89

SITE EVALUATION - PHASE II

Penta Wood Products, Inc.
Siren, Wisconsin

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OCT 11 1989

SITE EVALUATION - PHASE II

Penta Wood Products, Inc.
Siren, Wisconsin

October 1989
Ref. No. 2140

CONESTOGA-ROVERS & ASSOCIATES

CRA
Consulting Engineers

CONESTOGA-ROVERS & ASSOCIATES LIMITED
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October 11,1989

Reference No. 2140

Mr. David J. Kafura
WISCONSIN DEPARTMENT OF NATURAL RESOURCES
Northwest District Headquarters
Box 309
Spooner, WI 54801

Dear Dave:

RE: Penta Wood Products - Phase II Report

Please find enclosed three (3) copies of the Penta Wood Products - Phase II Report for your review and comment.

Upon completion of the Departments review of this report, please contact us to arrange a date and time to discuss the conclusions and recommendations presented in this report.

Should you have any questions, please do not hesitate to contact us.

Yours Very Truly,

CONESTOGA-ROVERS AND ASSOCIATES

S.E. Mockenhaupt

Stephen E. Mockenhaupt, B.Sc.

Enc.
cc: Vern Lundequam, PWP
Ron Frehner
SEM/jm

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1.0 INTRODUCTION

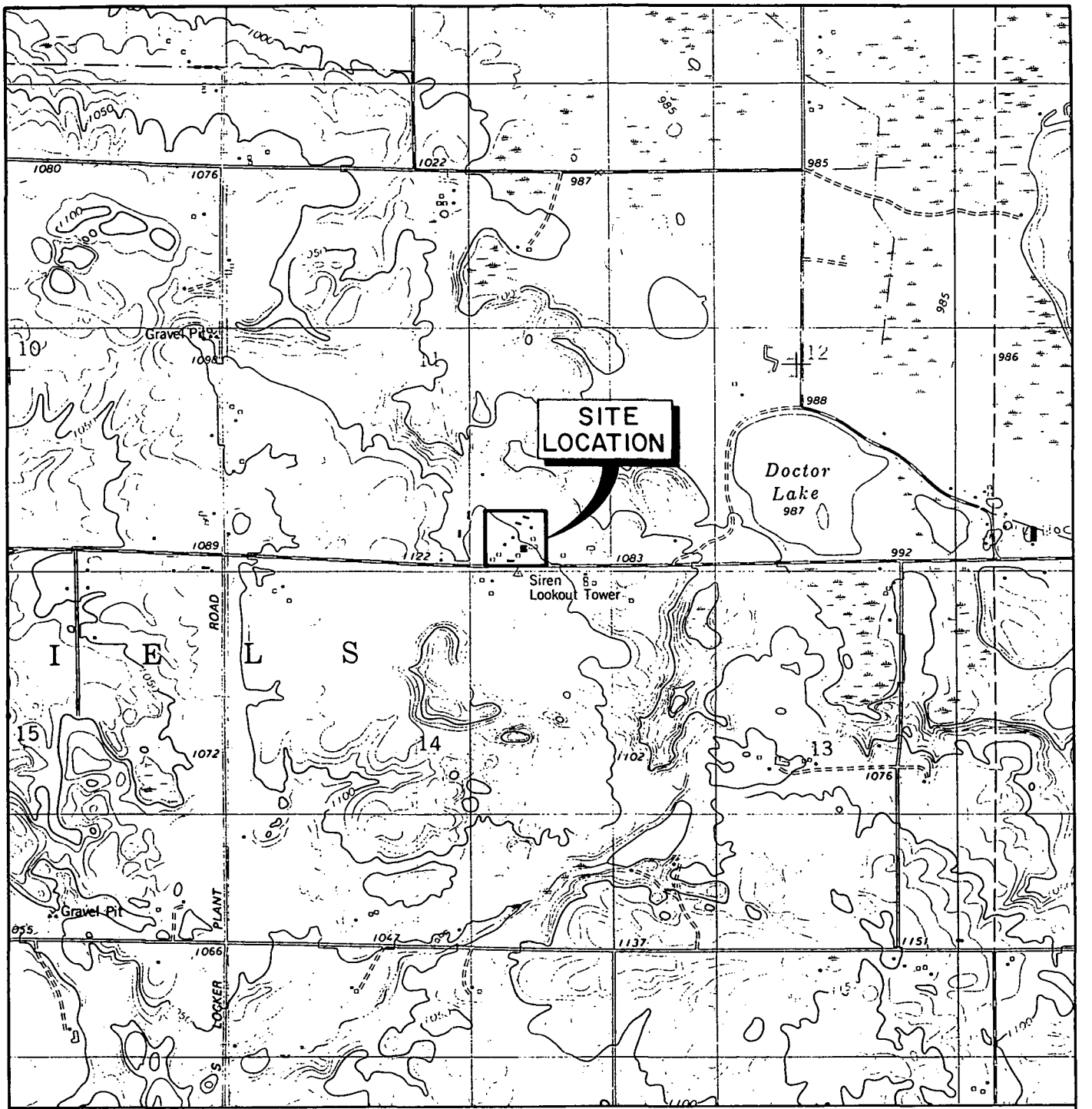
Penta Wood Products Inc. (PWP) is an operating wood treating facility located in Siren, Wisconsin, which has treated wood products since the 1950s with pentachlorophenol. Since 1975, PWP has also treated with chemonite (containing arsenic, copper and zinc). Figure 1 shows the location of the PWP site.

In 1987, the Wisconsin Department of Natural Resources (DNR) requested that PWP assess the environmental conditions at the Site as a result of a DNR study of Site conditions. Subsequently, Conestoga-Rovers and Associates (CRA) was retained by PWP to develop and implement a phased work plan to assess potential sources of contamination and to characterize the nature and extent of soil and groundwater contamination.

On August 21, 1987, on behalf of PWP, CRA submitted a work plan to assess PWP's operations. The findings of this work plan were outlined in a report titled "Site Evaluation - Penta Wood Products" submitted to the DNR in July 1988.

In this report, recommendations were made for further work at the PWP Site. This Phase II Scope of Work was modified by the DNR in two letters dated October 27, 1988, and March 7, 1989. The Phase II field work was completed during the spring and summer of 1989.

This report presents the results of the Phase II work plan.



SOURCE: USGS TOPOGRAPHIC MAP
SIREN WEST, WIS. QUADRANGLE

N

SCALE: 1" = 2000'

figure 1
SITE LOCATION
Penta Wood Products, Inc.

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2.0 BACKGROUND

A detailed history of PWP's plant operations and past spills and response actions are presented in the "Scope of Work" report dated August 21, 1987, and the "Site Evaluation" report dated July 21, 1988. This history is based on information provided by PWP. Figure 2 illustrates Site features.

2.1 PHASE I RESULTS

The results of the Phase I investigation indicated that the groundwater under the Site, below the hard pan, was contaminated with pentachlorophenol (PCP). The results also indicated that the surficial soils around the oil/water separator and the chemonite treating area have elevated concentrations of PCP and metals. However, the metals were not considered a potential source of groundwater contamination. The Phase II work plan outlined additional work to be done to further define the extent of this contamination.

2.2 PHASE II WORK PLAN

The Phase II work plan was outlined in Section 6.0 of the "Site Evaluation" report dated July 21, 1988. This work plan was modified based on comments provided by the DNR in two letters dated October 27, 1988, and March 7, 1989. This modified work plan was finalized in CRA's letter dated April 13, 1989.

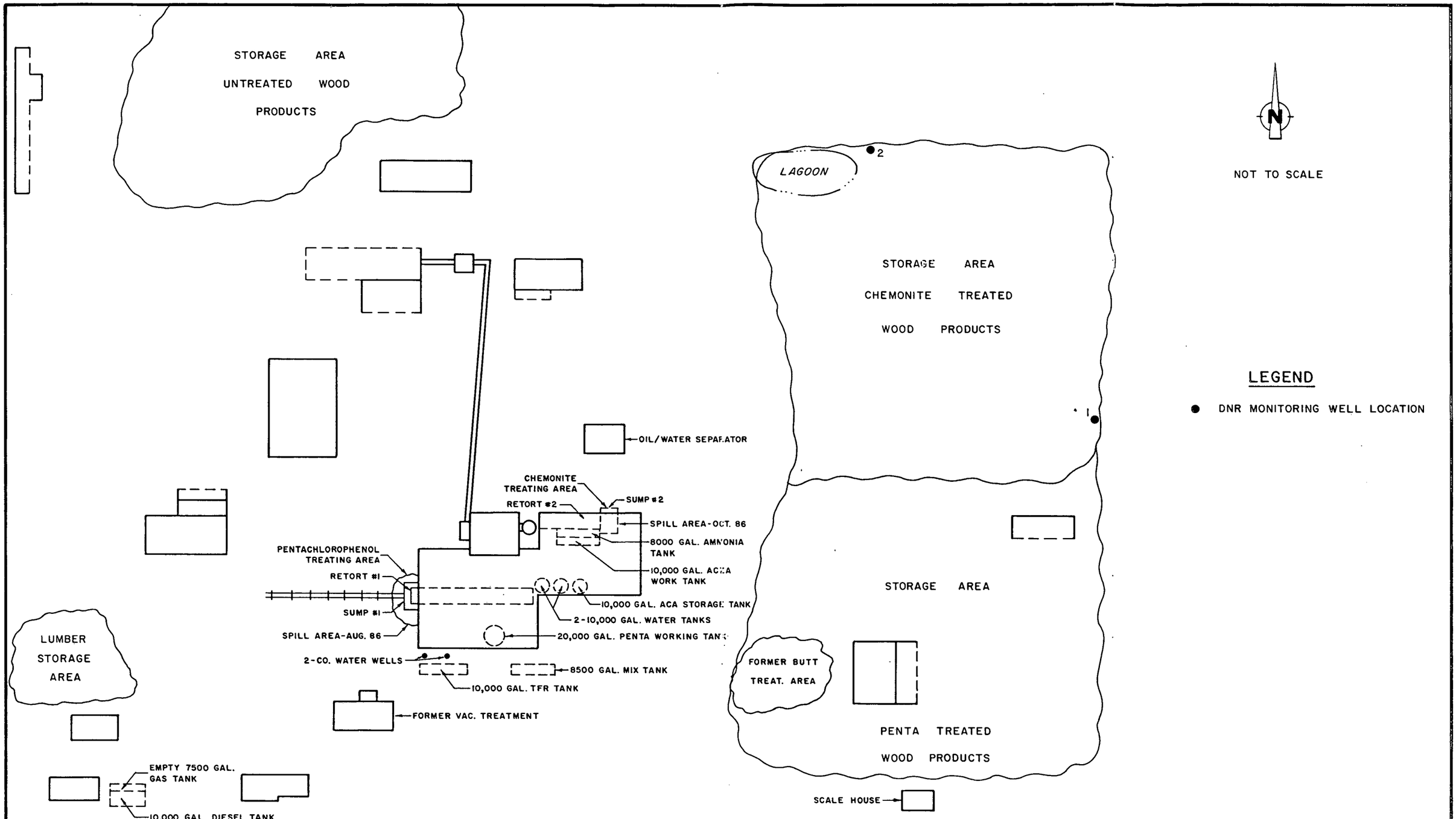

figure 2
SITE PLAN
Penta Wood Products, Inc.

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2140-14/08/87-M

3.0 PHASE II RESULTS

3.1 SOIL SAMPLING

During the week of June 12, 1989, the field work commenced at the PWP Site. Wisconsin Test Drilling (WTD) mobilized a Mobile Drill D-50 soils auger drill rig to the Site. This work involved drilling and sampling at two deep borings and 12 shallow borings.

Two soil borings were completed at locations shown on Figure 3. The purpose of these soil borings was to better define the soil stratigraphy of the Site and to allow for the installation of two monitoring wells as outlined in the Phase II Scope of Work. The overburden stratigraphic logs for these borings are presented in Appendix A. Upon completing these borings it was discovered that there was no groundwater or any evidence of groundwater on top of the hard pan unit. Therefore, after discussing this with the DNR, no monitoring wells were installed.

THIS WAS MY FAULT FOR NOT REQUIRING INSTALLATION AT THIS TIME DK

3.1.1 Production Well Area - Deep Boring

Boring B3, which is located very close to the company production wells, showed no evidence of contamination (i.e. visual or olfactory), hence, chemical soil samples were not taken at this soil boring. The hard pan

I WAS UNDER THE ASSUMPTION THEY WERE GOING TO DO ANALYSIS. DK

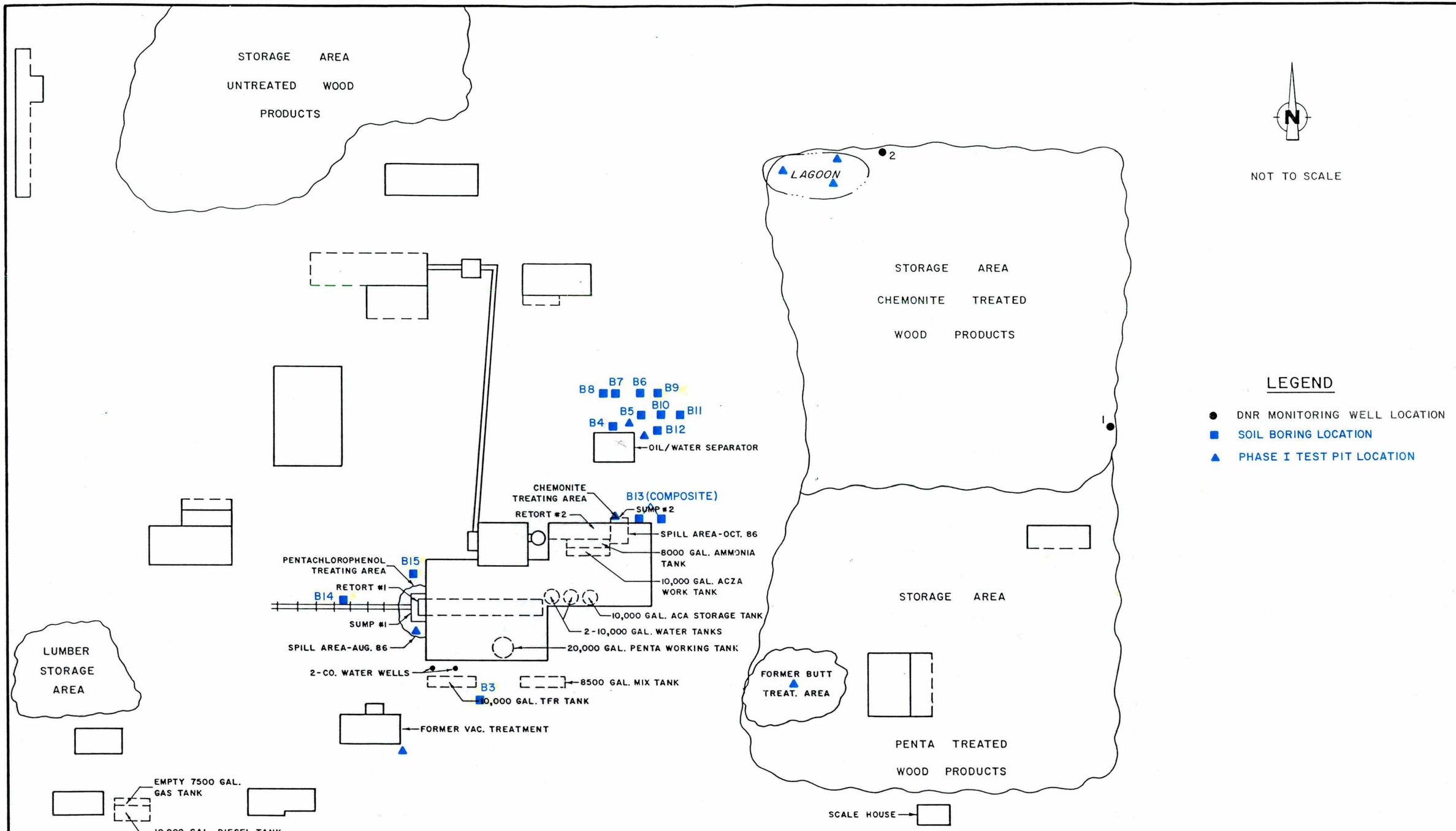

figure 3
PHASE II SOIL BORING LOCATIONS
Penta Wood Products, Inc.

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unit was encountered at a depth of 135 feet below ground surface which is consistent with the soil stratigraphy recorded on the water well logs for PWP's production wells.

3.1.2 Oil/Water Separator Deep Boring

Boring B4, which is located on the north side of the oil/water separator, did show evidence of soil contamination to a depth of approximately 15 feet below ground surface. The top 10 feet had both an "oily" film and an odor. The split spoon sample at 15 feet below ground surface had a slight odor, but no "oily" appearance. A sample was taken at a depth of 20 feet BGS and analyzed for PCP. This and all samples collected for chemical analysis were taken from a precleaned[1] split spoon. The results of these analyses are presented in Table 1 and the analytical lab report is presented in Appendix B. PCP was not detected below 15 feet.

The hard pan at B4 was found at a depth of 110 feet below ground surface. This correlates to approximately the same elevation found at B3.

3.1.3 Oil/Water Separator Shallow Borings

Eight additional shallow borings were conducted around the north side of the oil/water separator. This area was selected due to past

[1]The cleaning sequence consisted of a thorough scrubbing in trisodiumphosphate (TSP) followed by a solvent rinse of methanol, hexane and methanol. The spoon was then rinsed with distilled water.

TABLE 1
SUMMARY OF ANALYTICAL RESULTS

Sample Location	Depth (BGS)	Visual/Olfactory Contamination	Chemical Concentration
		Production Well/PCP Treating Area	
B4	20′	No	PCP - ND
B14	5′	No	PCP - ND
B14	10′	No	PCP - ND
B15	5′	No	PCP - ND
		Chemonite Treating Area	
B13	5′	No	PCP - 23 ug/kg As - ND Cu - 14 mg/kg Zn - 13 mg/kg
B13	10′	No	PCP - 4.1 mg/kg ? HIGHER CONC. THAN AT 5'. As - ND Cu - 14 mg/kg Zn - 11 mg/kg
		Oil/Water Separator Area	
B5	5′	No	PCP - ND
B5	10′	No	PCP - ND
B6	5′	No	PCP - ND
B6	10′	No	PCP - ND
B7	5′	No	PCP - ND
B8	5′	No	PCP - ND
B9	2′	Yes	PCP - 2,100 mg/kg QUITE A DISTANCE AWAY FROM OIL/WATER SEPERATOR BUILDING. DE
B9	5′	Yes	PCP - 170 mg/kg
B9	10′	No	PCP - ND
B10	5′	No	PCP - ND
B11	5′	No	PCP - ND
B12	5′	No	PCP - ND

Note:

ND - Not Detected

spills in the area and with consideration of drainage. The location of these borings are shown on Figure 4. Samples taken for PCP chemical analysis were taken from these soil borings at depths shown in Table 1. Also shown in this table are the analytical results for these soil samples. Appendix B contains the lab reports. The only soil boring that had detectable concentrations of PCP was boring B9. At this boring, the sample taken at 2 feet BGS had a concentration of 2,100 mg/kg and the 5 foot sample had a concentration of 170 mg/kg. The sample at 10 feet BGS was non-detect (ND).

3.1.4 Chemonite Treating Area

As requested by the DNR, chemical soil samples from boring B13 were taken at greater depths (5 feet and 10 feet) in this area. Figure 3 shows the location of these borings. A composite sample was taken from each boring at a depth of 5 feet and at 10 feet below ground surface. These samples were analyzed for the target metals of concern: arsenic, copper and zinc and for pentachlorophenol. The analytical results are summarized on Table 1. Appendix B contains the lab reports. A sample was collected and held for potential analysis by EP Toxicity Leach Testing procedures. In addition, deeper borings were conducted to provide a metals profile with depth. Analytical results for metals from both Phase I and II were reviewed and indicate that elevated levels of metals above background were limited to a depth of approximately 3 feet and metals concentrations at depths of 5 and 10 feet were found to be similar

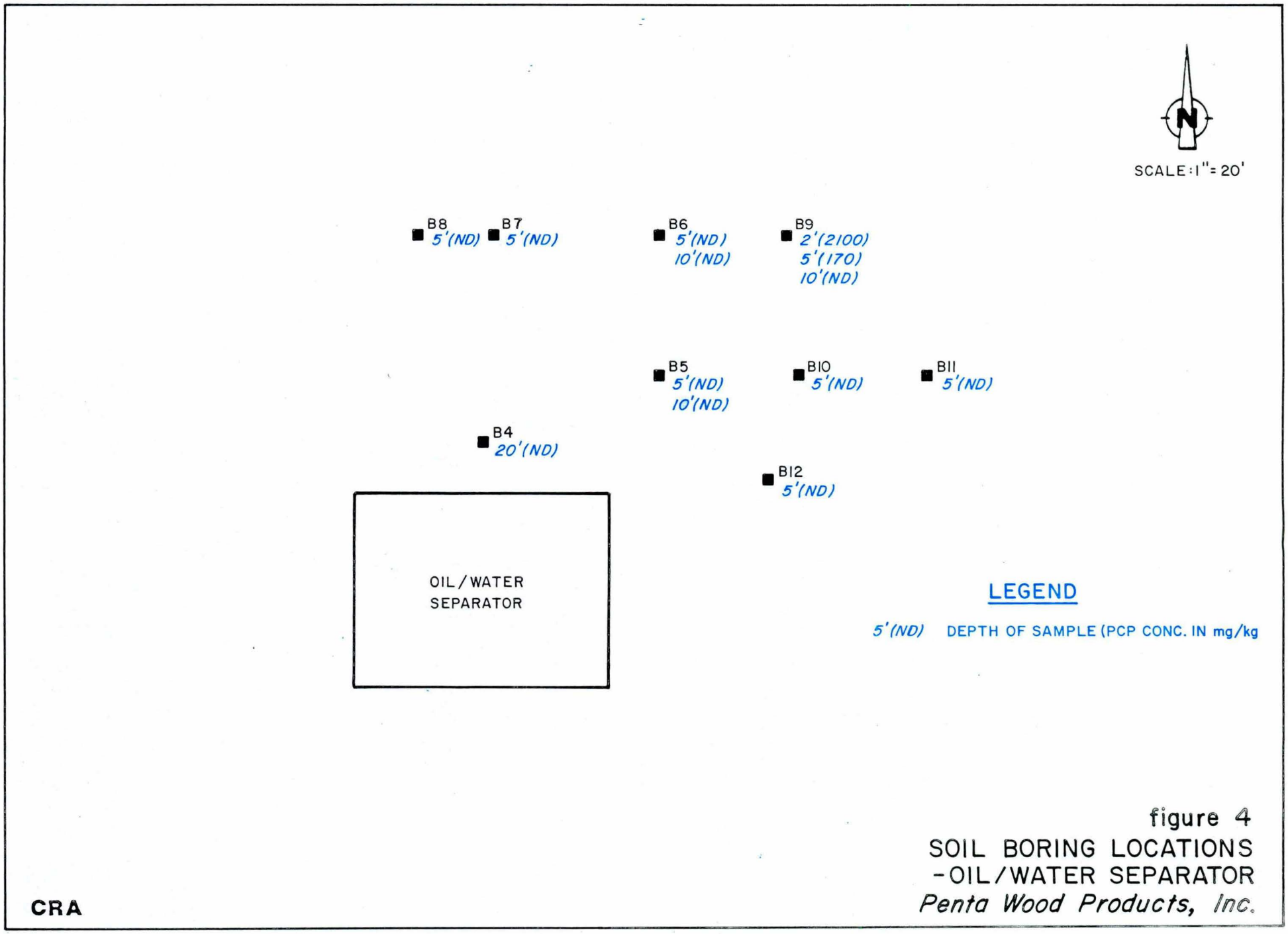

figure 4
SOIL BORING LOCATIONS
-OIL/WATER SEPARATOR
Penta Wood Products, Inc.

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to background concentration. As such, an EP Toxicity Leach test was not conducted on these samples because of the very low level presence of metals.

3.1.3 Pentachlorophenol Treating Area

As requested by the DNR, a boring, B14, was conducted in an area along the railroad tracks that lead into the penta treating retort cylinder. The DNR originally requested a test trench in this area, however, due to the potential for track disturbance, it was decided by both CRA and the DNR that a soil boring would be more appropriate. This soil boring location is shown on Figure 3. Chemical soil samples were taken at a depth of 5 and 10 feet below ground surface and analyzed for pentachlorophenol. These results are summarized on Table 1 and the actual lab reports are contained in Appendix B. Neither of these soil samples had concentrations of pentachlorophenol above the method detection limit.

During a field site inspection, the DNR expressed a concern about an area just north of the pentachlorophenol treating area. The retaining wall north of the pentachlorophenol retort sump has a PVC pipe coming out of the side of the wall. Upon further inspection it was found that this pipe did connect to the sump. This pipe was plugged on the sump end with sand. The DNR was concerned that this pipe may have drained treating solution out of the sump. It was decided that a soil boring, B15, should be done in this area. This location is shown on Figure 3. Due to the number of overhead utility lines and plant piping, a hand auger was used to take a chemical soil sample at a depth of

5 feet below ground surface. The analytical results are summarized in Table 1 and the lab reports are contained in Appendix B. The concentration of pentachlorophenol in this soil sample was non-detect.

3.3 GROUNDWATER SAMPLING - PRODUCTION WELL

During this field investigation, a water sample was taken from PWP's production wells. The faucet outside the treating building was turned on and the system was allowed to purge for 40 minutes to flush the lines to assure that a representative water sample was taken. This groundwater sample was analyzed for pentachlorophenol. The lab reports are contained in Appendix B. This groundwater sample showed pentachlorophenol at a concentration of 1,300 µg/L, which is consistent with concentrations reported previously.

3.4 WOOD CHIP/BOILER ASH SOIL SAMPLE

The DNR, in their letter dated March 7, 1989, requested a sample of ash be taken and analyzed for octachlorodibenzo-p-dioxin. CRA interviewed several PWP employees and were told that there was only one area where the boiler ash was deposited. This area is outside the door from the boiler room. After discussing this with the DNR, it was decided that a composite sample be taken from this ash pile. Twenty hand auger holes were conducted in

and on top of the ash pile to obtain a representative cross sectional sample. This sample was submitted for a complete (C1 through C8 congeners) dioxin analysis. The following evaluation was conducted by Dr. Paul Nees who is CRA's toxicologist.

NOW COMES THE DANCE AROUND THE RESULTS. SOMEBODY IS TRYING TO DIRTY THE WATER. DK

3.4.1 Evaluation of Chlorinated Dibenzoparadioxin (PCDD) Reported in a Soil/Ash Sample from Penta Wood Products Site

A composite sample of ash/soil was analyzed for PCDDs and the levels of tetra-, penta-, hexa- and octachlorinated isomers reported. The analyses were conducted by International Technology Corporation (IT) Analytical Services and reported July 27, 1989, to CRA. The sample was identified as Ash/Soil, Project ID 2140.

Evaluation Procedure

The evaluation of mixtures of PCDDs is frequently necessary but only a few of the 75 PCDD isomers have been studied sufficiently to conduct adequate risk assessments on the individual isomers. The isomers vary extensively with respect to their toxic potency although they all produce qualitatively similar toxic effects.

One isomer, 2,3,7,8-tetrachlorodibenzodioxon (2,3,7,8-TCDD), which is the most toxic, has been studied extensively. Comparative studies have been conducted on the other PCDD cogeners to allow estimates of their toxicity in comparison to 2,3,7,8-TCDD. From these comparisons, toxicity equivalence factors (TEFs) have been developed. See

Table 2. Multiplying the TEF times the concentration of the appropriate congener yields the concentration of 2,3,7,8-TCDD comparable to the congener concentration on a toxicity basis. With all cogeners converted to a 2,3,7,8-TCDD equivalent base, the concentrations can be added to determine the total 2,3,7,8-TCDD equivalent concentration and this concentration evaluated for potential health and environmental effects. This procedure and the TEFs have been developed by the Chlorinated Dioxin Work Group and published in a position document "Interim Task Assessment Procedures for Mixtures of Chlorinated-Dibenzodioxins and -Dibenzofurans (CDDs and CDFs)". This documented was updated April 1986.[2]

Evaluation and Discussion

Table 3 presents the reported PCDD concentrations for the sample and the 2,3,7,8-TCDD toxicity equivalent concentrations. Three equivalence values are presented for each homologous group (tetra-, penta-, hexa-, etc). The "worst case" set of values assumes all the isomers in the homologous group contain 2,3,7,8 position substitutions. 2,3,7,8 cogeners are considered more toxic than non-2,3,7,8 cogeners and are therefore given high TEF factors. The "best case" set of values assumes none of the isomers reported in the homologous group contains the 2,3,7,8 substitution. For the "more likely case", it is assumed that each isomer in the homologous group is present at equal

[2]Interim Risk Assessment Procedures for Mixtures of Chlorinated-Dibenzodioxins and -Dibenzofurans (CDDs and CDFs). Chlorinated Dioxin Work Group Position Paper: April 1986 - updated (Unpublished)

TABLE 2

2,3,7,8-TCDD TOXICITY EQUIVALENCE FACTORS (TEF)[1]

	PCDDs		PCDFs	
Chlorination	2,3,7,8-Cogeners	All Others	2,3,7,8-Cogeners	All Others
Mono-, Di-, Tri-	0	0	0	0
Tetra-	1	0.01	0.1	0.001
Penta-	0.5	0.005	0.1	0.001
Hexa-	0.04	0.0004	0.01	0.0001
Hepta-	0.001	0.00001	0.0001	0.00001
Octa-	0	0	0	0

Note:

1. Source: Chlorinated Dioxins Workgoup Position Document. April 1986 - updated. Interim Risk Assessment Procedures for Mixturs of Chlorinated -Dibenzodioxins and -Dibenzofurans (CDDs and CDFs).

TABLE 3

CONCENTRATIONS EXPRESSED AS 2,3,7,8-TCDD TOXICITY EQUIVALENTS

Chemical	Reported Concentration (ug/kg)	2,3,7,8-TCDD Equivalent Concentrations (ug/kg)			
		Worst Case	More Likely Case		Best Case
			2,3,7,8-Congeners	All Others	
2,3,7,8-TCDD	ND (0.084)	ND	ND	ND	ND
Other TCDD	ND (0.10)	ND	ND	ND	ND
Total PCDDs	0.260	0.130	0.009	0.001	0.001
Total HxCdds	3.800	0.152	0.003	0.001	0.002
Total HpCDDs	48.500	0.049	0.024	0.0002	0.00049
OCDD	74.200	0.000	0.000	0.000	0.000
Total PCDDs	126.760	0.331	0.037	0.003	0.003

HOW ABOUT DISCUSSION OF THE SOURCE?

I'D SPECULATE THAT THEY'VE BURNED PENTA-TREATED WOOD WASTES IN THEIR BOILER. I'D ALWAYS UNDERSTOOD THAT DIOXINS ARE PRESENT (AS A "CONTAMINANT") IN PENTACHLOROPHENOL. IF SO, DIOXINS WOULD BE PRESENT IN THE TREATED WOOD, AND/OR COULD BE FORMED FROM PCP AS A RESULT OF INCOMPLETE COMBUSTION IN THE BOILER.

HAVE THEY LOOKED FOR DIOXINS AT OTHER PCP-CONTAMINATED "HOT SPOTS"? SHOULD THEY?

DO WE WANT TO MEET & DISCUSS A COORDINATED APPROACH (GROUNDWATER, HAZ. WASTE, AIR MGMT., ETC.) TO THIS FACILITY - MAKE A MULTIDISCIPLINARY "PROJECT" OUT OF THEM?

AM 10/31/89

concentrations. In this evaluation where the original source of the PCDDs is not identified, the "most likely case" seems most appropriate. For the sake of completeness, values have been calculated and are presented for all three assumptions.

The total equivalent concentrations of 2,3,7,8-TCDD for the sample was 0.331, 0.039 and 0.003 ug/kg for worst, more likely and best case, respectively. These concentrations all are less than 1 ppb (ug/kg) guideline concentrations established by the Center for Disease Control (CDC) for 2,3,7,8-TCDD in soil in a residential area.[3] In the reference the author states: "We therefore conclude that a soil level of 1 ppb TCDD (2,3,7,8-TCDD) in residential areas is a reasonable level at which to express TCDD (2,3,7,8-TCDD) below 1 ppb are, for practical purposes considered not to reach a level of concern". With respect to commercial areas, CDC concludes: "Since these total doses for all routes are so much smaller than in residential areas, a level of concern may not necessarily be reached unless levels are several fold or more above 1 ppb".

Conclusion

The evaluation proposed by the Cancer Work Group Policy Document and the CDC guidelines for levels of 2,3,7,8-TCDD which would be a level of concern in soil from residential and industrial areas, support the conclusion that the reported concentrations of PCDDs in an ash/soil sample are not levels of public health concern, regardless of the disposition of the ash/soil.

[3]Kimbrough, R.D., et.al. Health Implications of 2,3,7,8-Tetrachlorodibenzodioxin (TCDD) Contamination of Residential Soil. Journal of Toxicology and Environmental Health, 14:47-93. 1984

4.0 CONCLUSIONS

Based on the findings of the Phase II Site Evaluation, the following conclusions are made:

1. There is no perched water in the upper sand unit around the treating/ production areas at the time of this investigation.

2. Groundwater in the lower sands below the hard pan continue to show elevated levels of pentachlorophenol. This water is used for production purposes, but use of this well as a drinking water source was discontinued in 1988.

3. Surface soils in and around the PWP production area are contaminated with pentachlorophenol. These areas include the oil/water separator building, the pentachlorophenol treating area and the chemonite treating area. This contamination appears to be limited to the top few feet of sand within these areas.

4. Metals concentrations in the surface soil around the chemonite treating area show elevated levels of the target metals. The soils below 3 feet below ground surface have background metals concentrations.

5. The boiler ash pile does show the presence of octachlorodibenzo-p-dioxin. When this dioxin is converted to a toxic equivalency as 2,3,7,8-TCDD, it is found that there is no significant health risk associated with the very low level dioxins present in the ash pile.

5.0 SCOPE OF WORK - PHASE III

5.1 PURPOSE

Phases I and II of this investigation have identified the presence of contamination at the PWP Site. The following work items are required to further define surface and subsurface contamination at the Site.

5.2 PHASE III WORK PLAN

5.2.1 Lower Sand Aquifer Wells

CRA proposes that three lower sand wells be installed at the location shown in Figure 5. These wells are required to determine groundwater flow direction in the lower sand aquifer and to determine whether or not purging from the company production wells are in fact containing the pentachlorophenol present in the lower sand aquifer.

These wells would be installed using cable tool drilling techniques. They will be installed to the same depth as the companies production wells. After the installations have been completed the wells will be developed and stabilized. A groundwater sample will be taken from each well and analyzed for pentachlorophenol. Groundwater elevations will also be calculated to determine groundwater flow directions in the lower sand aquifer.

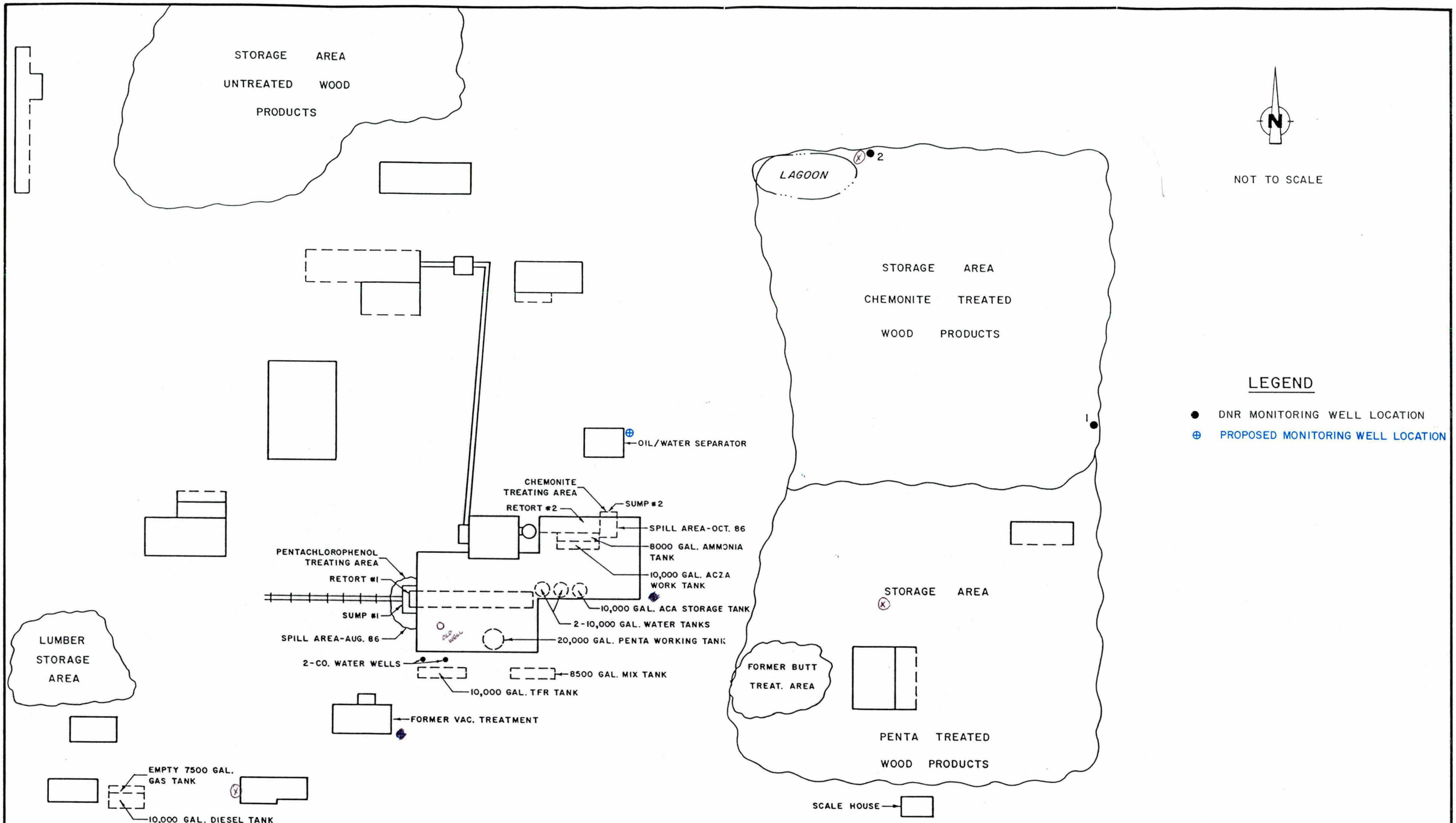

figure 5
PROPOSED LOWER SAND
MONITORING WELL LOCATIONS
Penta Wood Products, Inc.

CRA

2140-26/09/89-M

5.2.2 Production Well Area/Underground Storage Tanks

There are two underground storage tanks in the near vicinity of the company's production wells. The 8,500 gallon mix tank has been excavated and placed above ground in a containment building. The 10,000 gallon transfer tank is still under ground. This tank was pumped dry and filled with sand. The physical integrity of this tank is unknown. Therefore, CRA proposes that this tank be excavated and checked for former leakage. Three soil samples will be collected directly beneath the tank and analyzed for PCP.

5.2.3 Oil/Water Separator

CRA proposes that a hand auger borehole be advanced inside the building as deep as practical (at least 10 feet) to obtain a chemical soil sample. This chemical data is critical in determining how much of an impact this building has had on the soils under this building. Further delineation of soil contamination around the boring B9 area is also proposed.

APPENDIX A

STRATIGRAPHIC LOGS

WISCONSIN TEST DRILLING, INC.

FIELD BORING LOG

Sheet 1 Of 3

SCHOFIELD, WISCONSIN

FOR CRA — Penta Wood Products.

LOCATION Siren, WI — Elev.

Job No. 1745

Boring No. MW-3

GROUND WATER — While drilling: Dry — Before casing removal: — — After casing removal: —

Time after drilling: — — Depth to water: — — Depth to cave-in: Grout from 110.0'

Start 6-13-89 — Unit D-50 — Chief MM

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS (Casing/Probe — Weight 140# — Drop 30")	Unconfined Strength	Boulders	Blows on Casing Size	Blows on Probe Size	Drilling Method
											4¼ HSA
1	D	4	4								
		5		10	9	Brn. Med. Grain SAND					
2	D	9	10								
		14		12	24						
3	D	11	16								
		22		14	38						
						16.0'					
						M-SAND & M-C GRAVEL					
4	D	13	16								
		21		12	37						
						21.0'					
						F-C Milti-colored SAND w/Rd. CLAY, Some Gravel					
5	D	20	38								
		54		19	92						
6	D	14	21								
		28		15	49						
						31.0'					
						F-C Multi-colored SAND w/Rd. Clay, Some Gravel					
7	D	17	28								
		47		13	75						
						36.0'					
						F-C Multi-colored SAND w/Occas. Gravel					
8	D	18	33								
		48		11	81						
						41.0'					
						Fine Multi-colored SAND					
9	D	16	36								
		67		12	103						

WISCONSIN TEST DRILLING, INC. — **FIELD BORING LOG** — Sheet 2 Of

SCHOFIELD, WISCONSIN

FOR CRA — Penta Wood Products

LOCATION — Siren, WI — Elev.

Job No. 1745

Boring No. MW-3

GROUND WATER: While drilling Dry — Time after drilling — Before casing removal — Depth to water — After casing removal — Depth to cave-in

Start 6-13-89 — Unit D-50 — Chief MM

Casing/Probe — Weight 140# — Drop 30"

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Unconfined Strength	Boulders	Blows on Casing Size	Blows on Probe Size	Drilling Method
10	D	21	27			Fine Multi-colored SAND					4¼ HSA
		34		1.5	61						
11	D	15	27			55	55				
		44		1.4	71	56.0'					
						F-C Multi-colored SAND, Occas. Gravel					
12	D	21	45			60	60				
		55		1.5	100	61.0'					
						F-C Multi-colored SAND					
13	D	27	55			65	65				
		80		1.5	135	66.0'					
						F-C Multi-colored SAND w/Gravel					
14	D	32	38			70	70				
		42		1.0	89	71.0'					
						F-C Multi-colored SAND					
15	M	29	66			75	75				
		68		1.3	34	76.0'					
						F-C Multi-colored SAND, Occas. Gravel					
16	D	27	43			80 Brn. w/Silt Lens @ 81.0'	80				
		46		1.0	89	81.0'					
						F-C Multi-colored SAND, Occas. Gravel					
17	D	45	66			85	85				
		85		1.1	151						
18	D	20	47			90	90				
		93		1.0	140						
19	D	45	67			95	95				
		90		1.5	157						
						100	100				

WISCONSIN TEST DRILLING, INC. — **FIELD BORING LOG** — Sheet 3 Of 3

SCHOFIELD, WISCONSIN

FOR CRA — Penta Wood Products

LOCATION — Siren, WI — Elev.

Job No. 1745

Boring No. MW-3

GROUND WATER: While drilling: Dry — Time after drilling — Start

Before casing removal — Depth to water — Unit

After casing removal — Depth to cave-in — Chief

Casing/Probe — Weight 140# — Drop 30"

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/18	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Unconfined Strength	Boulders	Blows on Casing Size	Blows on Probe Size	Drilling Method
20	D	25	57								4¼
		87		1.4	144	F/C SAND, Multi-colored w/Gravel					HSA
21	D	28	56								
		100		1.4	156	105					
						110					
22	D	86	100								
				1.0	100	115					
23	D	110	73								
		73		.9	146	120					
24	D	72	97								
		93		1.0	190	125					
						126.0'					
						VC SAND & GRAVEL, Little Silt, Some Kind of Green Rock					
25	D	117	125								
				.5	125	130					
						130.5'					
						Sandy Silty CLAY					
26	W	150	200								
				1.0	200	135					
						E.O.B. @ 135.5'					
						Possible Hand Pan, Red					
						140					
						145					

WISCONSIN TEST DRILLING, INC.

FIELD BORING LOG

Sheet 1 Of 3

SCHOFIELD, WISCONSIN

FOR CRA — Penta Wood Products

LOCATION Siren, WI — Elev.

Job No. 1745

Boring No. MW-4

GROUND WATER	While drilling	Dry	Time after drilling		Start 6-15-89
	Before casing removal		Depth to water		Unit D-50
	After casing removal		Depth to cave-in	Grout from 95.0'	Chief MM

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Casing/Probe Weight 140# Drop 30"	Unconfined Strength	Boulders	Blows on Casing Size	Blows on Probe Size	Drilling Method
												4¼ HSA
						F-C SAND						
1	M	6	11									
		15		12	26							
						6.0'						
						F-C Multi-colored SAND						
2	M	7	15									
		19		14	34							
3	M	10	17									
		22		14	39							
4	M	22	26									
		29		15	55							
						21.0'						
						F-C Multi-colored SAND, Occas. Gravel						
5	M	28	35									
		33		16	68							
6	D	23	33									
		39		17	72							
7	D	39	52									
		54		17	106							
8	D	17	37									
		57		15	94							
9	D	25	50									
		60		17	110							

WISCONSIN TEST DRILLING, INC.

FIELD BORING LOG

Sheet 2 Of 3

SCHOFIELD, WISCONSIN

FOR CRA — Penta Wood Products

LOCATION Siren, WI — Elev.

Job No. 1745

Boring No. MW-4

GROUND WATER — While drilling: Dry — Time after drilling — Before casing removal — Depth to water — After casing removal — Depth to cave-in

Start 6-15-89
Unit D-50
Chief MM

Casing/Probe
Weight 140#
Drop 30"

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Unconfined Strength	Boulders	Blows on Casing Size	Blows on Probe Size	Drilling Method
10	D	20	37	1.0							4¼
		48			85	F-C Multi-colored SAND w/Gravel					HSA
11	M	50	50								
		62		.9	112						
12	M	16	50								
		112		1.1	162						
13	M	35	59								
		77		1.5	136						
						76.0'					
14	M	21	57			F & M Multi-colored SAND					
		85		1.5	142						
						86.0'					
15	D	216	42			M-C Multi-colored SAND w/Gravel					
		63		1.1	105						

55 60 65 70 75 80 85 90 95 100

WISCONSIN TEST DRILLING, INC. — **FIELD BORING LOG** — Sheet 3 Of 3

SCHOFIELD, WISCONSIN

FOR CRA — Penta Wood Products

LOCATION Siren, WI — Elev.

Job No. 1745

Boring No. MW-4

GROUND WATER	While drilling	Dry	Time after drilling
	Before casing removal		Depth to water
	After casing removal		Depth to cave-in

Start 6-15-89
Unit D-50
Chief MM

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/18	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Casing/Probe Weight 140# Drop 30"	Unconfined Strength	Boulders	Blows on Casing Size	Blows on Probe Size	Drilling Method
												4¼ HSA
16	D	137	75			F-M Brn. SAND						
		121		9	196	105						
17	D	300		2		Hard Pan						
						110 — E.O.B. @ 110.0'						
						115						
						120						
						125						
						130						
						135						
						140						
						145						

WISCONSIN TEST DRILLING, INC.

FIELD BORING LOG

Sheet 1 Of 1

SCHOFIELD, WISCONSIN

FOR CRA — Penta Wood Products

LOCATION Siren, WI — Elev.

Job No. 1745

Boring No. BH-5

GROUND WATER	While drilling	Dry	Time after drilling		Start 6-16-89
	Before casing removal		Depth to water		Unit D-50
	After casing removal		Depth to cave-in	7.2'	Chief MM

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Casing/Probe Weight 140# Drop 30"	Unconfined Strength	Boulders	Blows on Casing Size	Blows on Probe Size	Drilling Method
												4½ HSA
						Brn. F-C SAND						
1	D	Pushed		20								
2	D	Pushed		20		E.O.B. @ 12.0'						

5 10 15 20 25 30 35 40 45

WISCONSIN TEST DRILLING, INC.

FIELD BORING LOG

Sheet 1 Of 1

SCHOFIELD, WISCONSIN

FOR CRA — Penta Wood Products

LOCATION Siren, WI — Elev.

Job No. 1745

Boring No. BH-6

GROUND WATER	While drilling	Dry	Time after drilling		Start 6-16-89
	Before casing removal		Depth to water		Unit D-50
	After casing removal		Depth to cave-in	6.2'	Chief MM

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Casing/Probe Weight 140# Drop 30"	Unconfined Strength	Boulders	Blows on Casing Size	Blows on Probe Size	Drilling Method
												4¼ HSA
1	D	Pushed		20		Brn. F-C SAND						
2	D	Pushed		18		E.O.B. @ 12.0'						

5 10 15 20 25 30 35 40 45

WISCONSIN TEST DRILLING, INC.

FIELD BORING LOG

Sheet 1 Of 1

SCHOFIELD, WISCONSIN

FOR CRA Penta Wood Products

LOCATION Siren, WI Elev.

Job No. 1745

Boring No. BH-7

GROUND WATER	While drilling	Dry	Time after drilling		Start 6-16-89
	Before casing removal		Depth to water		Unit D-50
	After casing removal		Depth to cave-in	3.6'	Chief MM

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Casing/Probe Weight 140# Drop 30"	Unconfined Strength	Boulders	Blows on Casing Size	Blows on Probe Size	Drilling Method
												4¼ HSA
						Brn. F-C SAND						
1	D	Pushed		20		E.O.B. @ 7.0'						

WISCONSIN TEST DRILLING, INC.

FIELD BORING LOG

Sheet 1 Of 1

SCHOFIELD, WISCONSIN

FOR CRA — Penta Wood Products

LOCATION Siren, WI — Elev.

Job No. 1745

Boring No. BH-8

GROUND WATER	While drilling	Dry	Time after drilling		Start 6-16-89
	Before casing removal		Depth to water		Unit D-50
	After casing removal		Depth to cave-in	4.0'	Chief MM

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Casing/Probe Weight 140# Drop 30"	Unconfined Strength	Boulders	Blows on Casing Size	Blows on Probe Size	Drilling Method
												4¼ HSA
						Brn. F-C SAND						
1	D	Pushed		20		E.O.B. @ 7.0'						

WISCONSIN TEST DRILLING, INC.

FIELD BORING LOG

Sheet 1 Of 1

SCHOFIELD, WISCONSIN

FOR CRA — Penta Wood Products

LOCATION Siren, WI — Elev.

Job No. 1745

Boring No. BH-9

GROUND WATER	While drilling	Dry	Time after drilling		Start 6-16-89
	Before casing removal		Depth to water		Unit D-50
	After casing removal		Depth to cave-in	7.3'	Chief MM

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Casing/Probe Weight 140# Drop 30"	Unconfined Strength	Boulders	Blows on Casing Size	Blows on Probe Size	Drilling Method
												4¼ HSA
						Brn. F-C SAND						
1	D	Pushed		20								
2	D	Pushed		20		E.O.B. @ 12.0'						

5 10 15 20 25 30 35 40 45

WISCONSIN TEST DRILLING, INC.

FIELD BORING LOG

Sheet 1 Of 1

SCHOFIELD, WISCONSIN

FOR CRA — Penta Wood Products

LOCATION Siren, WI — Elev.

Job No. 1745

Boring No. BH-10

GROUND WATER

While drilling: Dry — Time after drilling:

Before casing removal: — Depth to water:

After casing removal: — Depth to cave-in: 4.2'

Start 6-16-89

Unit D-50

Chief MM

Casing/Probe

Weight 140#

Drop 30"

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Unconfined Strength	Boulders	Blows on Casing Size	Blows on Probe Size	Drilling Method
											4¼ HSA
						Brn. F-C SAND					
1	D	Pushed		18		E.O.B. @ 7.0'					

5 10 15 20 25 30 35 40 45

WISCONSIN TEST DRILLING, INC.

FIELD BORING LOG

Sheet 1 Of 1

SCHOFIELD, WISCONSIN

FOR CRA Penta Wood Products

LOCATION Siren, WI Elev.

Job No. 1745

Boring No. BH-11

GROUND WATER	While drilling	Dry	Time after drilling		Start 6-16-89
	Before casing removal		Depth to water		Unit D-50
	After casing removal		Depth to cave-in	4.0'	Chief MM

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Casing/Probe Weight 140# Drop 30"	Unconfined Strength	Boulders	Blows on Casing Size	Blows on Probe Size	Drilling Method
												4¼ HSA
						Brn. F-C SAND						
1	D	Pushed		2.0		E.O.B. @ 7.0'						

WISCONSIN TEST DRILLING, INC.

FIELD BORING LOG

Sheet 1 Of 1

SCHOFIELD, WISCONSIN

FOR CRA — Penta Wood Products

LOCATION Siren, WI — Elev.

Job No. 1745

Boring No. BH-12

GROUND WATER — While drilling: Dry; Before casing removal; After casing removal; Time after drilling; Depth to water; Depth to cave-in: 3.4'

Start 6-16-89
Unit D-50
Chief MM

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Casing/Probe Weight 140# Drop 30"	Unconfined Strength	Boulders	Blows on Casing Size	Blows on Probe Size	Drilling Method
						Brn. F-C SAND						4½ HSA
1	D	Pushed		2.0		E.O.B. @ 7.0'						

5 10 15 20 25 30 35 40 45

WISCONSIN TEST DRILLING, INC.

FIELD BORING LOG

Sheet 1 Of 1

SCHOFIELD, WISCONSIN

FOR CRA — Penta Wood Products

LOCATION Siren, WI — Elev.

Job No. 1745

Boring No. BH-13A

GROUND WATER	While drilling	Dry	Time after drilling		Start 6-16-89
	Before casing removal		Depth to water		Unit D-50
	After casing removal		Depth to cave-in	9.2'	Chief MM

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Casing/Probe Weight 140# Drop 30"	Unconfined Strength	Boulders	Blows on Casing Size	Blows on Probe Size	Drilling Method
												4¼ HSA
						Brn. F-C SAND, Trc. Silt						
1	D			2.0								
						E.O.B. @ 10.0'						
2	D			2.0		Grab Samples						

WISCONSIN TEST DRILLING, INC.

FIELD BORING LOG

Sheet 1 Of 1

SCHOFIELD, WISCONSIN

FOR CRA — Penta Wood Products

LOCATION Siren, WI — Elev.

Job No. 1745

Boring No. BH-13B

GROUND WATER	While drilling	Dry	Time after drilling		Start 6-16-89
	Before casing removal		Depth to water		Unit D-50
	After casing removal		Depth to cave-in	9.6'	Chief MM

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Casing/Probe Weight 140# Drop 30"	Unconfined Strength	Boulders	Blows on Casing Size	Blows on Probe Size	Drilling Method
						Brn. F-C SAND, Trc. Silt						4¼ HSA
1	D											
2	D					E.O.B. @ 10.0'						

WISCONSIN TEST DRILLING, INC.

FIELD BORING LOG

Sheet 1 Of 1

SCHOFIELD, WISCONSIN

FOR CRA — Penta Wood Products

LOCATION Siren, WI — Elev.

Job No. 1745

Boring No. BH-14

GROUND WATER	While drilling	Dry	Time after drilling		Start 6-16-89
	Before casing removal		Depth to water		Unit D-50
	After casing removal		Depth to cave-in	8.2'	Chief MM

Sample No.	Moisture	Blows on Sampler 0/6	Blows on Sampler 6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Casing/Probe Weight 140# Drop 30"	Unconfined Strength	Boulders	Blows on Casing Size	Blows on Probe Size	Drilling Method
												4¼ HSA
						Brn. F-C SAND						
1	D	Pushed		20								
2	D	Pushed		20		E.O.B. @ 12.0'						

5 10 15 20 25 30 35 40 45

APPENDIX B

ANALYTICAL REPORTS

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

JUL 31 89

CERTIFICATE OF ANALYSIS

Steve Mockenhaupt
CRA, Inc.
382 W. Country Road - D
St. Paul, MN 55112

DATE: July 27, 1989

PROJECT NUMBER: CRA482180

This is the Certificate of Analysis for the following sample:

Client Project ID:	2140
Date Received by Lab:	July 6, 1989
Number of Samples:	One (1)
Sample Type:	Ash/Soil

I. Introduction/Case Narrative

One (1) ash/soil sample was received 07-06-89 for the analysis of both isomer specific 2,3,7,8-TCDD and total tetra through octa (Cl_4-Cl_8) dioxin homologs. The sample and blank were spiked with an internal standard mixture containing 50 ng each of ^{13}C-2,3,7,8-TCDD, ^{13}C-PeCDD, ^{13}C-HxCDD, ^{13}C-HpCDD and ^{13}C-OCDD. The sample and blank were extracted and cleaned up using a modified version of the EPA reference method described in "RCRA SW-846, Method 8280," revised September, 1986. Extracts were analyzed by GC/MS operating in the selected ion monitoring mode for enhanced sensitivity.

(NM055)/sm

Reviewed and Approved:

Duane K. Root
Analytical Operations Manager

IT ANALYTICAL SERVICES
304 DIRECTORS DRIVE
KNOXVILLE, TN
(615) 690-3211

CRA, Inc.
Date: July 27, 1989
Client Project ID: 2140 Project ID No.: CRA482180

II. Analytical Results/Methodology

SAMPLE PREPARATION

A ten (10) gram aliquot of the ash/soil and 10 grams of sodium sulfate (for the blank) were weighed into separate soxhlet thimbles. The sample and blank were spiked with the internal standard mixture and allowed to stand overnight for equilibration followed by a soxhlet extraction with benzene for sixteen hours. The resulting extracts were filtered into a KD flask and the volume reduced to approximately 1 ml.

SAMPLE CLEANUP

To aid in the removal of chemical interferences, the sample and blank were cleaned up using dual column chromatography consisting of an acid-modified silica gel column followed by a neutral alumina column. Detailed descriptions of these cleanup techniques can be found in Option A of the U.S. Environmental Protection Agency, Region VII Protocol for "The Determination Of 2,3,7,8-TCDD In Soil And Sediment", revised September, 1983. Final extracts were concentrated to near dryness and raised to 50 μl with 25 ng ^{13}C-1,2,3,4-TCDD and 25 ng ^{13}C-1,2,3,7,8,9-HxCDD which were used as recovery standards.

GC/MS ANALYSIS

Isomer Specific TCDD - The sample extracts were analyzed using HRGC/LRMS scanning in the selected ion monitoring mode for enhanced sensitivity. The column used for this isomer specific analysis was a 60 m SP-2331 fused silica capillary column. Before acquisition of the sample data, a seven isomer performance mixture containing the six most closely eluting TCDD isomers was analyzed.

In addition, a seven point calibration plot was analyzed. The mean response factors obtained from this seven point calibration were used for all subsequent calculations. The shift standard, analyzed on the same day as the sample, produced a response factor within 10% of the seven point curve for TCDD. Percent recovery is reported by comparing ^{13}C-2,3,7,8-TCDD to ^{13}C-1,2,3,4-TCDD.

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KNOXVILLE, TN
(615) 690-3211

CRA, Inc.
Date: July 27, 1989
Client Project ID: 2140 Project ID No.: CRA482180

Total Dioxin - The sample and blank were analyzed for total dioxin homologs from Cl_4-Cl_8. The analytical approach employed by ITAS for the determination of total dioxins is considered semi-quantitative due to the lack of availability of all dioxin isomer standards. The standard analyzed each shift consisted of:

Dioxins

^{13}C-2,3,7,8-TCDD
^{13}C-1,2,3,4-TCDD
^{13}C-1,2,3,7,8-PeCDD
^{13}C-1,2,3,6,7,8-HxCDD
^{13}C-1,2,3,7,8,9-HxCDD
^{13}C-1,2,3,4,6,7,8-HpCDD
^{13}C-OCDD
2,3,7,8-TCDD
1,2,3,7,8-PeCDD
1,2,3,4,7,8-HxCDD
1,2,3,6,7,8-HxCDD
1,2,3,7,8,9-HxCDD
1,2,3,4,6,7,8-HpCDD
OCDD

Response factors were calculated for each compound in the standard relative to its ^{13}C labeled homolog; the same response was assumed applicable to all isomers in each homologous group. A seven point calibration plot was analyzed. The mean response factors obtained from this seven point calibration were used for all subsequent calculations. The shift standard, analyzed on the same day as the sample, produced a response factor within 30% of the multipoint.

The extracts were analyzed using HRGC/LRMS scanning in the selected ion monitoring mode for enhanced sensitivity. The column used for the analysis was a 60 m DB-5 fused silica capillary column.

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KNOXVILLE, TN
(615) 690-3211

CRA, Inc.
Date: July 27, 1989
Client Project ID: 2140 Project ID No.: CRA482180

GC/MS RESULTS

Isomer Specific TCDD - The results for the isomer specific analysis, shown in Appendix A, are reported in ppb. A detection limit is calculated from 2.5 times the signal in the area of the elution of ^{13}C-TCDD whenever a sample contains no detectable 2,3,7,8-TCDD.

Totals - The results for the totals analysis, shown in Appendix A, are reported in ppb with the total amount of each homologous group calculated. When more than one isomer in a homologous group of dioxin is found, all of the isomers are added together to produce a total homolog result. Detection limits are calculated from 2.5 times signal to noise when a "Not Detected" (ND) is reported. The detection limits are listed in parenthesis.

III. Quality Control

Routine laboratory non-project specific QA/QC was followed. Recoveries for the ^{13}C internal standards for each sample are presented with the sample analysis data.

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APPENDIX A

IT ANALYTICAL SERVICES
304 DIRECTORS DRIVE
KNOXVILLE, TN
(615) 690-3211

CRA, Inc.
Date: July 27, 1989
Client Project ID: 2140 Project ID No.: CRA482180

Dioxin/Furan Analysis - Method 8280

Client Sample ID: Ash Pile Composite

Sample Date: June 29, 1989
IT Sample ID: BB1547
Analysis Date: July 12, 1989

Analyte	Conc. (ng/g)	Analyte	Conc. (ng/g)
2,3,7,8-TCDD	ND(0.084)	2,3,7,8-TCDF	N/A
Total TCDD	ND(0.10)	Total TCDF	N/A
1,2,3,7,8-PeCDD	N/A	1,2,3,7,8-PeCDF	N/A
Total PeCDD	0.26	2,3,4,7,8-PeCDF	N/A
		Total PeCDF	N/A
1,2,3,4,7,8-HxCDD	N/A		
1,2,3,6,7,8-HxCDD	N/A	1,2,3,4,7,8-HxCDF	N/A
1,2,3,7,8,9-HxCDD	N/A	1,2,3,6,7,8-HxCDF	N/A
Total HxCDD	3.8	2,3,4,6,7,8-HxCDF	N/A
		1,2,3,7,8,9-HxCDF	N/A
1,2,3,4,6,7,8-HpCDD	N/A	Total HxCDF	N/A
Total HpCDD	48.5		
		1,2,3,4,6,7,8-HpCDF	N/A
Total OCDD	74.2*	1,2,3,4,7,8,9-HpCDF	N/A
		Total HpCDF	N/A
		Total OCDF	N/A

Internal Standard	% Recovery	Internal Standard	% Recovery
TCDD	70	TCDF	N/A
PeCDD	71	PeCDF	N/A
HxCDD	80	HxCDF	N/A
HpCDD	104	HpCDF	N/A
OCDD	124**		

*Calculated using single ions 460 vs 472, estimate only - exceeds calibration range

**Calculated using single ions 472 vs 402

N/A - Not Analyzed For.

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IT ANALYTICAL SERVICES
304 DIRECTORS DRIVE
KNOXVILLE, TN
(615) 690-3211

CRA, Inc.
Date: July 27, 1989
Client Project ID: 2140 Project ID No.: CRA482180

Dioxin/Furan Analysis - Method 8280

Client Sample ID: Reagent Blank

Sample Date: N/A
IT Sample ID: Blank 1447
Analysis Date: July 12, 1989

Analyte	Conc. (ng/g)	Analyte	Conc. (ng/g)
2,3,7,8-TCDD	ND(0.0095)	2,3,7,8-TCDF	N/A
Total TCDD	ND(0.028)	Total TCDF	N/A
1,2,3,7,8-PeCDD	N/A	1,2,3,7,8-PeCDF	N/A
Total PeCDD	ND(0.058)	2,3,4,7,8-PeCDF	N/A
		Total PeCDF	N/A
1,2,3,4,7,8-HxCDD	N/A		
1,2,3,6,7,8-HxCDD	N/A	1,2,3,4,7,8-HxCDF	N/A
1,2,3,7,8,9-HxCDD	N/A	1,2,3,6,7,8-HxCDF	N/A
Total HxCDD	ND(0.038)	2,3,4,6,7,8-HxCDF	N/A
		1,2,3,7,8,9-HxCDF	N/A
1,2,3,4,6,7,8-HpCDD	N/A	Total HxCDF	N/A
Total HpCDD	ND(0.032)		
		1,2,3,4,6,7,8-HpCDF	N/A
Total OCDD	ND(0.063)	1,2,3,4,7,8,9-HpCDF	N/A
		Total HpCDF	N/A
		Total OCDF	N/A

Internal Standard	% Recovery	Internal Standard	% Recovery
TCDD	86	TCDF	N/A
PeCDD	86	PeCDF	N/A
HxCDD	93	HxCDF	N/A
HpCDD	112	HpCDF	N/A
OCDD	122		

N/A - Not Analyzed For.

(NM055)/sm

pace laboratories, inc.

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California
Leawood, Kansas

Conestoga Rovers & Associates, Inc.
382 West County Road D
St. Paul, MN 55112

August 14, 1989
PACE Project Number: 890630517

Attn: Mr. Steven Mockenhaupt

Rec'd CRA
AUG 22 89

Penta Wood Products

Date Sample(s) Collected: 06/29/89
Date Sample(s) Received: 06/30/89

PACE Sample Number:			220190	220200
Parameter	Units	MDL	B-15 5'	Prod. Well
ORGANIC ANALYSIS				
INDIVIDUAL PARAMETERS				
Pentachlorophenol	ug/L	14	-	1300
Pentachlorophenol	mg/kg	4.6	ND	-

MDL Method Detection Limit
ND Not detected at or above the MDL.

The data contained in this report were obtained using EPA or other approved methodologies. All analyses were performed by me or under my direct supervision.

Dennis R. Seeger
Organic Chemistry Manager

pace laboratories, inc.

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California
Leawood, Kansas

Conestoga Rovers & Associates, Inc.
382 West County Road D
St. Paul, MN 55112

August 16, 1989
PACE Project Number: 890620515

Attn: Mr. Steven Mockenhaupt

2140

Date Sample(s) Collected: 06/15/89
Date Sample(s) Received: 06/20/89

PACE Sample Number:			203380	203390	203400
Parameter	Units	MDL	B5 5'	B5 10'	B6 5'
ORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Moisture content	%	1.0	12.3	4.6	3.4
Pentachlorophenol	mg/kg	0.8	ND	ND	ND

MDL Method Detection Limit
ND Not detected at or above the MDL.

pace laboratories, inc.

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California
Leawood, Kansas

August 16, 1989
PACE Project Number: 890620515

PACE Sample Number:			203410	203420	203430
Parameter	Units	MDL	B6 10'	B7 5'	B8 5'
ORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Moisture content	%	1.0	5.1	6.0	3.4
Pentachlorophenol	mg/kg	0.8	ND	ND	ND

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

Offices:
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Novato, California
Leawood, Kansas

August 16, 1989
PACE Project Number: 890620515

PACE Sample Number: / Parameter	Units	MDL	203440 B9 2'	203450 B9 5'	203460 B9 10'
ORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Moisture content	%	1.0	8.4	7.7	3.4
Pentachlorophenol	mg/kg	0.8	-	-	ND
Pentachlorophenol	mg/kg	17	2100	-	-
Pentachlorophenol	mg/kg	4.1	-	170	-

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

Offices:
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Novato, California
Leawood, Kansas

August 16, 1989
PACE Project Number: 890620515

PACE Sample Number:			203470	203480	203490
Parameter	Units	MDL	B10 5'	B11 5'	B12 5'
ORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Moisture content	%	1.0	4.2	5.6	6.5
Pentachlorophenol	mg/kg	0.8	ND	ND	ND

MDL Method Detection Limit
ND Not detected at or above the MDL.

Pace Laboratories, inc.

REPORT OF LABORATORY ANALYSIS

Offices:
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Leawood, Kansas

QUALITY CONTROL DATA

Client Name Conestoga Rovers & Associates PACE Project Number 890630.517

Project Name Penta Wood Products

SUMMARY OF ORGANIC METHOD BLANK PRECISION DATA

Parameter _____ Date of Analysis 7-24-89

Compound	Method Blank
PHENOL	ND
2-CHLOROPHENOL	ND
2-NITROPHENOL	ND
2,4-DIMETHYLPHENOL	ND
2,4-DICHLOROPHENOL	ND
4-CHLORO-3-METHYLPHENOL	ND
2,4,6-TRICHLOROPHENOL	ND
2,4-DINITROPHENOL	ND
4-NITROPHENOL	ND
2-METHYL-4,6-DINITROPHENOL	ND
PENTACHLOROPHENOL	ND

Comments: _____

NA Not Analyzed
ND Not Detected at or above the method detection limit

1710 Douglas Drive North □ Minneapolis, MN 55422 □ Phone (612) 544-5543

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REPORT OF LABORATORY ANALYSIS

QUALITY CONTROL DATA

Client Name Conestoga Rovers & Associates PACE Project Number 890630.517

Project Name Penta Wood Products Sample Spiked 22020

SUMMARY OF ORGANIC ACCURACY AND PRECISION DATA

Parameter EPA Method 604 Date of Analysis 7-24-89

Compound	MS % Rec	MSD % Rec	RPD	Accuracy Range	Precision Limit
Phenol	36	30	21	108-23	30%
2-Chlorophenol	81	68	17	126-38	30%
2-Nitrophenol	86	70	20	117-43	30%
2,4-Dimethylphenol	90	72	21	118-24	30%
2,4-Dichlorophenol	90	72	23	119-44	30%
4-Chloro-3-Methylphenol	93	72	26	122-99	30%
2,4,6-Trichlorophenol	116	89	27	119-53	30%
2,4-Dinitrophenol	29	89	101	143-12	30%
4-Nitrophenol	44	34	27	110-13	30%
2-Methyl-4,6-Dinitrophenol	114	89	0.71	136-30	30%
Pentachlorophenol	106	78	31	134-36	30%

Comments:

CRA Consulting Engineers
CONESTOGA-ROVERS & ASSOCIATES
651 Colby Drive, Waterloo, Ontario Canada N2V 1C2

SHIPPED TO (Laboratory name): Pace Labs

CHAIN OF CUSTODY RECORD

PROJECT Nº: 2140

PROJECT NAME: Penta Wood Products

SAMPLER'S SIGNATURE: A.S. Mackenhaupt (SIGN)

SEQ. Nº.	SAMPLE Nº.	DATE	TIME	SAMPLE LOCATOIN	SAMPLE TYPE	Nº OF CONTAINERS	REMARKS
	22019	6-29-89		B-15 5'	Soil	1	pentachlorophenol
	20	6-29-89		Prod. Well	Water	1	" "
				TOTAL NUMBER OF CONTAINERS		2	

ANTICIPATED CHEMICAL HAZARDS:

RELINQUISHED BY: [1] A.S. Mackenhaupt (SIGN)	DATE/TIME 6-30-89 8:30	RECEIVED BY: [2] (SIGN)
RELINQUISHED BY: [2] (SIGN)	DATE/TIME	RECEIVED BY: [3] (SIGN)
RELINQUISHED BY: [3] (SIGN)	DATE/TIME	RECEIVED BY: [4] (SIGN)
ADDITIONAL SIGNATURE SHEET REQUIRED ☐		

METHOD OF SHIPMENT: Pace Courier	SHIPPED BY: S. Mack	RECEIVED FOR LABORATORY BY: (SIGN)	DATE/TIME 6 130
CONDITION OF SEAL UPON RECEIPT: GENERAL CONDITION OF COOLER:		COOLER OPENED BY: (SIGN)	DATE/TIME

WHITE – CRA OFFICE COPY
YELLOW – RECEIVING LABORATORY COPY
PINK – CRA LABORATORY COPY
GOLDEN ROD – SHIPPERS

Nº 006541

pace laboratories, inc.

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California
Leawood, Kansas

August 16, 1989
PACE Project Number: 890620515

PACE Sample Number: / Parameter	Units	MDL	203500 B14 5'	203510 B14 10'	203520 B13 5'
INORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Arsenic	mg/kg	1.3	-	-	ND
Copper	mg/kg	0.25	-	-	14
Zinc	mg/kg	2.5	-	-	13
ORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Moisture content	%	1.0	3.0	2.9	6.1
Pentachlorophenol	mg/kg	0.8	ND	ND	23

ND Not detected at or above the MDL.
MDL Method Detection Limit

pace laboratories, inc.

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
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Coralville, Iowa
Novato, California
Leawood, Kansas

August 16, 1989
PACE Project Number: 890620515

PACE Sample Number:			203530	203540
Parameter	Units	MDL	B13 10'	B4 20'
INORGANIC ANALYSIS				
INDIVIDUAL PARAMETERS				
Arsenic	mg/kg	1.3	ND	-
Copper	mg/kg	0.25	14	-
Zinc	mg/kg	2.5	11	-
ORGANIC ANALYSIS				
INDIVIDUAL PARAMETERS				
Moisture content	%	1.0	7.9	3.3
Pentachlorophenol	mg/kg	0.8	4.1	ND

ND Not detected at or above the MDL.
MDL Method Detection Limit

The analyses of soil samples were performed 'as received' and do not reflect analyses on a dry weight basis unless indicated.

The data contained in this report were obtained using EPA or other approved methodologies. All analyses were performed by me or under my direct supervision.

Thomas L. Halverson
Inorganic Chemistry Manager

Dennis R. Seeger
Organic Chemistry Manager

pace laboratories, inc.

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California
Leawood, Kansas

QUALITY CONTROL DATA

Client Name Conestoga Rovers & Associates PACE Project Number 890620.515

Project Name 2140

SUMMARY OF INORGANIC ACCURACY AND PRECISION DATA

Parameter	Date of Analysis	Mthd Blk	Check Std. % Rec	True Value	Matrix Spike	% Rec	Rep. A	Rep. B	A-B	Mean % Rec
Arsenic	7-13-89	ND	113	10.0	10.4	104	10.38	10.22	0.16	109
Copper	7-3-89	0.01	99	2.00	1.80	90	NA	NA	-	100
Zinc	7-6-89	0.098	95	0.765	0.780	102	0.781	0.780	0.001	99

NA Not Analyzed

ND Not Detected at or above the method detection limit

pace laboratories, inc.

REPORT OF LABORATORY ANALYSIS

Offices:
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Novato, California
Leawood, Kansas

QUALITY CONTROL DATA

Client Name Conestoga Rovers & Associates PACE Project Number 890620.515

Project Name 2140 Sample Spiked 20339

SUMMARY OF ORGANIC ACCURACY AND PRECISION DATA

Parameter EPA Method 604 Date of Analysis 6/27/89

Compound	MS % Rec	MSD % Rec	RPD	Accuracy Range	Precision Limit
Phenol	10	12	14	108-23	30%
2-Chlorophenol	10	12	14	126-38	30%
2-Nitrophenol	9.6	11	12	117-43	30%
2,4-Dimethylphenol	9.2	11	16	118-24	30%
2,4-Dichlorophenol	9.6	11	12	119-44	30%
4-Chloro-3-Methylphenol	9.0	11	20	122-99	30%
2,4,6-Trichlorophenol	9.6	12	22	119-53	30%
2,4-Dinitrophenol	1.3	3.9	97	143-12	30%
4-Nitrophenol	0.0	4.0	200	110-13	30%
2-Methyl-4,6-Dinitrophenol	4.9	8.1	49	136-30	30%
Pentachlorophenol	6.1	9.4	42	134-36	30%

Comments: method blank - no compounds of interest detected

LABFM191 pg. 27

Standard turnaround

CRA Consulting Engineers
CONESTOGA-ROVERS & ASSOCIATES
651 Colby Drive, Waterloo, Ontario Canada N2V 1C2

SHIPPED TO (Laboratory name): Para Labs

CHAIN OF CUSTODY RECORD

PROJECT Nº: 2140

PROJECT NAME: Penta Wood Products

SAMPLER'S SIGNATURE: S.S. Mackenzie (SIGN)

SEQ. Nº	SAMPLE Nº	DATE	TIME	SAMPLE LOCATOIN	SAMPLE TYPE	Nº OF CONTAINERS	REMARKS
		6-15-89	2033	B5 5'	Soil	1	Pentachlorophenol - PCP
		6-15-89	39	B5 10'	Soil	1	PCP
		6-16-89	40	B6 5'	Soil	1	PCP
		6-16	41	B6 10'	Soil	1	PCP
		6-16	42	B7 5'	Soil	1	PCP
		6-16	43	B8 5'	Soil	1	PCP
		6-16	44	B9 2'	Soil	1	PCP
		6-16	45	B9 5'	Soil	1	PCP
		6-16	46	B9 10'	Soil	1	PCP
		6-16	47	B10 5'	Soil	1	PCP
		6-16	48	B11 5'	Soil	1	PCP
		6-16	49	B12 5'	Soil	1	PCP
		6-16	50	B14 5'	Soil	1	PCP
		6-16	51	B14 10'	Soil	1	PCP
		6-16	52	B13 5'	Soil	1	PCP
		6-16		B13 5'	Soil	1	Arsenic Copper, Zinc
		6-16	53	B13 10'	Soil	1	PCP
		6-16	53	B13 10	Soil	1	Arsenic, Copper, Zinc
		6-13	54	B4 20'	Soil	1	PCP
				TOTAL NUMBER OF CONTAINERS		~~18~~ 19	1 Blank

ANTICIPATED CHEMICAL HAZARDS:

RELINQUISHED BY: [1] S.S. Mackenzie (SIGN)	DATE/TIME 6-20-89 2:00	RECEIVED BY: [2] (SIGN)
RELINQUISHED BY: [2] (SIGN)	DATE/TIME	RECEIVED BY: [3] (SIGN)
RELINQUISHED BY: [3] (SIGN)	DATE/TIME	RECEIVED BY: [4] (SIGN)
ADDITIONAL SIGNATURE SHEET REQUIRED ☐		

METHOD OF SHIPMENT: Para Courier	SHIPPED BY: S. Mack	RECEIVED FOR LABORATORY BY: (SIGN) M. Pitruzzello	DATE/TIME 6-20-89
CONDITION OF SEAL UPON RECEIPT: GENERAL CONDITION OF COOLER:		COOLER OPENED BY: (SIGN)	DATE/TIME

WHITE – CRA OFFICE COPY
YELLOW – RECEIVING LABORATORY COPY
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GOLDEN ROD – SHIPPERS

Nº 006533