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DATE: 15 December 1995

TO: Harry Allen, U.S. EPA/ERT Work Assignment Manager

THROUGH: for R. M. Shapot, REAC Program Manager Vinod Kansal

FROM: M. F. Mohn, REAC Engineer MFM

SUBJECT: BIOREMEDIATION ACTIVITY SUMMARY, PENTA WOOD PRODUCTS SITE, DANIELS, WISCONSIN, WA # 0-026 - TECHNICAL MEMORANDUM

This memorandum describes activities conducted 24-29 July 1995 at the Penta Wood Products (PWP) site, located in Daniels, WI, by the United States Environmental Protection Agency/Environmental Response Team (U.S. EPA/ERT) and Roy F. Weston, Inc. (WESTON) Response Engineering and Analytical Contract (REAC) personnel. Several biological processes employed at the site for pentachlorophenol (PCP) degradation were evaluated in on-site bioremediation tests, including landfarming, biopiles, and anaerobic dechlorination. This memorandum, which contains the results of the final sampling event of the bioremediation tests conducted on-site, is a follow-up to a REAC memorandum dated 31 May 1995 (Mohn, 1995). All sampling protocols were identical to those of the May 1995 memorandum except where noted otherwise.

Table 1 and Figure 1 contain updated summaries of samples collected from the landfarm test plots. Appendix A contains all final analytical results. It should be noted that only one individual grab sample was collected from each landfarm plot (untreated and Daramend-treated) during the last sampling event. One grab sample was also collected from the original batch of soil used to supply the landfarm test plot soil. Table 2 summarizes physical characteristics of soil samples collected from the untreated and Daramend-treated landfarm plots. Figure 2 presents the average soil pH as a function of time for the landfarm plots. Table 2 and Figure 2 contain no additional data beyond that shown in the corresponding table in the memorandum issued 31 May 1995. However, average pH values were recalculated by converting pH measurement data into molar hydrogen ion concentrations, then calculating the negative log of the average molar hydrogen ion concentration. Appendix B contains laboratory notes and other information, including raw pH data and calculated pH values for all of the soil samples collected. It should be noted that most of the average pH values were not affected; those that were affected (approximately 10-20 percent of the averaged pH values) typically differed from the originally calculated average pH values by 0.1-0.2 pH units.

Tables 3 through 5 and Figures 3 through 5 contain updated summaries of samples collected from the biopiles. Tables 6 through 9 and Figure 6 contain updated summaries of anaerobic dechlorination samples. REAC personnel will perform statistical analyses of the completed data sets from the landfarm plots, biopiles, and anaerobic dechlorination studies. The results will be issued when completed.

Table 10 summarizes results from soil samples collected from a soil pile treated with white rot fungus. This treatability test was conducted by U.S. EPA Region V personnel in October 1994; no soil samples were collected by REAC personnel during the first three sampling events.

Following sample collection, the soil from the landfarm plots was removed from the wooden container used to house the landfarm test plots and transported to the building where the eight biopiles and the Region V white rot fungus test pile were situated. The soil was mixed with the biopile soil and the white rot soil using a John Deere 870 tractor equipped with a front bucket. The mixed soil was then pushed into a large single pile in preparation for use as a microbial seed source in large-scale pilot tests to be conducted on the concrete pad at the PWP site.

Soil samples were collected on 25 and 26 July 1995 by ERT and REAC personnel from selected on- and off-site areas to better define the extent of PCP contamination in the vicinity of the PWP site. These results are summarized in Table 11. The data will be input into REAC AutoCAD/Geosoft maps of the PWP site that delineate the extent of contamination. The modified maps will be issued separately.

Other site activities were performed in connection with the conclusion of this portion of the pilot-scale bioremediation tests:

- On 27 July 1995, water levels in site monitor wells were measured.
- On 27 July 1995, on-site meetings were held with local subcontractors in support of Requests for Proposals (RFPs) for soil excavation/preparation and soil tilling activities for possible large pilot-scale tests that will be conducted on-site.
- On 28 July 1995, soil samples were collected from the excavated water storage lagoon area for geotechnical analysis. Dimensions and wall slopes of the lagoon were measured, and photographs of the lagoon were taken to illustrate its current condition. This information will be needed if the lagoon is to be lined for water storage during possible future on-site activities.
- From 25-28 July 1995, ERT property was removed from the PWP site and was shipped back to the REAC facility in Edison, NJ. An additional trip to the PWP site was made on 17-18 October 1995 to pack and ship all remaining ERT property back to REAC.

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REFERENCES

1. M. Mohn/Technical Memorandum - Bioremediation Activity Summary, Penta Wood Products Site, Siren, WI, 31 May 1995/Roy F. Weston/REAC, Edison, NJ.

Tables

TABLE 1
Soil PCP Concentration vs. Time – Landfarm Plots
Penta Wood Products
Daniels, WI
December 1995

Treatment	Sampling Event/Sampling Date/Test Day				
	Initial/Oct 24, 1994/1		2 /Nov 29, 1994/37		
	Concentration	Average	Concentration	Average	% Reduction (1)
Untreated	52/57/46 45/48/47 44/40/35	46	55/58/46 49/47/39 50/61/22	47	−3
Untreated Composite (2)	--	--	--	--	--
Daramend	50/49/56 47/45/58 49/38/46	49	20/16/25 16/14/14 13/14/12	16	67
Daramend Composite (2)	--	--	--	--	--

Results in milligrams per kilogram (mg/kg).

(1) Compared to average initial PCP concentration of respective treatment.

(2) Prepared by combining soil from corresponding nine individual samples.

TABLE 1 (cont'd)
Soil PCP Concentration vs. Time – Landfarm Plots
Penta Wood Products
Daniels, WI
December 1995

Treatment	Sampling Event/Sampling Date/Test Day					
	3/Jan 3, 1995/72			4/Feb 8, 1995/108		
	Concentration	Average	% Reduction (1)	Concentration	Average	% Reduction (1)
Untreated	31/29/27 34/30/28 35/38/29	31	33	18/14/19 24/16/18 13/14/11	16	65
Untreated Composite (2)	28	--	39	14	--	70
Daramend	14/14/14 14/12/13 12/12/19	14	71	12/13/15 13/13/12 22/13/13	14	71
Daramend Composite (2)	13	--	73	13	--	73

Results in milligrams per kilogram (mg/kg).

(1) Compared to average initial PCP concentration of respective treatment.

(2) Prepared by combining soil from corresponding nine individual samples.

TABLE 1 (cont'd)
Soil PCP Concentration vs. Time – Landfarm Plots
Penta Wood Products
Daniels, WI
December 1995

Treatment	Sampling Event/Sampling Date/Test Day					
	5/Mar 14, 1995/142			6/Jul 27, 1995/278 (3)		
	Concentration	Average	% Reduction (1)	Concentration	Average	% Reduction (1)
Untreated	15/13/14 13/10/8.6	13	72	6.6	6.6	86
Untreated Composite (2)	15/15/13 16	--	65	--	--	--
Daramend	17/16/13 14/12/13	14	71	7.8	7.8	84
Daramend Composite (2)	14/13/10 12	--	76	--	--	--

Results in milligrams per kilogram (mg/kg).

(1) Compared to average initial PCP concentration of respective treatment.

(2) Prepared by combining soil from corresponding nine individual samples (no composite samples were collected during event 6).

(3) Listed data from individual grab samples. PCP concentration of original soil used for tests = 28 mg/kg.

TABLE 2
Average Physical Characterization Results of Test Soil – Landfarm Plots
Penta Wood Products
Daniels, WI
December 1995

Sampling Event	Date	Test Day	Temperature (deg C)			Moisture (%)		pH (std. units)	
			Ambient	Untreated	Daramend	Untreated	Daramend	Untreated	Daramend
Initial	10/24/94	1	12 (1)	--	--	12.0	20.2	6.6	6.3
2	11/29/94	37	-3.0	5.0	17.2	9.8	18.0	6.4	6.8
3	1/3/95	72	-14.5	12.4	18.2	8.2	14.4	6.3	5.9
4	2/8/95	108	-9.8	18.7	2.2	5.6	19.5	8.4	8.1
5	3/14/95	142	13.3	17.8	0.8	3.5	18.1	8.4	8.1

All temperature, moisture, and pH values for soil are average of nine individual measurements unless noted otherwise.
(1) Value equal to average ambient (air) temperature recorded in compost pile building on 10/24/94 (test day 1).

TABLE 3
Soil PCP Concentration vs. Time – Biopiles
Penta Wood Products
Daniels, WI
December 1995

Pile No.	Treatment	Sampling Event/Sampling Date/Test Day				
		Initial/Sep 12, 1994/1		2/Oct 23, 1994/42		
		Concentration	Average	Concentration	Average	% Reduction (1)
1	Control (Soil – 2 yd)/ Wood chips – 2 yd)	470/470/450 430/430/500 490/470/470	460	110/62/67	80	83
2	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (1 yd)	250/220/200 180/210/230 230/180/220	210	100/45/240	130	38
3	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (1 yd)/ Ammonium nitrate (1 bag)	220/230/230 250/240/240 230/260/230	240	54/33/270	120	50
4	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (2 yd)	190/170/150 140/150/160 160/170/180	160	240/53/99	130	20
5	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (2 yd)/ Ammonium nitrate (1 bag)/ Expanded sawdust (0.5 yd)	250/220/240 240/220/210 250/230/230	230	80/51/150	94	59
6	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (1 yd)/ Expanded sawdust (0.5 yd)	130/140/140 170/160/170 210/180/200	170	31/42/41	38	77
7	Soil (2 yd)/ Wood chips (2 yd)/ Ammonium nitrate (1 bag)/ Expanded sawdust (1 yd)	240/200/230 230/220/240 240/220/230	230	49/160/130	110	52
8	Soil (2 yd)/ Wood chips (2 yd)/ Ammonium nitrate (1 bag)/ Expanded sawdust (1 yd)/ Sawdust extract (neutralized)	220/230/250 220/220/200 220/220/220	220	180/46/92	110	50

Results in milligrams per kilogram (mg/kg).
(1) Compared to average initial PCP concentration of respective treatment.

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TABLE 3 (cont'd)
Soil PCP Concentration vs. Time – Biopiles
Penta Wood Products
Daniels, WI
December 1995

Pile No.	Treatment	Sampling Event/Sampling Date/Test Day					
		3/Nov 29, 1994/79			4/Jan 4, 1995/115		
		Concentration	Average	% Reduction (1)	Concentration	Average	% Reduction (1)
1	Control (Soil – 2 yd/ Wood chips – 2 yd)	54/110/97	87	81	74/73/77	75	84
2	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (1 yd)	240/260/300	270	–29	220/250/260	240	–14
3	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (1 yd)/ Ammonium nitrate (1 bag)	38/330/230	200	17	170/230/230	210	13
4	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (2 yd)	160/69/200	140	13	180/290/300	260	–63
5	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (2 yd)/ Ammonium nitrate (1 bag)/ Expanded sawdust (0.5 yd)	150/320/290	250	–9	200/240/280	240	–4
6	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (1 yd)/ Expanded sawdust (0.5 yd)	55/56/46	52	69	75/72/45	64	62
7	Soil (2 yd)/ Wood chips (2 yd)/ Ammonium nitrate (1 bag)/ Expanded sawdust (1 yd)	110/160/77	120	48	66/120/140	110	52
8	Soil (2 yd)/ Wood chips (2 yd)/ Ammonium nitrate (1 bag)/ Expanded sawdust (1 yd)/ Sawdust extract (neutralized).	80/110/180	120	45	120/110/150	130	41

Results in milligrams per kilogram (mg/kg).
(1) Compared to average initial PCP concentration of respective treatment.

TABLE 3 (cont'd)
Soil PCP Concentration vs. Time – Biopiles
Penta Wood Products
Daniels, WI
December 1995

Pile No.	Treatment	Sampling Event/Sampling Date/Test Day					
		5/Feb 8, 1995/150			6/Mar 15, 1995/185		
		Concentration	Average	% Reduction (1)	Concentration	Average	% Reduction (1)
1	Control (Soil – 2 yd/ Wood chips – 2 yd)	64/72/62 61/76/75 79/86/76	72	84	94/110/95 92/100/86 82/110/92	96	79
2	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (1 yd)	210/220/230 200/210/200 210/210/200	210	0	240/240/230 230/230/220 200/200/200	220	–5
3	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (1 yd)/ Ammonium nitrate (1 bag)	270/200/230 300/260/280 270/270/2[illegible]	260	–8	170/190/170 180/190/160 180/240/210	190	21
4	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (2 yd)	230/240/260 260/250/260 270/240/270	250	–56	160/150/130 180/170/170 240/240/240	190	–19
5	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (2 yd)/ Ammonium nitrate (1 bag)/ Expanded sawdust (0.5 yd)	250/260/250 250/270/280 330/280/330	280	–22	200/220/250 280/270/250 280/260/290	260	–13
6	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (1 yd)/ Expanded sawdust (0.5 yd)	96/80/60 67/67/69 59/57/57	68	60	110/120/120 87/83/88 84/87/93	97	43
7	Soil (2 yd)/ Wood chips (2 yd)/ Ammonium nitrate (1 bag)/ Expanded sawdust (1 yd)	130/140/130 130/120/130 120/120/110	130	43	150/110/130 170/170/190 140/140/150	150	35
8	Soil (2 yd)/ Wood chips (2 yd)/ Ammonium nitrate (1 bag)/ Expanded sawdust (1 yd)/ Sawdust extract (neutralized)	140/120/100 97/110/110 110/100/120	110	50	150/150/150 160/140/140 200/200/220	170	23

Results in milligrams per kilogram (mg/kg).
(1) Compared to average initial PCP concentration of respective treatment.

TABLE 3 (cont'd)
Soil PCP Concentration vs. Time – Biopiles
Penta Wood Products
Daniels, WI
December 1995

Pile No.	Treatment	Sampling Event/Sampling Date/Test Day 7/Jul 25, 1995/317 Concentration	Average	% Reduction (1)
1	Control (Soil – 2 yd/ Wood chips – 2 yd)	49/62/54 49/46/39 55/50/46	50	89
2	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (1 yd)	72/71/74 71/70/65 90/120/120	84	60
3	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (1 yd)/ Ammonium nitrate (1 bag)	55/55/55 66/63/59 50/59/56	58	76
4	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (2 yd)	24/31/34 27/27/21 100/120/120	53	67
5	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (2 yd)/ Ammonium nitrate (1 bag)/ Expanded sawdust (0.5 yd)	36/31/41 49/33/36 39/40/53	40	83
6	Soil (2 yd)/ Wood chips (2 yd)/ Turkey manure (1 yd)/ Expanded sawdust (0.5 yd)	16/65/16 9.4/8.7/12 14/15/12	19	89
7	Soil (2 yd)/ Wood chips (2 yd)/ Ammonium nitrate (1 bag)/ Expanded sawdust (1 yd)	17/17/16 35/32/34 19/40/23	26	89
8	Soil (2 yd)/ Wood chips (2 yd)/ Ammonium nitrate (1 bag)/ Expanded sawdust (1 yd)/ Sawdust extract (neutralized)	28/30/25 11/32/11 11/9.7/9.9	19	91

Results in milligrams per kilogram (mg/kg).
(1) Compared to average initial PCP concentration of respective treatment.

TABLE 4
Average Physical Characterization Results of Test Soil – Biopiles
Penta Wood Products
Daniels, WI
December 1995

Pile No.	Sampling Event/Sampling Date/Test Day					
	Initial/Sep 12, 1994/1			2/Oct 23, 1994/42		
	Temperature (deg C) (1)	Moisture (%)	pH (std. units)	Temperature (deg C)	Moisture (%)	pH (std. units)
1	21	18.5	6.2	14	25.1	6.8
2	27	20.9	8.5	14	31.4	8.5
3	29	24.7	8.7	13	37.6	8.1
4	28	21.1	8.2	14	31.7	8.4
5	38	26.6	8.2	13	40.2	8.5
6	26	14.1	8.0	13	19.5	8.0
7	22	16.8	6.6	13	21.6	6.8
8	24	20.8	6.9	13	27.6	6.7

(1) Temperature data from sampling event 1 collected manually. Temperature data from sampling events 2–6 collected by computer.

TABLE 4 (cont'd)
Average Physical Characterization Results of Test Soil – Biopiles
Penta Wood Products
Daniels, WI
December 1995

Pile No.	Sampling Event/Sampling Date/Test Day					
	3/Nov 29, 1994/79			4/Jan 4, 1995/115		
	Temperature (deg C)	Moisture (%)	pH (std. units)	Temperature (deg C)	Moisture (%)	pH (std. units)
1	10	20.4	6.0	5	20.5	5.2
2	14	28.3	7.1	8	25.1	7.1
3	13	32.9	6.7	5	32.0	7.0
4	12	33.3	6.7	5	30.5	7.0
5	15	33.8	7.0	8	31.9	7.3
6	14	15.9	6.7	8	15.8	6.5
7	11	17.7	6.3	8	14.3	6.1
8	14	23.6	6.4	7	23.2	6.6

TABLE 4 (cont'd)
Average Physical Characterization Results of Test Soil – Biopiles
Penta Wood Products
Daniels, WI
December 1995

Pile No.	Sampling Event/Sampling Date/Test Day					
	5/Feb 8, 1995/150			6/Mar 15, 1995/185		
	Temperature (deg C)	Moisture (%)	pH (std. units)	Temperature (deg C)	Moisture (%)	pH (std. units)
1	9	17.3	5.4	17	17.5	5.2
2	12	17.8	7.1	18	22.3	5.9
3	11	32.3	7.1	17	33.1	6.8
4	8	24.7	7.3	15	25.9	6.2
5	11	34.6	7.4	17	36.1	7.6
6	11	18.7	[illegible].6	16	20.7	6.5
7	12	15.8	6.2	16	17.5	6.4
8	8	22.5	6.7	15	24.4	6.8

TABLE 4 (cont'd)
Average Physical Characterization Results of Test Soil - Biopiles
Penta Wood Products
Daniels, WI
December 1995

Pile No.	Sampling Event/Sampling Date/Test Day		
	7/Jul 25/1995/317		
	Temperature (deg C)	Moisture (%)	pH (std. units)
1	--	16.2	6.3
2	--	20.0	6.1
3	--	31.5	5.8
4	--	29.7	6.0
5	--	34.9	6.1
6	--	18.8	6.5
7	--	18.6	5.8
8	--	22.9	6.7

TABLE 5
Water PCP Concentration vs. Time – Biopiles
P nta Wood Products
Daniels, WI
December 1995

Treatment	Sampling Event	Initial	2	3	4	5	6	7
	Sampling Date	Sep 12, 1994	Oct 23, 1994	Nov 29, 1994	Jan 4, 1995	Feb 8, 1995	Mar 15, 1995	Jul 25,1995
	Test Day	1	42	79	115	150	185	317
Influent		--	0.42	--	1.4	0.001	0.0012	0.0021
Leachate		--	13	--	4.9	8.4	2.4	4.9
Green Leachate Storage Tank 1		--	28	--	63	--	5.5	110
White Leachate Storage Tank 2		--	1.6	--	15	--	11	22
White Leachate Storage Tank 3		--	5.1	--	5.5	5.1	1.2	4.1
Sawdust Extract		--	--	--	1.8	--	--	--

Results in milligrams per liter (mg/L).

TABLE 6
Soil PCP Concentration vs. Time – Anaerobic Dechlorination
Penta Wood Products
Daniels, WI
December 1995

Cell No.	Treatment	Sampling Event/Sampling Date/Test Day				
		Initial/Oct 23, 1994/1		2 /Nov 28, 1994/37		
		Concentration	Average	Concentration	Average	% Reduction (1)
1	Untreated	27/18/40	28	13/18/14	15	47
2	Manure/Phosphate/Limestone/Blood meal	18/15/40	24	34/48/35	39	−63
3	Manure/Phosphate/Limestone	30/26/33	30	6.7/9.3/6.9	7.6	75
4	Phosphate/Blood meal	37/61/29	42	31/39/41	37	13

Results in milligrams per kilogram (mg/kg).

(1) Compared to average initial PCP concentration of respective treatment.

TABLE 6 (cont'd)
Soil PCP Concentration vs. Time – Anaerobic Declorination
Penta Wood Products
Daniels, WI
December 1995

Cell No.	Treatment	Sampling Event/Sampling Date/Test Day					
		3/Jan 4, 1995/74			4/Feb 8, 1995/109		
		Concentration	Average	% Reduction (1)	Concentration	Average	% Reduction (1)
1	Untreated	14/26/18	19	32	15/13/22	17	39
2	Manure/Phosphate/Limestone/Blood meal	2.5 J/6.1 J/6.1	4.9	80	6.2 J/8.9/2.4 J	5.8	76
3	Manure/Phosphate/Limestone	21/19/23	21	30	15/17/16	16	47
4	Phosphate/Blood meal	27/21/9	19	55	10/11/11	11	73

Results in milligrams per kilogram (mg/kg).
J Indicates compound found below detection limit and is an estimated value.
(1) Compared to average initial PCP concentration of respective treatment.

TABLE 6 (cont'd)
Soil PCP Concentration vs. Time – Anaerobic Declorination
Penta Wood Products
Daniels, WI
December 1995

Cell No.	Treatment	Sampling Event/Sampling Date/Test Day					
		5/Mar 14, 1995/143			6/Jul 25,1995/276		
		Concentration	Average	% Reduction (1)	Concentration	Average	% Reduction (1)
1	Untreated	22/20/24	22	21	6.3/6.8/15	9.4	66
2	Manure/Phosphate/Limestone/Blood meal	11/6.7 J/9.8	9.2	62	4.0 J/3.4 J/4.0 J	3.8	84
3	Manure/Phosphate/Limestone	25/28/27	27	10	2.6 J/7.4/5.6	5.2	83
4	Phosphate/Blood meal	17/6.6/7.5	10	76	3.0 J/6.1 J/11	6.7	84

Results in milligrams per kilogram (mg/kg).
J Indicates compound found below detection limit and is an estimated value.
(1) Compared to average initial PCP concentration of respective treatment.

TABLE 7
Soil Chlorophenol Concentration vs. Time – Anaerobic Dechlorination
Penta Wood Products
Daniels, WI
December 1995

Cell No.	Treatment	Sampling Event/Sampling Date/Test Day			
		Initial/Oct 23, 1994/1		2/Nov 28, 1994/37	
		Concentration	Average	Concentration	Average
1	Untreated	--	--	PCP: 23/19/18	PCP: 20
10[illegible]		--	--	m,p CP: 21/8.5/11 2,5 DiCP: ND/ND/ND 3,5 DiCP: 15/4.4 J/8.3 2,3,5 TriCP: 5.6 J/ND/3.4 J 2,3,4,6 TetCP: 22/5.9 J/12	m,p CP: 14 2,5 DiCP: ND 3,5 DiCP: 9.2 2,3,5 TriCP: 4.5 J (1) 2,3,4,6 TetCP: 13
2	Manure/Phosphate/Limestone/Blood meal			PCP: 78/36/57	PCP: 57
		--	--	m,p CP: ND/ND/ND 3,5 DiCP: 5.1/7.0/5.0 2,3,5 TriCP: 2.3 J/2.9/3.0 2,4,5 TriCP: ND/ND/ND 2,3,4,6 TetCP: ND/ND/ND	m,p CP: ND 3,5 DiCP: 5.7 2,3,5 TriCP: 2.7 2,4,5 TriCP: ND 2,3,4,6 TetCP: ND
3	Manure/Phosphate/Limestone			PCP: 5.4/7.0/5.4	PCP: 5.9
		--	--	m,p CP: 1.3 J/3.4 J/2.9 J 3,5 DiCP: 1.3 J/2.1 J/1.7 J 2,3,5 TriCP: ND/ND/ND 2,4,6 Tri CP: ND/ND/ND 2,3,4,6 TetCP: 23/18/16	m,p CP: 2.5 J 3,5 DiCP: 1.7 J 2,3,5 TriCP: ND 2,4,6 Tri CP: ND 2,3,4,6 TetCP: 19
4	Phosphate/Blood meal			PCP: 54/46/44	PCP: 48

Results in milligrams per kilogram (mg/kg).

Note: m,p CP denotes meta, para chlorophenol; 2,5 DiCP denotes 2,5–Dichlorophenol; 3,5 DiCP denotes 3,5–Dichlorophenol; 2,3,5 TriCP denotes 2,3,5–Trichlorophenol; 2,4,5 TriCP denotes 2,4,5–Trichlorophenol; 2,4,6 TriCP denotes 2,4,6–Trichlorophenol; 2,3,4,6 TetCP denotes 2,3,4,6–Tetrachlorophenol.

ND indicates compound not detected.

J indicates compound found below detection limit and is an estimated value.

(1) Nondetected value(s) not included in calculating average concentration of analyte.

TABLE 7 (cont'd)
Soil Chlorophenol Concentration vs. Time – Anaerobic Dechlorination
Penta Wood Products
Daniels, WI
December 1995

Cell No.	Treatment	Sampling Event/Sampling Date/Test Day			
		3/Jan 4,1995/74		4/Feb 8, 1995/109	
		Concentration	Average	Concentration	Average
1	Untreated	PCP: 13/28/21	PCP: 21	PCP: 13/10/22 E	PCP: 15
2	Manure/Phosphate/Limestone/Blood meal	m,p CP: ND/ND/ND 2,5 DiCP: ND/ND/ND 3,5 DiCP: ND/ND/ND 2,3,5 TriCP: ND/ND/ND 2,3,4,6 TetCP: ND/ND/ND PCP: 7/5.9/7	m,p CP: ND 2,5 DiCP: ND 3,5 DiCP: ND 2,3,5 TriCP: ND 2,3,4,6 TetCP: ND PCP: 6.6	m,p CP: ND/5.2/ND 2,5 DiCP: ND/1.3 J/ND 3,5 DiCP: ND/3.6/0.22 J 2,3,5 TriCP: ND/1.2 J/ND 2,3,4,6 TetCP: ND/2.3/ND PCP: 2.6/11/2.5	m,p CP: 5.2 J (1) 2,5 DiCP: 1.3 J (1) 3,5 DiCP: 1.9 J (1) 2,3,5 TriCP: 1.2 J (1) 2,3,4,6 TetCP: 2.3 (1) PCP: 5.4
3	Manure/Phosphate/Limestone	m,p CP: ND/ND/ND 3,5 DiCP: ND/3.3 J/ND 2,3,5 TriCP: ND/ND/ND 2,4,5 TriCP: ND/ND/4.0 J 2,3,4,6 TetCP: ND/ND/ND PCP: 33/16/20	m,p CP: ND 3,5 DiCP: 3.3 J (1) 2,3,5 TriCP: ND 2,4,5 TriCP: 4.0 J (1) 2,3,4,6 TetCP: ND PCP: 23	m,p CP: ND/ND/0.29 J 3,5 DiCP: 5.6/5.7/6.1 2,3,5 TriCP: 3.8/3.6/3.4 2,4,5 TriCP: ND/ND/ND 2,3,4,6 TetCP: 0.78 J/1.3 J/0.42 J PCP: 24/10/20	m,p CP: 0.29 J (1) 3,5 DiCP: 5.8 2,3,5 TriCP: 3.6 2,4,5 TriCP: ND 2,3,4,6 TetCP: 0.83 J PCP: 18
4	Phosphate/Blood meal	m,p CP: ND/ND/ND 3,5 DiCP: ND/ND/ND 2,3,5 TriCP: ND/ND/ND 2,4,6 TriCP: ND/ND/ND 2,3,4,6 TetCP: ND/4.0 J/ND PCP: 40/33/47	m,p CP: ND 3,5 DiCP: ND 2,3,5 TriCP: ND 2,4,6 TriCP: ND 2,3,4,6 TetCP: 4.0 J (1) PCP: 40	m,p CP: ND/0.80 J/ND 3,5 DiCP: ND/0.94 J/ND 2,3,5 TriCP: ND/0.56 J/ND 2,4,6 TriCP: ND/ND/ND 2,3,4,6 TetCP: 3.3/8.0/4.4 PCP: 8.4/27/15	m,p CP: 0.80 J (1) 3,5 DiCP: 0.94 J (1) 2,3,5 TriCP: 0.56 J (1) 2,4,6 TriCP: ND 2,3,4,6 TetCP: 5.2 PCP: 17

Results in milligrams per kilogram (mg/kg).

Note: m,p CP denotes meta, para chlorophenol; 2,5 DiCP denotes 2,5–Dichlorophenol; 3,5 DiCP denotes 3,5–Dichlorophenol; 2,3,5 TriCP denotes 2,3,5–Trichlorophenol; 2,4,5 TriCP denotes 2,4,5–Trichlorophenol; 2,4,6 TriCP denotes 2,4,6–Trichlorophenol; 2,3,4,6 TetCP denotes 2,3,4,6–Tetrachlorophenol.

ND indicates compound not detected.

J indicates compound found below detection limit and is an estimated value.

E indicates estimated value.

(1) Nondetected value(s) not included in calculating average concentration of analyte.

TABLE 7 (cont'd)
Soil Chlorophenol Concentration vs. Time – Anaerobic Dechlorination
Penta Wood Products
Daniels, WI
December 1995

Cell No.	Treatment	Sampling Event/Sampling Date/Test Day			
		5/Mar 14, 1995/143		6/Jul 25,1995/276	
		Concentration	Average	Concentration	Average
1	Untreated	PCP: 19/17/22	PCP: 19	PCP: 1.5/1.4/0.94	PCP: 1.3
2	Manure/Phosphate/Limestone/Blood meal	m,p CP: ND/ND/ND 2,5 DiCP: ND/ND/ND 3,5 DiCP: 0.64 J/ND/2.8 2,3,5 TriCP: ND/ND/1.1 J 2,3,4,6 TetCP: 1.1 J/ND/2.4 PCP: 7.5/8.1/12	m,p CP: ND 2,5 DiCP: ND 3,5 DiCP: 1.7 J (1) 2,3,5 TriCP: 1.1 J (1) 2,3,4,6 TetCP: 1.8 J (1) PCP: 9.2	m,p CP: NA/NA/NA 2,5 DiCP: ND/ND/ND 3,5 DiCP: ND/ND/ND 2,3,5 TriCP: ND/ND/ND 2,3,4,6 TetCP: ND/ND/ND PCP: ND/ND/ND	m,p CP: NA 2,5 DiCP: ND 3,5 DiCP: ND 2,3,5 TriCP: ND 2,3,4,6 TetCP: ND PCP: ND
3	Manure/Phosphate/Limestone	m,p CP: ND/ND/ND 3,5 DiCP: 10/ND/3. 2,3,5 TriCP: 6.1/ND/3.2 2,4,5 TriCP: ND/ND/ND 2,3,4,6 TetCP: 7.9/1.9/8.1 PCP: 17/34/16	m,p CP: ND 3,5 DiCP: 6.8 (1) 2,3,5 TriCP: 4.7 (1) 2,4,5 TriCP: ND 2,3,4,6 TetCP: 6.0 PCP: 22	m,p CP: NA/NA/NA 3,5 DiCP: ND/ND/ND 2,3,5 TriCP: ND/ND/ND 2,4,5 TriCP: ND/ND/ND 2,3,4,6 TetCP: ND/ND/ND PCP: ND/0.23/ND	m,p CP: NA 3,5 DiCP: ND 2,3,5 TriCP: ND 2,4,5 TriCP: ND 2,3,4,6 TetCP: ND PCP: 0.23 J (1)
4	Phosphate/Blood meal	m,p CP: ND/ND/ND 3,5 DiCP: ND/1.8/ND 2,3,5 TriCP: ND/ND/ND 2,4,6 TriCP: ND/0.76 J/ND 2,3,4,6 TetCP: 1.3/1.5 J/1.1 J PCP: 4.8/14/23	m,p CP: ND 3,5 DiCP: 1.8 (1) 2,3,5 TriCP: ND 2,4,6 TriCP: 0.76 J (1) 2,3,4,6 TetCP: 1.3 J PCP: 14	m,p CP: NA/NA/NA 3,5 DiCP: ND/ND/ND 2,3,5 TriCP: ND/ND/ND 2,4,6 TriCP: ND/ND/ND 2,3,4,6 TetCP: ND/ND/ND PCP: 0.70/ND/ND	m,p CP: NA 3,5 DiCP: ND 2,3,5 TriCP: ND 2,4,6 TriCP: ND 2,3,4,6 TetCP: ND PCP: 0.70 (1)

Results in milligrams per kilogram (mg/kg).

Note: m,p CP denotes meta, para chlorophenol; 2,5 DiCP denotes 2,5–Dichlorophenol; 3,5 DiCP denotes 3,5–Dichlorophenol; 2,3,5 TriCP denotes 2,3,5–Trichlorophenol; 2,4,5 TriCP denotes 2,4,5–Trichlorophenol; 2,4,6 TriCP denotes 2,4,6–Trichlorophenol; 2,3,4,6 TetCP denotes 2,3,4,6–Tetrachlorophenol.

ND indicates compound not detected.

NA indicates not analyzed.

J indicates compound found below detection limit and is an estimated value.

(1) Nondetected value(s) not included in calculating average concentration of analyte.

TABLE 8
Water PCP Concentration vs. Time – Anaerobic Dechlorination
Penta Wood Products
Daniels, WI
December 1995

Cell No.	Treatment	Sampling Event/Sampling Date/Test Day				
		Initial/Oct 23, 1994/1		2 /Nov 28, 1994/37		
		Concentration	Average	Concentration	Average	% Reduction (1)
1	Untreated	0.88/0.81	0.85	0.012/.012	0.012	99
2	Manure/Phosphate/Limestone/Blood meal	0.69/0.58	0.64	0.019/0.024	0.022	97
3	Manure/Phosphate/Limestone	0.046/0.039	0.043	0.022/0.021	0.022	49
4	Phosphate/Blood meal	0.17/0.17	0.17	0.006/0.005	0.006	96

Results in milligrams per liter (mg/L).
(1) Compared to average initial PCP concentration of respective treatment.

TABLE 8 (cont'd)
Water PCP Concentration vs. Time – Anaerobic Declorination
Penta Wood Products
Daniels, WI
December 1995

Cell No.	Treatment	Sampling Event/Sampling Date/Test Day					
		3/Jan 4, 1995/74			4/Feb 8, 1995/109		
		Concentration	Average	% Reduction (1)	Concentration	Average	% Reduction (1)
1	Untreated	0.019/0.020	0.020	98	0.015/0.015	0.015	98
2	Manure/Phosphate/Limestone/Blood meal	0.019/0.013	0.016	98	0.55/0.017 (2)	0.017	97
3	Manure/Phosphate/Limestone	0.007/0.010	0.009	79	0.043/0.011	0.027	37
4	Phosphate/Blood meal	0.008/0.017	0.013	92	0.017/0.008	0.013	92

Results in milligrams per liter (mg/L).
(1) Compared to average initial PCP concentration of respective treatment.
(2) Value of 0.55 mg/L assumed to be anomolous and was not used to calculate average PCP concentration or percent PCP reduction for the sample.

TABLE 8 (cont'd)
Water PCP Concentration vs. Time – Anaerobic Declorination
Penta Wood Products
Daniels, WI
December 1995

Cell No.	Treatment	Sampling Event/Sampling Date/Test Day					
		5/Mar 14, 1995/143			6/Jul 25, 1995/276		
		Concentration	Average	% Reduction (1)	Concentration	Average	% Reduction (1)
1	Untreated	0.033/0.022	0.028	97	0.012/0.016	0.014	98
2	Manure/Phosphate/Limestone/Blood meal	0.013/0.012	0.013	98	0.0086/0.0065	0.0076	99
3	Manure/Phosphate/Limestone	0.009/0.009	0.009	79	0.020/0.016	0.018	58
4	Phosphate/Blood meal	0.012/0.013	0.013	92	0.012/0.019	0.016	91

Results in milligrams per liter (mg/L).
(1) Compared to average initial PCP concentration of respective treatment.

TABLE 9
Water Chlorophenol Concentration vs. Time – Anaerobic Dechlorination
Penta Wood Products
Daniels, WI
December 1995

Cell No.	Treatment	Sampling Event/Sampling Date/Test Day			
		Initial/Oct 23, 1994/1		2/Nov 28, 1994/37	
		Concentration	Average	Concentration	Average
1	Untreated	--	--	PCP: ND/ND	PCP: ND
2	Manure/Phosphate/Limestone/Blood meal	--	--	m,p CP: ND/ND	m,p CP: ND
3	Manure/Phosphate/Limestone	--	--	3,5 DiCP: ND/0.018 J	3,5 DiCP: 0.018 J (1)
4	Phosphate/Blood meal	--	--	m,p CP: ND/ND 3,5 DiCP: ND/0.012 J	m,p CP: ND 3,5 DiCP: 0.012 J (1)

Results in milligrams per liter (mg/L).
Note: m,p CP denotes meta, para–chlorophenol; 3,5 DiCP denotes 3,5–Dichlorophenol.
J indicates compound found below detection limit and is an estimated value.
(1) Nondetected value not included in calculating average concentration of analyte.

TABLE 9 (cont'd)
Water Chlorophenol Concentration vs. Time – Anaerobic Dechlorination
Penta Wood Products
Daniels, WI
December 1995

Cell No.	Treatment	Sampling Event/Sampling Date/Test Day			
		3/Jan 4,1995/74		4/Feb 8, 1995/109	
		Concentration	Average	Concentration	Average
1	Untreated	PCP: ND/ND	PCP: ND	PCP: 0.006 J/0.011 J	PCP: 0.009 J
2	Manure/Phosphate/Limestone/Blood meal	m,p CP: ND/ND	m,p CP: ND	m,p CP: ND/10 J	m,p CP: 10 J (1)
3	Manure/Phosphate/Limestone	3,5 DiCP: ND/ND	3,5 DiCP: ND	3,5 DiCP: ND/ND	3,5 DiCP: ND
4	Phosphate/Blood meal	m,p CP: ND/ND 3,5 DiCP: ND/ND	m,p CP: ND 3,5 DiCP: ND	m,p CP: ND/4 J 3,5 DiCP: ND/ND	m,p CP: 4 J (1) 3,5 DiCP: ND

Results in milligrams per liter (mg/L).

Note: m,p CP denotes meta, para chlorophenol; 3,5 DiCP denotes 3,5 -Dichlorophenol.

J indicates compound found below detection limit and is an estimated value.

(1) Nondetected value not included in calculating average concentration of analyte.

TABLE 9 (cont'd)
Water Chlorophenol Concentration vs. Time – Anaerobic Dechlorination
Penta Wood Products
Daniels, WI
December 1995

Cell No.	Treatment	Sampling Event/Sampling Date/Test Day			
		5/Mar 14, 1995/143		6/Jul 25, 1995/276	
		Concentration	Average	Concentration	Average
1	Untreated	PCP: 0.013 J/0.018 J	PCP: 0.016 J	PCP: ND/ND	PCP: ND
2	Manure/Phosphate/Limestone/Blood meal	m,p CP: ND/ND	m,p CP: ND	m,p CP: ND/ND	m,p CP: ND
3	Manure/Phosphate/Limestone	3,5 DiCP: ND/ND	3,5 DiCP: ND	3,5 DiCP: ND/ND	3,5 DiCP: ND
4	Phosphate/Blood meal	m,p CP: ND/ND 3,5 DiCP: ND/ND 2,4 DiCP: NA	m,p CP: ND 3,5 DiCP: ND 2,4 DiCP:NA	m,p CP: NA 3,5 DiCP: ND/ND 2,4 DiCP: 0.0057 J/0.011	m,p CP: NA 3,5 DiCP: ND 2,4 DiCP: 0.0084

Results in milligrams per liter (mg/L).

Note: m,p CP denotes meta, para chlorophenol; 3,5 DiCP denotes 3,5–Dichlorophenol; 2,4 DiCP denotes 2,4–Dichlorophenol.

J indicates compound found below detection limit and is an estimated value.

NA indicates not analyzed.

TABLE 10
Soil PCP Concentration vs. Time - White Rot Fungus Pile (1)
Penta Wood Products
Daniels, WI
December 1995

Sampling Event/Sampling Date/Test Day	Initial/Oct 5, 1994/1	2/Nov 11, 1994/35 (2)	3/Dec 21, 1994/77 (2)	4/Feb 8, 1995/126	5/Mar 15, 1995/161	6/Jul 25, 1995/294 (3)
Concentration (mg/kg)	NR	7	21	32/33/35	15/31/29	14/5.8 J/3.4 J
Average (mg/kg)	NR	7	21	33	25	7.7

(1) Test conducted by U.S. EPA Region V.

(2) Analytical data from U.S. EPA Region V.

(3) Sample TOC concentration = 9,500 mg/kg.

J indicates compound found below detection limit and is an estimated value.

NR indicates not reported.

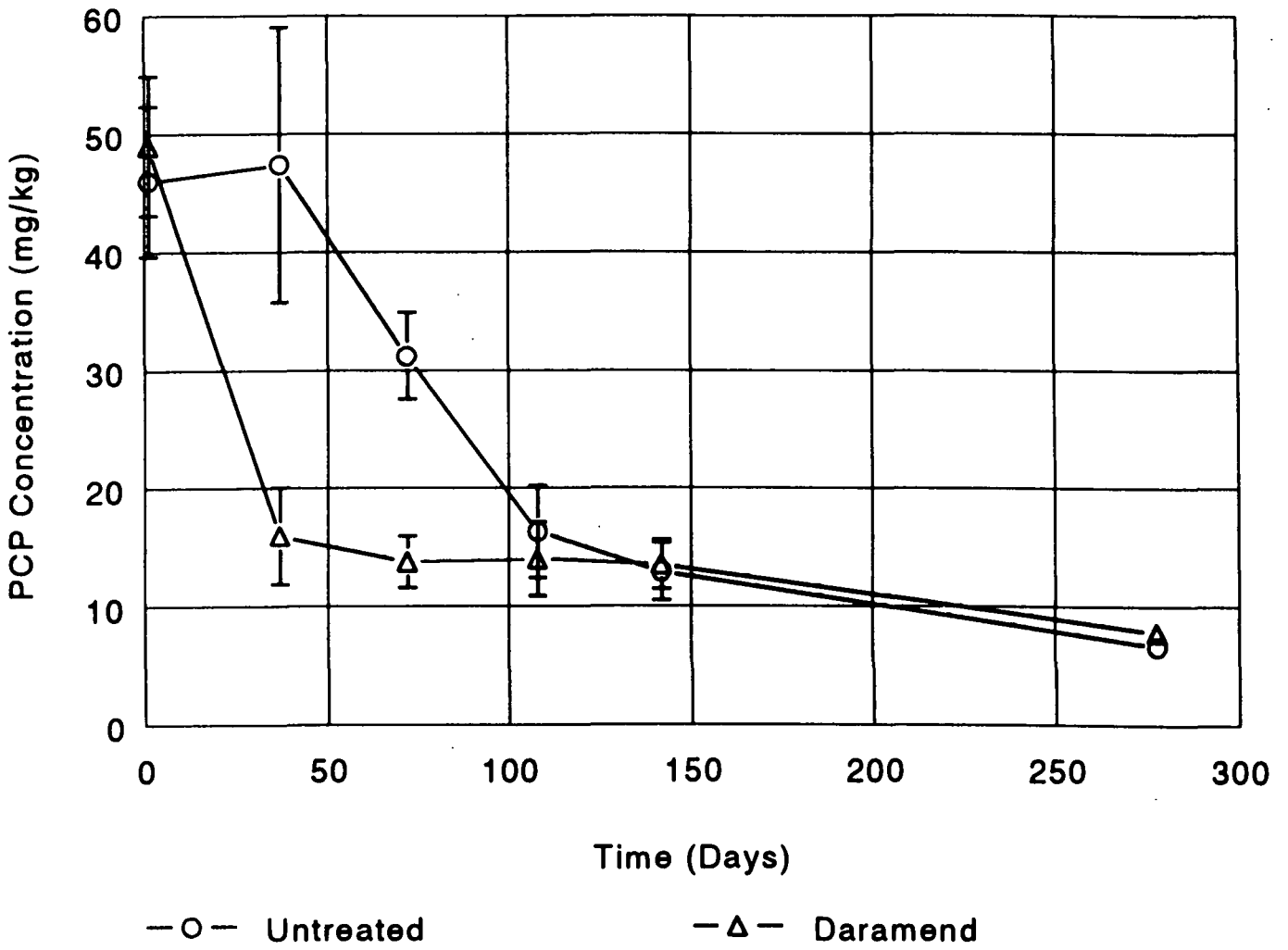
TABLE 11
Results of On- and Off-Site Sampling
Penta Wood Products
Daniels, WI
December 1995

Sample Location	PCP Concentration (mg/kg)
708 N, 686 E	4.7 U
708 N, 671 E	5.7
990 N, 200 E	5.5 U
1000 N, 190 E	11
1000 N, 210 E	5.4
1010 N, 200 E	5.5 U
1400 N, 220 E	25,000
1600 N, 178[illegible] E	1.0 J
1880 N, 1920 E	5.2 U
1910 N, 1915 E	1.5 J
1950 N, 1955 E	5.1 U

U indicates compound not detected.
J indicates compound found below detection limit and is an estimated value.

Figures

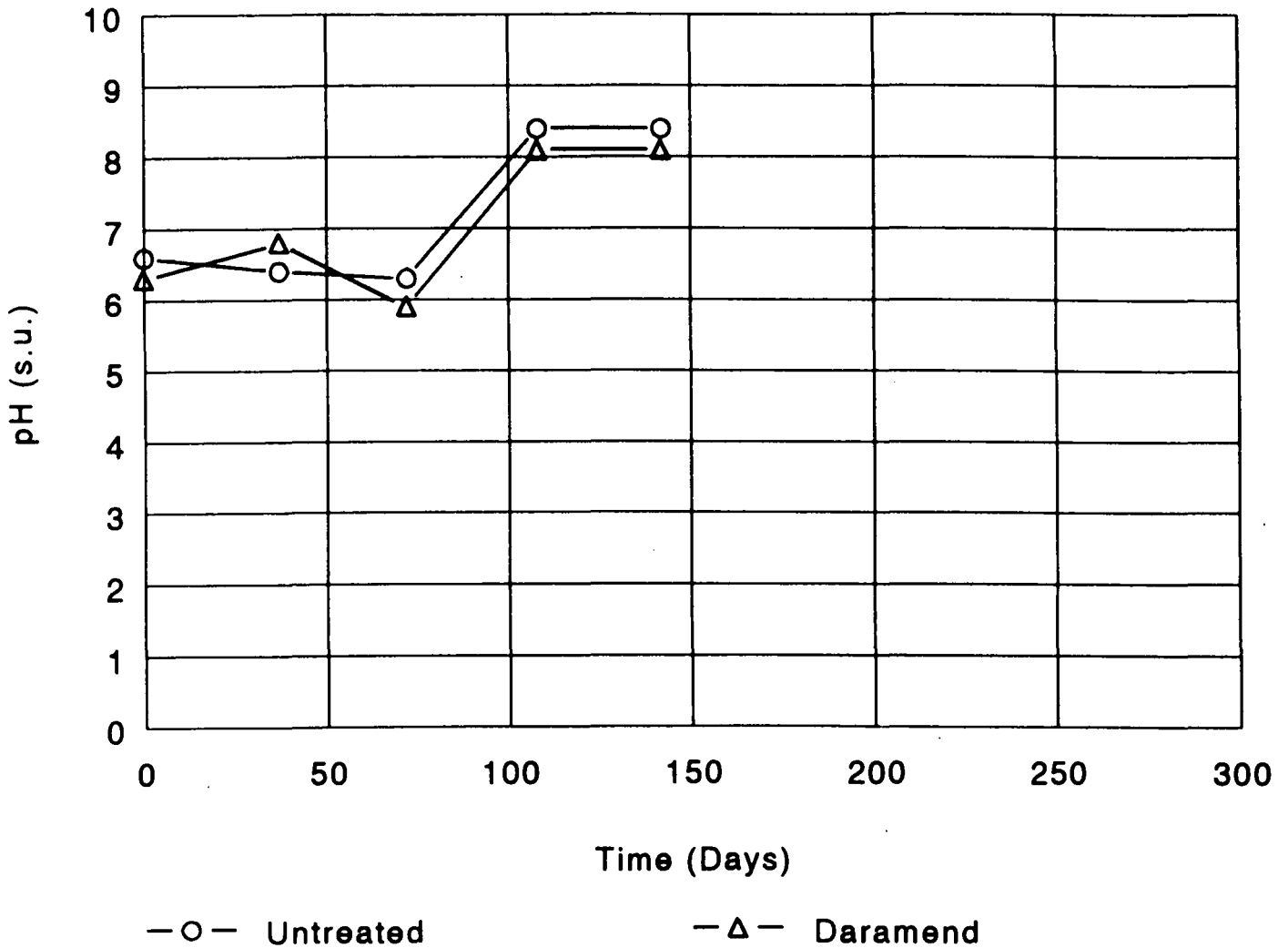
Average Soil PCP Concentration vs Time - Landfarm Plots



Lndfarx2.TC

U.S. EPA ENVIRONMENTAL RESPONSE TEAM RESPONSE ENGINEERING AND ANALYTICAL CONTRACT 68-C4-0022 WO# 03347-040-001-0026-01	FIGURE 1 PENTA WOOD PRODUCTS DANIELS, WISCONSIN DECEMBER 1995

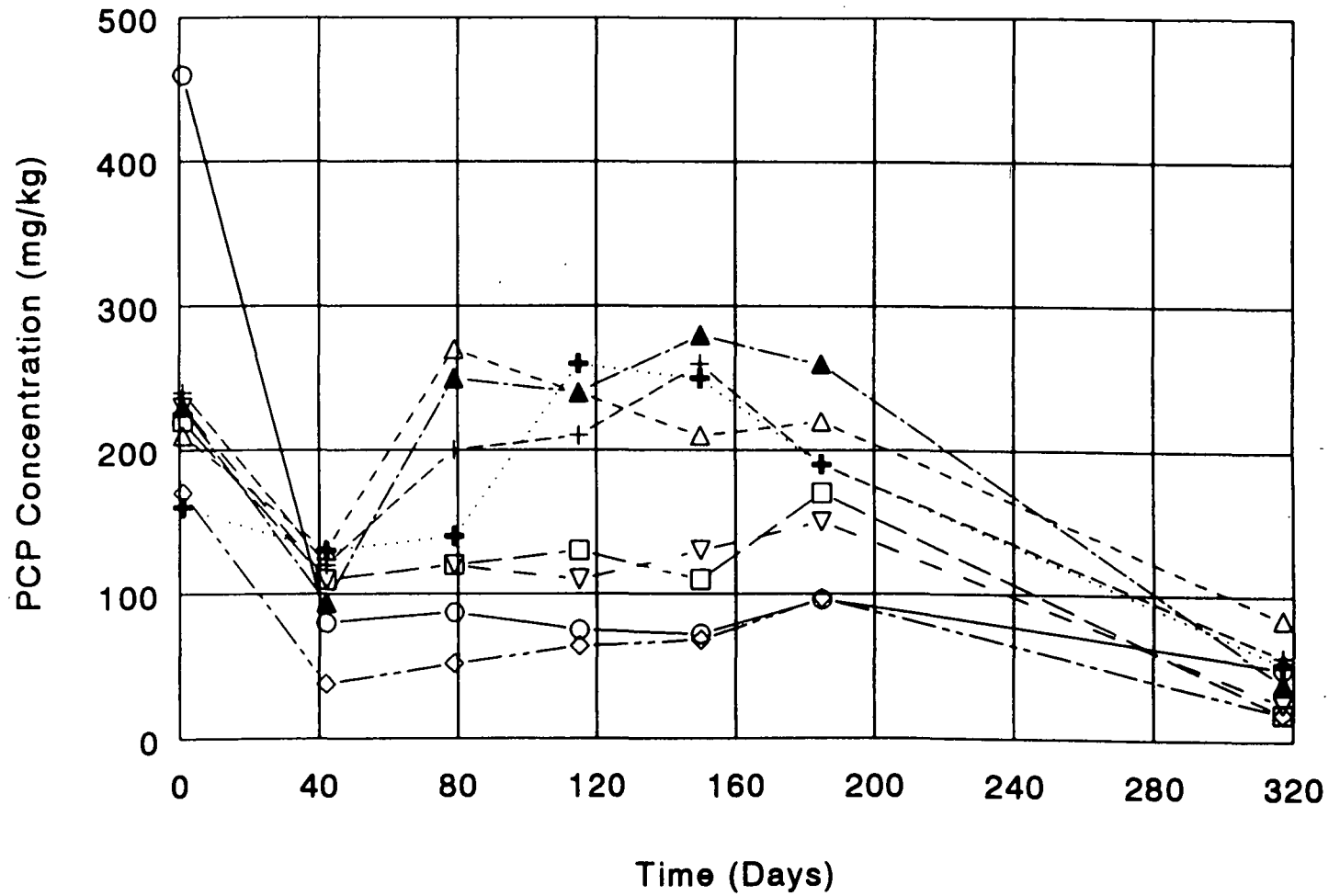
Average Soil pH vs Time - Landfarm Plots



LANDPH2.TC

U.S. EPA ENVIRONMENTAL RESPONSE TEAM RESPONSE ENGINEERING AND ANALYTICAL CONTRACT 68-C4-0022 WO# 03347-040-001-0026-01	FIGURE 2 PENTA WOOD PRODUCTS DANIELS, WISCONSIN DECEMBER 1995

Average Soil PCP Concentration vs Time - Biopiles

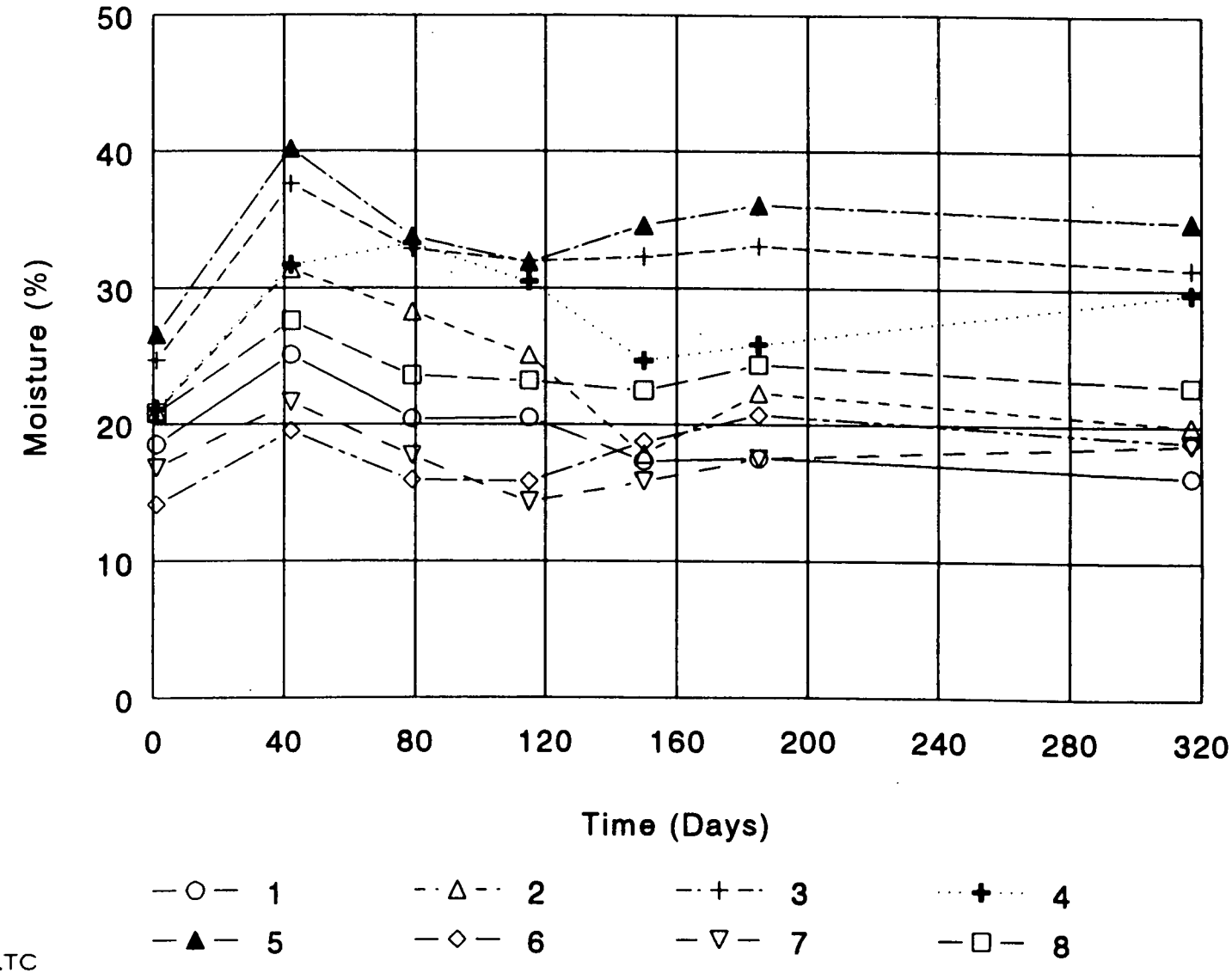


COMPOST2.TC

U.S. EPA ENVIRONMENTAL RESPONSE TEAM
RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
68-C4-0022
WO# 03347-040-001-0026-01

FIGURE 3
PENTA WOOD PRODUCTS
DANIELS, WISCONSIN
DECEMBER 1995

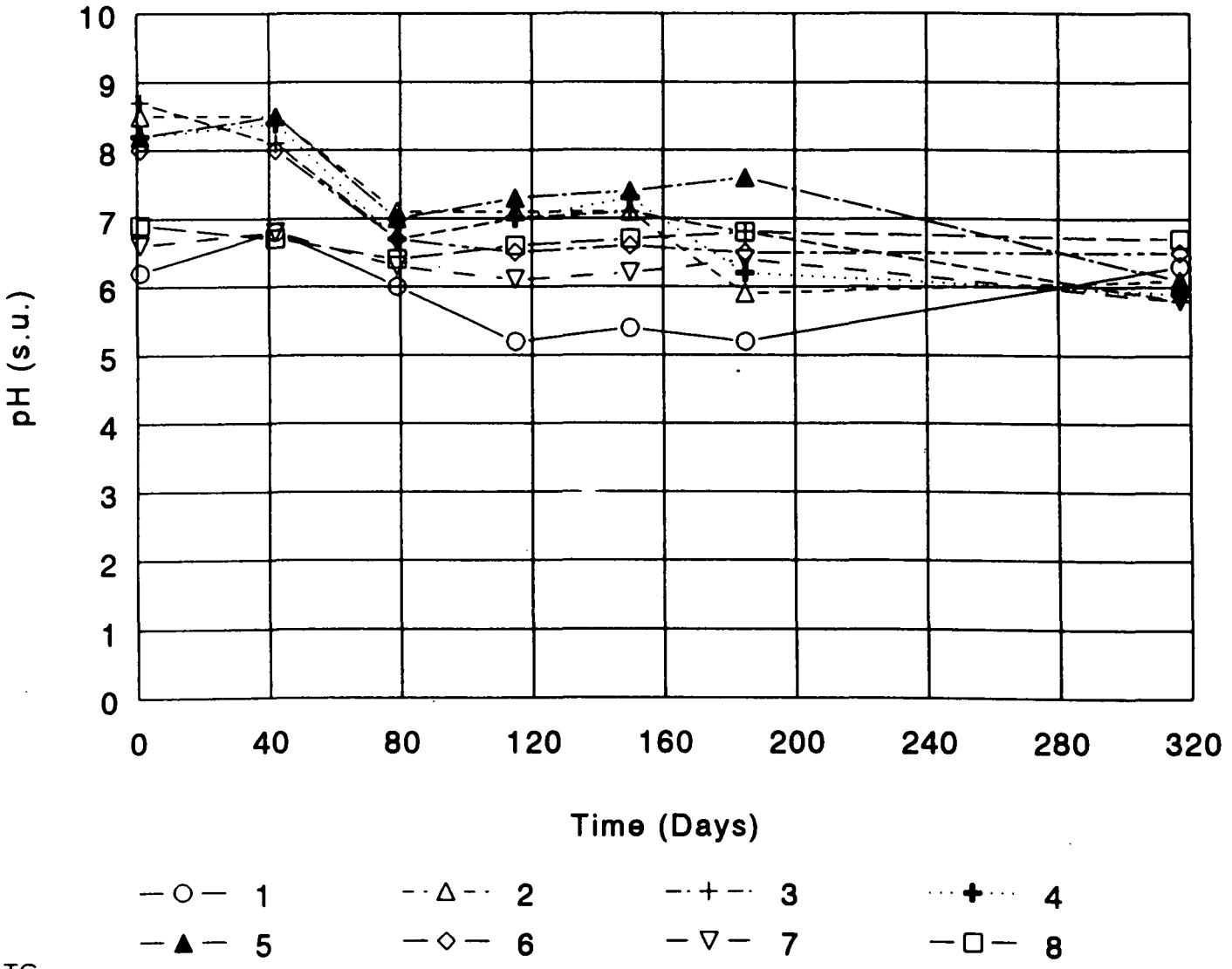
Average Soil Moisture vs Time - Biopiles



MOIST2.TC

U.S. EPA ENVIRONMENTAL RESPONSE TEAM RESPONSE ENGINEERING AND ANALYTICAL CONTRACT 68-C4-0022 WO# 03347-040-001-0026-01	FIGURE 4 PENTA WOOD PRODUCTS DANIELS, WISCONSIN DECEMBER 1995

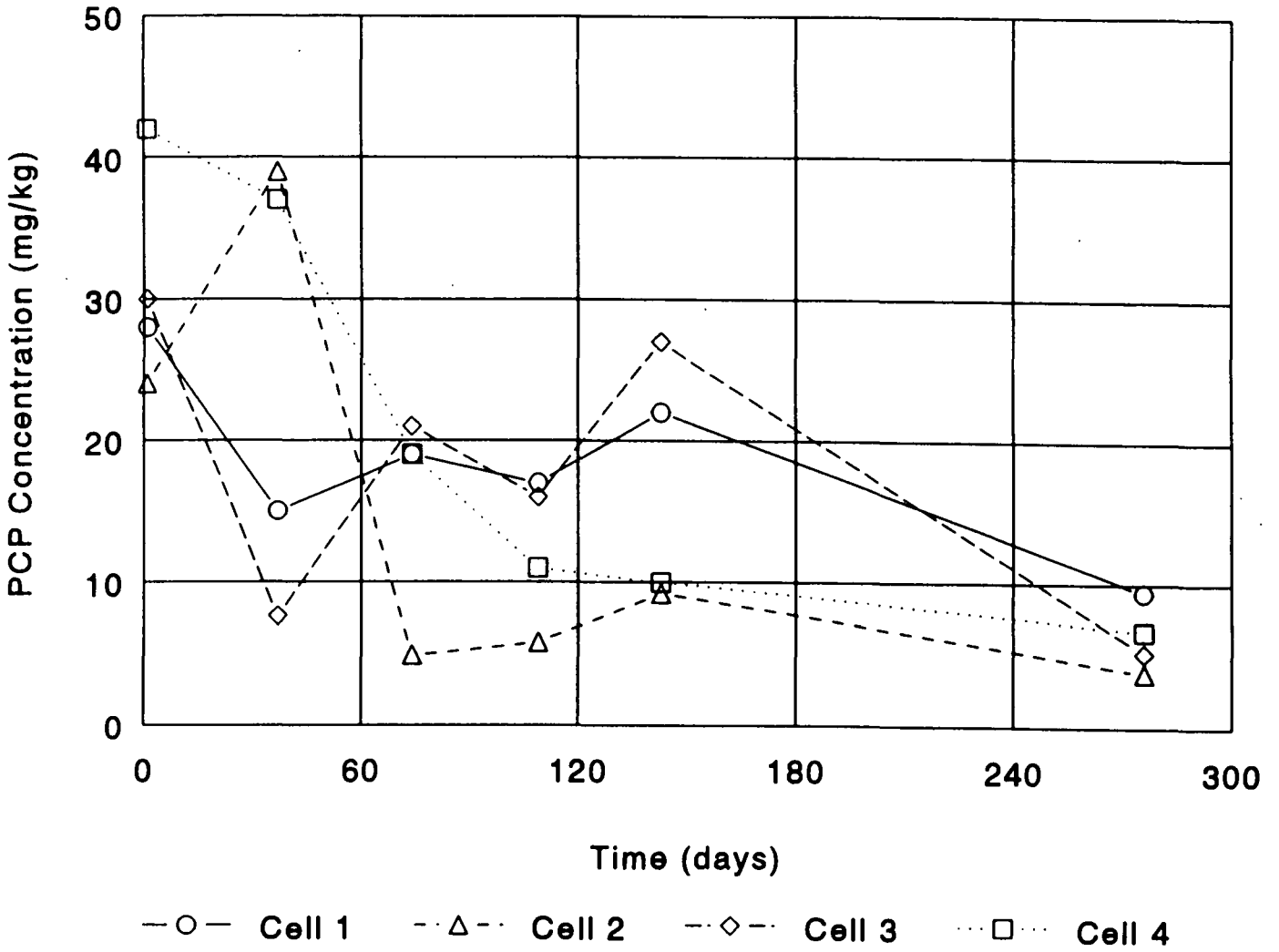
Average Soil pH vs Time - Biopiles



COMPH2.TC

U.S. EPA ENVIRONMENTAL RESPONSE TEAM RESPONSE ENGINEERING AND ANALYTICAL CONTRACT 68-C4-0022 WO# 03347-040-001-0026-01	FIGURE 5 PENTA WOOD PRODUCTS DANIELS, WISCONSIN DECEMBER 1995	

Average Soil PCP Concentration vs Time - Anaerobic Dechlorination



ANAEROB2.TC

U.S. EPA ENVIRONMENTAL RESPONSE TEAM RESPONSE ENGINEERING AND ANALYTICAL CONTRACT 68-C4-0022 WO# 03347-040-001-0026-01	FIGURE 6 PENTA WOOD PRODUCTS DANIELS, WISCONSIN DECEMBER 1995

Appendix A

APPENDIX A
Analytical Reports
Penta Wood Products
December 1995

WESTON WAY
WEST CHESTER, PA 19380
PHONE: 215-692-3030
TELEX: 83-5348

DATE: September 1, 1995

TO: R. Singhvi EPA/ERT

FROM: V. Kansal Analytical Section Leader Vinod Kansal

SUBJECT: DOCUMENT TRANSMITTAL UNDER WORK ASSIGNMENT # 0-026

Attached please find the following document prepared under this work assignment:

Penta Wood Products Site- Analytical Report

Central File WA# 0-026	(with attachment)
T. Mignone	Task Leader
M. Barkley	Data Validation and Report Writing Group Leader
H. Allen	Work Assignment Manager

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ANALYTICAL REPORT

Prepared by
Roy F. Weston, Inc.

Penta Wood Products
Siren, Wisconsin

September 1995

EPA Work Assignment No. 0-026
WESTON Work Order No. 03347-040-001-0026-01
EPA Contract No. 68-C4-0022

Submitted to
H. Allen
EPA-ERT

T. Mignone — Date 9/1/95
Task Leader

Analysis by:
REAC

V. Kansal — Date 9/1/95
Analytical Section Leader

Prepared by:
M. Barkley

R. M. Shapot — Date 9/5/95
Program Manager

Reviewed by:
G. Karustis

\026\DEL\AR\9509\Penta20

Table of Contents

Appendices will be furnished on request.

INTRODUCTION

The REAC Laboratories, in response to ERT work assignment #0-026, provided analytical support for samples collected from the Penta Wood Products Site, Siren, Wisconsin. The support included QA/QC, data review, and preparation of an analytical report containing a summary of the analytical methods, the results, and the QA/QC results. The support also included the installation and operation of a HHL in Siren, Wisconsin.

The samples were treated with procedures consistent with those described in SOP #1008 and are summarized in the following table:

COC #	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
09916	12	7/25/95	7/25/95	Soil	Pentachlorophenol	REAC-HHL *
09918	20	7/26/95	7/26/95			
09920	7	7/26/95	7/26/95			
09951	3	7/26/95	7/26/95			
09919	20	7/25/95	7/26/95			
09949	20	7/25/95	7/26/95			
09950	12	7/25/95	7/26/95			
09921	4	7/26/95	7/27/95			
09948	3	7/26/95	7/27/95			

* REAC-HHL REAC High Hazard Mobile Laboratory

CASE NARRATIVE

Pentachlorophenol Analysis - Package E302

The MS/MSD recoveries are outside QC limits for samples A02754, A04501, A04115, A04135, and A04175. The data are not affected.

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SUMMARY of ABBREVIATIONS

B	The analyte was found in the blank
BFB	Bromofluorobenzene
BPQL	Below the Practical Quantitation Limit
C	Centigrade
D	(Surrogate Table) this value is from a diluted sample and was not calculated (Result Table) this result was obtained from a diluted sample
CLP	Contract Laboratory Protocol
COC	Chain of Custody
CONC	Concentration
CRDL	Contract Required Detection Limit
DFTPP	Decafluorotriphenylphosphine
DL	Detection Limit
E	The value is greater than the highest linear standard and is estimated
EMPC	Estimated maximum possible concentration
J	The value is below the method detection limit and is estimated
HHL	High Hazard Laboratory
IDL	Instrument Detection Limit
ISTD	Internal Standard
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MI	Matrix Interference
MS	Matrix spike
MSD	Matrix spike duplicate
MW	Molecular weight
NA	either Not Applicable or Not Available
NC	Not Calculated
NS	Not Spiked
% D	Percent difference
% REC	Percent Recovery
PQL	Practical quantitation limit
PPBV	Parts per billion by volume
QL	Quantitation Limit
RPD	Relative percent difference
RSD	Relative Standard Deviation
SIM	Selected Ion Mode
U	Not Detected

m^3	cubic meter	kg	kilogram
l(L)	liter	g	gram
dl	deciliter	cg	centigram
ml	milliliter	mg	milligram
ul	microliter	ug	microgram
		ng	nanogram
		pg	picogram

* denotes a value that exceeds the acceptable QC limit

Abbreviations that are specific to a particular table are explained in footnotes on that table

Revision 7/26/95

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Analytical Procedure for Pentachlorophenol in Soil (SIM)

Extraction Procedure

Ten grams of sample was spiked with the surrogate 2,4,6-tribromophenol, mixed with 10 g anhydrous sodium sulfate, and shaker extrated three times with 40, 30, and 30 ml portions of 1:4 acetone:methylene chloride. A 1.0 ml aliquot was spiked with an internal standard phenanthrene-d_{10}, and analyzed.

Analytical Procedure

An HP 5971A Mass Selection Detector equipped with a 5890 Series II GC, a 7673A autosampler and controlled by an HP-Chem Station/Window/DOS 5.0 software driven IBM compatible computer was used to analyze the samples.

The instrument conditions were:

Column	Restek Rtx-5 (crossbonded SE-54) 30 meter x 0.25mm ID, 0.50 μm film thickness
Injection Temperature	290° C
Transfer Temperature	315° C
Source Temperature	240° C
Analyzer Temperature	240° C
Temperature Program	100° C for 0.5 min 30° C/min to 305° C Hold for 2 min.
Splitless Injection	Split time = 0.88 min
Injection Volume	2 μl

The GC/MS system was calibrated using 6 pentachlorophenol standards at 0.5, 1.0, 5.0, 10.0, 25.0, and 50.0 μg/ml. Before analysis each day, the system was tuned with 50 ng decafluorotriphenylphosine (DFTPP) and passed a continuing calibration check when analyzing a 5 μg/ml standard mixture in which the responses were evaluated by comparison to the average response of the calibration curve.

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The pentachlorophenol results, based on dry weight, are listed in Table 1.1. The concentration of the detected compounds was calculated using the following equation:

$$C_u = \frac{DF \times A_u \times I_{is} \times V_t}{A_{is} \times RF_{ave} \times V_i \times W \times D}$$

where

C_u	=	Concentration of analyte (µg/Kg)
DF	=	Dilution Factor
A_u	=	Area of analyte
I_{is}	=	Mass of internal standard (ng)
V_t	=	Volume of extract (µl)
A_{is}	=	Area of internal standard
RF_{ave}	=	Average Response Factor (unitless)
V_i	=	Volume of extract injected (µl)
W	=	Weight of sample (g)
D	=	Decimal per cent solids

The Average Response Factor is used to quantitate the analyses.

Response Factor calculation:

The response factor (RF) for each specific analyte is calculated based on the area response from the continuing calibration check as follows:

$$RF = \frac{A_c \times I_{is}}{A_{is} \times I_c}$$

where

RF	=	Response factor for a specific analyte
A_c	=	Area of the analyte in the standard
I_{is}	=	Mass of the internal standard in the standard
A_{is}	=	Area of the internal standard in the standard
I_c	=	Mass of the analyte in the standard

$$RF_{ave} = \frac{RF_1 + \ldots + RF_n}{n}$$

and

n = number of Samples

Revision of 4/20/95

\026\DEL\AR\9509\Penta20

TABLE 1.1 Results of the Analysis for Pentachlorophenol in Soil (SIM)
WA # 0-026 Penta Wood Products
(Results are Based on Dry Weight)

Sample Number	Location	Conc. (mg/Kg)	MDL (mg/Kg)
Blank 223	Sand Blank	U	5.0
A02754	1010N,200E	U	5.5
A02755	1400N,220E	25000	1300
A02756	1000N,190E	11	5.4
A02757	1000N,210E	5.4	5.4
A02758	990N,200E	U	5.5
A02759	708N,671E	5.7	5.4
A02760	708N,686E	U	4.7
A02761	1910N,1915E	1.5 J	5.7
A02762	1950N,1955E	U	5.1
A02763	1880N,1920E	U	5.2
A02764	1600N,1780E	1.0 J	4.6
A02298	D-TRT	7.8	6.4
A02299	D-CONTROL	6.6	4.5
A02300	D-SOURCE	28	4.2
Blank 224	Sand Blank	U	5.0
A04501	DS1A-6	6.3	6.0
A04502	DS1B-6	6.8	5.5
A04503	DS1C-6	15	4.0
A04504	DS2A-6	4.0 J	6.8
A04505	DS2B-6	3.4 J	7.7
A04506	DS2C-6	4.0 J	6.2
A04507	DS3A-6	2.6 J	5.6
A04508	DS3B-6	7.4	7.4
A04509	DS3C-6	5.6	5.5
A04510	DS4A-6	3.0 J	9.3
A04511	DS4B-6	6.1 J	8.0
A04512	DS4C-6	11	9.1

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TABLE 1.1 (cont'd) Results of the Analysis for Pentachlorophenol in Soil (SIM)
WA # 0-026 Penta Wood Products
(Results are Based on Dry Weight)

Sample Number	Location	Conc. (mg/Kg)	MDL (mg/Kg)
Blank 225	Sand Blank	U	5.0
A04115	1A1 COMP 7	49	5.8
A04116	1A2 COMP 7	62	5.3
A04117	1A3 COMP 7	54	4.6
A04118	1B1 COMP 7	49	5.7
A04119	1B2 COMP 7	46	6.0
A04120	1B3 COMP 7	39	5.7
A04121	1C1 COMP 7	55	5.5
A04122	1C2 COMP 7	50	5.7
A04123	1C3 COMP 7	46	5.9
A04124	2A1 COMP 7	72	6.2
A04125	2A2 COMP 7	71	5.6
A04126	2A3 COMP 7	74	5.9
A04127	2B1 COMP 7	71	5.9
A04128	2B2 COMP 7	70	5.6
A04129	2B3 COMP 7	65	5.9
A04130	2C1 COMP 7	90	6.0
A04131	2C2 COMP 7	120	6.2
A04132	2C3 COMP 7	120	5.8
A04133	3A1 COMP 7	55	6.5
A04534	3A2 COMP 7	55	6.9
BLANK	Sand Blank	U	5.0
A04135	3A3 COMP 7	55	7.6
A04136	3B1 COMP 7	66	7.6
A04137	3B2 COMP 7	63	7.3
A04138	3B3 COMP 7	59	7.0
A04139	3C1 COMP 7	50	7.6
A04140	3C2 COMP 7	59	6.5
A04141	3C3 COMP 7	56	7.6
A04142	4A1 COMP 7	24	6.9
A04143	4A2 COMP 7	31	7.1
A04144	4A3 COMP 7	34	7.4
A04145	4B1 COMP 7	27	7.1
A04146	4B2 COMP 7	27	6.7
A04147	4B3 COMP 7	21	7.1
A04148	4C1 COMP 7	100	6.1
A04149	4C2 COMP 7	120	6.0
A04150	4C3 COMP 7	120	7.0
A04151	5A1 COMP 7	36	7.1
A04152	5A2 COMP 7	31	7.0
A04153	5A3 COMP 7	41	7.4
A04554	5B1 COMP 7	49	7.3

TABLE 1.1 (cont'd) Results of the Analysis for Pentachlorophenol in Soil (SIM)
WA # 0-026 Penta Wood Products
(Results are Based on Dry Weight)

Sample Number	Location	Conc. (mg/Kg)	MDL (mg/Kg)
Blank 226	Sand Blank	U	5.0
A04155	5B2 COMP 7	33	7.4
A04156	5B3 COMP 7	36	7.3
A04157	5C1 COMP 7	39	7.6
A04158	5C2 COMP 7	40	7.4
A04159	5C3 COMP 7	53	6.8
A04160	6A1 COMP 7	16	6.0
A04161	6A2 COMP 7	65	5.0
A04162	6A3 COMP 7	16	5.6
A04163	6B1 COMP 7	9.4	4.3
A04164	6B2 COMP 7	8.7	5.2
A04165	6B3 COMP 7	12	5.2
A04166	6C1 COMP 7	14	5.7
A04167	6C2 COMP 7	15	5.6
A04168	6C3 COMP 7	12	5.5
A04169	7A1 COMP 7	17	6.0
A04170	7A2 COMP 7	17	5.8
A04171	7A3 COMP 7	16	6.2
A04172	7B1 COMP 7	35	5.7
A04173	7B2 COMP 7	32	5.5
A04174	7B3 COMP 7	34	5.2
Blank 226	Sand Blank	U	5.0
A04175	7C1 COMP 7	19	6.1
A04176	7C2 COMP 7	40	5.9
A04177	7C3 COMP 7	23	6.1
A04178	8A1 COMP 7	28	6.0
A04179	8A2 COMP 7	30	6.2
A04180	8A3 COMP 7	25	6.7
A04181	8B1 COMP 7	11	6.3
A04182	8B2 COMP 7	32	6.1
A04183	8B3 COMP 7	11	6.2
A04584	8C1 COMP 7	11	6.0
A04185	8C2 COMP 7	9.7	6.1
A04186	8C3 COMP 7	9.9	5.9
A02751	WR-A	14	6.0
A02752	WR-B	5.8 J	6.8
A02753	WR-C	3.4 J	6.5

Results of the Surrogate Recoveries for PCP in Soil

One surrogate, 2,4,6-tribromophenol, was added to the soil samples prior to extraction. The surrogate recoveries, listed in Table 2.1, range from 67 to 109. All 121 recoveries are within the acceptable QC limits.

Results of the MS/MSD Analysis for PCP in Soil

Samples A02754, A04501, A04115, A04135, A04155, A04175, and A02751 were chosen for matrix spike duplicate analysis for the soil samples. The percent recoveries, listed in Table 2.2, ranged from 93 to 128. Five out of 14 recoveries are within QC limits. The relative percent differences (RPDs), also listed in Table 2.2, ranged from 1 to 18. All seven RPD values are within QC limits.

TABLE 2.1 Results of the Surrogate Recoveries for PCP in Soil
WA # 0-026 Penta Wood Products

Sample Number	2,4,6-Tribromophenol Percent Recovery
Blank 223	80
A02754	75
A02754 MS	79
A02754 MSD	77
A02755	90
A02756	84
A02757	86
A02758	79
A02759	81
A02760	92
A02761	76
A02762	88
A02763	94
A02764	87
A02298	82
A02299	86
A02300	95
Blank 224	109
A04501	97
A04501 MS	94
A04501 MSD	91
A04502	97
A04503	100
A04504	92
A04505	85
A04506	88
A04507	89
A04508	91
A04509	87
A04510	88
A04511	89
A04512	91

Advisory QC Limits
19-122

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TABLE 2.1 (cont'd) Results of the Surrogate Recoveries for PCP in Soil
WA # 0-026 Penta Wood Products

Sample Number	2,4,6-Tribromophenol Percent Recovery
Blank 225	96
A04115	102
A04115 MS	104
A04115 MSD	93
A04116	105
A04117	104
A04118	105
A04119	104
A04120	104
A04121	106
A04122	105
A04123	101
A04124	104
A04125	105
A04126	106
A04127	106
A04128	103
A04129	109
A04130	106
A04131	109
A04132	106
A04133	106
A04134	107
Blank 226	100
A04135	104
A04135 MS	103
A04135 MSD	98
A04136	99
A04137	96
A04138	98
A04139	101
A04140	103
A04141	95
A04142	97
A04143	103
A04144	101
A04145	99
A04146	100
A04147	100
A04148	102
A04149	100
A04150	102
A04151	100
A04152	98
A04153	67
A04154	96

Advisory QC Limits
19-122

A:\0_026\090595\PSUR2.WK3

TABLE 2.1 (cont'd) Results of the Surrogate Recoveries for PCP in Soil
WA # 0-026 Penta Wood Products

Sample Number	2,4,6-Tribromophenol Percent Recovery
Blank 226	91
A04155	91
A04155 MS	89
A04155 MSD	86
A04156	90
A04157	90
A04158	91
A04159	97
A04160	94
A04161	95
A04162	93
A04163	95
A04164	94
A04165	95
A04166	95
A04167	97
A04168	94
A04169	95
A04170	94
A04171	96
A04172	100
A04173	97
A04174	99
Blank 228	92
A04175	93
A04175 MS	93
A04175 MSD	93
A04176	95
A04177	100
A04178	98
A04179	97
A04180	98
A04181	93
A04182	89
A04183	91
A04184	88
A04185	92
A04186	93
A04151	91
A04151 MS	93
A04151 MSD	92
A04152	94
A04153	87

Advisory QC Limits
19-122

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TABLE 2.2 Results of the MS/MSD Analysis for PCP in Soil
WA # 0-026 Penta Wood Site
(Results are Based on Dry Weight)

Sample number	Spike Added (mg/Kg)	Sample Conc. (mg/Kg)	MS Conc. (mg/Kg)	MSD Conc. (mg/Kg)	MS %Rec.	MSD %Rec.	RPD
A02754	111	ND	119	118	107 *	107 *	1
A04501	120	6.3	136	126	109 *	100	9
A04115	116	49.0	198	173	128 *	107 *	18
A04135	152	54.8	224	221	112 *	110 *	2
A04155	147	32.6	183	179	102	99	3
A04175	123	19.3	149	148	106 *	105 *	1
A02751	120	14.1	129	126	95	93	3

Advisory
QC Limits
% Rec. 9 – 103
RPD 50

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: PWP SITE
Project Number: 03347-040-001-0026-01
RFW Contact: M. MOHN Phone: 908-321-4257

No: 09916

SHEET NO. 1 OF 1

Sample Identification

Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCP
	A04501	DS1A-6	S	7/25/95	1	4 oz g/f	X
	A04502	DS1B-6					
	A04503	DS1C-6					
	A04504	DS2A-6					
	A04505	DS2B-6					
	A04506	DS2C-6					
	A04507	DS3A-6					
	A04508	DS3B-6					
	A04509	DS3C-6					
	A04510	DS4A-6					
	A04511	DS4B-6					
	A04512	DS4C-6					

MFM

MFM

00013

EB020065

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:
RANDOMLY SELECT SAMPLES FOR MS/MSD AT RATE OF 10%

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All Analysis	M. Mohn	7/25/95		7/26/95	11 20						

FORM #4 8/94

K

[redacted]

REAC, E[illegible]n, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAI[illegible] F CUSTODY RECORD

Project Name: PWP SITE
Project Number: 03347-040-001-0028-01
RFW Contact: M. MOHN Phone: 908-321-4257

No: 09918

SHEET NO. 1 OF 4

Blank 225

Sample Identification / **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCP			
[illegible]	A04115	1A1 COMP 7	S	7/25/95	1	4 oz gl / —	X			
	A04116	1A2 COMP 7								
	A04117	1A3 COMP 7								
	A04118	1B1 COMP 7								
	A04119	1B2 COMP 7								
	A04120	1B3 COMP 7								
	A04121	1C1 COMP 7								
	A04122	1C2 COMP 7								
	A04123	1C3 COMP 7								
	A04124	2A1 COMP 7								
	A04125	2A2 COMP 7								
	A04126	2A3 COMP 7								
	A04127	2B1 COMP 7								
	A04128	2B2 COMP 7								
	A04129	2B3 COMP 7								
	A04130	2C1 COMP 7								
	A04131	2C2 COMP 7								
	A04132	2C3 COMP 7								
	A04133	3A1 COMP 7								
	A04134	3A2 COMP 7								

SA

E020016

Matrix:

SD - Sediment		PW - Potable Water		S - Soil	
DS - Drum Solids		GW - Groundwater		W - Water	
DL - Drum Liquids		SW - Surface Water		O - Oil	
X - Other		SL - Sludge		A - Air	

Special Instructions:

RANDOMLY SELECT 10% OF SAMPLES FOR MS/MSD

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	M. Mohn	7/26/95	J. [illegible]	7/26/95	10:00						

FORM #4 8/94

000013

* U.S. GPO 1994-383-015

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: PWP
Project Number: 03347-040-001-0026-01
RFW Contact: MOHN Phone: 908-321-4257

No: 09920

SHEET NO. 1 OF ___

Sample Identification

Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCP
	A02754	1010 N, 200 E	S	7/25/95	1	40z gl —	X
.	A02755	1400 N, 220 E					
.	A02756	1000 N, 190 E					
.	A02757	1000 N, 210 E					
.	A02758	940 N, 200 E					
.	A02759	708 N, 671 E					
.	A02760	708 N, 686 E	↓	↓	↓	↓	↓

PCP

PCP

E3020057

00015

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:
SELECT 1 SAMPLE FOR MS/MSD

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All Analysis	M. Mohn	7/25/95	J. Lloyd	7/26/95	10:07						

FORM #4 8/94

#7

REAC, E[redacted] ll, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: PWP
Project Number: 03347-090-001-0026-01
RFW Contact: MOHN Phone: 908-321-4257

No: 09951
SHEET NO. 1 OF ___

Sample Identification

Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCP
	A02751	WR-A	S	7/25/95	1	4 oz gl -	X
	A02752	WR-B	↓	↓	↓	↓ ↓	↓
	A02753	WR-C	↓	↓	↓	↓ ↓	↓

MEM

MEM

E3040068

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:
SELECT 1 SAMPLE FOR MS/MSD

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	M. Mc	7/26/95	[illegible]	7/26/95	10:09						

FORM #4 8/94

PWA 20

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: PWP
Project Number: 03347-040-001-0026-01
RFW Contact: MOHN Phone: 908-321-4257

No: 09919

SHEET NO. 2 OF 4

226

Sample Identification / Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCP			
•MS	A04135	3A3 COMP 7	S	7/25/95	1	4oz gl / —	X			
	A04136	3B1 COMP 7								
	A04137	3B2 COMP 7								
	A04138	3B3 COMP 7								
	A04139	3C1 COMP 7								
	A04140	3C2 COMP 7								
	A04141	3C3 COMP 7								
	A04142	4A1 COMP 7								
	A04143	4A2 COMP 7								
	A04144	4A3 COMP 7								
	A04145	4B1 COMP 7								
	A04146	4B2 COMP 7								
	A04147	4B3 COMP 7								
	A04148	4C1 COMP 7								
	A04149	4C2 COMP 7								
	A04150	4C3 COMP 7								
	A04151	5A1 COMP 7								
	A04152	5A2 COMP 7								
	A04153	5A3 COMP 7								
	A04154	5B1 COMP 7								

MFA

00017

E3020059

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil		
DS -	Drum Solids	GW -	Groundwater	W -	Water		
DL -	Drum Liquids	SW -	Surface Water	O -	Oil		
X -	Other	SL -	Sludge	A -	Air		

Special Instructions: RANDOMLY SELECT 10% OF SAMPLES FOR MS/MSD

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	M. Mohn	7/26/95	[signature]	7/26/95	10:00						

FORM #4 8/94

2

* U 1994-383 015

REAC [redacted]
(908) 321-4200
EPA Contract 68-C4-0022

Project Name: PW, SITE
Project Number: 03347-040-001-0026-01
RFW Contact: MOHN Phone: 908-321-4257

No: 09949

SHEET NO. 3 OF 4

227

Sample Identification

Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCP			
	A04155	5B2 COMP 7	S	7/25/95	1	40z gl —	X			
	A04156	5B3 COMP 7								
	A04157	5C1 COMP 7								
	A04158	5C2 COMP 7								
	A04159	5C3 COMP 7								
	A04160	6A1 COMP 7								
	A04161	6A2 COMP 7								
	A04162	6A3 COMP 7								
	A04163	6B1 COMP 7								
	A04164	6B2 COMP 7								
	A04165	6B3 COMP 7								
	A04166	6C1 COMP 7								
	A04167	6C2 COMP 7								
	A04168	6C3 COMP 7								
	A04169	7A1 COMP 7								
	A04170	7A2 COMP 7								
	A04171	7A3 COMP 7								
	A04172	7B1 COMP 7								
	A04173	7B2 COMP 7								
	A04174	7B3 COMP 7								

PCP

EX020040

00018

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:
RANDOMLY SELECT 10% OF SAMPLES FOR MS/MSD

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All Analysis	M. Mott	7/26/95	[signature]	7/26/95	10:00						

FORM #4 8/94

20

* US GPO 1994-383-015

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: PWP SITE
Project Number: 03347-040-001-0026-01
RFW Contact: MOAN Phone: 908-321-4257

No: 09950

SHEET NO. 4 OF 7

228

Sample Identification / Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCP			
	A04175	7C1 COMP 7	S	7/25/95	1	4oz gl / —	X			
	A04176	7C2 COMP 7	↓	↓	↓	↓	↓			
	A04177	7C3 COMP 7								
	A04178	8A1 COMP 7								
	A04179	8A2 COMP 7								
	A04180	8A3 COMP 7								
	A04181	8B1 COMP 7								
	A04182	8B2 COMP 7								
	A04183	8B3 COMP 7								
	A04184	8C1 COMP 7								
	A04185	8C2 COMP 7								
	A04186	8C3 COMP 7	↓	↓	↓	↓	↓			

MFM

MFM

Matrix:

SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

Special Instructions:
RANDOMLY SELECT 10% OF SAMPLES FOR MS/MSD

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	M. Moan	7/26/95	[illegible]	7/26/95	10:00						

FORM #4 8/94

12

E3020061

00019

1994 383-015

REAC, E[redacted], NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: Penta Wood Products
Project Number: 026
RFW Contact: Mike Muhn Phone: 908-321-4257

No: 09921

SHEET NO. __ OF __

Sample Identification

Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCP
	02761	1910N, 1915E	S	7/26/95	1	G/Ice/None	X
	02762	1950N, 1955E	S	7/26/95	1	"	↓
	02763	1880N, 1920E	S	7/26/95	1	"	
	02764	1600N, 1780E	S	7/26/95	1	"	

MS
MSD

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:
MS/MSD on 10%.

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	M. Muhn	7/27/95	[redacted]	[redacted]	[redacted]						

FORM #4 8/94

* U S GPO 1994-383-015

00020

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: Penta Wood Products
Project Number: 026
RFW Contact: Mann Phone: 908-321-4200

No: 00948

SHEET NO. 1 OF 1

Sample Identification

Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	*			
	02298	D-Trt.	S	7/27/95	1	Glass/Nm	PCP			
	02299	D-Control	S	"	1	"				
	02300	D-Source	S	"	1	"				

E3020048

00021

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:

* PCP by GC/sim

Checked by: M. Talwar

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Anal.		7/27		7/28/95							

FORM #4 8/94

1994-383-015

Roy F. Weston, Inc.
GSA Raritan Depot
Building 209 Annex (Bay F)
2890 Woodbridge Avenue
Edison, New Jersey 08837-3679
908-321-4200 • Fax 908-494-4021

DATE: September 20, 1995

TO: R. Singhvi EPA/ERT

FROM: V. Kansal Analytical Section Leader Vinod Kansal

SUBJECT: DOCUMENT TRANSMITTAL UNDER WORK ASSIGNMENT # 0-026

Attached please find the following document prepared under this work assignment:

Penta Wood Products Site- Analytical Report

Central File WA# 0-026	(with attachment)
H. Allen	Work Assignment Manager
T. Mignone	Task Leader
M. Barkley	Data Validation and Report Writing Group Leader

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ANALYTICAL REPORT

Prepared by
Roy F. Weston, Inc.

Penta Wood Products
Siren, Wisconsin

September 1995

EPA Work Assignment No. 0-026
WESTON Work Order No. 03347-040-001-0026-01
EPA Contract No. 68-C4-0022

Submitted to
H. Allen
EPA-ERT

T. Mignone — Date
Task Leader

V. Kansal — 9/20/95 Date
Analytical Section Leader

R. M. Shapot — 9/21/95 Date
Program Manager

Analysis by:
REAC
Chem Tech

Prepared by:
L. Sun

Reviewed by:
M. Barkley

\026\DEL\AR\9509\Penta21

Table of Contents

Appendices will be furnished on request.

\026\DEL\AR\9509\Penta21

INTRODUCTION

The REAC Laboratories, in response to ERT work assignment #0-026, provided analytical support for samples collected from the Penta Wood Products Site, Siren, Wisconsin. This support included subcontracting of environmental samples as described in the following table. The support also included QA/QC, data review, and preparation of an analytical report containing a summary of the analytical methods, the results, and the QA/QC results.

The samples were treated with procedures consistent with those described in SOP #1008 and are summarized in the following table:

COC #	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
09914	8	7/25/95	7/26/95	Water	Pentachlorophenol	REAC
03619	5	7/25/95	7/26/95	Water		
09915	8	7/25/95	7/28/95	Water	Chlorinated Phenols	Chem Tech
09917	12	7/25/95	7/28/95	Soil		
01159	1	NA	7/28/95	Soil	Total Organic Content	

CASE NARRATIVE

Pentachlorophenol Analysis

Samples AC00405MS, AC00405MSD, A00406, A00407, A00408 and A00409 exceeded the REAC 7 days holding time by one day. The data are considered as estimated.

The surrogate recoveries for samples A00406, A00407, A00408 and A00409 were not recovered because of the large dilution.

Surrogate were outside the QC limits for samples A04515, A045116 and A04518. The data are considered as estimated.

Samples WBIK080195, AC0045MS, AC0045MSD, AC0045, A00406 (100X), A00408 (100X) and A00409 (100X) had internal standard above +100% of the area count of the continuing calibration. The data are not affected.

The MS recovery is outside the QC limits at a recovery of 115% for sample AC0045. The data are not affected.

\026\DEL\AR\9509\Penta21

Chlorinated Phenols Analysis

For both water and soil samples, holding times exceeded the seven day limits by two days, therefore, all data are estimated.

The soil samples were extracted by sonication, according to U.S. EPA SW-846 Method 3550.

The initial calibration for the soil samples analyzed on 7/20/95 exceeded the %RSD requirement for compound 2,4-dinitrophenol (37%). There were no positive hits for this compound. That data are not affected.

The continuing calibration for the soil samples analyzed on 8/7/95 exceeded the %D requirement for compound 4,6-dinitro-2-methylphenol (34.1%). There were no positive hits for this compound. The data are not affected.

The continuing calibration for the analyzed on 8/9/95 exceeded the %D requirement for compound 2,4-dinitrophenol (48.7%). There were no positive hits for this compound. The data are not affected.

For some soil samples, the internal standard area counts for chrysene-d_{12} and perylene-d_{12} are less than 50% of the associated calibration standard. Because there were no compounds quantitated by these internal standards, the data are not affected.

The 4-nitrophenol MS/MSD percent recoveries for water sample B04520 are outside the QC limits. The data are not affected.

TOC Analysis

The analytical data for total organic content analysis have been reviewed and were found to be acceptable.

SUMMARY of ABBREVIATIONS

B	The analyte was found in the blank
BFB	Bromofluorobenzene
BPQL	Below the Practical Quantitation Limit
C	Centigrade
D	(Surrogate Table) this value is from a diluted sample and was not calculated (Result Table) this result was obtained from a diluted sample
CLP	Contract Laboratory Protocol
COC	Chain of Custody
CONC	Concentration
CRDL	Contract Required Detection Limit
DFTPP	Decafluorotriphenylphosphine
DL	Detection Limit
E	The value is greater than the highest linear standard and is estimated
EMPC	Estimated maximum possible concentration
J	The value is below the method detection limit and is estimated
HHL	High Hazard Laboratory, Brunswick, GA
IDL	Instrument Detection Limit
ISTD	Internal Standard
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MI	Matrix Interference
MS	Matrix spike
MSD	Matrix spike duplicate
MW	Molecular weight
NA	either Not Applicable or Not Available
NC	Not Calculated
U	Not Detected
NS	Not Spiked
% D	Percent difference
% REC	Percent Recovery
PQL	Practical quantitation limit
PPBV	Parts per billion by volume
QL	Quantitation Limit
RPD	Relative percent difference
RSD	Relative Standard Deviation
SIM	Selected Ion Mode

m^3	cubic meter	kg	kilogram
l(L)	liter	g	gram
dl	deciliter	cg	centigram
ml	milliliter	mg	milligram
ul	microliter	ug	microgram
		ng	nanogram
		pg	picogram

* denotes a value that exceeds the acceptable QC limit

Abbreviations that are specific to a particular table are explained in footnotes on that table

Revision 4/20/95

\026\DEL\AR\9509\Penta21

Analytical Procedure for Pentachlorophenol in Water (SIM)
(REAC)

Extraction Procedure:

One liter of sample was spiked with 2,4,6-tribromophenol as a surrogate and extracted with three 60 ml portions of methylene chloride according to Method 625, Section 10, as outlined in the Federal Register Vol. 49, #209, Friday, October 26, 1984. The extract portions were combined and concentrated to 1.0 ml. An internal standard, phenanthrene-d_{10}, was added to the extract prior to analysis.

Analytical Procedure:

An HP 5890 Gas Chromatograph, equipped with a 5972 Mass Selective Detector and controlled by an DOS CHEM station computer was used to analyze the samples.

The instrument conditions were:

Column	HP5-MS (crossbonded SE-54) 30 meter x 0.25mm ID, 0.5 µm film thickness
Injection Temperature	260° C
Transfer Temperature	290° C
Temperature Program	100° C for 0.5 min 30 °C/min to 295° C hold for 9 min
Splitless Injection	Split time = 1.0 min
Injection Volume	2 µl

The GC/MS system was calibrated using 5 pentachlorophenol standards at 0.5, 1.0, 5.0, 10, 25, 50, and 50.0 µg/ml. All samples were quantified using the average response factor obtained from the calibration range. Before analysis each day, the system was tuned with 50 ng decafluorotriphenylphosphine (DFTPP) and passed a continuing calibration check by analyzing a 5.0 µg/ml standard mixture.

\026\DEL\AR\9509\Penta21

The Pentachlorophenol results are listed in Table 1.1. The concentration of the detected compounds was calculated using the following equation:

$$C_u = \frac{DF x A_u x I_{is} x V_t}{A_{is} x RF (or RF_{ave}) x V_i x V_o}$$

where

C_u	=	Concentration of target analyte (µg/L)
DF	=	Dilution Factor
A_u	=	Area of target analyte
I_{is}	=	Mass of specific internal standard (ng)
V_t	=	Volume of extract (µl)
A_{is}	=	Area of specific internal standard
RF	=	Response Factor (unitless)
RF_{ave}	=	average Response Factor
V_i	=	Volume of extract injected (µl)
V_o	=	Volume of sample (ml)

The RF_{ave} is used when a sample is associated with an initial calibration curve. The RF is used when a sample is associated with a continuing calibration curve.

Response Factor calculation:

The RF for each specific analyte is quantitated based on the area response from the continuing calibration check as follows:

$$RF = \frac{A_c \; x \; I_{is}}{A_{is} \; x \; I_c}$$

where

RF	=	Response factor for a specific analyte
A_c	=	Area of the analyte in the standard
I_{is}	=	Mass of the specific internal standard
A_{is}	=	Area of the specific internal standard
I_c	=	Mass of the analyte in the standard

$$RF_{ave} = \frac{RF_1 + \ldots + RF_n}{n}$$

and

n = number of Samples

Rev. 4/20/95

\026\DEL\AR\9509\Penta21

Analytical Procedure for Chlorinated Phenols in Water

The subcontract laboratory extracted the water samples by separatory funnel, according to U.S. EPA Method 3510 and analyzed the samples for chlorinated phenols, based on U.S. EPA Method 8270. These methods are outlined in "Test Methods for Evaluating Solid Waste; Physical/Chemical Methods", U.S. EPA, SW-846.

Results of the analysis for chlorinated phenols in water are listed in Table 1.2.

Analytical Procedure for Chlorinated Phenols in Soil

The subcontract laboratory extracted the soil samples by sonication, according to U.S. EPA Method 3550 and analyzed the samples for chlorinated phenols, based on U.S. EPA Method 8270. These methods are outlined in "Test Methods for Evaluating Solid Waste; Physical/Chemical Methods", U.S. EPA, SW-846.

Results of the analysis for chlorinated phenols in soil are listed in Table 1.3.

Analytical Procedure for Total Organic Content in Soil

The subcontract laboratory analyzed the soil samples for total organic content (TOC), according to U.S. EPA Method 9060. This method is outlined in "Test Methods for Evaluating Solid Wastes", SW-846, September, 1987.

Results of the analysis for TOC in soil are listed in Table 1.4.

Table 1.1 Results of the Analysis for Pentachlorophenol in Water

WA # 0-0026 Penta Wood Products Site

Sample ID	Sampling Location	Pentachlorophenol Conc. (µg/L)	MDL (µg/L)
WBLK073195	WATER BLANK	U	5.0
A-C04520	DW4B-6	19	17
A04513	DW1A-6	12	5.0
A04514	DW1B-6	16	5.3
A04515	DW2A-6	8.6	5.2
A04516	DW2B-6	6.5	5.2
A04517	DW3A-6	20	5.3
A04518	DW3B-6	16	5.0
A04519	DW4A-6	12	5.2
WBLK080195	WATER BLANK	U	5.0
A-C0045	BIO INFLUENT 7	2.1	5.2
A00406	~~BIO INFLUENT 7~~	4900	520
A00407	GREEN TANK 1-7	110000	10000
A00408	WHITE TANK 2-7	22000	5200
A00409	WHITE TANK 3-7	4100	500

BIO EFFLUENT 7

MJM
12/5/95

Table 1.2 Results of the Analysis for Chlorinated Phenols in Water

WA #0-026 Penta Wood Products Site

Sample ID Location	Method Blank ---		B04513 DW1A-6		B04514 DW1B-6		B04515 DW2A-6		B04516 DW2B-6	
Compound	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L
Phenol	U	10	U	10	U	10	U	10	U	10
2-Chlorophenol	U	10	U	10	U	10	U	10	U	10
2-Methylphenol	U	10	U	10	U	10	U	10	U	10
4-Methylphenol	U	10	U	10	U	10	U	10	U	10
2-Nitrophenol	U	10	U	10	U	10	U	10	U	10
2,4-Dimethylphenol	U	10	U	10	U	10	U	10	U	10
2,4-Dichlorophenol	U	10	U	10	U	10	U	10	U	10
4-Chloro-3-methylphenol	U	10	U	10	U	10	U	10	U	10
2,4,6-Trichlorophenol	U	10	U	10	U	10	U	10	U	10
2,5,6-Trichlorophenol	U	10	U	10	U	10	U	10	U	10
2,4-Dinitrophenol	U	10	U	10	U	10	U	10	U	10
4-Nitrophenol	U	10	U	10	U	10	U	10	U	10
4,6-Dinitro-2-methylphenol	U	10	U	10	U	10	U	10	U	10
Pentachlorophenol	U	10	U	10	U	10	U	10	U	10

Sample ID Location	B04517 DW3A-6		B04518 DW3B-6		B04519 DW4A-6		B04520 DW4B-6	
Compound	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L
Phenol	U	10	U	10	12	10	37	10
2-Chlorophenol	U	10	U	10	U	10	U	10
2-Methylphenol	U	10	U	10	U	10	U	10
4-Methylphenol	U	10	U	10	U	10	U	10
2-Nitrophenol	U	10	U	10	U	10	U	10
2,4-Dimethylphenol	U	10	U	10	U	10	U	10
2,4-Dichlorophenol	U	10	U	10	5.7 J	10	11	10
4-Chloro-3-methylphenol	U	10	U	10	U	10	U	10
2,4,6-Trichlorophenol	U	10	U	10	U	10	U	10
2,5,6-Trichlorophenol	U	10	U	10	U	10	U	10
2,4-Dinitrophenol	U	10	U	10	U	10	U	10
4-Nitrophenol	U	10	U	10	U	10	U	10
4,6-Dinitro-2-methylphenol	U	10	U	10	U	10	U	10
Pentachlorophenol	U	10	U	10	U	10	U	10

Table 1.3 Results of the Analysis for Chlorinated Phenols in Soil

WA #0-026 Penta Wood Products Site

Based on Dry Weight

Sample ID	Method Blank		B04501		B04502		B04503		B04504	
Location	---		DS1A-6		DS1B-6		DS1C-6		DS2A-6	
%Solid	100		17		17		17		19	
Compound	Conc. µg/kg	MDL µg/kg	Conc. µg/kg	MDL µg/kg	Conc. µg/kg	MDL µg/kg	Conc. µg/kg	MDL µg/kg	Conc. µg/kg	MDL µg/kg
Phenol	U	330	U	400	U	400	U	400	U	410
2-Chlorophenol	U	330	U	400	U	400	U	400	U	410
2-Methylphenol	U	330	U	400	U	400	U	400	U	410
4-Methylphenol	U	330	U	400	U	400	U	400	570	410
2-Nitrophenol	U	330	U	400	U	400	U	400	U	410
2,4-Dimethylphenol	U	330	U	400	U	400	U	400	U	410
2,4-Dichlorophenol	U	330	U	400	U	400	U	400	U	410
4-Chloro-3-methylphenol	U	330	U	400	U	400	U	400	U	410
2,4,6-Trichlorophenol	U	330	U	400	U	400	U	400	U	410
2,5,6-Trichlorophenol	U	330	U	400	U	400	U	400	U	410
2,4-Dinitrophenol	U	330	U	400	U	400	U	400	U	410
4-Nitrophenol	U	330	U	400	U	400	U	400	U	410
4,6-Dinitro-2-methylphenol	U	330	U	400	U	400	U	400	U	410
Pentachlorophenol	U	330	1500	400	1400	400	940	400	U	410

Sample ID	B04505		B04506		B04507		B04508	
Location	DS2B-6		DS2C-6		DS3A-6		DS3B-6	
%Solid	38		27		26		27	
Compound	Conc. µg/kg	MDL µg/kg	Conc. µg/kg	MDL µg/kg	Conc. µg/kg	MDL µg/kg	Conc. µg/kg	MDL µg/kg
Phenol	U	540	U	460	U	450	U	460
2-Chlorophenol	U	540	U	460	U	450	U	460
2-Methylphenol	U	540	U	460	U	450	U	460
4-Methylphenol	12000	540	17000	460	670	450	910	460
2-Nitrophenol	U	540	U	460	U	450	U	460
2,4-Dimethylphenol	U	540	U	460	U	450	U	460
2,4-Dichlorophenol	U	540	U	460	U	450	U	460
4-Chloro-3-methylphenol	U	540	U	460	U	450	U	460
2,4,6-Trichlorophenol	U	540	U	460	U	450	U	460
2,5,6-Trichlorophenol	U	540	U	460	U	450	U	460
2,4-Dinitrophenol	U	540	U	460	U	450	U	460
4-Nitrophenol	U	540	U	460	U	450	U	460
4,6-Dinitro-2-methylphenol	U	540	U	460	U	450	U	460
Pentachlorophenol	U	540	U	460	U	450	230	460

Sample ID	B04509		B04510		B04511		B04512	
Location	DS3C-6		DS4A-6		DS4B-6		DS4C-6	
%Solid	23		28		45		46	
Compound	Conc. µg/kg	MDL µg/kg	Conc. µg/kg	MDL µg/kg	Conc. µg/kg	MDL µg/kg	Conc. µg/kg	MDL µg/kg
Phenol	U	430	U	460	U	610	U	620
2-Chlorophenol	U	430	U	460	U	610	U	620
2-Methylphenol	U	430	U	460	U	610	U	620
4-Methylphenol	400 J	430	37000	460	15000	610	40000	620
2-Nitrophenol	U	430	U	460	U	610	U	620
2,4-Dimethylphenol	U	430	U	460	U	610	U	620
2,4-Dichlorophenol	U	430	U	460	U	610	U	620
4-Chloro-3-methylphenol	U	430	U	460	U	610	U	620
2,4,6-Trichlorophenol	U	430	U	460	U	610	U	620
2,5,6-Trichlorophenol	U	430	U	460	U	610	U	620
2,4-Dinitrophenol	U	430	U	460	U	610	U	620
4-Nitrophenol	U	430	U	460	U	610	U	620
4,6-Dinitro-2-methylphenol	U	430	U	460	U	610	U	620
Pentachlorophenol	U	430	700	460	U	610	U	620

Table 1.4 Results of the Analysis for Total Organic Content in Soil

WA #0-026 Penta Wood Products Site

Based on Dry Weight

Sample ID Location %Solid Analysis	Method Blank --- 100 Conc. mg/Kg	 MDL mg/Kg	B02753 WR-C 74 Conc. mg/Kg	 MDL mg/Kg
Total Organic Content	U	100	9500	130

QA/QC for Pentachlorophenol

Results of the Surrogate Recoveries for PCP in Water

One surrogate compound, 2,4,6-tribromophenol, was added to the water samples prior to extraction. The surrogate recoveries, listed in Table 2.1, range from 11 to 131. Four recoveries are reported as D (diluted out) because of large dilutions. Twelve out of 15 calculated recoveries are within acceptable QC limits.

Results of the MS/MSD Analysis for PCP in Water

Samples A-C04520 and A-C00405 were chosen for matrix spike/matrix spike duplicate (MS/MSD) analysis. The percent recoveries, listed in Table 2.2, range from 87 to 115. Three out of four recoveries are within QC limits. The relative percent differences (RPDs) ,also listed in Table 2.2, are 7 and 15. Both RPDs are within QC limits.

Table 2.1 Results of the Surrogate Recoveries for PCP in Water

WA # 0-026 Penta Wood Products Site

Sample ID	2,4,6-Tribromophenol % Recovery
WBLK073195	71
A-C04520	106
A-C04520 MS	103
A-C04520 MSD	111
A04513	107
A04514	111
A04515	131 *
A04516	130 *
A04517	62
A04518	11 *
A04519	110
WBLK080195	90
A-C0045	51
A-C0045 MS	100
A-C0045 MSD	96
A00406	D
A00407	D
A00408	D
A00409	D

PCP Pentachlorophenol

	Advisory QC Limits
2,4,6-Tribromophenol	19 - 122

Table 2.2 Results of the MS/MSD Analysis for PCP in Water

WA # 0-026 Penta Wood Products Site

Sample ID	Spike Added (µg/L)	Sample Conc. (µg/L)	MS Conc. (µg/L)	MSD Conc. (µg/L)	MS %Rec.	MSD %Rec.	% RPD
A-C04520	16.7	18.7	33.3	34.4	87	94	7
A-C00405	5.15	2.06	7.96	7.16	115 *	99	15

PCP Pentachlorophenol

QC Limits: RPD < 47
% Recovery = 17 - 109

QA/QC for Chlorinated Phenols

Results of the Surrogate Recoveries for Chlorinated Phenols in Water

Six surrogates, nitrobenzene-d_5, 2-fluorobiphenyl, phenol-d_5, 2-fluorophenol, terphenyl-d_{14} and 2,4,6-tribromophenol, were added to the water samples prior to extraction. The surrogate recoveries, listed in Table 2.3, range from 71 to 100. All 66 recoveries are within acceptable QC limits.

Results of the MS/MSD Analysis for Chlorinated Phenols in Water

Sample B04520 was chosen for matrix spike/matrix spike duplicate (MS/MSD) analysis. The percent recoveries, listed in Table 2.4, range from 77 to 89. Eight out of 10 recoveries are within QC limits. The relative percent differences (RPDs) ,also listed in Table 2.4, range form 0 (zero) and 2. All five RPDs are within QC limits.

Results of the Surrogate Recoveries for Chlorinated Phenols in Soil

Six surrogates, nitrobenzene-d_5, 2-fluorobiphenyl, phenol-d_5, 2-fluorophenol, terphenyl-d_{14} and 2,4,6-tribromophenol, were added to the soil samples prior to extraction. The surrogate recoveries, listed in Table 2.5, range from 23 to 112. All 192 recoveries are within acceptable QC limits.

Results of the MS/MSD Analysis for Chlorinated Phenols in Soil

Sample B04510 was chosen for matrix spike duplicate analysis for soil samples. The percent recoveries, listed in Table 2.6, range from 25 to 71. All 10 recoveries are within QC limits. The relative percent differences (RPDs), also listed in Table 2.6, range from 1 to 29. All five RPD values are within QC limits.

Table 2.3 Results of the Surrogate Recoveries for Chlorinated Phenols in Water

WA #0–026 Penta Wood Products Site

Sample ID	S1	S2	S3	S4	S5	S6
	%Recovery					
Water Blank	76	81	71	79	95	79
B04513	74	77	84	82	81	94
B04514	78	82	85	80	79	97
B04515	78	82	81	75	82	93
B04516	79	85	86	80	80	97
B04517	82	84	85	78	78	97
B04519	83	88	87	80	82	100
B04520	79	84	87	82	77	99
B04520MS	78	83	78	75	79	92
B04520MSD	79	81	78	77	79	92
B04518	79	84	80	76	100	100

	QC Limits
S1 = Nitrobenzene–d_5	35 – 114
S2 = 2–Fluorobiphenyl	43 – 116
S3 = Phenol–d_5	10 – 94
S4 = 2–Fluorophenol	21 – 100
S5 = Terphenyl–d_{14}	33 – 144
S6 = 2,4,6–Tribromophenol	10 – 123

Table 2.4 Results of the MS/MSD Analysis for Chlorinated Phenols in Water

WA #0-026 Penta Wood Products Site

Sample ID: B04520

Compound	Sample Conc. µg/L	Spiked Added µg/L	MS Conc. µg/L	MSD Conc. µg/L	MS %Rec.	MSD %Rec.	RPD	QC Limits RPD	QC Limits %Rec
Phenol	37.1	100	114.4	113.82	77	77	1	42	12-110
2-Chlorophenol	U	100	82.62	83.50	83	84	1	40	27-123
4-Chloro-3-methylphenol	U	100	87.66	88.55	88	89	1	42	23- 97
4-Nitrophenol	U	100	83.84	83.77	84 *	84 *	0	50	10- 80
Pentachlorophenol	U	100	81.11	79.40	81	79	2	50	9-103

Table 2.5 Results of the Surrogate Recoveries for Chlorinated Phenols in Soil

WA #0-026 Penta Wood Products Site

Sample ID	S1	S2	S3	S4	S5	S6
	%Recovery					
Soil Blank	64	80	54	55	51	76
B04505	23	93	57	57	69	103
B04504	61	87	59	58	74	98
B04508	60	97	60	59	82	100
B04509	59	89	53	54	77	94
B04507	61	88	56	57	82	102
B04503	69	90	54	54	83	104
B04505DL	73	102	101	78	67	87
B04505RE	39	92	80	77	63	99
B04504RE	72	89	79	74	69	98
B04508RE	72	86	79	74	75	97
B04509RE	75	83	74	72	68	93
B04507RE	73	87	84	77	72	98
B04503RE	77	92	81	74	71	96
B04506	38	91	76	70	71	100
B04501	69	88	76	68	69	101
B04502	80	84	81	71	72	100
B04510	35	90	83	76	74	111
B04511	42	85	82	72	74	92
B04506DL	63	96	94	74	63	84
B04511DL	71	100	97	77	69	85
B04506RE	40	92	77	72	73	97
B04510RE	38	89	80	76	78	109
B04511RE	42	88	79	76	73	97
B04501RE	76	89	73	68	73	102
B04502RE	82	92	75	76	77	108
B04512	38	91	81	76	80	97
B04512RE	40	96	80	75	80	97
B04510MS	42	87	70	75	76	109
B04510MSD	40	83	66	71	79	109
B04510DL	67	106	106	81	67	84
B04512DL	75	112	108	79	69	85

	QC Limits
S1 = Nitrobenzene-d_5	23 - 120
S2 = 2-Fluorobiphenyl	30 - 115
S3 = Phenol-d_5	24 - 113
S4 = 2-Fluorophenol	25 - 121
S5 = Terphenyl-d_{14}	18 - 137
S6 = 2,4,6-Tribromophenol	19 - 122

Table 2.6 Results of the MS/MSD Analysis for Chlorinated Phenols in Soil

WA #0-026 Penta Wood Products Site

Based on Dry Weight

Sample ID: B04510

Compound	Sample Conc. µg/Kg	Spiked Added µg/Kg	MS Conc. µg/Kg	MSD Conc. µg/Kg	MS %Rec.	MSD %Rec.	RPD	QC Limits RPD	QC Limits %Rec
Phenol	U	4630	2923	2887	63	62	1	35	26- 90
2-Chlorophenol	U	4630	2674	2714	62	59	6	50	25-102
4-Chloro-3-methylphenol	U	4630	3294	3210	71	69	3	33	26-103
4-Nitrophenol	U	4630	1543	1151	33	25	29	50	11-114
Pentachlorophenol	696.8	4630	3476	3550	60	62	3	47	17-109

Results of the Matrix Spike Analysis for TOC in Soil

Sample B02753 was chosen for the matrix spike analysis. The percent recovery is 109 and is listed in Table 2.7. There are no QC limits available.

Results of the Sample Duplicate Analysis for TOC in Soil

Sample B02753 was chosen for the sample duplicate analysis. The relative percent difference (RPD) is 1 and is listed in Table 2.8. There are no QC limits available.

Results of the LCS Analysis for TOC in Soil

The percent recoveries of the laboratory control sample analysis is 103 and is listed in Table 2.9. The recoverie is within the 95% confidence interval criteria which was provided by the subcontract laboratory.

Table 2.7 Results of the Matrix Spike Analysis for TOC in Soil

WA #0-026 Penta Wood Products Site

Based on Dry Weight

Sample ID: B02753

Analysis	Sample Conc. (mg/Kg)	MS Spike Added (mg/Kg)	MS Recovered Conc. (mg/Kg)	MS %Rec.	QC Limits
Total Organic Content	9482.48	5390.60	15342.32	109	NA

Table 2.8 Results of the Sample Duplicate Analysis for TOC in Soil

WA #0-026 Penta Wood Products Site

Sample ID: B02753

Analysis	Sample Conc. (mg/Kg)	Duplicate Conc. (mg/Kg)	RPD	QC Limits
Total Organic Content	9482.48	9595.69	1	NA

Table 2.9 Results of the LCS Analysis for TOC in Soil

WA #0-026 Penta Wood Products Site

Analysis	Reference Value (mg/Kg)	Observed Value (mg/Kg)	95% Confidence Interval (mg/Kg)	%Rec.
Total Organic Content	4000	4104	3200 - 4800	103

LCS Laboratory Control Sample

REAC, Edison, NJ
908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Pg 21

Project Name: PWP SITE
Project Number: 03347-040-001-0026-01
RFW Contact: M. MOHN Phone: 908-321-4257

No: 09915

SHEET NO. 1 OF ___

Sample Identification / Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	*
	B04513	DW1A-6	W	7/25/95		32 oz g/ —	X
	B04514	DW1B-6					
	B04515	DW2A-6					
	B04516	DW2B-6					
	B04517	DW3A-6					
	B04518	DW3B-6					
	B04519	DW4A-6					
	D-F04520	DW4B-6			3		

MFM

MFM

E3B10107

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
O - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions:
* = CHLORINATED PHENOLS

NEED MS/MSD ON D-F04520

Checked by: M. Talwar

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	M. Mohn	7/27/95	B Morgan	7/28/95	9:00	10/Analysis					

FORM #4 8/94

GPO 8101

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

PWA 21

CHAIN OF CUSTODY RECORD

Project Name: PWP SITE
Project Number: 03347-040-001-0026-01
RFW Contact: M. MOHN Phone: 908-321-4257

No: 09914

SHEET NO. 1 OF __

07269S

Sample Identification

Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCP
F42	A04513	~~PWA~~ DW1A-6	W	7/25/95	1	32 oz gl / —	X
F43	A04514	DW1B-6					
F44	A04515	DW2A-6					
F45	A04516	DW2B-6					
F46	A04517	DW3A-6					
F47	A04518	DW3B-6					
F48	A04519	DW4A-6					
~~F49~~ MS	~~A04520~~						
F49 MSD	A-C04520	DW4B-6			3		

MLM

MLM 3

00023

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:
NEED MS/MSD ON A-C 04520

Checked by: M. Trivedi

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	M. Mohn	7/26/95	B. Lee	7/26/95	1015	All PCP	B. Lee	7/26/95	[illegible]	7/26/95	1120

FORM #4 8/94

REAC, E[illegible]on, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHA[illegible]F CUSTODY RECORD

Project Name: PWP SITE
Project Number: 03347-040-001-0026-01
RFW Contact: MOHN Phone: 908-321-4257

No: 03619

SHEET NO. 1 OF ___

072795

Sample Identification

Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCP
F74	A-C00405	BIO INFLUENT 7	W	7/25/95	3	32 oz gl -	X
F75	A00406	BIO EFFLUENT 7	↓	↓	1	↓	↓
F76	A00407	GREEN TANK 1-7					
F77	A00408	WHITE TANK 2-7					
F78	A00409	WHITE TANK 3-7	↓	↓	↓	↓	↓

MEM

MEM

000224

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:

DO MS/MSD ON A-C00405

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All Analysis	M. Mohn	7/25/95	B Lewis	7/27/95	0915	5 Anchs	B Lewis	7/27/95	Cindy Bowman	07 27 95	10 25

FORM #4 8/94

* US GPO 1994-383 015

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

PWA 21

Project Name: PWP SITE
Project Number: 03347-040-001-0026-01
RFW Contact: M. MOHN Phone: 908-321-4257

No: 09917

SHEET NO. 1 OF ___

Sample Identification / **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative		*			
	B04501	DS1A-6	S	7/25/95	1	4 oz gl	–	X			
	B04502	DS1B-6									
	B04503	DS1C-6									
	B04504	DS2A-6									
	B04505	DS2B-6									
	B04506	DS2C-6									
	B04507	DS3A-6									
	B04508	DS3B-6									
	B04509	DS3C-6									
	B04510	DS4A-6									
	B04511	DS4B-6									
	B04512	DS4C-6									

MFM MFM

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:
* = CHLORINATED PHENOLS
RANDOMLY SELECT SAMPLES FOR MS/MSD AT RATE OF 10%

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY # ___

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	M. Mohn	7/27/95	B Moroughi	7/27/95	9:00	12/Analysis					

FORM #4 8/94

00025

REAC, EC [redacted]
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: PWP SITE
Project Number: 03377-040-001-0026-01
RFW Contact: MOHN Phone: 908-321-4257

No: 01159

SHEET NO. __ OF __

Sample Identification

Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	TOC
	B02753	WR-C	S	7/ /95	1	40z gl / —	X

MFA

MFA

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
-	Other	SL -	Sludge	A -	Air

Special Instructions: NEED MS/MSD

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
1/Analysis	M. Mohr	7/27/95	B Moroney	7/28/95	9:00	1/Analysis					

FORM #4 8/94

* US GPO 1994-383-015

00026

00026

00026

Roy F. Weston, Inc.
GSA Raritan Depot
Building 209 Annex (Bay F)
2890 Woodbridge Avenue
Edison, New Jersey 08837-3679
908-321-4200 • Fax 908-494-4021

Chemtech Consulting Group, Inc.
110 Route 4
Englewood, NJ 07631

Attn: **Emmanuel Hedvat**

August 2, 1995

Project # 3347-040-01-0026, Penta Wood Products(Engineering Bio) PWA 21

As per Weston REAC Purchase Order number 08-48698, please analyze samples according to the following parameters:

Analysis/Method	Matrix	# of samples
Chlorinated Phenols/ SW-846-8270	Soil Water	20 [1] 8
TAL Metals/ Series 7000 or 6010	Soil	20 [1,2]
Metals As,Cu,Zn/Series 7000 or 6010	Soil	20 [1,2]
Nitrate/EPA 352.1	Soil	20 [1,2]
Ammonia/EPA 350	Soil	20 [1,2]
TKN/EPA 351	Soil	20 [1,2]
Ortho phosphate/EPA 365.2	Soil	20 [1,2]
Total phosphorus/EPA 365.2	Soil	20 [1,2]
Chloride/EPA 325	Soil	20 [1,2]
Sulfate/SW-846-9038	Soil	20 [1,2]
TPH/EPA 418.1	Soil	20 [1,2]
TOC/SW-846-9060	Soil	20 [1,2]
Data package as per attached Deliverables Requirements		

Samples are expected to start arriving at your laboratory the week of July 24, 1995, see below for proposed sampling schedule. All applicable QA/QC (MS/MSD) analysis will be performed on each of our sample matrix. Preliminary results tables including MS/MSD's plus a signed copy of our Chain of Custody are due at REAC ten business days after sample receipt, with the complete data package due twenty one business days after sample receipt. The complete data package must include all items on the deliverables checklist.

Date	# of samples	Matrix	Analyte
July 24	8	Water	Chlorinated Phenols
July 24	12	Soil	Chlorinated Phenols

10-15 water samples will be collected for PCP analysis at random intervals between September and November.

[1] Mid August	10	All marked samples
[2] Late November	10	All marked samples

Please submit all reports and technical questions concerning this project to **John Johnson at (908) 321-4248** or fax to **(908) 494-4020**. Any contractual question, please call Cindy Ritchey at (908) 321-4296. Thank you

Sincerely,

George Armstrong
Data Validation and Report Writing Group Leader
Roy F. Weston, Inc. /REAC Project

GA:cs Attachments

cc. R. Singhvi
H. Allen
0026\non\mem\9508\sub\0026Con2
V. Kansal
Subcontracting File
B. Lewan
C. Ritchey
M. Mohn/T Mignone
G. Armstrong

Penta Wood Products, Inc., Daniels, WI – Treatment Data Summary

PWP – Aerobic Treatment of PCP–Contaminated Soil

	Treatment Time	
	09/13/94	10/22/94
Pile	0	39
1 Soil, Wood	464	80
2 Soil, Wood, Manure	213	128
3 Soil, Wood, Manure, Nitrate	237	119
4 Soil, Wood, Manure	163	131
5 Soil, Wood, Manure, Nitrate, Exp.Sawdust	232	94
6 Soil, Wood, Nitrate, Exp. Sawdust	167	38
7 Soil, Wood, Nitrate, Exp. Sawdust	228	113
8 Soil, Wood, Nitrate, Exp.Sawdust, Extract	222	106

Daramend Land Treatment Cell

	Treatment Time
	10/24/94
Chamber	0
D1B Control Soil	46
D2 Soil, Daramend	49

PWP – Anaerobic Treatment of PCP–Contaminated Soil

	Treatment Time
	10/24/94
Chamber PCP Concentrations in mg/kg	0
1 Soil	28
2 Soil, Manure, Phosphate, Lime, Bloodmeal	24
3 Soil, Manure, Phosphate, Lime	30
4 Soil, Phosphate, Bloodmeal	42
Water PCP Concentrations in mg/L	
1W Supernatant Water	0.845
2W Supernatant Water	0.635
3W Supernatant Water	0.043
4W Supernatant Water	0.170

PWP – Phanerochaete Treatment of PCP–Contaminated Soil

		Treatment Time
	Date	10/05/94
Treatment Duration	(Days)	0
Pile Soil, Phanerochaete sordida Inoculum	PCP(mg/Kg)	
	Avg. PCP (mg/Kg)	

(Date/Days)					Log PCP Conc	Treatment Tim
11/28/94	01/04/95	02/08/95	03/15/95	07/26/95		
76	113	148	183	316	0	39
87	75	72	96	50	2.6669	1.9013
267	243	210	221	84	2.3291	2.1083
199	210	263	188	58	2.3741	2.0755
143	257	253	187	56	2.2131	2.1162
253	240	278	256	40	2.3659	1.9716
52	64	68	97	19	2.2218	1.5798
116	109	126	150	26	2.3575	2.0531
123	127	111	168	19	2.3468	2.0253

(Date/Days)					Treatment Tim
11/28/94	01/04/95	02/08/95	03/15/95	07/26/95	
35	72	107	142	275	0
47	31	16	13	7	1.6628
16	14	14	14	8	1.6872

(Date/Days)					Treatment Tim
11/28/94	01/04/95	02/08/95	03/15/95	07/26/95	
35	72	107	142	275	0
15	19	17	22	9	1.4523
39	2	6	9	4	1.3862
8	21	16	27	5	1.4723
37	19	11	10	7	1.6267
0.012	0.020	0.015	0.028		
0.022	0.016	0.017	0.013		
0.022	0.009	0.027	0.009		
0.006	0.013	0.013	0.013		

(Date/Days)				
11/09/94	12/21/94	02/08/95	03/15/95	07/26/95
35	77	126	161	294
7	21	32	15	14
		33	31	5.8
		35	29	3.4
7	21	33	25	8

e (Days)

76	113	148
1.9395	1.8731	1.8593
2.4260	2.3862	2.3222
2.2996	2.3222	2.4205
2.1553	2.4094	2.4037
2.4037	2.3802	2.4437
1.7188	1.8062	1.8325
2.0632	2.0361	2.0988
2.0911	2.1027	2.0445

Days	1	2	3
0	2.6669	2.3291	2.3741
39	1.9013	2.1083	2.0755
76	1.9395	2.4260	2.2996
113	1.8731	2.3862	2.3222
148	1.8593	2.3222	2.4205

e (Days)

35	72	107
1.6762	1.4945	1.2131
1.2041	1.1392	1.1461

Days	D1B	D2
0	1.6628	1.6872
35	1.6762	1.2041
72	1.4945	1.1392
107	1.2131	1.1461

e (Days)

35	72	107
1.1761	1.2863	1.2218
1.5911	0.3222	0.7659
0.8827	1.3222	1.2041
1.5682	1.2788	1.0280

Days	1	2	3
0	1.4523	1.3862	1.4723
35	1.1761	1.5911	0.8827
72	1.2863	0.3222	1.3222
107	1.2218	0.7659	1.2041

Treatment Time (Days)

0	35	72
0.8479	1.3166	1.5229

Days	Pile
0	0.8479
35	1.3166
72	1.5229

Compost Piles

4	5	6	7	8
2.2131	2.3659	2.2218	2.3575	2.3468
2.1162	1.9716	1.5798	2.0531	2.0253
2.1553	2.4037	1.7188	2.0632	2.0911
2.4094	2.3802	1.8062	2.0361	2.1027
2.4037	2.4437	1.8325	2.0988	2.0445

Regression Ou

Constant	
Std Err of Y Est	
R Squared	
No. of Observations	
Degrees of Freedom	
X Coefficient(s)	
Std Err of Coef.	

Regression Output: No. #D1B

Constant	1.74051172
Std Err of Y Est	0.10496741
R Squared	0.84186125
No. of Observations	4
Degrees of Freedom	2
X Coefficient(s)	−0.0042783
Std Err of Coef.	0.00131117

Regression Output: No. #D2

Constant	1.54584965
Std Err of Y Est	0.18262736
R Squared	0.68013857
No. of Observations	4
Degrees of Freedom	2
X Coefficient(s)	−0.0047044
Std Err of Coef.	0.00228124

4
1.6267
1.5682
1.2788
1.0280

Regression Output: No. #1

Constant	1.37003354
Std Err of Y Est	0.11686567
R Squared	0.3768842
No. of Observations	4
Degrees of Freedom	2
X Coefficient(s)	−0.0016056
Std Err of Coef.	0.00145979

Regression Ou

Constant	
Std Err of Y Est	
R Squared	
No. of Observations	
Degrees of Freedom	
X Coefficient(s)	
Std Err of Coef.	

itput:	No. #1	Regression Output:		No. #2	Regression Ou
	2.38664427	Constant		2.26093071	Constant
	0.26133782	Std Err of Y Est		0.13345091	Std Err of Y Est
	0.57539542	R Squared		0.11456024	R Squared
	5	No. of Observations		5	No. of Observations
	3	Degrees of Freedom		3	Degrees of Freedom
−0.0045027		X Coefficient(s)	0.00071046		X Coefficient(s)
0.00223318		Std Err of Coef.	0.00114036		Std Err of Coef.

itput:	No. #2	Regression Output:		No. #3	Regression Ou
	1.48931825	Constant		1.27221209	Constant
	0.50533531	Std Err of Y Est		0.30172391	Std Err of Y Est
	0.4951396	R Squared		0.03204168	R Squared
	4	No. of Observations		4	No. of Observations
	2	Degrees of Freedom		2	Degrees of Freedom
−0.0088405		X Coefficient(s)	−0.0009697		X Coefficient(s)
0.00631225		Std Err of Coef.	0.0037689		Std Err of Coef.

itput:	No. #3		Regression Output:	No. #4	Regression Ou
	2.23161206	Constant		2.12357333	Constant
	0.14151158	Std Err of Y Est		0.10334594	Std Err of Y Est
	0.1523966	R Squared		0.58281216	R Squared
	5	No. of Observations		5	No. of Observations
	3	Degrees of Freedom		3	Degrees of Freedom
0.00088811		X Coefficient(s)	0.0018079		X Coefficient(s)
0.00120924		Std Err of Coef.	0.00088311		Std Err of Coef.

itput:	No. #4	
	1.68747435	
	0.07834052	
	0.9467075	
	4	
	2	
−0.0058329		
0.00097857		

rtput:	No. #5	Regression Output:	No. #6	Regression Ou
	2.20040153	Constant	1.9483194	Constant
	0.19872439	Std Err of Y Est	0.25574301	Std Err of Y Est
	0.20586948	R Squared	0.14347583	R Squared
	5	No. of Observations	5	No. of Observations
	3	Degrees of Freedom	3	Degrees of Freedom
0.00149756		X Coefficient(s)	−0.0015492	X Coefficient(s)
0.00169814		Std Err of Coef.	0.00218537	Std Err of Coef.

rtput:	No. #7	Regression Output:	No. #8
	2.23264519	Constant	2.23080881
	0.11804576	Std Err of Y Est	0.11340458
	0.41604126	R Squared	0.42606011
	5	No. of Observations	5
	3	Degrees of Freedom	3
−0.0014747		X Coefficient(s)	−0.0014462
0.00100872		Std Err of Coef.	0.00096906

Appendix B

APPENDIX B
Laboratory Notes
Penta Wood Products
December 1995

Calculation of average biopile pH values - Sampling Event 1

Biopile 1		
	pH	H+ conc (molar)
	6.30	5.01E-07
	6.20	6.31E-07
	6.20	6.31E-07
SUM	18.70	1.76E-06
AVG pH		6.23

Biopile 5		
	pH	H+ conc (molar)
	8.20	6.31E-09
	8.20	6.31E-09
	8.10	7.94E-09
SUM	24.50	2.06E-08
AVG pH		8.16

Biopile 2		
	pH	H+ conc (molar)
	8.50	3.16E-09
	8.50	3.16E-09
	8.60	2.51E-09
SUM	25.60	8.84E-09
AVG pH		8.53

Biopile 6		
	pH	H+ conc (molar)
	8.10	7.94E-09
	7.90	1.26E-08
	8.00	1.00E-08
SUM	24.00	3.05E-08
AVG pH		7.99

Biopile 3		
	pH	H+ conc (molar)
	8.80	1.58E-09
	8.70	2.00E-09
	8.70	2.00E-09
SUM	26.20	5.58E-09
AVG pH		8.73

Biopile 7		
	pH	H+ conc (molar)
	6.60	2.51E-07
	6.70	2.00E-07
	6.60	2.51E-07
SUM	19.90	7.02E-07
AVG pH		6.63

Biopile 4		
	pH	H+ conc (molar)
	8.20	6.31E-09
	8.20	6.31E-09
	8.30	5.01E-09
SUM	24.70	1.76E-08
AVG pH		8.23

Biopile 8		
	pH	H+ conc (molar
	6.70	2.00E-07
	7.00	1.00E-07
	6.90	1.26E-07
SUM	20.60	4.25E-07
AVG pH		6.85

Average pH values determined by converting pH measurement data into molar H^+ ion concentrations, then taking the - log of the average H^+ ion concentration.

MJM
12/6/95

Calculation of average biopile pH values - Sampling Event 2

Biopile 1		
	pH	H+ conc (molar)
	6.50	3.16E-07
	7.00	1.00E-07
	7.00	1.00E-07
SUM	20.50	5.16E-07
AVG pH		6.76

Biopile 5		
	pH	H+ conc (molar)
	8.80	1.58E-09
	8.30	5.01E-09
	8.60	2.51E-09
SUM	25.70	9.11E-09
AVG pH		8.52

Biopile 2		
	pH	H+ conc (molar)
	8.50	3.16E-09
	8.40	3.98E-09
	8.70	2.00E-09
SUM	25.60	9.14E-09
AVG pH		8.52

Biopile 6		
	pH	H+ conc (molar)
	8.20	6.31E-09
	8.00	1.00E-08
	7.90	1.26E-08
SUM	24.10	2.89E-08
AVG pH		8.02

Biopile 3		
	pH	H+ conc (molar)
	8.30	5.01E-09
	7.90	1.26E-08
	8.10	7.94E-09
SUM	24.30	2.55E-08
AVG pH		8.07

Biopile 7		
	pH	H+ conc (molar)
	7.00	1.00E-07
	6.90	1.26E-07
	6.60	2.51E-07
SUM	20.50	4.77E-07
AVG pH		6.80

Biopile 4		
	pH	H+ conc (molar)
	8.60	2.51E-09
	8.10	7.94E-09
	8.70	2.00E-09
SUM	25.40	1.25E-08
AVG pH		8.38

Biopile 8		
	pH	H+ conc (molar
	6.30	5.01E-07
	7.50	3.16E-08
	7.50	3.16E-08
SUM	21.30	5.64E-07
AVG pH		6.73

Calculation of average biopile pH values - Sampling Event 3

Biopile 1		
	pH	H+ conc (molar)
	6.70	2.00E-07
	5.70	2.00E-06
	6.20	6.31E-07
SUM	18.60	2.83E-06
AVG pH		6.03

Biopile 5		
	pH	H+ conc (molar)
	6.90	1.26E-07
	7.10	7.94E-08
	7.10	7.94E-08
SUM	21.10	2.85E-07
AVG pH		7.02

Biopile 2		
	pH	H+ conc (molar)
	7.00	1.00E-07
	7.10	7.94E-08
	7.10	7.94E-08
SUM	21.20	2.59E-07
AVG pH		7.06

Biopile 6		
	pH	H+ conc (molar)
	6.70	2.00E-07
	6.90	1.26E-07
	6.50	3.16E-07
SUM	20.10	6.42E-07
AVG pH		6.67

Biopile 3		
	pH	H+ conc (molar)
	6.40	3.98E-07
	7.10	7.94E-08
	7.10	7.94E-08
SUM	20.60	5.57E-07
AVG pH		6.73

Biopile 7		
	pH	H+ conc (molar)
	6.10	7.94E-07
	6.70	2.00E-07
	6.20	6.31E-07
SUM	19.00	1.62E-06
AVG pH		6.27

Biopile 4		
	pH	H+ conc (molar)
	6.30	5.01E-07
	7.10	7.94E-08
	7.10	7.94E-08
SUM	20.50	6.60E-07
AVG pH		6.66

Biopile 8		
	pH	H+ conc (molar
	6.10	7.94E-07
	7.00	1.00E-07
	6.50	3.16E-07
SUM	19.60	1.21E-06
AVG pH		6.39

Calculation of average biopile pH values - Sampling Event 4

Biopile 1		
	pH	H+ conc (molar)
	5.20	6.31E-06
	5.30	5.01E-06
	5.20	6.31E-06
SUM	15.70	1.76E-05
AVG pH		5.23

Biopile 5		
	pH	H+ conc (molar)
	7.30	5.01E-08
	7.20	6.31E-08
	7.30	5.01E-08
SUM	21.80	1.63E-07
AVG pH		7.26

Biopile 2		
	pH	H+ conc (molar)
	7.10	7.94E-08
	7.10	7.94E-08
	7.20	6.31E-08
SUM	21.40	2.22E-07
AVG pH		7.13

Biopile 6		
	pH	H+ conc (molar)
	6.70	2.00E-07
	6.70	2.00E-07
	6.30	5.01E-07
SUM	19.70	9.00E-07
AVG pH		6.52

Biopile 3		
	pH	H+ conc (molar)
	7.10	7.94E-08
	7.00	1.00E-07
	7.00	1.00E-07
SUM	21.10	2.79E-07
AVG pH		7.03

Biopile 7		
	pH	H+ conc (molar)
	6.10	7.94E-07
	6.00	1.00E-06
	6.40	3.98E-07
SUM	18.50	2.19E-06
AVG pH		6.14

Biopile 4		
	pH	H+ conc (molar)
	6.80	1.58E-07
	7.10	7.94E-08
	7.30	5.01E-08
SUM	21.20	2.88E-07
AVG pH		7.02

Biopile 8		
	pH	H+ conc (molar
	6.50	3.16E-07
	7.20	6.31E-08
	6.50	3.16E-07
SUM	20.20	6.96E-07
AVG pH		6.63

Calculation of average biopile pH values - Sampling Event 5

Biopile 1		
	pH	H+ conc (molar)
	5.40	3.98E-06
	5.30	5.01E-06
	5.40	3.98E-06
SUM	16.10	1.30E-05
AVG pH		5.36

Biopile 5		
	pH	H+ conc (molar)
	7.30	5.01E-08
	7.40	3.98E-08
	7.50	3.16E-08
SUM	22.20	1.22E-07
AVG pH		7.39

Biopile 2		
	pH	H+ conc (molar)
	7.10	7.94E-08
	7.20	6.31E-08
	7.10	7.94E-08
SUM	21.40	2.22E-07
AVG pH		7.13

Biopile 6		
	pH	H+ conc (molar)
	6.60	2.51E-07
	6.70	2.00E-07
	6.40	3.98E-07
SUM	19.70	8.49E-07
AVG pH		6.55

Biopile 3		
	pH	H+ conc (molar)
	7.10	7.94E-08
	7.10	7.94E-08
	7.20	6.31E-08
SUM	21.40	2.22E-07
AVG pH		7.13

Biopile 7		
	pH	H+ conc (molar)
	6.30	5.01E-07
	6.30	5.01E-07
	6.00	1.00E-06
SUM	18.60	2.00E-06
AVG pH		6.18

Biopile 4		
	pH	H+ conc (molar)
	7.20	6.31E-08
	7.40	3.98E-08
	7.30	5.01E-08
SUM	21.90	1.53E-07
AVG pH		7.29

Biopile 8		
	pH	H+ conc (molar
	6.50	3.16E-07
	6.90	1.26E-07
	7.00	1.00E-07
SUM	20.40	5.42E-07
AVG pH		6.74

Calculation of average biopile pH values - Sampling Event 6

Biopile 1		
	pH	H+ conc (molar)
	5.30	5.01E-06
	5.10	7.94E-06
	5.10	7.94E-06
SUM	15.50	2.09E-05
AVG pH		5.16

Biopile 5		
	pH	H+ conc (molar)
	7.40	3.98E-08
	7.70	2.00E-08
	7.70	2.00E-08
SUM	22.80	7.97E-08
AVG pH		7.58

Biopile 2		
	pH	H+ conc (molar)
	5.90	1.26E-06
	6.00	1.00E-06
	5.80	1.58E-06
SUM	17.70	3.84E-06
AVG pH		5.89

Biopile 6		
	pH	H+ conc (molar)
	6.50	3.16E-07
	6.50	3.16E-07
	6.40	3.98E-07
SUM	19.40	1.03E-06
AVG pH		6.46

Biopile 3		
	pH	H+ conc (molar)
	6.80	1.58E-07
	6.90	1.26E-07
	6.80	1.58E-07
SUM	20.50	4.43E-07
AVG pH		6.83

Biopile 7		
	pH	H+ conc (molar)
	6.30	5.01E-07
	6.50	3.16E-07
	6.30	5.01E-07
SUM	19.10	1.32E-06
AVG pH		6.36

Biopile 4		
	pH	H+ conc (molar)
	6.00	1.00E-06
	6.30	5.01E-07
	6.30	5.01E-07
SUM	18.60	2.00E-06
AVG pH		6.18

Biopile 8		
	pH	H+ conc (molar
	6.60	2.51E-07
	6.80	1.58E-07
	7.10	7.94E-08
SUM	20.50	4.89E-07
AVG pH		6.79

Calculation of average biopile pH values - Sampling Event 7

Biopile 1		
	pH	H+ conc (molar)
	6.30	5.01E-07
	6.30	5.01E-07
	6.30	5.01E-07
SUM	18.90	1.50E-06
AVG pH		6.30

Biopile 5		
	pH	H+ conc (molar)
	5.70	2.00E-06
	6.80	1.58E-07
	6.80	1.58E-07
SUM	19.30	2.31E-06
AVG pH		6.11

Biopile 2		
	pH	H+ conc (molar)
	6.40	3.98E-07
	6.20	6.31E-07
	5.80	1.58E-06
SUM	18.40	2.61E-06
AVG pH		6.06

Biopile 6		
	pH	H+ conc (molar)
	6.30	5.01E-07
	6.60	2.51E-07
	6.70	2.00E-07
SUM	19.60	9.52E-07
AVG pH		6.50

Biopile 3		
	pH	H+ conc (molar)
	5.70	2.00E-06
	5.80	1.58E-06
	5.90	1.26E-06
SUM	17.40	4.84E-06
AVG pH		5.79

Biopile 7		
	pH	H+ conc (molar)
	5.40	3.98E-06
	6.40	3.98E-07
	6.20	6.31E-07
SUM	18.00	5.01E-06
AVG pH		5.78

Biopile 4		
	pH	H+ conc (molar)
	5.70	2.00E-06
	6.10	7.94E-07
	6.20	6.31E-07
SUM	18.00	3.42E-06
AVG pH		5.94

Biopile 8		
	pH	H+ conc (molar
	6.50	3.16E-07
	6.70	2.00E-07
	6.80	1.58E-07
SUM	20.00	6.74E-07
AVG pH		6.65

Calculation of average landfarm pH values - Sampling event 1

Daramend		
	pH	H+ conc (molar)
	6.50	3.16E-07
	6.20	6.31E-07
	6.10	7.94E-07
	6.40	3.98E-07
	6.20	6.31E-07
	6.30	5.01E-07
	6.30	5.01E-07
	6.50	3.16E-07
	6.20	6.31E-07
SUM	56.70	4.72E-06
AVG pH		6.28

Untreated		
	pH	H+ conc. (molar)
	6.70	2.00E-07
	6.50	3.16E-07
	6.60	2.51E-07
	6.90	1.26E-07
	6.70	2.00E-07
	6.90	1.26E-07
	6.60	2.51E-07
	6.50	3.16E-07
	6.40	3.98E-07
SUM	59.80	2.18E-06
AVG pH		6.62

Calculation of average landfarm pH values - Sampling event 2

Daramend		
	pH	H+ conc (molar)
	7.40	3.98E-08
	6.40	3.98E-07
	6.70	2.00E-07
	7.00	1.00E-07
	6.50	3.16E-07
	7.10	7.94E-08
	7.80	1.58E-08
	6.90	1.26E-07
	7.10	7.94E-08
SUM	62.90	1.35E-06
AVG pH		6.82

Untreated		
	pH	H+ conc. (molar)
	6.50	3.16E-07
	6.40	3.98E-07
	6.40	3.98E-07
	6.40	3.98E-07
	6.40	3.98E-07
	6.40	3.98E-07
	6.20	6.31E-07
	6.40	3.98E-07
	6.40	3.98E-07
SUM	57.50	3.73E-06
AVG pH		6.38

Calculation of average landfarm pH values - Sampling event 3

Daramend		
	pH	H+ conc (molar)
	5.60	2.51E-06
	5.70	2.00E-06
	6.40	3.98E-07
	5.90	1.26E-06
	6.00	1.00E-06
	6.20	6.31E-07
	5.90	1.26E-06
	5.50	3.16E-06
	6.20	6.31E-07
SUM	53.40	1.28E-05
AVG pH		5.85

Untreated		
	pH	H+ conc. (molar)
	6.30	5.01E-07
	6.20	6.31E-07
	6.30	5.01E-07
	6.50	3.16E-07
	6.10	7.94E-07
	6.20	6.31E-07
	6.30	5.01E-07
	6.40	3.98E-07
	6.30	5.01E-07
SUM	56.60	4.78E-06
AVG pH		6.28

Calculation of average landfarm pH values - Sampling event 4

Daramend		
	pH	H+ conc (molar)
	7.90	1.26E-08
	8.30	5.01E-09
	8.30	5.01E-09
	8.30	5.01E-09
	8.40	3.98E-09
	8.30	5.01E-09
	7.90	1.26E-08
	7.80	1.58E-08
	8.00	1.00E-08
SUM	73.20	7.51E-08
AVG pH		8.08

Untreated		
	pH	H+ conc. (molar)
	8.50	3.16E-09
	8.60	2.51E-09
	8.60	2.51E-09
	8.30	5.01E-09
	8.30	5.01E-09
	8.40	3.98E-09
	8.50	3.16E-09
	8.40	3.98E-09
	8.40	3.98E-09
SUM	76.00	3.33E-08
AVG pH		8.43

Calculation of average landfarm pH values - Sampling event 5

Daramend		
	pH	H+ conc (molar)
	8.60	2.51E-09
	8.50	3.16E-09
	8.60	2.51E-09
	8.30	5.01E-09
	8.30	5.01E-09
	8.20	6.31E-09
	7.70	2.00E-08
	7.90	1.26E-08
	7.90	1.26E-08
SUM	74.00	6.97E-08
AVG pH		8.11

Untreated		
	pH	H+ conc. (molar)
	8.40	3.98E-09
	8.30	5.01E-09
	8.30	5.01E-09
	8.30	5.01E-09
	8.30	5.01E-09
	8.40	3.98E-09
	8.40	3.98E-09
	8.30	5.01E-09
	8.60	2.51E-09
SUM	75.30	3.95E-08
AVG pH		8.36

9/11/94

Biopiles

Ea. Pile 1

20.7 - 17 / 20.7

Sample	Wt. of Tin	Wt. of Tin foil + Sample	Wt of Sample	wt after incubation		pH	MC
		x	x	x	x		
1A	0.6	20.7	20.1	17.0	16.4	6.3	18.4 17.9
1B	0.6	21.0	20.4	17.0	16.4	6.2	19.0 19
1C	0.6	20.7	20.1	17.2	16.6	6.2	16.9 1
				Avg		6.2	18.5
Pile 2							
2A	0.6	24.0	23.4	19.5	18.9	8.5	18.8 19
2B	0.6	20.9	20.3	16.7	16.1	8.5	20.0 2
2C	0.6	18.6	18.0	14.6	14.0	8.6	21.0 2
				Avg		8.5	20.
— 9/12/94							
Pile 3							
3A	1.4	41.9	40.5	31.8	30.4	8.8	24.1 24.
3B	1.2	42.1	40.9	31.9	30.7	8.7	24.2 24
3C	1.0	41.1	40.1	31.3	30.3	8.7	23.6 24
				Avg			24.
Pile 4							
4A	1.0	41.2	40.2	32.0	31	8.2	22 22.5
4B	0.9	41.1	40.2	32.7	31.8	8.2	20. 20.4
4C	0.9	41.2	40.3	33.3	32.4	8.3	19.2 19.
							21.
Pile 5							1
5A	1.3	41.5	40.2	31.3	V.R	30	8.2
5B	1.4	43.6	42.2	V.R	33.0 30.7	32.1	30.7 8.2
5C	1.4	41.6	40.2	30.7		29.3	8.
							26.6

Pile 6

							M.C
6A	1.2	41.7	40.5	35.0	33.1	8.1	16.5 ~~16.1~~
6B	1.4	44.9	43.5	39.0	37.6	7.9	13.6 ~~13.1~~
6C	1.2	42.2	41	37.2	36	8.0	12.2 ~~11.6~~
							(14.1)

Pile 7

7A	1.2	42.3	41.1	35.6	34.4	6.6	16.3 ~~15.6~~
7B	1.8	45.1	43.3	37.7	35.9	6.7	17.1 ~~16.4~~
7C	1.2	43.8	42.6	36.6	35.4	6.6	16.9 ~~16.4~~
							(16.8)

Pile 8

8A	1.2	42.3	41.1	33.3	32.1	6.7	21.9 ~~21.3~~
8B	1.2	43.5	42.3	34.9	33.7	7.0	20.3 ~~19.8~~
8C	1.4	42.8	41.4	34.4	33	6.9	20.3 ~~19.8~~
							(20.8)

~~pH check~~

2ND BIOPILE EVENT - MOISTURE/pH

REAC FIELD DATA SHEET
Moisture Content, pH, Temperature
Fax: (908)494-4021

10/24/94

S.No	Sample Description	Cup Weight	Cup + Wet	Wet	Cup + Dry	Dry	Moisture	pH	Temperature	
	Pile & Location	gram	gram	gram	gram	gram	Percent		Location/Pile	Reading
1	1A	0.4	29.0	27.6	21.4	21.0	23.9	7.6		
2	1B	0.5	30.0	29.5	22.9	22.4	24.1	7.6	6.8	
3	1C	0.4	30.9	30.5	22.6	22.2	27.2	7.0		
	2A	~~0.5~~ 0.4	29.4	29.0	20.7	20.3	30.0	8.5		
	2B	0.4	29.4	29.0	20.5	19.9	31.4	8.4	8.5	
	2C	0.4	28.7	28.3	19.4	19.0	32.9	8.7		
	3A	0.4	31.8	31.4	21.0	19.6	37.6	8.3		
	3B	0.4	31.8	31.4	19.3	18.9	39.8	7.9	8.1	
	3C	0.4	30.3	29.9	19.7	19.3	35.4	8.1		
	4A	0.4	28.6	28.2	17.7	17.3	38.7	8.6		
	4B	0.4	31.1	30.7	~~27.8~~ 18.6	18.2	40.7	8.1	8.5	
	4C	0.4	36.7	36.3	24.5	24.1	33.6	8.7		
	5A	0.4	28.3	27.9	17.0	~~17~~ 16.6	40.5	8.8		
	5B	0.5	330	32.5	19.9	19.4	40.1	8.3	8.6	
	5C	0.7	34.1	33.4	20.8	20.1	39.8	8.6		
	6A	0.4	36.0	35.6	28.3	27.9	21.6	8.2		
	6B	0.4	33.1	32.7	27.8	27.4	16.2	8.0	8.0	
	6C	0.7	34.0	33.3	27.1	26.4	20.7	7.9		
	7A	0.4	35.4	35.1	27.6	27.2	22.5	7.0		2.3 x 10
	7B	0.4	33.8	33.4	27.2	26.8	19.8	6.9	6.9	36.8
	7C	0.7	35.2	34.5	27.4	26.7	22.6	6.6		
	8A	0.5 340	~~350~~ ~~340~~	33.5	24.7	24.2	27.8	6.3		= 10%
	8B	0.5	34.9	34.4	25.2	24.7	28.2	7.5	7.1	
	8C	0.4	36.8	36.4	27.0	26.6	26.9	7.5		
	LF1	0.4	38.1	37.7	35.0	34.				
	LF2				31.6					

OK
MFM

WESTON

SHEET ____ of ____

CLIENT/SUBJECT PWP - EVENT 3 - 11/29/94 W.O. NO. ____

TASK DESCRIPTION Bio Piles - Cold Arroyo TASK NO. ____

PREPARED BY MFM DEPT ____ DATE ____

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____

Pile	% H2O	pH
1	20.4	6.2
2	28.3	7.1
3	32.9	6.9
4	33.3	6.8
5	33.8	7.0
6	15.5	6.7
7	17.7	6.3
8	23.6	6.5

Date: 11/29/94 (2ND perm ...

SAMPLE		pH	% H2O
CT 1-2	+	6.5	10.2 ~~11.4~~
2-2	+	6.4/6.4	8.6 / 8.5 ~~9.3/9.4~~
3	+	6.4	9.5 ~~10.5~~
4	+	6.4	9.4 ~~10.4~~
5	-	6.4	9.5 ~~10.5~~
6	-	6.4	9.6 ~~10.6~~
7	-	6.2	10.5 ~~11.7~~
8	-	6.4	11.1 ~~12.5~~
9	+	6.4	11.2 ~~12.6~~
Avg		6.4	9.8 ~~10.9~~
DT 1-2	-	7.4	20.3 ~~25.0~~
2	-	6.4	19.2 ~~23.7~~
3	-	6.7	19.4 ~~24.0~~
4	-	7.0/7.0	15.6 / 15.9 ~~19.0/18.9~~
5	-	6.5	18.0 ~~22.0~~
6	-	7.1	20.1 ~~25.1~~
7	-	7.8	16.1 ~~19.2~~
8	-	6.9	15.9 ~~18.9~~
9	-	7.1	19.6 ~~24.4~~
Avg		7.0	18.0 ~~22.0~~

% H2O - wet - OK MFM 2/16/95

DARAMEND - pH / % H2O VS TIME

Roy F. Weston, Inc.
Environmental Technology Laboratory
254 Welsh Pool Road
Lionville, Pennsylvania 19341-1345
610-701-6174 • Fax 610-701-6175

14 December 1994

Mr. Mike Mohn
Roy F. Weston, Inc.
REAC
Edison, New Jersey 088373616

Re: Physical Testing Results for Penta Wood Products Soil Samples
WESTON Job No. 9412X001

Dear Mr. Mohn:

Attached are the results of physical testing conducted on the forty-seven soil samples received by WESTON on 1 December 1994. The following geotechnical tests were performed in accordance with the cited methods:

ASTM-D-2216	Natural Moisture Content
ASTM-D-4974	Soil pH

If you have any questions concerning these results, please call Russell Frye at (610) 701-6173.

Very truly yours,

ROY F. WESTON, INC.

Joseph F. Martino, P.E.
Senior Section Manager
Environmental Technology Laboratory

JFM/cab
attachments

Table 1 Geotechnical Tests Performed, Reference Methods and Test Numbers		
Test Parameter	**Method[1]**	**Test Numbers**
Natural Moisture Content	D 2216	47
Soil pH	D4974	47

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

NATURAL MOISTURE CONTENT AND SOIL pH

PROJECT	REAC-Penta Wood Products	PROJECT ANALYST	SPM	OVEN MODEL	VWR
JOB NUMBER	9412X001	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-02	DATE RECEIVED	12/01/94	DATE COMPLETED	12/14/94

SAMPLE DATA								
ETL Sample Number	001	002	003	004	005	006	007	008
Project Sample I. D.	B00136	B00137	B00138	B00139	B00140	B00141	B00142	B00143

MOISTURE CONTENT								
Total Solids, %	78.8	78.8	81.1	72.9	72.2	69.9	67.2	67.1
Moisture Content, % wet	21.2	21.2	18.9	27.1	27.8	30.1	32.8	32.9
Moisture Content, % dry	26.9	26.9	23.3	37.1	38.4	43.0	48.8	49.0

SOIL pH								
Soil pH	6.7	5.7	6.2	7.0	7.1	7.1	6.4	7.1

1A Comp 3 1B Comp 3 1C Comp 3 2A Comp 3 2B Comp 3 2C Comp 3 3A Comp 3 3B Comp 3

Hw: 20.4
pH: 6.2

Hw: 28.3
pH: 7.1

Hw: 32.9
pH: 6.9

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

NATURAL MOISTURE CONTENT AND SOIL pH

PROJECT	REAC-Penta Wood Products	PROJECT ANALYST	SPM	OVEN MODEL	VWR
JOB NUMBER	9412X001	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-02	DATE RECEIVED	12/01/94	DATE COMPLETED	12/14/94

SAMPLE DATA								
ETL Sample Number	009	010	011	012	013	014	015	016
Project Sample I. D.	B00144	B00145	B00146	B00147	B00148	B00149	B00150	B00151

MOISTURE CONTENT								
Total Solids, %	67.1	67.7	66.4	66.1	68.2	65.5	65.0	84.0
Moisture Content, % wet	32.9	32.3	33.6	33.9	31.8	34.5	35.0	16.0
Moisture Content, % dry	49.0	47.7	50.6	51.3	46.6	52.7	54.0	19.0

SOIL pH								
Soil pH	7.1	6.3	7.1	7.1	6.9	7.1	7.1	6.7

3C Comp 3 4A Comp 3 4B Comp 3 4C Comp 3 5A Comp 3 or 5B Comp 3 5C Comp 3 6A Comp 3

Htw : 33.3
pH : 6.8

Htw : 33.8
pH : 7.0

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

NATURAL MOISTURE CONTENT AND SOIL pH

PROJECT	REAC-Penta Wood Products	PROJECT ANALYST	SPM	OVEN MODEL	VWR
JOB NUMBER	9412X001	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-02	DATE RECEIVED	12/01/94	DATE COMPLETED	12/14/94

SAMPLE DATA								
ETL Sample Number	017	018	019	020	021	022	023	024
Project Sample I. D.	B00152	B00153	B00154	B00155	B00160	B00161	B00162	B00163

MOISTURE CONTENT								
Total Solids, %	84.8	83.6	83.4	82.7	89.8	91.5	90.5	90.6
Moisture Content, % wet	15.2	16.4	16.6	17.3	10.2	8.5	9.5	9.4
Moisture Content, % dry	17.9	19.6	20.0	20.9	11.4	9.3	10.5	10.4

SOIL pH								
Soil pH	6.9	6.5	6.1	6.7	6.5	6.4	6.4	6.4

6B Comp 3 6C Comp 3 7A Comp 3 7B Comp 3 ~~7C Comp 3~~

Htw = 15.1
pH = 6.7

Htw: 17.7
pH: 6.3

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

NATURAL MOISTURE CONTENT AND SOIL pH

PROJECT	REAC-Penta Wood Products	PROJECT ANALYST	SPM	OVEN MODEL	VWR
JOB NUMBER	9412X001	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-02	DATE RECEIVED	12/01/94	DATE COMPLETED	12/14/94

SAMPLE DATA								
ETL Sample Number	025	026	027	028	029	030	031	032
Project Sample I. D.	B00164	B00165	B00166	B00167	B00179	B00168	B00169	B00170

MOISTURE CONTENT								
Total Solids, %	90.5	90.4	89.5	88.9	88.8	79.7	80.8	80.6
Moisture Content, % wet	9.5	9.6	10.5	11.1	11.2	20.3	19.2	19.4
Moisture Content, % dry	10.5	10.6	11.7	12.5	12.6	25.4	23.7	24.0

SOIL pH								
Soil pH	6.4	6.4	6.2	6.4	6.4	7.4	6.4	6.7

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

NATURAL MOISTURE CONTENT AND SOIL pH

PROJECT	REAC-Penta Wood Products	PROJECT ANALYST	SPM	OVEN MODEL	VWR
JOB NUMBER	9412X001	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-02	DATE RECEIVED	12/01/94	DATE COMPLETED	12/14/94

SAMPLE DATA								
ETL Sample Number	033	034	035	036	037	038	039	040
Project Sample I. D.	B00171	B00172	B00173	B00174	B00175	B00176	B00156	B00157

MOISTURE CONTENT								
Total Solids, %	84.1	82.0	79.9	83.9	84.1	80.4	80.7	76.1
Moisture Content, % wet	15.9	18.0	20.1	16.1	15.9	19.6	19.3	23.9
Moisture Content, % dry	19.0	22.0	25.1	19.2	18.9	24.4	23.8	31.5

SOIL pH								
Soil pH	7.0	6.5	7.1	7.8	6.9	7.1	6.2	6.1

7C Comp 3 ~~7C Comp 3~~
8A Comp 3

Hw = 23.6
pH = 6.5

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

NATURAL MOISTURE CONTENT AND SOIL pH

PROJECT	REAC-Penta Wood Products	PROJECT ANALYST	SPM	OVEN MODEL	VWR
JOB NUMBER	9412X001	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-02	DATE RECEIVED	12/01/94	DATE COMPLETED	12/14/94

SAMPLE DATA								
ETL Sample Number	041	042	043	044	045	046	047	
Project Sample I. D.	B00158	B00159	B00151 DUP	B00152 DUP	B00161 DUP	B00171 DUP	B00159 DUP	

MOISTURE CONTENT								
Total Solids, %	75.5	77.5	84.4	84.9	91.4	84.4	76.8	
Moisture Content, % wet	24.5	22.5	15.6	15.1	8.6	15.6	23.2	
Moisture Content, % dry	32.5	29.0	18.5	17.7	9.4	18.5	30.1	

SOIL pH								
Soil pH	7.0	6.5	6.7	6.8	6.4	7.0	6.5	

8B Comp 3 | 8C Comp 3 | 6A Comp 3 DUP | 6B Comp 3 DUP | Ct 2-2 DUP | DT4-2 DUP | 8C Comp 3 DUP

9411X012 9412X001

ENGINEERING BIO - PLAN 13

CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Project Name: PENTA WOOD PRODUCTS
Project Number: 03347-040-001-0026-02
RFW Contact: M. Mohn Phone: 908-321-4237

No: 10053

SHEET NO. ____ OF ____

SAMPLE IDENTIFICATION — ANALYSES REQUESTED

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative		% H2O/pH			
001	NB00136	1A COMP 3	S	11/29/94	1	4 oz gl	—	X			
002	B00137	1B	↓	↓	↓	↓	↓	↓			
003	B00138	1C									
004	B00139	2A									
005	B00140	2B									
006	B00141	2C									
007	B00142	3A									
008	B00143	3B									
009	B00144	3C									
010	B00145	4A									
011	B00146	4B									
012	B00147	4C									
013	B00148	5A									
014	B00149	5B									
015	B00150	5C									
016	B00151	6A									
017	B00152	6B									
018	B00153	6C									
019	B00154	7A									
020	B00155	7B	↓	↓	↓	↓	↓	↓			

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions:
DO RANDOMLY SELECTED DUPLICATES AT RATE OF 10%

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	M. Mohn	11/30/94	[signature]	12/1	1300						

9412X001

ENGINEERING BIO - PWA 13

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

Project Name: PENTA WOOD PRODUCTS
Project Number: 03347-090-001-0076-01
RFW Contact: M. MOHN Phone: 908-321-4257

No: 10054

SHEET NO. ____ OF ____

SAMPLE IDENTIFICATION | ANALYSES REQUESTED

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative	%H2O/pH			
039	B00156	7C COMP 3	S	11/29/94	1	4 oz gl / —				
040	B00157	8A	↓	↓	↓	↓	↓			
041	B00158	8B	↓	↓	↓	↓	↓			
042	B00159	8C	↓	↓	↓	↓	↓			
043	B00151 DUP	6A COMP 3	S	11/29/94	1	4 oz gl / —	%H2O/pH	Randomly Selected Duplicates		
044	B00152 DUP	6B COMP 3	↓	↓	↓	↓	↓	↓		
045	B00161 DUP	CT2-2	↓	↓	↓	↓	↓	↓		
046	B00171 DUP	DT4-2	↓	↓	↓	↓	↓	↓		
047	B00159 DUP	8C Comp 3	↓	↓	↓	↓	↓	↓		

MEM

MEM

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions:

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	M. Mohn	11/30/94	[signature]	12/1	1300						

941X001

ENGINEERING BIO - PWA '3

CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

Project Name: PENTA WOOD PRODUCTS
Project Number: 03747-010-021-0026-01
RFW Contact: M. MORA Phone: 908-321-4257

No: 10055

SHEET NO. ____ OF ____

SAMPLE IDENTIFICATION / ANALYSES REQUESTED

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative	% H_2O/OH	
021	BA00160	CT1-2	S	11/29/94	1	4 oz gl/ --	X	MF1
022	BA00161	CT2-2						
023	BA00162	CT3-2						
024	B00163	CT4-2						
025	B00164	CT5-2						
026	B00165	CT6-2						
027	B00166	CT7-2						
028	B00167	CT8-2						
029	B00168	CT9-2						
030	B00168	DT1-2						
031	B00169	DT2-2						
032	B00170	DT3-2						
033	B00171	DT4-2						
034	B00172	DT5-2						
035	B00173	DT6-2						
036	B00174	DT7-2						
037	B00175	DT8-2						
038	B00176	DT9-2						
				MF1				

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions:
DO RANDOMLY SELECTED DUPLICATES AT RATE OF 10%.

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	M. Mora	11/30/94	[signature]	12/1	1320						

WESTON

SHEET ____ of ____

CLIENT/SUBJECT PWP W.O. NO. ____

TASK DESCRIPTION Averages for Event 4 - 1/4/95 TASK NO. ____

PREPARED BY MFM DEPT ____ DATE ____

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____

Pile	% Hw	pH
1	20.5	5.2
2	25.1	7.1
3	32.0	7.0
4	30.5	7.1
5	31.9	7.3
6	15.8	6.6
7	14.3	6.2
8	23.2	6.7

Date: 1/3/95

3rd Daremond sample event

SAMPLE	pH	% H2O (wet) Oil - MFF
DT 1-3	5.6	18.0 ~~22.0~~
2	5.7	16.9 ~~20.3~~
3	6.9	16.2 ~~19.3~~
4	5.9	11.7 ~~13.3~~
5	6.0	11.9 ~~13.5~~
6	6.2	17.3 ~~20.5~~
7	5.9/6.0	10.9 ~~12.2~~
8	5.5	13.1 ~~15.1~~
9	6.2	13.3 ~~15.7~~
AVG	5.9	14.4
DT 1-9 COMP 3	5.9	13.7 ~~15.7~~
DC 1-3	6.3	7.4 ~~8.4~~
2	6.2	6.2 ~~6.4~~
3	6.3	7.0 ~~7.5~~
4	6.5	7.5 ~~8.1~~
5	6.1	8.1 ~~8.5~~
6	6.2	8.3 ~~9.1~~
7	6.3	9.0 ~~9.6~~
8	6.9	9.9 ~~11.0~~
9	6.3	10.3 ~~11.5~~
AVG	6.3	~~8.5~~ 8.2
DC 1-9 COMP 3	6.2	8.5

Roy F. Weston, Inc.
Environmental Technology Laboratory
254 Welsh Pool Road
Lionville, Pennsylvania 19341-1345
610-701-6174 • Fax 610-701-6175

16 January 1995

Mr. Mike Mohn
Roy F. Weston, Inc.
REAC
Edison, New Jersey 088373616

Re: Physical Testing Results for Penta Wood Products Soil Samples
WESTON Job No. 9412X001

Dear Mr. Mohn:

Attached are the data sheets and the results of physical testing conducted on the nine soil samples received by WESTON on 6 January 1995. The following geotechnical tests were performed in accordance with the cited methods:

ASTM-D-2216	Natural Moisture Content
ASTM-D-4974	Soil pH

If you have any questions concerning these results, please call Russell Frye at (610) 701-6173.

Very truly yours,

ROY F. WESTON, INC.

Joseph F. Martino, P.E.
Senior Section Manager
Environmental Technology Laboratory

JFM/ag
attachments

ENGINEERING - BIO - DARA

PWA 15

REAC, E[illegible]on, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHA[illegible] OF CUSTODY RECORD

Project Name: PENTA WOOD PRODUCTS
Project Number: 03347-040-001-0026-01
RFW Contact: ~~[illegible]~~ M. MOHN Phone: 908-321-4257

No: 03624

SHEET NO 1 OF 1 MFM

9501X001

Sample Identification **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	pH	% MOISTURE		
001	B09928	DT1-3	S	1/3/95	ONE	4oz GLASS/None	✓	✓		
002	B09929	DT2-3	↓	↓	↓	↓	↓	↓		
003	B09930	DT3-3								
004	B09931	DT4-3								
005	B09932	DT5-3								
006	B09933	DT6-3								
007	B09934	DT7-3								
008	B09935	DT8-3								
009	B09936	DT9-3								
010	B09937	DT1-9 COMP3								
011	B09938	~~DC1-3~~ DC1-3								
012	B09939	DC2-3								
013	B09940	DC3-3								
014	B09941	~~DC4-4~~ DC4-3								
015	B09942	DC5-3								
016	B09943	DC6-3								
017	B09944	DC7-3								
018	B09945	DC8-3								
019	B09946	DC9-3								
020	B09947	DC1-9 COMP3	↓	↓	↓	↓	↓	↓		

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

Special Instructions:
RANDOMLY SELECT SAMPLES FOR DUPLICATE ANALYSES AT RATE OF 10%.

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Checked by: MFM

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ALL/ANALYSIS	M. TALWAR	1/3/95	[signature]	6 JAN 95	1130						

ENGINEER'S - BIO COMPOST

REAC, Ec n, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHA OF CUSTODY RECORD

Project Name: PENTA WOOD PRODUCTS
Project Number: #3347-040-001-0026-01
RFW Contact: M. MOHN Phone: 908-321-4251

No: 03654

SHEET NO. 1 OF 2

9501X001

Sample Identification | **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	pH	% MOISTURE		
021	B00332	1A COMP 4	S	1/4/95	ONE	4OZ GLASS/NONE	✓	✓		
022	B00333	1B COMP 4								
023	B00334	1C COMP 4								
024	B00335	2A COMP 4								
025	B00336	2B COMP 4								
026	B00337	2C COMP 4								
027	B00338	3A COMP 4								
028	B00339	3B COMP 4								
029	B00340	3C COMP 4								
030	B00341	4A COMP 4								
031	B00342	4B COMP 4								
032	B00343	4C COMP 4								
033	B00344	5A COMP 4								
034	B00345	5B COMP 4								
035	B00346	5C COMP 4								
036	B00347	6A COMP 4								
037	B00348	6B COMP 4								
038	B00349	6C COMP 4								
039	B00350	7A COMP 4								M.T
040	B00351	7B COMP 4								

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions:
RANDOMLY SELECT SAMPLES FOR DUPLICATE ANALYSES AT RATE OF 10%.

Checked by: MFM

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ALL/ANALYSIS	M. TALWAR	1/4/95	S. McMann	1130	1/4/95						

8/94

ENGINEERING - BIO

PWA 15

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: PENTA WOOD PRODUCTS
Project Number: 03347-040-001-0026-01
RFW Contact: M. MUHN Phone: 908-321-4251

No: 03655

SHEET NO. 2 OF 2

9501X001

Sample Identification | **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	pH	% Moisture		
041	BOD352	7C COMP 4	S	1/4/95	ONE	402 GLASS/NONE	✓	✓		
042	BOD353	8A COMP 4	↓	↓	↓	↓	↓	↓		
043	BOD354	8B COMP 4	↓	↓	↓	↓	↓	↓		
044	BOD355	8C COMP 4	↓	↓	↓	↓	↓	↓		
045	BOD356 DUP									
046	BOD357 DUP									
047	BOD339 DUP									
048	BOD345 DUP									
049	BOD353 DUP									

MF

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:

RANDOMLY SELECT SAMPLES FOR DUPLICATE ANALYSES AT RATE OF 10%

Checked by: MFN

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ALL ANALYSIS	M. TALWAR	1/4/95	[signature]	1/5/95	1130						

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

NATURAL MOISTURE CONTENT AND SOIL pH

PROJECT	REAC-Penta Wood Products	PROJECT ANALYST	SPM	OVEN MODEL	VWR
JOB NUMBER	9501X001	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-02	DATE RECEIVED	01/06/95	DATE COMPLETED	01/16/95

SAMPLE DATA								
ETL Sample Number	001	002	003	004	005	006	007	008
Project Sample I. D.	B09928	B09929	B09930	B09931	B09932	B09933	B09934	B09935

MOISTURE CONTENT								
Total Solids, %	82.0	83.1	83.8	88.3	88.1	82.7	89.1	86.9
Moisture Content, % wet	18.0	16.9	16.2	11.7	11.9	17.3	10.9	13.1
Moisture Content, % dry	22.0	20.3	19.3	13.3	13.5	20.9	12.2	15.1

SOIL pH								
Soil pH	5.6	5.7	6.4	5.9	6.0	6.2	5.9	5.5

1A Copy

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

NATURAL MOISTURE CONTENT AND SOIL pH

PROJECT	REAC-Penta Wood Products	PROJECT ANALYST	SPM	OVEN MODEL	VWR
JOB NUMBER	9501X001	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-02	DATE RECEIVED	01/06/95	DATE COMPLETED	01/16/95

SAMPLE DATA								
ETL Sample Number	009	010	011	012	013	014	015	016
Project Sample I. D.	B09936	B09937	B09938	B09939	B09940	B09941	B09942	B09943

MOISTURE CONTENT								
Total Solids, %	86.7	86.3	92.6	93.8	93.0	92.5	91.9	91.7
Moisture Content, % wet	13.3	13.7	7.4	6.2	7.0	7.5	8.1	8.3
Moisture Content, % dry	15.4	15.9	7.9	6.6	7.5	8.1	8.8	9.1

SOIL pH								
Soil pH	6.2	5.9	6.3	6.2	6.3	6.5	6.1	6.2

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

NATURAL MOISTURE CONTENT AND SOIL pH

PROJECT	REAC-Penta Wood Products	PROJECT ANALYST	SPM	OVEN MODEL	VWR
JOB NUMBER	9501X001	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-02	DATE RECEIVED	01/06/95	DATE COMPLETED	01/16/95

SAMPLE DATA								
ETL Sample Number	017	018	019	020	021	022	023	024
Project Sample I. D.	B09944	B09945	B09946	B09947	B00332	B00333	B00334	B00335

MOISTURE CONTENT								
Total Solids, %	91.0	90.1	89.7	92.1	78.0	79.9	80.7	75.2
Moisture Content, % wet	9.0	9.9	10.3	7.9	22.0	20.1	19.3	24.8
Moisture Content, % dry	9.9	11.0	11.5	8.5	28.3	25.1	23.9	33.0

SOIL pH								
Soil pH	6.3	6.4	6.3	6.2	5.2	5.3	5.2	7.1

1A Comp 4 1B Comp 4 1C Comp 4 2A Comp 4

% Hw = 20.5

pH = ~~25.6~~ 5.2

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

NATURAL MOISTURE CONTENT AND SOIL pH

PROJECT	REAC-Penta Wood Products	PROJECT ANALYST	SPM	OVEN MODEL	VWR
JOB NUMBER	9501X001	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-02	DATE RECEIVED	01/06/95	DATE COMPLETED	01/16/95

SAMPLE DATA								
ETL Sample Number	025	026	027	028	029	030	031	032
Project Sample I. D.	B00336	B00337	B00338	B00339	B00340	B00341	B00342	B00343

MOISTURE CONTENT								
Total Solids, %	74.4	75.1	67.9	67.5	68.5	66.8	68.3	73.3
Moisture Content, % wet	25.6	24.9	32.1	32.5	31.5	33.2	31.7	26.7
Moisture Content, % dry	34.5	33.1	47.3	48.2	46.1	49.6	46.4	36.4

SOIL pH								
Soil pH	7.1	7.2	7.1	7.0	7.0	6.8	7.1	7.3

2B Comp 1 2C Comp 1 3A Comp 1 3B Comp 1 3C Comp 1 4A Comp 1 4B Comp 1 4C Comp 1

% Hw = 25.1
pH = 7.1

% Hw : 32.0
pH : 7.0

% Hw = 30.5
pH = 7.1

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

NATURAL MOISTURE CONTENT AND SOIL pH

PROJECT	REAC-Penta Wood Products	PROJECT ANALYST	SPM	OVEN MODEL	VWR
JOB NUMBER	9501X001	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-02	DATE RECEIVED	01/06/95	DATE COMPLETED	01/16/95

SAMPLE DATA								
ETL Sample Number	033	034	035	036	037	038	039	040
Project Sample I. D.	B00344	B00345	B00346	B00347	B00348	B00349	B00350	B00351

MOISTURE CONTENT								
Total Solids, %	67.9	67.7	68.7	84.4	83.7	84.5	84.4	84.4
Moisture Content, % wet	32.1	32.3	31.3	15.6	16.3	15.5	15.6	15.6
Moisture Content, % dry	47.3	47.7	45.6	18.5	19.4	18.4	18.5	18.4

SOIL pH								
Soil pH	7.3	7.2	7.3	6.7	6.7	6.3	6.1	6.0

5A Comp 4 5B Comp 4 5C Comp 4 6A Comp 4 6B Comp 4 6C Comp 4 7A Comp 4 7B Comp 4

Hw : 31.9
pH : 7.3

Hw = 15.8
pH = 6.6

Hw = 14.3
pH = 6.2

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

NATURAL MOISTURE CONTENT AND SOIL pH

PROJECT	REAC-Penta Wood Products	PROJECT ANALYST	SPM	OVEN MODEL	VWR
JOB NUMBER	9501X001	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-02	DATE RECEIVED	01/06/95	DATE COMPLETED	01/16/95

SAMPLE DATA								
ETL Sample Number	041	042	043	044	045	046	047	048
Project Sample I. D.	B00352	B00353	B00354	B00355	B09934 DUP	B00334 DUP	B00339 DUP	B00345 DUP

MOISTURE CONTENT								
Total Solids, %	88.2	77.7	75.9	76.8	89.1	81.0	67.3	66.7
Moisture Content, % wet	11.8	22.3	24.1	23.2	10.9	19.0	32.7	33.3
Moisture Content, % dry	13.4	28.6	31.7	30.2	12.2	23.5	48.7	49.9

SOIL pH								
Soil pH	6.4	6.5	7.2	6.5	6.0	5.3	6.9	7.3

7C Comp 4 — 8A Comp 4 — 8B Comp 4 — 8C Comp 4

$H_2O = 23.2$

$pH = 6.7$

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

NATURAL MOISTURE CONTENT AND SOIL pH

PROJECT	REAC-Penta Wood Products	PROJECT ANALYST	SPM	OVEN MODEL	VWR
JOB NUMBER	9501X001	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-02	DATE RECEIVED	01/06/95	DATE COMPLETED	01/16/95

SAMPLE DATA								
ETL Sample Number	049							
Project Sample I. D.	B00353 DUP							

MOISTURE CONTENT								
Total Solids, %	78.4							
Moisture Content, % wet	21.6							
Moisture Content, % dry	27.5							

SOIL pH								
Soil pH	6.6							

WESTON

SHEET ____ of ____

CLIENT/SUBJECT PWP W.O. NO. ____

TASK DESCRIPTION Sample Event 5 - Avg Calcs TASK NO. ____

PREPARED BY MTM DEPT ____ DATE ____

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____

Pile	% H_2O	pH (su.)
1	17.3	5.4
2	17.8	7.2
3	32.3	7.1
4	24.7	7.3
5	34.6	7.4
6	18.7	6.6
7	15.8	6.2
8	22.5	6.8

Date: 2/7/95
4th Diamond Sampling Event

Sample	pH	% H_2O (wet)
DT 1-3A Comp 4	7.86 ~~7.86 7.9~~	21.1
DT 1-3B Comp 4	8.27	21.3
DT 1-3C Comp 4	8.34	22.1
DT 4-6 A Comp 4	8.25	20.1
DT 4-6 B Comp 4	8.37	19.7
DT 4-6 C Comp 4	8.28	19.4
DT 7-9 A Comp 4	7.92	17.2
DT 7-9 B Comp 4	7.79	17.2
DT 7-9 C Comp 4	7.95	17.0
AVG	~~8.11~~ 8.1	19.5
DT 1-9 Comp 4	~~8.08~~ 8.1/8.1 ~~8.16~~	18.2/18.1
DC 1-3 A Comp 4	8.46	5.6
DC 1-3 B Comp 4	8.59	5.8
DC 1-3 C Comp 4	8.64	5.6
DC 4-6 A Comp 4	8.27	6.1
DC 4-6 B Comp 4	8.31	6.2
DC 4-6 C Comp 4	8.35	6.0
DC 7-9 A Comp 4	8.46	5.2
DC 7-9 B Comp 4	8.44	5.1
DC 7-9 C Comp 4	8.36	5.2
AVG	~~8.43~~ 8.4	~~5.64~~ 5.6
DC 1-9 Comp 4	8.64/8.62 = 8.6/8.6	5.7/5.9

Inter-Office Memorandum

TO: Mike Mohn

FROM: Russell Frye RJDT DATE: 23 February 1995

PROJECT: Penta Wood Products W.O. NO.: 03347-040-001-0026-01

SUBJECT: **Geotechnical Testing Results**

ACTION:

Geotechnical testing results for the Penta Wood Products project are attached. Twenty (20) soil samples, job number 9502X003 were submitted to WESTON's Environmental Technology Laboratory (ETL) on 9 February 1995 for geotechnical testing. Two (2) randomly selected duplicate samples were also analyzed (project sample numbers B02261 and B02271, ETL sample number 021 and 022, respectively).

The geotechnical tests requested are presented in the attached custody transfer/work request.

The geotechnical tests performed including reference method and test number are presented in Table 1.

If you require additional information or have any questions, please call me at (610) 701-6173.

Table 1 Geotechnical Tests Performed, Reference Methods and Test Numbers		
Test Parameter	**Method[1]**	**Test Numbers**
Natural Moisture Content	D 2216	22
Soil pH	D 4974	22

1 All analytical methods derived from the Annual Book of ASTM Standards, Section 4, Volume 4.08, Soil and Rock; Building Stones; Geotextiles, American Society of Testing Materials, Philadelphia, PA, 1991 unless noted otherwise.

9502X003

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

PWA 16 - ENGINEERING - BIO-DATA

CHAIN OF CUSTODY RECORD

Project Name: PENTA WOOD PRODUCTS
Project Number: 03347-040-001-0026-01
RFW Contact: M. MOHN Phone: 908-321-4257

No: 09712

SHEET NO. 1 OF __

Sample Identification / Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	% H2O	pH		
001	B02252	DT 1-3A COMP 4	S	2/7/95	1	4 oz g / —	X	X		
002	B02253	DT 1-3B COMP 4								
003	B02254	DT 1-3C COMP 4								
004	B02255	DT 4-6A COMP 4								
005	B02256	DT 4-6B COMP 4								
006	B02257	DT 4-6C COMP 4								
007	B02258	DT 7-9A COMP 4								
008	B02259	DT 7-9B COMP 4								
009	B02260	DT 7-9C COMP 4								
010	B02261	DT 1-9 COMP 4								
011	B02262	DC 1-3A COMP 4								
012	B02263	DC 1-3B COMP 4								
013	B02264	DC 1-3C COMP 4								
014	B02265	DC 4-6A COMP 4								
015	B02266	DC 4-6B COMP 4								
016	B02267	DC 4-6C COMP 4								
017	B02268	DC 7-9A COMP 4								
018	B02269	DC 7-9B COMP 4								
019	B02270	DC 7-9C COMP 4								
020	B02271	DC 1-9 COMP 4	↓	↓	↓	↓	↓	↓		

Matrix:
SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other SL - Sludge A - Air

021 B02274 DT-9 COMP D-1
022 B02271 DC-1-9 COMP DUP

Special Instructions:
RANDOMLY SELECT SAMPLES FOR DUPLICATE ANALYSIS AT RATE OF 10%.

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
Bio Analysis	M. Mohn	2/8/95		2/9/95	1100						

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

MOISTURE CONTENT AND pH

PROJECT	Penta Wood Products	PROJECT ANALYST	RJA	OVEN MODEL	VWR
JOB NUMBER	9502X003	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03547-040-001-0026-01	DATE RECEIVED	02/09/95	DATE COMPLETED	02/10/95

SAMPLE DATA								
BTL Sample Number	001	002	003	004	005	006	007	008
Project Sample I. D.	B02252	B02253	B02254	B02255	B02256	B02257	B02258	B02259

MOISTURE CONTENT								
Total Solids, %	78.9	78.7	77.9	79.9	80.3	80.6	82.8	82.8
Moisture Content, % wet	21.1	21.3	22.1	20.1	19.7	19.4	17.2	17.2
Moisture Content, % dry	26.7	27.1	28.4	25.2	24.5	24.0	20.8	20.8

pH								
pH, standard units	7.86	8.27	8.34	8.25	8.37	8.28	7.92	7.79
	DT 1-3 A Comp 4	DT 1-3 B Comp 4	DT 1-3 C Comp 4	DT 4-6 A Comp 4	DT 4-6 B Comp 4	DT 4-6 C Comp 4	DT 7-9 A Comp 4	DT 7-9 B Comp 4

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

MOISTURE CONTENT AND pH

PROJECT	Penta Wood Products	PROJECT ANALYST	RJA	OVEN MODEL	VWR
JOB NUMBER	9502X003	QA/QC ANALYST	RWP	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-01	DATE RECEIVED	02/09/95	DATE COMPLETED	02/10/95

SAMPLE DATA								
E.T.L. Sample Number	009	010	011	012	013	014	015	016
Project Sample I. D.	B02260	B02261	B02262	B02263	B02264	B02265	B02266	B02267
MOISTURE CONTENT								
Total Solids, %	83.0	81.8	94.4	94.2	94.4	93.9	93.8	94.0
Moisture Content, % wet	17.0	18.2	5.6	5.8	5.6	6.1	6.2	6.0
Moisture Content, % dry	20.5	22.3	5.9	6.2	6.0	6.5	6.6	6.4
pH								
pH, standard units	7.95	8.08	8.46	8.59	8.64	8.27	8.31	8.35
	DT 7-9C Comp 4	DT 1-9 Comp 4	DC 1-3A Comp 4	DC 1-3B Comp 4	DC 1-3C Comp 4	DC 4-6A Comp 4	DC 4-6B Comp 4	DC 4-6C Comp 4

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

MOISTURE CONTENT AND pH					
PROJECT	Penta Wood Products	PROJECT ANALYST	RJA	OVEN MODEL	VWR
JOB NUMBER	9502X003	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-01	DATE RECEIVED	02/09/95	DATE COMPLETED	02/10/95

SAMPLE DATA								
ETL Sample Number	017	018	019	020	021	022		
Project Sample I. D.	B02268	B02269	B02270	B02271	B02261 Dup	B02271 Dup		
MOISTURE CONTENT								
Total Solids, %	94.8	94.9	94.8	94.3	81.9	94.1		
Moisture Content, % wet	5.2	5.1	5.2	5.7	18.1	5.9		
Moisture Content, % dry	5.5	5.3	5.5	6.0	22.1	6.2		
pH								
pH, standard units	8.46	8.44	8.36	8.64	8.10	8.62		

DC 7-9A Comp 4 | DC 7-9B Comp 4 | DC 7-9C Comp 4 | DC 1-9 Comp 4 | DT 1-9 COMP 4 (DUP) | DC 1-9 COMP 4 (DUP)

Inter-Office Memorandum

TO: Mike Mohn

FROM: Russell Frye

DATE: 23 February 1995

PROJECT: Penta Wood Products

W.O. NO.: 03347-040-001-0026-01

SUBJECT: **Geotechnical Testing Results**

ACTION:

Geotechnical testing results for the Penta Wood Products project are attached. Twenty-four (24) soil samples, job number 9502X006 were submitted to WESTON's Environmental Technology Laboratory (ETL) on 10 February 1995 for geotechnical testing. Three (3) randomly selected duplicate samples were also analyzed (project sample numbers A02010, A02020, and A02024, ETL sample number 025, 026 and 027, respectively).

The geotechnical tests requested are presented in the attached custody transfer/work request.

The geotechnical tests performed including reference method and test number are presented in Table 1.

If you require additional information or have any questions, please call me at (610) 701-6173.

c:\wp51\geotech\results\restmpl.mem

02/23/95

Table 1 Geotechnical Tests Performed, Reference Methods and Test Numbers		
Test Parameter	**Method[1]**	**Test Numbers**
Natural Moisture Content	D 2216	27
Soil pH	D 4974	27

[1] All analytical methods derived from the Annual Book of ASTM Standards, Section 4, Volume 4.08, Soil and Rock; Building Stones; Geotextiles, American Society of Testing Materials, Philadelphia, PA. 1991 unless noted otherwise.

ENGINEERING- BIO

PWA 16

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: Penta Wood Products
Project Number: 03347-040-001-0026-01
RFW Contact: M. MOHN Phone: 908-321-4257

No: 09719

SHEET NO. 2 OF 2

Sample Identification / **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	pH	% moisture		
021	A02021	7C1-3-Comp5	S	2/8/95	1	4oz gl	x	x		
022	A02022	8A1-3-Comp5	|	|	|	|	|	|		
023	A02023	8B1-3-Comp5	|	|	|	|	|	|		
024	A02024	8C1-3-Comp5								
025	A02010	A1-3Comp5	DUP OF 010							
026	A02020	7B1-3-Comp5	DUP OF 020							
027	A02024	8C1-3-Comp5	DUP OF 024							

MED 3/9/95

Matrix:

SD - Sediment	PW - Potable Water	S - Soil
DS - Drum Solids	GW - Groundwater	W - Water
DL - Drum Liquids	SW - Surface Water	O - Oil
X - Other	SL - Sludge	A - Air

Special Instructions:
DUPLICATES @ 10% RATE.

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	M. Mohn	2/9/95									

FORM #4

7502X006

ENGINEERING - BIO

PWA 16

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: Penta Wood Products
Project Number: 03342-040-001-0026-01
RFW Contact: M. MOHN Phone: 908-321-4257

No: 09718

SHEET NO. 1 OF 2

Sample Identification | **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	pH	% moisture		
001	A02001	1A1-3-Comp S	S	2/8/95	1	4 oz gl/-	±	±		
002	A02002	1B1-3-Comp S								
003	A02003	1C1-3-Comp S								
004	A02004	2A1-3-Comp S								
005	A02005	2B1-3-Comp S								
006	A02006	2C1-3-Comp S								
007	A02007	3A1-3-Comp S								
008	A02008	3B1-3-Comp S								
009	A02009	3C1-3-Comp S								
010	A02010	4A1-3-Comp S								
011	A02011	4B1-3-Comp S								
012	A02012	4C1-3-Comp S								
013	A02013	5A1-3-Comp S								
014	A02014	5B1-3-Comp S								
015	A02015	5C1-3-Comp S								
016	A02016	6A1-3-Comp S								
017	A02017	6B1-3-Comp S								
018	A02018	6C1-3-Comp S								
019	A02019	7A1-3-Comp S								
020	A02020	7B1-3-Comp S								

2
3

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions:
RANDOMLY SELECT SAMPLES FOR DUPLICATE ANALYSIS AT RATE OF 10%.

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Name/Reason	Relinquished By	Date	Received By	Date	Time	Name/Reason	Relinquished By	Date	Received By	Date	Time
RV Analysis	M. Mohn	2/9/95									

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

MOISTURE CONTENT AND pH					
PROJECT	Peeta Wood Products	PROJECT ANALYST	RJA	OVEN MODEL	VWR
JOB NUMBER	9502X006	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-01	DATE RECEIVED	02/10/95	DATE COMPLETED	02/14/95

SAMPLE DATA								
ETL Sample Number	001	002	003	004	005	006	007	008
Project Sample I. D.	A 02001	A 02002	A 02003	A 02004	A 02005	A 02006	A 02007	A 02008
MOISTURE CONTENT								
Total Solids, %	82.2	81.9	84.1	83.5	82.7	80.4	67.1	68.3
Moisture Content, % wet	17.8	18.1	15.9	16.5	17.3	19.6	32.9	31.7
Moisture Content, % dry	21.6	22.2	18.9	19.7	20.9	24.4	49.1	46.4
pH								
pH, standard units	5.41	5.34	5.42	7.13	7.19	7.14	7.12	7.14

1A1-3 COMP 5 1B1-3 1C1-3 2A1-3 2B1-3 2C1-3 3A1-3 3B1-3

Hw: 17.3
pH: 5.4

Hw: 17.1
pH: 7.2

Hw = 32.3
pH = 7.1

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

MOISTURE CONTENT AND pH

PROJECT	Penta Wood Products	PROJECT ANALYST	RJA	OVEN MODEL	VWR
JOB NUMBER	9502X006	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-01	DATE RECEIVED	02/10/95	DATE COMPLETED	02/14/95

SAMPLE DATA								
ETL Sample Number	009	010	011	012	013	014	015	016
Project Sample I. D.	A 02009	A 02010	A 02011	A 02012	A 02013	A 02014	A 02015	A 02016

MOISTURE CONTENT								
Total Solids, %	67.8	72.2	78.1	75.5	67.5	64.1	64.6	81.2
Moisture Content, % wet	32.2	27.8	21.9	24.5	32.5	35.9	35.4	18.8
Moisture Content, % dry	47.6	38.6	28.1	32.4	48.1	56.1	54.9	23.1

pH								
pH, standard units	7.17	7.17	7.35	7.34	7.32	7.36	7.53	6.61

3C1-3 4A1-3 4B1-3 4C1-3 5A1-3 5B1-3 5C1-3 6A1-3

H20 : 24.7
pH : 7.3

H20 : 34.6
pH : 7.4

T

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ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

MOISTURE CONTENT AND pH

PROJECT	Penta Wood Products	PROJECT ANALYST	RJA	OVEN MODEL	VWR
JOB NUMBER	9502X006	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-01	DATE RECEIVED	02/10/95	DATE COMPLETED	02/14/95

SAMPLE DATA								
ETL Sample Number	017	018	019	020	021	022	023	024
Project Sample I. D.	A 02017	A 02018	A 02019	A 02020	A 02021	A 02022	A 02023	A 02024

MOISTURE CONTENT								
Total Solids, %	81.1	81.6	84.3	85.6	82.7	77.9	77.2	77.4
Moisture Content, % wet	18.9	18.4	15.7	14.4	17.3	22.1	22.8	22.6
Moisture Content, % dry	23.2	22.5	18.7	16.9	20.9	28.4	29.5	29.1

pH								
pH, standard units	6.67	6.44	6.29	6.34	5.96	6.52	6.87	7.04

6B1-3 6C1-3 7A1-3 7B1-3 7C1-3 8A1-3 8B1-3 8C1-3

Htw = 18.7
pH = 6.6

Htw = 15.8
pH = 6.2

Htw = 22.5
pH = 6.8

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

MOISTURE CONTENT AND pH								
PROJECT	Penta Wood Products		PROJECT ANALYST		RJA	OVEN MODEL		VWR
JOB NUMBER	9502X006		QA/QC ANALYST		RWF	OVEN TEMPERATURE, C		105
W. O. NUMBER	03347-040-001-0026-01		DATE RECEIVED		02/10/95	DATE COMPLETED		02/14/95

SAMPLE DATA								
ETL Sample Number	025	026	027					
Project Sample I. D.	A 02010 Dup	A 02020 Dup	A 02024 Dup					

MOISTURE CONTENT								
Total Solids, %	72.2	85.5	77.1					
Moisture Content, % wet	27.8	14.5	22.9					
Moisture Content, % dry	38.5	17.0	29.8					

pH								
pH, standard units	7.20	6.32	6.99					

WESTON

SHEET ____ of ____

CLIENT/SUBJECT PWP W.O. NO. ____

TASK DESCRIPTION Event 6 - Average calcs. TASK NO. ____

PREPARED BY MFM DEPT ____ DATE ____

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____

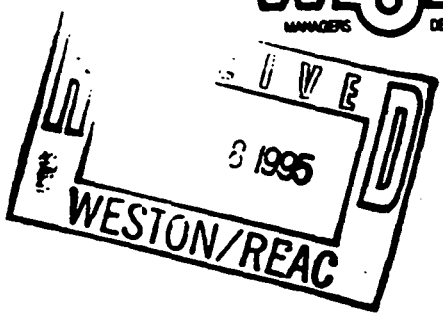
Pile	% H2O	pH
1	17.5	5.2
2	22.3	5.9
3	33.1	~~6.85~~ 6.9
4	25.9	6.2
5	36.1	7.6
6	20.7	6.5
7	17.5	6.5
8	24.4	6.8

[illegible] Daramend

SAMPLE	% H_2O	pH
DT 1-3A	19.7	8.6
1-3B	18.9	8.5
1-3C	19.0	8.6
4-6A	17.8	8.3
4-6B	17.9	8.3
4-6C	17.4	8.2
7-9A	17.2	7.7
7-9B	17.2	~~7.8~~ 7.9
7-9C	17.4	7.9
Average	18.1	8.2
DT 1-9 comps	18.5/18.6	8.5/8.6
DC 1-3A	3.5	8.4
1-3B	3.5	8.3
1-3C	3.3	8.3
4-6A	3.8	8.3
4-6B	4.1	8.3
4-6C	3.8	8.4
7-9A	3.3	8.4
7-9B	3.0	8.3
7-9C	3.1	8.6
Average	3.5	8.4
DC 1-9	3.0/3.2	8.7/8.7

Inter-Office Memorandum

WESTON MANAGERS DESIGNERS/CONSULTANTS



TO: Mike Mohn

FROM: Russell Frye RF 6173

DATE: 10 April 1995

PROJECT: Penta Wood Products

W.O. NO.: 03347-040-001-0006-01

SUBJECT: **Geotechnical Testing Results**

ACTION:

Geotechnical testing results for the Penta Wood Products project are attached. Twenty-Seven (27) soil samples, job number 9503X006 were submitted to WESTON's Environmental Technology Laboratory (ETL) on 16 March 1995 for geotechnical testing.

The geotechnical tests requested are presented in the attached custody transfer/work request.

The geotechnical tests performed including reference method and test number are presented in Table 1.

If you require additional information or have any questions, please call me at (610) 701-6173.

Table 1 Geotechnical Tests Performed, Reference Methods and Test Numbers		
Test Parameter	**Method[1]**	**Test Numbers**
Natural Moisture Content	D 2216	22
Soil pH	D 4974	22

1 All analytical methods derived from the Annual Book of ASTM Standards, Section 4, Volume 4.08, Soil and Rock; Building Stones; Geotextiles, American Society of Testing Materials, Philadelphia, PA, 1991 unless noted otherwise.

ENGINEERING - BIO - COMPOST PWA 18R

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

95C3X006
[redacted]271

CHAIN OF CUSTODY RECORD

Project Name: PENTA WOOD PRODUCTS
Project Number: 0334J-OW-001-0026-01
RFW Contact: M. MOHN Phone: (908) 321-4200

No: 099013

SHEET NO. 1 OF 2

Sample Identification

Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	pH	Pyrosfate		
001	A02936	1A1-3 Comp6	S	3/14/95	1	40zglss / none	X	X		
002	A02937	1B1-3 Comp6								
003	A02938	1C1-3 Comp6								
004	A02939	2A1-3 Comp6								
005	A02940	2B1-3 Comp6								
006	A02941	2C1-3 Comp6								
007	A02942	3A1-3 Comp6								
008	A02943	3B1-3 Comp6								
009	A02944	3C1-3 Comp6								
010	A02945	4A1-3 Comp6								
011	A02946	4B1-3 Comp6								
012	A02947	4C1-3 Comp6								
013	A02948	5A1-3 Comp6								
014	A02949	5B1-3 Comp6								
015	A02950	5C1-3 Comp6								
016	A02951	6A1-3 Comp6								
017	A02952	6B1-3 Comp6								
018	A02953	6C1-3 Comp6								
019	A02954	7A1-3 Comp6								
020	A02955	7B1-3 Comp6	↓	↓	↓	↓	↓	↓		

3 bottles

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:

Perform duplicate analyses randomly at rate of 10%

temp 5.6

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
Analysis	[redacted]	3/15/95	[redacted]	3/16/95	1500		Fed Ex	3-16-95	T. Bevins	3-16-95	5:30

ENGINEERING - BIO - COMPOST - PWA 18R

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

9503X006
~~9503X271~~

CHAIN OF CUSTODY RECORD

Project Name: PONTA WOOD PRODUCTS
Project Number: 03347-040-001-0026-01
RFW Contact: M. MOHN Phone: (908) 321-4200

No: 09009

SHEET NO. 2 OF 2

Sample Identification / Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	pH	% moisture		
021	A02956	7C1-3 Comp6	S	3/14/95	1	4oz glass/none	X	X		
022	A02957	8A1-3 Comp6	↓	↓	↓	↓	↓	↓		
023	A02958	8B1-3 Comp6	↓	↓	↓	↓	↓	↓		
024	A02959	8C1-3 Comp6	↓	↓	↓	↓	↓	↓		

3/15/95 3/15/95

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

temp 5.6

Special Instructions:
perform duplicate analyses randomly at a rate of 10%

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
all/Analysis	[illegible]	3/15/95	[illegible]	3/16/95	1500		Fed Ex	3-16-95	I. Bemis	3-16-95	950

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

MOISTURE CONTENT AND pH

PROJECT	Penta Wood Products	PROJECT ANALYST	RJA	OVEN MODEL	VWR
JOB NUMBER	9503X006	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-01	DATE RECEIVED	03/16/95	DATE COMPLETED	04/04/95

SAMPLE DATA								
ETL Sample Number	001	002	003	004	005	006	007	008
Project Sample I. D.	AO2936	AO2937	AO2938	AO2939	AO2940	AO2941	AO2942	AO2943

MOISTURE CONTENT								
Total Solids, %	82.7	82.5	82.3	77.8	77.2	78.0	68.9	65.9
Moisture Content, % wet	17.3	17.5	17.7	22.2	22.8	22.0	31.1	34.1
Moisture Content, % dry	21.0	21.2	21.5	28.5	29.5	28.2	45.2	51.8

pH								
pH, standard units	5.31	5.07	5.10	5.89	6.00	5.82	6.83	6.90

1A1-3 1B1-3 1C1-3 2A1-3 2B1-3 2C1-3 3A1-3 3B1-3

Comp 6

Hw = 17.5
pH = 5.2

Hw = 22.3
pH = 5.9

Hw = 33.1
pH = 6.85

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

MOISTURE CONTENT AND pH

PROJECT	Penta Wood Products	PROJECT ANALYST	RJA	OVEN MODEL	VWR
JOB NUMBER	9503X005	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-01	DATE RECEIVED	03/16/95	DATE COMPLETED	04/04/95

SAMPLE DATA								
ETL Sample Number	009	010	011	012	013	014	015	016
Project Sample I. D.	AO2944	AO2945	AO2946	AO2947	AO2948	AO2949	AO2950	AO2951

MOISTURE CONTENT								
Total Solids, %	66.0	75.3	73.9	73.1	66.3	63.8	61.5	77.7
Moisture Content, % wet	34.0	24.7	26.1	26.9	33.7	36.2	38.5	22.3
Moisture Content, % dry	51.4	32.8	35.2	36.8	50.9	56.8	62.5	28.8

pH								
pH, standard units	6.82	6.03	6.30	6.29	7.41	7.67	7.65	6.53

3C1-3 4A1-3 4B1-3 4C1-3 5A1-3 5B1-3 5C1-3 6A1-3

Htw = 25.9
pH = 6.2

Htw = 36.1
pH = 7.6

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

MOISTURE CONTENT AND pH

PROJECT	Penta Wood Products	PROJECT ANALYST	RJA	OVEN MODEL	VWR
JOB NUMBER	9503X005	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-01	DATE RECEIVED	03/16/95	DATE COMPLETED	04/04/95

SAMPLE DATA								
ETL Sample Number	017	018	019	020	021	022	023	024
Project Sample I. D.	AO2952	AO2953	AO2954	AO2955	AO2956	AO2957	AO2958	AO2959

MOISTURE CONTENT								
Total Solids, %	79.9	80.2	82.9	84.0	80.6	74.4	75.6	76.8
Moisture Content, % wet	20.1	19.8	17.1	16.0	19.4	25.6	24.4	23.2
Moisture Content, % dry	25.2	24.7	20.7	19.1	24.1	34.4	32.3	30.1

pH								
pH, standard units	6.48	6.38	6.31	6.47	6.29	6.63	6.77	7.09

6B1-3 6C1-3 7A1-3 7B1-3 7C1-3 8A1-3 8B1-3 8C1-3

Hwo = 20.7
pH = 6.5

Hwo = 17.5
pH = 6.5

Hwo = 24.4
pH = 6.8

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

MOISTURE CONTENT AND pH

PROJECT	Penta Wood Products	PROJECT ANALYST	RJA	OVEN MODEL	VWR
JOB NUMBER	9503X005	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-01	DATE RECEIVED	03/16/95	DATE COMPLETED	04/04/95

SAMPLE DATA								
ETL Sample Number	025	026	027					
Project Sample I. D.	AO2945 Dup	AO2955 Dup	AO2959 Dup					

MOISTURE CONTENT								
Total Solids, %	73.6	84.3	76.4					
Moisture Content, % wet	26.4	15.7	23.6					
Moisture Content, % dry	35.9	18.6	30.8					

pH								
pH, standard units	6.05	6.46	7.09					

Inter-Office Memorandum

WESTON MANAGERS DESIGNERS/CONSULTANTS

TO: **Mike Mohn**

FROM: **Russell Frye** DATE: **10 April 1995**

PROJECT: **Penta Wood Products** W.O. NO.: **03347-040-001-0006-01**

SUBJECT: **Geotechnical Testing Results**

ACTION:

Geotechnical testing results for the Penta Wood Products project are attached. Twenty-Two (22) soil samples, job number 9503X005 were submitted to WESTON's Environmental Technology Laboratory (ETL) on 16 March 1995 for geotechnical testing.

The geotechnical tests requested are presented in the attached custody transfer/work request.

The geotechnical tests performed including reference method and test number are presented in Table 1.

If you require additional information or have any questions, please call me at (610) 701-6173.

Table 1 Geotechnical Tests Performed, Reference Methods and Test Numbers		
Test Parameter	**Method[1]**	**Test Numbers**
Natural Moisture Content	D 2216	22
Soil pH	D 4974	22

1 All analytical methods derived from the Annual Book of ASTM Standards, Section 4, Volume 4.08, Soil and Rock; Building Stones; Geotextiles, American Society of Testing Materials, Philadelphia, PA, 1991 unless noted otherwise.

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022
9503X005
~~9503CI70~~

ENGINEERING ... LANDFARM - PWA 18R

CHAIN OF CUSTODY RECORD

Project Name: PENTA WOOD PRODUCTS
Project Number: 03347-040-001-0026-01
RFW Contact: M. MOHN Phone: (908) 321-4200

No: 09911

SHEET NO. 1 OF 1

Sample Identification							Analyses Requested			
REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	pH	% moisture		
001	B02235	DT 1-3A Comps	S	3/14/95	1	4oz glass / none	X	X		
002	B02236	DT 1-3B Comps	↓	↓	↓	↓	↓	↓		
003	B02237	DT 1-3C Comps								
004	B02238	DT 4-6A Comps								
005	B02239	DT 4-6B Comps								
006	B02477	DT 4-6C Comps								
007	B02478	DT 7-9A Comps								
008	B02479	DT 7-9B Comps								
009	B02480	DT 7-9C Comps								
010	B02481	DT 1-9 Comps								
011	B02482	DC 1-3A Comps								
012	B02483	DC 1-3B Comps								
013	B02484	DC 1-3C Comps								
014	B02485	DC 4-6A Comps								
015	B02486	DC 4-6B Comps								
016	B02487	DC 4-6C Comps								
017	B02488	DC 7-9A Comps								
018	B02489	DC 7-9B Comps								
019	B02490	DC 7-9C Comps								
020	B02491	DC 1-9 Comps	↓	↓	↓	↓	↓	↓		

Matrix:
SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other SL - Sludge A - Air

temp 5.6

Special Instructions:
Perform duplicate analyses randomly at rate of 10%

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
20/Analysis	D. Enchi	3/15/95	[illegible]	3/16/95	1300		Fed Ex	3-16-95	I. Bernie	3.16.95	9:30

8/94

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

MOISTURE CONTENT AND pH

PROJECT	Penta Wood Products	PROJECT ANALYST	RJA	OVEN MODEL	VWR
JOB NUMBER	9503X005	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-01	DATE RECEIVED	03/16/95	DATE COMPLETED	04/04/95

SAMPLE DATA								
ETL Sample Number	001	002	003	004	005	006	007	008
Project Sample I. D.	BO2235	BO2236	BO2237	BO2238	BO2239	BO2477	BO2478	BO2479

MOISTURE CONTENT								
Total Solids, %	80.3	81.1	81.0	82.2	82.1	82.6	82.8	82.8
Moisture Content, % wet	19.7	18.9	19.0	17.8	17.9	17.4	17.2	17.2
Moisture Content, % dry	24.5	23.4	23.4	21.6	21.8	21.1	20.8	20.8

pH								
pH, standard units	8.56	8.50	8.57	8.33	8.30	8.20	7.71	7.87

DT 1-3A Comp 5 DT 1-3 B DT 1-3C DT4-6A DT4-6 B DT4-6C DT 7-9A DT 7-9 B

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

MOISTURE CONTENT AND pH

PROJECT	Penta Wood Products	PROJECT ANALYST	RJA	OVEN MODEL	VWR
JOB NUMBER	9503X005	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-01	DATE RECEIVED	03/16/95	DATE COMPLETED	04/04/95

SAMPLE DATA								
ETL Sample Number	009	010	011	012	013	014	015	016
Project Sample I. D.	BO2480	BO2481	BO2482	BO2483	BO2484	BO2485	BO2486	BO2487

MOISTURE CONTENT								
Total Solids, %	82.6	81.5	96.5	96.5	96.7	96.2	95.9	96.2
Moisture Content, % wet	17.4	18.5	3.5	3.5	3.3	3.8	4.1	3.8
Moisture Content, % dry	21.1	22.7	3.6	3.6	3.4	4.0	4.3	4.0

pH								
pH, standard units	7.94	8.54	8.43	8.34	8.30	8.30	8.32	8.38
	DT 7-9 C	DT 1-9 Cans	DC 1-3A	DC 1-3B	DC 1-3C	DC 4-6A	DC 4-6B	DC 4-6C

ROY F. WESTON, INC. ENVIRONMENTAL TECHNOLOGY LABORATORY

MOISTURE CONTENT AND pH

PROJECT	Penta Wood Products	PROJECT ANALYST	RJA	OVEN MODEL	VWR
JOB NUMBER	9503X005	QA/QC ANALYST	RWF	OVEN TEMPERATURE, C	105
W. O. NUMBER	03347-040-001-0026-01	DATE RECEIVED	03/16/95	DATE COMPLETED	04/04/95

SAMPLE DATA								
ETL Sample Number	017	018	019	020	021	022		
Project Sample I. D.	BO2488	BO2489	BO2490	BO2491	BO2481 Dup	BO2491 Dup		
MOISTURE CONTENT								
Total Solids, %	96.7	97.0	96.9	97.0	81.4	96.8		
Moisture Content, % wet	3.3	3.0	3.1	3.0	18.6	3.2		
Moisture Content, % dry	3.4	3.1	3.2	3.1	22.9	3.3		
pH								
pH, standard units	8.44	8.34	8.61	8.70	8.55	8.68		
	DC 7-9 A	DC 7-9 B	DC 7-9 C	DC 1-9 comp 5	DT 1-9 comp 5	DT 1-9 comp 5		

Pile	9/11/95			10/22/95			11/28/95			01/03/95			2/8/95			3/14/95		
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
1	ND	ND	ND	13.1	14.0	13.6	10.1	10.4	10.2	4.4	5.5	5.0	8.4	9.1	8.8	16.5	16.8	16.7
2	ND	ND	ND	13.5	14.1	13.7	14.0	14.0	14.0	7.5	8.3	7.9	11.3	12.2	11.8	17.3	18.4	18.1
3	ND	ND	ND	12.4	13.8	13.3	12.7	12.7	12.7	4.2	4.2	5.4	10.5	10.4	10.5	16.4	17.1	16.9
4	ND	ND	ND	12.7	14.1	13.6	11.7	11.7	11.7	4.8	5.7	5.2	8.1	8.5	8.3	14.3	15.1	14.9
5	ND	ND	ND	12.1	13.4	12.8	14.6	14.8	14.7	7.6	8.2	7.9	10.7	11.2	11.0	15.7	16.9	16.5
6	ND	ND	ND	12.3	13.2	12.8	13.7	13.9	13.8	8.0	8.5	8.3	10.2	10.9	10.6	15.9	16.1	16.0
7	ND	ND	ND	12.0	13.0	12.6	10.9	11.1	11.0	7.1	8.2	7.5	11.7	12.2	12.0	15.7	16.0	15.9
8	ND	ND	ND	12.4	12.9	12.7	13.3	13.7	13.5	6.5	7.1	6.8	7.8	8.3	8.0	14.4	15.3	14.8
Big Ambient	ND	ND	ND	12.3	13.6	13.2	11.0	12.4	11.6	7.0	17.1	12.2	-2.6	14.8	7.5	12.7	21.9	15.7
utside Amble	ND	ND	ND	ND	ND	ND	ND	ND	ND	-19.3	-11.0	-16.0	-17.7	-5.9	-10.7	9.6	14.5	12.3

Biopile temperature data

Note: these data are from the day before each sampling event. Since the thermocouples were removed from the piles on sampling days - the daily average would be affected. The temperature of the piles on the day before sampling days is expected to be similar.

M.T. Mork 5/24/95

Date	Pile 1			Pile 2			Pile 3			Pile 4			Pile 5			Pile 6			Pile 7			Pile 8			Bldg Ambient			Outside Ambient		
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
→	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
40	6.53	13.95	10.58	8.67	15.33	11.03	6.59	16.4	11.22	9.53	16.72	12.7	8.67	17.26	11.63	9.25	15.98	11.52	9.91	13.67	11.17	-51.7	15.16	-9.67	9.39	16.14	11.12	ND	ND	ND
	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
113	2.76	3.8	3.363	6.5	7.14	6.92	2.8	3.83	3.398	-102	52.84	-15.4	6.82	7.43	7.098	7.2	7.8	7.455	6.21	7.26	6.783	5.86	6.35	6.108	9.12	13.52	11.38	-22.8	-18.2	-20.4
147	8.4	9.1	8.82	11.3	12.2	11.78	10.4	10.7	10.54	-97.3	0	-39.7	10.7	11.2	10.96	10.2	10.9	10.56	11.7	12.2	11.96	7.8	8.3	8.04	-2.9	14.8	7.54	-17.7	-5.9	-10.7
184	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

BIOPILE TEMPERATURE MEASUREMENTS (°C)

9/12/94 – COLLECTED MANUALLY W/ THERMOCOUPLE

BIOPILE	READINGS	AVERAGE
1	20.8, 20.9, 21.5	21.1
2	27.3, 26.7, 24.9	27.1
3	29.0, 30.6, 27.9	29.2
4	28.8, 29.6, 29.9	27.8
5	37.0, 38.6, 38.3	~~26.2~~ 38.0
6	27.1, 26.9, 25.0	26.2
7	22.3, 21.7, 22.5	22.2
8	24.2, 24.2, 23.9	24.1

Ambient = 19.6 °C

Each # represents a complete depth core. This core will be composited well mixed + then divided into 4 samples. (3 samples for PCP + 1 for other parameters).

This protocol will result in:

PCP: 9 samples per pile x 8 piles = 72

Other: 3 samples/pile x 8 piles = 24

1400 cl told D Crowe the results of our discussion with H. Allen.

1700 Gave D. Crowe my memo on S/S to cancel - he said he will read it over the weekend & let me know if OK. I gave Rick H. the disk + hard copy of the memo as is.

1730 Left REAC

M. Mol 9/9/94

9/11/94 0600 - Got picked up by Arrow Service - started to Edina to pick up R. Vennie to go_th to Newark Airport → PWP site.

1100 Arrived at Minn (St Paul airport.

REAC
13

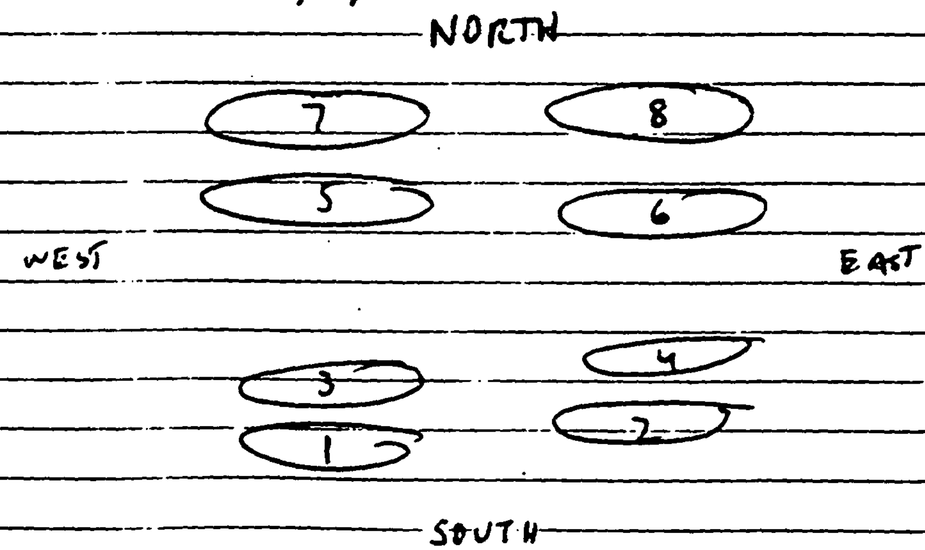
1130 Took ½ hr lunch

1200 Started towards Siren, WI.

~1315 Arrived at Wood River Dam & checked in. We will soon go to PWP site.

1430 Got to Wood River site – no one there. Went to town to see if we could purchase equipment. Went back to PWP site – met M. [illegible], S. Butler, & K. [illegible] there. They had been in the lower part of the site earlier & did not see us.

~1600 Started to do sampling of bio piles. Layout of piles:



5)
1)
2)
3)
4)
5)

1C1 1B1
1C2 1B2
1C3 1B3
1C4 1B4

Sampling procedure:

1) Divide compost pile into 3 equal sections by length.

2) Use 4" hand auger - obtain core sample down to chips at bottom.

3) Remove all soil & place into 5 gal plastic bucket. Screen w/ 1/4" screen.

4) ~~Composite~~ REP Mix up sample well & place into 4 x 4 oz glass jars & 1 x 8 oz glass jar.

5) Samples: this will provide, for each pile:

a) 3 sets of 3 equal (replicate) samples for PLP analysis.

b) 3 sets of 1 x 4 oz } for other
1 x 8 oz } parameters
(To be sent to S/C Lab).

Pile 1 (control - 2 yd³ soil + 2 yd³ wood chips) - samples called:

1C1	1B1	1) 1A1 Comp.	GIVEN DISCRETE SAMPLE NAMES
1C2	1B2	2) 1A2 Comp	
1C3	1B3	3) 1A3 Comp.	
1C4	1B4	4) 1A4 Comp	1 x 4 oz - S/C Lab 1 x 8 oz

In all cases, a sample for pH was grabbed, + also for % moisture. These samples will be tested tomorrow.

Pile 2 – 2 yd³ soil + 2 yd³ wood chips + 1 yd³ turkey manure.

Samples:

1) 2A1	2B1	2C1
2A2	2B2	2C2
2A3	2B3	2C3
2A4	2B4	2C4

"A" sample was obtained from Western side of pile, "B" from middle, + "C" from Eastern side of pile.

MFP 1900 ~~1930~~ ~~Left PWP site~~ Finished sampling piles 1+2 – started to decon all buckets + sampling tools.

MFP 1945 ~~1730~~ Left PWP site w/ MANO.

2000 Got to hotel – went to dinner

2100 Wrote up notes + plan tomorrow – we will finish sampling tomorrow + ship samples. We will then set up system & run manually if needed.

2130

M. [illegible] 9/11/94

...a pH was
moisture.
tomorrow.
...yd³ wood
...ure.
...to Western
...iddle, +
...le.
...samples
...ion all
...v.
...liner
tomorrow -
...rrow. +
...then set up
needed.
- 9/11/94

9/12/94 0730 Arrived at PWP site.

Talked to Brad Stemple (TAT) - he asked us if we could do a PCP in water test sample - I said OK. I asked RAMU to do it. This water sample is from MW 6 (shallow) well.

Brad said the pump test is scheduled for ~~the~~ 9/27. They still have to get a liner for the storage lagoon.

0900 Ramu started to prep sample for pH, + % H_2O.

I started to pack samples for shipment to H.H. Lab in Brunswick, GA.

1200 We sampled bio piles 3 + 4

Pile 3: 2 yd³ soil + 2 yd³ wood chips + 1 yd³ turkey manure + 1 bag NH_3NO_3.

Pile 4: 2 yd³ soil + 2 yd³ wood chips + 2 yd³ turkey manure ~~+~~

3A1	3B1	3C1	4A1	4B1	4C1
3A2	3B2	3C2	4A2	↓	↓
3A3	3B3	3C3	4A3	↓	↓
3A4	3B4	3C4	4A4	4B4	4C4

1530 Went to lunch

1600 Called H. Allen at ERT - told him we plan to finish grabbing samples today. Tomorrow we will manually add the to piles - to get 60% H2O. How much we add will be based on % H2O figures from samples in oven now.

Told him we are monitoring pH + temp.

I also said we should add the water slowly - not in 1 dose. He agreed with me. He also said that my E-mail regarding the postponing of my project report was OK.

He also said that I could give my copy of the S/S memo to Wally - even though I told him that nobody had read through it + reviewed it. He + said don't worry about it.

1610 Started to get samples from piles 5-8.

Pile 5: 2 yd^3 soil + 2 yd^3 wood chips + 1 yd turkey manure + 0.5 yd^3 expanded sawdust.

same as 5?
KG.

Pile 6: 2 yd^3 soil + 2 yd^3 wood chips + 1 yd^3 turkey manure + 0.5 yd^3 expanded sawdust

Pile 7: 2 yd^3 soil + 2 yd^3 wood chips + 1 yd^3 sawdust + 1 bag NH_3NO_3

Pile 8: 2 yd^3 soil + 2 yd^3 wood chips + 1 yd^3 expanded sawdust + 1 bag NH_3NO_3

All samples were obtained. We also got samples ~~from~~ for pH, % H_2O, + temp readings.

~~Ht~~: I also held a wet pH paper above piles 1-4. Pile 1 - paper did not change ∴ no NH_3 given off. Pile 2-4. - paper turned to pH 10-11. ∴ NH_3 given off.

Left site ~ 8:10 pm.

9/13/94 0730 Went to PWP site

Started doing paperwork on all PCP samples. Packed up remaining PCP samples for shipment to HHL. Packed up samples for other parameters. Sent all samples out.

Called JoANN Boyd at SRI - told her we are going to send out TPH as an additional parameter for the soil samples.

Also called John Johnson - told him I was going to add TPH to PWA # 58. He said OK. I also said that the PWA for the soil flushing study - which included 22 TPH. I said the TPH slots were still open. He said OK

Shipped all samples out by Fed Ex.

Added 10 gal of H2O to each of the 8 piles - just to start the wetting process.

Cleaned up lab area & packed materials & equipment up to ship back to PSSC

Left site at

9/14/94

all
remaining
to HHL.
parameters.

I -
send out
ameter for

told him
PWA # 8R.
said that
ship study -
I said
open 1k

, Fed Ex.

of the
ting process.

ial materials
to room

9/14/94 0730 arrived at PWP site

Started to get piles ready - Wally told me that he would send me a worker to help me.

Todd ___ (TMT) came to help me set up the water distribution system for the piles.

Water in 7000 gal tank
↓
850 gal day tank — 2 SUBMERSIBLES (INDEPENDENT)
PILES 1-4 PILES 5-8

I hooked up air distribution system.

4 air blowers - used - ~~2 per pile~~
2 piles per blower

Problem w/ overload of current?
Fuse blew - we need to get new fuses + Power strips.

Only 2 air blowers were hooked up.

left site at 2000

M. Mol 9/14/94

9/15/94 0730 Arrived at site

Having pump &/or electrical problem. No pumps are working.

Ramm will do porosity of samples.

I will grab sample of soil blend used to make piles – for geotech analysis. Went to area where Brad Stimple (TAT) told me it is located – could not find it. – it looks like ~~not~~ only 2 piles of 1) sawdust + 2) sand are there. (they are the ingredients).

~0900 Got message from H. Compton about Evendum – he wants to know what the status is. I called + left him a voice mail – told him that:

1) Eliminated SEM + EDAX

2) We are only doing MEP on 4 samples (see p. 160).

Worked on water distribution system – got everything set up. Used electricity from the lab (for sump pump).

9/16/94

2400
~~1200~~

9/19/94

9/16/94 Arrived at 0730 to site

Talked to Walter Neils (OSC - Pini Wood Prod) - showed him the line pile report - he said it looked good. He asked me to give him a list of things for them to do as far as operating the system.

I made up a list of items & left it on Wally's desk. We left the site at ~ 2:00 pm & went to the airport.

2400 ~~1200~~ am — I got home at 12:00 pm (midnight).

M. Mot 9/16/94

9/19/94 0730 Arrived REAC

Worked on memo for H. Allen - ~~made~~ made table corrections.

Called Brad Stemple (TAT - 715-349-7798) & Willy Neils - left message with each - told them we need a place to put the computer. We also need a phone line to connect the computer up with.

Brad asked me to check with H. Allen

10/19/99 0730 Arrived NEAL

Started to pack for PWP trip - went over manifest w/ R. Vemuri. We then went to Bay to start packing.

We will send sampling equipment, H&S stuff, tarps, string, to arrive at Ward River dam on 10/20. The rest of the material will be shipped to PWP site on Fri, 10/21/99.

H. Allen said the keys will be shipped to Ward River dam on 10/20/99.

1200 lunch

1215 Worked on sed flushing memo - gave to D. Crowne to review.

1300 Went over manifest - made sure that we are not forgetting anything.

1630 Left NEAL

M. Mah 10/19/99

10/20/99 Got picked up by Arrow limo at 5:00 am. Picked up P. Sarnick, R. Lewis + R. Vemuri, - went to Newark airport.

0840 Got on flight to M[illegible]apolis

1100 Arrived at Minneapolis airport ~1415

Went to Hertz - got rental car

1200 Lunch

~ 1230 Drove to A to Z rental - picked up Bobcat, trailer, & Rototiller. 1720

Started to drive to Grantsburg

~ 1400 Checked in at hotel

Heard a grinding noise in car on way to hotel - sounded like grinding - only lasted ~1 sec each time. At hotel - called Hertz - spoke to Sue at 1-800-654-4173. Told her about noise. She said she would put a note in computer. 1900 10/21/97

She said if I had further trouble, call up & she might get another car delivered. I said OK.

~ 1410 Called YI WHE LIN - he said I could ship saplings on Mon rather than tomorrow. (I will collect Sun & Mon).

~1415 Called C. Snyder - asked her about Ferrell Gas Co. - she said it is OK to call - I will call Wade Clavin - set up schedule

1420 Called Wade Clavin at Ferrell Gas Co - 715-866-4311. He said he will deliver the tanks on Monday morning. Heaters will probably arrive Mon or Tues I said OK.

Started to pack up items left on site previously - to send back to REAC.

1900 Left PWP site

M Mok 10/20/97

10/21/97 0730 Arrived at PWP site

MFM, R. Lewis, P. Sarsich, R. Vennari

P. Sarsich worked on computer control of pile.

M. Mok + R. Vennari - collected samples of bio pile. Procedure: Collected 3 individual cores from each pile. Pile 1 had 1A (west end), 1B, + 1C (east end). Each core was MFM composited ~~+ then the sample was quabbed~~.

Each composite was screened through a "¼" screen. Then the sample was grabbed from the screened material. 5 samples for pH & % moisture were also taken 10/22/99

pH measurements were obtained & moisture samples were put in the oven

10/22/99
~~10/23/99~~
SATURDAY

10/22/99

MFM

10/22/99
~~10/23/99~~ Arrived PWP site at 0730.
SATURDAY

MFM, P.S, RL, RV.

Worked on sewing together giant 50' x 80' tarp. Installed in bio bldg.

R V[illegible] started to put together ~~[illegible]~~ ^new anaerobic dechlorination reactor.

Fixed sump pump – [illegible] ^line was below surface level of liquid in tank – it was siphoning back + making pump work more often. – Raised hose to prevent siphoning. OK.

Monday
10/24/94

P. Bueso - working on Daramend study set up. Rods set up to hold Daramend / soil mixture + control soil.

2070
~~2000~~ - Left site. M. Mol 10/23/94

23
10/~~24~~/94 0730 Arrived PWP site - MPM, P. Sanok, R. Lewis, R. Vemuri.
MPM
SUNDAY P. Bueso also arrived.

R. Lewis went to work w/ P. Bueso to help him w/ Daramend work. P. Bueso said he will be done tomorrow (Mon).

P. Sanok - working on oxygen control of pits.

R. Vemuri - string anaerobic dechlorinate samples. He is then going to obtain samples

2000 Left PWP site.

2115 Worked on plan for activities at PWP tomorrow

2140 Worked on Eversdon final report -

2310 Stopped working on Eversdon report

M. Mol 10/23/94

Monday
10/24/94 0730 Arrived PW P site

Packed samples for YI HVA LIN - sent samples from this pile to High Hazard Lab.

MFA
~~Talked to Wally Hinds~~

Heater company (Ferrell Gas in Webster) came to site to install 3 x 1000 gal tanks. Also installed 2 x 350,000 BTU torpedo heaters. One heater does not turn on. - I will call them back. They are coming tomorrow to fill tanks with propane.

Talked to Wally - He told me:
He asked me
1) OK to drain large 7000 gal tank. I told him I would put a submersible pump in the tank + let it drain onto the ground. He said OK. I (+ Brad Stringle) told him that the groundwater in it had a very low level of PCP. He said OK.

2) I told him that I gave the Ferrell gas man the site key. He said he would rather not give it out. He asked me to get it back. I said OK. He said to tell them to

call him up to arrange a site visit when they need to check things out.

3) He asked me what the water temperature is. I said I would find out.

4) He asked me what the pile temperature was. I said it didn't look like it had changed much.

5) He said he would send people up if I needed them to help look after things, etc.

They may be able to help with:

1) Roto tilling (every 2 weeks)

2) Collecting % H₂O samples. (every 2 weeks)

3) Getting leachate, feed water, & sawdust juice readings (whenever at site).

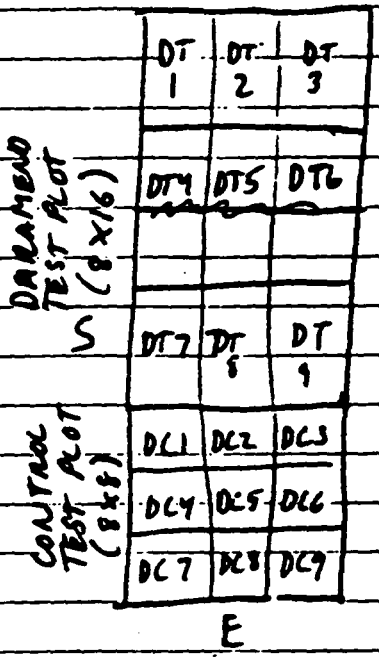
He seemed like he was very agreeable to ~~some of~~ us being there & was willing to help us.

DARAMEND

CONSTRUC

Collected samples from Diamond pile.

Layout of samples were:



Samples were taken as shown above (for PCP). Other parameters were taken as composites: DT 1-3 comp
DT 4-6 comp
DT 7-9 Comp
DC 1-3 Comp
DC 4-6 Comp
DC 7-9 Comp

DT 1-3 Comp Un
DT 4-6 Comp Un
DT 7-9 Comp Un

Note: all samples were first screened

through a "1/4" screen before collecting the sample.

10/26/83

10/26/99 0730 Went to Punta Gorda

Drained out 700 gal tank.

Filled day tank & half filled other leachate tank.

Finished building metal cages to put over the heaters for protection.

Set heaters at ~65°F

Set day tank water heater at ~65-70°F. It was set at ~60°F.

Left PWP site at ~ 14:30

Went to Wood River Clean to check out.

Drove to airport -

Got home at 12:30 am (00 30 on 10/27/99)

M. Mok 10/26/99

be an order for > 20K :. may have to go to Cincinnatti to be checked + approved

~1430

1400 Talked to F Mills — he said it is OK to kill samples w/ formaldehyde, then send later.

1710 Talked w/ Paul Bueno from W.R. Grace - about Daramend pile — he said he would like to maintain ~ 25-30% H2O in the pile. I said OK

1630 left NEA

M. Mott 11/25/97

11/26/97 0500 Mott picked up by Avon Limo service — got taken to Newark Airport — for trip (#6) to Peoria.

~1030 Arrived at Minneapolis / St Paul Airport.

~1040 Called Cindy Snyder - told her I would need a lab to do analyses of chlorinated phenols. She said OK but it may be a different lab than what is chosen for additional analyses of these samples in the future. I said OK

~1500

1900

Hot car, drove to A-Z to pick up auger & coring machine. Then drove to Penta site.

~1430 Arrived at Penta site w/ R. Lewis & P. Sarsick. Put away items shipped by Fed Ex - Then started to get anaerobic dechlorination test samples - water & soil samples. All samples will be tested for both PCP & chlorinated phenols.

The lab to do the analyses for chlorinated phenols is:

ANALAB
205 CAMPUS PLAZA I
RARITAN CENTER
EDISON NJ 08837
ATTN: JOE LA RUSSO

908-225-4111

(Should put on COC when need results by)

~1500 Noted oven was broken - I will most likely send oven back to REAC & send % H_2O / pH samples to ETL for testing.

1900 Left Penta site w/ R. Lewis & P. Sarsick.

2115 Started to write out labels + COC sheets for anaerobic dechlorination samples.

Also filled in notes + made list of things to do tomorrow at PWP site

HRS for 11/28:
5am – 8 pm = 15 – 1 = 14 hrs
+ ~~4pm~~ 9:15 pm – 11:20 pm = 2 hrs
= 16 hrs

M. Nash 11/28/94

Tues ~~Wed~~

11/29/94 0730 Arrived PWP site.

Started to pack anaerobic dechlor. sample in coolers to ship out.

Talked to Wally Neill – about groundwater pump – he said to go to the ~~p~~ Biotrol building + turn on the switch for the well pump. Then turn on the switch for the well pump in the bio bldg.

We tried this – it worked. Filled up the 850 gal day tank (influent) with H_2O. P. Sarsick worked on computer control of piles.

~1200

~1200 Collected bio pile samples - 3 samples from each pile - CX - 1a, 1b, 1c - comp 3. Samples for ICP + H2O/pH

Collected samples for Daramend land-farming area.

DT

1	2	3
4	5	6
7	8	9

DARAMEND

CT

1	2	3
4	5	6
7	8	9

CONTROL

All samples were first screened by a 1/4" screen. From each test area - (Daramend + control) - a small amt of screened soil was saved + composited to get 2 samples:

1) DT 1-9 Comp 2 (composite of) sections 1-9 in the Daramend plot.

2) CT 1-9 Comp 2 - (composite of) sections 1-9 in the Control plot).

These 2 samples were sent to P. Bucan:

GRACE DEARBORN
3451 ERINDALE STN. RD
PO BOX 3060, STATION A
MISSISSAUGA, ONTARIO L5A 3T5

1900 Left PWP site -

2000 Worked on writing out labels for samples + cleaning bottles of samples, + getting samples ready to ship out tomorrow.

Note: also collected 10 samples of soil for BNA analysis (duplicates) as per Ray Senghas. Samples were:

1) 1A Comp 3
2) 2A
3) 3A
4) 4A
5) 5A
6) 6A
7) 7A
8) 8A
9) 9 DT 1-9 Comp 2
10) CT 1-9 Comp 2

6:45 pm (1845)

M&M
H 2300 Stopped writing out labels + filling out field data sheets.

Note: forgot to fill in - while working in the landfarming area noted that control area was very cold + wet looking - underside of lid was covered w/ dripping moisture.

In contrast, Davamend plot was dries + was warm to the touch. - Also there was a lot of mold + bio activity obviously growing there

Temperatures were monitored: a thermocouple was used to grab a temp measurement for each plot section.

	Section	Temperature (°C)	
6:45 pm (1845)	DT 1	16.4	
	2	17.6	
	3	17.4	
	4	17.5	
	5	17.7	
	6	16.6	Avg = 17.2
	7	16.2	
	8	18.8	
	9	16.4	
	CT 1	4.9	
	2	5.3	
	3	5.3	
	4	4.5	
	5	4.9	
	6	5.2	Avg = 5.0
	7	4.9	
	8	5.2	
	9	5.1	

Ambient temp = -3 ~~°C~~

Outside temp: 21°F = -6°C

Total hours for 11/29/94 :

7:30 am - 7:00 pm (did not take break for lunch) = 11.5 hrs

+ 8:00 pm - 11:00 pm = 3 hrs

= 14.5 hrs.

M. Mol 11/29/94

11/30/94 0730 Arrived at PWP site w/ R. Lewis + P. Sansail. Met G. Prince at gate.

Started to pack samples for shipment.

also collected the following water samples:

1) Bio influent 3
2) Bio leachate 3
3) Green leachate tank 1 - 3
4) White leachate tank 2 - 3
5) White leachate tank 3 - 3

Note: Tank 3 had ~ 500 gal of H₂O in it prior to adding the leachate

The following volumes were noted for the tanks:

1800

12/1/94

Green leachate tank – (1)
White leachate tank 2 –
White leachate tank 3 –

Rototilled landfarming plots with rototiller – first had to get rototiller together

Went to cement pad with H. allen – went determined strength measurement of randomly selected area on pad – ~ 7000 psi Measurement was taken by Concrete test hammer.
Ready was 42
2ND ready was 40

1500 Left PWP site.

Hours: 9.5

M. Mok 11/30/94

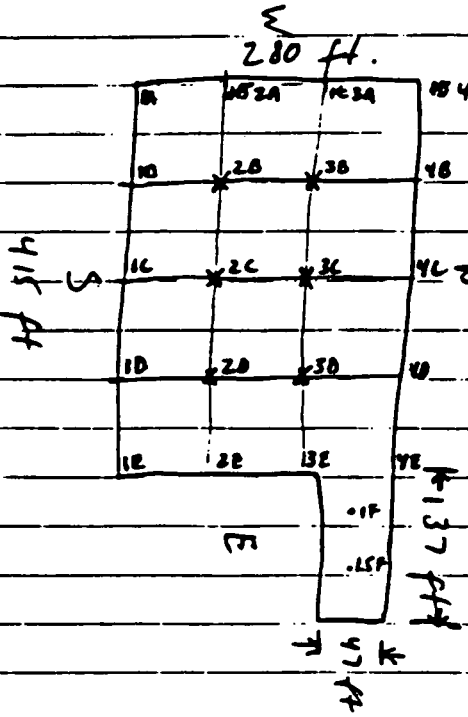
12/1/94 0730 Arrived at PWP site with P. Sawicki & R. Lewis.

Started to ship out items to RESC.

Went to concrete pad to get measurements of physical strength. The in place concrete test hammer was used to get the measurements

The cement pad was leveled up onto

a grid layout:



TOTAL AREA
116200 + 6439 = 2.8 ACRE
43560
613195 ft³
÷ 5' HIGH = 22,711 yds³
÷ 27 = 841.524 TONS (AUG.)

The coring machine was used to obtain cement cores from the pad surface. Cores were ~ 6" long. Six cores were obtained - they were collected from: 2B
3B
2C
3C
2D
3D

The cores all looked reasonably sound - no visible cracks, or chunks missing.

It took several hours to collect the cores because the vacuum attachment did not work - I called A-Z Rental Center - 612-890-8990 - to see if they could help me. - they could not tell me anything that I could use

I collected the cores without any vacuum.

The bio piles were turned by hand - This took several hours + 2 men.

1800 Left site with P. Samuel + R. Lewis.

2000 Worked in hotel - on data sheets for in-place strength measurements

2100 Stopped work.

Hours: 7:30 - 6:00 pm = 10.5 - 1 = 9.5
+ 8:00 - 9:00 pm = 1

TOTAL = 10.5

M. Mol 12/1/94

12/6/94 0730 Went to PWP site w/ R. Lewis & P. Hancock

1430 a
a

Collected readings + levels of tanks + all meters:

1) Feed tank - Vol = ~500 gal

Pump 1 vol → 831.9 gal
Pump 2 vol → 457.8 gal

2) Leachate minute clock = 13029.9 min

Tank 1 (green) - 1200 gal
2 (white) - 1500 gal
3 (white) - 250 gal

3) Sawdust juices - ~~2200~~ 220 gal

Flowmeter - 275.3 gal

Note: There were 6 x 55 gal drums of leachate from tank #2. Each drum was 2/3 full.

~0930 Left PWP site - went to hotel to check out. Headed for airport.

/99

dont

Still has
Kachi to

t see if
p date.

g they
ler.

d on

12/30/99

1/3/95 0500 Got picked up at home by Arrow limo service → drove to Newark airport for trip to PWP site (trip #7). Picked up Mandeep Talwar on way.

~1030 Arrived at airport in MN – got car – drove to ~~hotel~~ main – get lunch

1130 lunch

1200 Started to go to Siren –

~1340 Arrived at hotel – Wood River Inn –

1400 Drove to site – started to transport supplies into bldg at PWP site –

~1430 Drove to Siren 66 gas station – Talked to guy there – he said stop back tomorrow morning – they may be able to move tank

I measured tank at site:

4 ft high x 5 ft wide x 16 ft long

= 320 ft^3
= 2394 gal

~1500 Called Ferrell gas co – told Carol that I will be at site this week.

She will send someone out to check gas level.

Measured ~~volumes of~~ flow volumes that were on pumps, etc:

1) PUMP 1

2) PUMP 2

3) Sawdust juice

4) leachate clock.

~1530 Started to collect soil samples from Diamond plots. Collected 9 samples from heated & control plots. Also measured temperatures:

1)	DT1	~~6.7 C~~, 17.4
2)	DT2	~~11.3~~, 17.0
3)	DT3	~~11.4~~, 17.1
4)	DT4	16.0
5)	DT5	17.8
6)	DT6	17.0
7)	DT7	23.1
8)	DT8	21.6
9)	DT9	19.9

Avg = 18.2

1) 2) 3) 4) 5) 6) 7) 8) 9)

~1900

~1930

2130

2230

...t to

... volumes

1)	DC 1	12.9
2)	DC 2	13.6
3)	DC 3	12.9
4)	DC 4	~~12.220~~ 12.0
5)	DC 5	13.3
6)	DC 6	12.8
7)	DC 7	11.5
8)	DC 8	11.6
9)	DC 9	10.9 Avg = 12.4

Ambient = −14.5°C

~1900 Finished sampling Diamond piles

~1930 Left PWP site.

2130 Worked on notes & telling M. Talen how to prep samples for shipment – he filled out sample paperwork – FOS, COC, etc.

2230 Stopped working

Total hours for 1/3/94:

5:00 am (EST) → 7:30 pm (CST)
= 8:30 pm (EST)
− ½ hour lunch

+ 1 hour at hotel = (16 hrs)

M. Mol 1/3/95

samples
collected
control plots
:

7=

W

4)

1/4/95 0700 Started to check samples + COC's, FOS, etc (M. Talevan dist samples) to make sure they were OK

We will send out PLP (Oaramond) + samples to HWL + P. Bucens today.

0830 Went to GWP site. Measured temperature - outside -: - 24°C = -10°F
Thermocouple used.

0900 Purchased H2S drinks, cat litter, etc.

Went to SIREN 66 gas station - talked to Mike - he came to site with us to check out tank. He said they can do it this afternoon or tomorrow. I said OK.

0930 Called SITWT site 301-373-2470. Talked to JOHN BOURRET from ETL (ERCS) He said:

1) They have a trailer + power available.

2) May have to set up in bldg (they have torpedo tests there now). They are plning to test the bldg - but may not be in time.

3) They have a waste generator number

4) Stand up data is still 1107 although there is still uncertainty about 1 weeks. He will keep me posted.

Voice mail # of John BOURET:
804 - 358 - 5858
BOX 129

Collected soil samples for Bio Piles. Collected an extra bottle for each XA Comp 4 sample EX: 1A Comp 4 - to send to Analab for soxhlet extraction. H Allen called me. told me to do the same 10 samples that we did last time for BNA. d said OK.

Collected soil + H2O samples for anaerobic declorination study.

~~Attempt at~~ Tried to pump well water - did not pump - lines probably frozen. We need more water.

Planned large rectangular box tank - 4' high x 5' wide x 16 ft long = 320 ft^3 = ~2400 gal.

Went to Brian 66 gas station - got in touch with Scott Thomas at Southside Auto (715) 349-2626.

South side auto direction:

Go E on 70, make R at Sinclair 66 gas station. Go ~ 1/4 mile - on L side -

800
2000

He came w/ truck to move tank - he could not - it was frozen to ground

2100
↓
2400

Got call from G. Pierce - get the level measurements in wells. Ordered well keys + oil/the interface probe -

Th

11:55 a.m. Following measurements were obtained from the meters for the bio piles:

1/5/95

1) PUMP 1 - 853.3 gal

2) PUMP 2 496.0 gal

~1000

3) SAWDUST JUICE 280.45 gal

4) leachate 13048 min

Tank 1 1200 gal
2 1500 gal
3 ~350 gal

seen 66
- a

tool -
longer to

get
wells.
interface

obtained
piles:

Worked on collecting samples almost entire day.

~~800~~ 2000 Left pump site.

2100 ↓ 2400 Worked on COC & FDS, labels for samples in order to ship out for tomorrow.

Total hours worked = 12.5 + 3
= 15.5 hrs.

M. Mol 1/4/95

Th 1/5/95

0700 Started to check labels, COC, FDS, etc. filled out by M. Tolman, & he checked my paperwork & labels.

~1000 Went to site after talking on phone w/ D. Crouse, H. Allen, S. Target, etc. Srpr

Started to pack samples for Fed Ex.

Forgot to enter: on Wed (1/4/95) - added CaO to Diamond & Control piles: 2.1 kg for Diamond, 1.2 kg for control piles. It was sprinkled on top of the piles.

Started to manually turn [illegible] piles with shovels.

Rototilled Daramend + control plots, then added H_2O. Added ~60 gallons to Daramend plot, + ~15 gal to control plot. 1230

Sisson Fire Dept delivered H_2O to site. (1200 gal into 7000 gal tank) We then filled up 850 gal dry tank + several 35 gal containers. 1/6/95

~~Gotta~~ Had to re-rototill after even adding H_2O to ~~pit~~ landfarm ~~that had soil samples~~

Forgot to enter above (before rototilling again) - collected core samples (4) from Dara. plot - composited + mixed - took pH - of 2 samples:

1) Dara - 9.7
2) Dara (DUP) - 9.6

Same with control (4 randomly collected cores):

1) Control 9.5
2) Control (Dup) - 9.5

lis pile

tal plate,
~60 gallon
15 gal to

H2O to site,
tank)
0 gal dry
thinner,

il after OFA
thatched

rototilly
sample (4)
ited + mixed -

only collected

dn conversation w/ H. Allen - he said
CaO may make pH go up to high. -
he was right.

10 BNA'S - sent to Anlab -

2230 Left PWP site (finished up
lis pile turning).

M. Mol 1/5/95

1/6/95 0700 Got time sheets - started
to call in hours.

0730 Went to PWP site after
buying flat sprinkler hose - to
replace old hose (clogged up).
Also - got 2 water filters - to
remove solids from H2O to prevent
clogging -

Mandep T. installed plumbing
changes, M. Mol - collected soil
sample from Stain 1-9. (Otherwise
known as a line of stain from Stain
10 - to Stain 12) Sample consisted
of surface soil from Stain 11 +
Stain 12) - Composite.

Sample was sent to F. Miller by Fed Ex.

Helped M. Jalum to change over hoses + filter on water feed. Removed vacuum breakers. 2030

One new hose did not work - we must get another one 2100

~~Loft~~ H2O/oil interface probe - arrived - Following info taken:

* 1) MW 3 175.85 ft (H2O level)

* 2) MW 4 106.60

3) MW 19 104.30

* * indicates ~~adapter~~ tape guide used - subtract 2/10 ft. 2300

Did not enter:

1/4/95 - @ 1730 :	* 1/5/95 @ 1350
Pump 1 - 853.35 gal	892.2
Pump 2 - 496.05 gal	541.90

~~# - Done after~~ MFA
~~Sawdust [illegible] 280.45~~ MFA

...ge over
...led
...work - we
...roll -
...taken
(1 hr lunch)
- subtract
/15/95 @1350
892.2
541.90

2030 Left site to check hardware store opening time tomorrow: 7:45 am - We will get new hose

2100 Started working on oil/water interface probe - tried to fix - (it gave continuous beep + both lights lit).

Cleaned probe -
Changed batteries
Cleaned connection in top of probe - this worked

Probe is OK.

Filled in notebook -

2300 Stopped for night.

M. M[signature]

Tot hours: 7:00 am - 8:30 pm
(no lunch)
= 13.5
+ 2 hours at hotel
= 15.5

8 hrs already charged:

∴ fill out supplemental for 7.5 hrs.

M. M[signature] 1/6/95

1/7/95 MFM 0700 Met w/ Mandeep Talwar - planned what to do today - we are going to get a new hose (?) + water filters for the feed system

0745 Got connections + filters for water feed system. Started to put new hoses on + ~~system~~ MFM place filters in line. Finished - system worked OK - also ~~1030 Started~~ MFM removed vacuum breakers + elevated ~~hoses~~ MFM pumps from bottom of tank to prevent pulling up debris + solids

~1030 Started to measure well levels of water - all wells on site - (separate paper) -

~~7~~ MFM 1415 Finished ~~about~~ MFM measuring well levels.

Made arrangements to return home on 1/7/95 as originally scheduled

1430 ~~Returned~~ Left PWP site - went to hotel + checked out. Went to airport -

1230 pm Arrived home

Total hrs for 1/7/95 - 17.5

M Mol 1/7/95

1/9/95

$359/WK - UNLIM MILAGE
59.99/DAY EXTRA
BACK SEATS ARE REMOVABLE

Note: Before leaving PWP site –
obtained following data on ~~flowm~~ ~~meters~~ flows:
Sat, 2:00 pm 1/7/95:

1) Feed tank – 600 gal
2) PUMP 1 – 925.6 gal
3) PUMP 2 – 571.1 gal
4) Sawdust juice – 283.7 gal
5) Leachate – 13062.1 gal

— M. Mol 1/7/95

1/9/95 0730 Arrived REAC

Started to get ready for SMWT job.

Dave Ercolini will be going with me.

Called Enterprise Car Rental in Langhorne – 750-1200. Arranged to have rent a mini van on 1/16/95 – they will pick me up at 4:30 pm. I did not give credit card #. – They gave me a confirmation #: 469830.

They will pick me up at 4:30 pm at my house on Mon, 1/16/95. Talked to RICK.

$359/WK - UNLIM MILAGE
59.99/DAY EXTRA
BACK SEATS ARE REMOVABLE

Solomons
for myself
$58.00
rate.
for
Calvert
not accept

alled them -
d on a
x free

he Holiday

m is

Note: forgot to enter - on 1/6/95 at
P&P site - 1200 gal H_2O delivered by
Siren Fire Dept.
7732 State Rt 70
(715) 349-2466

Water was used for influent feed
to bio piles.

M. Mol 1/9/95

1/10/95 0730 Arrived REAC

Worked on SMWT prep for trip.

Brought water level indicator (Sol…
Model 121 Interface Meter) to …
+ packed to ship to Rental Respo…

Called D. Brady - told her that n…
hotel in Solomons, MD will accept
tax exempt form.

Talked to Brett Pasapane today
Enprotec by phone (1-610-701-73…
regarding doing ground penetrating radar
at SMWT site to locate a buried
well casing of PVC. I said it
may be next week - he said he
may be available - he will also
check to see if the instrument is available

Forgot to enter data collected at P&P site (see p. 78)

pH of Daramend + Control plot soil:

DATE - 1/7

Sample	pH (meter)	pH (paper)
Control	8.7	6-7
Control (Dup)	8.5	7
Daramend	8.8	7-8
Daramend (Dup)	8.8	7-8
Control (after H_2O_2 addition)	8.4	6-7
Daramend (after H_2O_2 addition)	8.5	6-7

Note: first 4 samples collected before CaO addition + H_2O_2 addition.

Added 15 gal H_2O_2 to control plot. 60 gal to Daramend plot. (see p. Rototilled following addition of CaO, then again after addn H_2O_2.

M. Mok 1/10/95

2/3/95 0730 Arrived REAC

Worked on concrete memo containing new analytical results for cement cans.

Gave to R. Tolra, S. Finnelli, + D. Crum to review.

1200 lunch

1215 Worked on memo

1400 Went to bay to make sure job was packed for PWP site.

1630 Left REAC

M. Mol 2/3/95

2/6/95 M 0445 Picked up at home by Arrow – then picked up P. Lassal & D. Molnar. Flight at 0745.

Checked in at hotel ~ 1:00 pm. Got to PWP site ~ 1330.

Worked on ripping apart biopiles – also roto tilled biopiles & then rebuilt the piles.

Note: took 1/2 hour lunch after getting to Minneapolis.

1900 Left site at 7:00 pm.

Total hours for 2/6/95 = 14-½ = 13.5

M. Merk 2/6/95

2/7/95 T 0730 Arrived PWP site - MFM, PS, GN.

0800 Started to take well level measurements. Very cold - ~ -10 °C - had to come in several times to get warm

1100 - Completed well measurements.

Also collected Daramend + anaerobic dechlorination samples.

1200 Went to lunch - met H. Allen. (Lunch = 1 hr)

1300 Also collected temperatures from Daramend piles. N. H: Control piles were hotter than Daramend piles. H. Allen noted this also. We were all surprised.

Note: We will add H2O to Daramend + control piles next month - Control looked dry

1800 Left site.

1915 Worked on paperwork for anaerobic dechlorination samples + Daramend

samples - COC, FDS, labels, etc. prepped for shipment next day.

2200 Stopped work -

Total hours for 2/7/95 = ~~9.5~~

10.5 - 1 + 3 = 12.5 hrs.

M. Mol 2/7/95

2/8/95 0730 West to PWP site -

Packed samples collected on 2/7/95 for Fed Ex shipment.

P.S. & GM collected bio pile samples.

Method of collection: 9 samples per pile. Similar to initial sampling event:

Three cores were taken. Each core was placed in a separate 5 gallon bucket & mixed well, then screened w/ a ¼" mesh, ¼ inch screen. The screened soil was then used to collect 4 separate (identical) jars of soil. Jars were labeled:

1) 1A1 Comp 5 (PCP)
2) 1A2 Comp 5 (PCP)
3) 1A3 Comp 5 (PCP)
4) 1A1-3 Comp 5 (% H2O / pH)

ete.

This resulted in 9 PCP samples per pile + 3 % H2O/pH samples per pile.

The total # of samples was 72 PCP + 24 % H2O/pH samples.

This method was per H. Allen request.

Note: when we pulled the Daramend samples, the following procedure was used: (as per H. Allen):

1/7/95

Take cores from section 1-3, mix up into a composite, then screen through a 1/4 inch screen. Then collect 3 1/4 soil samples:

1/95

samples.

per pile:

1) DT 1-3 A Comp 4
2) DT 1-3 B Comp 4
3) DT 1-3 C Comp 4

were

2 bottles of each sample were collected - one for PCP, one for % H2O/pH

~~In addition a total of~~

Crushed a 1/4 inch soil

The same method was used for sections 4-6, + 7-9 in both Daramend + control plots. A total of 9 samples from each plot was obtained.

were

In addition, 2 composite samples (DT 1-9 Comp 4, DC 1-9 Comp 4)

were collected. These will be sent to WR Grace for MM as a split sample

H. Allen asked us to re do the well level measurement numbers on MW 3, 4, + any other well. - P.S. + GM re did the numbers on these wells + GS. The numbers were very similar (see separate sheet log of well data).

1300 K. Glatz came to PWP site - spoke to him briefly about activities at PWP site.

Also - placed a metal corrugated strip on top of pile #7 - North side - to protect it from the heat of the heater - this pile appeared to be the driest.

Note: sump pump was not working - appeared to be burnt out. Replaced with new pump - New pump checked out - it worked - time minute clock functioned OK.

P.S. got the computer working OK.

~1700 Left site - P.S., GM, + MM went to MM hotel room to work on labels, FDS, + COC for samples. Worked on labels + paperwork until 1900.

1900

2030

2200

1900 Went to dinner

2030 Came back to room & finished filling out COC for all bio pile samples & checking all work done prior. Also - filled out paperwork for 3 H2O samples collected from the influent, leachate, & tank #3.

Also - forgot to enter - HA, GM, & PS collected 3 white rot samples. Samples were collected from 3 different spots as follows: 3 different cores were collected, & all 3 cores were placed in a bucket. Then soil was mixed, then ~~placed in~~ mixed screened w/ a 1/4 inch screen. The screened soil was then used to collect 3 identical soil samples called:

1) WR-A
2) WR-B
3) WR-C

Then samples were sent for PCP analysis.

2200 ~~Stopped working on~~ Finished working on paperwork & notes in notebook.

Total hrs for 2/8/95:

$11\frac{1}{2} - \frac{1}{2} + 1\frac{1}{2} = 12\frac{1}{2}$.

M. Mok 2/8/95

2/9/95 0730 Arrived PWP site.

Packed up all samples for shipment to labs for analysis.

Inspected bio setup.

P.S. collected data for volumes & gallons in flowmeters. (see P.S. notes).

Sprayed ~ 15 gallons of inoculant juice on pile #8.

Note: P Feed tank has only ~ 200 gal H_2O left in it.

Note: on Tues – went to Scio Fire Dept – spoke to Chris (delivered H_2O to us during Jan trip to PWP). – asked him if they would deliver H_2O to PWP site again for donation. He said he would ask – he said last time the fire chief, etc., was were not too thrilled that the truck was driven to PWP site – they had understood that we would bring our own truck (?).

He said he would get back to me & let me know if they could deliver the H_2O. I said OK

[redacted]

On Wed - Chris called + said that due to politics - the fire dept would not deliver the H2O to the site.

He suggested I call Doris at the village offices - (349-2273). I called - she told me to call JACK HUNTER at 349-2493.

Called Jack Hunter - he told me we could buy the H2O - but they could not deliver it - I told him I did not have a way to get it - he suggested Burnett Co. Dairy Coop.

However, at end of conversation - he said they might be able to send out a fire truck - I told him they already did + that they did not want to again. He said the fire chief sometimes acts like he is better than others. (?) (This must be the politics Chris spoke of) -

He told me to call him when I am ready to come up - maybe we can work something out.

Called Dale Olson at Burnett Co. Dairy Coop - he said they would not be able to divert a truck to get water for us.

Make sure everything was OK at PWP site -

0900 Left site. Drove to hotel to check out.

1000 Left hotel - drove to Minneapolis -

Dropped off samples at Fed Ex - got done at 1200.

1200 lunch - at Mall of America.

1300 Had to wait for flight - stayed at Mall of America until ~ 3:00 pm -

Drove to Minneapolis airport for flight

Returned auto, checked into airport.

1200 Got home at 12:00 pm.

M. Mok 2/9/95

2/10/95 0730 Arrived NEA

Worked on expense report for PWP trip.

Worked on cement memo - got comments back from 1st review - started to incorporate comments.

1630 Left NEA

M. Mok 2/10/95

2/13/

1000

1100

1130

1200

1300

3/13/95 0400 Got picked up at home by 1930
Arrow Limo service. Picked up
D. Ercolini + G. Molan – to go
to PWP site. 2100

0900 Arrived in Minneapolis, MN – drove to
Grantsburg, WI – checked in hotel
(Wood River Inn) – ~ 1100

Went to PWP site – started to
check systems – started checked #6
pump – did not pump H_2O – still
frozen

~1200 Started to break down bio piles +
rototill them – added ~ 2 lb of
NH_4NO_3 fertilizer to each pile 3/14/95
after being broken down, + before
rototilling.

1300 Talked to H. Allen ~ – before doing
rototilling – he said to do add
~ 2 lb fertilizer to the compost
piles – OK.

~1000

1700 Collected composite sample of Stain Area
1-9 soil from in between Stain
Area 11+12 – for F. Miller – I
will send it tomorrow. ~0630

1730 Left site

M. Mol 3/13/95

1930 Worked on notes + looked at new work - oil interface meth

2100 Stopped work

Total hours for 3/13/95:

4:00 am → 5:30 pm (= 6:30 PA Time)
= 14.5 − 1 hr lunch = 13.5

+ 7:30 pm − 9:00 pm = 1.5

= (15 hr)

M. Mok 3/13/95

3/14/95 0700 Picked up U Haul truck at West 70 sales office. Went to PWP site + loaded 2 × 250 gal white plastic cubes on truck. Sent D.E. + G.M for H2O at Town of Shantsting garage. No problem. Water was then transferred by submersible pump into day tank.

~ 1000 D. E + G M collected bio pile samples, M F M collected anaerobic dechlorination samples.

~ 0630 Talked to excavation contractor at breakfast - asked him to look at tank to see if he could move it.

3/13/95

~1100 Excavation contractor stopped by & looked at tank - he said he would like to buy it.

1400 lunch - 1 hr

1500 Second H₂O trip - 2 more H₂O cubes - filled up 850 gal tank

15 1600 Started to collect Daramend samples & Control samples - control pile was very dry.

Temperature readings:

1)	DT 1	~~22~~ -0.2 °C
2)	2	-0.1 °C
3)	3	1.5
4)	4	0.0
5)	5	-0.3
6)	6	0.5
7)	7	1.2
8)	8	4.5
9)	9	0.2

Avg = 0.81 °C

1)	DC 1	14.8 °C	
2)	2	17.1	
3)	3	20.6	
4)	4	16.6	
5)	5	18.4	
6)	6	20.1	
7)	7	17.0	
8)	8	17.2	
9)	9	18.5	Avg = 17.8 °C

Ambient = 13.3 °C

Samples DT 1 - DT 3 were composited together & screened. Then 3 samples were collected: DT 1-3A Comp 5
DT 1-3B Comp 5
DT 1-3C Comp 5

This procedure was also used for DT 4-6 & DT-7-9

Also, nutrient & other parameter samples were collected: DT 1-3 Comp 5
DT 4-6 Comp 5
DT 7-9 Comp 5

The control plot was also sampled for corresponding samples.

Also collected composite: DT 1-9
DC-1-9
for P. Bueers.

Added moisture to Daramend piles :
~60 gallons to Daramend pile &
~20-30 gallons to the control pile.

The piles were then rototilled &
recovered.

~1700 GM + DE returned truck to U-Haul
& have to get a receipt.

~1730 Collected soil samples from stock
soil piles from outside storage pile.

STOCK Soil #1 - Large pile near west side of Daramend bldg. 2230

STOCK SOIL #2 - small pile
near 1000 N 600 E marker. 2300

H. Allen was present at the time.

~1800 Cleaned up building, put labels on
anaerobic dechlorination samples.

1900 Left PWP site.

2100 Worked on notes & plans in 3/15/95.

2200 Called B. Stringle (312-886-0406) -
left message - re problems w/ storage
tanks - sounds like something in N tank,

not S track.

Got address of lab (SLC) to send nutrient samples (soil) to:

GP Environmental
202 Perry Parkway
Gaithersburg, MD 20877
Attn: Ken Ilver

Phone: 301-926-6802

~~2300~~ ~~Stopped working~~ MFT
2230 Filled out shipping papers for samples for tomorrow. Also corrected field data sheets.

2300 Stopped work

Tot. hrs for 3/14/94:

0700 to 1900 - 1 = 11

+ ~~1900~~ MFT - 2100 - 2300 = 2

TOT = 11 + 2 = (13 hr.)

M. Mel 3/14/95

3/15/95 0730 Arrived at PWP site.

Started to pack coolers with samples to ship to labs. All soil & water samples went out by Fed Ex.

1700 Lunch (1 hr)

1500 Started to take well level measurements.

Collected oil sample from MW 15. Lowered S.S. bailer (with bottom taped) into well & pulled out sample. Vol ~ 200-300 ml. Oil was dark brown - black in appearance & was appeared thicker than #2 oil.

1930 Left PWP site.

M. Mark 3/15/95 0930

Hrs for 3/15/95 : 11 1000

3/16/95 0730 Arrived at AWP site. 2100

Packed up water level measurement device & oil sample to go to Fed Ex.

0800 Obtained volumes & flow measurements of all tanks:

le

samples
oil +
ed Ex.

measurements.

MW 15.
bottom taped)
sample
oil was
reasure +
#2 oil.

3/15/95

surement
fed Ex.

Influent feed Hts tank : 800 gal

Green Tank 1 : 1350 gal

White Tank 2 : 1500 gal

White Tank 3 : 575 gal

White cake : 80 gal

Pump 1 : 990.9 gal

Pump 2 : 767.1 gal

~~0930~~ MFC
~~Left pwp~~

Checked sump pump to make sure it
works. OK

0930 Left pwp site, went to hotel to
check out.

1000 Drove to MN airport - made it -
flight was delayed to 2:00 pm.

2100 Arrived at home - dropped off by
Arrow Line.

3/16/95 M. Mark

Total Hrs for 3/16/95 = 12.5

2/6/95 Flow meter 1 - 949.2 2/8/95
Flow " 2 - 725.2
3 2x5.2
Tank 3 450
Day Tank 200
Minute Clock - 49725.2

Air Temp -9.8°C

DT 2	1.2°C
DT 3	1.2°C
DT 4	1.2°C
DT 5	1.6°C
DT 6	1.6°C
DT 7	3.7°C
DT 8	4.3°C
DT 9	3.4°C

DC 1	16.5°C
DC 2	17.7°C
DC 3	16.3°C
DC 4	20.4°C
DC 5	19.2°C
DC 6	17.7°C
DC 7	21.6°C
DC 8	20.9°C
DC 9	19.0°C

PS

49.2

5.2

8.5.2

9725.2

2/8/95 Flow meter 1 - 982.64

Flow Meter 2 - 757.75

Flow meter 3 - ———

Tank 3 - 515

Duy Tank - 180

#5

~~10/21/95~~ MFM 10/21/94

Daraud

DC1	0.5	28.2	27.7	6.5	24.8	24.3 12.3
2	0.4	24.2	23.8	6.2	21.4	21.0 11.8
	0.3	24.5	24.2	6.1	21.7	21.4 11.6
	0.4	31.8	31.4	6.4	27.5	27.1 13.7
(new)	0.4	29.0	28.6	6.2	25.9	25.5 10.8
	0.4	29.7	29.3	6.3	26.5	26.1 10.9
	0.4	32.6	32.2	6.3	28.7	28.3 12.1
	0.4	38.8	38.4	6.5	34.0	33.6 12.5
	0.4	33.3	32.9	6.2	29.3	28.9 12.2
				6.3 Avg		~~12.0~~ Avg
DT1	0.4	30.5	30.1	6.7	24.1	23.7 ~~20.9~~ 21.3
	0.7	32.4	31.7	6.5	25.1	24.4 23.0
	0.4	37.6	37.2	6.6	29.5	29.1 21.8
	0.4	30.4	30	6.9	24.8	24.4 18.7
	0.4	27.0	26.6	6.7	22.5	22.1 16.9
	0.4	31.4	31.0	6.9	25.2	24.8 20.0
	0.4	29.3	28.9	6.6	24.0	23.6 18.3
	0.4	29.6	29.2	6.5	23.8	23.4 19.9
	0.4	30.7	30.3	6.4	23.7	23.3 ~~22.8~~ 23.1
				6.6 Avg		20.3 Avg

~~2ND BIOPSIE EVENT~~

INITIAL DARAMEND EVENT

checked
DC MFM
5/17/95

WESTON

SHEET 1 of ____

CLIENT/SUBJECT PWP W.O. NO.

TASK DESCRIPTION Mass of PCP in Leachate TASK NO.

PREPARED BY MFM DEPT DATE 5/23/95 | APPROVED BY

MATH CHECK BY DEPT DATE

METHOD REV. BY DEPT DATE | DEPT DATE

1) 1350 gal of 32 mg/L (avg) PCP conc.

= 5110 L of 32 mg/L

= 5110 (32) = ~~16,352~~ 163,520 mg = 163 g PCP

2) 1500 gal of 9.2 mg/L (avg) PCP conc.

= 5677 L of 9.2 mg/L

= 5677 (9.2) = 52,228 mg = 52 g PCP

3) 575 gal of 4.2 mg/L (Avg) PCP conc

~~216~~ = 2176 L of 4.2 mg/L

= 2176 (4.2) = 9,140 mg = 9 g PCP

tot = 224 g PCP

WESTON

SHEET 2 of ___

CLIENT/SUBJECT PWP W.O. NO. ___

TASK DESCRIPTION ___ TASK NO. ___

PREPARED BY MFM DEPT ___ DATE 9/23 | APPROVED BY

MATH CHECK BY ___ DEPT ___ DATE ___

METHOD REV. BY ___ DEPT ___ DATE ___ | DEPT ___ DATE ___

Total of 224 g PCP in ~~35~~ 3425 gal leachate.

do this a significant fraction of the amt PCP lost from the soil?

A) Assume that 8 piles each had ~ 2 tons soil.

∴ contribution of all 8 piles was = .

∴ only need to take average initial PCP ~~conc~~ value.

B) Avg [PCP] of biopiles (initial):

PILE #	PCP Conc (mg/kg)
1	960
2	210
3	240
4	160
5	230
6	170
7	230
8	220

240 = Avg PCP conc.

CLIENT/SUBJECT PWP W.O. NO. ___

TASK DESCRIPTION ___ TASK NO. ___

PREPARED BY MFA DEPT ___ DATE 5/23

MATH CHECK BY ___ DEPT ___ DATE ___

METHOD REV. BY ___ DEPT ___ DATE ___

APPROVED BY ___ DEPT ___ DATE ___

There are 8 piles of soil with an avg of 240 mg/kg PCP.

~~1 pile~~ =

How many mg of PCP in entire mass of soil?

$8 \times 2 \text{ tons} = 8 \times \overset{4,000}{\cancel{2,000}} \text{ lb} = \overset{32,000}{\cancel{16,000}} \text{ lb} = \cancel{14.5 \times 10^6}$

$= \underset{14545}{\cancel{70,400}} \text{ kg soil} \quad \cancel{14,545}$

$\text{of } \frac{240 \text{ mg } \cancel{\text{kg}} \text{ PCP}}{1 \text{ kg soil}} = \frac{X}{\underset{14545}{\cancel{70,400}} \text{ kg soil}}$

$X = 240 \left(\frac{14545}{\cancel{70,400}} \right) = 16.9 \times 10^6 \text{ mg PCP}$ in the total mass of soil in 8 piles.

$= \underset{3491}{\cancel{16896}} \text{ g } \cancel{\text{in}} \text{ PCP in soil} \quad \cancel{3,491}$

Amt removed ~~by water~~ in leachate = 224 g

$\therefore \frac{224 \text{ g (in leachate)}}{\underset{3491}{\cancel{16896}} \text{ g (total available)}} = \overset{6.4\%}{\cancel{1.3\%}}$ of avail PCP was removed in leachate.

What is the amount of dilution in each biopile as a result of adding amendments?

Assumptions:

1) Soil in each pile = 2 yd^3 = 2.6 tons = 5200 lb.
   (1 yd^3 = 1.35 tons)

2) Wood chips in each pile = 2 yd^3 = 2345 lb
   (1 yd^3 = 1173 lb*)
   density = ~~.7 g/cc~~ 43 lb/ft^3

∴ Each pile without addition of anything else besides soil + wood chips = 5200 + 2345
= 7545 lb

Since the control pile (#1) had soil + wood chips, the combined wt of soil + wood chips will be the "standard" – the concentration (initial) of the control pile (soil + wood chips) was 460 mg/kg.

M. Nash 5/23/95

3) Sawdust → same density as wood chips
   = ~~0.7 g/cc~~ = 586 lb in ½ yd^3
   43 lb/ft^3 1172 lb in 1 yd^3

4) Ammonia NO_3 → bag is 100 lb = 62 lb/ft^3

5) turkey manure (assume density similar to water) = 1 g/cc
   ∴ 1 yd^3 = ~ 1674 lb

EXPECTED DILUTIONS IN BIOPILES

PILE 2 $\frac{1674 \text{ lb turkey manure}}{7545 \text{ lb (soil + wood)}} \times 100 = 22\%$

PILE 3 ~~=~~ $\frac{1674 \text{ lb turkey manure} + 100 \text{ lb } NH_4NO_3}{7545 \text{ lb soil + wood}}$

$= \frac{1774}{7545} \times 100 = 24\%$

PILE 4 $\frac{3348 \text{ lb turkey manure}}{7545 \text{ lb soil + wood}} = 44\%$

PILE 5 $\frac{1674 \text{ lb turkey manure} + 586 \text{ lb sawdust} + 100 \text{ lb } NH_4NO_3}{7545 \text{ lb wood + soil}}$

$= \frac{2360 \text{ lb}}{7545} \times 100 = 31\%$

PILE 6 $\frac{1674 \text{ lb turkey manure} + 586 \text{ lb sawdust}}{7545 \text{ lb soil + wood}}$

$= \frac{2260}{7545} \times 100 = 30\%$

M. Mohr 5/23/95

PILE 7 $\frac{1172 \text{ lb sawdust} + 100 \text{ lb } NH_4NO_3}{7595 \text{ lb soil + wood}}$

$= \frac{1272 \text{ lb}}{7595 \text{ lb}} \times 100 = 17\%$

PILE 8 * $\frac{100 \text{ lb } NH_4NO_3}{7595} \times 100 = 1\%$

* does not include sawdust extract - all soil samples are expressed in mg/kg dry wt - this means that no solids contribution to pile 8 from sawdust extract.

Note: The weights of the amendments (as added), were on a wet weight basis. This means that the wt added was partially water (turkey manure was not 100% solids). - thus the dilution effect would be even less than what the calculations above indicate.

Also - screening prior to collecting sample may removed some of the wood chips. - may have affected the calculations.

- MFM 5/23/95

COMPARISON OF ACTUAL INITIAL PCP CONC. VALUES WITH EXPECTED DILUTION FACTORS DUE TO AMENDMENT ADDITION

PILE NO.	INITIAL [PCP] (mg/kg)	(100-%) OF INITIAL VALUE FOR PILE 1	CALCULATED DILUTION FACTOR
1	460	—	—
2	210	54	22
3	240	48	24
4	160	65	44
5	230	50	31
6	170	63	30
7	230	50	17
8	220	52	1

M. Mohr
5/23/95