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March 23, 1999

Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
Attn: Mr. Larry Seto
Hazardous Materials Specialist

SUBJECT: GROUNDWATER SPARGING/VAPOR EXTRACTION SYSTEM PERFORMANCE REPORT, WEYERHAEUSER PAPER COMPANY, ALAMEDA CORRUGATED BOX FACILITY, 1801 HIBBARD STR., STID 1202

Dear Mr. Seto,

Per the recent request by your agency, West & Associates Environmental Engineers, Inc. respectfully submits this letter report summarizing the remedial effectiveness of the groundwater sparging/vapor extraction (GWS/VE) system operated at the Weyerhaeuser facility referenced above.

Full scale operation of the sparging system began at the end of March 1996. The system was shut down in late February 1998.

REMEDIAL EFFECTIVENESS

The remedial effectiveness of the GWS/VE system has been evaluated based on the reduction of contamination concentrations in groundwater.

The sparge system was designed to reduce groundwater contaminant concentrations by 1) directly stripping volatiles from the groundwater and by 2) oxygenating the groundwater to enhance natural biological degradation of hydrocarbon contamination.

Groundwater Contaminant Concentrations

A continued decreasing trend in TPH-g and BTXE concentrations in MW-3B was observed since air sparging activities began. Table 1 presents the percent reduction in TPH-gas and benzene concentrations in well MW-3B measured between February 1996 and August 1998. MW-3B has historically been the most contaminated well at the site.

TABLE 1
GROUNDWATER CONTAMINANT COMPARISON: WELL MW-3B
FIRST QUARTER 1996 THRU THIRD QUARTER 1998
All Values in ug/l

Date	TPH (gas)	BENZENE	PERCENT REDUCTION TPH-gas (since 2/96)	PERCENT REDUCTION BENZENE (since 2/96)
2/96	19,000	2,100	NA	NA
6/96	11,000	1,300	42%	38%
9/96	6,000	840	68%	60%
11/96	5,500	440	71%	79%
2/97	12,000	1,000	37%	52%
6/97	2,030	293	89%	86%
9/97	2,140	33.7	88%	98%
12/97	1,200	95.0	94%	95%
2/98	2,370	176	88%	92%
5/98	3,160	170	83%	92%
8/98	1,700	99.3	91%	95%

ABBREVIATIONS

ug/l: Micrograms per liter

TPH: Total Petroleum Hydrocarbons

A decrease in soil vapor volatile concentrations and groundwater contaminant concentrations was observed since start up of the sparging system. In August 1998 TPH-gas and benzene concentrations in MW-3B were approximately 91% and 95% lower, respectively, than prior to the start up of groundwater sparging.

Contaminant Mass Removal

This section presents the estimated total of contaminant mass removed as a result of direct stripping of volatiles by the GWS/VE system.

Laboratory chemical analysis results for vapor samples collected during pilot test activities are presented in Table 2.

TABLE 2
LABORATORY ANALYTICAL RESULTS FOR VAPOR SAMPLES
all values in mg/M³

SAMPLE ID	DESCRIPTION	TPH-G	BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES
VAPOR-1	All zones operating; pre-treatment of vapors	14	ND	ND	ND	ND
VAPOR-2	Zone II operating only; pre-treatment of vapors	5,200	ND	ND	36	56

NOTES

ND: Not Detected

The data presented above was used to make a correlation between field PID readings and laboratory chemical analysis results.

Based on PID readings recorded at the time vapor samples "VAPOR-1" and "VAPOR-2" were collected a conversion factor of 8.2 has been derived for converting measurement units of ppmv (PID) to mg/M³. For example a PID reading of 10 ppmv would be equivalent to 82 mg/M³.

The following factors were use to conservatively estimate the mass of contamination stripped from groundwater below the site.

- Average vapor concentration: 1.15 ppmv (PID) or 9.43 mg/M³
- Average SVE blower flow rate: 35 cfm
- 14,016 hours of operation

Based on the information presented above it is conservatively estimated that 18 lbs (~2.5 gallons) of TPH as gasoline was sparged from groundwater below the site.

Biological Degradation

Biological degradation is believed to have played a significant role in reducing contaminant concentrations below the site. Biological degradation is believed to have been significantly enhanced by the oxygenation of groundwater as a result of the air sparging activities.

GROUNDWATER SPARGING/VAPOR EXTRACTION, WEYERHAEUSER PAPER COMPANY, 4/4

CONCLUSIONS

Six months after discontinuing active groundwater remediation, gasoline based contaminant concentrations continue to decline. This continued decline in contaminant concentrations is attributed to natural biological degradation.

It has been conservatively estimated that a total of 18 lbs of TPH as gasoline contamination was removed from groundwater by stripping volatiles via air sparging.

In August 1998 TPH-gas and benzene concentrations in MW-3B were approximately 91% and 95% lower, respectively, than prior to the start up of groundwater sparging.

It is concluded that groundwater quality at the WPC Alameda site will continue to improve without the necessity of further active remediation.

Should you require any additional information please contact me at (707) 451-1360.

Sincerely,



Brian W. West PE
President
West & Associates Environmental Engineers, Inc.
BWW/eb

cc: James McCourt, Weyerhaeuser Office of the Environment, Tacoma

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4.5 Pit Water Management

Pit dewatering was generally not necessary at the site. Groundwater did not rapidly seep into the open excavation during digging activities. Excavation activities were coordinated so that backfilling was conducted immediately upon reaching the total depth of each zone of the excavation. Each excavation zone was backfilled to at least 5 feet BGS the same day total depth in that zone was reached. By coordinating most of the excavation and backfill activities this way, groundwater generally did not accumulate in the open excavations.

However, during excavation and backfilling activities in Zone I, the excavation was left open for more than 24 hours prior to backfilling and water did accumulate in the pit. In that circumstance pit de-watering was accomplished by placing an electric submersible pump in the excavation. Extracted groundwater was pumped to a holding tank, filtered and then passed through activated carbon treatment units to remove all gasoline contaminants. Treated water was sampled to verify decontamination effectiveness and then used to adjust backfill soil moisture content for proper compaction. Due to soil drying during aeration, considerable water had to be added during the backfill process in order to permit proper compaction. Treated groundwater accounted for less than 10% of the water added for compaction purposes. *

Neither TPH as gas nor BTEX were detected above laboratory detection limits in the treated water sample, identified as WPC DISCHARGE. Laboratory analysis results of the treated groundwater are presented on the laboratory report forms in the appendix.

4.6 Control of Surface Runoff

During periods of rain, all aeration activities were terminated and all soil stockpiles were covered with plastic sheeting. Therefore, no contaminated surface water was generated at the site. Little or no precipitation fell during the project duration. Control of surface runoff was not a major project activity.

4.7 Contaminated Soil Off-Haul

A total of approximately 420 yd³ of contaminated soil was transported to the Vasco Road Landfill in Livermore, California for disposal. Approximately 170 yd³ consisted of gasoline contaminated soil and approximately 250 yd³ consisted of waste oil contaminated soil. The non-hazardous waste manifests are presented in the appendix.

Larry-

Most recent oil & grease data

Where is MW 3 B?
Not installed until 12/95



TABLE 4-8
PETROLEUM CONTAMINATION ANALYSES - GROUNDWATER
FEBRUARY 1994
All Values in ug/l

WELL ID	OIL & GREASE	TPH (diesel)	TPH (gas)	BENZENE	TOLUENE	XYLENES	ETHYL BENZENE
MW-1	ND	ND	ND	1.5	ND	ND	ND
MW-2	ND	ND	200	390	25	50	7.1
MW-3	ND	ND	5400	3900	680	840	390
MW-4	ND	ND	1000	54	2.7	4.7	1.4
MW-5	ND	ND	ND	1.8	ND	ND	ND
MW-6	ND	ND	ND	2.6	ND	ND	ND
MW-7	ND	ND	ND	ND	ND	ND	ND
MW-9	ND	ND	1,900	63	4.3	14	22
MW-10	ND	ND	ND	ND	ND	ND	ND
MW-11	ND	ND	ND	ND	ND	ND	ND
QC	ND	ND	ND	ND	ND	ND	ND

4-17

NOTES

ND: Not Detected, Minimum detection limits for each compound listed on original laboratory report forms

Please print or type. Form designed for use on slitte (12-pitch typewriter).
 IN CASE OF AN EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8602; WITHIN CALIFORNIA CALL 1-800-852-7550

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. CA1C10101514218712		Manifest Document No. 01010101		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.							
3. Generator's Name and Mailing Address WEYERHAEUSER PAPER COMPANY 1801 Hibbard Street, Alameda, CA. 94501						A. State Manifest Document Number 90542164									
4. Generator's Phone (415) 523-6121						B. State Generator's ID									
5. Transporter 1 Company Name H & H Ship Service Company			6. US EPA ID Number CA1D10101477111618			C. State Transporter's ID 200505		D. Transporter's Phone (415) 543-4835							
7. Transporter 2 Company Name						E. State Transporter's ID									
8. US EPA ID Number						F. Transporter's Phone									
9. Designated Facility Name and Site Address H & H Ship Service Company 220 China Basin Street San Francisco, CA 94107						10. US EPA ID Number CA1D10101477111618		G. State Facility's ID							
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)						12. Containers No. Type		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.			
a. OIL AND WATER NON RCRA HAZARDOUS WASTE LIQUID						01011 TIT		0.5000		G		State: 134			
												EPA/Other			
												State			
												EPA/Other			
b.										State		EPA/Other			
c.												State		EPA/Other	
d.												State		EPA/Other	
J. Additional Descriptions for Materials Listed Above FUEL, OIL AND WATER PROFILE #A0773						K. Handling Codes for Wastes Listed Above a. 01 b. c. d.									
16. Special Handling Instructions and Additional Information JOB #7457 24 Hr. Emergency Contact: H & H # (415) 543-4835 APPROPRIATE PROTECTIVE CLOTHING AND RESPIRATOR															
18. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.															
Printed/Typed Name JAMES HORN				Signature <i>James Horn</i>				Month Day Year 10/4/25/91							
17. Transporter 1 Acknowledgement of Receipt of Materials Printed/Typed Name ESTEBAN M. PENALVER				Signature <i>Esteban M. Penalver</i>				Month Day Year 10/4/25/91							
18. Transporter 2 Acknowledgement of Receipt of Materials Printed/Typed Name				Signature				Month Day Year							
19. Discrepancy Indication Space															
20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in item 19. Printed/Typed Name PETER YIMBO															
Signature <i>Peter O. Yimbo</i>				Month Day Year 10/4/25/91											

RESPONSE CENTER 1-800-424-8802; WITHIN CALIFORNIA CALL 1-800-852-7550

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. CIAIC0000151421671200000000		Manifest Document No. 00000000		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.	
		3. Generator's Name and Mailing Address WEYERHAEUSER PAPER COMPANY 1301 Hibbard Street, Alameda, CA. 94501						A. State Manifest Document Number 90542180	
4. Generator's Phone (415) 523-6121						B. State Generator's ID			
5. Transporter 1 Company Name H & H Ship Service Company			6. US EPA ID Number CIAIC00001477111612			C. State Transporter's ID 200550		D. Transporter's Phone (415) 543-4235	
7. Transporter 2 Company Name			8. US EPA ID Number			E. State Transporter's ID		F. Transporter's Phone	
9. Designated Facility Name and Site Address H & H Ship Service Company 220 China Basin Street San Francisco CA 94107						10. US EPA ID Number CIAIC00001477111612		G. State Facility's ID	
						H. Facility's Phone (415) 543-4235			
11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)					12. Containers No.	13. Total Quantity	14. Unit Wt/Vol	15. Waste No.	
a. OIL AND WATER NON RCRA HAZARDOUS WASTE LIQUID					1	0351010	G	State 134 EPA/Other	
b.								State EPA/Other	
c.								State EPA/Other	
d.								State EPA/Other	
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						a. 01		b.	
						c.		d.	
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Printed/Typed Name JAMES W HORN				Signature <i>James W Horn</i>			Month Day Year 10/10/91		
17. Transporter 1 Acknowledgement of Receipt of Materials									
Printed/Typed Name JOSE J MORENO				Signature <i>Jose J Moreno</i>			Month Day Year 10/12/91		
18. Transporter 2 Acknowledgement of Receipt of Materials									
Printed/Typed Name				Signature			Month Day Year		
19. Discrepancy Indication Space									
20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.									
Printed/Typed Name PETER YIMBO				Signature <i>Peter C. Yimbo</i>			Month Day Year 10/25/91		

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