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FIRST PROGRESS REPORT ON SURVEY OF CONTAMINANTS IN VACTOR TRUCK WASTES: RESULTS OF JULY 1991 SAMPLING

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INTRODUCTION

Vactor trucks are widely used in the Puget Sound area to remove sediments and standing water from storm drain facilities such as catch basins (Herrera Environmental Consultants, Inc. 1991). Disposal of vactor wastes is an important issue because of their potential to contaminate surface waters or ground waters. There are presently few data on the chemical, physical, and bacteriological nature of vactor wastes, although contaminated catch basin sediments and water, which may constitute the bulk of these wastes, have been well documented in the Puget Sound region (Tetra Tech, Inc. 1988; Resource Planning Associates 1990). Lead, polychlorinated biphenyls (PCBs), polynuclear aromatic hydrocarbons (PAHs), and septage are examples of contaminants that have been found during catch basin surveys.

The Department of Ecology (Ecology) does not have any formal guidelines regarding the disposal of vactor wastes. As a result, some existing disposal practices may violate or dangerous waste regulations, or otherwise be harmful to the environment. In order for Ecology to develop guidelines that address appropriate disposal practices, more information is needed on the nature of vactor wastes.

In response to this data gap, the Toxics Section of Ecology's Environmental Investigations Program, in conjunction with PTI Environmental Services of Bellevue, Washington, is conducting a survey of contaminants in vactor truck wastes. This survey was conceived of by the Stormwater Unit (Water Quality Program) and will be used by them to develop guidelines for disposal of vactor wastes. The status of the survey, a description of the sampling effort, and results of sample analysis to date are reported here.

Status of the Present Survey

PTI Environmental Services of Bellevue, Washington was hired to conduct a portion of the survey under funding from a Puget Sound Estuary Program (PSEP) grant. They have fulfilled their commitment by completing the following tasks:

Task	Completion Dates
• Prepare a project work plan	draft-May 1991
• Prepare a sampling and analysis plan (SAP)	draft-July 1991
• Collect vactor decant water and sediment samples[1]	July 1991
• Analyze decant water samples	July-August 1991
• Prepare technical memorandum with results of decant water analyses	draft-September 1991

[1]Sediment samples were collected by Ecology.

Ecology will complete the remainder of the project with funds from a 205(j) grant. Tasks to be completed include:

Task	Target Completion Dates
• Analyze sediments collected July 1991	December 1991
• Conduct follow-up sampling	March 1992
• Prepare final report	September 1992

Analysis of sediment samples is complete and results are presented in this report. Analytical costs for the sediment samples collected in July 1991 was $18,395, leaving $16,105 available for analysis of follow-up samples (total funds allocated for sample analysis = $34,500).

The final report will include an interpretation of all data with respect to relevant water quality, dangerous waste disposal, and toxics clean-up criteria. It is slated for completion in September 1992.

METHODS

Sampling was conducted July 22-31 as a cooperative effort between PTI and Ecology. Unless otherwise noted, sampling methods were consistent with those described in PTI's document: *Characterization of Catch Basin Wastes: Sampling and Analysis Plan* (PTI Environmental Services 1991a).

Sampling Locations

Sites were selected to characterize contaminants from three broad land use areas: high-density residential, commercial/light industrial, and heavy industrial. Table 1 lists sites where samples were collected from vactor trucks. Appendix A shows map locations of each station. Vactor trucks operated exclusively in one of the three land use categories for each day of sampling.

All vactoring in Snohomish County was originally scheduled to be done in the Paine Field area. However, based on advice from the Snohomish County vactor crew, other areas were utilized because they better represented the targeted land use types.

Sampling Procedures

Figure 1 schematically diagrams the sampling routine in Snohomish County. All of the Snohomish County samples were collected from vactor trucks after they arrived at the

Table 1. Description of Vactor Water and Sediment Sampling Sites

Station #	City or County	Land Use	Maintenance Jurisdiction	Sampling Date	Sample Type
1	Snohomish Co.	Residential	Snohomish Co. Public Works Dept.	22 July 1991	Water, Sediment
2	Snohomish Co.	Residential	Snohomish Co. Public Works Dept.	23 July 1991	Water, Sediment
3	Snohomish Co.	Residential	Snohomish Co. Public Works Dept.	23 July 1991	Water, Sediment
4	Snohomish Co.	Commercial/Light Industrial	Snohomish Co. Public Works Dept.	24 July 1991	Water, Sediment
5	Snohomish Co.	Commercial/Light Industrial	Snohomish Co. Public Works Dept.	24 July 1991	Water, Sediment
6	Snohomish Co.	Commercial/Light Industrial	Snohomish Co. Public Works Dept.	25 July 1991	Water, Sediment
7	Snohomish Co.	Commercial/Light Industrial	Snohomish Co. Public Works Dept.	25 July 1991	Water, Sediment
8	Seattle	Heavy Industrial	Seattle Engineering Dept.	29 July 1991	Water, Sediment
9	Seattle	Heavy Industrial	Seattle Engineering Dept.	29 July 1991	Water
10	Seattle	Heavy Industrial	Seattle Engineering Dept.	29 July 1991	Water
11	Seattle	Heavy Industrial	Seattle Engineering Dept.	29 July 1991	Water, Sediment
12	Seattle	Heavy Industrial	Seattle Engineering Dept.	30 July 1991	Water, Sediment
13	Seattle	Heavy Industrial	Seattle Engineering Dept.	30 July 1991	Water
14	Seattle	Heavy Industrial	Seattle Engineering Dept.	30 July 1991	Water
15	Seattle	Heavy Industrial	Seattle Engineering Dept.	30 July 1991	Water, Sediment
16	Snohomish Co.	Residential	Snohomish Co. Public Works Dept.	31 July 1991	Water, Sediment

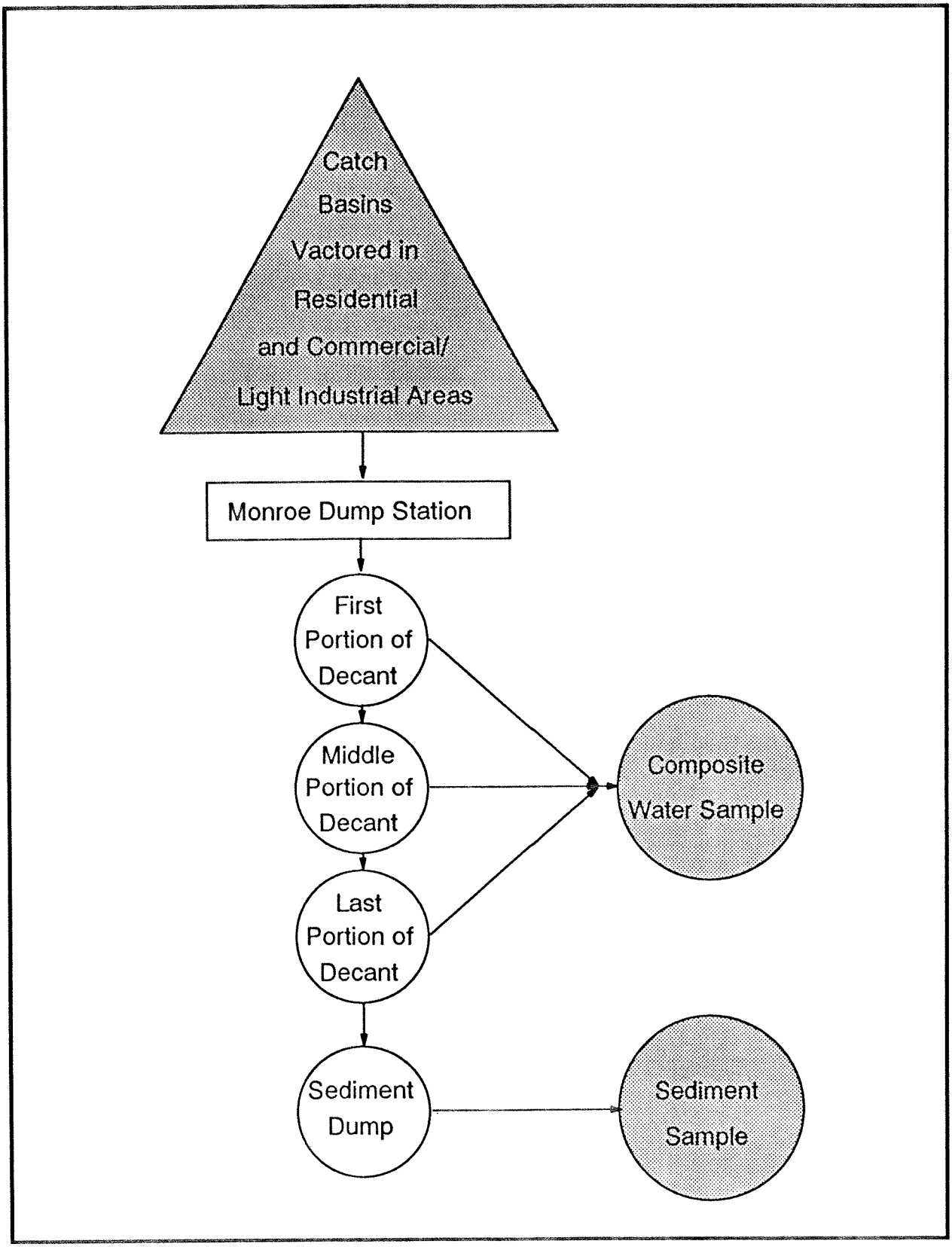

Figure 1. Schematic of Sample Design in Snohomish County Residential and Commercial/Light Industrial Areas

Snohomish County Public Works Monroe dump station. Figure 2 illustrates the sampling routine for Seattle. Samples were collected at a Seattle transfer station except where on-site decant samples were taken to measure intra-truck variability.

Water

Samples of decant water were collected twice each day as water was drained from the tanks of the vactor trucks. A composite sample of approximately 9 liters was obtained by sampling directly from the decant hose or spout of the vactor truck into a large stainless steel bucket. Approximately equal aliquots (i.e. 3 liters each) of water from the initial, middle, and end portions of each decant were collected. The composite sample was then homogenized and subsampled by pouring directly into appropriate containers for the indicated analyses. Field measurements for water samples included pH, temperature, and specific conductance.

Sediment

After water was completely drained from the vactor trucks, the remaining sediment was dumped into a pile on the ground. Samples were scooped from this pile into a stainless steel bucket. An effort was made to collect samples that were representative in terms of moisture content and grain size. Once in the bucket, the sediment was homogenized (minimally prior to taking subsamples for volatile organics analysis). Subsamples were collected from this homogenate and placed into appropriate containers.

All sampling equipment was decontaminated prior to use by scrubbing with laboratory grade detergent (Alconox) followed by sequential rinses with tap water, deionized water, 6M hydrochloric acid, deionized water, and pesticide-grade acetone. Sample buckets were primed with decant water prior to sampling to eliminate any residual chemicals used in the decontamination process.

Laboratory Analysis and Data Quality

Table 2 summarizes the analytical methods used for vactor water and sediment. In general, the data quality objectives described in the sampling and analysis plan (PTI Environmental, Services 1991a) and the project proposal (Serdar, 1991) were met. However, limits of detection for semi-volatile organic compound analysis in sediment were one to two orders of magnitude higher than desired and one order of magnitude higher for pesticide/PCB analysis.
Decant water data were reviewed for qualitative and quantitative accuracy, validity and usefulness by PTI and the laboratories performing the analyses. Sediment data were reviewed by staff at the Manchester Laboratory. Data quality reviews are presented in Appendix B. All data were deemed acceptable for use without any qualification beyond that presented with the data.

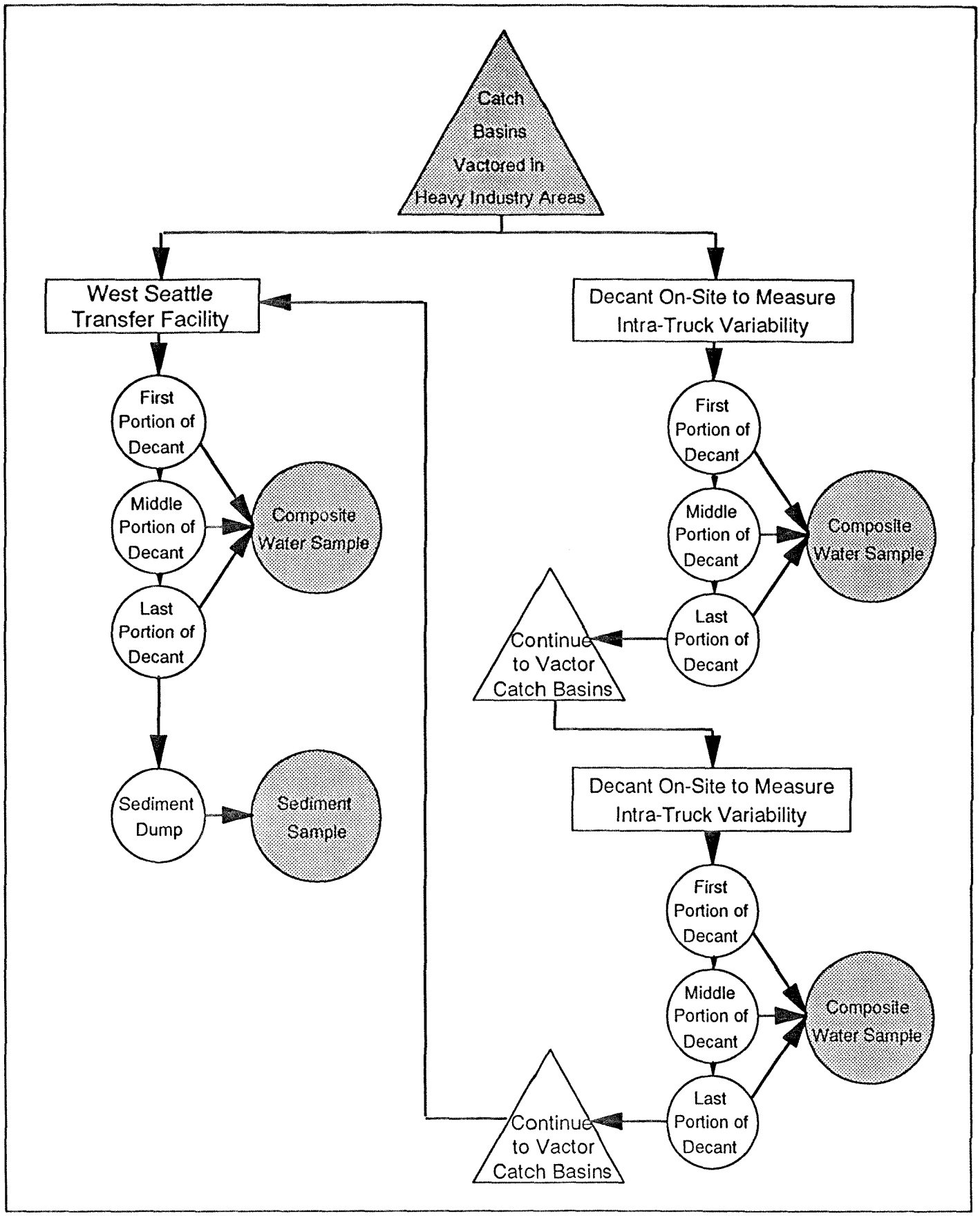

Figure 2. Schematic of Sample Design in Seattle Heavy Industrial Area

Table 2. Summary of Analytical Methods for Vactor Water and Sediment

Parameter	Method	Reference	Laboratory
WATER			
pH	EPA 150.1	EPA, 1984	Columbia Analytical Services, Inc.
Conductivity	EPA 120.1	EPA, 1984	Columbia Analytical Services, Inc.
Hardness	EPA 6010	EPA, 1987	Columbia Analytical Services, Inc.
	SM 314A	APHA, 1985	
Fecal Coliform	SM 9221C	APHA, 1989	Columbia Analytical Services, Inc.
Biological Oxgygen Demand	EPA 405.1	EPA, 1984	Columbia Analytical Services, Inc.
Chemical Oxygen Demand	EPA 410.1	EPA, 1984	Columbia Analytical Services, Inc.
Oil and Grease	EPA 413.1	EPA, 1984	Columbia Analytical Services, Inc.
Total Organic Carbon	EPA 415.1	EPA, 1984	Columbia Analytical Services, Inc.
Total Dissolved Solids	EPA 160.1	EPA, 1984	Columbia Analytical Services, Inc.
Total Suspended Solids	EPA 160.2	EPA, 1984	Columbia Analytical Services, Inc.
Solids, settleable	EPA 160.5	EPA, 1984	Columbia Analytical Services, Inc.
Turbidity	EPA 180.1	EPA, 1984	Columbia Analytical Services, Inc.
Cyanide	EPA 335.2	EPA, 1984	Columbia Analytical Services, Inc.
Total Metals			
As, Cd, Cr, Cu,			
Pb, Ni, Ag, Zn	AA/ICP/GFAA	EPA, 1987	Columbia Analytical Services, Inc.
Mercury (Hg)	CVAA	EPA, 1987	Columbia Analytical Services, Inc.
Volatile Organic Compounds	EPA 8240	EPA, 1986a	Analytical Technolgies, Inc.
Semi-Volatile Organic Compounds	EPA 8270	EPA, 1986a	Analytical Technolgies, Inc.
PCBs	EPA 8080	EPA, 1986a	Analytical Technolgies, Inc.
SEDIMENT			
Percent Solids	EPA 160.3	EPA, 1984	Sound Analytical Services, Inc.
	SM 2540 B	APHA, 1989	
Total Organic Carbon	EPA 415.1	EPA, 1984	Sound Analytical Services, Inc.
Total Petroleum Hydrocarbons	EPA 418.1	EPA, 1984	Spectra Laboratories, Inc.
Grain Size	Sieve-Pipet	EPA, 1986b	Soil Technology, Inc.
PP Metals (Total)	AA/ICP/GFAA	EPA, 1986a	Manchester Laboratory
Mercury (Hg)	CVAA	EPA, 1986a	Manchester Laboratory
Volatile Organic Compounds	EPA 8240	EPA, 1986a	Weyerhaeuser Analytical and Testing Services
Semi-Volatile Organic Compounds	EPA 8270	EPA, 1986a	Weyerhaeuser Analytical and Testing Services
Pesticides/PCBs	EPA 8080	EPA, 1986a	Weyerhaeuser Analytical and Testing Services

Quality assurance samples collected in the field included three VOC trip blanks for decant water and a duplicate split sediment sample to estimate analytical plus handling precision. Acetone and methylene chloride were the only compounds detected in the trip blanks. Acetone results were not reported in 15 of 16 samples because the blank concentration was greater than one-fifth of the analytical results (EPA "five times rule"). Methylene chloride was also found in the associated reagent blanks and results were not reported in 9 of 16 samples. Results for bis(2-ethylhexyl) phthalate, a common plasticizer, were not reported in four samples because of reagent blank contamination.

The relative percent difference (RPD; range as a percent of mean) between the split sediment samples (#'s 308140 and 308141) was excellent for most analyses. RPD was 27% for total petroleum hydrocarbon (TPH), 9% for toluene + ethylbenzene + xylenes, 4% for total PAHs, 1% for copper, 12% for lead, and 5% for zinc.

RESULTS AND DISCUSSION

Decant Water[2]

Results of conventional analyses of decant water are shown in Table 3. Samples from the industrial areas generally show the highest biological oxygen demand, chemical oxygen demand, and total organic carbon. Total suspended solids (TSS), turbidity, and fecal coliform levels were highly variable yet elevated in most cases. TSS levels ranged from 265 to 110,000 mg/L and were generally highest in samples from the industrial areas.

Table 4 shows metals and cyanide results. Comparison of decant water results to EPA water quality criteria for toxic substances in surface waters (EPA, 1986c) reveal numerous exceedances for metals and cyanide. These comparisons should be used with caution since 1) criteria are for surface waters and decant water is not necessarily discharged to a surface water, and 2) decant water is, in essence, a slurry and elevated concentrations of some analytes may be attributed to the high particulate fraction found in most samples.

Metals concentrations were generally higher in the industrial samples, probably a reflection of TSS levels (samples were not filtered). Figure 3 illustrates the positive correlations between arsenic, cadmium, chromium, copper, lead, and zinc concentrations and TSS. In each plot, however, the highest metal concentration appears to be an outlier, which suggests that TSS is not the sole determinant of metals concentrations. Arsenic showed the strongest relationship (R squared = 0.3653) while zinc showed the weakest (R squared = 0.2057). Cyanide was detected in 10 of 16 samples ranging from 0.02 to 0.07 mg/L.

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[2]Results of decant water analysis are reported in *Characterization of Catch Basin Wastes: Draft Technical Memorandum* (PTI Environmental Services, 1991b).

Table 3. Results of Conventional Analysis of Vactor Decant Water - July, 1991

Station Number	pH	Conductivity (μmhos/cm)	Hardness as CaCO3 (mg/L)	Fecal Coliform Bacteria (MPN/100mL)	Biological Oxygen Demand (mg/L)	Chemical Oxygen Demand (mg/L)	Oil & Grease (mg/L)	Total Organic Carbon (mg/L)	Total Dissolved Solids (mg/L)	Total Suspended Solids (mg/L)	Solids, Settleable (mg/L)	Turbidity (ntu)
High-density Residential												
1	7.98	537	707	16000	100	200	9	50	299	265	184	23000
2	7.33	475	678	16000	471	8900	9	3040	232	41700	210	15000
3	6.89	365	92	16000	109	530	40	90	196	1020	6	130
16	7.24 J	329	200	1600	90	500	16	280	207	2750	145	310
Commercial/Light Industrial												
4	7.39	189	73	2200	28	120	7	50	95	365	2	300
5	6.93	197	74	16000	86	600	10	170	114	910	6	900
6	7.79	184	147	2800	34	380	8	100	130	2460	4	1800
7	7.10	1110	249	16000	290	4100	17	2000	550	9260	65	4000
Industrial												
8	7.51	1070	762	2 U	276	1900	16	5340	395	111000	324	52000
9	6.68	189	194	2 U	473 J	2470	11	470	117	6200	53	6000
10	6.75	289	12	16000 J	280	6820	13	4590	179	13300	178	22000
11	7.10 J	364	413	1600	260	15100	11	5520	216	24300	117	17000
12	7.38	481	483	16000	285	26900	11	7880	250	10700	42	92
13	6.89	398	519	1600	281	28500	37	10500	319	8720	189	44000
14	6.94	429	610	1600	270	10000	12	4490	275	38600	209	39000
15	6.94	299	400	1600	1090 J	13600	25	4260	177	14600	24	55

MPN = Most probable number of fecal coliform bacteria colonies.
U = Undetected.
J = Estimated.
Indicates samples taken from the same vactor truck.

Table 4. Results of Metals and Cyanide Analysis of Vactor Decant Water – July, 1991

Station Number	Metals (mg/L)									
	Arsenic	Cadmium	Chromium	Copper	Cyanide	Lead	Mercury	Nickel	Silver	Zinc
High-density Residential										
1	0.31	0.02	0.63	1.0	0.03	1.0	0.0134	0.76	0.02 U	4.6
2	0.59	0.05	0.41	0.93	0.02	2.6	0.0159	0.61	0.02 U	6.1
3	0.04	0.01	0.02	0.14	0.01 U	1.2	0.0012	0.04	0.02 U	1.2
16	0.04	0.01 U	0.10	0.19	0.01 U	0.40	0.0006	0.15	0.02 U	1.5
Commercial/Light Industrial										
4	0.01	0.01 U	0.04	0.11	0.01 U	0.37	0.0005 U	0.04	0.02 U	0.73
5	0.02	0.01	0.06	0.19	0.01 U	0.60	0.0005 U	0.07	0.02 U	1.1
6	0.05	0.03	0.24	0.31	0.01 U	0.39	0.0007	0.18	0.02 U	1.4
7	0.08	0.08	0.50	0.45	0.06	0.68	0.0056	0.25	0.02 U	9.0
Industrial										
8	1.24	0.12	1.81	7.6	0.07	13 J	0.0032	1.3	0.03	18
9	0.14	0.04	0.32	1.42	0.02	3.7	0.0022	0.35	0.02 U	9.7
10	0.52	0.18	2.23	10.1	0.04	17 J	0.0551	2.4	0.05	31
11	0.37	0.03	0.31	1.47	0.03	2.7	0.0219	0.4	0.02 U	5.8
12	0.68	0.05	0.70	2.7	0.04	4.5	0.0218	0.68	0.02 U	10
13	1.54	0.05	0.78	2.4	0.04	5.0	0.0239	0.72	0.02 U	10
14	0.92	0.17	2.69	9.4	0.01 U	12 J	0.0188	2.3	0.03	24
15	0.37	0.05	0.51	1.9	0.03	2.9	0.0127	0.54	0.02 U	7.0

U = Undetected
J = Estimated
Indicates samples taken from the same vactor truck

Exceeds EPA chronic freshwater criteria (EPA 1986c), see text for caveats.

Exceeds EPA acute and chronic freshwater criteria (EPA 1986c), see text for caveats.

Note: Criteria for cadmium, chromium, copper, lead, nickel, silver, and zinc are hardness-dependent. For hardness values, see Table 3.

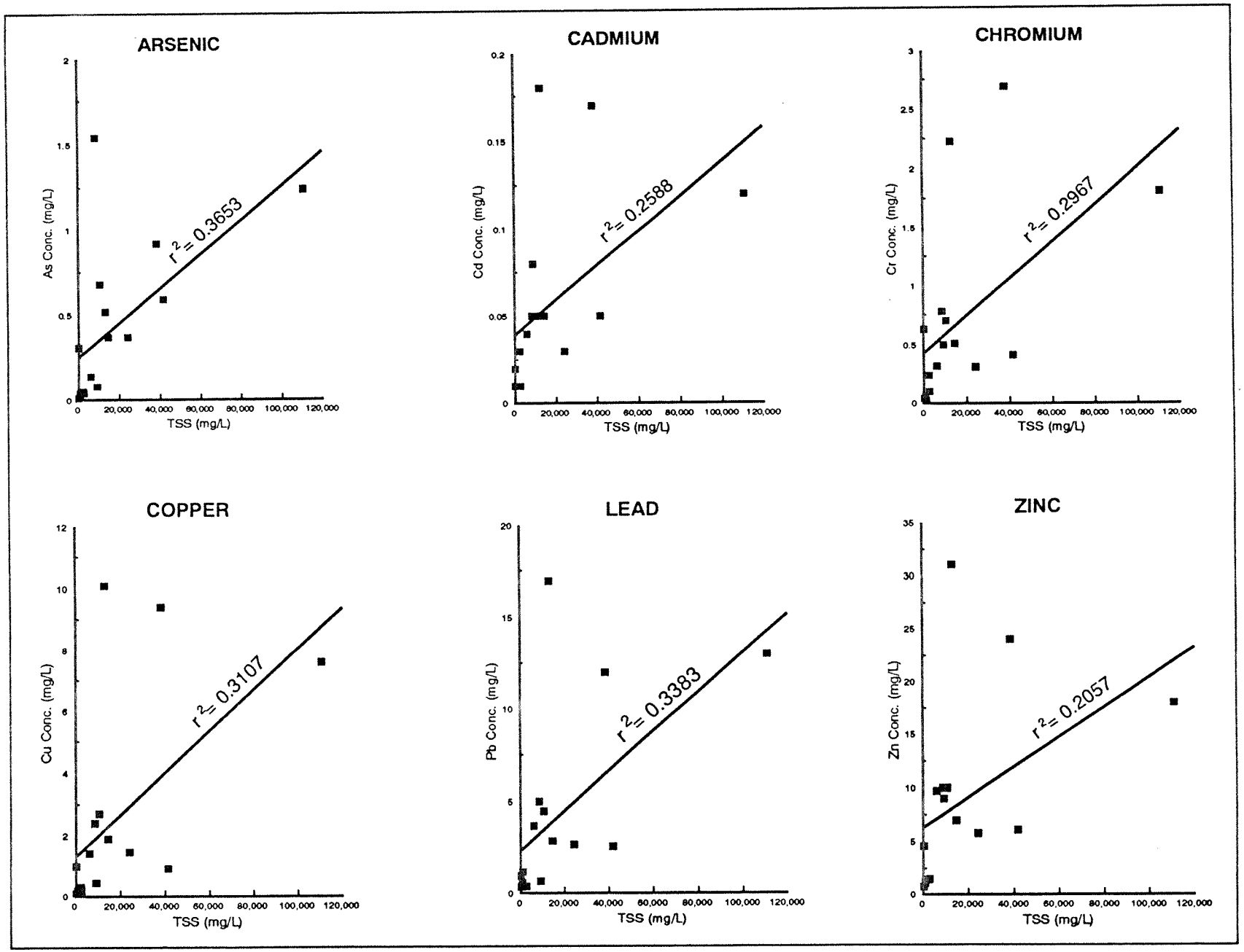

Figure 3. Relationships Between Total Suspended Solids and Concentrations of Six Elements in Vactor Decant Water Collected in July 1991

Several volatile organic compounds were detected in decant water (Table 5). The most frequently detected (in decreasing order; frequency of detection in parentheses) were toluene (15/16), xylenes (10/16), and ethylbenzene (8/16). These compounds are common petroleum fuel derivatives and are used in paints and thinners (PTI Environmental Services, 1991c).

Table 6 shows the results of semivolatile organics analysis of decant water. Phenol and naphthalene, the most frequently detected compounds, were found in four samples each concentrations ranging from 4 to 75 μg/L. Three samples had 4-methylphenol at concentrations ranging from 4 to 33 μg/L. Phenanthrene and 2-methylnaphthalene were found in two samples each at 2 to 7 μg/L. The latter three compounds were found in industrial samples only.

Tentatively identified organic compounds in decant water are shown in Appendix C. They include numerous C7 - C10 hydrocarbons which are generally petroleum-derived. However, vactor decant water was not analyzed for TPH. PCBs and pesticides were not detected in any samples at detection limits of 0.5 - 1.3 μg/L (Table 7).

Sediments

Conventional analysis of vactor sediments are shown in Table 8. Total organic carbon levels were fairly consistent throughout (range = 1.2 - 2.2%). Grain size determinations show that about 60 - 80% of each sample was composed of sand.

Table 9 shows metals concentrations in vactor sediments. All thirteen priority pollutant metals were detected except for thallium. However, silver was detected in only one sample and antimony was detected in only two samples, and those analytical results were below minimum quantitation limits. Zinc, lead, and copper were present at the highest concentrations, and were elevated in the industrial areas compared to residential and commercial areas. Chromium was also elevated but concentrations did not appear to be strongly related to land-use.

Residential, commercial, and industrial vactor samples had mean lead and chromium concentrations of 92, 91, 170 mg/Kg and 84, 131, and 117 mg/Kg, respectively. Lead and chromium are constituents of the toxicity characteristic list described in Washington's dangerous waste regulations (Ch. 173-303 WAC). Solid waste may be designated as dangerous waste if concentrations of each of these metals is 5.0 mg/L or greater when analyzed using the Toxicity Characteristic Leaching Procedures (TCLP). Although TCLP was not conducted on the vactor sediment samples, some potentially qualify as dangerous waste based on the rule of thumb that solid waste with dry weight toxicant concentrations (ppm) exceeding the criteria by a factor of 20 are potential dangerous wastes. This qualification was met, on average, by vactor sediment samples from commercial and industrial areas.

Table 5. Results of Volatile Organic Compound Analysis of Vactor Decant Water – July, 1991

Station Number	VOCs (ug/L)										
	Acetone	Benzene	Bromo-dichloro-methane	Bromo-form	Bromo-methane	2-Butanone	Carbon Disulfide	Carbon tetra-chloride	Chloro-benzene	Chloro-ethane	
High-density Residential											
1	B	5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	10 U	
2	B	5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	10 U	
3	850 J	5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	10 U	
16	B	5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	10 U	
Commercial/Light Industrial											
4	B	5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	10 U	
5	B	5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	10 U	
6	B	5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	10 U	
7	B	5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	10 U	
Industrial											
8	B	5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	10 U	
9	B	5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	10 U	
10	B	5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	10 U	
11	B	5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	10 U	
12	B	5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	10 U	
13	B	2 J	5 U	5 U	10 U	10 U	5 U	5 U	5 U	10 U	
14	B	5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	10 U	
15	B	5 U	5 U	5 U	10 U	20	5 U	5 U	5 U	10 U	
Trip Blanks											
TB-1	140	5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	10 U	
TB-2	50	5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	10 U	
TB-3	16	5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	10 U	

B = Values not reported due to blank contamination
U = Undetected.
J = Estimated.

Indicates compound was detected.

Indicates samples taken from the same vactor truck.

Table 5. Results of Volatile Organic Compound Analysis of Vactor Decant Water – July, 1991 (Cont'd)

Station Number	VOCs (ug/L) Chloro-form	Chloro-methane	Dibromo-chloro-methane	1,1-Di-chloro-ethane	1,2-Di-chloro-ethane	1,1-Di-chloro-ethene	1,2-Di-chloro-ethene	1,2-Di-chloro-propene	Cis 1,3-Di-chloro-propene	Trans 1,3-Di-chloro-propene	Ethyl-benzene
High-density Residential											
1	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
3	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
16	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1 J
Commercial/Light Industrial											
4	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
6	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
7	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Industrial											
8	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	2 J
9	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	4 J
10	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1 J
11	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	2 J
12	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
13	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	30
14	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3 J
15	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	4 J
Trip Blanks											
TB-1	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TB-2	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TB-3	5 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

U = Undetected.

J = Estimated.

Indicates compound was detected.

Indicates samples taken from the same vactor truck.

Table 5. Results of Volatile Organic Compound Analysis of Vactor Decant Water – July, 1991 (Cont'd)

Station Number	VOCs (ug/L)								
	2-Hexanone	4-Methyl-2 Pentanone	Methylene Chloride	Styrene	1,1,2,2-Tetra-chloro-ethane	Tetra-chloro-ethylene	Toluene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane
High-density Residential									
1	10 U	10 U	5 U	5 U	5 U	5 U	26	5 U	5 U
2	10 U	10 U	5 U	5 U	5 U	5 U	16	5 U	5 U
3	10 U	10 U	5 U	5 U	5 U	5 U	32	5 U	5 U
16	10 U	10 U	B	5 U	5 U	5 U	3	5 U	5 U
Commercial/Light Industrial									
4	10 U	10 U	5 U	5 U	5 U	5 U	6	5 U	5 U
5	10 U	10 U	5 U	5 U	5 U	5 U	83	5 U	5 U
6	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
7	10 U	10 U	5 U	5 U	5 U	5 U	96	5 U	5 U
Industrial									
8	10 U	9 J	B	5 U	5 U	5 U	180	5 U	5 U
9	10 U	10 U	B	5 U	5 U	5 U	130	5 U	5 U
10	10 U	10 U	B	5 U	5 U	5 U	77	5 U	5 U
11	10 U	11	B	5 U	5 U	5 U	100	5 U	5 U
12	10 U	7 J	B	5 U	5 U	5 U	15	5 U	5 U
13	10 U	7 J	B	5 U	5 U	5 U	190	5 U	5 U
14	10 U	10 U	B	5 U	5 U	5 U	41	5 U	5 U
15	10 U	9 J	B	5 U	5 U	5 U	84	5 U	5 U
Trip Blanks									
TB-1	10 U	10 U	13	5 U	5 U	5 U	5 U	5 U	5 U
TB-2	10 U	10 U	8	5 U	5 U	5 U	5 U	5 U	5 U
TB-3	10 U	10 U	11	5 U	5 U	5 U	5 U	5 U	5 U

U = Undetected.

J = Estimated.

B = Values not reported due to blank contamination

Indicates compound was detected.

Indicates samples taken from the same vactor truck.

Table 5. Results of Volatile Organic Compound Analysis of Vactor Decant Water – July, 1991 (Cont'd)

Station Number	VOCs (ug/L) Trichloro-ethene	Vinyl Acetate	Vinyl Chloride	Total Xylenes
High-density Residential				
1	5 U	--	10 U	5 U
2	5 U	--	10 U	5 U
3	5 U	--	10 U	5 U
16	5 U	10 U	10 U	12
Commercial/Light Industrial				
4	5 U	--	10 U	5 U
5	5 U	--	10 U	5 U
6	5 U	--	10 U	5 U
7	5 U	--	10 U	32
Industrial				
8	5 U	10 U	10 U	7
9	5 U	10 U	10 U	22
10	5 U	10 U	10 U	7
11	5 U	10 U	10 U	8
12	5 U	10 U	10 U	7
13	5 U	10 U	10 U	160
14	5 U	10 U	10 U	20
15	5 U	10 U	10 U	20
Trip Blanks				
TB-1	5 U	10 U	10 U	5 U
TB-2	5 U	10 U	10 U	5 U
TB-3	5 U	--	10 U	5 U

U = Undetected.

-- Value not reported

Indicates compound was detected.

Indicates samples taken from the same vactor tr

Table 6. Results of Semivolatile Organic Compound Analysis of Vactor Decant Water – July, 1991

Station Number	SVOCs (ug/L)									
	N-Nitroso-Dimethyl-amine	Phenol	Aniline	Bis(2-chloro-ethyl) ether	2-Chloro-phenol	1,3-Di-chloro-benzene	1,4-Di-chloro-benzene	Benzyl Alcohol	1,2-Di-chloro-benzene	2-Methyl-phenol
High-density Residential										
1	10 U	15	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
3	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
16	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Commercial/Light Industrial										
4	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
5	10 U	75	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
6	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
7	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Industrial										
8	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
9	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
10	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
11	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
12	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
13	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	5 J
14	10 U	4 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
15	10 U	2 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

U = Undetected.

J = Estimated.

Indicates compound was detected.

Indicates samples taken from the same vactor truck.

Table 6. Results of Semivolatile Organic Compound Analysis of Vactor Decant Water – July, 1991 (Cont'd)

Station Number	SVOCs (ug/L)								
	Bis-(2-Chloro-isopropyl) ether	4-Methyl-phenol	N-Nitroso Di-n-propylamine	Hexa-chloro-ethane	Nitro-benzene	Iso-phorone	2-Nitro-phenol	2,4-Dimethyl phenol	Benzoic Acid
High-density Residential									
1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	18 J
2	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	250 UJ
3	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	250 UJ
16	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50 UJ
Commercial/Light Industrial									
4	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50 UJ
5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50 UJ
6	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50 UJ
7	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	250 UJ
Industrial									
8	50 U	33	50 U	50 U	50 U	50 U	50 U	50 U	250 UJ
9	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	250 UJ
10	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	250 UJ
11	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50 UJ
12	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50 UJ
13	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50 UJ
14	10 U	4 J	10 U	10 U	10 U	10 U	10 U	10 U	50 UJ
15	10 U	4 J	10 U	10 U	10 U	10 U	10 U	10 U	50 UJ

U = Undetected.

J = Estimated.

UJ = Estimated undetected value.

Indicates compound was detected.

Indicates samples taken from the same vactor truck.

Table 6. Results of Semivolatile Organic Compound Analysis of Vactor Decant Water – July, 1991 (Cont'd)

Station Number	SVOCs (ug/L)								
	Bis(2-chloro-ethoxy) methane	2,4-Dichloro-phenol	1,2,4-Trichloro-benzene	Naph-thalene	4-Chloro-aniline	Hexa-chloro-butadiene	4-Chloro-3-Methyl phenol	2-Methyl Naph-thalene	Hexa-chloro-cyclo-pendadiene
High-density Residential									
1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
3	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
16	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Commercial/Light Industrial									
4	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
6	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
7	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Industrial									
8	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
9	50 U	50 U	50 U	12 J	50 U	50 U	50 U	50 U	50 U
10	50 U	50 U	50 U	50 U	50 U	50 U	25 J	50 U	50 U
11	10 U	10 U	10 U	4 J	10 U	10 U	10 U	10 U	10 U
12	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
13	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
14	10 U	10 U	10 U	4 J	10 U	10 U	10 U	3 J	10 U
15	10 U	10 U	10 U	7 J	10 U	10 U	10 U	3 J	10 U

U = Undetected.

J = Estimated.

Indicates compound was detected.

Indicates samples taken from the same vactor truck.

Table 6. Results of Semivolatile Organic Compound Analysis of Vactor Decant Water – July, 1991 (Cont'd)

Station Number	SVOCs (ug/L) 2,4,6-Trichloro-phenol	2,4,5-Trichloro-phenol	2-Chloro-Naph-thalene	2-Nitro-aniline	Dimethyl phthalate	Ace-naph-thylene	3-Nitro-aniline	Acenaph-thene	2,4-Dinitro-phenol
High-density Residential									
1	10 U	50 U	10 U	50 U	10 U	10 U	50 U	10 U	50 U
2	50 U	250 U	50 U	250 U	50 U	50 U	250 U	50 U	250 U
3	50 U	250 U	50 U	250 U	50 U	50 U	250 U	50 U	250 U
16	10 U	50 U	10 U	50 U	10 U	10 U	50 U	10 U	50 U
Commercial/Light Industrial									
4	10 U	50 U	10 U	50 U	10 U	10 U	50 U	10 U	50 U
5	10 U	50 U	10 U	50 U	10 U	10 U	50 U	10 U	50 U
6	10 U	50 U	10 U	50 U	10 U	10 U	50 U	10 U	50 U
7	50 U	250 U	50 U	250 U	50 U	50 U	250 U	50 U	250 U
Industrial									
8	50 U	250 U	50 U	250 U	50 U	50 U	250 U	50 U	250 U
9	50 U	250 U	50 U	250 U	50 U	50 U	250 U	50 U	250 U
10	50 U	250 U	50 U	250 U	50 U	50 U	250 U	50 U	250 U
11	10 U	50 U	10 U	50 U	10 U	10 U	50 U	10 U	50 U
12	10 U	50 U	10 U	50 U	10 U	10 U	50 U	10 U	50 U
13	10 U	50 U	10 U	50 U	10 U	10 U	50 U	10 U	50 U
14	10 U	50 U	10 U	50 U	10 U	10 U	50 U	10 U	50 U
15	10 U	50 U	10 U	50 U	10 U	10 U	50 U	10 U	50 U

U = Undetected.

Indicates samples taken from the same vactor truck.

Table 6. Results of Semivolatile Organic Compound Analysis of Vactor Decant Water – July, 1991 (Cont'd)

Station Number	SVOCs (ug/L)								
	4-Nitro-phenol	Dibenzo-furan	2,4-Dinitro-toluene	2,6-Dinitro-toluene	Diethyl phthalate	4-Chloro-phenyl phenyl ether	Fluorene	4-Nitro-aniline	2-Methyl-4,6-Di-nitro-phenol
High-density Residential									
1	50 UJ	10 U	10 U	10 U	10 U	10 U	10 U	50 U	50 U
2	250 UJ	50 U	50 U	50 U	50 U	50 U	50 U	250 U	250 U
3	250 UJ	50 U	50 U	50 U	50 U	50 U	50 U	250 U	250 U
16	50 UJ	10 U	10 U	10 U	10 U	10 U	10 U	50 U	50 U
Commercial/Light Industrial									
4	50 UJ	10 U	10 U	10 U	10 U	10 U	10 U	50 U	50 U
5	50 UJ	10 U	10 U	10 U	10 U	10 U	10 U	50 U	50 U
6	50 UJ	10 U	10 U	10 U	10 U	10 U	10 U	50 U	50 U
7	250 UJ	50 U	50 U	50 U	50 U	50 U	50 U	250 U	250 U
Industrial									
8	250 UJ	50 U	50 U	50 U	50 U	50 U	50 U	250 U	250 U
9	250 UJ	50 U	50 U	50 U	50 U	50 U	50 U	250 U	250 U
10	250 UJ	50 U	50 U	50 U	50 U	50 U	50 U	250 U	250 U
11	50 UJ	10 U	10 U	10 U	10 U	10 U	10 U	50 U	50 U
12	50 UJ	10 U	10 U	10 U	10 U	10 U	10 U	50 U	50 U
13	50 UJ	10 U	10 U	10 U	10 U	10 U	10 U	50 U	50 U
14	50 UJ	10 U	10 U	10 U	10 U	10 U	10 U	50 U	50 U
15	50 UJ	10 U	10 U	10 U	10 U	10 U	3 J	50 U	50 U

U = Undetected.

J = Estimated.

UJ = Estimated undetected value.

Indicates compound was detected.

Indicates samples taken from the same vactor truck.

Table 6. Results of Semivolatile Organic Compound Analysis of Vactor Decant Water – July, 1991 (Cont'd)

Station Number	SVOCs (ug/L)								
	N-Nitroso-Diphenyl-amine	4-Bromo-phenyl phenyl ether	Hexa-chloro-benzene	Penta-chloro-phenol	Phenan-threne	Anthracene	Di-n-butyl-phthalate	Fluor-anthene	Benzidine
High-density Residential									
1	10 U	10 U	10 U	50 U	10 U	10 U	10 U	10 U	100 U
2	50 U	50 U	50 U	250 U	50 U	50 U	50 U	50 U	500 U
3	50 U	50 U	50 U	250 U	50 U	50 U	50 U	50 U	500 U
16	10 U	10 U	10 U	50 U	10 U	10 U	10 U	10 U	100 U
Commercial/Light Industrial									
4	10 U	10 U	10 U	50 U	10 U	10 U	10 U	10 U	100 U
5	10 U	10 U	10 U	50 U	10 U	10 U	10 U	10 U	100 U
6	10 U	10 U	10 U	50 U	10 U	10 U	10 U	10 U	100 U
7	50 U	50 U	50 U	250 U	50 U	50 U	50 U	50 U	500 U
Industrial									
8	50 U	50 U	50 U	250 U	50 U	50 U	50 U	50 U	500 U
9	50 U	50 U	50 U	250 U	50 U	50 U	50 U	50 U	500 U
10	50 U	50 U	50 U	250 U	50 U	50 U	50 U	50 U	500 U
11	10 U	10 U	10 U	50 U	10 U	10 U	10 U	10 U	100 U
12	10 U	10 U	10 U	50 U	10 U	10 U	10 U	10 U	100 U
13	10 U	10 U	10 U	50 U	2 J	10 U	31	10 U	100 U
14	10 U	10 U	10 U	50 U	10 U	10 U	10 U	10 U	100 U
15	10 U	10 U	10 U	50 U	7 J	10 U	10 U	3 J	100 U

U = Undetected.

J = Estimated.

Indicates compound was detected.

Indicates samples taken from the same vactor truck.

Table 6. Results of Semivolatile Organic Compound Analysis of Vactor Decant Water – July, 1991 (Cont'd)

Station Number	SVOCs (ug/L) Pyrene	Butyl benzyl phthalate	3,3'-Dichloro-benzidine	Benzo(a) anthracene	Bis(2-ethyl-hexyl-phthalate	Chrysene	Di-n-octyl phthalate	Benzo(b) fluor-anthene	Benzo(k) fluor-anthene
High-density Residential									
1	10 U	10 U	20 U	10 U	29	10 U	10 U	10 UJ	10 U
2	50 U	50 U	100 U	50 U	B	50 U	50 U	50 U	50 U
3	50 U	50 U	100 U	50 U	50 U	50 U	50 U	50 U	50 U
16	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U
Commercial/Light Industrial									
4	10 U	10 U	20 U	10 U	B	10 U	10 U	10 U	10 U
5	10 U	10 U	20 U	10 U	B	10 U	10 U	10 U	10 U
6	10 U	10 U	20 U	10 U	B	10 U	10 U	10 U	10 U
7	50 U	50 U	100 U	50 U	440	50 U	50 U	50 UJ	50 U
Industrial									
8	50 U	50 U	100 U	50 U	50 U	50 U	50 U	50 U	50 U
9	50 U	50 U	100 U	50 U	50 U	50 U	50 U	50 U	50 U
10	50 U	50 U	100 U	50 U	50 U	50 U	50 U	50 UJ	50 U
11	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 UJ	10 U
12	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U
13	10 U	5 J	20 U	10 U	15	10 U	10 U	10 U	10 U
14	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U
15	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U

U = Undetected.

J = Estimated.

B = Compound detected in associated reagent blank

Indicates compound was detected.

Indicates samples taken from the same vactor truck.

Table 6. Results of Semivolatile Organic Compound Analysis of Vactor Decant Water – July, 1991 (Cont'd)

Station Number	SVOCs (ug/L) Benzo(a) pyrene		Indeno (1,2,3-cd)-pyrene		Dibenzo (a,h) anth-racene		Benzo (g,h,i) perylene	
High-density Residential								
1	10	U	10	U	10	U	10	U
2	50	U	50	UJ	50	U	50	UJ
3	50	U	50	UJ	50	U	50	UJ
16	10	U	10	UJ	10	U	10	UJ
Commercial/Light Industrial								
4	10	U	10	UJ	10	U	10	UJ
5	10	U	10	UJ	10	U	10	UJ
6	10	U	10	UJ	10	U	10	UJ
7	50	U	50	U	50	U	50	U
Industrial								
8	50	U	50	UJ	50	U	50	UJ
9	50	U	50	UJ	50	U	50	UJ
10	50	U	50	U	50	U	50	U
11	10	U	10	U	10	U	10	U
12	10	U	10	UJ	10	U	10	UJ
13	10	U	10	UJ	10	U	10	UJ
14	10	U	10	UJ	10	U	10	UJ
15	10	U	10	UJ	10	U	10	UJ

U = Undected

UJ = Estimated undetected value

Indicates samples taken from the same vactor truck

Table 7. Results of PCB Analysis of Vactor Decant Water – July, 1991

Station Number	PCBs (ug/L)						
	Aroclor-1016	Aroclor-1221	Aroclor-1232	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260
High-density Residential							
2	0.6 *U*	1.3 *U*	1.3 *U*	0.6 *U*	0.6 *U*	0.6 *U*	0.6 *U*
3	0.5 *U*	1.0 *U*	1.0 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*
Commercial/Light Industrial							
4	0.5 *U*	1.0 *U*	1.0 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*
5	0.5 *U*	1.0 *U*	1.0 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*
6	0.5 *U*	1.0 *U*	1.0 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*
7	0.5 *U*	1.0 *U*	1.0 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*
Industrial							
8	0.6 *U*	1.1 *U*	1.1 *U*	0.6 *U*	0.6 *U*	0.6 *U*	0.6 *U*
11	0.5 *U*	1.0 *U*	1.0 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*
12	0.5 *U*	1.0 *U*	1.0 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*
15	0.5 *U*	1.0 *U*	1.0 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*

U = Undetected.

Table 8. Results of Conventional Analysis of Vactor Sediment – July, 1991

Land-Use:	Residential				Commercial				Industrial				
Station #:	1	2	3	16	4	5	6	7	8	11	12	15	15-Dup.
Date:	7/22	7/23	7/23	7/31	7/24	7/24	7/25	7/25	7/29	7/29	7/30	7/30	7/30
Lab Log#:	308130	308131	308132	308142	308133	308134	308135	308136	308137	308138	308139	308140	308141
Percent Solids (%)	73	74	69	61	73	61	68	72	73	68	71	73	69
Total Organic Carbon (mg/Kg, dry)	14000	13000	16000	17000	15000	22000	12000	18000	19000	19000	15000	16000	16000
Grain Size (%)													
gravel (> 2000um)	26	7	10	17	19	6	10	17	9	33	7	20	3
sand (2000-62um)	59	75	74	72	71	63	67	64	75	57	81	70	81
silt (62-2um)	12	16	15	11	10	28	21	19	13	9	10	9	11
clay (< 2um)	3	2	1	0	0	3	2	0	3	1	2	1	5

Table 9. Results of Metals Analysis of Vactor Sediments (mg/Kg, dry weight basis) – July, 1991

Land-Use:	Residential				Commercial				Industrial				
Station #:	1	2	3	16	4	5	6	7	8	11	12	15	15–Dup.
Date:	7/22	7/23	7/23	7/31	7/24	7/24	7/25	7/25	7/29	7/29	7/30	7/30	7/30
Lab Log#:	308130	308131	308132	308142	308133	308134	308135	308136	308137	308138	308139	308140	308141
Antimony	3.7 PNJ	3 UN	5.1 PNJ	3 UN	3 PNJ	3 UN	3 UN	3 UN	3 UN	3 UN	3 UN	3 UN	3 UN
Arsenic	6.1	4.6	4.0	5.9	3.6	4.8	6.8	4.9	9.9	7.8	10	18	17
Beryllium	0.53	0.42 P	0.41 P	0.35 P	0.47 P	0.47 P	0.36 P	0.43 P	0.35 P	0.41 P	0.41 P	0.44 P	0.44 P
Cadmium	0.7 P	1.2 P	1.2 P	0.7 P	1.2 P	1.6	1.1 P	1.8	2	1 P	1.2 P	1 P	1.5
Chromium	87	131	89	28 NJ	118	98	108 NJ	200 NJ	154 NJ	241 NJ	34 NJ	43 NJ	34 NJ
Copper	19	27	38	26	26	40	34	42	560	89	80	186	184
Lead	57	107	141	65	85	128	47	105	194	181	178	147	130
Mercury	0.10 N	0.07 N	0.14 N	0.10	0.04 P	0.15	0.06 N	0.11 N	0.07 N	0.13 N	0.13	0.14	0.17
Nickel	41	50	45	39	50	51	33	48	47	86	35	68	38
Selenium	0.2 P	0.2 U	0.4 P	0.2 U	0.2 U	0.2 P	0.4 P	0.8	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Silver	0.3 UN	0.3 UN	0.3 UN	0.3 UN	0.3 UN	0.3 UN	0.3 UN	0.3 UN	0.51 PN	0.3 UN	0.3 UN	0.3 UN	0.3 UN
Thallium	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Zinc	90	135	153	174 J	206	247	140 J	241 J	558 J	236 J	262 J	295 J	280 J

U=Undetected

N=Spiked sample recovery not within control limits

J=Estimate

P=Analyte was detected below the minimum quantitation limit

Results of volatile organics analysis of vactor sediments is shown in Table 10. Tentatively identified organic compounds in vactor sediments are shown in Appendix D. Toluene, xylenes, and ethylbenzene were the most frequently detected volatile organic compounds, and like decant water, the highest concentrations were generally found in samples from the industrial areas. Samples from the industrial areas had concentrations of these compounds ranging from 9 to 3300 μg/Kg.

Table 11 shows the results of semivolatile organics analysis of vactor sediments. PAHs were the predominant semivolatile organic compounds detected in sediments. PAHs are formed during the incomplete combustion of organic material, especially fossil fuels (PTI Environmental Services, 1991c). Samples collected from residential areas had the highest total PAHs (mean = 49,000 μg/Kg) compared to industrial and commercial areas (means = 24,000 and 18,000 mg/Kg, respectively). Table 12 shows a comparison of vactor sediment data with cleanup criteria from the Model Toxics Control Act cleanup regulation (MTCA; Ch. 173-340 WAC). MTCA cleanup levels for carcinogenic PAHs in generic soils is exceeded, on average, in vactor sediment samples from all three land-uses categories. The residential vactor sediments also exceeds MTCA cleanup levels for industrial soils.

Results of TPH analysis of vactor sediments are also included in Table 11. TPH levels were substantially higher in sediments from commercial and industrial areas (2700 and 2600 mg/Kg, respectively) compared to residential sediments (730 mg/Kg). Mean TPH concentrations in all three land-use categories exceed MTCA cleanup levels for generic and industrial soils (Table 12).

None of the 27 pesticide/PCB compounds were found at detection limits ranging from 22 to 540 μg/Kg (Table 13).

CONCLUSIONS

1) Vactor decant water, when not filtered or allowed to settle, contains high concentrations of solids.

2) Cyanide and metals concentrations in vactor decant water frequently exceed EPA water quality criteria for surface waters. This, in part, may be a reflection of the high concentrations of suspended solids. There is a positive correlation between metals and total suspended solids concentrations in the decant water samples. However, this correlation is not always strong, implying that high dissolved metals concentrations may also be present.

3) Toluene, xylenes, and ethylbenzene are the most frequently detected organic compounds in decant water and the most frequently detected volatile organics in vactor sediments.

Table 10. Results of Volatile Organic Compound Analysis of Vactor Sediment (mg/Kg, dry weight basis) – July, 1991

Land-Use:	Residential				Commercial				Industrial				
Station #:	1	2	3	16	4	5	6	7	8	11	12	15	15–Dup.
Date:	7/22	7/23	7/23	7/31	7/24	7/24	7/25	7/25	7/29	7/29	7/30	7/30	7/30
Lab Log#:	308130	308131	308132	308142	308133	308134	308135	308136	308137	308138	308139	308140	308141
Chloromethane	13 U	14 U	15 U	17 U	14 U	16 U	14 U	15 U	15 U	14 U	14 U	16 U	14 U
Bromomethane	13 U	14 U	15 U	17 U	14 U	16 U	14 U	15 U	15 U	14 U	14 U	16 U	14 U
Vinyl Chloride	13 U	14 U	15 U	17 U	14 U	16 U	14 U	15 U	15 U	14 U	14 U	16 U	14 U
Chloroethane	13 U	14 U	15 U	17 U	14 U	16 U	14 U	15 U	15 U	14 U	14 U	16 U	14 U
Methylene Chloride	7 U	7 U	7 U	8 U	7 U	8 U	7 U	7 U	7 U	7 U	7 U	8 U	7 U
Acetone	55 UJ	150 J	100 UJ	45 UJ	30 UJ	60 UJ	45 UJ	25 UJ	50 UJ	60 UJ	60 UJ	140 UJ	1800 UJ
Carbon Disulfide	7 U	7 U	7 U	8 U	7 U	8 U	7 U	7 U	7 U	7 U	7 U	8 U	7 U
1,1-Dichloroethene	7 U	7 U	7 U	8 U	7 U	8 U	7 U	7 U	7 U	7 U	7 U	8 U	7 U
1,1-Dichloroethane	7 U	7 U	7 U	8 U	7 U	8 U	7 U	7 U	7 U	7 U	7 U	8 U	7 U
1,2-Dichloroethene (total)	7 U	7 U	7 U	8 U	7 U	8 U	7 U	7 U	7 U	7 U	7 U	8 U	7 U
Chloroform	7 U	7 U	7 U	8 U	7 U	8 U	7 U	7 U	7 U	7 U	7 U	8 U	7 U
1,2-Dichloroethane	7 U	7 U	7 U	8 U	7 U	8 U	7 U	7 U	7 U	7 U	7 U	8 U	7 U
2-Butanone (MEK)	13 U	11 J	19 J	17 U	14 U	16 U	14 U	15 U	24 J	14 U	20 J	16 U	14 U
1,1,1-Trichloroethane	7 U	7 U	7 U	8 U	7 U	8 U	7 U	7 U	7 U	7 U	7 UJ	8 U	7 U
Carbon Tetrachloride	7 U	7 U	7 U	8 U	7 U	8 U	7 U	7 U	7 U	7 U	7 UJ	8 U	7 U
Vinyl Acetate	13 U	14 U	15 U	17 U	14 U	16 U	14 U	15 U	15 U	14 U	14 UJ	16 U	14 U
Bromodichloromethane	7 U	7 U	7 U	8 U	7 U	8 U	7 U	7 U	7 U	7 U	7 UJ	8 U	7 U
1,2-Dichloropropane	7 U	7 U	7 U	8 U	7 U	8 U	7 U	7 U	7 U	7 U	7 UJ	8 U	7 U
cis-1,3-Dichloropropene	7 U	7 U	7 U	8 U	7 U	8 U	7 U	7 U	7 U	7 U	7 UJ	8 U	7 U
Trichloroethene	7 U	7 U	7 U	8 U	7 U	8 U	7 U	7 U	7 U	7 U	7 UJ	8 U	7 U
Dibromochloromethane	7 U	7 U	7 U	8 U	7 U	8 U	7 U	7 U	7 U	7 U	7 UJ	8 U	7 U
1,1,2-Trichloroethane	7 U	7 U	7 U	8 U	7 U	8 U	7 U	7 U	7 U	7 U	7 UJ	8 U	7 U
Benzene	7 U	7 U	7 U	8 U	7 U	8 U	7 U	7 U	7 U	7 U	7 UJ	8 U	7 U
trans-1,3-Dichloropropene	7 U	7 U	7 U	8 U	7 U	8 U	7 U	7 U	7 U	7 U	7 UJ	8 U	7 U
Bromoform	7 U	7 U	7 U	8 U	7 U	8 U	7 U	7 U	7 U	7 U	7 UJ	8 U	7 U
4-Methyl-2-Pentanone	13 U	14 U	15 U	17 U	14 U	16 UJ	14 U	15 UJ	15 U	14 UJ	14 UJ	16 UJ	14 U
2-Hexanone	13 U	14 U	15 U	17 U	14 U	16 UJ	14 U	15 UJ	15 U	14 UJ	14 UJ	16 UJ	14 U
Tetrachloroethene	7 U	7 U	7 U	8 U	7 U	8 UJ	7 U	7 UJ	7 U	7 UJ	7 UJ	8 UJ	7 U
1,1,2,2-Tetrachloroethane	7 U	7 U	7 U	8 U	7 U	8 UJ	7 U	7 UJ	7 U	7 UJ	7 UJ	8 UJ	7 U
Toluene	83	160	780 D	54	140	680 DJ	7 U	120 J	3300 D	1300 D	600 DJ	1200 D	1300 D
Chlorobenzene	45	7 U	7 U	8 U	7 U	8 UJ	7 U	7 UJ	7 U	7 UJ	7 UJ	8 UJ	7 U
Ethylbenzene	7 U	7 U	10 J	10	7 U	8 UJ	7 U	7 UJ	32	7 UJ	9 J	190 J	140
Styrene	7 U	7 U	7 U	8 U	7 U	8 UJ	7 U	7 UJ	7 U	7 UJ	7 UJ	8 UJ	7 U
Total Xylenes	7 U	9 J	18 J	61	7 U	8 UJ	7 U	14 J	110	190 J	34 J	1400 D	1600 D

U=Undetected
J=Estimated
D= Sample diluted to obtain analytical result
Indicates compound was detected

Table 11. Results of Semivolatile Organic Compound Analysis of Vactor Sediment (mg/Kg, dry weight basis) – July, 1991

Land-Use:	Residential				Commercial				Industrial				
Station #:	1	2	3	16	4	5	6	7	8	11	12	15	15–Dup.
Date:	7/22	7/23	7/23	7/31	7/24	7/24	7/25	7/25	7/29	7/29	7/30	7/30	7/30
Lab Log#:	308130	308131	308132	308142	308133	308134	308135	308136	308137	308138	308139	308140	308141
Phenol	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
Bis(2–Chloroethyl)Ether	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
2–Chlorophenol	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
1,3–Dichlorobenzene	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
1,4–Dichlorobenzene	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
Benzyl Alcohol	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
1,2–Dichlorobenzene	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
2–Methylphenol	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
Bis(2–Chloroisopropyl)Ether	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
4–Methylphenol	310 J	7200 U	3800 U	1100 J	260 J	1500 J	890 U	430 J	1500 J	4600 U	540 J	980 J	1300 J
N–Nitroso–di–n–Propylamine	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
Hexachloroethane	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
Nitrobenzene	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
Isophorone	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
2–Nitrophenol	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
2,4–Dimethylphenol	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
Benzoic Acid	120 J	35000 U	18000 U	14000 U	92 J	20000 U	4300 U	500 J	19000 U	22000 U	22000 U	24000 U	12000 U
Bis(2–Chloroethoxy)Methane	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
2,4–Dichlorophenol	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
1,2,4–Trichlorobenzene	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
Naphthalene	890 U	7200 U	480 J	2800 U	900 U	4100 U	890 U	3800 U	3900 U	730 J	4500 U	660 J	510 J
4–Chloroaniline	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
Hexachlorobutadiene	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
4–Chloro–3–Methylphenol	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
2–Methylnaphthalene	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	680 J	2200 J	4500 U	1000 J	890 J
Hexachlorocyclopentadiene	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
2,4,6–Trichlorophenol	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
2,4,5–Trichlorophenol	4300 U	35000 U	18000 U	14000 U	4400 U	20000 U	4300 U	19000 U	19000 U	22000 U	22000 U	24000 U	12000 U
2–Chloronaphthalene	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
2–Nitroaniline	4300 U	35000 U	18000 U	14000 U	4400 U	20000 U	4300 U	19000 U	19000 U	22000 U	22000 U	24000 U	12000 U
Dimethyl Phthalate	890 U	7200 U	3800 U	2800 U	900 U	760 J	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
Acenaphthylene	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
2,6–Dinitrotoluene	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
3–Nitroaniline	4300 U	35000 U	18000 U	14000 U	4400 U	20000 U	4300 U	19000 U	19000 U	22000 U	22000 U	24000 U	12000 U
Acenaphthene	890 U	2400 J	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	820 J	4500 U	4900 U	2400 U
2,4–Dinitrophenol	4300 U	35000 U	18000 U	14000 U	4400 U	20000 U	4300 U	19000 U	19000 U	22000 U	22000 U	24000 U	12000 U
4–Nitrophenol	4300 U	35000 U	18000 U	14000 U	4400 U	20000 U	4300 U	19000 U	19000 U	22000 U	22000 U	24000 U	12000 U
Dibenzofuran	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	710 J	4500 U	4900 U	2400 U

U=Undetected
J=Estimated

☐ *Indicates compound was detected*

Table 11. Results of Semivolatile Organic Compound Analysis of Vactor Sediment (mg/Kg, dry weight basis) – July, 1991 (Cont'd)

Land-Use:	Residential				Commercial				Industrial				
Station #:	1	2	3	16	4	5	6	7	8	11	12	15	15–Dup.
Date:	7/22	7/23	7/23	7/31	7/24	7/24	7/25	7/25	7/29	7/29	7/30	7/30	7/30
Lab Log#:	308130	308131	308132	308142	308133	308134	308135	308136	308137	308138	308139	308140	308141
2,4-Dinitrotoluene	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
Diethyl Phthalate	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
4-Chlorophenyl Phenylether	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
Fluorene	890 U	1100 J	470 J	2800 U	900 U	550 J	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
4-Nitroaniline	4300 U	35000 U	18000 U	14000 U	4400 U	20000 U	4300 U	19000 U	19000 U	22000 U	22000 U	24000 U	12000 U
4,6-Dinitro-2-Methylphenol	4300 U	35000 U	18000 U	14000 U	4400 U	20000 U	4300 U	19000 U	19000 U	22000 U	22000 U	24000 U	12000 U
N-Nitrosodiphenylamine	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	600 J	4500 U	4900 U	300 J
4-Bromophenyl Phenylether	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
Hexachlorobenzene	100 J	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
Pentachlorophenol	4300 U	35000 U	18000 U	14000 U	4400 U	20000 U	4300 U	19000 U	19000 U	22000 U	22000 U	24000 U	12000 U
Phenanthrene	250 J	4000 J	5800	550 J	630 J	5700	160 J	3200 J	2600 J	10000	2300 J	1900 J	1900 J
Anthracene	890 U	1900 J	940 J	2800 U	120 J	660 J	890 U	450 J	3900 U	1500 J	640 J	4900 U	810 J
Di-n-Butyl Phthalate	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
Fluoranthene	370 J	21000	8600	650 J	1300	7500	190 J	5000	4300	13000	3200 J	2500 J	2400
Pyrene	300 J	43000	6900	600 J	820 J	5000	140 J	3700 J	3300 J	10000	2800 J	1900 J	1900 J
Butylbenzyl Phthalate	260 J	7200 U	4300	2800 U	150 J	640 J	890 U	1200 J	550 J	4600 U	4500 U	4900 U	2400 U
3,3'-Dichlorobenzidine	1800 U	14000 U	7500 U	5600 U	1800 U	8200 U	1800 U	7700 U	7700 U	9100 U	9000 U	9800 U	4800 U
Benzo(a)Anthracene	890 U	6500 J	3000 J	330 J	420 J	2700 J	890 U	1900 J	1600 J	5100	1300 J	980 J	960 J
Chrysene	190 J	11000	4000	390 J	640 J	3700 J	890 U	2600 J	2200 J	6700	2000 J	1400 J	1300 J
Bis(2-Ethylhexyl)Phthalate	1700	6500 J	11000	4900	4400	20000	3100	30000	5200	6000	10000	11000	12000
Di-n-Octyl Phthalate	890 U	7200 U	3800 U	2800 U	900 U	4100 U	890 U	3800 U	3900 U	4600 U	4500 U	4900 U	2400 U
Benzo(b)Fluoranthene	150 J	15000	2600 J	**	540 J	**	**	2200 J	1500 J	4300 J	1100 J	790 J	1300 J
Benzo(k)Fluoranthene	160 J	12000	2600 J	290 J**	720 J	5400 **	100 J**	2500 J	1300 J	4500 J	1300 J	850 J	2400 U
Benzo(a)Pyrene	150 J	13000	3000 J	290 J	480 J	3000 J	90 J	1900 J	1500 J	4300 J	1100 J	740 J	830 J
Indeno(1,2,3-cd)Pyrene	890 U	8100	2300 J	2800 U	340 J	2400 J	890 U	1500 J	1300 J	3800 J	800 J	570 J	460 J
Dibenzo(a,h)Anthracene	890 U	7200 U	620 J	2800 U	900 U	870 J	890 U	510 J	3900 U	1200 J	4500 U	4900 U	2400 U
Benzo(g,h,i)Perylene	110 J	7200	2000 J	2800 U	340 J	2000 J	890 U	1300 J	1100 J	3600 J	910 J	650 J	610 J
Total LPAHs	250	9400	7690	550	750	6910	160	3850	2600	13050	2940	2560	2720
Total HPAHs	1430	136800	35620	2550	5600	32570	520	23110	18300	56500	14510	10380	9760
Total Petroleum Hydrocarbons	440	750	910	830	1200	4600	440	4400	2200	2700	2300	2600	3400

U=Undetected
J=Estimated
LPAH=Low molecular weight polycyclic aromatic hydrocarbon
HPAH=High molecular weight polycyclic aromatic hydrocarbon

*** Benzo(b)Fluoranthene + Benzo(k)Fluoranthene*
Indicates compound was detected

Table 12. Comparisons of Carcinogenic PAH and Total Petroleum Hydrocarbon Concentrations with MTCA Cleanup Levels

	Vactor Sediments			MTCA Cleanup Levels*	
	Residential Land-Use (mean)	Commercial Land-Use (mean)	Industrial Land-Use (mean)	Generic soils	Industrial soils
Carcinogenic PAHs (mg/Kg) [sum of benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)-pyrene, indeno(1,2,3-cd)pyrene, and dibenzo(a,h)anthracene]	21	8.6	12	1.0	20
Total Petroleum Hydrocarbons (mg/Kg)	730	2700	2600	200	200

** = Model Toxics Control Act Cleanup Regulation, Ch 173-340 WAC*

Table 13. Results of Pesticide/PCB Analysis of Vactor Sediment (mg/Kg, dry weight basis) – July, 1991

Land-Use:	Residential				Commercial				Industrial				
Station #:	1	2	3	16	4	5	6	7	8	11	12	15	15–Dup.
Date:	7/22	7/23	7/23	7/31	7/24	7/24	7/25	7/25	7/29	7/29	7/30	7/30	7/30
Lab Log#:	308130	308131	308132	308142	308133	308134	308135	308136	308137	308138	308139	308140	308141
alpha–BHC	22 U	23 U	24 U	27 U	22 U	25 U	24 U	23 U	24 U	23 U	22 U	25 U	23 U
beta–BHC	22 U	23 U	24 U	27 U	22 U	25 U	24 U	23 U	24 U	23 U	22 U	25 U	23 U
delta–BHC	22 U	23 U	24 U	27 U	22 U	25 U	24 U	23 U	24 U	23 U	22 U	25 U	23 U
gamma–BHC (Lindane)	22 U	23 U	24 U	27 U	22 U	25 U	24 U	23 U	24 U	23 U	22 U	25 U	23 U
Heptachlor	22 U	23 U	24 U	27 U	22 U	25 U	24 U	23 U	24 U	23 U	22 U	25 U	23 U
Aldrin	22 U	23 U	24 U	27 U	22 U	25 U	24 U	23 U	24 U	23 U	22 U	25 U	23 U
Heptachlor Epoxide	22 U	23 U	24 U	27 U	22 U	25 U	24 U	23 U	24 U	23 U	22 U	25 U	23 U
Endosulfan I	22 U	23 U	24 U	27 U	22 U	25 U	24 U	23 U	24 U	23 U	22 U	25 U	23 U
Dieldrin	43 U	45 U	48 U	54 U	44 U	51 U	47 U	46 U	47 U	45 U	44 U	50 U	46 U
4,4'–DDE	43 U	45 U	48 U	54 U	44 U	51 U	47 U	46 U	47 U	45 U	44 U	50 U	46 U
Endrin	43 U	45 U	48 U	54 U	44 U	51 U	47 U	46 U	47 U	45 U	44 U	50 U	46 U
Endosulfan II	43 U	45 U	48 U	54 U	44 U	51 U	47 U	46 U	47 U	45 U	44 U	50 U	46 U
4,4'–DDD	43 U	45 U	48 U	54 U	44 U	51 U	47 U	46 U	47 U	45 U	44 U	50 U	46 U
Endosulfan Sulfate	43 U	45 U	48 U	54 U	44 U	51 U	47 U	46 U	47 U	45 U	44 U	50 U	46 U
4,4'–DDT	43 U	45 U	48 U	54 U	44 U	51 U	47 U	46 U	47 U	45 U	44 U	50 U	46 U
Methoxychlor	220 U	230 U	240 U	270 U	220 U	250 U	240 U	230 U	240 U	230 U	220 U	250 U	230 U
Endrin Ketone	43 U	45 U	48 U	54 U	44 U	51 U	47 U	46 U	47 U	45 U	44 U	50 U	46 U
alpha–Chlordane	220 U	230 U	48 U	270 U	220 U	250 U	240 U	230 U	240 U	230 U	220 U	250 U	230 U
gamma–Chlordane	220 U	230 U	48 U	270 U	220 U	250 U	240 U	230 U	47 U	230 U	220 U	250 U	230 U
Toxaphene	430 U	450 U	480 U	540 U	440 U	510 U	470 U	460 U	470 U	450 U	440 U	500 U	460 U
Aroclor–1016	220 U	230 U	240 U	270 U	220 U	250 U	240 U	230 U	240 U	230 U	220 U	250 U	230 U
Aroclor–1221	220 U	230 U	240 U	270 U	220 U	250 U	240 U	230 U	240 U	230 U	220 U	250 U	230 U
Aroclor–1232	220 U	230 U	240 U	270 U	220 U	250 U	240 U	230 U	240 U	230 U	220 U	250 U	230 U
Aroclor–1242	220 U	230 U	240 U	270 U	220 U	250 U	240 U	230 U	240 U	230 U	220 U	250 U	230 U
Aroclor–1248	220 U	230 U	240 U	270 U	220 U	250 U	240 U	230 U	240 U	230 U	220 U	250 U	230 U
Aroclor–1254	430 U	450 U	480 U	540 U	440 U	510 U	470 U	460 U	470 U	450 U	440 U	500 U	460 U
Aroclor–1260	430 U	450 U	480 U	540 U	440 U	510 U	470 U	460 U	470 U	450 U	440 U	500 U	460 U

U=Undetected

4) PAH and total petroleum hydrocarbon concentrations are high in vactor sediment. Carcinogenic PAH and TPH concentrations in vactor sediments from residential, commercial, and industrial areas exceed MTCA cleanup levels.

5) Aside from PAHs in vactor sediments, concentrations of most detected analytes were higher in wastes from industrial-use areas than they were in wastes from residential and commercial areas.

6) Pesticides and PCBs were not detected in vactor decant water or sediment, although detection limits were higher than called for in the sampling and analysis plan.

RECOMMENDATIONS

1) Collect and analyze filtered vactor decant water samples to determine concentrations of dissolved metals. Also analyze total metals in unfiltered samples to determine the relationship between particulate and dissolved components.

2) Collect and analyze additional vactor decant water samples for toluene, xylenes, ethylbenzene, and TPH.

3) Collect and analyze additional vactor sediment samples for priority pollutant metals. If warranted, use Toxicity Characteristic Leaching Procedures (TCLP) for metals to determine if levels meet criteria for dangerous waste designation under Ch. 173-303 WAC.

4) Collect and analyze additional vactor sediment samples for petroleum-derived contaminants such as benzene, ethylbenzene, toluene, xylenes, PAHs, and TPH.

5) Meet with staff of Ecology's Water Quality, Hazardous Waste, and Toxics Cleanup Programs for input on regulatory implications of the results reported here.

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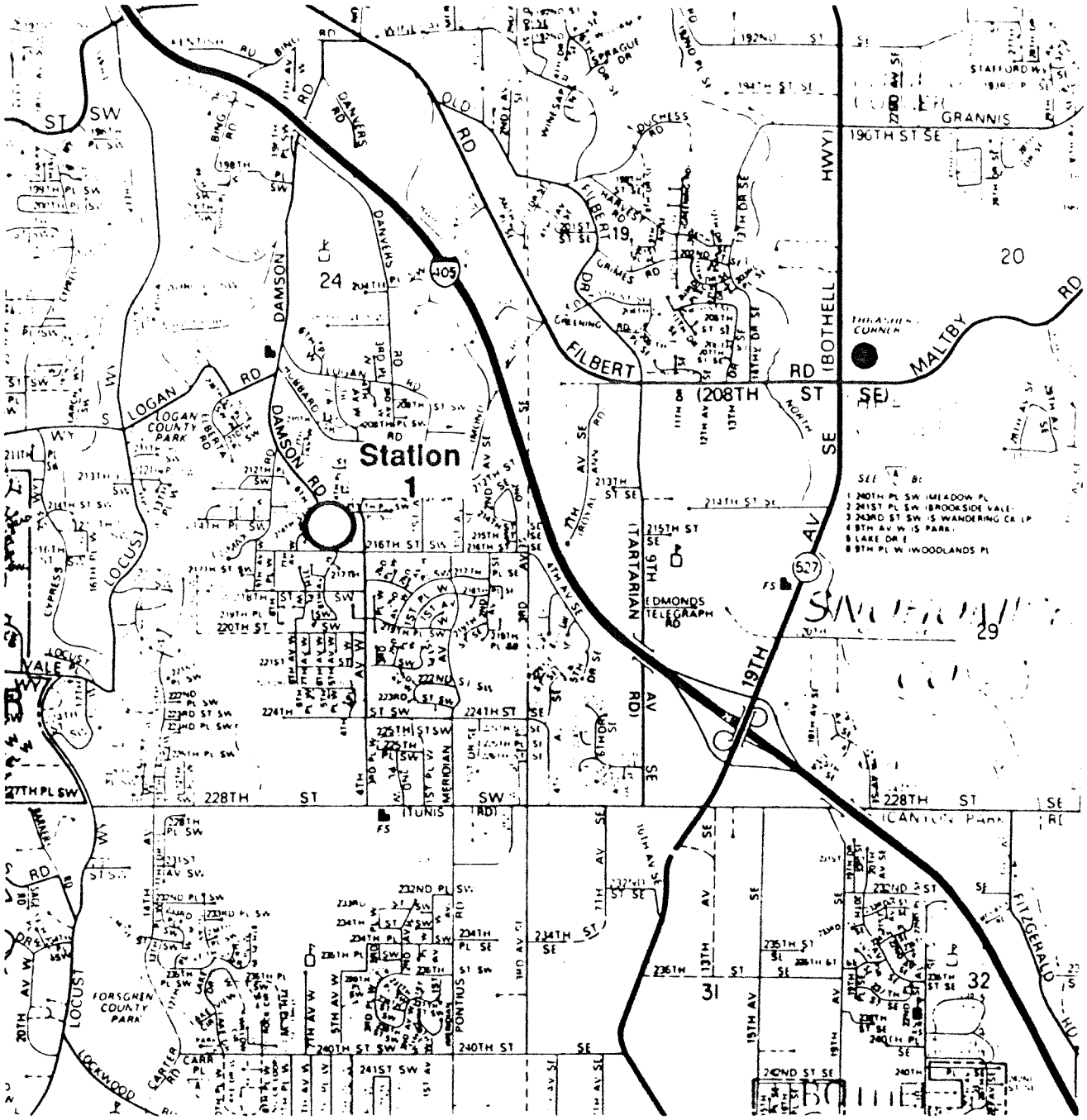
APPENDIX A

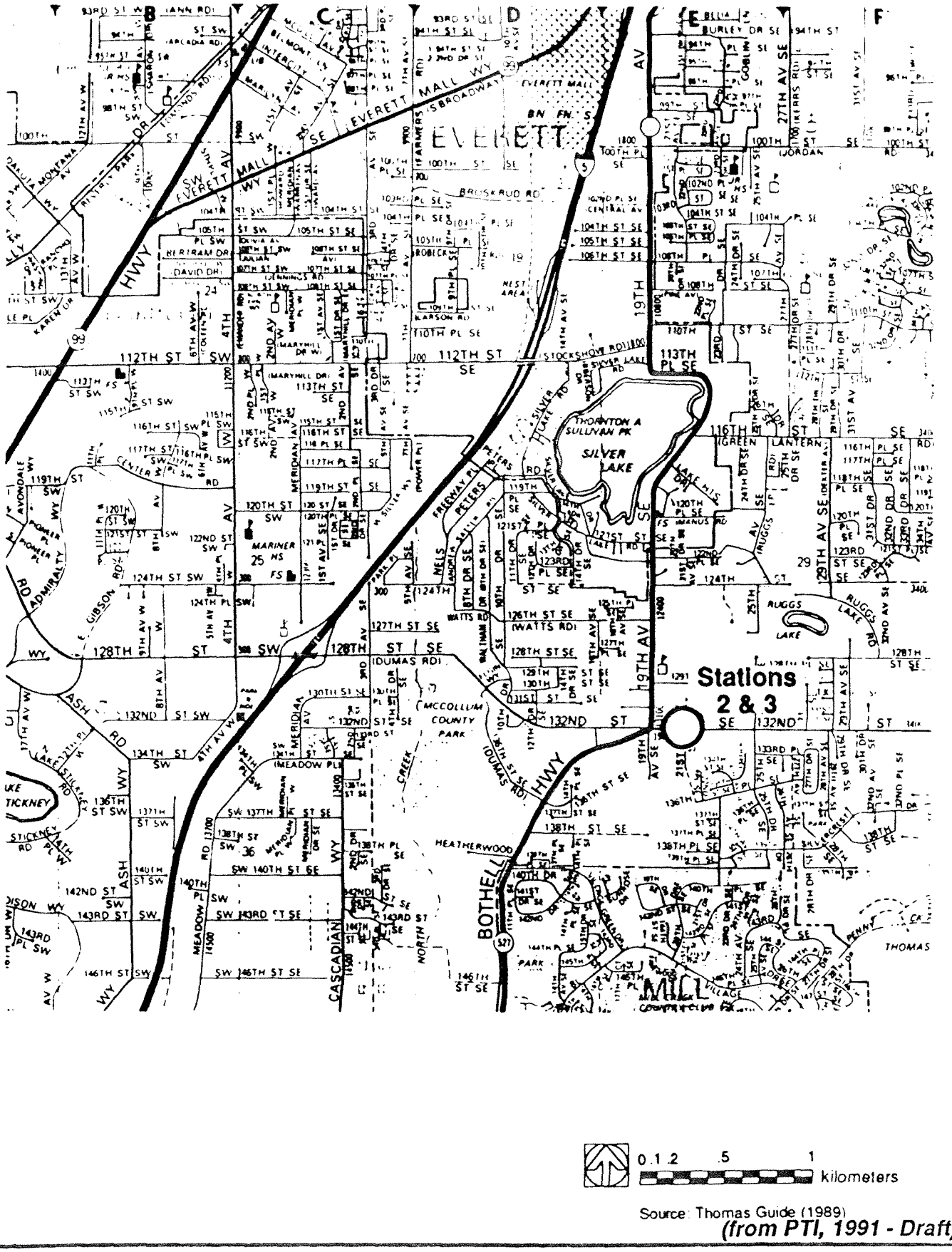
Maps of Sampling Stations



Source: Thomas Guide (1989)

(from PTI, 1991 - Draft)

Figure A1. Location of Station 1 (Snohomish County)



Source: Thomas Guide (1989)
(from PTI, 1991 - Draft)

Figure A2. Location of Stations 2 and 3 (Snohomish County)

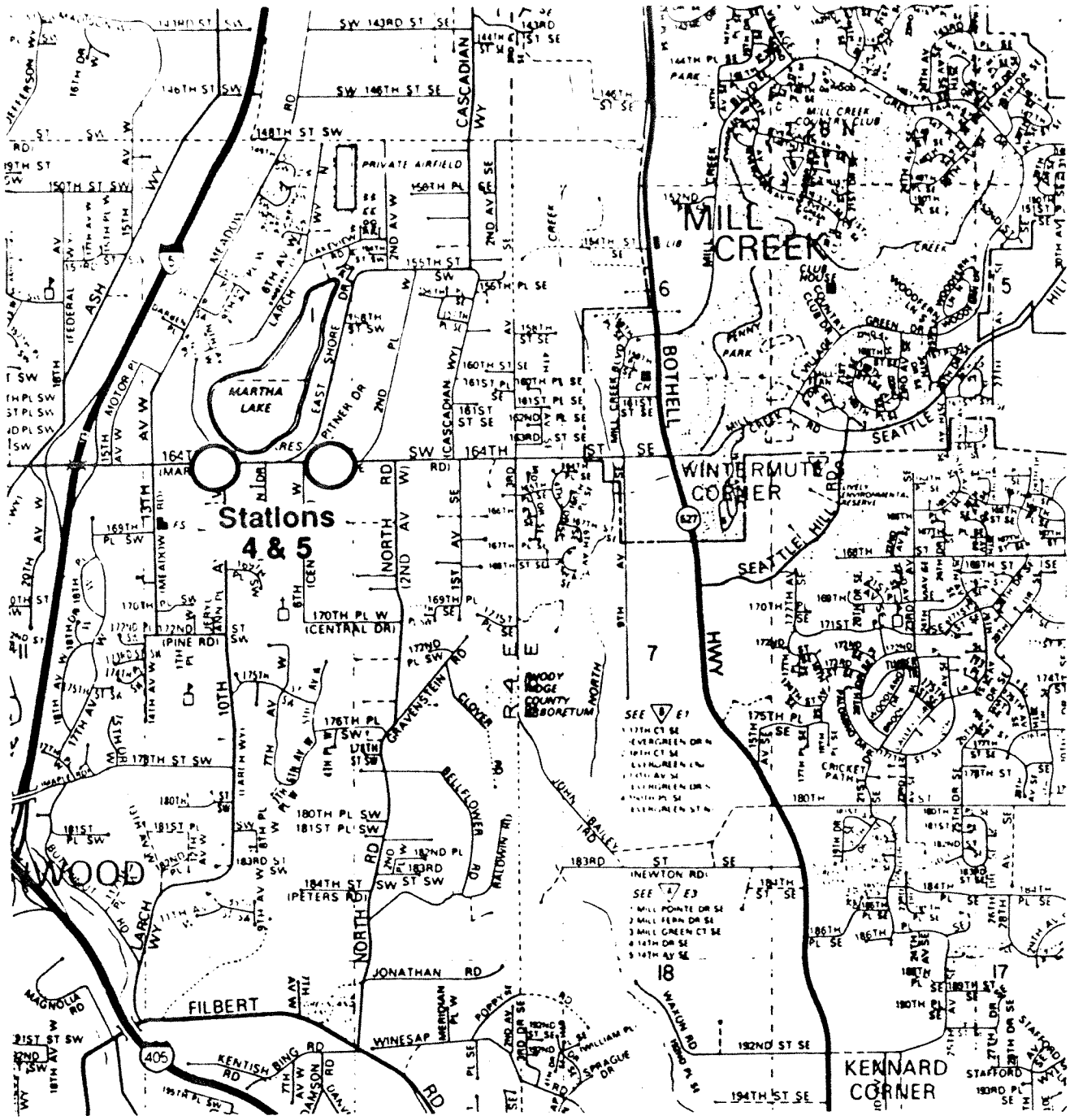


Figure A3. Location of Stations 4 and 5 (Snohomish County)

C744-35 0991

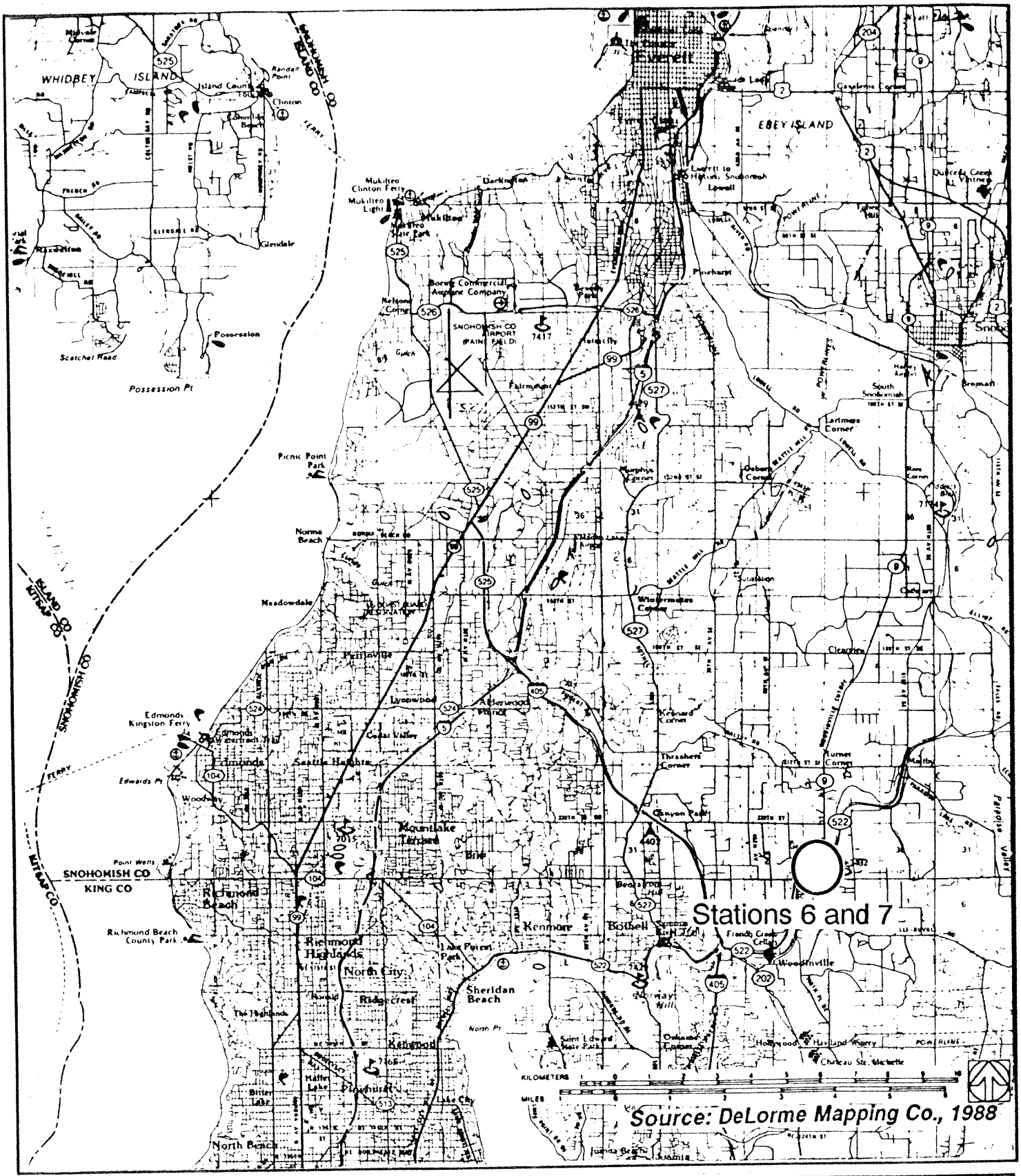


Figure A4. Location of Stations 6 and 7 (Snohomish County)

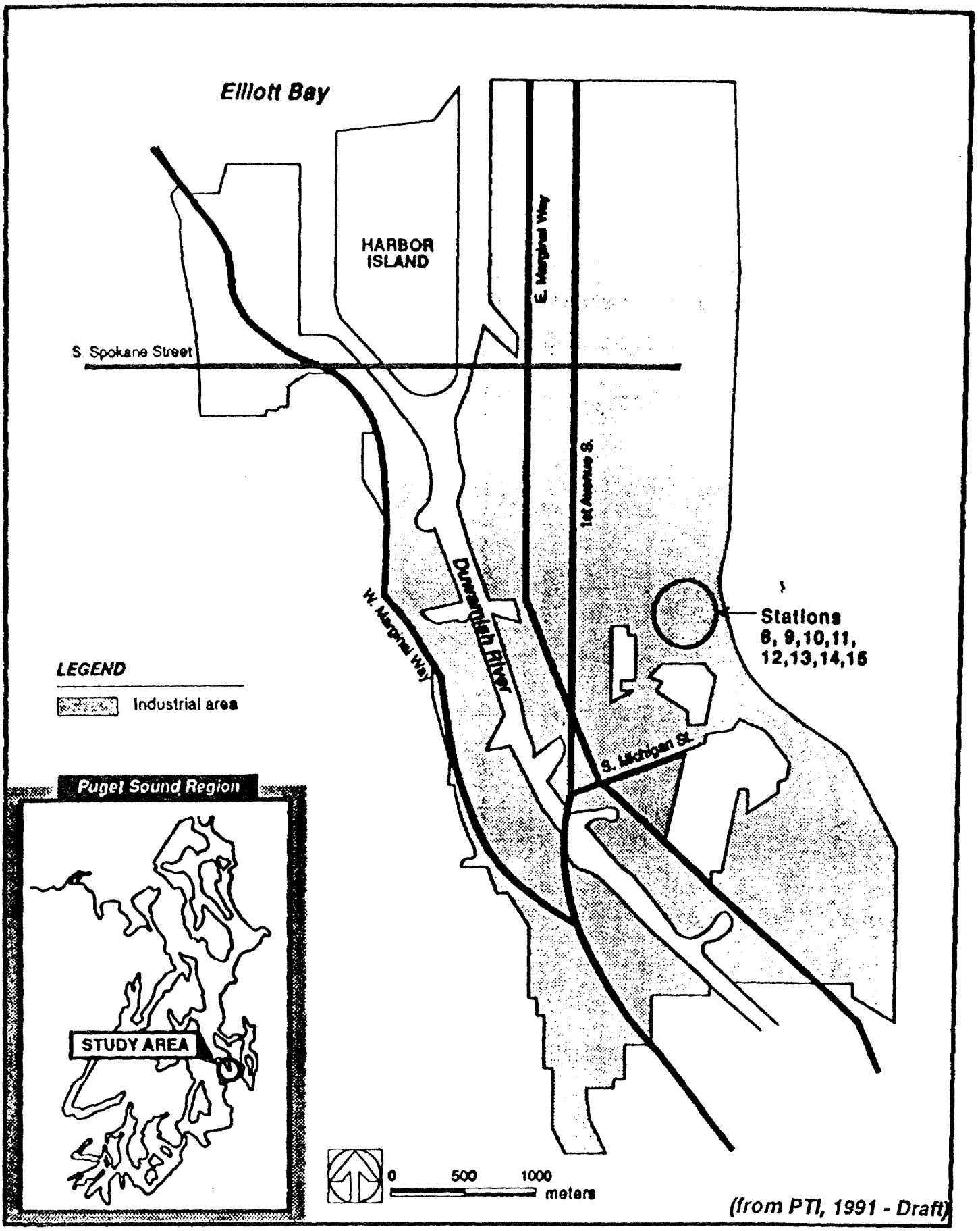
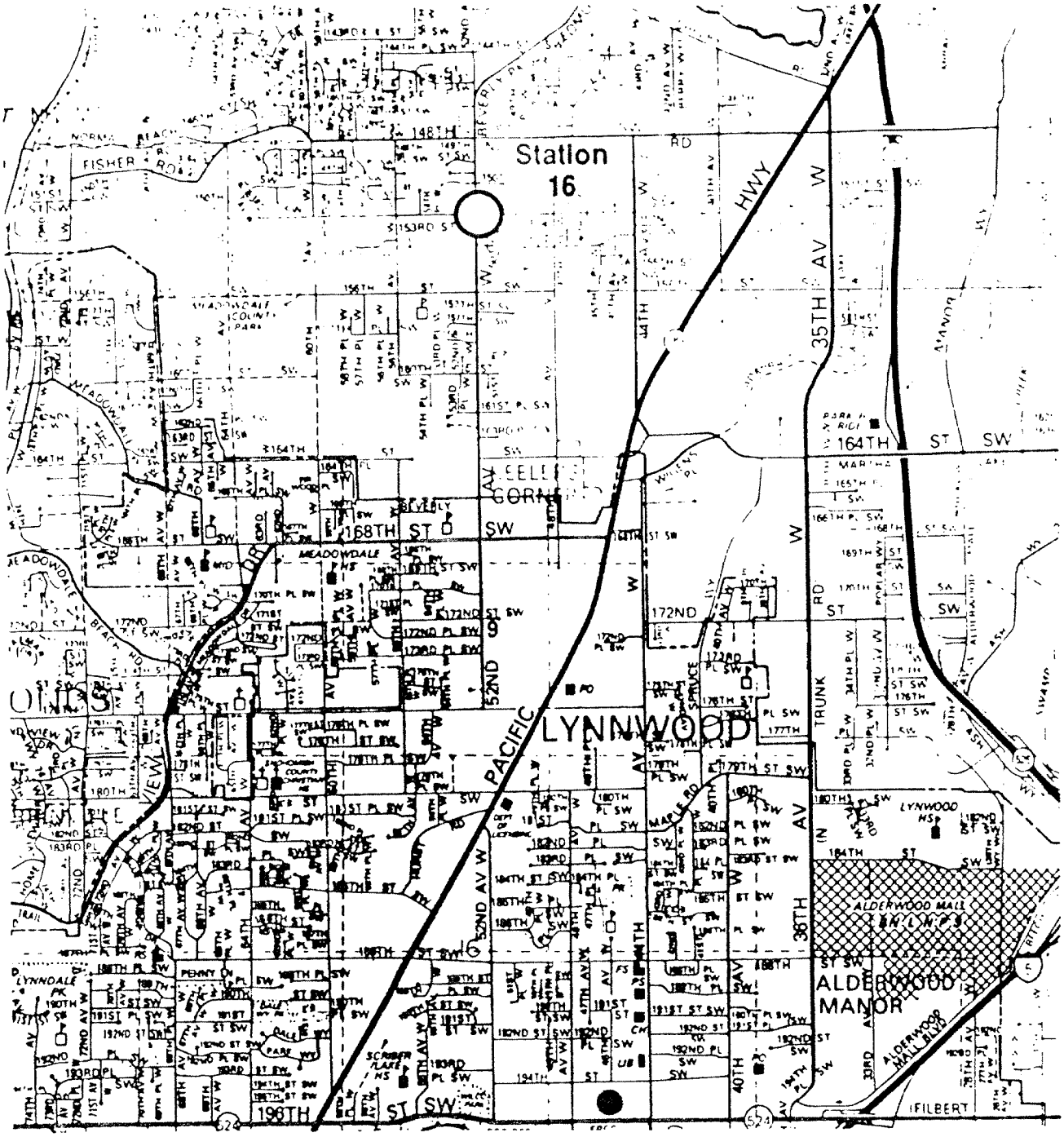


Figure A5. Location of Stations 8 - 15 (Seattle)



Source Thomas Guide (1989)

(from PTI, 1991 - Draft)

Figure A6. Location of Station 16 (Snohomish County)

APPENDIX B

Quality Assurance Review

DATA QUALITY ASSURANCE REVIEW

This section summarizes the results of a quality assurance review of chemical analyses for conventional analytes, metals, VOCs, semivolatile ABN compounds, and PCBs in water.

QUALITY CONTROL METHODS

The quality assurance review for all analyses included examination of the following laboratory data:

- Sample extraction, digestion, and preparation logs
- All instrument printouts
- Instrument tuning, calibration, and continuing calibration verification performance and results
- Method blank summaries and results
- Surrogate compound and matrix spike results
- Sample duplicate (conventional chemistry) and matrix spike duplicate (organic compounds) results
- Internal standards performance and results

- All sample results and EPA CLP equivalent reporting forms (i.e., Forms I and I-TIC), including chromatograms and mass spectral identifications for all target analytes and tentatively identified compounds

- Sample holding times and chain-of-custody records

- Manual data transcriptions and computer algorithms.

Data qualifiers were assigned, as necessary, during the quality assurance review. Following the validation procedures, data quality was assessed with respect to completeness, analytical methods, accuracy, and precision.

DATA QUALITY EVALUATION

The results of data validation are presented in the following four sections. The completeness of the data package, the qualifiers assigned to individual measurements, and the laboratory's overall performance are addressed in each section.

The following qualifiers were assigned to the data during quality assurance review. A *J* qualifier was assigned during the quality assurance review to indicate that the reported data are considered estimates and that a greater degree of uncertainty is associated with these data than with nonqualified data. The *J* qualifier was assigned to results that were reported at a concentration less than the contract-required quantitation limit (CRQL) or because the reported concentration exceeded the concentration of the highest standard used to establish the initial calibration. In addition, the *J* qualifier may also be associated with the *U* qualifier to indicate that the target analytes were not detected at a concentration greater than the CRQL, but are considered estimates because other quality

assurance criteria were not met. All data assigned *J* or *UJ* qualifiers are acceptable. A *B* qualifier was assigned during the quality assurance review to indicate that the reported data are considered estimates because method blank contamination was identified. In some instances, a *J* qualifier is also associated with the *B* qualifier to indicate that the reported value is below the CRQL. A *U* qualifier was assigned by the laboratory to all results reported as not detected and reported at the CRQL. Because the detection limits for these results are acceptable, a *U* qualifier does not reflect negatively on laboratory performance.

Analysis of Metal and Conventional Analytes

The results reported for conventional analytes associated with the SDG are acceptable as reported by the laboratory with the following qualifications:

- Eight analytical results (2 percent of all results) were qualified as estimates (*J*). Four results (two pH and two biological oxygen demand) were qualified as estimates because of exceeded holding times. One result (fecal coliform bacteria) was qualified as an estimate because of improper sample handling. Three results for lead were qualified as estimates because of poor matrix spike recovery as well as poor duplicate precision.

- A *U* qualifier was assigned by the laboratory to 24 results (7 percent of all results) that were reported as not detected and reported at the CRQL. A *UJ* qualifier was assigned to one result.

In addition to these qualifications, six results had been calculated or transcribed incorrectly. These calculation or transcription errors were corrected.

All other specifications stipulated by PTI (1991 a,c), U.S. EPA (1984), and APHA (1989) were met by the laboratory and further qualification of the data was not required in accordance with procedures established by U.S. EPA (1988b).

Analysis of Volatile Organic Compounds

All results reported for VOCs for the 16 water samples in the SDG are acceptable as reported by the laboratory with the following qualifications:

- A *J* qualifier was assigned to 17 results (3 percent of all results) that had values lower than the CRQL or because the reported concentration exceeded the concentration of the highest standard used to establish the initial calibration.

- A *B* qualifier was assigned to 9 results (2 percent of all results) for dichloromethane to indicate blank contamination. One result was qualified *JB* to indicate that the reported value is below the CRQL.

- A *U* qualifier was assigned by the laboratory to 474 results (87 percent of all results) that were reported as not detected and reported at the CRQL.

The qualifiers assigned to selected results are not unusual for the analysis of environmental samples, with the exception of data qualified because the upper linear range of the instrument was exceeded. The laboratory should have diluted these samples and reanalyzed them. However, because of holding time restrictions this procedure could not be performed.

All other specifications stipulated by U.S. EPA (1986b, 1988a) and PTI (1991a,b) were met by the laboratory and further qualification of the data was not required in accordance with procedures established by U.S. EPA (1988a).

The target analytes detected in the samples associated with the SDG include acetone, ethylbenzene, toluene, total xylenes, dichloromethane, 4-methyl-2-pentanone, 2-butanone, and 0–5 tentatively identified compounds. In addition, the analyses performed on the two trip blanks detected acetone and dichloromethane; acetone was used in field decontamination procedures and both of these compounds are also common laboratory contaminants.

Analysis of Semivolatile Acid/Base/Neutral Compounds

All results reported for ABN compounds for the 16 water samples in the SDG are acceptable as qualified during the quality assurance review. Qualification of the data was required for the following reasons:

- A *J* qualifier was assigned to 18 results (2 percent of all results) for two reasons. First, the *J* qualifier was assigned when the criteria for continuing calibration analyses (U.S. EPA 1986b, 1988a) were not met. The target compounds that were affected include benzoic acid, 4-nitrophenol, benzo(b)fluoranthene, indeno(1,2,3-c,d)pyrene, and benzo(g,h,i)perylene. Second, the *J* qualifier was assigned because the results were reported at concentrations less than the CRQL.

- A *B* qualifier was assigned during the quality assurance review to one result for bis(2-ethylhexyl)phthalate to indicate that the reported data are considered estimates because method blank contamination was identified. Four results also have a *J* qualifier associated with the *B* qualifier to indicate that the reported value is below the CRQL.

- A *U* qualifier was assigned by the laboratory to 1,000 results (92 percent of all results) reported as not detected and reported at

the CRQL. A *UJ* qualifier was assigned to 59 results (5 percent of all results).

The qualifiers assigned are not unusual for the analysis of environmental samples, with the exception of the data that were qualified because the criteria for continuing calibration analyses were not met. The laboratory should have reanalyzed all continuing calibration standards that did not meet U.S. EPA (1986b, 1988a) criteria for acceptable performance to identify whether the outliers were isolated occurrences.

All other specifications stipulated by U.S. EPA (1986b, 1988a) and PTI (1991a,b) were met by the laboratory and further qualification of the data was not required in accordance with procedures established by U.S. EPA (1988a).

The target analytes detected in the samples associated with the SDG include phenol, benzoic acid, bis(2-ethylhexyl)phthalate, 4-chloro-3-methylphenol, naphthalene, 4-methylphenol, 2-methylnaphthalene, fluorene, phenanthrene, di-*n*-butyl phthalate, butylbenzyl phthalate, and several tentatively identified compounds (e.g., organic acids, hydrocarbons, and unknown compounds).

Analysis of Polychlorinated Biphenyls

All results reported for PCBs for the 10 samples in the SDG are acceptable as reported by the laboratory. Qualification of the data was not required during the quality assurance review and all results were assigned a *U* qualifier by the laboratory to indicate that PCBs were not detected at a concentration greater than the CRQL.

The criteria specified by U.S. EPA (1986b, 1988a) and PTI (1991a,b) for acceptable laboratory performance were met by the laboratory, with the exception

of the surrogate recovery data for dibromooctafluorobiphenyl (DBOFB). The spiking concentration for DBOFB used by the laboratory exceeded the instrument's upper linear range; therefore, the concentrations could not be quantified. However, because the laboratory used dibutylchlorendate as an additional surrogate compound and acceptable recoveries were reported, qualification of the sample data was not required.

All other specifications stipulated by U.S. EPA (1986b, 1988a) and PTI (1991a,b) were met by the laboratory and further qualification of the data was not required in accordance with procedures established by U.S. EPA (1988a).

WASHINGTON STATE DEPARTMENT OF ECOLOGY
ENVIRONMENTAL INVESTIGATIONS AND LABORATORY SERVICES
MANCHESTER LABORATORY

September 19, 1991

TO: Dave Serdar

FROM: Randy Knox RSK

SUBJECT: QA Summary on Sediment Samples.

SAMPLE RECEIPT:

The samples from the Catch Basin Disposal Study project were received by the Manchester Laboratory in three batches on 7/25/91, 7/31/91, and 8/01/91 in good condition.

HOLDING TIMES:

All analyses were performed within the specified holding times for metals analysis (28 days for mercury, 180 days for all other metals).

INSTRUMENT CALIBRATION:

Instrument calibration was performed before each analytical run and checked by initial calibration verification standards and blanks. Continuing calibration standards and blanks were analyzed at a frequency of 10% during the run and again at the end of the analytical run. All initial and continuing calibration verification standards were within the control limits of +/- 10%. AA calibration gave correlation coefficients greater than the criteria of 0.995. A correlation coefficient of 0.995 or higher means that the calibration is acceptable. The thallium data for samples 308130 - 308134 lacks an ending blank to demonstrate the absence of carryover. Since no thallium was detected in the samples, carryover is not a problem and the data does not need qualification. The ending interference check standard for lead and nickel for samples 308135 - 308142 is lower than the - 80% allowed. Values are 75% and 78% respectively. The initial check is within the acceptable window.

PROCEDURAL BLANKS:

The procedural blanks associated with these samples showed no detectable levels of analytes except copper and lead. Levels of these elements in the samples is >10X that found in the blanks so qualification of the data is not necessary.

SPIKED SAMPLE ANALYSIS:

Spiked sample and duplicate spiked sample analysis were performed on sample number(s) 308130, 308133, 308135 for most elements and 308130, 308135, and 308142 for mercury. All spike recoveries were within the acceptable limits of +/- 25% for sediment sample analysis except those for antimony, silver, and mercury and chromium on one spiked sample but not the other. Antimony is difficult to recover from many sediment samples without a specific prep. Antimony data is flagged with an N to indicate the low recovery obtained. Silver recovery ranged from 57% to 87%. Low silver recovery is common from sediment matrices. Silver data is flagged with an N to indicate it is an estimate because of the low spike recoveries. Mercury data associated with samples 308135 - 308138 was prepped with a sample which had a spike recovery of 153%. The duplicate spike recovery was 92%, well within established limits. This data was flagged with an N to indicate the recovery fluctuation and susequent uncertainty in the sample level. Chromium data on samples 308135 - 308142 is flagged with an N to indicate the high recovery shown, 156% and 122%.

PRECISION DATA:

The duplicate results of the spiked and duplicate spiked sample were used to calculate precision related to the analysis of these samples. The % RPD for all parameters was well within the +/- 20% window for duplicate analysis. Mercury data for the set of spiked samples associated with samples 308135 - 308138 is the exception. This data as earlier noted with the recovery data is flagged with an N to indicate it is estimated.

ICP SERIAL DILUTION ANALYSIS:

The Relative Percent Difference (RPD) between sample results and the results for a serial dilution of the same sample were less than 10% for all elements except the zinc associated with samples 308135 -308142. This zinc data is flagged with an J to indicate it is estimated. Failure of serial dilution to pass may indicate the presence of interference.

SUMMARY:

The data generated by the analysis of the above referenced samples can be used with qualification of silver and antimony data as an estimated owing to low recoveries. Some mercury and chromium data is flagged as estimated due to high and erratic recovery. Some zinc data is flagged because in an associated sample, zinc data did not pass the serial dilution test.

If you have any questions about the results or the methods used to obtain these results please call me at SCAN 744-4737.

cc Bill Kammin

State of Washington Department of Ecology
Manchester Environmental Laboratory
7411 Beach Dr. East Port Orchard WA. 98366

Data Review
December 6, 1991

Project: **Catch Basin Disposal Study**

Samples: 308130 308131 308132 308133 308134 308135 308136
308137 308138 308139 308140 308141 308142

Laboratory: Weyerhaeuser Analytical and Testing Services 6347

By: Stuart Magoon

Case Summary

These analyses were reviewed for qualitative and quantitative accuracy, validity, and usefulness. Specific methods used and problems incurred during the analysis are detailed in the Case Narrative. Specific problems with the QC will be noted and referenced to the Case Narrative.

There is no need to assimilate the "dilution factor" or "sample wt/vol" into the final values reported; these calculations have already been figured into the reported values.

Where the term "EPA SAMPLE NO." appears take this to mean DOE Laboratory number. These forms are from the SOW for the US EPA CLP and any reference to the EPA is unintentional.

These results have been reported on a dry weight basis.

DATA QUALIFIER DEFINITIONS

U - The analyte was not detected at or above the associated value.

UJ - The analyte was not detected at or above the associated estimated value.

J - The analyte was positively identified. the associated numerical value is an estimate.

NR - Not Reported. This analyte was added as part of the Matrix Spike solution and is not reported here.

E - The concentration of this analyte exceeded the calibration range, and a dilution should be performed.

D - The result was derived from an analysis of a sample that required a secondary dilution.

NJ - There is evidence that the analyte is present. The associated numerical value is an estimate.

REJ- The data are not unusable for all purposes.

X - This is an artifact. This qualifier does not bear any significance as to the usefulness of the result(s).

Volatiles

Sample	Date Collect	Date Extd	Date Anlz	#Days collect to ext	#Days Collect to anal
308130	7/22	NA	8/7	NA	16 of 14
308131	7/23	NA	8/7	NA	15 of 14
308132	7/23	NA	8/7	NA	15 of 14
308132DL	7/23	NA	8/8	NA	16 of 14
308133	7/24	NA	8/8	NA	15 of 14
308134	7/24	NA	8/7	NA	14 of 14
308134DL	7/24	NA	8/23	NA	30 of 14
308135	7/25	NA	8/7	NA	13 of 14
308136	7/25	NA	8/7	NA	13 of 14
308136RE	7/25	NA	8/8	NA	14 of 14
308137	7/29	NA	8/7	NA	9 of 14
308137DL	7/29	NA	8/23	NA	25 of 14
308138	7/29	NA	8/7	NA	9 of 14
308138DL	7/29	NA	8/8	NA	10 of 14
308139	7/30	NA	8/7	NA	8 of 14
308139DL	7/30	NA	8/8	NA	9 of 14
308140	7/30	NA	8/7	NA	8 of 14
308140DL	7/30	NA	8/8	NA	9 of 14
308141	7/30	NA	8/7	NA	8 of 14
308141DL	7/30	NA	8/19	NA	20 of 14
308142	7/31	NA	8/7	NA	7 of 14

These samples were analyzed within the SW 846 recommended holding time, with five exceptions.
The "RE" suffix is an abbreviation for re-analysis. The "DL" suffix is an abbreviation for dilution.

Method Blanks:

Acetone was detected in all but one of the five method blanks. Several siloxane compounds were detected in two of the blanks. These siloxane compounds are probably the result of column bleed and not native to any of the blanks or samples.

Surrogates:

Surrogate recoveries for these samples, the matrix spikes, and the associated method blanks are reasonable, acceptable and within QC limits, with several minor exceptions. These surrogate recovery outliers are a reflection of the low internal standard recoveries for Chlorobenzene-d5. All results associated with internal standards that were below the QC limit have been qualified with a "UJ" or "J".

Matrix spikes (MS/MSD):

Matrix spike recoveries and precision data are acceptable and within QC limits, with two exceptions for the spiked sample 308131.
Toluene was spiked at 69 ppb The toluene recovery in the MSD was recovered below the QC limit, but within the QC limit for the MS. This resulted in an RPD value of 60, which was also outside to the QC limit. Analysis of the sample showed Toluene was present at 160 ppb, a little more than two times the amount spiked. The low recovery for the MSD of sample 308131 is appears to be due to poor sample homogeneity, however, all three internal standards for the MS were below the QC acceptance limits. The MS analysis should have been re-analyzed. All non-detects for 308131MS have been qualified with a "UJ", positives have been qualified with a "J".
Use the MS/MSD recovery and precision data for sample 308137.

Sample Data:

This data is acceptable for use. The results for analytes that have been qualified with an "E" should not be used for the final report, instead use results from the secondary dilution ("D").
Although the "J" qualified values are considered estimates they should be accurate to within the order of magnitude reported.

Semivolatiles (BNA)

Sample	Date Collect	Date Extd	Date Anlz	# Days collect to ext	# Days extract to anal
308130	7/22	8/09	8/22	18 of 14	13 of 40
308131	7/23	8/09	8/22	17 of 14	13 of 40
308132	7/23	8/09	8/22	17 of 14	13 of 40
308133	7/24	8/09	8/22	16 of 14	13 of 40
308134	7/24	8/09	8/22	16 of 14	13 of 40
308135	7/25	8/09	8/22	15 of 14	13 of 40
308136	7/25	8/09	8/22	15 of 14	13 of 40
308137	7/29	8/09	8/22	11 of 14	13 of 40
308138	7/29	8/09	8/22	11 of 14	13 of 40
308139	7/30	8/09	8/22	10 of 14	13 of 40
308140	7/30	8/09	8/22	10 of 14	13 of 40
308141	7/30	8/09	8/22	10 of 14	13 of 40
308142	7/31	8/09	8/22	09 of 14	13 of 40

All these samples were extracted within a reasonable period of time. Seven of the thirteen samples were extracted one to four days beyond the SW 846 recommended holding time of fourteen days. These outliers are minor and do not necessitate the need for qualification of the data.

Method Blanks:

No target analytes or non-target analytes (TIC's) were detected in the method blank.

Surrogates:

All surrogate recoveries for these samples, the matrix spikes, and the associated method blank are reasonable, acceptable and within QC limits.

Matrix Spike and Matrix Spike Duplicate (MS/MSD):

MS/MSD recoveries and precision data are acceptable and within QC limits.

Sample Data:

This data is acceptable for use. Note that data qualifiers may modify the usefulness of the individual values.
The results that have been qualified with a "J" should be accurate within the order of magnitude reported.

Recommendation:
Analyze samples for TPH 418.1, due to large number of TIC's as hydrocarbons.

Organochlorine Pesticides and PCB's

Sample	Date Collect	Date Extd	Date Anlz	#Days collect to ext	#Days extract to anal
308130	7/22	8/09	8/25	18 of 14	17 of 40
308131	7/23	8/09	8/26	17 of 14	16 of 40
308132	7/23	8/09	8/25	17 of 14	17 of 40
308133	7/24	8/09	8/25	16 of 14	16 of 40
308134	7/24	8/09	8/26	16 of 14	17 of 40
308135	7/25	8/09	8/26	15 of 14	17 of 40
308136	7/25	8/09	8/26	15 of 14	17 of 40
308137	7/29	8/09	8/26	11 of 14	17 of 40
308138	7/29	8/09	8/26	11 of 14	17 of 40
308139	7/30	8/09	8/26	10 of 14	17 of 40
308140	7/30	8/09	8/26	10 of 14	17 of 40
308141	7/30	8/09	8/26	10 of 14	17 of 40
308142	7/31	8/09	8/25	09 of 14	16 of 40

All these samples were extracted within a reasonable period of time. Seven of the thirteen samples were extracted one to four days beyond the SW 846 recommended holding time of fourteen days. These outliers are minor and do not necessitate the need for qualification of the data.

Method Blanks:

No target compounds were detected in the method blank.

Surrogates:

All surrogate recoveries for these samples, the matrix spikes, and the associated method blank are reasonable, acceptable and within QC limits, with four exceptions. See the Case Narrative.

Matrix Spike and Matrix Spike Duplicate (MS/MSD):

All MS/MSD recoveries are twice the levels expected, and outside of the quality control limits. See Case Narrative. Precision data (RPD) is acceptable and within limits. Since the recovery was high and no analytes were detected in any of these samples; no action is required.

Sample Data:

This data is acceptable for use without the need for additional data qualifiers.
No organochlorine pesticides or polychloronated biphenyls were detected in any of the samples.

Weyerhaeuser

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Tel (206) 924 6872
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CASE NARRATIVE

WEYERHAEUSER (WEYER)
ANALYTICAL AND TESTING SERVICES

Case Number: 06347
SDG Number: 308130
Contract Number: CBDS Project

Samples from this case (06347) were received on 8/1/91. This case was comprised of soils for VOAs, BNAs, and Pesticides. The requested analyses were as follows:

SAMPLE ID	MATRIX	ANALYSIS REQUESTED
308130	Soil	BNA; VOA; Pest
308131	Soil	BNA; VOA; Pest
308132	Soil	BNA; VOA; Pest
308132DL	Soil	VOA
308133	Soil	BNA; VOA; Pest
308134	Soil	BNA; VOA; Pest
308134DL	Soil	VOA
308135	Soil	BNA; VOA; Pest
308136	Soil	BNA; VOA; Pest
308136RE	Soil	VOA
308137	Soil	BNA; VOA; Pest
308137DL	Soil	VOA
308138	Soil	BNA; VOA; Pest
308138DL	Soil	VOA
308139	Soil	BNA; VOA; Pest
308139DL	Soil	VOA
308140	Soil	BNA; VOA; Pest
308140DL	Soil	VOA
308141	Soil	BNA; VOA; Pest
308141DL	Soil	VOA
308142	Soil	BNA; VOA; Pest
308131MS	Soil	VOA
308131MSD	Soil	VOA
308137MS	Soil	VOA
308137MSD	Soil	VOA
308142MS	Soil	BNA; Pest
308142MSD	Soil	BNA; Pest

Several anomalies existed with this sample set that are listed below. The anomalies are broken up into three categories for ease of explanation.

1. VOA

   a) All samples and blanks contain a peak at approximately scan #50 that is >10% of the nearest internal standard. This peak is carbon dioxide and is not searched in any of the samples. A spectra of this peak is on file at the laboratory for review.

   b) The quantitation mass for 2-Butanone was changed from m/z72 to m/z 73 due to low sensitivity with m/z 72.

   c) Surrogate and/or internal standards were outside QC limits on samples 308134DL, 308136, 308138, 308139, 308140, 308137DL, ~~308137MS, and 308137MSD.~~ All of these samples were rerun either not diluted or as dilutions. In all cases both runs are submitted. Sample 308131MS also had problems but as this was an MS and no criteria for reruns is listed in CLP for MS samples, the sample was not rerun. Sample 308137 was not rerun either based on the fact that the same problem occurred on the MS and MSD. Several of the reruns were performed outside holding times.

2. PESTICIDES

   a) Four samples, 308131, 308136, 308142MS, and 308142MSD have high surrogate recoveries. It appears that these samples were double spiked or split 1/10 instead of 1/20. The calculations were performed using the information from the bench sheets. The spike recoveries are also high by a factor of two in the MS and MSD indicating that the samples were split incorrectly and not spiked incorrectly. As these are advisory limits only and no compounds were found in any of the samples, no action was taken. Another indication that this is what happened is the detection of a peak in the MS and MSD at 7.66 minutes being much larger than in the original sample.

3. BNA

   a) Some of the PAHs in the MS and MSD are higher than the original sample. The surrogate recoveries are also higher in the MS and MSD. In all cases, the QC limits for the surrogates are within limits. These are low level hits and required no further action.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

9/10/91

Dennis M. Catalano
Laboratory Manager

Date

Please feel free to contact me with any questions concerning this data report. I can be reached at (206) 924-6242.

Sincerely,

Dennis M. Catalano, Manager
Organic Laboratory
Weyerhaeuser Analytical & Testing Services

APPENDIX C

Tentatively Identified Organic Compounds in Decant Water

Station #9

Technologies,

ATI I.D. # 9107-328-4

VOLATILE ORGANIC ANALYSIS
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT	: PTI ENVIRONMENTAL SERVICES	DATE SAMPLED	: 07/29/91
PROJECT #	: C744-35	DATE RECEIVED	: 07/30/91
PROJECT NAME	: CATCH BASINS	DATE EXTRACTED	: N/A
CLIENT I.D.	: C72912	DATE ANALYZED	: 08/14/91
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8240	DILUTION FACTOR	: 1

COMPOUND	FLAG	SCAN	ESTIMATED CONCENTRATION
BENZENE, 1-ETHYL-2-METHYL-		1012	9.0 NJ
BENZENE, 1-ETHYL-3-METHYL-		1060	15
BENZENE, 1-ETHYL-4-METHYL-		1109	12
BENZENE, 1-METHYL-3-PROPYL-		1129	8.0
CYCLOHEXANEMETHANOL, .ALPHA., .ALPHA., 4-TRIMETHYL		1227	13

STATION #10

Technologies,

ATI I.D. # 9107-328-7

VOLATILE ORGANIC ANALYSIS
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT	: PTI ENVIRONMENTAL SERVICES	DATE SAMPLED	: 07/29/91
PROJECT #	: C744-35	DATE RECEIVED	: 07/30/91
PROJECT NAME	: CATCH BASINS	DATE EXTRACTED	: N/A
CLIENT I.D.	: C72923	DATE ANALYZED	: 08/14/91
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8240	DILUTION FACTOR	: 1

COMPOUND	FLAG	SCAN	ESTIMATED CONCENTRATION
BENZENE, 1,3,5-TRIMETHYL-		1060	7.0 NJ
BENZENE, 1-ETHYL-4-METHYL-		1109	6.0
UNDECANE		1125	8.0
CYCLOHEXANEMETHANOL, .ALPHA., .ALPHA., 4-TRIMETHYL		1227	14
BICYCLO[2.2.1]HEPTAN-2-ONE, 1,7,7-TRIMETHYL		1255	10

STATION #11

Technologies,

ATI I.D. # 9107-328-10

VOLATILE ORGANIC ANALYSIS
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT	: PTI ENVIRONMENTAL SERVICES	DATE SAMPLED	: 07/29/91
PROJECT #	: C744-35	DATE RECEIVED	: 07/30/91
PROJECT NAME	: CATCH BASINS	DATE EXTRACTED	: N/A
CLIENT I.D.	: C72934	DATE ANALYZED	: 08/14/91
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8240	DILUTION FACTOR	: 1

COMPOUND	FLAG	SCAN	ESTIMATED CONCENTRATION
BENZENE, (1-METHYLETHYL)-		1059	6.0 NJ
CYCLOHEXANEMETHANOL, .ALPHA., .ALPHA., 4-TRIMETHYL		1227	15
CAMPHOR		1255	8.0
NAPHTHALENE, 1,2,3,4-TETRAHYDRO		1268	7.0

STATION #12

Technologies,

ATI I.D. # 9107-338-1

VOLATILE ORGANIC ANALYSIS
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT	: PTI ENVIRONMENTAL SERVICES	DATE SAMPLED	: 07/30/91
PROJECT #	: C744-35	DATE RECEIVED	: 07/31/91
PROJECT NAME	: CATCH BASINS	DATE EXTRACTED	: N/A
CLIENT I.D.	: C73001	DATE ANALYZED	: 08/13/91
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8240	DILUTION FACTOR	: 1

COMPOUND	FLAG	SCAN	ESTIMATED CONCENTRATION
UNDECANE		1124	15 NJ
BENZENE, 1-METHYL-2-(1-METHYLETHYL		1136	9.0
UNKNOWN		1192	9.0
DODECANE		1220	9.0
TRIDECANE		1295	9.0

STATION #13

Technologies,

ATI I.D. # 9107-338-4

VOLATILE ORGANIC ANALYSIS
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT	: PTI ENVIRONMENTAL SERVICES	DATE SAMPLED	: 07/30/91
PROJECT #	: C744-35	DATE RECEIVED	: 07/31/91
PROJECT NAME	: CATCH BASINS	DATE EXTRACTED	: N/A
CLIENT I.D.	: C73012	DATE ANALYZED	: 08/13/91
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8240	DILUTION FACTOR	: 1

COMPOUND	FLAG	SCAN	ESTIMATED CONCENTRATION
BENZENE, 1,2,3-TRIMETHYL-		1017	5.0 NJ
BENZENE, 1-ETHYL-3-METHYL-		1058	7.0
CYCLOHEXENE, 4-METHYL-1-(1-METHYL		1083	6.0
BENZENE, 1,2,3-TRIMETHYL-		1107	6.0
CYCLOHEXANEMETHANOL, .ALPHA., .ALPHA., 4-TRIMETHYL		1226	14

STATION #14

Analytical Technologies, Inc.

ATI I.D. # 9107-338-7

VOLATILE ORGANIC ANALYSIS
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT	: PTI ENVIRONMENTAL SERVICES	DATE SAMPLED	: 07/30/91
PROJECT #	: C744-35	DATE RECEIVED	: 07/31/91
PROJECT NAME	: CATCH BASINS	DATE EXTRACTED	: N/A
CLIENT I.D.	: C73023	DATE ANALYZED	: 08/14/91
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8240	DILUTION FACTOR	: 1

COMPOUND	FLAG	SCAN	ESTIMATED CONCENTRATION
BENZENE, 1-ETHYL-2-METHYL-		1580	7.0 NJ

STATION #15

Technologies,

ATI I.D. # 9107-338-10

VOLATILE ORGANIC ANALYSIS
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT	: PTI ENVIRONMENTAL SERVICES	DATE SAMPLED	: 07/30/91
PROJECT #	: C744-35	DATE RECEIVED	: 07/31/91
PROJECT NAME	: CATCH BASINS	DATE EXTRACTED	: N/A
CLIENT I.D.	: C73034	DATE ANALYZED	: 08/14/91
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8240	DILUTION FACTOR	: 1

COMPOUND	FLAG	SCAN	ESTIMATED CONCENTRATION
BENZENE, 1-ETHYL-2-METHYL-		1512	7.0 NJ
BENZENE, 1,2,3-TRIMETHYL-		1580	9.0 J

STATION #16

Analytical Technologies, Inc.

ATI I.D. # 9108-015-1

VOLATILE ORGANIC ANALYSIS
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT	: PTI ENVIRONMENTAL SERVICES	DATE SAMPLED	: 07/31/91
PROJECT #	: C744-35	DATE RECEIVED	: 08/01/91
PROJECT NAME	: CATCH BASINS	DATE EXTRACTED	: N/A
CLIENT I.D.	: C73101	DATE ANALYZED	: 08/14/91
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8240	DILUTION FACTOR	: 1

COMPOUND	FLAG	SCAN	ESTIMATED CONCENTRATION
BENZENE, 1-ETHYL-2-METHYL-		1012	120 NJ
BENZENE, ETHYL, METHYL-		1045	26
BENZENE, 1,2,4-TRIMETHYL-		1060	100
BENZENE, 1-ETHYL-4-METHYL-		1109	11
BENZENE, 1,2-DIETHYL-		1129	14 J

~~ECOLOGY~~ STATION # 1

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

ATI I.D. : 10881801

COMPOUNDS	RESULTS (µg/L)
METHYLBUTANOIC ACID	100 NJ
ORGANIC ACID	100
HEXANOIC ACID	20
HEXANOIC ACID	30
CAMPHOR	20
HEXADECENOIC ACID	30

STATION #2

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

ATI I.D. : 10881809

COMPOUNDS	RESULTS
PENTANOIC ACID	100 NJ
CAMPHOR	100
OXYGENATED HYDROCARBON C10	1000
OCTENOIC ACIDS	900

STATION # 3

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

ATI I.D. : 10881808

COMPOUNDS	RESULTS (ug/L)
OXYGENATED HYDROCARBON C8	100 NJ
OCTENOIC ACIDS	100 ↓

STATION #4

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

ATI I.D. : 10881810

COMPOUNDS	RESULTS
OXYGENATED HYDROCARBON C7	40 NJ

STATION #5

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

ATI I.D. : 10881811

COMPOUNDS	RESULTS (ug/L)
METHYL BUTANOIC ACID	100 NJ
BUTOXY ETHANOL	200
OXYGENATED HYDROCARBON C10	20
OXYGENATED HYDROCARBON C7	100
METHYL INDOLE	20
OXYGENATED HYDROCARBON C7	400

STATION # 7

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

ATI I.D. : 10881807

COMPOUNDS	RESULTS (ug/L)
OXYGENATED HYDROCARBON C10	100 NJ
ETHYL METHYLHEPTANE	100
PROPYL HEPTANOL	100
PROPYL HEPTANOL	100
OXYGENATED HYDROCARBON C8	100
HEXADECANE	100

STATION # 9

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

ATI I.D. : 10881804

COMPOUNDS	RESULTS (ug/L)
CAMPHOR	200 NJ

STATION #10

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

ATI I.D. : 10881803

COMPOUNDS	RESULTS (ug/L)
BUTANEDIOL	100 NJ
METHOXYPROPOXYPROPANOL	1000
CAMPHOR	100
OXYGENATED HYDROCARBON C7	600

STATION # 11

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

ATI I.D. : 10881802

COMPOUNDS	RESULTS (ug/L)
UNKNOWN	100 NJ
METHOXYPROPOXYPROPANOL	200
OXYGENATED HYDROCARBON C10	20
ISOOCTANOL	20
OXYGENATED HYDROCARBON C10	40
OXYGENATED HYDROCARBON C7	300

STATION #12

Technologies, Inc

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

ATI I.D. : 10881816

COMPOUNDS	RESULTS (ug/L)
METHOXYPROPOXYPROPANOL	70 NJ
CAMPHOR	20 ↓
OXYGENATED HYDROCARBON C7	200 ↓

STATION #13

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

ATI I.D. : 10881815

COMPOUNDS	RESULTS (ug/L)
DIMETHYLBENZENE	40 NJ
OXYGENATED HYDROCARBON C7	100
OXYGENATED HYDROCARBON C7	5000
4-NONYLPHENOLS	60
OXYGENATED HYDROCARBON C7	3000 J

STATION # 14

Technologies, inc

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

ATI I.D. : 10881814

COMPOUNDS	RESULTS (ug/L)
METHYLBUTANOIC ACID	100 NJ
HEXANOIC ACID	50
CAMPHOR	200
CYCLOHEXANECARBOXYLIC ACID	90
OCTACOSANE	20
HEXATRICONTANE	20
OCTACOSANE	20
PENTATRIACONTENE	20
HEXATRIACONTANE	40

STATION #15

Analytical Technologies, Inc

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

ATI I.D. : 10881813

COMPOUNDS	RESULTS (ug/L)
CAMPHOR	100 NJ
CYCLOHEXANECARBOXYLIC ACID	40
OXYGENATED HYDROCARBON C7	100

STATION #16

Analytical Technologies, Inc

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

ATI I.D. : 10881812

COMPOUNDS	RESULTS (ug/L)
DIMETHYLBENZENE	20 NJ
PROPYL BENZENE	40
ETHYLMETHYLBENZENE	200
TRIMETHYLBENZENE	60
METHYLETHYLBENZENE	40
TRIMETHYLBENZENE	200
DIETHYLBENZENE	20
DIMETHYLETHYLBENZENE	20
PHOSPHORIC ACID TRIBUTYLESTER	1000

APPENDIX D

Tentatively Identified Organic Compounds in Vactor Sediment

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

308130

Lab Name: WEYERHAEUSER Contract: 046-5751

Lab Code: WEYER Case No.: 06347 SAS No.: _____ SDG No.: 308130

Matrix: (soil/water) SOIL Lab Sample ID: 75271

Sample wt/vol: 5.0 (g/mL) G Lab File ID: A8550

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 25 Date Analyzed: 08/07/91

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	111842	Nonane	25.19	11	J
2.	5881174	Octane, 3-ethyl-	26.27	9.3	J

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

308131

Lab Name: WEYERHAEUSER Contract: 046-5751

Lab Code: WEYER Case No.: 06347 SAS No.: _____ SDG No.: 308130

Matrix: (soil/water) SOIL Lab Sample ID: 75272

Sample wt/vol: 5.0 (g/mL) G Lab File ID: A8551

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 28 Date Analyzed: 08/07/91

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown hydrocarbon	19.49	9.7	J
2.	2867052	.alpha.-Thujene	22.59	38	J
3.		Unknown hydrocarbon	23.57	15	J
4.	6069983	Cyclohexane, 1-methyl-4-(1-m	24.45	8.3	J
5.		UNKNOWN	24.89	8.3	J
6.	124185	Decane	25.22	33	J
7.		Unknown hydrocarbon	26.32	19	J

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

308132

Lab Name: WEYERHAEUSER Contract: 046-5751

Lab Code: WEYER Case No.: 06347 SAS No.: _____ SDG No.: 308130

Matrix: (soil/water) SOIL Lab Sample ID: 75273

Sample wt/vol: 5.0 (g/mL) G Lab File ID: A8552

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 33 Date Analyzed: 08/07/91

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	7045672	Cyclohexane,2-ethyl-1,3-dime	23.59	52	J
2.		Unknown hydrocarbon	26.32	30	J

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

308133

Lab Name: WEYERHAEUSER Contract: 046-5751

Lab Code: WEYER Case No.: 06347 SAS No.: _____ SDG No.: 308130

Matrix: (soil/water) SOIL Lab Sample ID: 75274

Sample wt/vol: 5.0 (g/mL) G Lab File ID: A8575

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 29 Date Analyzed: 08/08/91

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 1678826	Cyclohexane, 1-methyl-4-(1-m	24.50	35	J NJ

-methyl-4-(1-methylethyl)- trans-

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

308134

Lab Name: WEYERHAEUSER Contract: 046-5751

Lab Code: WEYER Case No.: 06347 SAS No.: _____ SDG No.: 308130

Matrix: (soil/water) SOIL Lab Sample ID: 75275

Sample wt/vol: 5.0 (g/mL) G Lab File ID: A8554

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 36 Date Analyzed: 08/07/91

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 80568	ALPHA-PINENE, (-)-	22.59	37	BNJ

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1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

308136RE

Lab Name: WEYERHAEUSER Contract: 046-5751

Lab Code: WEYER Case No.: 06347 SAS No.: _____ SDG No.: 308130

Matrix: (soil/water) SOIL Lab Sample ID: 75277RE

Sample wt/vol: 5.0 (g/mL) G Lab File ID: A8577

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 33 Date Analyzed: 08/08/91

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown hydrocarbon	23.60	33	J NJ
2. 124185	Decane	25.22	27	J
3. 2847725	Decane, 4-methyl-	26.31	21	J

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

308137

Lab Name: WEYERHAEUSER Contract: 046-5751

Lab Code: WEYER Case No.: 06347 SAS No.: _____ SDG No.: 308130

Matrix: (soil/water) SOIL Lab Sample ID: 75278

Sample wt/vol: 5.0 (g/mL) G Lab File ID: A8557

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 32 Date Analyzed: 08/07/91

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	1678917	Cyclohexane, ethyl-	16.44	54	J
2.	2216344	Octane, 4-methyl-	17.44	19	J
3.	2216333	Octane, 3-methyl-	17.84	8.8	J
4.	4926903	Cyclohexane, 1-ethyl-1-methy	20.75	24	J
5.	80568	ALPHA-PINENE, (-)-	22.64	31	J
6.	17301949	Nonane, 4-methyl-	23.07	88	J
7.	5911046	Nonane, 3-methyl-	23.57	100	J
8.	489203	Cyclopentane, 1,2-dimethyl-3	24.90	66	J
9.	124185	Decane	25.24	380	J
10.	2847725	Decane, 4-methyl-	26.32	100	J

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.: 308138

Lab Name: WEYERHAEUSER Contract: 046-5751

Lab Code: WEYER Case No.: 06347 SAS No.: _____ SDG No.: 308130

Matrix: (soil/water) SOIL Lab Sample ID: 75279

Sample wt/vol: 5.0 (g/mL) G Lab File ID: A8558

Level: (low/med) LOW Date Received: 08/01/91

Moisture: not dec. 29 Date Analyzed: 08/08/91

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 6 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	111842	Nonane	19.59	110	J NJ
2.	5911046	Nonane, 3-methyl-	23.59	65	J
3.	6069983	Cyclohexane, 1-methyl-4-(1-m	24.52	65	J
4.	103651	Benzene, propyl-	24.92	70	J
5.	124185	Decane	25.24	370	J
6.	4110445	Octane, 3,3-dimethyl-	26.32	110	J

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.: 308140

Lab Name: WEYERHAEUSER Contract: 046-5751

Lab Code: WEYER Case No.: 06347 SAS No.: _____ SDG No.: 308130

Matrix: (soil/water) SOIL Lab Sample ID: 75281

Sample wt/vol: 5.0 (g/mL) G Lab File ID: A8560

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 36 Date Analyzed: 08/08/91

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 103651	Benzene, propyl-	24.92	47	J
2. 611143	Benzene, 1-ethyl-2-methyl-	25.46	310	J
3. 95636	Benzene, 1,2,4-trimethyl-	25.69	100	J

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

308141

Lab Name: WEYERHAEUSER Contract: 046-5751

Lab Code: WEYER Case No.: 06347 SAS No.: _____ SDG No.: 308130

Matrix: (soil/water) SOIL Lab Sample ID: 75282

Sample wt/vol: 5.0 (g/mL) G Lab File ID: A8561

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 31 Date Analyzed: 08/08/91

Column (pack/cap) CAP Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Number TICs found: 3

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 103651	Benzene, propyl-	24.94	35	J NJ
2. 611143	Benzene, 1-ethyl-2-methyl-	25.42	200	J
3. 95636	Benzene, trimethyl-	25.66	72	J

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

308142

Lab Name: WEYERHAEUSER Contract: 046-5751

Lab Code: WEYER Case No.: 06347 SAS No.: _____ SDG No.: 308130

Matrix: (soil/water) SOIL Lab Sample ID: 75283

Sample wt/vol: 5.0 (g/mL) G Lab File ID: A8562

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 41 Date Analyzed: 08/08/91

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 98828	Benzene, (1-methylethyl)-	23.27	80	J
2. 103651	Benzene, propyl-	24.94	200	J
3. 611143	Benzene, 1-ethyl-2-methyl-	25.44	1000	J
4. 95636	Benzene, 1,2,4-trimethyl-	25.67	270	J

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EPA SAMPLE NO.

308130

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: WEYERHAEUSER Method: 8270

Lab Code: WEYER Case No.: 06347 SAS No.: SDG No.: 75271

Matrix: (soil/water) SOIL Lab Sample ID: 75271

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 2BN10816B

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 26 dec. Date Extracted: 08/09/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/16/91

GPC Cleanup: (Y/N) Y pH: 7.6 Dilution Factor: 1.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1.~~		~~UNKNOWN~~	~~4.85~~	~~45000~~	~~JX~~
2.	57-10-3	HEXADECANOIC ACID	24.00	3000	JX
3.	24035-50-5	1-PHENANTHRENECARBOXALDEHYDE	24.84	1500	JX
4.	10544-50-0	SULFUR, MOL. (S8)	25.12	1300	JX
5.		UNKNOWN	25.81	1500	JX
6.		UNKNOWN hydrocarbon	25.94	1200	JX
7.	57-11-4	OCTADECANOIC ACID	26.41	960	JX
8.		UNKNOWN	28.71	3900	JX
9.		UNKNOWN	30.04	1800	JX
10.	630-02-4	OCTACOSANE	32.04	1600	JX
11.		UNKNOWN	32.89	2200	JX
12.		UNKNOWN	33.36	1400	JX
13.		UNKNOWN hydrocarbon	33.96	1100	JX
14.		UNKNOWN hydrocarbon	35.82	840	JX
15.		UNKNOWN	35.92	1800	JX
16.		UNKNOWN	36.42	1900	JX
17.	83-47-6	.GAMMA.-SITOSTEROL	38.09	4300	JX
18.		UNKNOWN	38.26	890	JX
19.		UNKNOWN	38.62	1800	JX
20.		UNKNOWN	39.44	850	JX

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

308131

Lab Name: WEYERHAEUSER Method: 8270

Lab Code: WEYER Case No.: 06347 SAS No.: SDG No.: 75271

Matrix: (soil/water) SOIL Lab Sample ID: 75272

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 2BN10816C

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 28 dec. Date Extracted: 08/09/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/16/91

GPC Cleanup: (Y/N) Y pH: 7.2 Dilution Factor: 8.0

Number TICs found: 20 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~	~~4.73~~	~~91000~~	JX
2.	140-66-9	PHENOL, 4-(1,1,3,3-TETRAMETH	19.10	5500	JX NJ
3.		UNKNOWN	23.54	7800	JX
4.		UNKNOWN	25.81	4700	JX
5.	3442-78-2	PYRENE, 2-METHYL-	27.44	5400	JX
6.	3353-12-6	PYRENE, 4-METHYL-	27.72	5100	JX
7.		UNKNOWN hydrocarbon	27.91	3300	JX
8.		UNKNOWN	28.66	6500	JX
9.		UNKNOWN hydrocarbon	28.99	6500	JX
10.	629-99-2	PENTACOSANE	30.04	9800	JX
11.		~~UNKNOWN~~ Hexatriacontane	31.06	12000	JX
12.		~~UNKNOWN~~ Pentatriacontane	32.04	17000	JX
13.	630-02-4	OCTACOSANE	32.99	38000	JX
14.	205-82-3	BENZO[J]FLUORANTHENE	33.76	10000	JX
15.	630-03-5	NONACOSANE	33.94	28000	JX
16.		UNKNOWN hydrocarbon	34.87	16000	JX
17.		UNKNOWN hydrocarbon	35.79	14000	JX
18.		UNKNOWN hydrocarbon	37.72	6500	JX
19.		UNKNOWN	38.07	10000	JX
20.		UNKNOWN	38.59	5500	JX

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

308132

Lab Name: WEYERHAEUSER Method: 8270

Lab Code: WEYER Case No.: 06347 SAS No.: SDG No.: 75271

Matrix: (soil/water) SOIL Lab Sample ID: 75273

Sample wt/vol: 30.9 (g/mL) G Lab File ID: 2BN10816D

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 32 dec. Date Extracted: 08/09/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/16/91

GPC Cleanup: (Y/N) Y pH: 7.0 Dilution Factor: 4.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1.~~		~~UNKNOWN~~	~~4.75~~	~~69000~~	~~JX~~
2.	57-10-3	HEXADECANOIC ACID	23.95	4200	JX
3.		UNKNOWN	25.79	4100	JX
4.		UNKNOWN	26.09	2500	JX
5.		UNKNOWN PAH	27.19	2800	JX
6.		UNKNOWN	28.67	4700	JX
7.		UNKNOWN hydrocarbon	30.04	4200	JX
8.		UNKNOWN hydrocarbon	32.04	3700	JX
9.		UNKNOWN	32.87	4700	JX
10.	205-82-3	BENZO[J]FLUORANTHENE	33.76	2800	JX
11.		UNKNOWN hydrocarbon	33.94	2800	JX
12.		UNKNOWN	35.64	4200	JX
13.	630-03-5	NONACOSANE	35.81	3700	JX
14.		UNKNOWN hydrocarbon	35.91	3400	JX
15.		UNKNOWN	36.19	3900	JX
16.		UNKNOWN	36.42	3000	JX
17.		UNKNOWN	38.09	11000	JX
18.		UNKNOWN	38.24	2700	JX
19.		UNKNOWN	38.62	5700	JX
20.	1058-61-3	STIGMAST-4-EN-3-ONE	39.41	2500	JX

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EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

308133

Lab Name: WEYERHAEUSER Method: 8270

Lab Code: WEYER Case No.: 06347 SAS No.: SDG No.: 75271

Matrix: (soil/water) SOIL Lab Sample ID: 75274

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 2BN10816E

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 27 dec. Date Extracted: 08/09/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/16/91

GPC Cleanup: (Y/N) Y pH: 7.0 Dilution Factor: 1.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1.~~		~~UNKNOWN~~	~~4.87~~	~~53000~~	~~JX~~
2.	57-10-3	HEXADECANOIC ACID	24.04	3800	JX
3.		UNKNOWN	28.76	3400	JX
4.		UNKNOWN hydrocarbon	30.14	2600	JX
5.	630-02-4	OCTACOSANE	32.14	2200	JX
6.		UNKNOWN	32.54	1400	JX
7.		UNKNOWN	32.97	1000	JX
8.		UNKNOWN	33.09	1500	JX
9.		UNKNOWN	33.41	1300	JX
10.		UNKNOWN	33.47	840	JX
11.		UNKNOWN	34.06	2400	JX
12.		UNKNOWN	35.09	1200	JX
13.		UNKNOWN	35.76	2000	JX
14.		UNKNOWN hydrocarbon	35.91	1500	JX
15.		UNKNOWN hydrocarbon	36.01	2900	JX
16.		UNKNOWN	36.52	3200	JX
17.		UNKNOWN	37.44	2400	JX
18.		UNKNOWN	38.19	3800	JX
19.		UNKNOWN	38.34	1200	JX
20.		UNKNOWN	38.72	1500	JX

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EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

308134

Lab Name: WEYERHAEUSER Method: 8270

Lab Code: WEYER Case No.: 06347 SAS No.: SDG No.: 75271

Matrix: (soil/water) SOIL Lab Sample ID: 75275

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 2BN10816F

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 36 dec. Date Extracted: 08/09/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/16/91

GPC Cleanup: (Y/N) Y pH: 6.8 Dilution Factor: 4.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1.~~	~~UNKNOWN~~	~~4.75~~	~~63000~~	~~JX~~
2.	UNKNOWN	30.11	9200	JX NJ
3.	UNKNOWN hydrocarbon	31.71	5000	JX
4.	UNKNOWN hydrocarbon	32.11	2600	JX
5.	UNKNOWN	32.47	4000	JX
6.	UNKNOWN hydrocarbon	32.51	3600	JX
7.	UNKNOWN	33.07	7000	JX
8.	UNKNOWN	33.39	4400	JX
9.	UNKNOWN	33.46	4700	JX
10.	UNKNOWN hydrocarbon	34.02	7900	JX
11.	UNKNOWN	34.94	2600	JX
12.	UNKNOWN	35.06	4300	JX
13.	UNKNOWN	35.72	9700	JX
14.	UNKNOWN hydrocarbon	35.89	5200	JX
15.	UNKNOWN	35.99	8400	JX
16.	UNKNOWN	36.52	10000	JX
17.	UNKNOWN hydrocarbon	36.84	4100	JX
18.	UNKNOWN	38.19	17000	JX
19.	UNKNOWN	38.32	4100	JX
20.	UNKNOWN	38.71	6000	JX

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EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

308135

Lab Name: WEYERHAEUSER Method: 8270

Lab Code: WEYER Case No.: 06347 SAS No.: SDG No.: 75271

Matrix: (soil/water) SOIL Lab Sample ID: 75276

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 2BN10816G

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 27 dec. Date Extracted: 08/09/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/16/91

GPC Cleanup: (Y/N) Y pH: 7.4 Dilution Factor: 1.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	4.90	52000	JX
2.	74645-98-0	DODECANE, 2,7,10-TRIMETHYL-	17.42	1200	JX NJ
3.	544-76-3	HEXADECANE	18.97	1900	JX
4.	629-78-7	HEPTADECANE	20.44	2100	JX
5.	54105-67-8	HEPTADECANE, 2,6-DIMETHYL-	20.52	1800	JX
6.		~~UNKNOWN~~ Hexadecane-	21.84	1800	JX
7.		~~UNKNOWN~~ Dodecane, 2,7,10-Trimethyl	21.97	1500	JX
8.		~~UNKNOWN~~ Undecane, 3,8-Dimethyl	23.17	1500	JX
9.	57-10-3	HEXADECANOIC ACID	24.04	4000	JX
10.		UNKNOWN	24.44	1600	JX
11.	629-97-0	DOCOSANE	25.67	1400	JX
12.	57-11-4	OCTADECANOIC ACID	26.44	1600	JX
13.		UNKNOWN	28.74	3700	JX
14.		UNKNOWN hydrocarbon	30.11	1600	JX
15.		UNKNOWN	31.71	1400	JX
16.		UNKNOWN	32.94	1600	JX
17.		UNKNOWN	33.44	2300	JX
18.		UNKNOWN	35.72	2200	JX
19.		UNKNOWN	35.89	1000	JX
20.		UNKNOWN	36.51	1800	JX

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

308136

Lab Name: WEYERHAEUSER Method: 8270

Lab Code: WEYER Case No.: 06347 SAS No.: SDG No.: 75271

Matrix: (soil/water) SOIL Lab Sample ID: 75277

Sample wt/vol: 30.8 (g/mL) G Lab File ID: 2BN10816H

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 33 dec. Date Extracted: 08/09/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/16/91

GPC Cleanup: (Y/N) Y pH: 6.7 Dilution Factor: 4.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	4.75	65000	JX
2.		UNKNOWN hydrocarbon	27.27	3700	JX NJ
3.		UNKNOWN hydrocarbon	30.12	7700	JX
4.		UNKNOWN hydrocarbon	31.72	6600	JX
5.	630-02-4	OCTACOSANE	32.14	7100	JX
6.		UNKNOWN	32.54	6900	JX
7.		UNKNOWN	32.74	11000	JX
8.		UNKNOWN	33.09	5600	JX
9.		UNKNOWN	33.41	3800	JX
10.		UNKNOWN	33.47	5100	JX
11.		UNKNOWN Tetracosane 2,6,10,14-tetramethyl	34.04	5000	JX
12.		UNKNOWN	35.09	5700	JX
13.		UNKNOWN	35.76	11000	JX
14.		UNKNOWN	35.91	4300	JX
15.		UNKNOWN	36.01	5100	JX
16.		UNKNOWN	36.54	12000	JX
17.		UNKNOWN	37.46	4900	JX
18.		UNKNOWN	38.22	14000	JX
19.		UNKNOWN	38.36	3700	JX
20.		UNKNOWN	38.74	5800	JX

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

308137

Lab Name: WEYERHAEUSER Method: 8270

Lab Code: WEYER Case No.: 06347 SAS No.: SDG No.: 75271

Matrix: (soil/water) SOIL Lab Sample ID: 75278

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 2BN10816I

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 32 dec. Date Extracted: 08/09/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/16/91

GPC Cleanup: (Y/N) Y pH: 7.3 Dilution Factor: 4.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~	~~4.78~~	~~72000~~	~~JX~~
2.	74645-98-0	DODECANE, 2,7,10-TRIMETHYL-	17.42	5100	JX NJ
3.	544-76-3	HEXADECANE	18.97	7500	JX
4.	629-78-7	HEPTADECANE	20.44	7000	JX
5.	55045-11-9	TRIDECANE, 5-PROPYL-	20.52	4600	JX
6.		~~UNKNOWN~~ Dodecane [illegible]	21.84	5500	JX
7.		~~UNKNOWN~~ Heptadecane	23.15	6200	JX
8.	57-10-3	HEXADECANOIC ACID	23.99	7400	JX
9.		UNKNOWN Hydrocarbon	24.44	6200	JX
10.	54833-48-6	HEPTADECANE, 2,6,10,15-TETRA	25.66	3800	JX
11.		UNKNOWN hydrocarbon	27.96	4500	JX
12.	511-15-9	2-PHENANTHRENOL, 4B,5,6,7,8,	28.29	16000	JX
13.		UNKNOWN	29.69	3400	JX
14.		UNKNOWN hydrocarbon	30.07	5000	JX
15.		UNKNOWN hydrocarbon	32.07	5100	JX
16.	630-02-4	OCTACOSANE	33.02	5200	JX
17.		UNKNOWN hydrocarbons	33.99	5000	JX
18.		UNKNOWN	34.14	16000	JX
19.		UNKNOWN	35.69	7800	JX
20.	630-03-5	NONACOSANE	35.86	5000	JX

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EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

308138

Lab Name: WEYERHAEUSER Method: 8270

Lab Code: WEYER Case No.: 06347 SAS No.: SDG No.: 75271

Matrix: (soil/water) SOIL Lab Sample ID: 75279

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 2BN10822E

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 29 dec. Date Extracted: 08/09/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/22/91

GPC Cleanup: (Y/N) Y pH: 7.0 Dilution Factor: 5.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	13.79	6700	JX NJ
2.	62238-11-3	DECANE, 2,3,5-TRIMETHYL-	15.52	16000	JX
3.	74645-98-0	DODECANE, 2,7,10-TRIMETHYL-	17.17	19000	JX
4.	544-76-3	HEXADECANE	18.70	24000	JX
5.		UNKNOWN hydrocarbon	19.42	6300	JX
6.	629-78-7	HEPTADECANE	20.17	12000	JX
7.		~~UNKNOWN~~ Dodecane, 2,7,10-Trimethyl	20.25	11000	JX
8.		~~UNKNOWN~~ Dodecane 2,6,11-Trimethyl	21.55	11000	JX
9.		~~UNKNOWN~~ Dodecane 2,7,10-Trimethyl	21.69	9900	JX
10.		~~UNKNOWN~~ Hexadecane	22.89	14000	JX
11.		~~UNKNOWN~~ Hexadecane	24.15	6500	JX
12.		~~UNKNOWN~~ Undecane 3,8-Dimethyl	25.37	5200	JX
13.		UNKNOWN	27.66	5500	JX
14.	511-15-9	2-PHENANTHRENOL, 4B,5,6,7,8,	27.97	29000	JX
15.		UNKNOWN hydrocarbon	29.79	5300	JX
16.	630-02-4	OCTACOSANE	31.77	8700	JX
17.	630-03-5	NONACOSANE	33.69	13000	JX
18.		~~UNKNOWN~~ Hexatriacontane	35.56	7300	JX
19.		UNKNOWN	36.12	10000	JX
20.		UNKNOWN	37.77	18000	JX

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

308139

Lab Name: WEYERHAEUSER Method: 8270

Lab Code: WEYER Case No.: 06347 SAS No.: SDG No.: 75271

Matrix: (soil/water) SOIL Lab Sample ID: 75280

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 2BN10822G

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 27 dec. Date Extracted: 08/09/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/22/91

GPC Cleanup: (Y/N) Y pH: 7.1 Dilution Factor: 5.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	544-76-3	HEXADECANE	18.69	6800	JX NJ
2.	629-78-7	HEPTADECANE	20.15	4900	JX
3.	54105-67-8	HEPTADECANE, 2,6-DIMETHYL-	20.24	3900	JX
4.		~~UNKNOWN~~ Dodecane 4,7,10-trimethyl	21.54	4800	JX
5.		~~UNKNOWN~~ Dodecane [illegible]	22.89	9400	JX
6.	57-10-3	HEXADECANOIC ACID	23.69	6100	JX
7.		~~UNKNOWN~~ Dodecane [illegible]	24.15	4900	JX
8.		~~UNKNOWN~~ Hexadecane	25.37	3700	JX
9.		UNKNOWN	26.54	2400	JX
10.		~~UNKNOWN~~ Decanedioic Acid Diocty Ester	27.86	3500	JX
11.	511-15-9	2-PHENANTHRENOL, 4B,5,6,7,8,	27.96	4700	JX
12.		UNKNOWN hydrocarbon	29.79	6400	JX
13.		UNKNOWN Hexatriacontane	31.79	5900	JX
14.		UNKNOWN	33.07	9400	JX
15.	630-03-5	NONACOSANE	33.69	7400	JX
16.		UNKNOWN hydrocarbons	34.62	2900	JX
17.		UNKNOWN	35.34	8400	JX
18.		UNKNOWN hydrocarbon	35.56	4300	JX
19.		UNKNOWN	36.12	9300	JX
20.		UNKNOWN	37.79	11000	JX

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

308140

Lab Name: WEYERHAEUSER Method: 8270

Lab Code: WEYER Case No.: 06347 SAS No.: SDG No.: 75271

Matrix: (soil/water) SOIL Lab Sample ID: 75281

Sample wt/vol: 30.9 (g/mL) G Lab File ID: 2BN10822H

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 35 dec. Date Extracted: 08/09/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/22/91

GPC Cleanup: (Y/N) Y pH: 7.0 Dilution Factor: 5.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	544-76-3	HEXADECANE	18.70	10000	JX NJ
2.	629-78-7	HEPTADECANE	20.17	8600	JX
3.	54105-67-8	HEPTADECANE, 2,6-DIMETHYL-	20.25	12000	JX
4.		~~UNKNOWN~~ Hexadecane	21.57	8500	JX
5.		~~UNKNOWN~~ Dodecane 2,6,10-Trimethyl-	21.70	9200	JX
6.		~~UNKNOWN~~ Dodecane 2,7,10-Trimethyl-	22.90	15000	JX
7.	57-10-3	HEXADECANOIC ACID	23.77	28000	JX
8.		UNKNOWN	24.10	8700	JX
9.		UNKNOWN hydrocarbon	24.17	6400	JX
10.	629-97-0	DOCOSANE	25.39	7100	JX
11.		UNKNOWN hydrocarbon	26.56	3100	JX
12.		UNKNOWN	28.97	6700	JX
13.		UNKNOWN hydrocarbon	29.81	9400	JX
14.		~~UNKNOWN~~ Tetratetracontane 3,5,24-Trimethyl-	31.81	8200	JX
15.	630-03-5	NONACOSANE	33.72	12000	JX
16.		UNKNOWN hydrocarbon	34.64	8300	JX
17.		UNKNOWN	35.37	11000	JX
18.		~~UNKNOWN~~ Tetratetracontane	35.57	13000	JX
19.		UNKNOWN	36.16	11000	JX
20.		UNKNOWN	37.81	12000	JX

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

308141

Lab Name: WEYERHAEUSER Method: 8270

Lab Code: WEYER Case No.: 06347 SAS No.: SDG No.: 75271

Matrix: (soil/water) SOIL Lab Sample ID: 75282

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 2BN10822I

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 31 dec. Date Extracted: 08/09/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/22/91

GPC Cleanup: (Y/N) Y pH: 7.1 Dilution Factor: 2.5

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	544-76-3	HEXADECANE	18.72	8600	JX NJ
2.	629-78-7	HEPTADECANE	20.20	7400	JX
3.	54105-67-8	HEPTADECANE, 2,6-DIMETHYL-	20.29	7900	JX
4.		~~UNKNOWN~~ Dodecane 2,6,11-trimethyl	21.60	6800	JX
5.		~~UNKNOWN~~ Dodecane 2,7,10-trimethyl	21.74	7100	JX
6.		UNKNOWN	22.84	7600	JX
7.		UNKNOWN hydrocarbon	22.94	7500	JX
8.	84-64-0	1,2-BENZENEDICARBOXYLIC ACID	23.80	13000	JX
9.	57-10-3	HEXADECANOIC ACID	23.85	7200	JX
10.		UNKNOWN hydrocarbon	24.20	4400	JX
11.	10544-50-0	SULFUR, MOL. (S8)	24.90	11000	JX
12.	54833-48-6	HEPTADECANE, 2,6,10,15-TETRA	25.42	5400	JX
13.	57-11-4	OCTADECANOIC ACID	26.26	5600	JX
14.		UNKNOWN	28.24	23000	JX
15.	78-51-3	ETHANOL, 2-BUTOXY-, PHOSPHAT	29.04	3400	JX
16.		UNKNOWN hydrocarbon	29.87	5700	JX
17.		UNKNOWN hydrocarbon	31.87	3700	JX
18.		UNKNOWN hydrocarbon	33.79	4300	JX
19.		UNKNOWN hydrocarbon	35.66	3500	JX
20.		UNKNOWN	36.24	6000	JX V

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

308142

Lab Name: WEYERHAEUSER Method: 8270

Lab Code: WEYER Case No.: 06347 SAS No.: SDG No.: 75271

Matrix: (soil/water) SOIL Lab Sample ID: 75283

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 2BN10822J

Level: (low/med) LOW Date Received: 08/01/91

% Moisture: not dec. 41 dec. Date Extracted: 08/09/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/22/91

GPC Cleanup: (Y/N) Y pH: 7.3 Dilution Factor: 2.5

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	611-14-3	BENZENE, 1-ETHYL-2-METHYL-	7.00	6300	JX NJ
2.	526-73-8	BENZENE, 1,2,3-TRIMETHYL-	7.70	3000	JX
3.	544-76-3	HEXADECANE	18.70	3300	JX
4.	126-73-8	PHOSPHORIC ACID TRIBUTYL EST	19.52	4100	JX
5.	629-78-7	HEPTADECANE	20.15	3400	JX
6.	57-10-3	HEXADECANOIC ACID	23.72	5100	JX
7.	10544-50-0	SULFUR, MOL. (S8)	24.84	4500	JX
8.		UNKNOWN	25.52	4200	JX
9.	511-15-9	2-PHENANTHRENOL, 4B,5,6,7,8,	27.96	4300	JX
10.		UNKNOWN	28.42	4800	JX
11.	629-99-2	PENTACOSANE	29.77	3900	JX
12.	630-02-4	OCTACOSANE	31.77	4100	JX
13.		UNKNOWN	32.62	2400	JX
14.		UNKNOWN hydrocarbon	33.69	3000	JX
15.		UNKNOWN	34.72	5100	JX
16.		UNKNOWN	35.66	9900	JX
17.	57-88-5	CHOLESTEROL	35.92	4600	JX
18.	83-47-6	.GAMMA.-SITOSTEROL	37.81	14000	JX
19.		UNKNOWN	38.31	4200	JX
20.	1058-61-3	STIGMAST-4-EN-3-ONE	39.14	4000	JX