Weyerhaeuser

32901 Weyerhaeuser Way South
Federal Way, Washington 98003
Analytical Chemistry Laboratories
Tacoma, Washington 98477
Tel (206) 924 6872
Fax (206) 924 6654

Weyerhaeuser Analysis and Testing Services
Service Request 06521

GEO ENGINEERS INC. WATER SAMPLES

Aroclor and Chlorinated Hydrocarbon Analysis

Seven water samples were analyzed for Aroclors, using a modified method 3050 for sample preparation and method 8080 for Aroclor GC analysis and method 8120 for Chlorinated Hydrocarbon GC analysis. The results are summarized below.

Lab Sample Number	Sample Description	
76461	MW-1-3	8/19/91 1415
76462	MW-2A	8/19/91 1500
76463	MW-2B	8/19/91 1500
76464	MW-3A	8/19/91 1300
76465	MW-3B	8/19/91 1300
76466	MW-4	8/19/91 1200
76467	TRIP BLANK	

UNITS IN PPB (UG/L)

CAS NO. COMPOUND	76461	76462	76463	76464	76465
SURROGATE REC - Aroclor	94%	NA%*	NA%*	114%	84%
SURROGATE REC - chlorobenz	90%	NA%*	NA%*	101%	93%
1,2 Dichlorobenzene	<8.0	13000	13000	<8.0	<8.0
1,3 Dichlorobenzene	<8.0	13000	13000	<8.0	<8.0
1,4 Dichlorobenzene	<8.0	3800	3800	<8.0	<8.0
Trichlorobenzene	<0.40	22000	22000	<0.40	<0.40
Tetrachlorobenzene	<0.20	200	190	<0.20	<0.20
Pentachlorobenzene	<0.20	<0.20	<0.20	<0.20	<0.20
Hexachlorobenzene	<0.10	<0.10	<0.10	<0.10	<0.10
12674-11-2--Aroclor-1016	<0.025	<0.025	<0.025	<0.025	<0.025
11104-28-2--Aroclor-1221	<0.025	<0.025	<0.025	<0.025	<0.025
11141-16-5--Aroclor-1232	<0.025	<0.025	<0.025	<0.025	<0.025
53469-21-9--Aroclor-1242	<0.025	<0.025	<0.025	<0.025	<0.025
12672-29-6--Aroclor-1248	<0.025	<0.025	<0.025	<0.025	<0.025
11097-69-1--Aroclor-1254	<0.025	<0.025	<0.025	<0.025	<0.025
11096-82-5--Aroclor-1260	0.18	430	400	0.27	0.19

*Indicates that because of the high level of Aroclor, the sample was diluted - resulting in the surrogate being diluted out.

Approved [signature] Date 8/29/91

USEPA SF
1335776

Weyerhaeuser

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GEO ENGINEERS INC. WATER SAMPLES

Aroclor and Chlorinated Hydrocarbon Analysis

UNITS IN PPB (UG/L)

CAS NO. COMPOUND	76466	76467
SURROGATE REC - Aroclor	100%	70%
SURROGATE REC - chlorobenz	91%	137%
1,2 Dichlorobenzene	<8.0	<8.0
1,3 Dichlorobenzene	<8.0	<8.0
1,4 Dichlorobenzene	<8.0	<8.0
Trichlorobenzene	<0.40	<0.40
Tetrachlorobenzene	<0.20	<0.20
Pentachlorobenzene	<0.20	<0.20
Hexachlorobenzene	<0.10	<0.10
12674-11-2--Aroclor-1016	<0.025	<0.025
11104-28-2--Aroclor-1221	<0.025	<0.025
11141-16-5--Aroclor-1232	<0.025	<0.025
53469-21-9--Aroclor-1242	<0.025	<0.025
12672-29-6--Aroclor-1248	<0.025	<0.025
11097-69-1--Aroclor-1254	<0.025	<0.025
11096-82-5--Aroclor-1260	0.26	<0.025

A matrix spike and matrix spike duplicate were done on both the chlorinated benzenes and the aroclors. The results are summarized below

CAS NO. COMPOUND	MS	MSD
SURROGATE REC - Aroclor	99%	101%
SURROGATE REC - chlorobenz	154%	98%
1,2 Dichlorobenzene	77%	72%
1,3 Dichlorobenzene	77%	72%
1,4 Dichlorobenzene	67%	71%
Trichlorobenzene	57%	62%
Hexachlorobenzene	NA%	NA%
11096-82-5--Aroclor-1260	79%	101%

Approved _____ Date 8/29/91

WEYERHAEUSER FIFTY YEARS

Geo Engineers

FAX TRANSMITTAL

8410 - 154th Avenue NE
Redmond, Washington 98052
Telephone: (206) 861-6000
Fax: (206) 861-6050

To: US EPA
Region 10

Date: August 22, 1991

File: 0249-023-B14

Fax Number: 553-0110

Attention: Ms. Eileen Heilman

Regarding: Weyerhaeuser Snoqualmie PCB Assessment

Pages	Date	Description
1		Fax Transmittal
1		Chemical Analytical Results for MW-1 and MW-2 Note: Depths have changed since first FAX, Mistake corrected
8		Boring Logs MW-1, MW-2, MW-3, MW-4

Total Pages: 10

Comments:

Signed: [illegible]

Weyerhaeuser

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Weyerhaeuser Analysis and Testing Services
Service Request 06459

GEO ENGINEERS INC. SOIL SAMPLES

Aroclor Analysis

Seven soil were analyzed for Aroclors, using a modified method 3050 for sample preparation and method 8080 for GC analysis. The results summarized below.

Lab Sample Number	Sample Description		Depth (feet)
76051	MW-1-2	8/12/91	7.5
76052	MW-1-6	8/12/91	15.5
76053	MW-1-9	8/12/91	23.0
76054	MW-2-2	8/12/91	7.0
76055	MW-2-7A	8/12/91	18.0
76056	MW-2-7B	8/12/91	18.0
76057	MS-2-10	8/12/91	25.0

UNITS IN PPM (UG/G)

CAS NO.	COMPOUND	76051	76052	76053	76054	76055
12674-11-2	Aroclor-1016	<0.025	<0.025	<0.025	<0.025	<25
11104-28-2	Aroclor-1221	<0.025	<0.025	<0.025	<0.025	<25
11141-16-5	Aroclor-1232	<0.025	<0.025	<0.025	<0.025	<25
53469-21-9	Aroclor-1242	<0.025	<0.025	<0.025	<0.025	<25
12672-29-6	Aroclor-1248	<0.025	<0.025	<0.025	<0.025	<25
11097-69-1	Aroclor-1254	<0.025	<0.025	<0.025	<0.025	<25
11096-82-5	Aroclor-1260	<0.025	<0.025	<0.025	0.073	300

CAS NO.	COMPOUND	76056	76057
12674-11-2	Aroclor-1016	<2.5	<0.25
11104-28-2	Aroclor-1221	<2.5	<0.25
11141-16-5	Aroclor-1232	<2.5	<0.25
53469-21-9	Aroclor-1242	<2.5	<0.25
12672-29-6	Aroclor-1248	<2.5	<0.25
11097-69-1	Aroclor-1254	<2.5	<0.25
11096-82-5	Aroclor-1260	32	1.5

Approved [signature] Date 8/20/91

WEYERHAEUSER FIFTY YEARS

GeoEngineers Inc.

JOB NO.	CLIENT	LOCATION
249-23-B14	Weyerhaeuser	Snoqualmie

LOCATION OF BORING — NORTH ARROW

DRILLING METHOD: Hollow Stem Auger

BORING NO. MW-1

SHEET 1 OF 2

SAMPLING METHOD: Dames AND Moore 2½ Foot interval 300 lb hammer

WATER LEVEL				
TIME				
DATE				
CASING DEPTH				

DRILLING	START	FINISH
TIME	0820	1000
DATE	8/12/91	8/12/91

DATUM — ELEVATION

SURFACE CONDITIONS: sandy gravel with sparse weeds.

DRILLING CONTR. Holt

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	SOIL DESCRIPTION	COMMENTS
						0			
						1			
				26		2			
DM	18/10	2.5	1/3.0	3/4/13/13	bag	3	X SM	Brn Silty Sand w/ gravel (Dense, moist)	Tip = 0 TLV = 0 SS
				2		4			
DM	18	5.0	2/5.5	4/1/1	bag split	5			Tip = TLV =
				4	CA	6		No Recovery. Sample driven 6 more inches w/o recovery. Refusal at 9.0 feet	Tip = 0
DM	18/18	7.5	3/8.0	9/1/3	bag	7			TLV = 64 NS
						8		Green Sandy Clay w/ gravel (Soft, wet)	
				3		9	X CL	(very soft, moist)	Tip = 0
DM	18	10.0	4/10.5	1/1/2	bag	10			TLV = 26 NS
				1		11	X CL	Green Gray Clay w/ OR Mottling (very soft, moist)	Tip = 0
DM	18	12.5	5/13	1/0/1	bag	12			TLV = 50 NS
						13	X CL	Gr Silty Clay (very soft, moist)	
				2		14			Tip = 0
DM	18/10	15.0	6/15.5	1/1/1	bag	15			TLV = — NS
				5	CA	16	X SM	Grey Sil Fine Sand w/ org. (Loose, wet)	
DM	18/18	17.5	7/18	0/1/3	bag	17		Gr Silty Fine Sand w/ organics (v. loose, wet)	Tip = 0 TLV = — NS
						18			
						19			
						20			

BY Sarah Kingery DATE 8/12/91 CHK'D BY

GEI 25-81

GeoEngineers Inc.

JOB NO.	CLIENT	LOCATION
249-23-B14	Weyerhaeuser	Snoqualmie

LOCATION OF BORING — NORTH ARROW

See page 1.

DRILLING METHOD: Hollow Stem Auger

SAMPLING METHOD: Dames and Moore 2½ foot interval

BORING NO. MW-1

SHEET 2 OF 2

					DRILLING START	DRILLING FINISH
WATER LEVEL						
TIME					TIME 0820	TIME 1000
DATE					DATE 8/12/91	DATE 8/12/91
CASING DEPTH						

DATUM ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	SOIL DESCRIPTION	COMMENTS
DM	18/18	20.0	8/20.5	1/1/2	bag	20			T.P = 0
				8		21		Grey Silty Sand w/ occ org. (loose, wet)	TLV = — NS
DM	18/	22.5	9/23	3/3/5	bag	22	SM		T.P = 0
						23		Same (loose, wet)	TLV = ~~NS~~ NS
				7		24			
DM	18/18	25.0	10/25.5	0/3/4	bag	25			T.P = 0
						26		Grey silty fine Sand (loose, wet)	TLV = — NS
						27		Boring complete at 26.5 ft on 8/12/91	
						28			
						29			
						30			
						1			
						2			
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						0			

DRILLING CONTR. Holt

BY Sarah Kingery DATE 8/12/91 CHK'D BY

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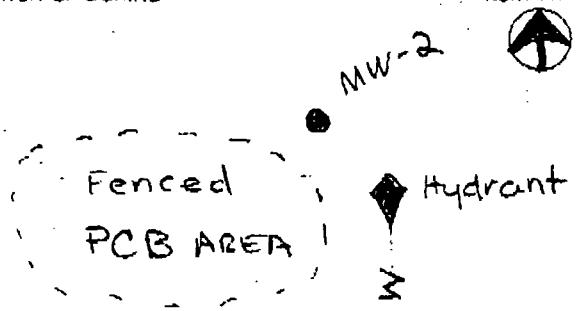
GeoEngineers Inc.

JOB NO.	CLIENT	LOCATION
249-23-B14	Weyerhaeuser	Snoqualamie

LOCATION OF BORING — NORTH ARROW



DRILLING METHOD: Hollow Stem Auger

SAMPLING METHOD: Dames and Moore 2½ ft interval

BORING NO. MW-2

SHEET 1 OF 2

				DRILLING START	DRILLING FINISH
WATER LEVEL	16.00	16.00	7.2	TIME	TIME
TIME	1345	1400	1800	1300	1430
DATE	8/12/91	8/12/91	8/12/91	DATE 8/12/91	DATE 8/12/91
CASING DEPTH	15.00	20.0	well installed		

DATUM ELEVATION

SURFACE CONDITIONS: Sandy gravel w/ sparse vegitation.

DRILLING CONTR. Holt

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	SOIL DESCRIPTION	COMMENTS
						0			
				10		1			
DM	18/1	2.5	1/3.0	16/9/1	bag	2			TIP=0.0 TLV=— SS
						3	SM	Brn Silty Fine Sand (loose, moist) (Drillers kept going w/o ✓ sample	
				2		4			
DM	18/1	5.0	2/4.5	1/1/1	bag	5			TIP=0 TLV=— SS
						6		ORANGE, Clay (v. soft, moist)	
DM	1/10	1.5	3/8		bag (CA)		CL		~~TIP~~ ~~TLV~~
				3		8		Or Clay w/layers of Br Medium Sand and wood frag. (Soft, moist)	
DM	18/2	10.0	4/10.5	3/2/1	bag	9			TIP=0 TLV=— SS
						10			
				2		11	CL	Same (soft, moist)	
DM	18/10	12.5	5/13	1/1/1	bag	12			TIP=0 TLV=— NS
						13	SM	Gr Si Sand w spots of ORANGE (v. loose, wet)	
				2		14			
DM	18/2	15.0	6/15.5	2/1/1	bag	15	SM		TIP=14.1 TLV=—
				5		16	▽	Grey Silty Sand w/ organics (v. Loose, wet) SS Background	(Motor oil) MOTH BALL odor
DM	18	17.5	7/18	9/2/3	bag	17			
					(CA) spilt	18	SM	Grey Silty Fine Sand (loose, wet)	
						19			TIP=45 ppm SS
						20		Background	Moth ball odor

BY Sarah Ringery DATE 8/12/91 CHK'D BY

GEI 25-81

GeoEngineers Inc.

JOB NO.	CLIENT	LOCATION
249-23-314	Weyerhaeuser	Snoqualamie

LOCATION OF BORING — NORTH ARROW

See Page 1

DRILLING METHOD: Hollow Stem Auger

SAMPLING METHOD: Dames & Moore 2½ ft Interval 300 lb hammer

BORING NO. MW-2

SHEET 2 OF 2

WATER LEVEL	16.0	7.2			DRILLING START TIME	DRILLING FINISH TIME
TIME	1400	1900			1300	1430
DATE	8-12-91	8-12-91			DATE 8/12/91	DATE 8/12/91
CASING DEPTH	20.0	well installed				

DATUM — ELEVATION

SURFACE CONDITIONS:

DRILLING CONTR. Holt

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	SOIL DESCRIPTION	COMMENTS
DM	18/18	20.0	8/20.5	1/2/1	bag	20			
						21	SM	Gr silty fine Sand w/ org. (wood) (v. loose, wet)	Tip = 12.6 SS
				7		22		(Respirator on)	
DM	18/10	22.5	9/23	0/3/4	bag	23	SM	Same as above (loose, wet)	Tip: -- NS
				10		24			
DM	18/10	25.0	10/25.5	1/4/6	bag	25			
					CH	26	SM	Grey silty fine Sand w/ organics (loose, wet)	Tip = 2.2 NS
						27		Boring Complete at 26.5 feet on 8/12/91	(No odor)
						28		Ground water observed at 16.0 ft.	
						29			
						30			
						1			
						2			
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						0			

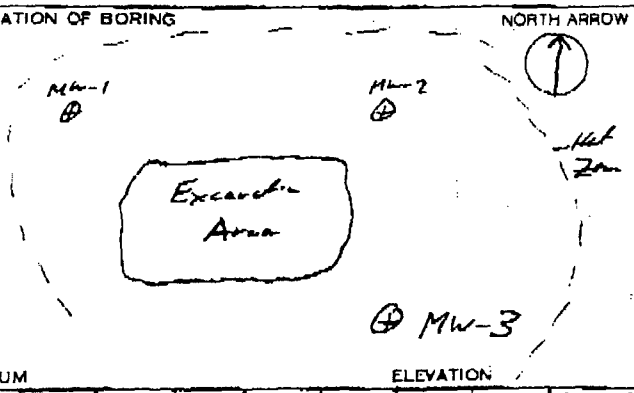
BY Sarah Dingery DATE 8/12/91 CHK'D BY

GEI 25-81

GeoEngineers Inc.

JOB NO.	CLIENT	LOCATION
0249-023-014	Weyerhaeuser	Snoqualmie

LOCATION OF BORING — NORTH ARROW



DATUM — ELEVATION

DRILLING METHOD:	BORING NO.
HSA	MW-3
SAMPLING METHOD:	SHEET 1 OF 2
D + M	DRILLING

					START TIME	FINISH TIME
WATER LEVEL	7.6 from ground				0930	1100
TIME	1400					
DATE	8/16				DATE 8/16	DATE 8/16
CASING DEPTH	25'					

DRILLING CONTR. Hold Testing Bill + Charlie

BY TTT DATE 8/16 CHK'D BY

SURFACE CONDITIONS: Gravelly

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	SOIL DESCRIPTION	COMMENTS
						0	SP-SM	Br fine to med sa w/ silt, gravel, occa cobbles (Med Dens, Moist)	
						1			
						2			
DM	18/10	2 1/2	1/3	9/8/6 (14)		3		Br fine to med sa w/ silt and gravel (M Dens, Moist)	SS 5.0 Tip
						4		Soft at 4' (Driller comment)	5.0 TLV
						5			
DM	18/10	5	2/5 1/2	2/1/1/2 (2)		6	SM	Br si fine to med sa w/ co sa (V Loose, Moist to Wet)	NS 3.4 Tip
						7			
DM	18/10	7 1/2	3/8	1/1/1 (2)		8	CL	Br to Lt Br clay w/ occa fine to med sa, (V Soft to Wet) & organics Soft	NS 0.4 Tip 100 TLV
						9			
DM	18/12	10	4/10 1/2	4/2/3 (6)		10			
						11		Lt Br with Gray Clay and occa sand and occa organics (M Stiff, Moist)	NS 2.0 Tip
						12			
DM	18/8	12 1/2	5/12 1/2	1/1/1 (1)		13	ML	Br si to clay w/ v fine sa (V Soft, Wet)	NS 4.5 Tip 100 TLV
						14			
DM	18/17	15	6/15 1/2	1/1/1 (2)		15			
						16	SM	Dk Br si fine sa w/ organic matter (V Loose, Wet)	NS 2.0 Tip 90 TLV
						17			
DM	18/15	17 1/2	7/18	3/2/3 (5)		18		Same w/ wood chips (Loose, Wet)	NS 3.0 Tip 150 TLV
						19			
						20			

GEI 25-81

GeoEngineers Inc.

JOB NO.	CLIENT	LOCATION
0241-022-014	Weyerhaeuser	Snoqualmie

LOCATION OF BORING

NORTH ARROW

DRILLING METHOD:

SAMPLING METHOD:

BORING NO. MW-3

SHEET 2 OF 2

WATER LEVEL				
TIME				
DATE				
CASING DEPTH				

DRILLING: START TIME / FINISH TIME; DATE / DATE

DATUM ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	SOIL DESCRIPTION	COMMENTS
OM	18/15	20	8/20½	11/1/1		20	SM to SP SM	Same w/ less organic matter (V Loose, Wet)	NS 0.0 tip 80 TLV
				2		21			
OM	18/12	22½	9/23	0/1/4		22			
				5		23 CR		Same (Loose, Wet) (Grading to fn sa w/silt)	NS 8.0 Tip
						24			
OM	18/12	25	10/25½	1/3/4		25	SP		
				8		26		Gr v fn to fn sa w/ tr silt (Loose, Wet)	NS 6.5 Tip
						27			
						28		Screen 20' – 25' Blank + – 20' Sand Filter 17 – 25½ Bentonite Grout	
						29			
						30			
						1			
						2			
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						0			

DRILLING CONTR

CHK'D BY

DATE

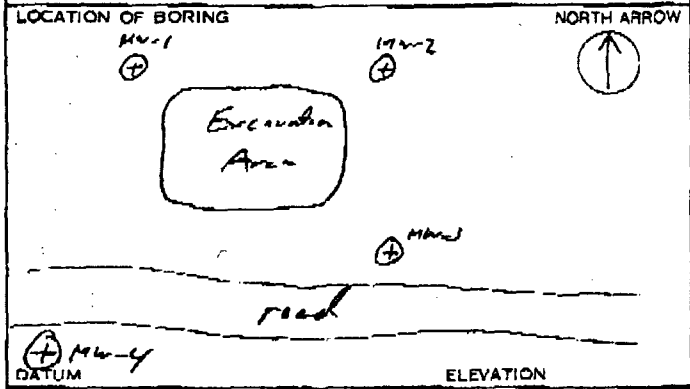
BY

GEI 25-81

GeoEngineers Inc.

JOB NO.	CLIENT	LOCATION
0249-023-04	Weyerhaeuser	Snoqualmie

LOCATION OF BORING



ELEVATION

DRILLING METHOD: ~~Auger~~ HSA

SAMPLING METHOD: D + M

WATER LEVEL	~6.5' from ground			
TIME	1945			
DATE	8/16			
CASING DEPTH	25'			

BORING NO. MW-4

SHEET 1 OF 2

DRILLING

START TIME	FINISH TIME
1530	1645
DATE 8/16	DATE 8/16

DRILLING CONTR. Hart Testing

BY 8/11, Chris

SURFACE CONDITIONS: Gravelly

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	SOIL DESCRIPTION	COMMENTS
						0			
						1	SP		
						2			
DM	18/10	2 1/2	1/3	7/7/6		3		Gr f to med sa w/ tr si, coarse sand and gravel (M Den, Moist)	SS
				(13)		4			0.0 Tip
DM	18/11	5	2/5 1/2	1/0/1		5			
				(1)		6		Same w/ wood fragments (wood of material may be stuff, wtly wood is there (V Soft, Moist to Wet)	NS 0.0 Tip
						7	CL		
DM	18/14	7 1/2	3/8	1/0/1		8 (CA)		Gr Clay w/ occa organic matter and wood fragments (V Soft, Moist)	NS
				(1)		9			0.0 Tip
DM	18/18	10	4/10 1/2	1/1/1		10			
				(2)		11		Gr Clay w/ v occa fine organics (V Soft, Moist)	NS 0.0 Tip
						12			
DM	18/16	12 1/2	5/13	1/0/2		13	SM	Gr si v fine to fine sa w/ layers of	NS
				(2)		(CA) 14		Gr v fine sa w/ si (V Loose, Moist)	0.0 Tip
DM	18/13	15	6/15 1/2	1/1/2		15	SP-SM		
				(3)		16		Gr v fine to fine sa w/ si, occa organics (V Loose, Wet)	NS 0.0 Tip
						17			
DM	18/16	17 1/2	7/18	2/2/2		18		Gr v fine to fine sa w/ si to layers si v fine to fine sa (V Loose, Wet) to Loose	NS
				(4)		19			0.0 Tip
						20			

BY TTF DATE 8/16/91 CHK'D BY

GEI 25-81

GeoEngineers Inc.

JOB NO.	CLIENT	LOCATION
0249-023-B14	Weyerhaeuser	Snoqualmie

LOCATION OF BORING

NORTH ARROW

DRILLING METHOD:

SAMPLING METHOD:

BORING NO. MW-4

SHEET 2 OF 2

						DRILLING START TIME	DRILLING FINISH TIME
WATER LEVEL							
TIME							
DATE						DATE 8/16	DATE
CASING DEPTH							

DATUM

ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	SOIL DESCRIPTION	COMMENTS
						20		SP-SM	
DM	18/14	20	8/20½	3/6/6		21		SM Gravelly fine to medium sand to very fine to fine sand w/ some organics (M Den, Wet)	NS 0.0 Tip
				(12)		22			
DM	18/13	22½	9/23	2/5/5	(CA)	23		Loose to Same (M Den, Wet)	NS 0.0 Tip
				(10)		24			
DM	18	25	10/25½	1/5/6		25			
				(9)		26		Same (Loose, Wet) (grades of coarser?)	NS 0.0 Tip
						27			
						28			
						29			
						30			
						1			
						2			
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						0			

DRILLING CONTR.

BY

DATE

CHK'D BY

GE1 25-81