PERCHED GROUNDWATER REPORT

WEYERHAEUSER'S CASCADE DIVISION
SNOQUALMIE FALLS
PLYWOOD PLANT FIRE SITE

for

The Weyerhaeuser Company

by

HDR Engineering, Inc.
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June 1989

WEYERHAEUSER

FIGURES

TABLES

APPENDIXES

1.0 INTRODUCTION

This project was conducted for the Weyerhaeuser Company to determine the extent of soil and shallow groundwater contamination at the Snoqualmie Falls Mill resulting from the spillage of PCB-contaminated transformer fluid and to recommend expeditious and effective remedial actions.

On February 14, 1989, Weyerhaeuser Company contracted with HDR Engineering, Inc. (HDR) to assist in evaluating PCB-contaminated materials at the site. The results of that investigation recommended the installation of groundwater monitoring wells in the vicinity of the two leaking transformers to evaluate the extent of groundwater contamination.

On March 17, 1989, Weyerhaeuser Company extended the contract with HDR to perform additional work including the installation of six monitoring wells, groundwater sampling and well boring samples.

This report discusses the drilling and sampling activities, the results of the sampling and recommends necessary action for Weyerhaeuser Company to direct a comprehensive cleanup of PCB-contaminated materials at the site.

1.1 Site Background

During the evening of February 5, 1989, a fire erupted at the plywood manufacturing facility located in the southeast portion of the Snoqualmie Falls Mill. The 160,000 square foot building was a complete loss as the fire fighters were hampered by frozen water lines and extreme cold.

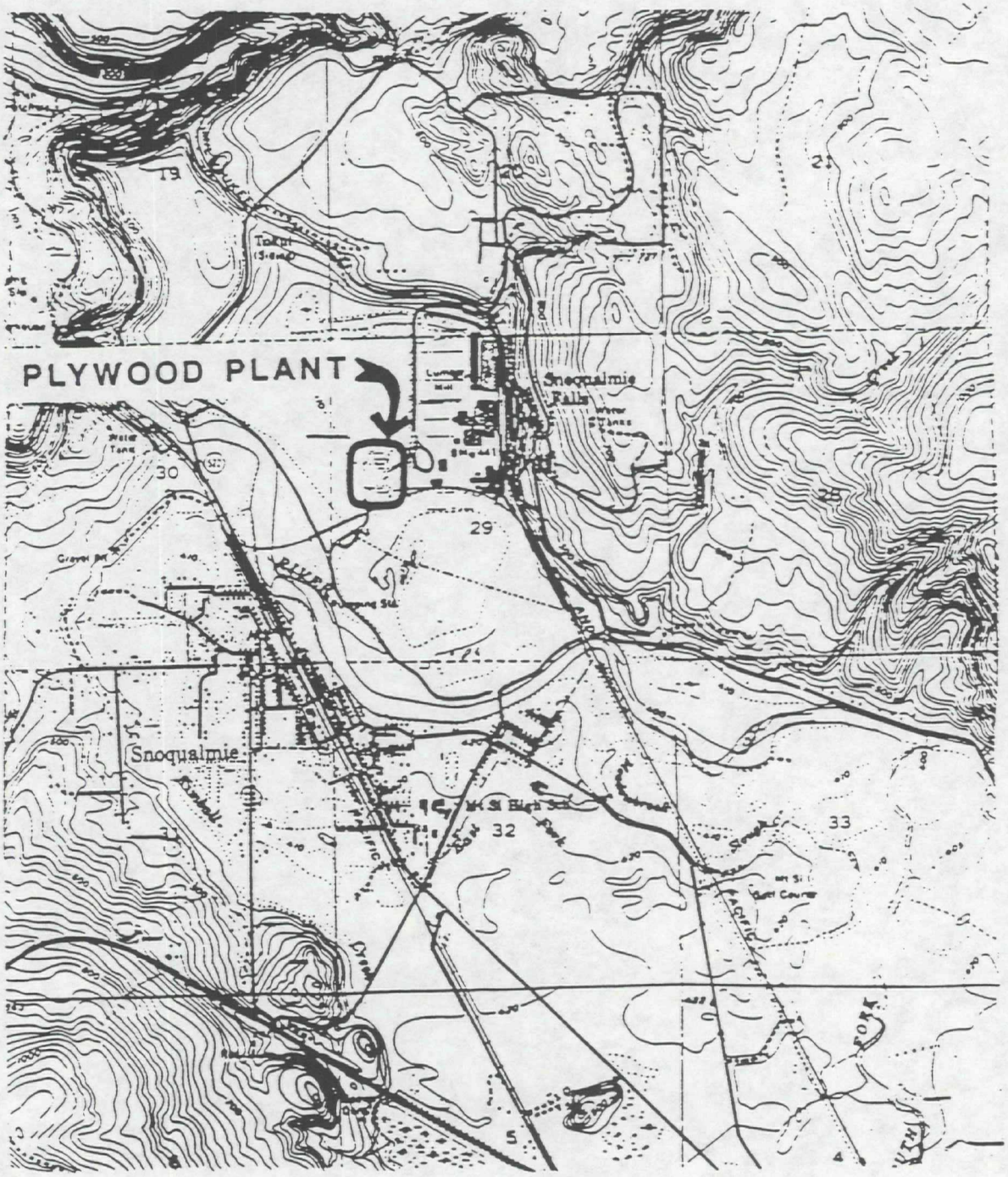
High voltage electrical equipment serving the plant's numerous industrial motors and lighting systems includes several askerel filled [polychlorinated biphenyl (PCB) bearing cooling fluid] pad mounted transformers. Although these transformers were located outdoors, they were sufficiently close to the building to be exposed to the heat and falling debris. None of the transformers catastrophically ruptured, however two had some observed leakage (estimated to be 5-10 gallons) around the porcelain secondary bushings.

The initial investigation by HDR indicated the soil adjacent to transformers T-12 and T-17 was contaminated with PCBs to depths of 2.5 feet and PCBs had already contacted the shallow aquifer.

1.2 Site Description

The mill is located near the town of Snoqualmie, Washington at the foot of the Cascade Mountains in King County (Figure 1.1).

There are several surface water features in the vicinity of the mill, including the Snoqualmie River and the log pond to the south (Figure 1.2). Trenches and shallow excavations in the vicinity of the plywood plant indicate that a shallow (and possibly perched) groundwater aquifer exists under the site at a depth of approximately two feet at the two transformer sites. The piezometric gradient and direction of flow of this groundwater layer is currently unknown. However, it is likely that the extensive concrete foundations of the plywood plant create a slight



SITE LOCATION MAP

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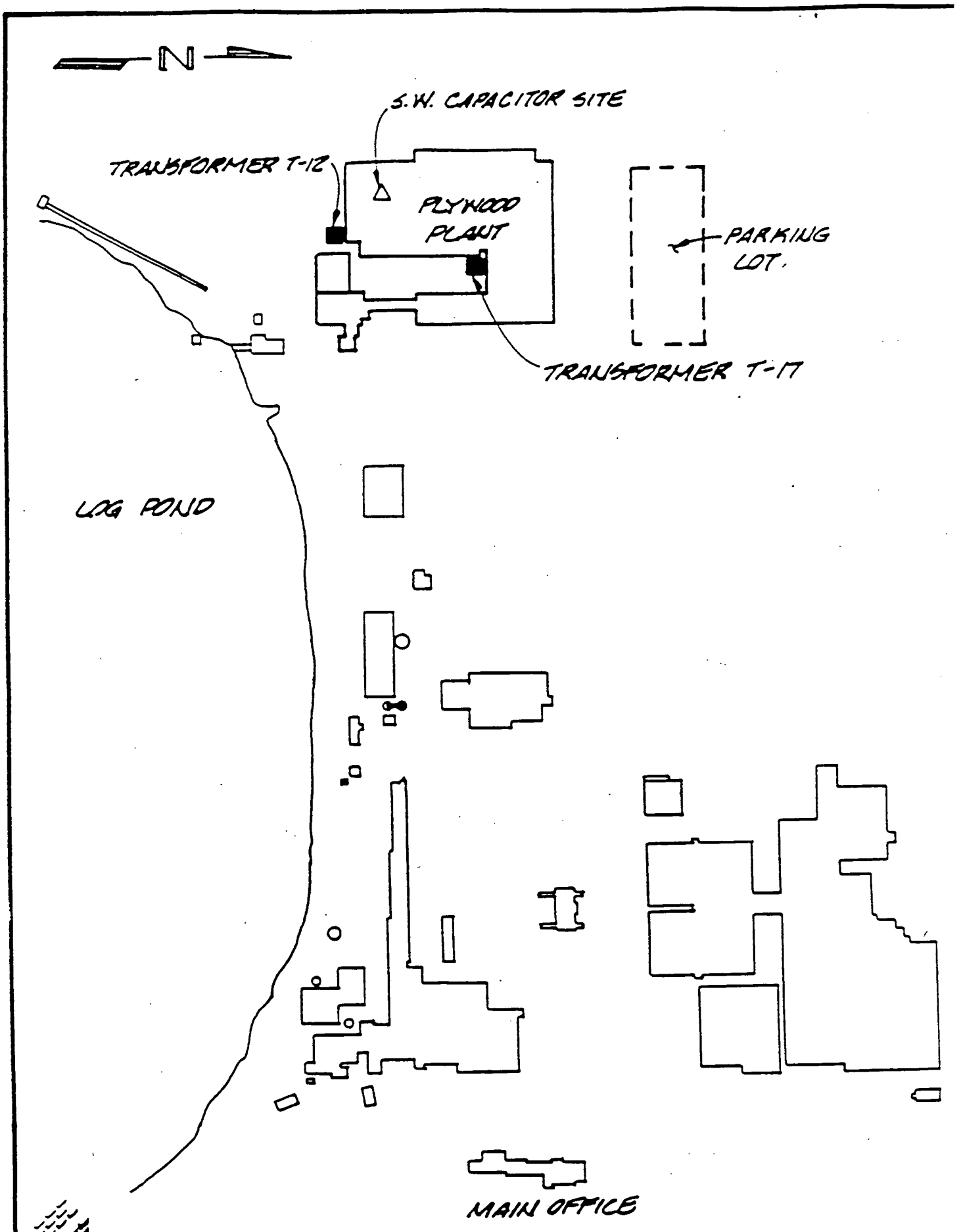
FIGURE 1.1



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SITE MAP

FIGURE 1.2

depression in the piezometric surface, due to exclusion of infiltration by rainfall. This would result in a localized tendency for materials on or in the water to flow toward these areas.

1.3 Purpose

This report addresses three project objectives:

1) Discussion of the drilling operation and methods,

2) Summary of sampling methods and evaluation of laboratory results, and

3) Recommendation of necessary measures to effect a responsive cleanup of the sites.

2.0 SAMPLING LOCATIONS

Three groundwater wells were installed around each of the transformers sites. The locations of these wells were determined by the extent of contamination confirmed by soil samples and to establish a bracket around the potential contamination plume. One well was installed up-gradient to each transformer; the remaining two wells were located down-gradient of each transformer. The groundwater gradient was estimated based on elevations noted at each of the two sites during well installation. This method minimizes the number of wells required to characterize each location.

Each well was drilled until a less permeable confining layer was observed. Original plans specified drilling to this layer or to a maximum depth of 15 feet, however at each well boring a compacted clay layer was observed at depths ranging from five to eight feet. One or two split spoon samples were taken at each boring to characterize the stratigraphy and the cuttings from the auger were closely monitored and classified.

The monitoring well locations are shown in Figure 2.1.

3.0 DRILLING OPERATIONS

Monitoring well borings were drilled by a hollow stem auger mounted to the back of a mobile rig. This method was selected based upon the materials expected to be encountered beneath the surface, the ease of mobilizing from one well to another, and because of the quick pace at which it can drill shallow depths. The hollow stem auger cores through the subsurface soils bringing the cored soils up to the surface as it rotates. These soils were shoveled directly into 55-gallon drums following characterization. Drilling operations were provided by Tacoma Pump and Drilling, Inc.

The field geologist logged each boring while it was being drilled by observing the soil cuttings. However this method can only estimate the depths of changes in stratigraphy. To accurately characterize the boring, a split spoon sample was taken at five foot intervals, with a minimum of two split spoon samples per boring. A split spoon is an 18-inch long, two inch diameter soil sampler which is attached to a rod located on the rig and is driven through the hollow portion of the auger and to an 18-inch depth ahead of the bottom of the auger. This enables the

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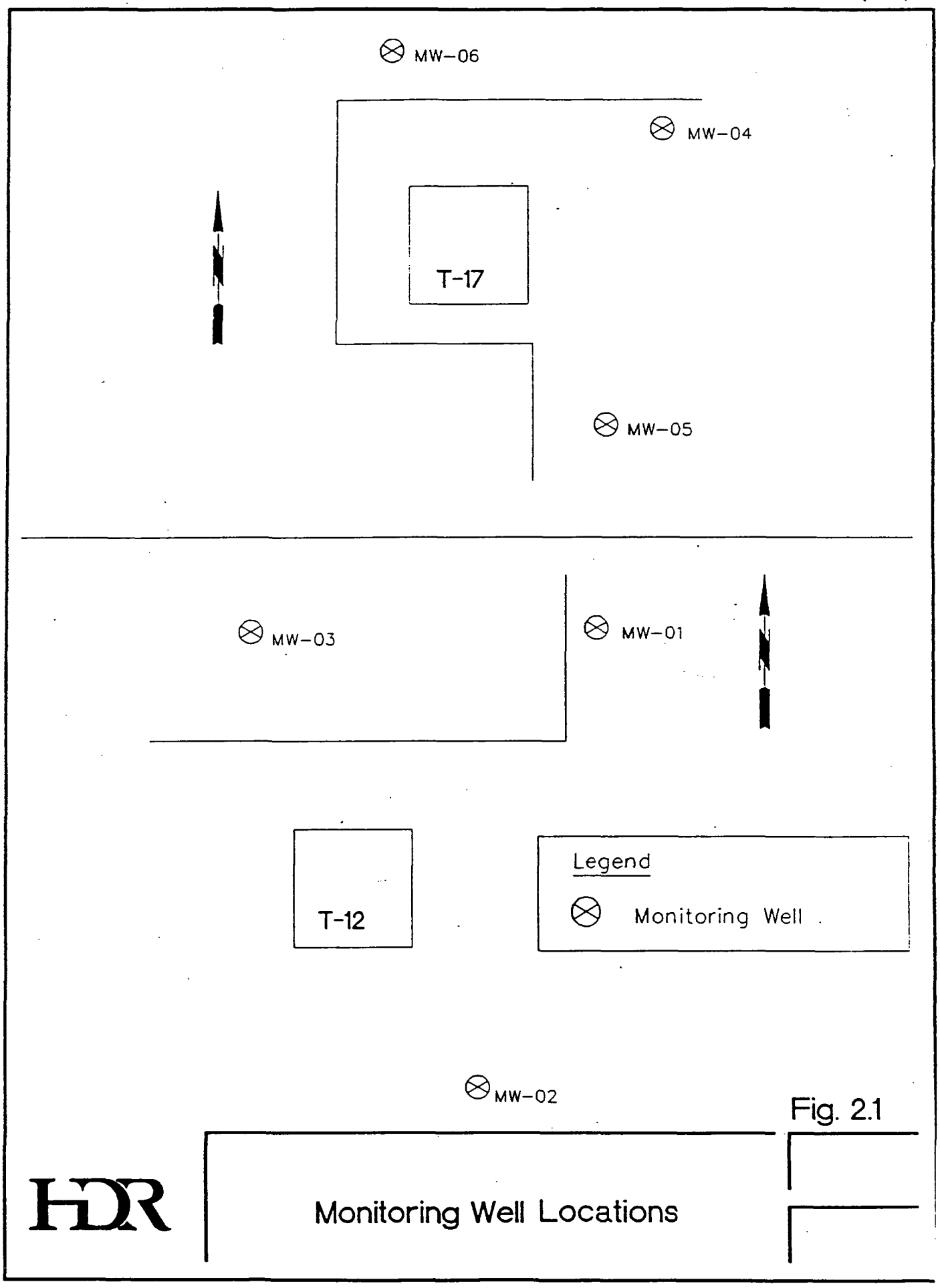

Fig. 2.1

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Monitoring Well Locations

geologist to view an undisturbed portion of the soil. The geologist recorded information on depth drilled, problems with borehole advancement, the materials encountered, and the contact with groundwater. The drilling logs are located in Appendix A.

The drill rig and all associated downhole equipment was steam cleaned (high pressure and hot water) prior to arrival at the site, between boreholes and upon termination of drilling activities. This action was taken to prevent any cross contamination between boreholes. The split spoon sampler, which was use to obtain samples for laboratory analysis in addition to characterizing the soil, went through a more rigorous decontamination procedure to ensure a pure laboratory sample. This included rinses with alconox and water, deionized water, a muriatic acid and water mix (1:20), acetone and hexane.

3.1 Well Construction

Monitoring wells were constructed with two-inch diameter, Schedule 40 PVC threaded pipe. The well screens consist of two-inch diameter, Schedule 40 PVC pipe, 2.5 feet in length with 0.02 inch slotted screen. The sand pack (Colorado silica #16) was selected to conform with the screen slot size and native soils and was placed around the screen and at least one foot above the top of the screen. A bentonite plug was placed above the top of the sand pack and was at least one foot thick; this plug expands as it cures and prohibits surface water from traveling down the area around the well and into the monitored screen zone. Cement was placed above the bentonite plug continuing to the surface. Monitoring well construction is shown in Figure 3.1.

The PVC pipe was extended above the ground to provide easy access and to prohibit surface runoff into the well; the pipe extended an average of two feet above the ground. A steel monument with a locking lid was placed around the exposed well to protect the well from damage and tampering.

All six wells are screened between 3.0 and 5.5 ft. beneath ground surface. A six inch bottom cap was placed directly beneath the screen, giving a total well depth of six feet below ground surface elevation. Refer to Appendix A for detailed diagrams of well construction.

3.2 Well Development

The monitoring wells were developed by using stainless steel bailers which were dropped into the hole, lifted up and down to agitate any fines in the well, and then bailed out. This was performed continuously until the well was free of fines or until the well was bailed dry. If the latter occurred, it was allowed time to recharge and then the bailing was continued until a silt and sand free condition was achieved. All well water and associated fines were placed into 55-gallon drums.

This process of development was chosen because of the speed in setting up the development operation, the shallowness of the wells and the effectiveness of using ailers. It is important to clean the wells of fines in order to have a productive, long term well.

The bailers were run through a rigorous decontamination procedure identical to the procedure used in split spoons (see Section 3.0) to minimize the potential of crosscontamination from well to well. The line used to drop the bailers into the well were discarded into 55-gallon drums.

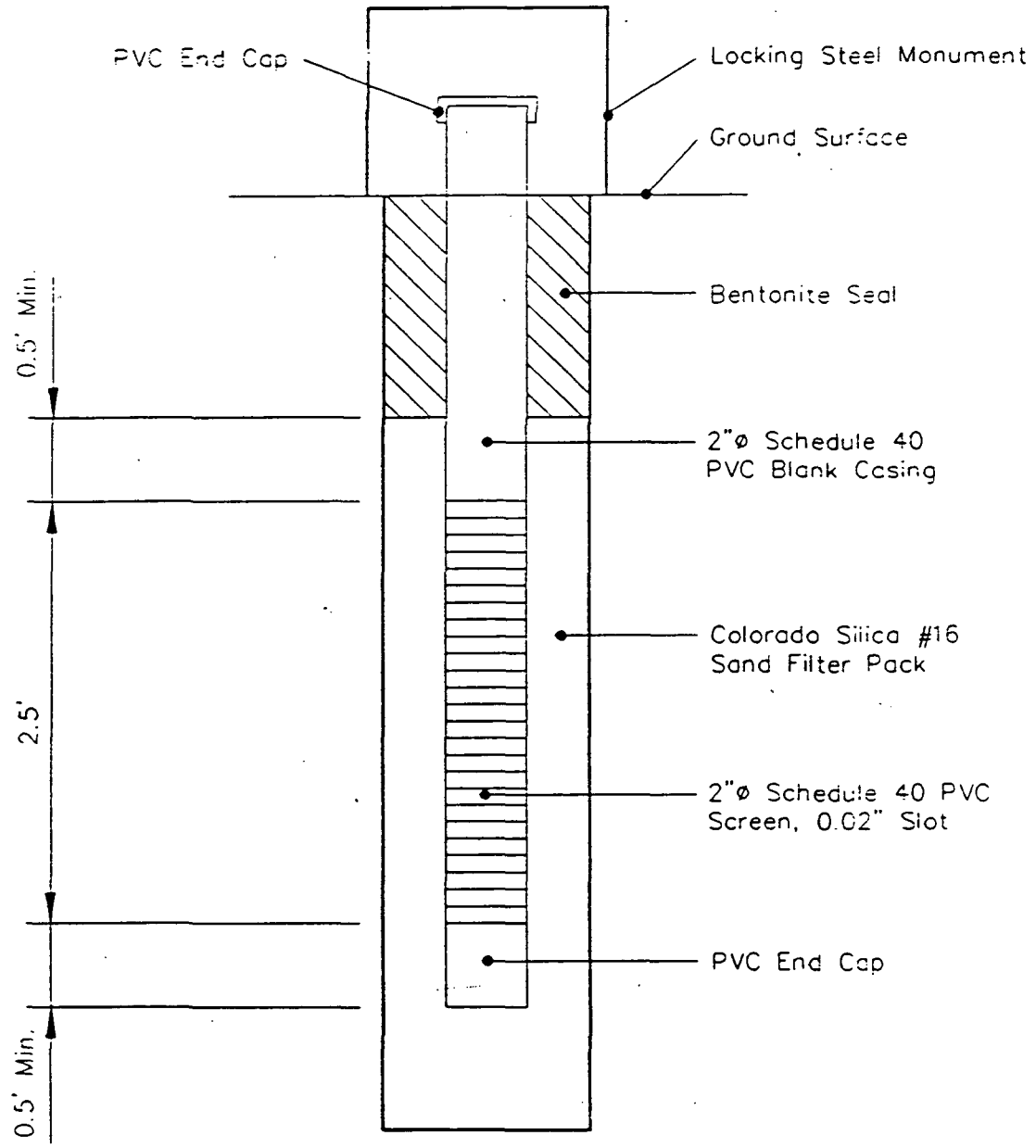


Fig. 3.1

Date:

HDR

Well Construction Diagram

3.3 Surveying of Monitoring Wells

All six monitoring wells were surveyed at the top of the PVC casing and at ground level. Elevations were measured to obtain accurate water levels. All wells were surveyed on April 6, 1989 by HDR personnel. An assumption was made upon which all of the elevations are dependant on; that is, the elevation of the log pond is 408.00 feet (mean sea level).

This assumption was made to determine the elevations of the wells in relation to each other. If more accurate survey information is needed, HDR suggests that survey data be based upon a known benchmark.

4.0 SAMPLING ACTIVITIES AND FIELD OBSERVATIONS

4.1 Well Boring Sampling

During well drilling, several split spoon samples were extracted from the borings to determine the lithology at given depths. An 18-inch long, two inch diameter stainless steel sampler was driven through the hollow stem auger and 18 inches into the base of the borehole.

Eight of these split spoon samples were analyzed for PCB content. A total of ten samples for laboratory analysis were obtained from the eight split spoons; therefore, two of the split spoons were divided into two laboratory samples each, serving as a duplicate sample. Eight samples were sent to Weyerhaeuser's laboratory, one from each split spoon. Two more samples were sent to Enseco's laboratory; these samples originated from the two split spoons from which two samples were extracted. A list of the sample numbers, the depth they were obtained from and where the samples were sent is shown in Table 4.1.

The split spoons were decontaminated as described in Section 3.0.

4.2 Groundwater Sampling

Following development of the six monitoring wells, groundwater samples were obtained for laboratory analysis. These samples were analyzed for PCBs, trichlorobenzene and tetrachlorobenzene.

A total of nine samples were taken; eight of these samples were groundwater samples and one was a rinsate sample taken on the bailer (described further in Section 4.4). The eight groundwater samples were taken from the six wells. In a procedure similar to the soil boring samples, two of the wells had two samples each. Six of the samples were sent to Weyerhaeuser's laboratory, one from each well, and the remaining two samples were sent to Enseco's laboratory. The rinsate sample was also taken to Weyerhaeuser's laboratory.

Prior to extracting a sample, the stainless steel bailer was decontaminated. Twenty pound test line was tied to the top of the bailer to lower it into the well. The depth of the well and the water level were measured and the difference between the two, or the height of the water column, was determined. This value was converted into gallons and multiplied by three to obtain a volume of water to be extracted

TABLE 4.1 WELL BORING SAMPLE SUMMARY

DATE (1989)	SAMPLE NUMBER	LOCATION	DEPTH	LABORATORY
March 30	WY-T12-01-S-101	MW-01	5'-6.5'	Weyerhaeuser
March 31	WY-T17-04-S-102	MW-04	7'-8.5'	Weyerhaeuser
March 31	WY-T17-05-S-103	MW-05	4'-5.5'	Weyerhaeuser
March 31	WY-T17-05-S-104	MW-05	4'-5.5'	Weyerhaeuser
March 31	WY-T12-02-S-105	MW-02	3.5'-5'	Weyerhaeuser
March 31	WY-T12-02-S-106	MW-02	5'-6.5'	Weyerhaeuser
March 31	WY-T12-02-S-107	MW-02	5'-6.5'	Enseco
April 3	WY-T12-03-S-108	MW-03	5'-6.5'	Weyerhaeuser
April 3	WY-T12-03-S-109	MW-03	5'-6.5'	Enseco
April 3	WY-T17-06-S-110	MW-06	5'-6.5'	Weyerhaeuser

All samples were analyzed for PCBs.

from the well so that the water column would be evacuated three times with the bailer. The well was bailed continuously until this volume was extracted or until the well ran dry. The purpose of purging the wells is to extract any standing water from the well and to sample the well with newly recharged water.

Following purging, the well was allowed to recharge. The same stainless steel bailer used for purging was then used to sample the wells. Groundwater was poured from the bailer into pre-cleaned and pre-labeled sample jars, then placed in iced coolers and prepared for delivery to the laboratory.

Sample information is shown in Table 4.2.

4.3 Groundwater and Surface Elevations

Groundwater and surface elevations were taken to determine the direction of groundwater flow. These measurements are imperative in the event that a extensive cleanup has to be performed and down gradient barriers need to be constructed up. HDR conducted water level elevation measurements on April 5 and 13, 1989. The results of those measurements are listed in Table 6.3.

4.4 Field QA/QC Sampling

One rinsate sample was taken on the stainless steel bailer to determine if the decontamination procedures used were adequate. Laboratory supplied deionized water was poured on the inside and along the outside of the bailer and into sample jars following decontamination of the bailer. The rinsate sample (WY-12-03-R) was taken on April 5, 1989 between groundwater samples and was submitted to Weyerhaeuser's laboratory.

There were several duplicate samples taken. Duplicate samples determine the consistency of the laboratory's analytical procedures and, if more than one laboratory is utilized, is a check to determine each laboratory's accuracy. Every sample that was sent to Enseco's laboratory (two soil boring and two groundwater samples), was a duplicate sample that was split and sent to both laboratories. This was used to compare the results of the two laboratories. There was one well boring sample that was split and sent to Weyerhaeuser's laboratory as two samples (WY-T17-05-S-103 and WY-T17-05-S-104), as a check on the consistency of their procedures.

5.0 SAMPLE HANDLING AND DOCUMENTATION

All sample containers are glass containers supplied by the respective laboratories. Each sample was labeled and all required documentation completed at the site by the sampler prior to relinquishing custody to the laboratories. All sample bottles were taped around the seal, placed inside zip-lock bags and sealed inside iced coolers with vermiculite adsorbent. All samples were packaged in accordance with Department of Transportation requirements for ORM-E (49 CFR, Part 173 through 177) and appropriately labeled for express shipping to the laboratories.

The field sampler recorded important information such as the date, time, location, depth, analysis to be performed, and sample number on the chain-of-custody form as well as in the log book prior to releasing custody to the laboratory.

TABLE 4.2 GROUNDWATER SAMPLE SUMMARY

DATE (1989)	SAMPLE NUMBER	LOCATION	LABORATORY
April 5	WY-12-01-A	MW-01	Weyerhaeuser
April 5	WY-12-01-D	MW-01	Enseco
April 5	WY-12-02-A	MW-02	Weyerhaeuser
April 5	WY-12-03-A	MW-03	Weyerhaeuser
April 5	WY-17-04-A	MW-04	Weyerhaeuser
April 5	WY-17-05-A	MW-05	Weyerhaeuser
April 5	WY-17-06-A	MW-06	Weyerhaeuser
April 5	WY-17-06-D	MW-06	Enseco

All samples were analyzed for PCBs, trichlorobenzene and tetrachlorobenzene.

6.0 SITE INVESTIGATION RESULTS AND CONCLUSIONS

6.1 Well Boring Samples

During monitoring well installation, several split spoon subsurface soil samples were extracted. These samples were analyzed for PCBs, trichlorobenzenes and tetrachlorobenzenes.

Only one sample, extracted from MW-01 at a depth of 5 ft.- 6.5 ft. indicated any contamination of PCBs, containing 1.7 ppm of Aroclor 1260. All other samples had concentrations less than 0.2 ppm or below detection limits. None of the analyses detected trichlorobenzenes nor tetrachlorobenzenes.

The results of the soil boring samples analyses are shown in Appendix B.

6.2 Groundwater Sampling

Six wells were installed, three bracketing each transformer location. After the wells had been purged and allowed time to recharge, they were sampled with a stainless steel bailer. Groundwater samples were collected and sent to Weyerhaeuser's and Enseco's laboratories to be analyzed for PCBs, trichlorobenzenes and tetrachlorobenzenes.

All the samples had concentrations of contaminants either below detection limits or were extremely low. The highest level of PCBs were found in MW-01, with a concentration of 0.014 ppm.

These laboratory results indicate that whatever PCBs were released to the environment, they have not traveled far (for the wells are approximately 15' from the transformer locations) or that they have not yet reached the water table in significant amounts. This will make the cleanup easier since the contamination is being confined to the spill area.

Results of the laboratory analyses on the groundwater samples are shown in Appendix B.

6.3 Groundwater Elevations

Groundwater elevations were measured at all six wells prior to sampling. The elevations were abnormally high considering the terrain and it was speculated that there may have been a perched water table beneath the building. Elevations taken on April 5, 1989 showed the water table less than one foot beneath the ground surface at transformer T-12 but three to five feet below ground at transformer T-17.

Following a meeting on the subject, it was discovered that a fire fighting water line was inadvertently left on. This water line is very close to transformer T-12. When the water supply to this line was shut off, the groundwater elevations dropped quickly. The supply was later reopened, resulting in a rapid rise in the groundwater elevations. It was discovered that the water line was leaking close to the transformer location.

Appendix A

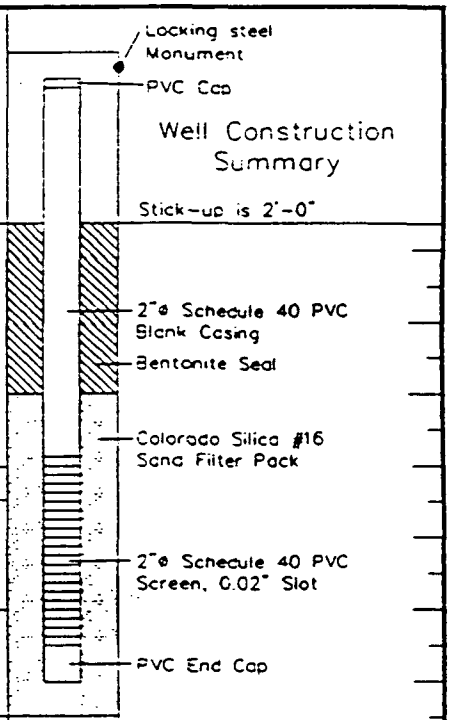
HDR Engineering Inc.

FIELD DRILLING LOG

Page 1 of 1

Project Name : Weyerhaeuser Number : 06810-001-102	Boring Number: MW-01	Coordinates or Location: T-12	
Engineer : Mary Murphy Geologist : Dick Sprague	Surface Elevation: 417.08	GWL	Depth : (Encountered) Depth : (Static)
Drilling Methods: Holiow Stem Auger	Hole Diameter: 6"	Fluid Used:	Date Started : 3/30/89 Completed : 3/30/89
Hazardous Waste Remarks:		Safety Notes:	

Depth (ft.)	Sample Type & No.	Sample Depth Interval	Blows Count	Recovery Length / %	Profile	Description
0						SAND and gravel, grey-brown, very clayey and silty with decomposing organics and cobbles 2 to 12 inches diameter.
1						
2						
3	Split Spoon-	3'-	7/15/20	10%		COBBLES
4		4.5'				CLAY, silty, sandy, grey, very moist to saturated.
5	Split Spoon WY-T12-01 S-101	5'-	4/3/4	50%		CLAY, silty, sandy, black with blue green clay mottles; 20-30% decomposed wood.
6		6.5'				
7						
8						
9						



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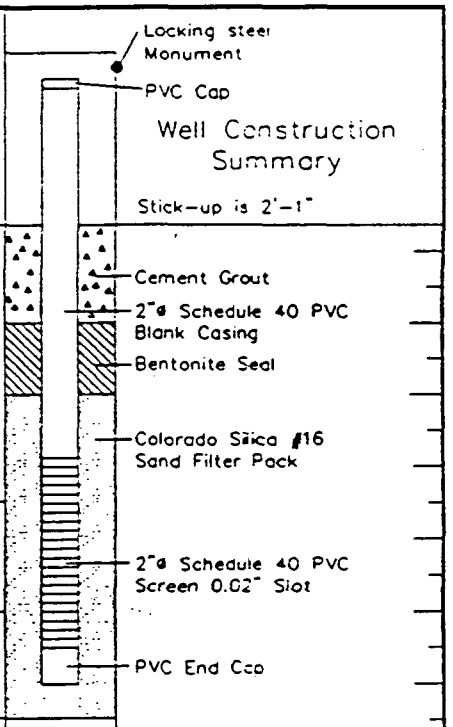
HDR Engineering Inc.

FIELD DRILLING LOG

Project Name : Weyerhaeuser Number : 06810-001-102	Boring Number: MW-02	Coordinates or Location: T-12
Engineer : Mary Murphy Geologist : Dick Sprague	Surface Elevation: 417.20	GWL Depth : (Encountered) Depth : (Static)
Drilling Methods: Hollow Stem Auger	Hole Diameter: 6"	Fluid Used:
Date Started : 3/31/89 Completed : 3/31/89		
Hazardous Waste Remarks:	Safety Notes:	

Depth (ft)	Sample Type & No.	Sample Depth Interval	Blows Count	Recovery Length / %	Profile	Description
0						SAND. Coarse, gravelly, silty, dark brown, with cobbles up to 6 inches diameter.
1						
2						
3						
4	Split Spoon WY-T12-02 S-105	3.5'- 5'	16/22/25	5%		GRAVEL. With silty coarse sand.
5	See Note	5' 6.5'	4/3/3	N/A		CLAYEY SILT. With fine sand, dark gray
6						
7						
8						
9						



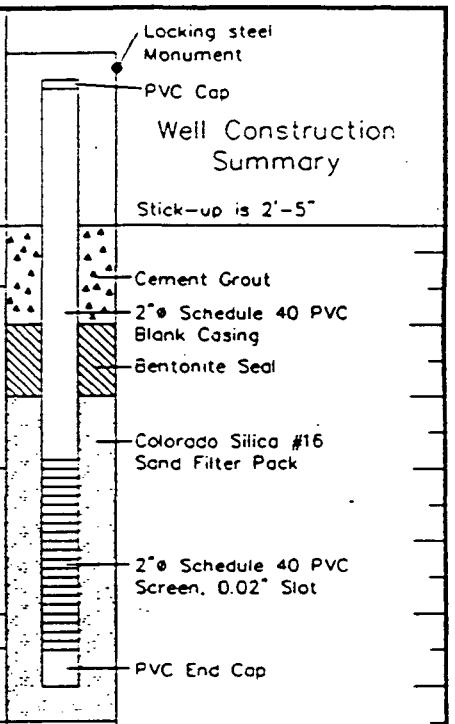
NOTES: One split spoon sample was extracted at the 5'-6½" depth from which two samples were taken for analysis : WY-T12-02-S-106 and WY-T12-02-S-107.

HDR Engineering Inc.

FIELD DRILLING LOG

Project Name : Weyerhaeuser Number : 06810-001-102	Boring Number: MW-03	Coordinates or Location: T-12	
Engineer : Mary Murphy Geologist : Dick Sprague	Surface Elevation: 417.02	GWL Depth : <0.7' (Encountered) Depth : (Static)	
Drilling Methods: Hollow Stem Auger	Hole Diameter: 6"	Fluid Used:	Date Started : 4/3/89 Completed : 4/3/89
Hazardous Waste Remarks:		Safety Notes:	

Depth (ft.)	Sample Type & No	Sample Depth Interval	Blows Count	Recovery Length / %	Profile	Description
0						Concrete pad
1						GRAVEL. With coarse sand. brown water encountered at <0.7'
2						
3						GRAVEL. with coarse sandy silt. dark grayish brown. with cobbles up to 6 inches diameter.
4	Split Spoon -	3.5'- 5'	5/5/5	<5%		
5	See Note	5'- 6.5'	2/2/2	N/A		SILTY CLAY. Gray to olive gray
6						SILTY CLAY TO CLAYEY SILT. With very fine sand. very dark grey. with lenses of black decayed wood
7						
8						
9						



NOTES. One split spoon sample was extracted at the 5'-6½" depth from which two samples were taken for analysis : WY-T12-03-S-108 and WY-T12-03-S-109.

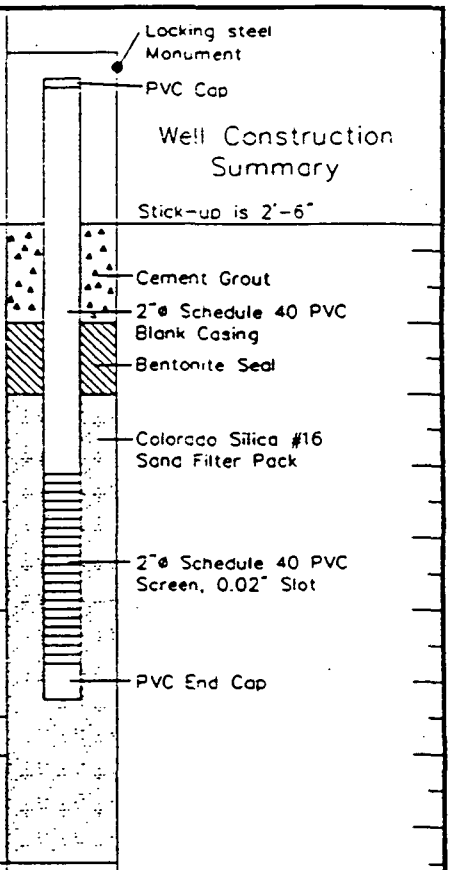
HDR Engineering Inc.

FIELD DRILLING LOG

Page 1 of 1

Project Name : Weyerhaeuser Number : 06810-001-102	Boring Number: MW-04	Coorainates or Location: T-17	
Engineer : Mary Murphy Geologist : Dick Sprague	Surface Elevation: 416.55	GWL Depth : 4'-5' (Encountered) Depth : (Static)	
Drilling Methods: Hollow Stem Auger	Hole Diameter: 6"	Fluid Used:	Date Started : 3/31/89 Completed : 3/31/89
Hazardous Waste Remarks:	Safety Notes:		

Depth (ft.)	Sample Type & No.	Sample Depth Interval	Blows Count	Recovery Length / %	Profile	Description
0						SAND, Coarse, gravelly, silty, brown to light brown
1						
2						
3						
4	Split Spoon	3.5'- 5'	17 / 22 / 13	0%		Wood Fragments encountered from 3'-4' Water encountered from 4'-5'
5						GRAVEL, Sandy, light brown
6						
						SILT, Sandy, clayey, light brown
7	Split Spoon WY-T17-04 S-102	7'- 8.5'	2 / 2 / 2	10%		CLAY, silty, gray with 2 inch diameter gravel
8						
9						



NOTES:

Concern arose when it was realized that the elevated water levels could have actually increased the possibility that PCBs were carried away from the transformer sites. To date, that transport has not been observed.

Subsequent water level elevations were taken on April 13, 1989 after the groundwater in the area had a chance to stabilize. Results of those measurements are shown below.

TABLE 6.3 GROUNDWATER ELEVATION

Well Number	Depth to Water 4/05/89 (a)(ft)	Depth to Water 4/13/89 (a)(ft)
MW-01	0.98	NA
MW-02	1.40	2.24
MW-03	0.36	2.24
MW-04	3.94	4.07
MW-05	2.56	4.09
MW-06	2.36	4.49

(a) Measured from ground surface.
(NA) Well could not be accessed on this date.

7.0 EXTENT OF CONTAMINATION

Results of the laboratory analysis indicates that PCB contamination is confined to a small area directly around the spill. The soil boring and groundwater sampling results prove that little, if any, contamination is extending out to the wells.

PCB molecules readily adhere to soil particles and it is difficult to move PCBs laterally through the water table. Approximately four to five feet beneath the ground surface is a layer of compacted clay. Therefore, the mobility of the PCBs should be limited both laterally and vertically.

8.0 RECOMMENDATIONS

Since the PCB contamination has not spread far, it is important to isolate the contamination from clean soil, then excavate the PCB contaminated soils.

A barrier system should be set up around each transformer to prevent perched groundwater from passing into the excavation zone. To accomplish an enclosed barrier, one that will contain the contamination within the transformer areas, impermeable borders should be placed on all four sides and the bottom.

There is a clay layer approximately four to five feet beneath ground surface. This layer should prohibit groundwater from rapidly moving vertically.

To eliminate groundwater flow in and out of the contaminated zone, a trench should be dug completely around the zone, down to the clay layer and approximately 40 feet on each side. An impermeable boundary, such as a geomembrane liner, should be

placed down to the clay, along the bottom of the trench and up along the outer wall of the trench. This will effectively isolate water within the barrier.

The trench should be backfilled with sand and pea gravel. A perforated pipe should run at the base of the trench, inclined to flow towards one or more sumps with pumps placed in them. The groundwater will be drawn toward the pipes and out to the sumps and can be pumped out to a tank truck or treatment area. This will cause the soil within the barrier zone to dry.

Prior to designing the barrier system, soil samples should be taken at the groundwater interface in test pits around the perimeter. These pits should be dug by a backhoe, four to five feet long and as deep as needed until clay is reached. Samples of groundwater and soil should be taken in the water bearing zone for PCB analysis, and samples of the clay layer at the base of the pit should be tested for permeability. The results of these samples should be analyzed to determine the extent of PCB contamination.

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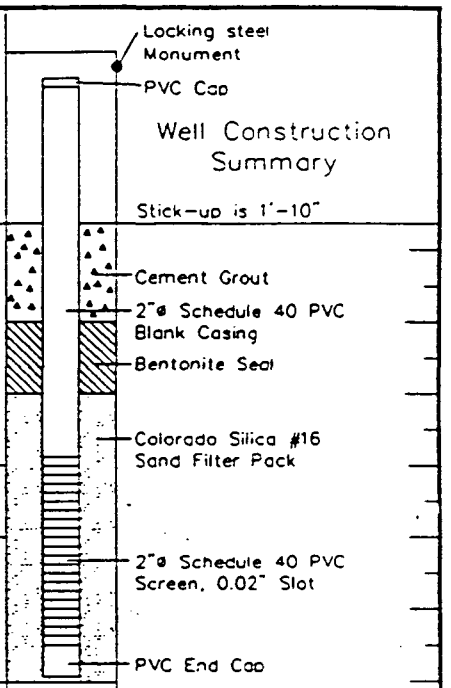
National Research Council of Canada. Polychlorinated Dibenzo-p-Dioxins: Criteria for Their Effects on Man and His Environment. Ottawa. 1981.

HDR Engineering Inc.

FIELD DRILLING LOG

Project Name : Weyerhaeuser Number : 06810-001-102	Boring Number: MW-05	Coordinates or Location: T-17	
Engineer : Mary Murphy Geologist : Dick Sprague	Surface Elevation: 415.96	GWL Depth : (Encountered Depth : (Static	
Drilling Methods: Hollow Stem Auger	Hole Diameter: 6"	Fluid Used:	Date Started : 3/31/89 Completed : 3/31/89
Hazardous Waste Remarks:		Safety Notes:	

Depth (ft.)	Sample Type & No.	Sample Depth Interval	Blows Count	Recovery Length / %	Profile	Description
0						SAND, gravelly, clayey, grey with gravel 1½ to 4 inches diameter, very dark grey to black.
1						
2						
3						CLAY, grey with coarse sand
4	See Note	4'-	4 4 / 4 4	N/A		CLAY, silty, sandy, very dark grey grading to black with gravel from ½ to 1 inch diameter.
5		5.5'	5 3			
6						
7						
8						
9						



NOTES: Two split spoon samples were extracted at the 4'-5½' depth.
Sample numbers are WY-T17-05--S-103 and WY-T17-05-S-104.

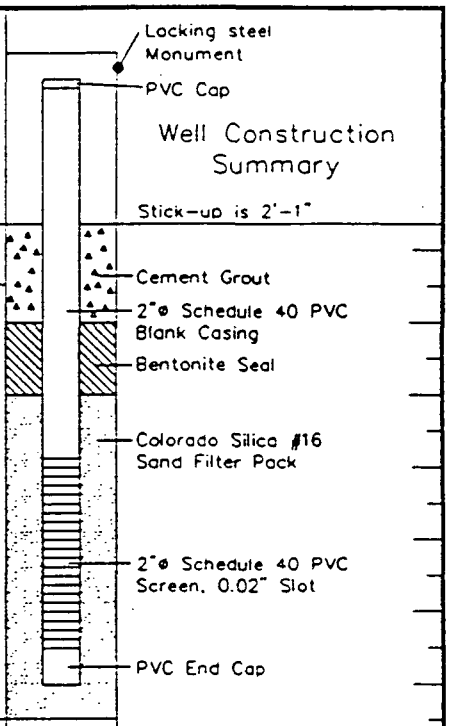
HDR Engineering Inc.

FIELD DRILLING LOG

Project Name : Weyerhaeuser Number : 06810-001-102	Boring Number: MW-06	Coordinates or Location: T-17
Engineer : Mary Murphy Geologist : Dick Sprague	Surface Elevation: 416.63	GWL Depth : (Encountered) Depth : (Static)

Drilling Methods: Hollow Stem Auger	Hole Diameter: 6"	Fluid Used:	Date Started : 4/3/89 Completed : 4/3/89
Hazardous Waste Remarks:		Safety Notes:	

Depth (ft.)	Sample Type & No.	Sample Depth Interval	Blows Count	Recovery Length / %	Profile	Description
0						CONCRETE PAD
1						SAND. Coarse to medium, silty gravelly with cobbles up to 4 inches diameter
2						
3						
4						
5	Split Spoon WY-T17-06 S-110	5'- 6.5'	17/7/3	5-10%		
6						
7						
8						
9						



NOTES:

Appendix B

SOIL BORING SAMPLING RESULTS

Sample Number	PCB (Aroclor 1260) (ppm)	Trichlorobenzene (ppm)	Tetrachlorobenzene (ppm)
WY-T12-01-S-101	1.7	<0.02	NA
WY-T17-04-S-102	0.18	<0.02	NA
WY-T17-05-S-103	<0.08	<0.02	NA
WY-T17-05-S-104	<0.08	<0.02	NA
WY-T12-02-S-105	<0.08	<0.02	NA
WY-T12-02-S-106	<0.08	<0.02	NA
WY-T12-02-S-107	ND	ND	NA
WY-T12-03-S-108	<0.08	<0.02	NA
WY-T12-03-S-109	ND	NA	NA
WY-T17-06-S-110	<0.10	<0.02	NA

NA = Not available
ND = Not detected

GROUNDWATER SAMPLING RESULTS

Sample Number	PCB (Aroclor 1260) (ppm)	Trichlorobenzene (ppm)	Tetrachlorobenzene (ppm)
WY-12-01-A	0.014	0.003	NA
WY-12-02-A	<0.001	<0.001	NA
WY-12-03-A	<0.001	<0.001	NA
WY-12-03-R	<0.001	<0.001	NA
WY-17-04-A	0.004	0.004	NA
WY-17-05-A	<0.001	<0.001	NA
WY-17-06-A	<0.001	<0.001	NA
WY-12-01-D	0.0059	0.0032	0.0001
WY-17-06-D	ND	ND	ND

NA = Not available
ND = Not detected