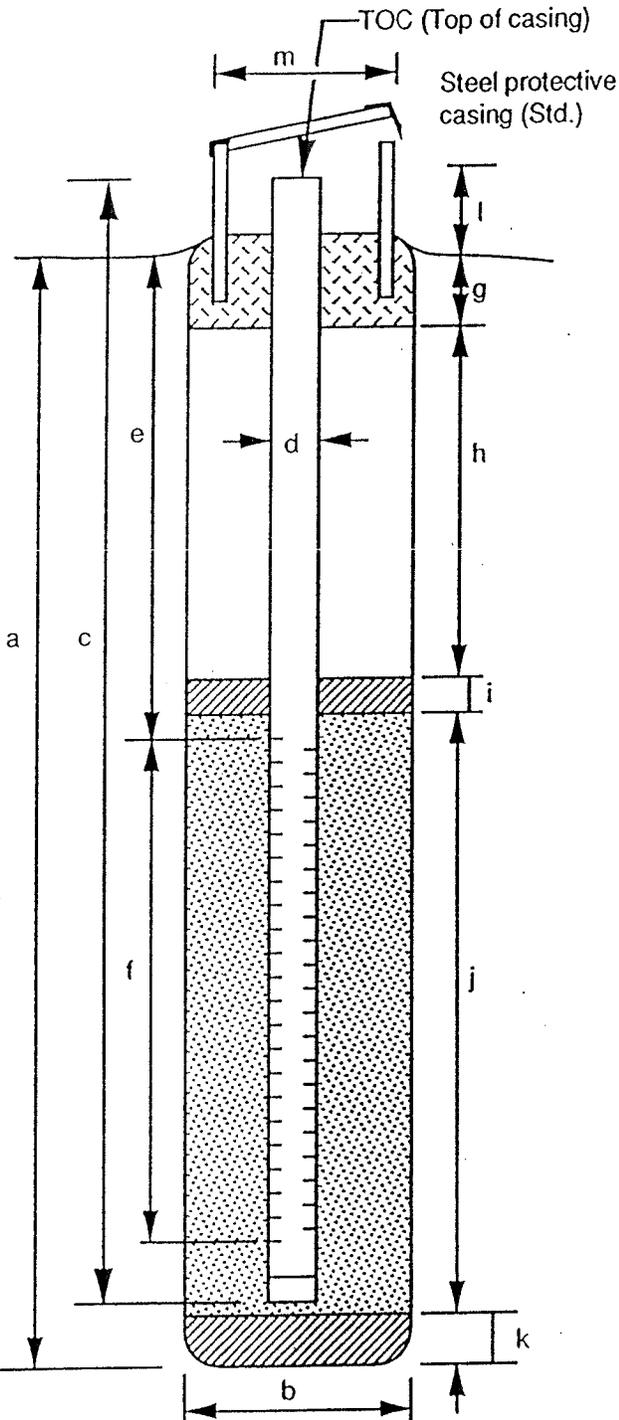


EMCON ASSOCIATES

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 12.8 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 R. 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

RECOVERY PERCENT	POCKET PENETROMETER (Tone/5F)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
100	4.5							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)
	2.5							
	2							
	1							
90	1.5 to 2			5				@ 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.
	1.5 to 2							
	1.5							
	1							
	1							
	1							
100	1			10				@ 10.5 feet: grades to a brown (10YR 5/3).
	1							
	1							
	1							
	1							
	1							
	1							
100	1			15				@ 13.5 feet: approximately one macropore per sq. inch. @ 14.0 feet: driller notes water in borehole.
	1							
	1							
86	1							17.0 to 32.5 feet: CLAYEY SILT (CL), brown (10YR 3/2), slight rust red mottling, low plasticity fines; stiff; wet.
	1							@ 18.8 feet: light olive gray (2.5Y 5/4).
	1.5							
68				20				

8/10/93
 5/26/93

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.



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 2 OF 2
GROUND ELEV. 137.80'
TOTAL DEPTH 32.50'
DATE COMPLETED 05/26/93

RECOVERY PERCENT	POCKET PENETRO-METER (Tons/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
100	<0.5			25				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 peds; minor relic root traces; some macropores; wet.
100	2 2 2			30				@ 30.9 feet: slight purplish tint, no mottling; abundant 1/32- to 1/16-inch macropores, approximately 10 per sq. inch; very stiff; wet.
	3			35				BORING TERMINATED AT 32.5 FEET.
				40				

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.

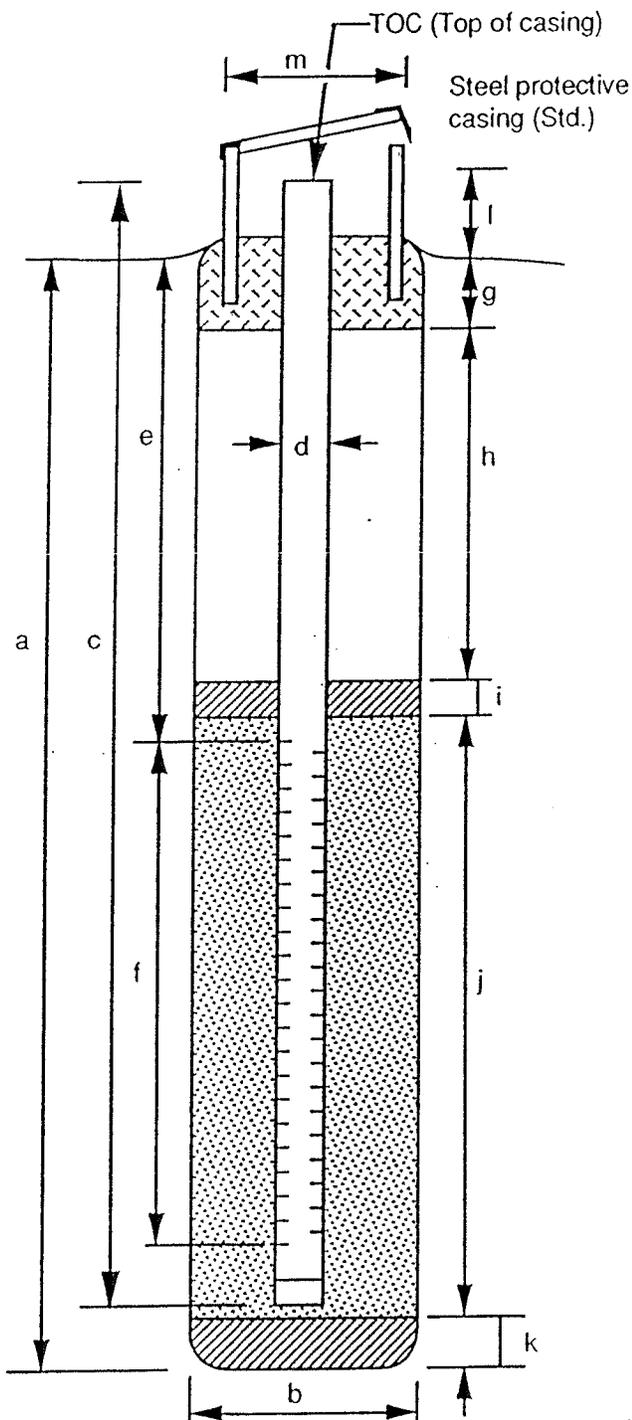




WELL DETAILS

CLIENT Riverbend Landfill Company, Inc.
 PROJECT NUMBER 0258-001.24
 PROJECT NAME MW-5 Remedial Investigation
 LOCATION McMinnville, Oregon
 WELL PERMIT NO. 52007

BORING / WELL NO. MW-7A
 TOP OF CASING ELEV. 149.56
 GROUND SURFACE ELEV. 146.7
 DATUM Feet Mean Sea Level
 INSTALLATION DATE 5/26/93



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.

Prepared by: Craig Fanshier

Reviewed by: Craig D. 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-7B
PAGE 1 OF 9
GROUND ELEV. 146.50'
TOTAL DEPTH 146.50'
DATE COMPLETED 06/18/93

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
88	1			1				<p>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).</p> <p>@ 0 to 4.0 feet: small roots.</p> <p>@ 6.0 to 14.0 feet: abundant small macro pores, approximately 5 per square inch.</p> <p>@ 8.8 feet: moist.</p>
				2				
				2.5				
				2				
100	1.5			5				
				1.5				
				1.5				
				1				
				1				
				1				
100	0.75 to 1			10				

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 2 OF 9
GROUND ELEV. 146.50'
TOTAL DEPTH 146.50'
DATE COMPLETED 06/18/93

RECOVERY PERCENT	POCKET PENETROMETER (Tone/SF)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
100	0.75 1 0.75 1 1 1 0.5 0.5		6/17/93	15 20				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)
90								

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 3 OF 9
GROUND ELEV. 146.50'
TOTAL DEPTH 146.50'
DATE COMPLETED 06/18/93

RECOVERY PERCENT	POCKET PENETRO-METER (Tons/5F)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
100	1		8/10/93	25				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)
	1.25							22.0 to 24.0 feet: CLAYEY SILT (ML), as above at 17.0 to 20.0 feet, higher silt content.
	1.5							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)
	2.5							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)
	0.5							@ 25.3 to 25.5 feet: SILTY SAND (SM), as above at 24.0 to 24.5 feet.
	2							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.
100								29.0 to 29.5 feet: SILTY CLAY TO SANDY CLAY (CL), continues.
				30				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/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 4 OF 9
GROUND ELEV. 146.50'
TOTAL DEPTH 146.50'
DATE COMPLETED 06/18/93

RECOVERY PERCENT	POCKET PENETROMETER (Tone/SF)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	0.5							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)
	1.5							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)
	1.5			35				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.
100	1.5							@ 34.5 to 37.8 feet: medium to high plasticity; columnar peds with 2-4" vertical fractures, moist. Note: very little water in borehole.
	1.75							
	1							
	1.5							
	1.5							@ 38.5 feet: 1" thick lense of stained soil, olive brown.
100	1.5							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.
				40				

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 5 OF 9
GROUND ELEV. 146.50'
TOTAL DEPTH 146.50'
DATE COMPLETED 06/18/93

RECOVERY PERCENT	POCKET PENETRO-METER (Tons/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
100	1	31		45				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. @ 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, arkosic; firm; moist to wet. @ 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).
86								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.
20	3.5			50				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.

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

RECOVERY PERCENT	POCKET PENETROMETER (Tone/SF)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
70				55				<p>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.</p>
				60				<p>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.</p>
100				60				<p>57.5 to 61.0 feet: SILTY GRAVEL (GM), olive (5Y 4/3).</p>

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 7 OF 9
GROUND ELEV. 146.50'
TOTAL DEPTH 146.50'
DATE COMPLETED 06/18/93

RECOVERY PERCENT	POCKET PENETROMETER (Tone/SF)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
								47.5 to 54.5 feet: SILTY GRAVEL (GM), continued.
	2.5							61.0 to 64.5 feet: CLAYEY SILT (ML), dark greenish gray (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.
	3							
	4							64.5 to 65.0 feet: SILTY GRAVEL (GM), dark greenish gray (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.
100				65				
	4							65.0 to 67.0 feet: CLAYEY GRAVEL (GC), dark greenish gray (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.
								67.0 to 68.5 feet: SILTY GRAVEL (GM), dark greenish gray (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.
	4.5							68.5 to 71.0 feet: CLAYEY SILT (ML), continues.
90				70				

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 8 OF 9
GROUND ELEV. 146.50'
TOTAL DEPTH 146.50'
DATE COMPLETED 06/18/93

RECOVERY PERCENT	POCKET PENETRO-METER (Tons/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
33				75				<p>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.</p> <p>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.</p> <p>Note: bedrock contact at 72.5 feet.</p> <p>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)</p>
				80				

REMARKS

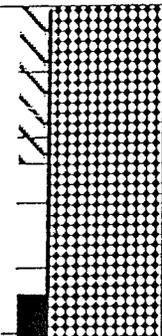
Drilled w/8" OD (4.25" ID) HSA. Samples continuously collected w/5'-long, 3" ID split barrel and 1.5'-long, 3" OD split spoon fitted w/rings. Bedrock was cored w/NX (3.5" OD) diamond core. A 2" PVC monitoring well was constructed in the borehole. Well construction information presented in Well Details. 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 9 OF 9
 GROUND ELEV. 146.50'
 TOTAL DEPTH 146.50'
 DATE COMPLETED 06/18/93

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
20		50/5"		85			72.5 to 82.6 feet: BASALT, continued. BORING TERMINATED AT 82.6 FEET.	
				90				

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.

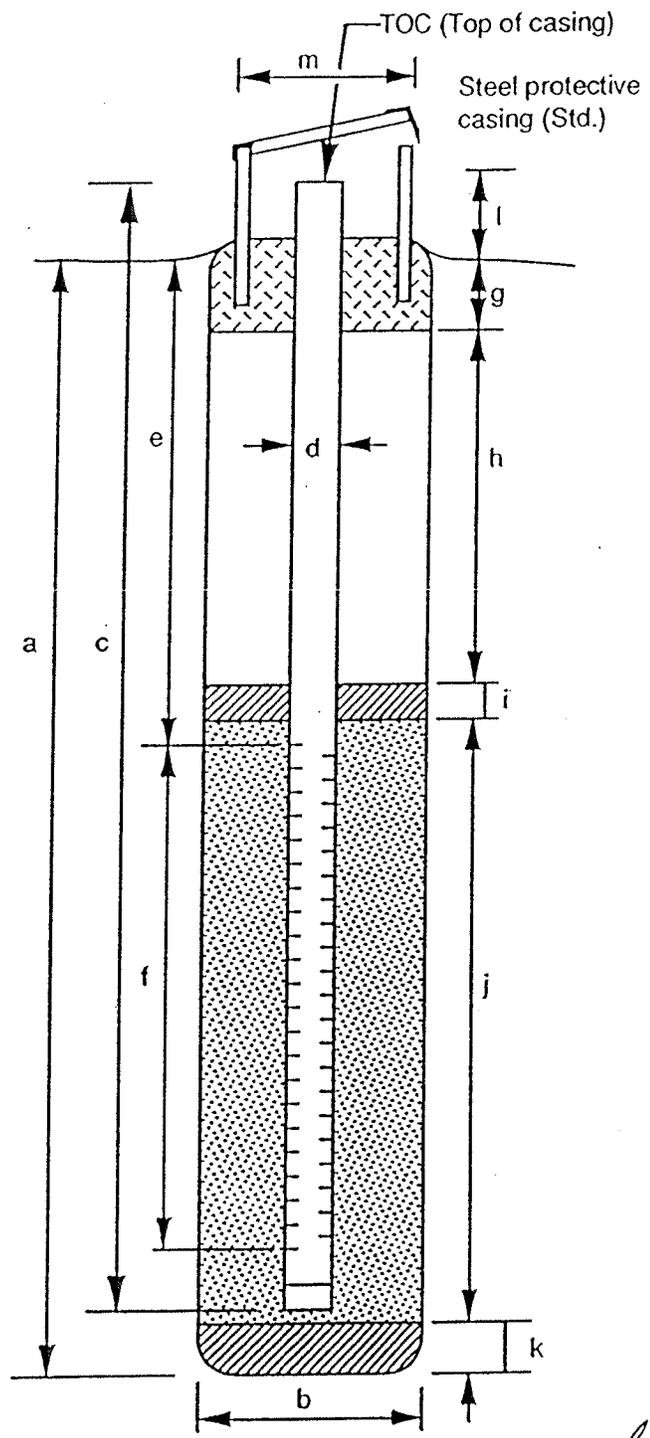


**EMCON
NORTHWEST**

WELL DETAILS

CLIENT Riverbend Landfill Company, Inc.
 PROJECT NUMBER 0258-001.24
 PROJECT NAME Remedial Investigation
 LOCATION McMinnville, Oregon
 WELL PERMIT NO. 52010

BORING / WELL NO. MW-7B
 TOP OF CASING ELEV. 149.34
 GROUND SURFACE ELEV. 146.5
 DATUM Feet-Mean Sea Level
 INSTALLATION DATE 6/22/93



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.

Prepared by: Craig Fanshier

Reviewed by: Craig R. Fanshier Date: 10/1/93

Ventura Mec 4 Rev. 7/23/81

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

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOLOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
100	> 4.5							<p>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.</p> <p>@ 6.5 feet: damp to moist, some moisture along ped sutures.</p> <p>@ 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.</p> <p>@ 12.0 feet: some large, 1/4-inch-diameter, vertical oriented gray mottling; moisture same as above.</p> <p>@ 14.5 feet: sharp color change to dark greenish gray (5BG 4/1), no mottling, no visible macro pores; wet (mostly along soil ped surfaces).</p> <p>@ 16.5 to 19.5 feet: slight purplish tint.</p> <p>@ 17.0 to 18.5 feet: soft crumbly zone; stiff; soil parts in horizontal blocky planes, parting surfaces are smooth and glisten.</p>
100	3.5			5				
	2.75							
100	1.75							
	1.75							
	2.25							
	2.5							
	2.75							
100	3.0		10					
	3.0		1/5/94					
	3.0							
	2.5							
	2.75		10/20/93					
100	2.5		15					
	2.0							
	2.6							
	1.5							
	1.0							
100	2.0			20				

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-8A
PAGE 2 OF 2
GROUND ELEV. 124.10'
TOTAL DEPTH 24.50'
DATE COMPLETED 10/20/93

RECOVERY PERCENT	POCKET PENETROMETER (Tons/SF)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOLOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
				25		25		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.
				30				
				35				
				40				

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.

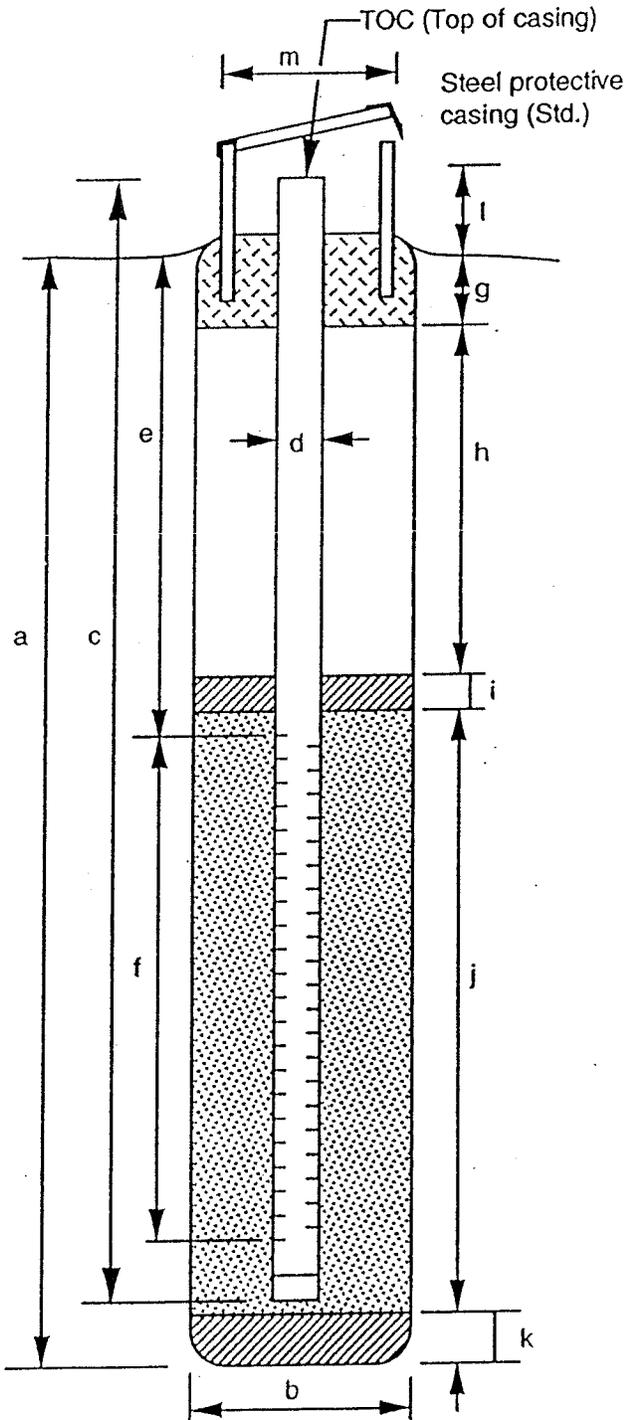


**EMCON
NORTHWEST**

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



EXPLORATORY BORING

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

WELL CONSTRUCTION

c. Total casing length (+1.9 to 23.6) 25.5 ft.
 Material Schedule 40 PVC
 d. Diameter 2 in.
 e. Depth to top perforations 13.3 ft.
 f. Perforated length 9.5 ft.
 Perforated interval from 13.3 to 22.8 ft.
 Perforation type Machine Slotted
 Perforation size 0.010 Inches
 g. Surface seal (0 to 3.0) 3.0 ft.
 Material Concrete
 h. Backfill N.A. ft.
 Material N.A.
 i. Seal (3.0 to 10.2) 7.2 ft.
 Material Bentonite
 j. Gravel pack 13.3 ft.
 Gravel pack interval from 10.2 to 23.5 ft.
 Material 10-20 Gradation Sand
 k. Bottom seal/fill (23.5 to 24.5) 1.0 ft.
 Material Bentonite
 l. Casing stickup 1.9 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-8B
PAGE 1 OF 3
GROUND ELEV. 124.30'
TOTAL DEPTH 49.50'
DATE COMPLETED 10/25/93

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOLOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
89	4.5							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.
	3.0							
	1.75							
100	2.0			5				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.
	2.0							
	2.0							
	2.5							
	2.5							
	1.75							
	1.75							
100	1.75		10					9.2 to 22.0 feet: SILTY CLAY (CL), brown (10YR 4/3), medium plasticity fines; stiff to very stiff; damp.
	2.5		10					@ 11.0 feet: minor amounts of vertically oriented gray mottling on poorly developed ped surfaces.
	2.0							
	1.5							
	1.5							
100		24		15				@ 14.5 feet: bluish gray (5B 4/1) and dark greenish gray (5BG 4/1).
	2.5							@ 16.0 feet: wet, soil somewhat crumbly - parts easily along poorly developed angular blocky peds.
100	3.0		10					@ 17.0 to 18.0 feet: soil ped surfaces are smooth to slick, slightly glazed and glistening.
	2.0							
	1.75							
	1.5							
				20				

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-8B
PAGE 2 OF 3
GROUND ELEV. 124.30'
TOTAL DEPTH 49.50'
DATE COMPLETED 10/25/93

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOLOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
	1.5	24						9.2 to 22.0 feet: SILTY CLAY (CL), continued.
100	1.75							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.
	1.0							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.
90	1.0			25				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.
	1.0							@ 28.5 feet: 15 percent fine (3/8-inch) gravel.
83		46		30				29.0 to 39.0 feet: SANDY GRAVEL (GP), coarse sands and gravels (approximately 50 percent of each).
14								@ 31.5 feet: sand lenses. @ 32.0 to 34.5 feet: no recovery in corebarrel, 1.0 foot of sand heave in augers.
								@ 36.0 to 38.5 feet: rocky hard drilling. @ 38.5 to 39.5 feet: easier drilling, less rocky. @ 39.5 feet: hard drilling.
40				35				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.
100				40				39.5 to 42.0 feet: SANDSTONE (SS), continued.

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-8B
 PAGE 3 OF 3
 GROUND ELEV. 124.30'
 TOTAL DEPTH 49.50'
 DATE COMPLETED 10/25/93

RECOVERY PERCENT	POCKET PENETROMETER (Tons/SF)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOLOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
100				45				<p>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.</p> <p>42.0 to 46.5 feet: SILTSTONE (SLST), gray; fine grain, low to moderate hardness; weakly to moderately weathered; locally hard drilling. @ 43.5 feet: few very small (0.5 mm) pyrite crystals. @ 45.0 feet: approximately 1.25-inch-thick subvertical basaltic injection dyke.</p> <p>46.5 to 49.5 feet: BASALT, gray; fine grain; massive; hard, fresh, brecciated; locally very hard drilling.</p> <p>BORING TERMINATED AT 49.5 FEET.</p>
				50				
				55				
				60				

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.

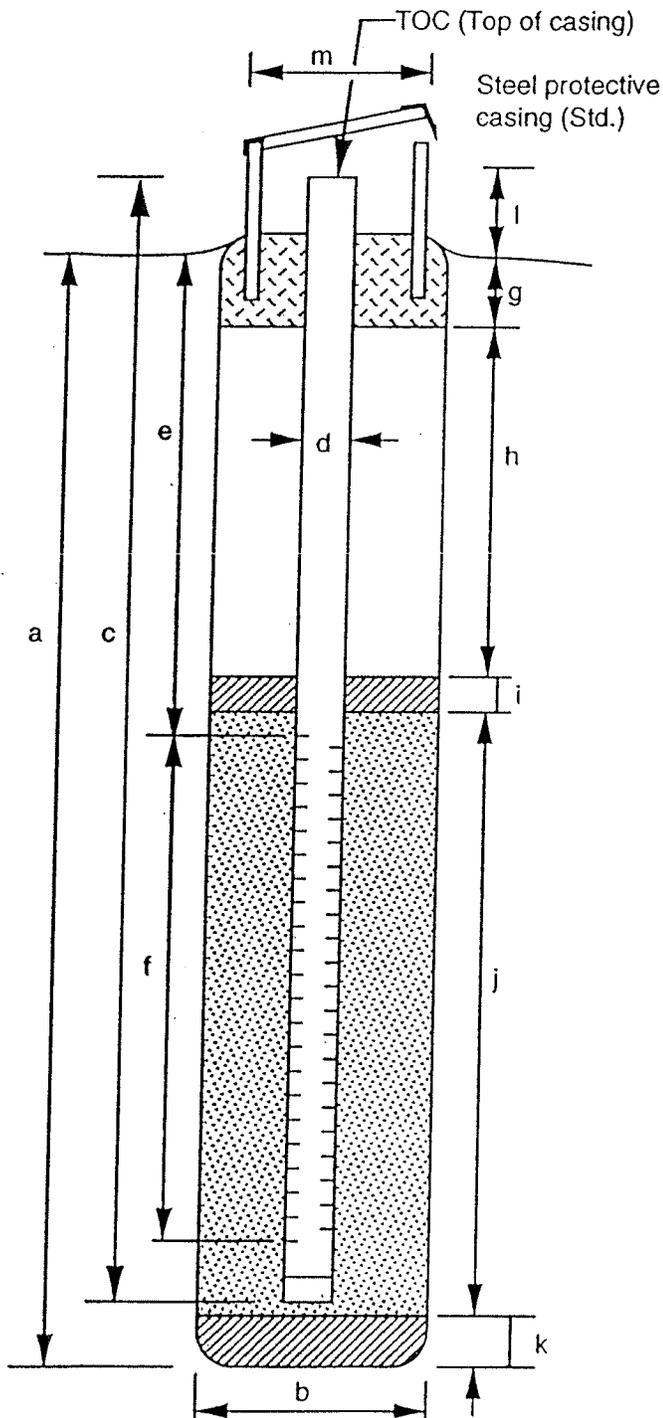


**EMCON
NORTHWEST**

WELL DETAILS

CLIENT Riverbend Landfill Company, Inc.
 PROJECT NUMBER 0258-001.28
 PROJECT NAME Additional Hydrogeologic Inv.
 LOCATION McMinnville, Oregon
 WELL PERMIT NO. 59132

BORING / WELL NO. MW-8B
 TOP OF CASING ELEV. 126.81
 GROUND SURFACE ELEV. 124.3
 DATUM Feet-Mean Sea Level
 INSTALLATION DATE 10/25/93



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

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOLOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
100				5				<p>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.</p> <p>Note: soil is generally tight 0 to 24.0 feet.</p> <p>@ 0 to 8.0 feet: some small macro pores, 2 to 5 per square inch.</p> <p>@ 3.0 to 9.0 feet: rust red mottling (approximately 40 percent).</p> <p>@ 3.0 to 16.0 feet: mostly high plasticity fines.</p> <p>@ 5.0 to 24.0 feet: several larger diameter (1/8 to 1/2-inch) macro pores.</p> <p>@ 7.5 feet: moist.</p> <p>@ 13.0 feet: color change to very dark gray (5Y 3/1) with approximately 20 percent reddish brown mottling.</p> <p>@ 16.0 feet: soil ped surfaces have glazed, smooth, glistening surfaces; wet.</p>
	4.5			4.0				
	3.5			2.5				
100			▽ 1/5/94	2.0				
	2.0			2.0				
	1.78			1.5				
100				10				
	2.0			1.75				
	1.75			1.75				
	1.0			1.0				
100			▽ 10/21/93	15				
	2.5			2.0				
	2.0			2.0				
	2.0			2.0				
	1.5			2.0				
				1.5				
				20				

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.

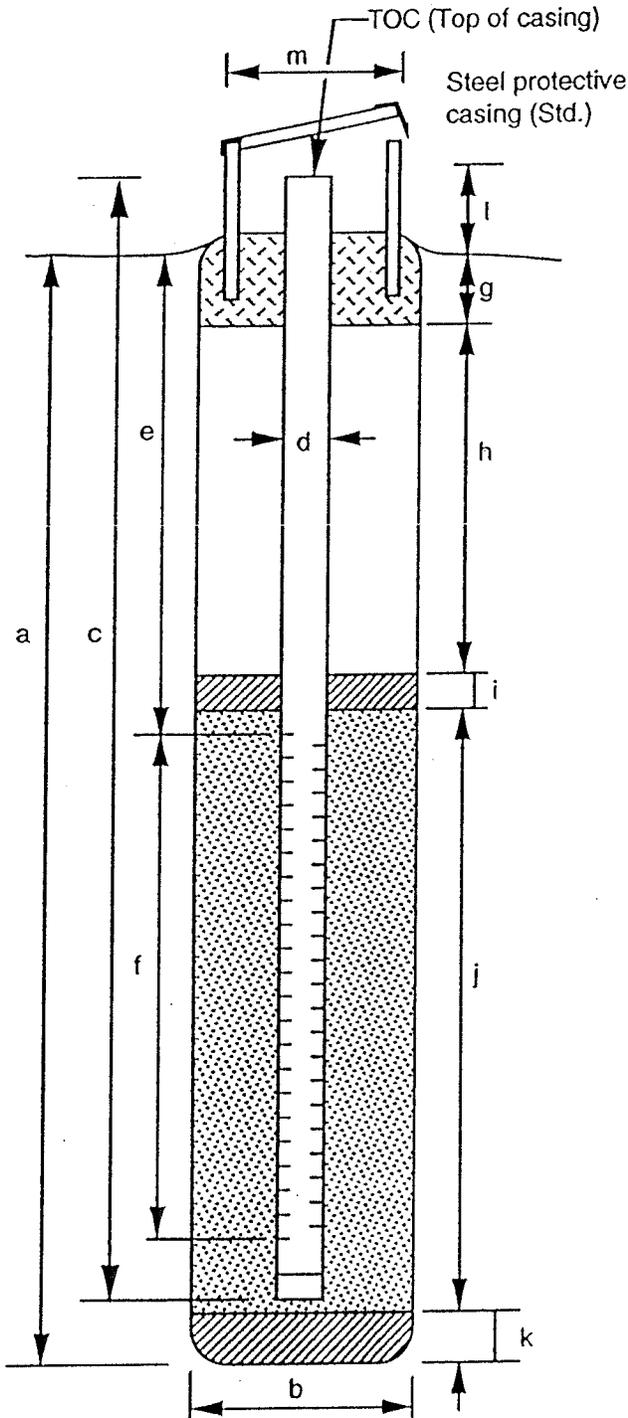


**EMCON
NORTHWEST**

WELL DETAILS

CLIENT Riverbend Landfill Company, Inc.
 PROJECT NUMBER 0258-001.28
 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 (+2.6 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 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 ELEV. 124.80'
 TOTAL DEPTH 36.50'
 DATE COMPLETED 08/24/94

SAMPLE NUMBER	RECOVERY PERCENT	BLOW COUNTS (N COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
S-1	27	2-2-3 (5)		5				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.
S-2	20	6-4-9 (13)		10				@ 8.5 feet: color changes to dark greenish gray (5GY 4/1), with 20 percent reddish brown mottling; stiff.
S-3	93	3-4-7 (11)	▽ 8/31/94	15				@ 13.5 feet: color is all dark greenish gray (5GY 4/1).
S-4	53	3-6-6 (12)		20				@ 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 approximated 50 feet east of MW-9B, which was decommissioned.



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

SAMPLE NUMBER	RECOVERY PERCENT	BLOW COUNTS (N COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
				8/24/94				0 to 20.5 feet: SILTY CLAY (CL), continued.
S-5	87	2-2-3 (5)		25				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.
S-6	100	2-3-4 (7)						@ 27.5 to 28.5 feet: transitional contact between clayey silt (ML) and silty sand (SM).
S-7	93	2-2-4 (6)		30				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).
S-8	87	26-12-27 (39)						@ 33.3 feet: 0.2-inch of SILTY SAND.
S-9		27-50/6*		35				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.
				40				

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 approximated 50 feet east of MW-9B, which was decommissioned.

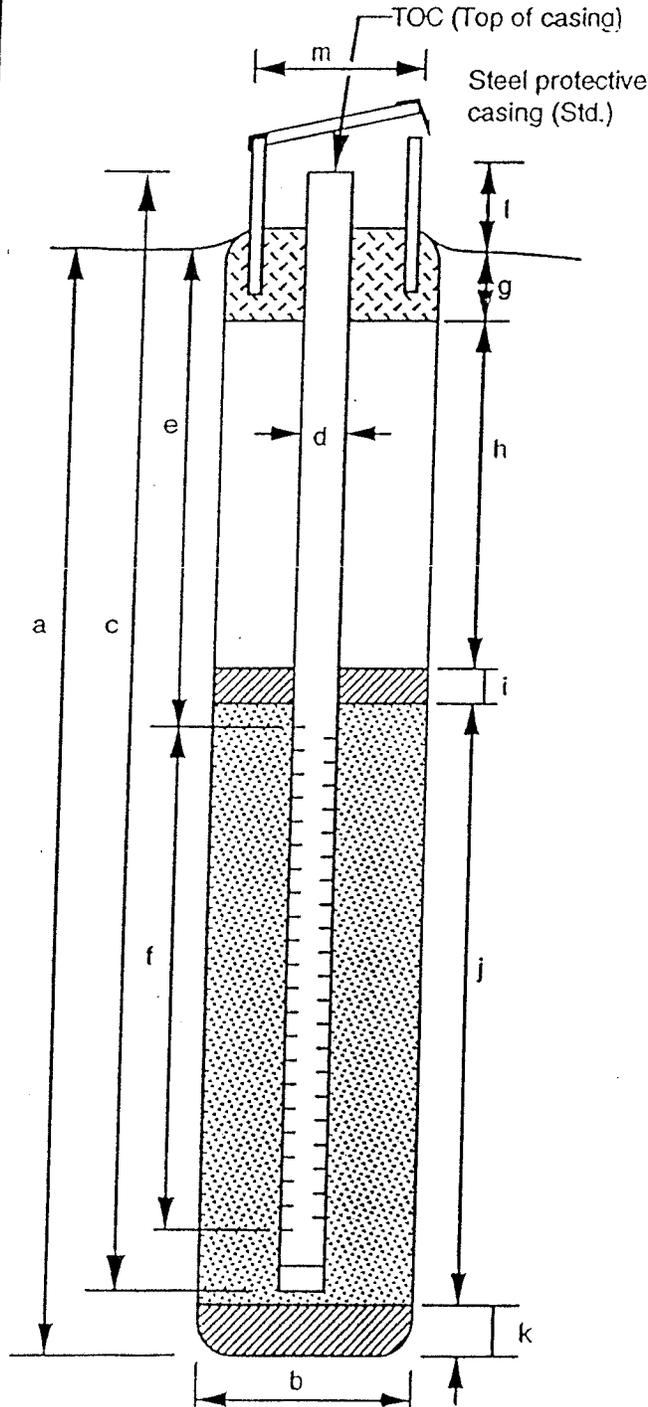


**EMCON
NORTHWEST**

WELL DETAILS

CLIENT Riverbend Landfill Company, Inc.
 PROJECT NUMBER 0258-001.45
 PROJECT NAME Monitoring Well Replacement
 LOCATION McMinnville, Oregon
 WELL PERMIT NO. 69764

BORING / WELL NO. MW-9B (R)
 TOP OF CASING ELEV. 127.40
 GROUND SURFACE ELEV. 124.8
 DATUM Feet-Mean Sea Level
 INSTALLATION DATE 8/24/94



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.

Prepared by: Craig Fanshier

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

RECOVERY PERCENT	POCKET PENETROMETER (Tone/SF)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOLOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
100	> 1.5		▽ 1/5/94	5				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.
94	2.0			10				@ 7.5 feet: 3-inch-thick SILTY SAND (SM) lense, 10 percent low plasticity fines (silt); 90 percent fine sand, rounded to subrounded, well sorted; appears loose; moist. @ 8.0 feet: brown (10YR-4/3); moist.
100	1.0			15				@ 10.5 feet: 3-inch-thick SILTY SAND (SM) lense, similar to the one at 7.5 feet.
100	1.5		▽ 5/27/93					@ 14.5 feet: wet.
97	2.0			20				@ 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.
80	0.75	11						

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

RECOVERY PERCENT	POCKET PENETROMETER (Tone/SF)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOLOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
				25				0 to 25.5 feet: CLAYEY SILT (ML), continued. @ 21.0 feet: color changes to dark grayish gray (5G 4/1); 2-inch sand lense above color change. @ 22.0 to 23.5 feet: platy varves, sandy surface to each varve (fine sand).
				30				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.
				35				27.0 to 28.3 feet: SILTY CLAY (CL), dark greenish gray (5G 4/1); medium plasticity fines; very stiff; wet.
				40				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.

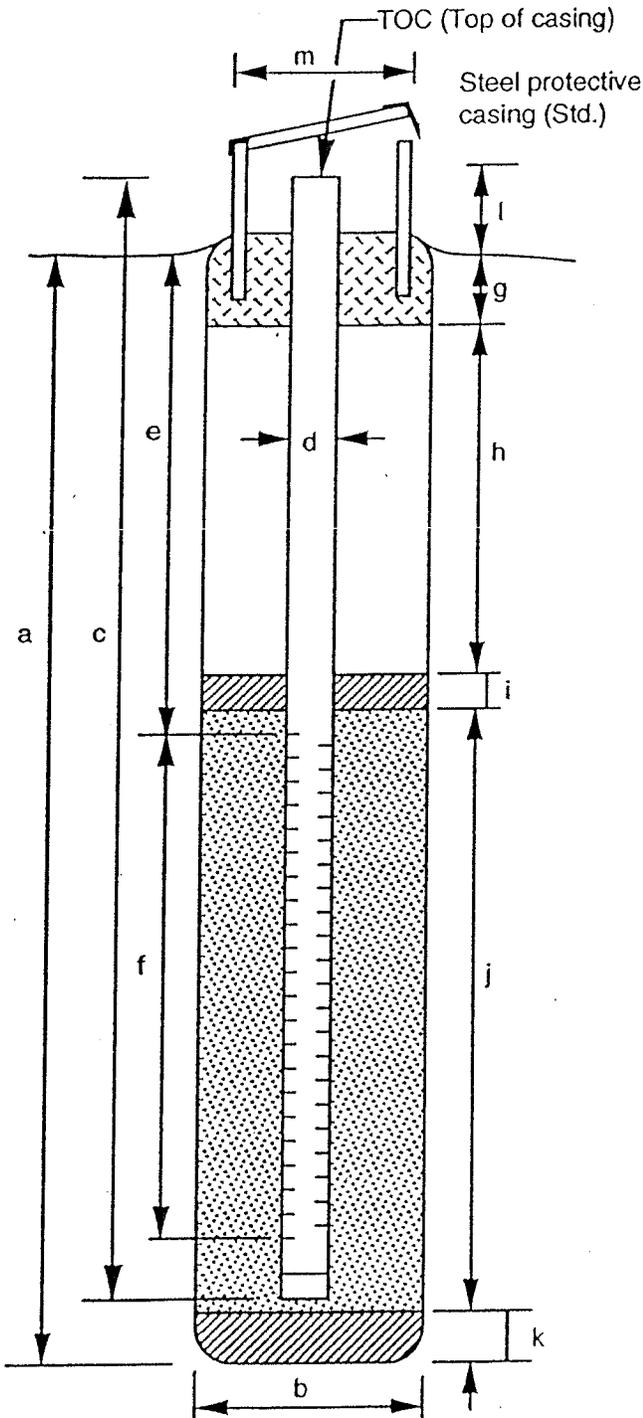


**EMCON
NORTHWEST**

WELL DETAILS

CLIENT Riverbend Landfill Company, Inc.
 PROJECT NUMBER 0258-001.28
 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
 g. Surface seal (0 to 2.5) 2.5 ft.
 Material Concrete
 h. Backfill N.A. ft.
 Material N.A.
 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

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOLOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
90	1.0							0 to 4.0 feet: CLAYEY SILT (ML), brown (10YR 5/3), mostly evenly colored, trace lightly reddish brown mottling; 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.
	4.0							
	4.0							
	3.5							
	2.5							
100	2.0							4.0 to 28.0 feet: SANDY SILT (SM), brown (10YR 4/3), approximately 5 percent small, light reddish brown mottling; 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.
	2.5			5				@ 9.0 feet: changes to medium stiff to stiff. @ 11.0 feet: wet.
	2.0							
	2.5							
100	1.75		10/25/93 ▽	10				@ 14.0 to 14.5 feet: SILTY SAND (SM) lense.
	1.5							
	1.0							
	1.5							
	1.0							
100	0.75							@ 17.5 to 17.9 feet: CLAYEY SILT (ML), very stiff. @ 18.4 to 18.9 feet: SILTY SAND (SM) lense. @ 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).
	0.5			15				
	0.75		1/5/94 ▽					
	0.5							
	3.0							
	1.5							
100	3.5			20				

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 2 OF 4
GROUND ELEV. 150.80'
TOTAL DEPTH 69.00'
DATE COMPLETED 10/25/93

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOLOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
	2.0							4.0 to 28.0 feet: SANDY SILT (SM), continued.
	1.5							@ 20.0 feet: interbedded small (0.2- to 0.6-foot-thick) CLAYEY SILT (ML) and SILTY SAND (SM) lenses.
	1.5							@ 20.0 to 23.0 feet: slight purplish tint.
100	1.0	25		25				
100	2.5							@ 26.0 feet: SANDY SILT (ML) lenses.
	4.0							
	2.5							@ 28.0 feet: soil is crumbly; wet.
	1.0							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.
100	3.5			30				
	0.75							
	1.5							
	>0.5							
	>0.5							
	1.0							
80	1.5	25		35				@ 35.0 to 39.0 feet: drilling gets harder (hard layers with several small gravels); very stiff.
	>0.5							
100	3.0							@ 37.0 to 38.0 feet: 20 percent fine gravels; grayish green (5G 4/2).
	2.5							@ 38.0 feet: rocky drilling noise.
40				40				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.
DRILL METHOD Hollow Stem Auger
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

RECOVERY PERCENT	POCKET PENETRO-METER (Tone/SF)	PENETRA-TION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOLOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
100		50/6"		45				<p>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.</p> <p>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 gravels, matrix supported, mostly rounded; appears medium dense; wet. Note: the clayey matrix is sticky. Minor 2 to 6 inch lense with approximately 5 percent fines; loose.</p> <p>@ 41.0 feet: core barrel recovery blocked by 3 inch rock wedged into the core barrel.</p> <p>@ 44.0 feet: split spoon in CLAYEY GRAVEL (GC), penetration blocked by gravel; dense.</p> <p>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), gravels subangular, matrix supported; dense to very dense; wet.</p> <p>@ 49.0 to 54.0 feet: mostly fine gravel in a dense silty sand with trace clay matrix; very hard drilling, engine is lugging.</p> <p>@ 53.5 to 53.8 feet: 2-inch-thick SILTY CLAY (CL) lense in the core barrel shoe.</p> <p>@ 54.0 feet: color changes to dark greenish gray (5GY 4/1).</p> <p>@ 54.0 to 54.3 feet: CLAYEY GRAVEL (GC).</p> <p>@ 57.5 to 58.2 feet: lenses of SILTY CLAY (CL) with 5 percent medium sand (possibly altered volcanic ash).</p> <p>@ 59.0 feet: thin clay lense.</p>
57				50				
96				55				
96				60				

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

RECOVERY PERCENT	POCKET PENETROMETER (Tone/SF)	PENETRATION (Blows/Ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOLOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
100	4.0			65	65	65		<p>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.</p> <p>61.0 to 61.5 feet: SILTY SAND (SM)</p> <p>61.5 to 62.5 feet: SAND (SP)</p> <p>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.</p> <p>@ 67.0 feet: several 1-inch by 1/16-inch gravels (flat), many gravels rounded.</p> <p>@ 68.0 to 69.0 feet: appears looser.</p> <p>@ 69.0 feet: 1-foot of sand heave in auger.</p> <p>BORING TERMINATED AT 69.0 FEET.</p>
				70				
				75				
				80				

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.

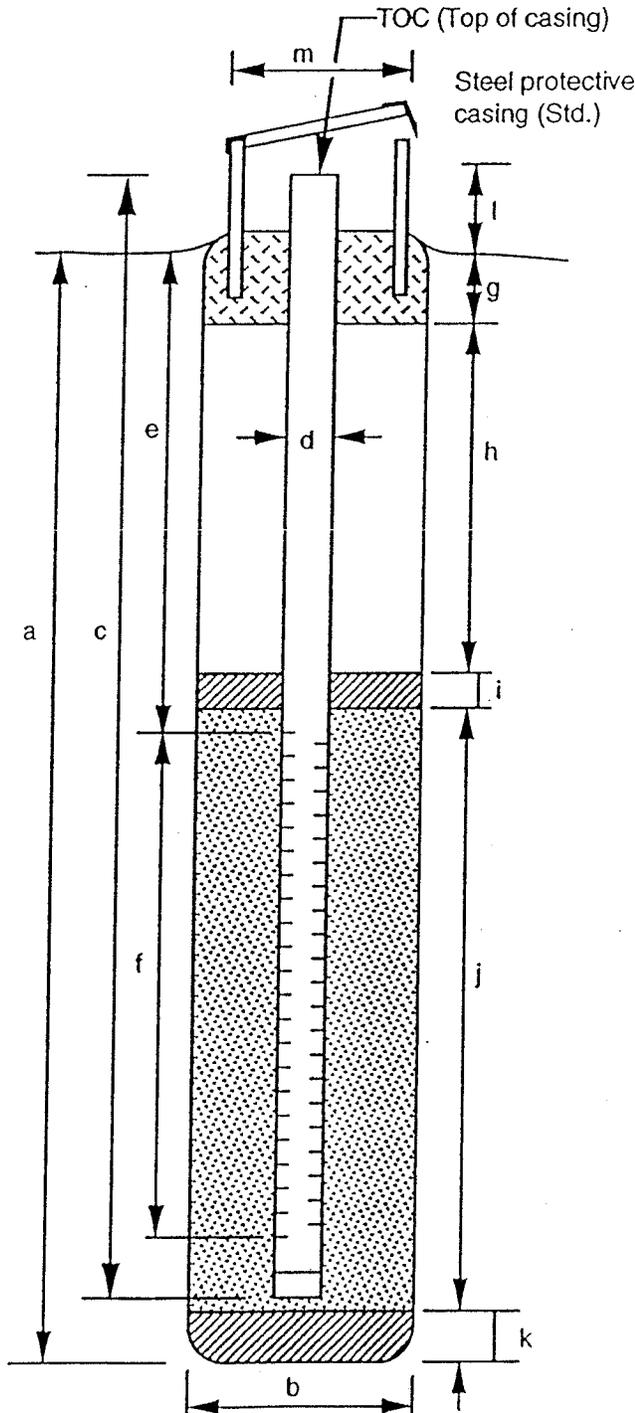


**EMCON
NORTHWEST**

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.

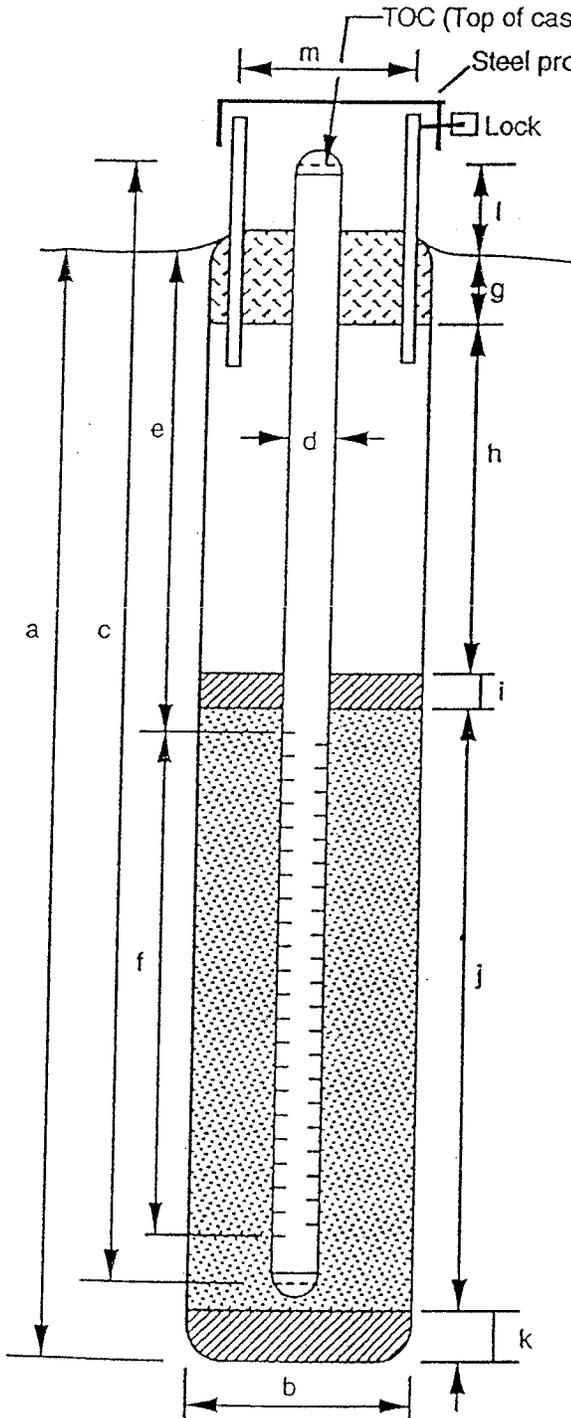
Prepared by: Craig Fanshier

WELL DETAILS



EMCON

CLIENT Riverbend Landfill Company, Inc BORING / WELL NO. MW-12A
 PROJECT NUMBER 0258-001.50 TOP OF CASING ELEV. 126.0
 PROJECT NAME Additional Hydrogeologic Investigation GROUND SURFACE ELEV. 123.8
 LOCATION McMinnville, Oregon 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.

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-12A
PAGE 1 OF 2
GROUND ELEV. 123.80'
TOTAL DEPTH 25.50'
DATE COMPLETED 07/19/95

SAMPLE METHOD AND NUMBER	RECOVERY (PERCENT)	BLOW COUNTS (N COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
SS S-1	60	6-7-9 (16)		5				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.
SS S-2	80	6-8-8 (16)		10				@ 9.0 feet: approximately 20 to 30 percent gray mottling.
SS S-3*	100	2-2-3 (5)	7/24/95	15				@ 14.0 feet: 5 percent fine sand; firm; moist, visible moisture on mottled soil.
SS S-4*	100	1-1-2 (3)	7/19/95	20				@ 19.0 feet: wet.



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.

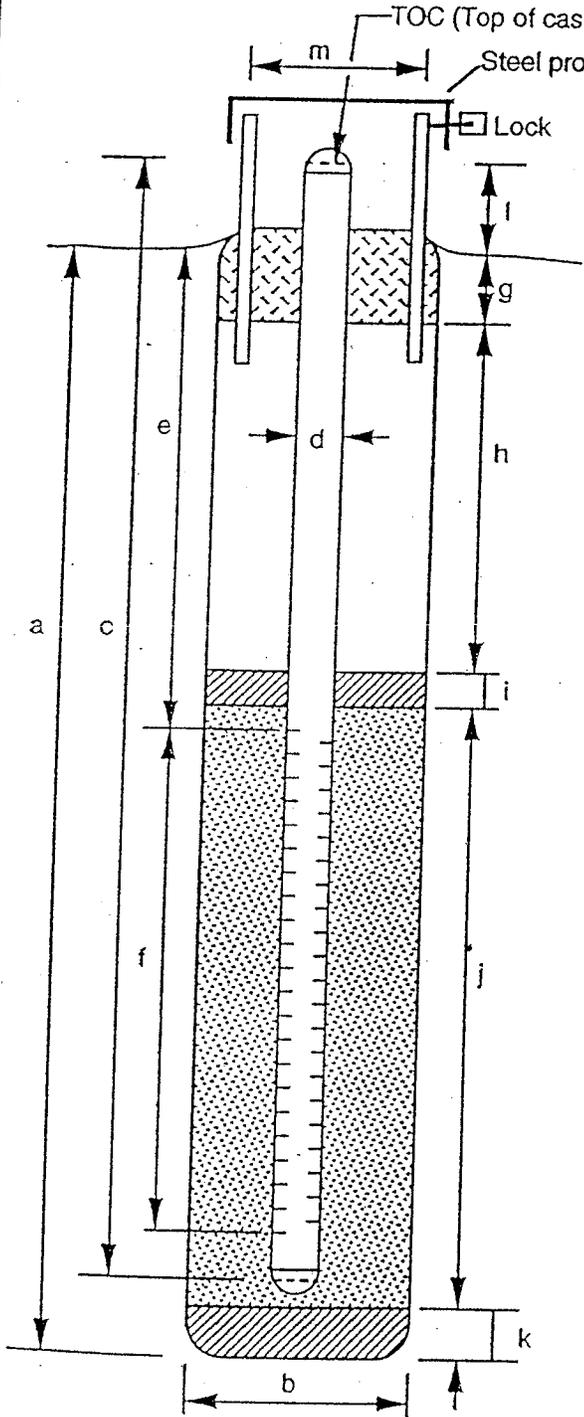
EMCON

WELL DETAILS



EMCON

CLIENT Riverbend Landfill Company, Inc BORING / WELL NO. MW-12B
 PROJECT NUMBER 0258-001.50 TOP OF CASING ELEV. 126.54
 PROJECT NAME Additional Hydrogeologic Investigation GROUND SURFACE ELEV. 124.0
 LOCATION McMinnville, Oregon DATUM FT - MSL
 WELL PERMIT NO. 80944 INSTALLATION DATE 7/19/95



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 2 OF 3
 GROUND ELEV. 124.00'
 TOTAL DEPTH 49.90'
 DATE COMPLETED 07/19/95

POCKET PENETRO-METER (Tons/SF)	SAMPLE TYPE	BLOW COUNTS (RECOVERY PERCENT)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
0.8	CS	96						12.5 to 22.0 feet: SILTY CLAY (ML) WITH SAND; continued.
1.0								@ 20.0 to 21.7 feet: 50 percent dark reddish brown and 50 percent gray mottling.
<0.5			▽ 7/18/95					@ 22.0 feet: wet.
<0.5								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.
1.0	CS	100		25				@ 22.5 feet: a single 3-inch by 1/2-inch basalt gravel found within the silt matrix.
1.0								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.
	CS	76		30				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.
	CS	100		35				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.
				40				



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

POCKET PENETROMETER (Tons/SF)	SAMPLE TYPE	BLOW COUNTS (RECOVERY PERCENT)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	CS	NA 90		45				<p>37.2 to 40.0 feet: SILTY GRAVEL (GM), continued: in the silty matrix; dense; driller noted very hard drilling; wet. The contact with the overlying unit is abrupt.</p> <p>40.0 to 48.0 feet: 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.</p> <p>@ 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.</p> <p>@ 44.8 to 48.0 feet: very hard drilling.</p>
	CS	NA 94		50				<p>48.0 to 49.9 feet: CLAYEY GRAVEL (GC); 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.</p>
				55				
				60				

Total depth drilled = 49.9 feet.
 Total depth sampled = 49.9 feet.



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.

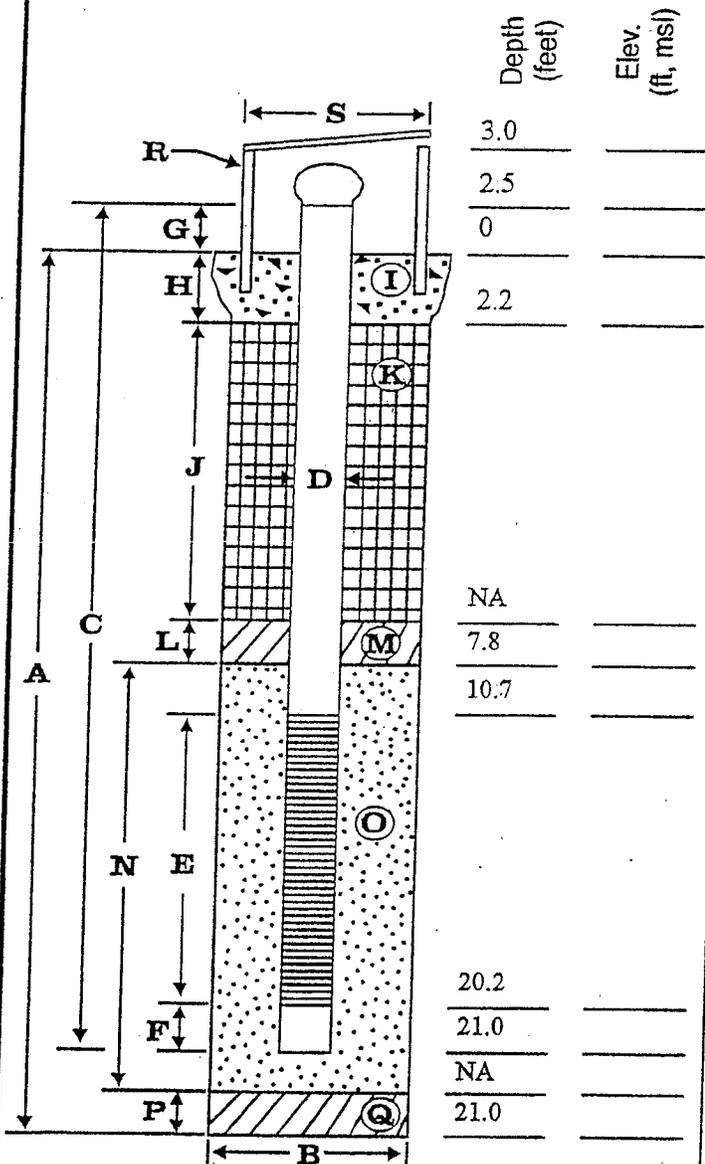
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WELL DETAILS

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-14A
 Top of Casing Elev.: See note
 Ground Surface Elev.: See note
 Installation Date: 10/16/96
 Permit/Start Card No.: 93674



EXPLORATORY BORING

A. Total depth: 21.0 ft.
 B. Diameter: 10.0 in.
 Drilling method: Hollow-stem auger

WELL CONSTRUCTION

C. Well casing length: 23.5 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: 0.010 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: 5.6 ft.
 K. Annular seal material: Bentonite chips
 L. Filter pack seal thickness: NA ft.
 M. Filter pack seal material: NA
 N. Sand pack thickness: 13.2 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: - 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-14A
PAGE 1 OF 2
GROUND ELEV.
TOTAL DEPTH 42.00'
DATE COMPLETED 10/15/96

SAMPLE NUMBER (RECOVERY PERCENT)	SAMPLE TYPE	BLOW COUNTS (N COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
S-1	Grab							0 to 3.0 feet: SILTY CLAY (CL) ; dark brown; medium plasticity fines; damp.
				5				3.0 to 16.5 feet: SANDY SILT (ML) ; reddish brown; trace reddish mottling; 60 to 70 percent low to medium plasticity fines; 30 to 40 percent fine sand; very soft; moist.
S-2 (100)	SS2	1-1-3 (4)		15				
S-3 (100)	SS1	1-1-0 (1)	▽					16.5 to 19.0 feet: SILTY SAND (SM) ; reddish brown; 40 percent low to medium plasticity fines; 60 percent fine sand; wet; very loose; some layers (approximately 0.2-foot thick) have approximately 15 to 25 percent fines.
S-4 (100)	SS1	1-1-1 (2)	10/16/96 8:30					19.0 to 21.0 feet: SANDY SILT (ML) ; reddish brown with 5 to 10 percent gray mottling; cont.
				20				



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

BORING NO. MW-14A
PAGE 2 OF 2
GROUND ELEV.
TOTAL DEPTH 42.00'
DATE COMPLETED 10/15/96

SAMPLE NUMBER (RECOVERY PERCENT)	SAMPLE TYPE	BLOW COUNTS (IN COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
S-5 (100)	SS2	3-5-8 (13)		<div style="display: flex; align-items: center;"> <div style="border-left: 1px solid black; border-right: 1px solid black; height: 100%; position: relative;"> 25 30 35 40 </div> </div>				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

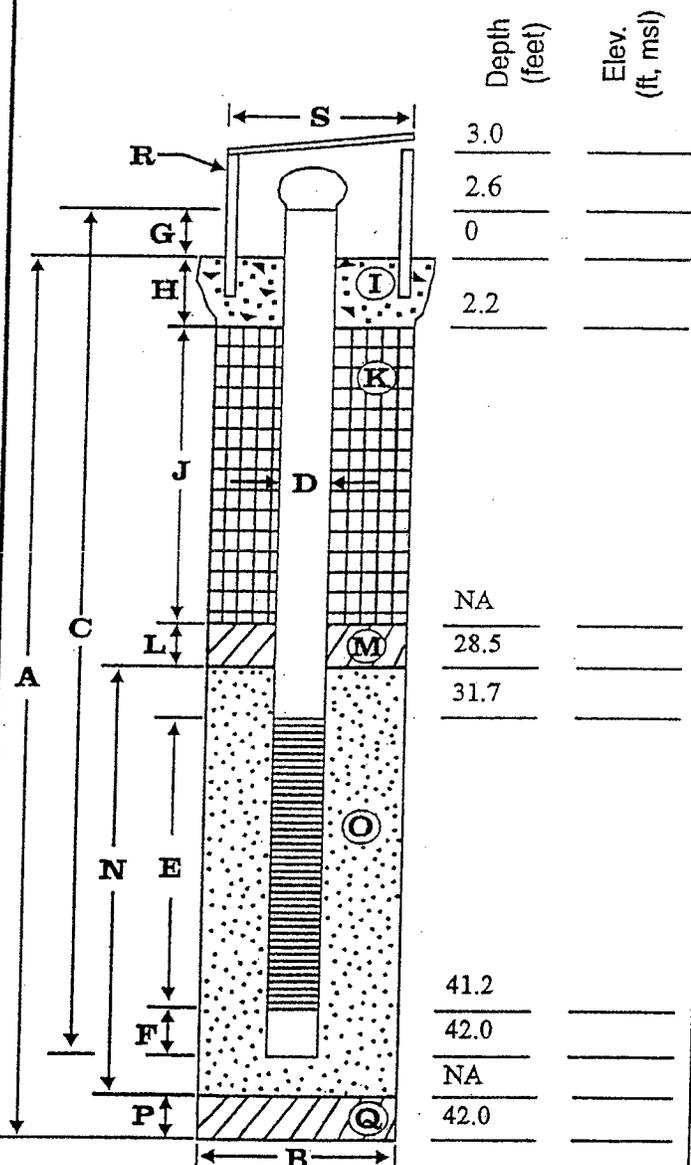
Exploratory boring drilled with 10-inch OD (6.25-inch ID) hollow stem augers. Soil sampled with 1.4-inch (SS1) and 2.5-inch (SS2) ID, 1.5-foot-long split-spoon samplers. Additional lithologic detail was provided from samples collected from the deeper boring approximately 8-feet away. A 2-inch PVC monitoring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



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-14B
 Top of Casing Elev.: See note
 Ground Surface Elev.: See note
 Installation Date: 10/15/96
 Permit/Start Card No.: 93673



EXPLORATORY BORING

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

WELL CONSTRUCTION

C. Well casing length: 44.6 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 (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 (N COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
				5	10	15	20	<p>0 to 3.0 feet: SILTY CLAY (CL); dark brown; medium plasticity fines; damp.</p> <hr style="border-top: 1px dashed black;"/> <p>3.0 to 15.0 feet: CLAYEY SILT (ML); brown with trace reddish mottling; low plasticity; medium stiff; damp.</p> <p>@ 10.0 feet: 0.2-foot thick layer with 85 to 90 percent medium plasticity fines; 10 to 15 percent fine sand; firm; damp.</p> <hr style="border-top: 1px dashed black;"/> <p>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.</p> <p>@ 17.0 feet: potential coarsening downward sequence.</p>
S-1 (53)	SS1	2-4-4 (8)			5			
S-2 (66)	SS1	2-2-4 (8)			10			
S-3 (100)	SS1	1-1-0 (1)	▽ 11/2/96		15			



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-14B**
 PAGE **2 OF 3**
 GROUND ELEV.
 TOTAL DEPTH **42.00'**
 DATE COMPLETED **10/19/96**

SAMPLE NUMBER (RECOVERY PERCENT)	SAMPLE TYPE	BLOW COUNTS (IN COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
S-4 (100)	SS1	1-1-1 (2)						15.0 to 21.0 feet: SANDY SILT (ML); continued. @ 20.0 feet: 20 percent dark reddish brown mottling; 2 percent wood fragments.
S-5 (100)	SS2	1-2-3 (5)						21.0 to 27.8 feet: SILTY SAND (SM); dark greenish gray with reddish mottling; 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.
S-6 (100)	SS2	1-1-2 (3)						@ 23.5 feet: grades to 25 percent fine, 70 percent fine to medium sand (F:M = 2:1) with 5 percent wood fragments; wet.
S-7 (100)	SS2	1-4-4 (8)	10/14/96 25					@ 24.0 to 27.8 feet: sand; reddish brown; 15 percent low plasticity fines; wet.
S-8 (100)	SS1	1-17-19 (36)						@ 27.5 to 27.8 feet: clayey silt.
S-9 (66)	SS1	15-18-21 (39)						27.8 to 33.0 feet: SANDY GRAVEL (GP); greenish gray with some reddish brown mottling 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.
S-10 (53)	SS2	21-50/4"		30				@ 31.0 feet: some sand and gravel heave in augers.
S-11 (60)	SS2	30-50/3"						
S-12 (60)	SS2	9-50/6"						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.
S-13 (46)	SS2	11-50/2"		35				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.
S-24 (33)	SS2	50/5"						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.
S-15 (33)	SS2	50/5"						@ 38.5 feet: several 1.5-inch rounded basalt



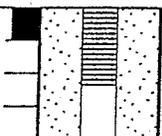
REMARKS

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-14B
PAGE 3 OF 3
GROUND ELEV.
TOTAL DEPTH 42.00'
DATE COMPLETED 10/19/96

SAMPLE NUMBER (RECOVERY PERCENT)	SAMPLE TYPE	BLOW COUNTS (IN COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
S-16	SS2	50/5"		45				gravel. Drilling terminated at 42.0 feet bgs.
				50				
				55				
				60				



REMARKS

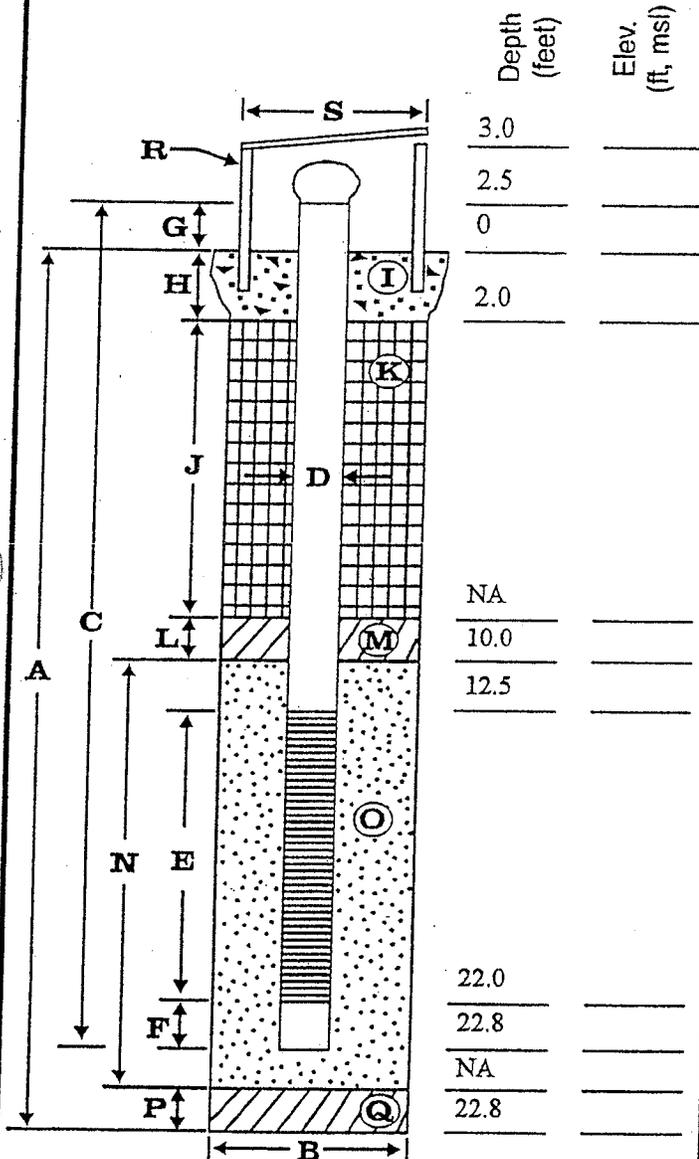
Exploratory boring drilled with 10-inch OD (6.25-inch ID) hollow stem augers. Soil sampled with 1.4-inch (SS1) and 2.5-inch (SS2) ID, 1.5-foot-long split-spoon samplers. A 2-inch PVC monitoring well was constructed in the borehole. Well construction information is summarized on the attached well details.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

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-15A
PAGE 1 OF 2
GROUND ELEV.
TOTAL DEPTH 22.80'
DATE COMPLETED 10/21/96

SAMPLE NUMBER (RECOVERY PERCENT)	SAMPLE TYPE	BLOW COUNTS (N COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
				5				0 to 20.0 feet: SILTY CLAY (CL) ; dark reddish brown; medium plasticity fines; damp. @ 2.0 feet: changes to dark yellowish brown. @ 5.0 feet: dark yellowish brown; with less than 10 percent gray mottling; stiff to very stiff. @ 10.0 feet: several 1/16-inch diameter macropores with gray interior linings, many smaller macropores (0.1- to 0.2-mm diameter). @ 15.0 feet: trace black organic material.
			▽ 11/5/96	10				
				15				
				20				



EMCON

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.
 DRILL METHOD Hollow Stem Auger
 LOGGED BY Craig D. Fanshier

BORING NO. MW-15A
 PAGE 2 OF 2
 GROUND ELEV. _____
 TOTAL DEPTH 22.80'
 DATE COMPLETED 10/21/96

SAMPLE NUMBER (RECOVERY PERCENT)	SAMPLE TYPE	BLOW COUNTS (N COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
S-1	SS1	6-13-23 (36)	11/21/96					<p>20.0 to 22.8 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) macropores; with water.</p> <p>Drilling terminated at 22.8 feet bgs.</p>



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.

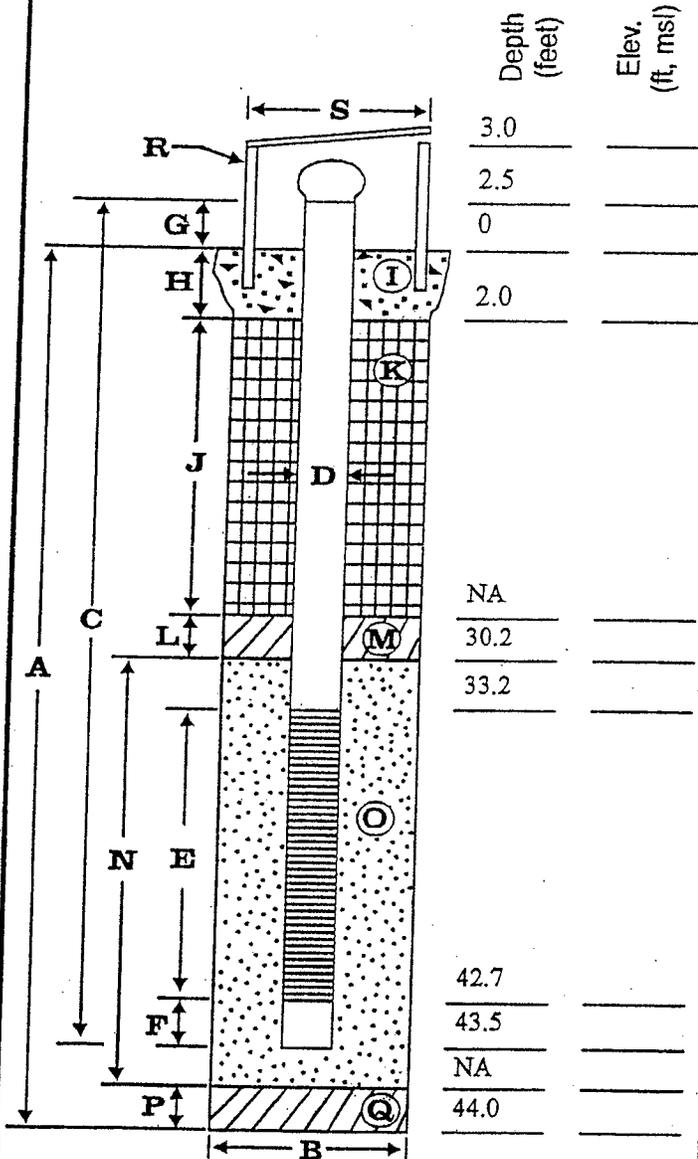
EMCON



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 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
 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: 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.

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-15B
 PAGE 1 OF 3
 GROUND ELEV. _____
 TOTAL DEPTH 44.00'
 DATE COMPLETED 10/18/96

SAMPLE NUMBER (RECOVERY PERCENT)	SAMPLE TYPE	BLOW COUNTS (N COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
S-1	Grab	6-13-23 (36)						0 to 20.0 feet: SILTY CLAY (CL); dark reddish brown; medium plasticity fines; damp.
S-2	Grab							@ 2.0 feet: changes to dark yellowish brown.
S-3 (100)	SS1	4-6-9 (15)		5				@ 5.0 feet: dark yellowish brown; with less than 10 percent gray mottling; stiff to very stiff.
S-4 (100)	SS1	2-5-7 (12)		10				@ 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).
S-5 (100)	SS1	5-9-12 (21)	▽ 15 10/23/96 ▽ 11/5/96					@ 15.0 feet: trace black organic material.
				20				



EMCON

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.
 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

SAMPLE NUMBER (RECOVERY PERCENT)	SAMPLE TYPE	BLOW COUNTS (IN COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
S-6 (73)	SS1	5-8-12 (20)						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) macropores; with water.
S-7 (100)	SS2	3-4-6 (10)		25				25.2 to 29.5 feet: SANDY SILT (ML) ; brown, 20 percent gray mottling; 55 percent low plasticity fines; 45 percent fine sand, subangular to angular; firm; wet. Large macropores with wet interiors; silt content varies from approximately 55 to 65 percent with gradational silty sand layers 0.1 to 0.3-feet thick.
S-8 (100)	SS1	2-2-3 (5)						@ 29.5 feet: driller notes slightly rougher drilling, possibly gravels.
S-9 (67)	SS2	21-50/5"		30				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.
S-10 (73)	SS1	26-21-23 (44)						
S-11 (80)	SS2	8-23-39 (62)		35				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.
				40				



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

40258-001.053.RIVBD.sb:3.12/10/86...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-16A
PAGE 1 OF 2
GROUND ELEV.
TOTAL DEPTH 23.50'
DATE COMPLETED 10/23/96

SAMPLE NUMBER (RECOVERY PERCENT)	SAMPLE TYPE	BLOW COUNTS (IN COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
S-1	SS1	3-7-8-14	 15 10/23  11/5	20				<p>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).</p> <p>@ 1.5 feet: color changes from dark brown to brown to yellowish red.</p>



EMCON

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.

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-16A**
 PAGE **2 OF 2**
 GROUND ELEV. _____
 TOTAL DEPTH **23.50'**
 DATE COMPLETED **10/23/96**

SAMPLE NUMBER (RECOVERY PERCENT)	SAMPLE TYPE	BLOW COUNTS (IN COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION	
(100)		(15)		<div style="display: flex; align-items: center;"> <div style="border-right: 1px solid black; padding-right: 5px;"> <div style="background-color: black; width: 10px; height: 10px; margin-bottom: 5px;"></div> </div> <div style="border-left: 1px solid black; border-right: 1px solid black; padding: 0 5px;"> <div style="background-color: #cccccc; width: 100%; height: 100%;"></div> </div> <div style="border-left: 1px solid black; border-right: 1px solid black; padding: 0 5px;"> <div style="background-color: #e0e0e0; width: 100%; height: 100%;"></div> </div> </div>	<div style="border-right: 1px solid black; padding-right: 5px;"> <div style="background-color: #cccccc; width: 100%; height: 100%;"></div> </div>	<div style="border-right: 1px solid black; padding-right: 5px;"> <div style="background-color: #e0e0e0; width: 100%; height: 100%;"></div> </div>	<div style="border-right: 1px solid black; padding-right: 5px;"> <div style="background-color: #e0e0e0; width: 100%; height: 100%;"></div> </div>	<div style="border-right: 1px solid black; padding-right: 5px;"> <div style="background-color: #e0e0e0; width: 100%; height: 100%;"></div> </div>	<p>0 to 25.0 feet: SILTY CLAY (CL); continued. @ 20.0 feet: several small macropores with water, pores are light gray.</p> <p>@ 22.0 to 23.5 feet: firm drilling, green clay returns.</p> <hr/> <p>Drilling terminated at 23.5 feet.</p>
				25					
				30					
				35					
				40					



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.

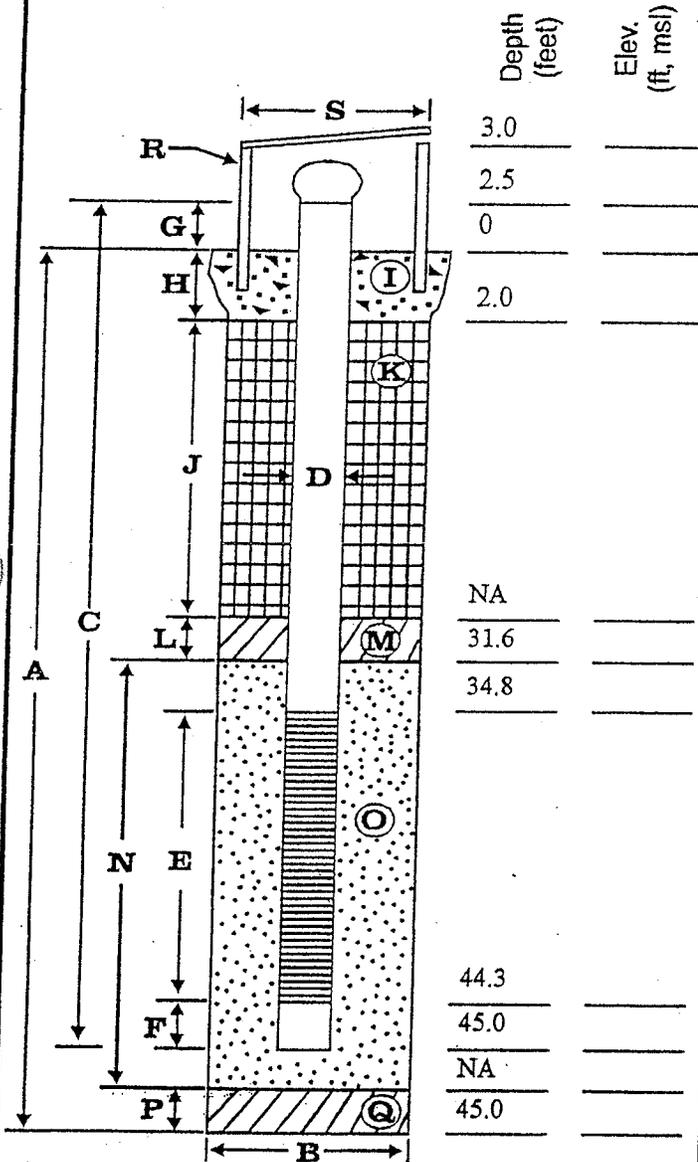
EMCON



WELL DETAILS

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

Boring/Well No.: MW-16B
 Top of Casing Elev.: See note
 Ground Surface Elev.: See note
 Installation Date: 10/23/96
 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 (stickup): 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.

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-16B**
 PAGE **2 OF 3**
 GROUND ELEV. _____
 TOTAL DEPTH **46.00'**
 DATE COMPLETED **10/22/96**

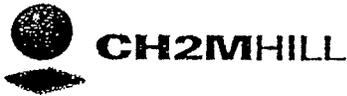
SAMPLE NUMBER (RECOVERY PERCENT)	SAMPLE TYPE	BLOW COUNTS (IN COMP)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	WELL DETAILS	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
S-4 (100)	SS1	4-7-9 (16)						0 to 25.0 feet: SILTY CLAY (CL) ; continued. @ 20.0 feet: several small macro pores with water, pores are light gray. @ 22.0 to 24.0 feet: firm drilling, green clay returns.
S-5 (100)	SS1	2-2-3 (5)		25				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.
S-6 (100)	SS1	1-2-2 (4)		30				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 mottling in the sandy silt layers (approximately 0.2- to 0.5-foot thick).
S-7 (0.5)	SS1	8-23-26 (45)		35				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.
				40				



REMARKS

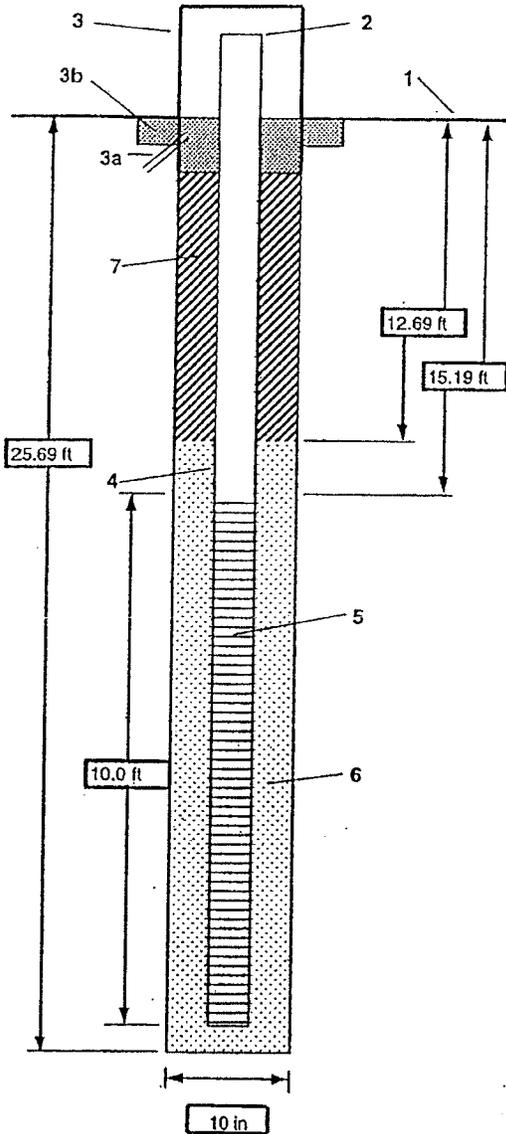
12-inch ID temporary surface casing was installed in a 14-inch diameter borehole drilled with HSA to approximately 9 feet. The annulus between the surface casing and the borehole was filled with bentonite. The exploratory boring was drilled through the surface casing with 10-inch OD (6.25-inch ID) hollow 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.

EMCON



PROJECT NUMBER 159636.A0.03	BORING NUMBER MW-17A (L40373)	SHEET 1 OF 1
WELL COMPLETION DIAGRAM		

PROJECT : Riverbend Landfill	LOCATION : McMinnville, Oregon	Installation date(s): 09/25/2000
ELEVATION : 151.12 ft msl	DRILLING CONTRACTOR : Geo-Tech Explorations, Inc.	
DRILLING METHOD AND EQUIPMENT USED : B-59 Mobile Hollow-Stem Auger (6.25" ID)		
WATER LEVELS :	START : 8:30	END : 10:30
		LOGGER : B. Long



- 1- Ground elevation at well 151.12 ft msl
- 2- Top of casing elevation 153.83 ft msl
- 3- Wellhead protection cover type Above-ground monument
 - 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 Silica sand (10-20)
 - a) Quantity used 8-50 lb bags
- 7- Type of seal Medium bentonite chips
 - a) Quantity used 8-50 lb bags
 - b) Top of seal 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



BORING NUMBER
MW-17A

SHEET 1 of 1

SOIL BORING LOG

PROJECT : Riverbend Landfill LOCATION : McMinnville, Oregon DATE: 09/25/2000
 ELEVATION : 151.12 ft msl DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.
 DRILLING METHOD : HSA-6.25 ID Hollow-Stem Auger
 WATER LEVELS : START : 8:30 END: 10:30 am LOGGER : R.E.Long

DEPTH BELOW SURFACE (FT)		SOIL DESCRIPTION	COMMENTS
SAMPLE No.	GRAPHIC LOG	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	
5	[Stippled pattern]	Sandy SILT (ML); reddish-brown; moist; medium stiff; low plasticity; nonstratified; macropores, some rootlets	
10		Sandy SILT with 10-15% clay (ML); dark reddish-brown to brown; moist; medium stiff; low plasticity; nonstratified; macropores	
15	[ML label]	SILT w/very fine sand, clay (15+ %) (ML); lt brown to tan; mottled from 8'-12'; moist; stiff; medium plasticity; non-stratified	
20		SILT w/very fine sand, clay (15-20%) (MH); gray; moist to wet; very stiff; medium - high plasticity	Thin (1/4") seam of coarse sand @ 18.5 ft Noted density increase @ 20 ft
25	[ML label]		End of boring @ 25 ft bgs



CH2MHILL

BORING NUMBER

Borehole 17B

SHEET 1 of 3

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

DEPTH BELOW SURFACE (FT)		SOIL DESCRIPTION	COMMENTS
SAMPLE INTERVAL, #	GRAPHIC LOG	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	
5		Sandy SILT (ML), reddish-brown, moist, stiff, low plasticity, nonstratified, macropores, some rootlets	
		Sandy SILT with 10-15% clay (ML); dark reddish-brown to brown; moist; stiff; low plasticity; nonstratified; macropores	
10		SILT w/very fine sand, clay (15+ %) (ML); light brown; mottled from 8'-12'; moist; med. stiff; medium plasticity; non-stratified	
15			
20		SILT w/very fine sand, clay (15-20%) (ML); gray; moist to wet; stiff to very stiff; medium - high plasticity	Thin (1/4") seam of coarse sand @ 18.5 ft Noted density increase @ 20 ft
25			
30		sandy SILT with trace of clay (ML); gray; moist; stiff low-medium plasticity, becomes drier with depth below 30 feet.	
35			



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

DEPTH BELOW SURFACE (FT)		SOIL DESCRIPTION	COMMENTS
SAMPLE INTERVAL, #	GRAPHIC LOG	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	
35-36		SILT (ML); bluish-gray; dry to moist; stiff; medium plasticity; massive	Fine sand seam (<1/2" thick) @ 41.5 ft
36-37			
37-38		Clay with gravel (CL); Light gray & greenish; moist, stiff, medium plasticity; gravel clasts oxidized, subangular, up to 2 cm dia.; matrix supported; moist; stiff; medium plasticity	
38-39			
39-40			
40-41			
41-42			
42-43			
43-44			
44-45			
45-46	CLAY with silt and gravel (CL); greenish-gray and gray, moist, hard, strong oxidation on gravel, clasts to 1.5 cm diameter; 10-15% gravel; moisture increased @ 58-60 ft	Drilling slows drastically @ 57 ft & deeper (to approx 5 ft/hr)	
46-47			
47-48	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.	Distinct transition @ 63 ft to very dry & denser; blow counts increase 2-3 times	
48-49			
49-50			
50-51			
51-52			
52-53			
53-54			
54-55			
55-56			
56-57			
57-58			
58-59			
59-60			
60-61			
61-62			
62-63			
63-64			
64-65			
65-66			
66-67			
67-68			
68-69			
69-70			
70-71			



BORING NUMBER
Borehole 17B

SHEET 3 of 3

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

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



BORING NUMBER
MW-18A

SHEET 1 of 1

SOIL BORING LOG

PROJECT : Riverbend Landfill

LOCATION : McMinnville, Oregon

DATE: 09/26/2000

ELEVATION : 146.77 ft msl

DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.

DRILLING METHOD :

Hollow-Stem Auger

WATER LEVELS :

START :

END:

LOGGER : B. Long

DEPTH BELOW SURFACE (FT)		SOIL DESCRIPTION	COMMENTS
SAMPLE INTERVAL, #	GRAPHIC LOG	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	
		Grass field, pea gravel (old road bed) Samples not obtained 0'-4'	
5		SILT (ML), Lt. Brown, moist, medium stiff, platy, massive, mica fragments, fine roots, macropores, trace clay.	
10		CLAY (CL), Lt brown (10-30% clay), medium stiff, platy, mica fragments, rootlets, macropores, increasing moisture @ 10' From 13-25 feet - 1"-2" seams of sandy silt @ 6"-10" intervals;	
15		As above, but mottled lt brown, fewer rootlets & macropores, saturated	
20		As above w/some organic fragments, no rootlets or macropores	
25		Clay (CL), bluish-gray, wet, stiff, homogeneous, trace mica.	



CH2MHILL

PROJECT NUMBER
159636.A0.03

BORING NUMBER
MW-18B (L40374)

SHEET 1 OF 1

WELL COMPLETION DIAGRAM

PROJECT: Riverbend Landfill

LOCATION: McMinnville, Oregon

Installation date(s): 09/25/2000

ELEVATION: 146.58 ft msl

DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.

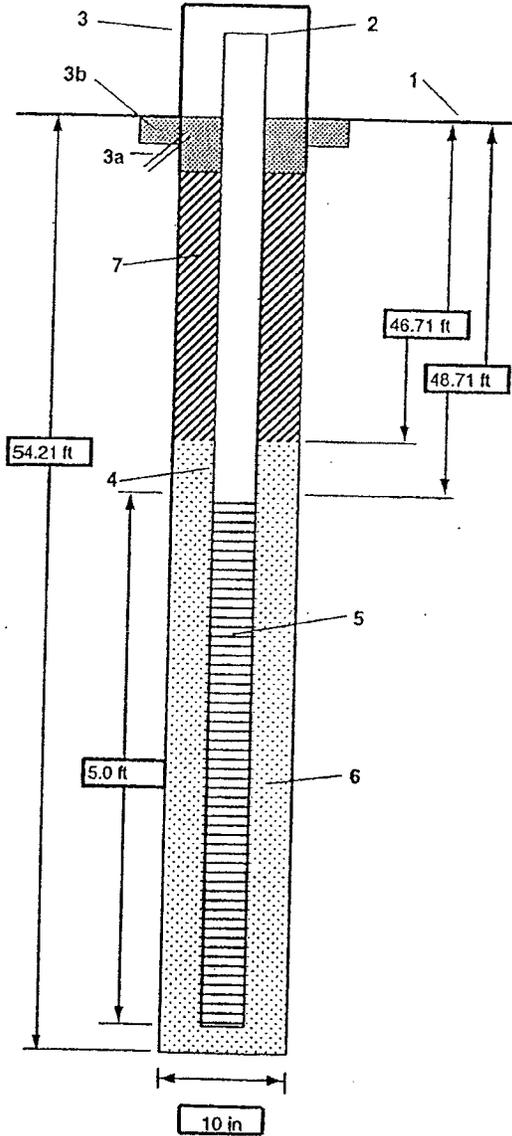
DRILLING METHOD AND EQUIPMENT USED: B-59 Mobile Hollow-Stem Auger (6.25" ID)

WATER LEVELS:

START:

END:

LOGGER: B. Long



1- Ground elevation at well	<u>146.58 ft msl</u>
2- Top of casing elevation	<u>148.57 ft msl</u>
3- Wellhead protection cover type	<u>Above-ground monument</u>
a) drain tube?	<u>No</u>
b) concrete pad dimensions	<u>Approx. 2' x 2'</u>
4- Diameter/type of well casing	<u>2" Sch. 40 PVC</u>
5- Type/slot size of screen	<u>2" Sch.40 PVC / 0.010 slot</u>
6- Type screen filter	<u>Silica sand (10-20)</u>
a) Quantity used	<u>7-50 lb bags</u>
7- Type of seal	<u>Bentonite grout</u>
a) Quantity used	<u>2-50 lb bags</u>
b) Top of seal	<u>Concrete</u>
Development method	<u>Pump & surge</u>
Development time	<u>Approx. 2.5 hrs</u>
Estimated purge volume	<u>80 gallons</u>
Comments	<u>Well screen length is nominal; actual screened portion is approx. 6 inches shorter than labeled length</u>



BORING NUMBER

MW-18B

SHEET 1 of 2

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 END:

LOGGER : B. Long

DEPTH BELOW SURFACE (FT)		SOIL DESCRIPTION	COMMENTS
SAMPLE INTERVAL, #	GRAPHIC LOG	SOIL DESCRIPTION	
		SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	
		Grass field, pea gravel (old road bed), over light brown SILT Samples not obtained 0'-4'	
5	ML	SILT (ML), Lt. Brown, moist, medium stiff, platy, massive, mica fragments, fine roots, macropores, trace clay.	
10		CLAY with silt (CL), Lt brown, medium stiff, platy, mica fragments, rootlets, macropores, increasing moisture @ 10' From 13-25 feet - 1"-2" seams of sandy silt @ 6"-10" intervals	
15		As above, but mottled lt brown, fewer rootlets & macropores, saturated	
20	CL	As above w/some organic fragments, no rootlets or macropores	
25		Clay (CL), bluish-gray, wet, stiff, homogeneous, trace mica.	
30			
35			



BORING NUMBER

MW-18B

SHEET 2 of 2

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 : END: LOGGER : B. Long

DEPTH BELOW SURFACE (FT)		SOIL DESCRIPTION	COMMENTS
	SAMPLE INTERVAL, #	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	
	GRAPHIC LOG		
		CLAY (CL), dark gray, moist, med stiff to stiff, homogeneous, trace of mica fragments	
40		Poorly graded fine GRAVEL with clay (GP), dark gray, moist, very dense, iron oxide on gravel clasts; basalt clasts to 1/2"	
		CLAY (CL), Yellowish-brown to lt gray (mottled), moist, stiff, trace coarse sand, highly weathered	
45			
		Poorly graded fine GRAVEL (GP) with sand and silt, reddish brown, wet, dense, clast supported, basalt.	
50			
55			
60		As above with greater silt content	End of boring @ 62 ft



BORING NUMBER

MW-19A

SHEET 1 of 1

SOIL BORING LOG

PROJECT : Riverbend Landfill

LOCATION : McMinnville, Oregon

DATE: 09/27/2000

ELEVATION : 149.05 ft msl

DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.

DRILLING METHOD :

How-Stem Auger

WATER LEVELS :

START :

LOGGER : R.E. Long

DEPTH BELOW SURFACE (FT)		SOIL DESCRIPTION	COMMENTS
SAMPLE INTERVAL, #	GRAPHIC LOG	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	
		SILT (ML), Lt. Brown, moist, soft, plowed field; no sample 0'-4'	
5		Sandy SILT (ML), Lt brown, dry to moist, soft, platey, root channels, trace clay, trace organics	
	ML		
10		CLAY (CL), light brown to light gray, moist to wet, medium stiff, medium plasticity.	
		seams of silty sand, 1"-3" thick @ 6"-8" intervals	
15		Interbeds of silt & clay, lt brown to lt gray, moist to wet, no roots or macropores (ML-CL)	
	CL		
20		seams of very fine sand, 3"-6" thick @ 1'-3' intervals	
25		Interbeds of lt gray clay & reddish-brown silty-sand; some iron-rich nodules	
	CL		
30		CLAY (CL), bluish-gray to dark gray, medium stiff, moist to wet, trace of mica particles	
			End of Boring 30 Feet.



SOIL BORING LOG

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

LOGGER : R.E. Long

DEPTH BELOW SURFACE (FT)		SOIL DESCRIPTION	COMMENTS
SAMPLE INTERVAL, #	GRAPHIC LOG	SOIL-NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	
		SILT (ML), Lt. Brown, moist, soft, plowed field; no sample 0'-4'	
5	ML	Sandy SILT (ML), Lt brown, dry to moist, soft, platy, root channels, trace clay, trace organics	
10		CLAY (CL), light brown to light gray, moist to wet, medium stiff, medium plasticity.	
		seams of silty sand, 1"-3" thick @ 6"-8" intervals	
15	CL	interbeds of silt & clay, lt brown to lt gray, moist to wet, no roots or macropores (ML-CL)	
20		seams of very fine sand, 3"-6" thick @ 1'-3' intervals	
25		interbeds of lt gray clay & reddish-brown silty-sand; some iron-rich nodules	
	CL	CLAY (CL), bluish-gray to dark gray, medium stiff, moist to wet, trace of mica particles	
30		CLAY (CL), bluish-gray to dark gray clay, stiff, wet, interbedded with reddish-brown clay (approx. 1.5 ft. thick beds)	
35	CL		



BORING NUMBER		SHEET 2 of 4
Borehole 19B		
SOIL BORING LOG		

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

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL, #	SOIL DESCRIPTION	COMMENTS
	GRAPHIC LOG	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	
40	CL	CLAY (CL), dark gray clay, moist, stiff, massive, plastic (CL)	
45	CL	CLAY (CL), dark gray & dark reddish-brown clay, moist, stiff, trace of coarse sand, plastic.	
	GC	Poorly graded fine GRAVEL with clay (GC), dark reddish-brown, moist, trace sand, matrix-supported.	
50	CL	CLAY (CL), light gray clay, mottled with reddish-brown, moist, plastic (CL)	
55	CL	SILTSTONE (SLST), dark gray, hard, sand content (15-20%), friable, semi-consolidated, dry. Thin interbeds of clay.	
65	CL	CLAY (CL), dark grayish-green, moist, soft, with 1-inch to 2-inch interbeds of siltstone	
70	CL	SILTSTONE, Grayish-green siltstone, dry, hard	



BORING NUMBER

Borehole 19B

SHEET 3 of 4

SOIL BORING LOG

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

DEPTH BELOW SURFACE (FT)		SOIL DESCRIPTION	COMMENTS
	SAMPLE INTERVAL, #	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	
	GRAPHIC LOG		
75	[Vertical line pattern]	SILTSTONE, Grayish-green, dry, hard, friable, little fine sand.	
80	[Dotted pattern]	SANDSTONE, gray, dry, very dense. Mostly basalt sand.	
85	[Vertical line pattern]	SILTSTONE, Grayish-green, dry, hard. Some sand.	
90	[Vertical line pattern]	As above, with occasional seams of soft plastic clay	
95	[Dotted pattern]	SANDSTONE, light gray to gray, with silt & clay, moist, friable, weak to moderate cementation	
100	[Vertical line pattern]	SILTSTONE, olive to gray, moist, very dense. Fine-grained, friable	
105	[Vertical line pattern]		



BORING NUMBER

Borehole 19B

SHEET 4 of 4

SOIL BORING LOG

PROJECT : Riverbend Landfill

LOCATION : McMinnville, Oregon

DATE: 09/27/2000

ELEVATION : 149.05 ft msl

DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.

DRILLING METHOD :

Hollow-Stem Auger

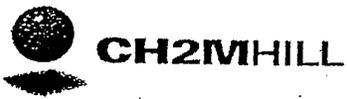
WATER LEVELS :

START :

END:

LOGGER : B. Long

DEPTH BELOW SURFACE (FT)		SOIL DESCRIPTION	COMMENTS
SAMPLE INTERVAL, #	GRAPHIC LOG	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	
110		SANDSTONE, bluish-gray to gray, dry. Coarse-grained, with seams of plastic clay, moist; sandstone weak to mod-cemented CLAY (CL), dark gray to black plastic clay with siltstone fragments; organics present	End of boring @ 111 ft



PROJECT NUMBER
159636.A0.03

BORING NUMBER
MW-20A (L40378) SHEET 1 OF 1

WELL COMPLETION DIAGRAM

PROJECT: Riverbend Landfill

LOCATION: McMinnville, Oregon

Installation date(s): 10/02/2000

ELEVATION: 127.20 ft msl

DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.

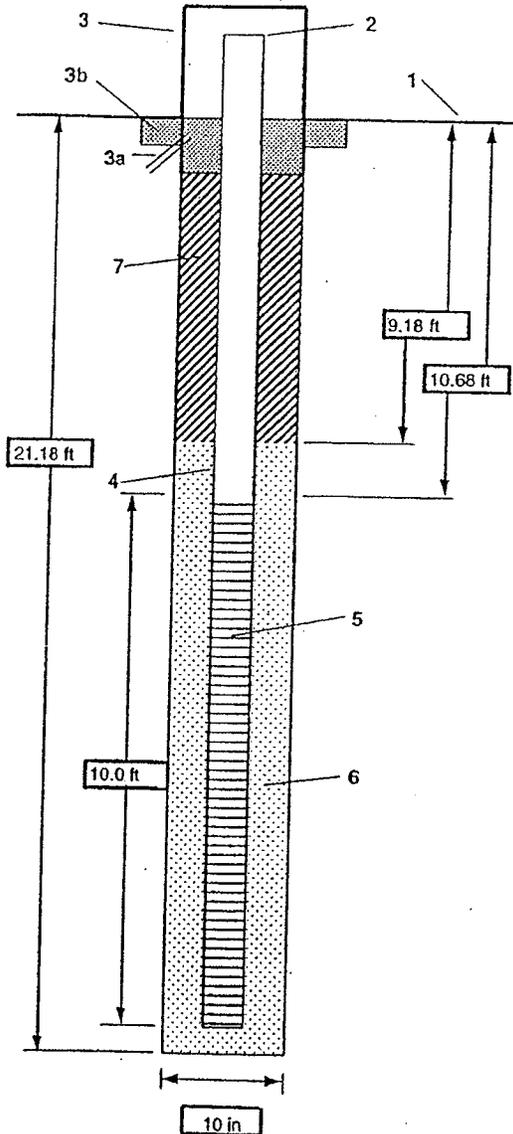
DRILLING METHOD AND EQUIPMENT USED: B-59 Mobile Hollow-Stem Auger (6.25" ID)

WATER LEVELS:

START:

END:

LOGGER: B. Long



- 1- Ground elevation at well 127.20 ft msl
- 2- Top of casing elevation 129.92 ft msl
- 3- Wellhead protection cover type Above-ground monument
 - 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 Silica sand (20-40)
 - a) Quantity used 9 - 50 lb bags
- 7- Type of seal Medium bentonite chips
 - a) Quantity used 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



CH2MHILL

BORING NUMBER
MW-20A

SHEET 1 of 1

SOIL BORING LOG

PROJECT : Riverbend Landfill

LOCATION : McMinnville, Oregon

DATE: 10/02/2000

ELEVATION : 127.20 ft msl

DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.

DRILLING METHOD :

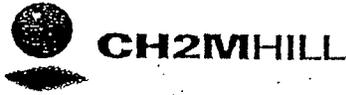
Hollow-Stem Auger

WATER LEVELS :

START :

LOGGER : B. Long

DEPTH BELOW SURFACE (FT)		SOIL DESCRIPTION	COMMENTS
SAMPLE INTERVAL, #	GRAPHIC LOG	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	
5		Grassy field Cuttings: CLAY (CL), gray, moist, medium stiff	
10		CLAY w/silt (CL), mottled reddish-brown, medium stiff, moist, trace organics, sand-sized iron nodules, small root channels	
15		As above, but stiffer, moist to wet; darker gray beginning @ 12'	
20		CLAY with silt and very fine sand (CL), gray, moist, stiff, few root channels, moist	



PROJECT NUMBER
159636.A0.03

BORING NUMBER
MW-20B (L40377) SHEET 1 OF 1

WELL COMPLETION DIAGRAM

PROJECT: Riverbend Landfill

LOCATION: McMinnville, Oregon

Installation date(s): 10/02/2000

ELEVATION: 127.10 ft msl

DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.

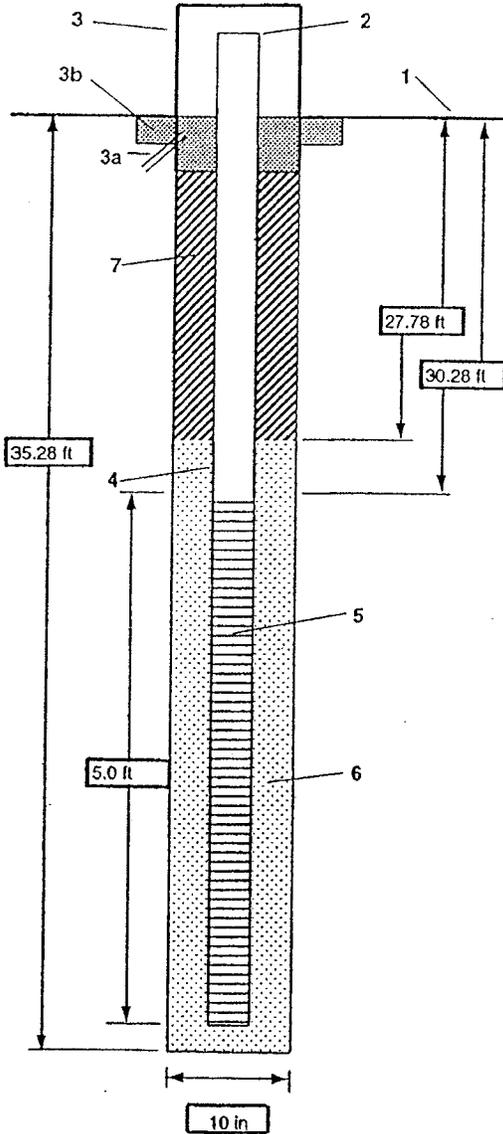
DRILLING METHOD AND EQUIPMENT USED: B-59 Mobile Hollow-Stem Auger (6.25" ID)

WATER LEVELS:

START:

END:

LOGGER: B. Long



- | | |
|-----------------------------------|-----------------------------------|
| 1- Ground elevation at well | <u>127.10 ft msl</u> |
| 2- Top of casing elevation | <u>129.72 ft msl</u> |
| 3- Wellhead protection cover type | <u>Above-ground monument</u> |
| a) drain tube? | <u>No</u> |
| b) concrete pad dimensions | <u>Approx. 2' x 2'</u> |
| 4- Diameter/type of well casing | <u>2" Sch. 40 PVC</u> |
| 5- Type/slot size of screen | <u>2" Sch.40 PVC / 0.010 slot</u> |
| 6- Type screen filter | <u>Silica sand (10-20)</u> |
| a) Quantity used | <u>7 -50 lb bags</u> |
| 7- Type of seal | <u>Bentonite chips</u> |
| a) Quantity used | <u>26 - 50 lb bags</u> |
| b) Top of seal | <u>Concrete</u> |

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

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

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL, #	GRAPHIC LOG	SOIL DESCRIPTION	COMMENTS
			SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	
5		CL	Grassy field Cuttings: CLAY (CL), gray, moist, medium stiff.	
10		CL	CLAY w/silt (CL), mottled reddish-brown, medium stiff, moist, trace organics, sand-sized iron nodules, small root channels,	
15		CL	As above, but stiffer, moist to wet; darker gray beginning @ 12'	
20		CL	CLAY with silt and very fine sand (CL), gray, moist, stiff, few root channels, moist	
25		GP	fine root channels to 24 feet. 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)	
30		GP		
35		GP		



BORING NUMBER

MW-20B

SHEET 2 of 2

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

DEPTH BELOW SURFACE (FT)		SOIL DESCRIPTION	COMMENTS
SAMPLE INTERVAL, #	GRAPHIC LOG	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	
40		GRAVEL with clay, reddish-brown, moist to wet, dense, matrix supported, basalt gravel clasts	End of boring @ 40 ft



BORING NUMBER

MW-21A

SHEET 1 of 1

SOIL BORING LOG

PROJECT : Riverbend Landfill

LOCATION : McMinnville, Oregon

DATE: 10/04/2000

ELEVATION : 116.18 ft msl

DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.

DRILLING METHOD :

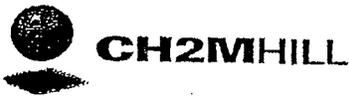
Hollow-Stem Auger

WATER LEVELS :

START : 9:00 END: 11:50

LOGGER : D. Orłowski

DEPTH BELOW SURFACE (FT)		SOIL DESCRIPTION	COMMENTS
SAMPLE INTERVAL, #	GRAPHIC LOG	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	
		Grassy field No samples obtained 0'-4'	
5	ML	SILT with fine sand (ML), reddish-brown, moist, medium stiff, low plasticity ; root channels present	
		SILT (ML), reddish-brown; moist; medium stiff, some mottled gray areas; higher moisture than 4'-6'; medium plastic.	
10	ML	Brown and gray mottling ; some rootlets; decayed wood particle @ 11'; increased gray mottling @ 11'; very moist; med-high plasticity	
			End of boring @ 13 ft



PROJECT NUMBER
159636.A0.03

BORING NUMBER
MW-21B (L40379) SHEET 1 OF 1

WELL COMPLETION DIAGRAM

PROJECT: Riverbend Landfill

LOCATION: McMinnville, Oregon

Installation date(s): 10/04/2000

ELEVATION: 116.56 ft msl

DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.

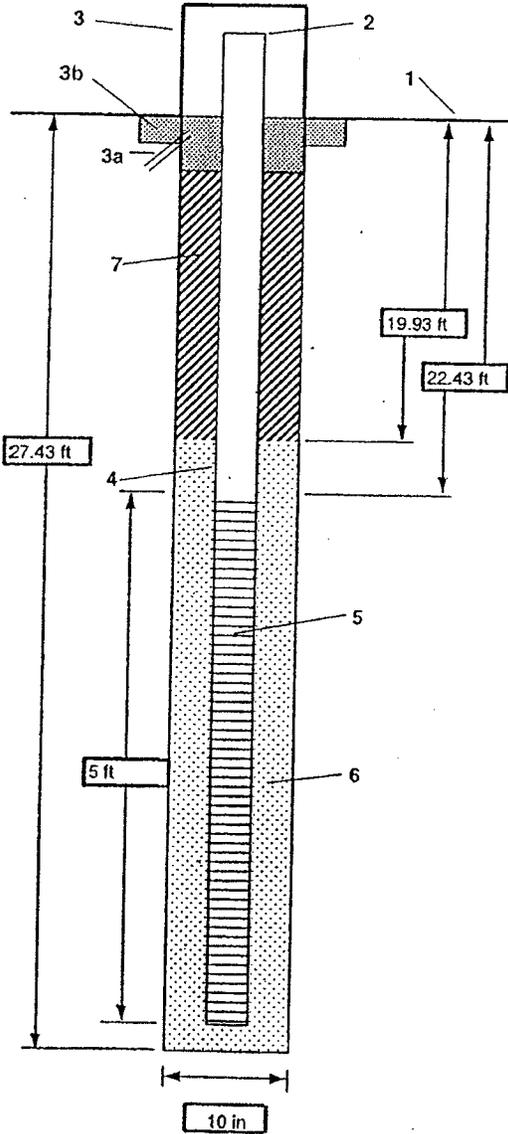
DRILLING METHOD AND EQUIPMENT USED: B-59 Mobile Hollow-Stem Auger (6.25" ID)

WATER LEVELS:

START: 9:00

END: 11:50

LOGGER: D. Orowski



1- Ground elevation at well	<u>116.56 ft msl</u>
2- Top of casing elevation	<u>119.53 ft msl</u>
3- Wellhead protection cover type	<u>Above-ground monument</u>
a) drain tube?	<u>No</u>
b) concrete pad dimensions	<u>Approx. 2' x 2'</u>
4- Diameter/type of well casing	<u>2" Sch. 40 PVC</u>
5- Type/slot size of screen	<u>2" Sch. 40 PVC / 0.010 slot</u>
6- Type screen filter	<u>Silica sand (10-20)</u>
a) Quantity used	<u>7 - 50 lb bags</u>
7- Type of seal	<u>Bentonite chips</u>
a) Quantity used	<u>16 - 50 lb bags</u>
b) Top of seal	<u>Concrete</u>
Development method	<u>Pump & surge</u>
Development time	<u>Approx. 5 hours</u>
Estimated purge volume	<u>312 gallons</u>
Comments	<u>Well screen length is nominal; actual screened portion is approx. 6 inches shorter than labeled length</u>



BORING NUMBER
MW-21B

SHEET 1 of 1

SOIL BORING LOG

PROJECT : Riverbend Landfill LOCATION : McMinnville, Oregon DATE: 10/04/2000
 ELEVATION : 116.56 ft msl DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.
 DRILLING METHOD : Hollow-Stem Auger
 WATER LEVELS : START : 13:30 END: 15:40 LOGGER : D. Orłowski

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL, #	GRAPHIC LOG	SOIL DESCRIPTION	COMMENTS
0-4			Grassy field, over ft. Brown SILT. No samples obtained 0'-4'	
5		ML	SILT with fine sand (ML), reddish brown, moist, med. stiff low plasticity	
5-10		ML	SILT with fine sand (ML), reddish-brown, moist, med. stiff faint mottling; moderate plasticity	
10-15		ML	SILT (ML), brown and gray mottling, moist, stiff; some rootlets; decayed wood particle @ 11'; increased gray mottling @ 11';	
15-20		SP	Higher moisture, high plasticity Poorly-graded SAND with silt (SP); gray-brown, wet, dense. clay present (10%); (SP)	
20-25		GP-GM	Poorly-graded GRAVEL with silt and sand; reddish-brown, wet, dense, gravel clasts subrounded, 5-20 mm; (GP), sand is medium to coarse.	
25-30		SP	Poorly-graded coarse SAND with silt (SP); gray, wet, dense.	
30-35		GM	GRAVEL with silt, sand, and clay, reddish-brown and gray (GM); wet, dense, sand (10%), round gravel to 25 mm; clast-supported;	
35-36		SM	SILTY SAND (SM), red-brown, wet; dense, gravel (10%) (SM)	
36-37		ML	SILT with sand (ML), red-brown; moist; stiff, low plast.	
37-38				End of boring @ 34 ft